Appendix 1.1 Location of Specified Information in the ES

Specified Information in Part 1 of the EIA regulations		Location within the ES
4 (2)	The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors—	
4 (2)(a)	Population and Human Health	Population Assessment provided within **Chapter 7: Socio Economics**.
4(2)(b)	Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC	See **Chapter 5: Ecological Impact Assessment** (and associated appendices).
4(2)(c)	Land, soil, water, air and climate	See **Chapter 4: Air Quality** (and associated appendices). Also see **Chapter 9: Water Environment and Flood Risk** (and associated appendices). Also see **Chapter 10: Climate Change and Greenhouse Gases** (and associated appendices).
4(2)(d)	Material assets, Cultural Heritage and the landscape	See **Chapter 6: Landscape and Visual Amenity** (and associated appendices). Also see **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives**

Specified Information in Part 1 of the EIA regulations		Location within the ES
4(2)(e)	The interaction between the factors referred to in sub-paragraphs (a) to (d)	See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.**
4(3)	The effects referred to in paragraph (2) on the factors set out in that paragraph must include the operational effects of the proposed development, where the proposed development will have operational effects.	See **Chapters 4 to 10** and **Appendices (Volume II),** which outline the operational effects and likely residual effects of the Proposed Development.
4(4)	The significant effects to be identified, described and assessed under paragraph (2) include the expected significant effects arising from the vulnerability of the proposed development to major accidents and disasters that are relevant to that development.	Major Accidents and Disasters have been scoped out of the EIA with agreement from Cardiff Council. See **Chapter 1: Introduction and EIA Methodology.**
4(5)	The relevant planning authority or the Secretary of State must ensure that they have, or have access as necessary to, sufficient expertise to examine the environmental statement.	

Specified Information in Schedule 4 of EIA Regulations		Location within the ES
1	Description of the development, including in particular:	
(a)	A description of the location of the development;	See **Chapter 2: Description of the Site, Surroundings and Background**.
(b)	A description of the physical characteristics of the whole development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.**
(c)	A description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapters 4 to 10** and **Appendices (Volume II).**
(d)	An estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operational phases;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapter 4: Air Quality** (and associated appendices). Also see **Appendix 3.3 Noise Impact Assessment** (and associated appendices). Also see **Chapter 10: Climate Change** (and associated appendices).
2	A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapters 4 to 10** and **Appendices (Volume II).**
3	A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort based on the availability of	See **Chapter 2: Description of the Site, Surroundings and Background**. Also see **Chapters 4 to 10** and **Appendices (Volume II).**

	environmental information and scientific knowledge;	
4	A description of the factors specified in regulation 4(2) likely to be significantly affected by the development: population, human health, biodiversity (for example flora and fauna), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity, quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;	See **Chapter 1: Introduction and EIA Methodology** outlines which topics have been scoped out of the ES, in agreement with Cardiff Council. Also see **Chapters 4 to 10** and **Appendices (Volume II).** See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.**
5	A description of the likely significant effects of the development on the environment resulting from, inter alia;	See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.** Also see **Chapters 4 to 10** and **Appendices (Volume II).**
(a)	The construction and existence of the development, including, where relevant, demolition works;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapters 4 to 10** and **Appendices (Volume II).** See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.**
(b)	The use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapters 4 to 10** and **Appendices (Volume II).**
(c)	The emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** **Chapter 4: Air Quality.** **Appendix 3.3 Noise Impact Assessment** Waste and Ground Conditions and Contamination has been considered and relevant receptors have been determined not likely to experience significant environmental effects, and the topic has been subsequently scoped out of the EIA with agreement from Cardiff Council. See **Chapter 1: Introduction and EIA Methodology**

(d)	The risks to human health, cultural heritage or the environment (for example due to accidents or disasters)	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapter 7: Socio-economics** (and associated appendices)**.** See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.** Vulnerability to Major Accidents and Disasters have been considered and relevant receptors have been determined not likely to experience significant environmental effects, and the topic has been subsequently scoped out of the EIA with agreement from Cardiff Council. See **Chapter 1: Introduction and EIA Methodology**
(e)	The cumulative of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;	See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.** Also see **Chapters 4 to 10** (and associated appendices).
(f)	The impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change;	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapter 10: Climate Change and Greenhouse Gases.**
(g)	The technologies and the substances used.	See **Chapter 3: Proposed Development, Demolition, Construction and Description of Alternatives.** Also see **Chapters 4 to 10** (and associated appendices).
6	A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge), encountered compiling the required information and the main uncertainties involved.	See **Chapter 1: Introduction and EIA Methodology** Also see **Chapters 4 to 10** (and associated appendices).
7	A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	See **Chapter 1: Introduction and EIA Methodology** Also see **Chapters 4 to 10** (and associated appendices).

		See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.**
8	A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters that are relevant to the project concerned.	See **Chapter 1: Introduction and EIA Methodology.** Also see **Chapters 4 to 10** (and associated appendices). See **Chapter 11: Residual Effects, Mitigation and Monitoring and Cumulative Effects.** Vulnerability to Major Accidents and Disasters have been considered and relevant receptors have been determined not likely to experience significant environmental effects, and the topic has been subsequently scoped out of the EIA with agreement from Cardiff Council. See **Chapter 1: Introduction and EIA Methodology**
9	A non-technical summary of the information is provided under paragraphs 1 to 8.	See **Volume III: Non-Technical Summary.**
10	A reference list detailing the sources used for the descriptions and assessments is included in the Environmental Statement.	All ES Chapters as footnotes.

DEVELOPMENT MANAGEMENT
DELEGATION OF PLANNING FUNCTIONS FORM

City Development

LOCAL GOVERNMENT ACT 1972 SECTION 101
DELEGATION OF PLANNING FUNCTIONS – SCREENING AND SCOPING OPINION

Mr J Jaulim
Iceni, Da Vinci House
44 Saffron Hill
London

Application Number:	**SC/21/00018/MJR**
Location:	**CARDIFF EAST PARK AND RIDE**
Proposal:	**REQUEST FOR A FORMAL EIA SCOPING OPINION FOR COMMERCIAL DEVELOPMENT**

1. INTRODUCTION

I refer to your application dated 17th December 2021, which comprises an Environmental Impact Assessment Scoping Report (hereafter referred to as the SR) and plans. The application requests scoping opinion for the proposed commercial development and access bridge.

2. BACKGROUND

The applicant had sought the view of the LPA of screening the development, to see if it was to be considered EIA development. The LPA responded on 7th December, 2021 that in its view the proposal was above the threshold set within the EIA regulations and based upon the submitted information the proposal would constitute EIA development (reference SC/21/00006/MJR). This application seeks the view of the LPA to the Scoping of the submission of the Environmental Statement Full details are outlined in chapter 3 of the Scoping Report (RS). For clarity, the details of the development for screening and scoping are the same.

The site location is indicated in figure 1 below:

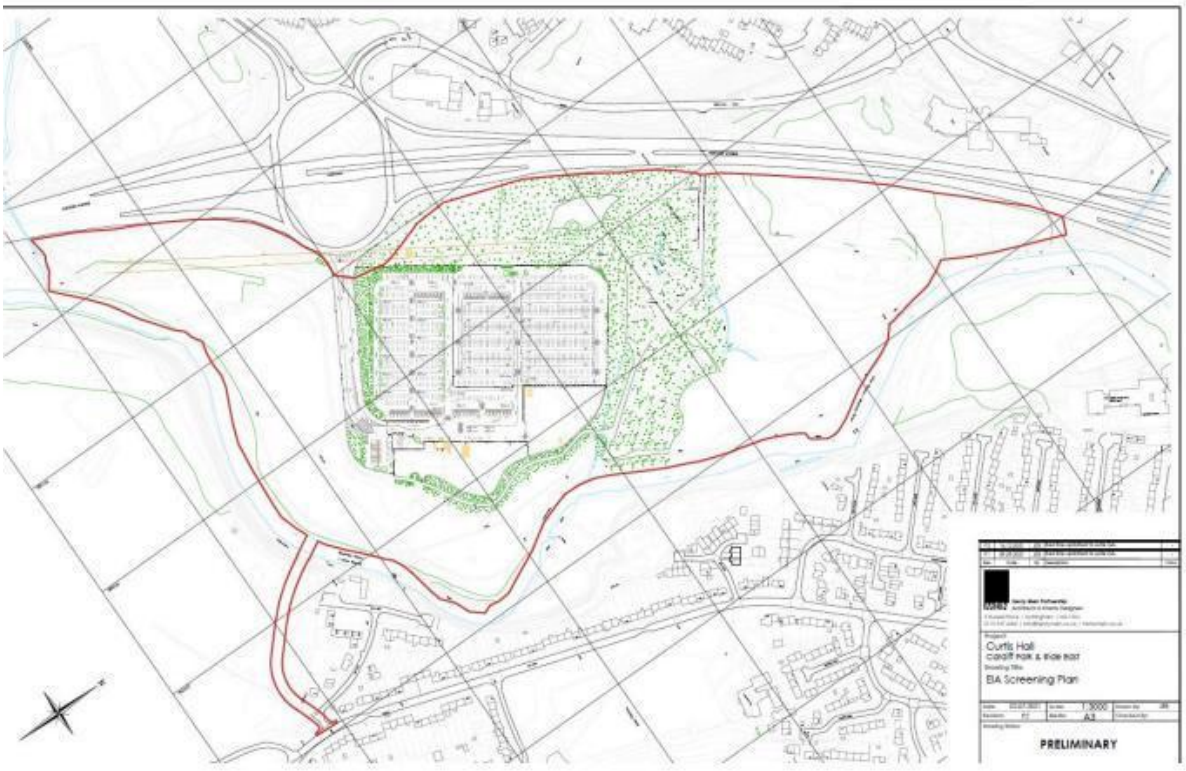

Figure 1: Site Location

3. SITE HISTORY

No relevant planning history.

4. SCREENING OPINION

This has been considered and confirmed by the LPA that the proposal is an EIA development (reference SC/21/00006/MJR)

5. SCOPING OPINION

This opinion sets out the information that Cardiff Council considers should be included in the Environmental Statement (hereafter referred to as ES) for the subject development. This has taken account of the following in accordance with Part 4, article 14 (6) of the EIA Regs:

a) any information provided by the applicant about the proposed development (Iceni Request for an EIS Scoping Opinion);
b) the specific characteristics of the particular development;
c) the specific characteristics of development of the type concerned; and
d) the environmental features likely to be significantly affected by the development.

The document submitted contains sufficient information for Cardiff Council to provide a formal Screening and Scoping Opinion under Regulations 14(2) of the Town and

Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (hereafter referred to as EIA Regs).

The content of the Environmental Statement (hereafter referred to as ES) which accompanies an EIA development must include, as a minimum, the information set out in the EIA regs which is detailed in Part 5, Regulation 17 and Schedule 4. Part 5, Regulation 17 (c) requires an ES to be based on the most recent scoping opinion.

Please note the scoping opinion is based on the information available to the Local Planning Authority at this time. The information provided is not a definitive list of the ES / EIA requirements and further information may be required following an application for this project, to ensure a full assessment is carried out.

6. INTERNAL CONSULTEE RESPONSES

The scoping opinion is informed by responses received from the internal and external consultees. The responses are summarised in Section 6 (internal) and Section 7 (external) and where necessary, the full response is provided.

Ecology Officer: The following concerns were raised.

Statutory Designated Sites

The Severn Estuary Ramsar, the Severn Estuary Special Area of Conservation (SAC), and the Severn Estuary Special Protection Area (SPA) are noted with 3.4km. The site is within 1000m of a connecting watercourse with ditches/or streams on the site and includes a connecting road over the Rhymney River.

“Two nationally designated sites would also be considered as part of the assessment these are the Rhymney River Section Site of Special Scientific Interest (SSSI) located 1.6 km to the south, Howardian Local Nature reserve (LNR) located 1.7km to the south.” There is potential for hydrological connectivity
to the SSSI.

Non-statutory Sites

“Ten non-statutory designated sites identified as part of the data search, the closest of these was the River Rhymney Site of Important Nature Conservation (SINC) located 22m east of the Site boundary. It is anticipated that the proposals are unlikely to affect the SINC habitats so long as appropriate pollution prevention measures are put in place, due to the close proximity of the SINC to the development footprint, the proposals may affect the species using the SINC such as foraging and commuting bats.”

This will require further assessment especially given the direct impact of a road bridge spanning the River Rhymney SINC and a road running parallel with part of the SINC to the north.

The River Rhymney SINC also appears to be within the site boundary, not adjacent, given the proposed red line boundary.

Habitats:
Broadleaved semi-natural woodland, large area of dense scrub, bracken, hardstanding car park, scattered scrub, a building, bare ground, poor semi-improved

grassland, seasonal standing water and a drain. Ancient woodland has also been identified. The majority of the woodland at the site is likely to be habitat of principal importance. The mosaic of habitats, especially connected to the river is also of importance at the site.

Protected Species/Species of Principal Importance
The documents note the following species:
- Birds – habitat for a range of species.
- Great crested newt – scoped out.
- Reptiles – surveys undertaken, no records. Survey validity needs further assessment in the future.
- Hedgehogs – assumed to be present.
- Bats – trees with bat roosting potential, also bat activity transects undertaken with 6 species
identified thus far. Survey validity needs further assessment in the future.
- Badgers – potential to be present, none recorded.
- Hazel dormouse – surveys being undertaken, dormouse identified at the site.

Survey validity will need further assessment in the future.

Invasive non-native species
“Extensive Japanese knotweed, together with less abundant Himalayan balsam, both invasive species listed on Schedule 9 of the WCA 1981 (as amended) were recorded.” This is a correct assessment of the situation, they are extensive at the site.

On-Site enhancements/ Off -Site enhancements
The following are so far stated and welcomed:
“Planting should aim to enhance retained or adjacent vegetation and be of native species, or those of known value to wildlife, sourced from local nurseries to enhance foraging opportunities for local birds and bats, by increasing the invertebrate diversity on-Site. A buffer should be maintained to the Ancient Woodland comprising native trees and scrub planting. Installation of bird nest and bat boxes on trees to be retained around the Site to provide opportunities for a range of species recorded within the local area. “

Deviation /Limitations – Surveys
Survey validity needs further assessment in the future when all survey results are shown.

Summary of requirements / Conditions
The methods for the Ecology Chapter of the Environmental Statement (ES) state that it will follow that of “the CIEEM (Chartered Institute of Ecology and Environmental Management) Guidelines for PEA (CIEEM, 2013) and CIEEM Guidelines for EcIA (Ecological Impact Assessment) (CIEEM, 2016).”
Please note there is now a 2018 version. This approach is welcomed.

The EcIA should also conform to the British Standard BS42020:2013, entitled ‘Biodiversity – Code of Practice for Planning and Development’. Other aspects of best practice for habitats-species groups should also be followed such as, Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.) The Bat Conservation Trust, London.

The general methodology for impact assessment is welcomed and it is noted that this will vary between subject areas.

The Ecology chapter should include:

- The scoping process and its conclusions.
- Establishing the baseline.
- The important ecological features and their nature conservation value which will include those that have legal protection/controlled. The importance of the overall ecosystem should also be considered at this point.
- The impact assessment which includes characterising impacts and their effects (including cumulative), incorporating avoidance to mitigation, residual effects, compensation if required, monitoring and ecological enhancement.

A number of other aspects have been identified that should be considered. These include:
- No mention that a Habitat Regulation Assessment screening stage will be undertaken.
- No mention of how potential impacts will be avoided on the Rhymney River Section SSSI.
- The protection/increased enhancement at the River Rhymney SINC given its proximity.
- Considerations of habitats of principal importance (Environment (Wales) Act 2016).
- The impacts on ecosystems and ecosystem services should be fully considered.
- Ensuring the provision of appropriate green corridors, mosaic habitats and ecotones.

- Whether there will be any requirement for habitat offsetting.
- The level of enhancement is considered relatively minor. More ambitious features of greater ecosystem value could be installed such as ponds and wildflower meadows.
- Mitigation should include a strategy to control/eradicate invasive plant species given their extent.
- Consideration of an enhancement to clean up rubbish from the River Rhymney alongside the site.
- Has a breeding bird survey been discussed? Particularly due to the loss of dense scrub, woodland and the associated edges of such habitats. This is particularly important to evaluate the impacts upon Section 7 species (Environment (Wales) Act 2016) and Birds of Conservation Concern.
- Whether this was a detailed PGLRA or relatively broad during the PEAR?
- Whether a PRA has been undertaken on the security building?
- Imperative that species listed under Section 7 of the Environment (Wales) Act 2016 have been fully considered and assessed as required.
- There is no mention of potential impacts upon otter, this should be included both along the river and potential for holts on site.
- There is no mention of potential impacts upon fish species.
- There is no mention of potential impacts upon protected/Section 7 plant or invertebrate species.

As it currently stands Greenhouse Gas Emissions (GHG) and Climate Change has been scoped out from the EIA process. Considering the increase in commercial units and the increase in the road network, GHG and Climate Change, it is advised it is scoped in. Particularly as Cardiff Council declared a Climate Emergency in March 2019. The Institute of Environmental Management and Assessment Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance indicates that "*Where an EIA is to be undertaken based on other factors, it is envisaged that the*

assessment would include GHG emissions assessment as a matter of routine as a precautionary approach". The scope of such an ES Chapter should be agreed with a consultant with experience in this field. This aspect of the ES would therefore provide the calculations regarding GHG emissions and appropriate mitigation for GHG reduction i.e. the use of renewable energy to substantially power the site.

Trees and Landscape Officer

Based on the illustrative masterplan development will involve large-scale loss of 'B' category trees that should be retained and protected as part of development. No provision to mitigate such losses is indicated on the illustrative masterplan although the Scoping and Screening reports refer to mitigation planting.

I note the nominal provision of a 15m 'buffer' bounding the TPO and ancient woodland, but would note that the development substantially erodes the existing tree corridors that link this woodland to the wider GI network, replacing them with yards, units and car-parking. The woodland is vulnerable outside the context of development due to the presence of over-sailing power cables. Power companies have powers to cut back and remove trees close to their apparatus without needing TPO consent. Ancient and TPO woodland (in this case with a 'wet woodland' element consequent of the springs and streams, eventually discharging into the Rhymney) is especially sensitive to change and would typically require a much larger 'buffer' than would apply to the average woodland. For veteran trees the general advice is that the RPA should ideally extend in all directions from the tree stem to a distance equal to 15 times its diameter, or five metres beyond the canopy, whichever is the greater. This exceeds the x12 diameter calculation for non-veteran trees. Ancient woodland is not a collection of veteran trees (though it may contain such), but is a hugely complex ecosystem developed over thousands of years. I have seen figures such as 40m quoted as buffers to ancient woodland.

Neither the Scoping or Screening reports give consideration to the impact of development on vegetated soil (in general terms). This is a critical resource in mitigating the predicted impacts of climate change and greenhouse gas emissions. Policy KP15 includes explanatory text concerning the importance of vegetated soil in the context of climate change. The loss of and disturbance to vegetated soil may not only result in the release of greenhouse gases, but also a significant loss of soil functionality in terms of the role it plays in mitigating the impacts of climate change. Soil is also a huge reservoir of biodiversity, so its loss or damage may impact on development in terms of the enhancement of biodiversity. A Soil Resource Survey and Plan (not referenced in the Scoping or Screening reports) is the best practical measure to characterise and quantify the soil resource, but it would also be expected that consideration be given to the wider importance of vegetated soil at the site in mitigating the predicted impacts of climate change.

Traffic and Transportation

The transportation manager has advised that the proposed development is anticipated to generate significant vehicle movements during construction and once operational. Any transport assessment must consider short, medium and longer term traffic implication and how these will be mitigated.

Any assessment must consider sensitivity analysis given that any study may be affected by the recent Covid pandemic, which has altered traffic patterns.

Conservation/Placemaking

No comments to make in relation to ES submission beyond those matters already considered

Minerals and Waste Officer

No comments received.

Land Use Policy

No comments received

7. EXTERNAL CONSULTEE RESPONSES

Natural Resources Wales (NRW)

NRW have raised extensive comments in relation to the scope in respect of the following key issues.

Ecology

General Biodiversity

The ES must include a description of all the existing natural resources and wildlife interests within and in the vicinity of the proposed development, together with an assessment of the significance of any likely effects, and the measures that will be implemented to avoid, mitigate and/or compensate for the anticipated effect.

We would recommend that the developer consults Cardiff's Ecologist on the scope of the work to ensure that regional and local biodiversity issues are adequately considered, particularly those habitats and species listed in Cardiff's Local Biodiversity Action Plan. In addition, other species listed under Section 7 of the Environment Act (Wales) 2016 are important for the conservation of biological diversity in Wales, and it is expected that these species would also be considered within the ES.

We would expect the developer to contact other relevant people/organisations for biological information/records relevant to the site and its surrounds. These include SEWBREC, Cardiff and Valleys Bat Groups, local Wildlife Trust etc.

Key Habitats

In general, a Phase I survey of the site should be undertaken to describe and map the key habitats of the site and species of particular importance. This should be undertaken in accordance with the NCC Phase 1 survey guidelines (NCC (1990). Handbook for Phase 1 habitat survey. NCC, Peterborough) and should be undertaken and completed during the summer to ensure the best change of identifying the habitats present.

Protected Species

We note that a number of surveys for protected species are ongoing, in the absence of any details we are unable to provide comments or advice on the surveys undertaken. However, surveys should comply with current best practice guidelines. If surveys deviate from best practice, full justification for this should be included within the ES.

We provide detailed comments on some species below, however, surveys for protected species should be undertaken by suitably qualified, experienced and where necessary, licensed surveyors in accordance with published guidance, where this exists, and best practice. We advise that updated surveys are undertaken to inform the ES where previous survey information may now be out of date.

Where protected species are likely to be affected, the ES should contain detailed information of all the measures that will be undertaken, in order of preference, to:

(i) avoid impacts to those species,
(ii) mitigate for any unavoidable impacts and
(iii) compensate for any impacts

that can neither be avoided nor mitigated for. The presence of a protected species is a material consideration for the Planning Authority when considering a planning application; this information will be required regardless of whether the application is a full or outline application.

Where protected species are likely to be affected, the ES should contain detailed information identifying the species-specific impacts in the short, medium and long term together with any mitigation and compensation measures proposed to offset the impacts identified. We advise that the ES set out how long-term mitigation or compensation will be assured, including monitoring, management and long term financial and management responsibility. Where the potential for significant impacts on protected species is identified, we advocate that a Conservation Plan is prepared for the relevant species and included within or as an annex
to the ES.

The ES should also detail any protected species licences that will be required for the development and for EPS set out how the scheme satisfies the three EPS licensing tests as set out in the Conservation of Species and Habitats Regulations 2017.

We advise the ES to assess how the proposed green infrastructure will link into the green infrastructure of adjacent sites and how it will be enhanced to ensure it is an ecologically functional and robust network capable of functioning for the protected species concerned in a built environment.

Dormice

We are aware of dormice within the immediate vicinity and note the potential for suitable habitat to support dormice within the site boundary. We note that dormice surveys are currently ongoing and recommend that these surveys adhere to best practice guidelines. In addition, we advise that the likely impacts upon this species and measures to mitigate these impacts and to conserve dormice in the developed landscape are included in the ES.
We note that a licence was obtained for works previously undertaken at the site, the nest boxes identified are likely to be part of the previous mitigation/monitoring scheme and should be taken into consideration for this application.

Bats
We note that there are numerous records of bats in the vicinity and suitable bat habitat exists on site. We advise that surveys are carried out in accordance with best practice guidelines.

Surveys should identify bat use of the site, identify any roosts present, the nature of the roost and key foraging and flight lines for bats. Any roosts likely to be impacted by the proposals should be identified and an impact assessment undertaken and included within the ES.

Otters
We note that a new access bridge over the Rhymney River is included within the plans and that surveys for otter have not been included within the Scoping Report. Given the records of this species less than 1km away along the Rhymney River, we advise that targeted otter surveys are undertaken to establish and inform an assessment of the likely use of the site by this species. Avoidance, mitigation or compensation measures should be proposed if necessary.

Protected Sites
Section 6.33 of the report notes that the Rhymney River Section Site of Special Scientific Interest (SSSI) has been scoped into the report. The key pathway for harm to this site is along the Rhymney river. Activities which may cause harm include pollution to the River Rhymney, particularly silt pollution and any work works which will result in changes to the geomorphology of the river.

Water Resources and Flood Risk

Flood Risk
Our Flood Risk Map confirms the application site lies within C2 of the Development Advice Map (DAM) as contained in TAN15 and the Flood Map for Planning (FMfP) identifies the application site to be at risk of flooding and falls into Flood Zones 2 and 3 (Rivers). Section 6.1117 of the Scoping Report confirms a Flood Consequences Assessment (FCA) will be undertaken and Section 6.119 states that hydraulic modelling will be carried out. Guidance on modelling specifications is available on our website Natural Resources Wales / Developing hydraulic models for flood risk. Guidance on modelling for flood consequences assessments is available on our website Natural Resources Wales / Modelling for Flood

The FCA will need to demonstrate compliance with current planning policy, including technical criteria within Appendix 1 of Technical Advice Note 15. The applicant should note that an updated TAN15 is scheduled for June 2023. Further information can be found in the recent Welsh Government letter.

Flood Risk Activity Permit
Furthermore, we note in section 3.2 of the Scoping Report that the proposed development comprises ‘A new spine road and access bridge over the river’. A Flood Risk Activity Permit (FRAP) would be required for this element of the project. We refer you to our website for further advice.

Water Quality
Section 6.121 and 6.150 of the Scoping Report refers to the preparation and inclusion of a Construction Environmental Management Plan (CEMP) in the ES. The CEMP should be informed by best practice measures.

Water Framework Directive (WFD) Assessment
We recommend the Applicant carries out a Water Framework Directive (WFD) Compliance Assessment. This should include an assessment of all relevant phases of the project. The WFD Compliance Assessment will assess any potential effects of the project on water body status and objectives in accordance with the WFD Regulations

2017. These can be direct effects e.g., the physical footprint of the scheme, or they can be indirect i.e., any secondary impacts arising to processes or species through biotic or migratory routes. Although the WFD regulations are separate to the EIA regulations, the compliance assessment will draw upon information and assessment within relevant topics of the ES. The WFD Compliance Assessment can be submitted as an appendix of the ES and cross referenced in relevant ES chapters.
We can provide further advice and guidance on how to carry out a WFD Compliance Assessment.

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Dwr Cymru Welsh Water
No comments received.

Welsh Government Planning
No comments received.

8. SCOPING OPINION: DISCUSSION

This Scoping Opinion will be structured to align with the Screening and Scoping Report.

CHAPTER 1: INTRODUCTION
The content of this chapter as proposed in the Scoping Request is largely agreed.

CHAPTER 2: SITE CHARACTERISTICS
This needs to be included but Chapter 2 of the submitted scoping report appears acceptable.

CHAPTER 3: THE PROPOSED DEVELOPMENT
Schedule 4 (2) of the EIA Regs requires 'a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the applicant or appellant which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'

The SR is silent on how the proposal has been formulated. 'Do nothing' is a possibility given the nature of the site. The question that needs to be answered is what is the driver for this development? Is it to create employment, is it to create the bridge? Once the driver is known then the assessment of 'do nothing' is not a viable alternative. It is acknowledged that later in the SR that alternatives to the proposed development will be covered in the ES but the SR is unclear in terms of what information will be provided in the ES and it is necessary that the statutory requirement is met.

In relation to the description of the proposed development, this must satisfy the requirements of Schedule 4 (1) of EIA regs which requires:

- a description of the location of the development;
- a description of the physical characteristics of the whole development, including, where relevant, requisite demolition works and the land-use requirements during the construction and operational phases
- a description of the main characteristics of the operational phase of the development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used

- an estimate, by type and quantity, of expected residues and emissions (such as water, air, oil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operational phases.

This section should provide as much detail as possible in terms of the development and include all aspects of the proposals including structures to be removed, tree loss, etc.

CHAPTER 4: CONSTRUCTION PROGRAMME AND METHODOLOGY

The SR has provided a broad framework for assessment, which in principle is acceptable. However at this stage, it is not clear what the impacts from the proposal are in the short, medium or long term and these need to be addressed. The construction phase should consider the method of construction e.g piling and the effect this would have, in terms of noise and vibration, within the area and on ecological sensitive receptors.

Mitigation measures may be required to address the construction process. This will need to be managed and heavy vehicle movements should avoid the peak hours of traffic. The mitigation measures must be determined once the extent of the impact is appropriately quantified and evidenced in the ES.

CHAPTER 5: AIR QUALITY

The SR considers a framework for the assessment of air quality, which in principle is acceptable, but this needs to consider the comments raised by the Council's Ecology Officer and must be informed by the proposed transport modelling on terms of flows of traffic.

The air quality assessment also needs to consider construction phases and how this will be monitored and assessed within the ES. Any mitigation and monitoring should be explained within the ES.

CHAPTER 6: BIODIVERSITY

The SR has considered biodiversity, in terms of the effects known at this time. Whilst the broad framework outlined in paragraphs 6.25-6.44 are acceptable, further work is required as outlined in the comments from the council's Tree and Ecologist Officers along with the comments from NRW.

CHAPTER 8 TRAFFIC AND TRANSPORT

The SR has considered a broad framework, which in principle is acceptable. Discussion between the applicant and Transportation colleagues should be considered. The ES should consider alternative modes to the car and how they will be achieved and by whom. Active travel is considered within the SR but no strategy has been explained how active travel will be encouraged through the design or promotion of the site.

Where car uses are proposed consideration should be given to how this will affect the network and different times of the day and year.

CHAPTER 9: WATER RESOURCES & FLOOD RISK

The SR provides a broad framework which is in principle agreeable. However, the comments from NRW need to be considered. Surface water flooding will need to ensure it meets SAB requirements and these should be explained within the ES. Any assessment should include known climate change adjustments and should be

informed on the most up-to-date information. It is understood discussion between WSP and NRW are ongoing and these should include an objective evaluation of the proposed flooding model.

CHAPTER 10:RESIDUAL IMPACTS, MITIGATION AND CUMULATIVE EFFECTS
It is important that those schemes in proximity to the site that benefit from planning permission or the subject on an application should be considered within the cumulative effects. The approach suggested in paragraphs 6.154-6.156 is considered an acceptable approach.

RESPONSE TO MATTERS PROPOSED TO BE SCOPED OUT

• Archaeology and Built Heritage; agreed but an updated desk top study should be undertaken to exclude any new issues

• Daylight, Sunlight and Overshadowing; agreed

• Energy and Sustainability; agreed but the final design should justify how the orientation, use of materials and any other feature have been incorporated to reduce energy consumption, LPA would expect to see a BREEAM rating of excellent, or an equivalent system that meets the same aim, and ideally how the site could generate its own energy so that it has 'net zero' effect. The assessment should also consider if a local heat network is feasible.

• Ground Conditions and Contamination; agreed

• Greenhouse Gas Emissions and Climate Change- given the ecology comments these should be **scoped into the ES** including impact upon soil, as this is a finite resource. In terms of Climate change, this should consider all relevant matters including embodied carbon emission and how the soil that will be removed from the site can be reused rather than 'shipped' away from the site.

• Major Accidents and Disasters; This requires justification given the potential of flooding of the site and surrounding area at this stage it is suggested that this be **scoped in.**

• Noise and Vibration given the proximity of noise sensitive receptors (notably but not exclusively for construction) and ecological sensitives this should be **scoped in.**

• Townscape and Visual Impact; Given the site is within a green / river corridor combined with the proposed level of development this should be **scoped into** the ES

• Waste; and Wind Microclimate. Agreed

9. OTHER EIA RELATED MATTERS

ES Technical Appendices
The ES must be supported by relevant technical appendices.

Non-Technical Summary
Part 5, Regulation 17 (3) (e) and Schedule 4 of the EIA Regs requires the ES to be

supported by a Non-Technical Summary. This is required to provide an overview of the contents of ES.

Obtaining the relevant data

Schedule 4 (6) of the EIA Regs requires 'a description of the forecasting methods or evidence used to identify and assess the effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.' (Emphasis added). The Screening and Scoping Report is not clear to how limitations are to be identified and included within the ES. It is advised to clarify this within the EIA Method of Assessment Chapter.

Not all the relevant topics are included in the SR to identify limitations (it appears to be addressed in relation to Biodiversity and Nature Conservation, Landscape and Visual Impact and Traffic and Transport). If the assessment methods for the other topic areas did not encounter limitations, this should be explicit in the ES.

10. SCOPING OPINION: CONCLUSIONS

The above constitutes the LPA's scoping opinion but does not preclude the fact that additional information may be requested or added to the Environmental Statement in connection with the planning application as outlined in paragraph 13(9) of the regulations.

11. OTHER NON-EIA RELATED MATTERS

Outside of the EIA scope, other matters raised during this scoping opinion need to be addressed either through the planning application, or separately (as indicated below). These matters can be summarised as follows:

- Section 6.131 of the Scoping Report identifies DCWW Welsh Water public surface and foul/combine water drainage sewers are located within the development site. We recommend the applicant clarifying if the intention is to connect to this network for the foul water produced by the site. We refer you to WG Circular 008/2018 on private drainage, and specifically paragraphs 2.3 – 2.5, which stress the first presumption must be to provide a system of foul drainage discharging into a public sewer.
- A shadow Habitat Impact Assessment should be submitted with the application.
- Those aspects that have been scoped out of the ES will still need to be submitted as planning document and should address the points raised above.

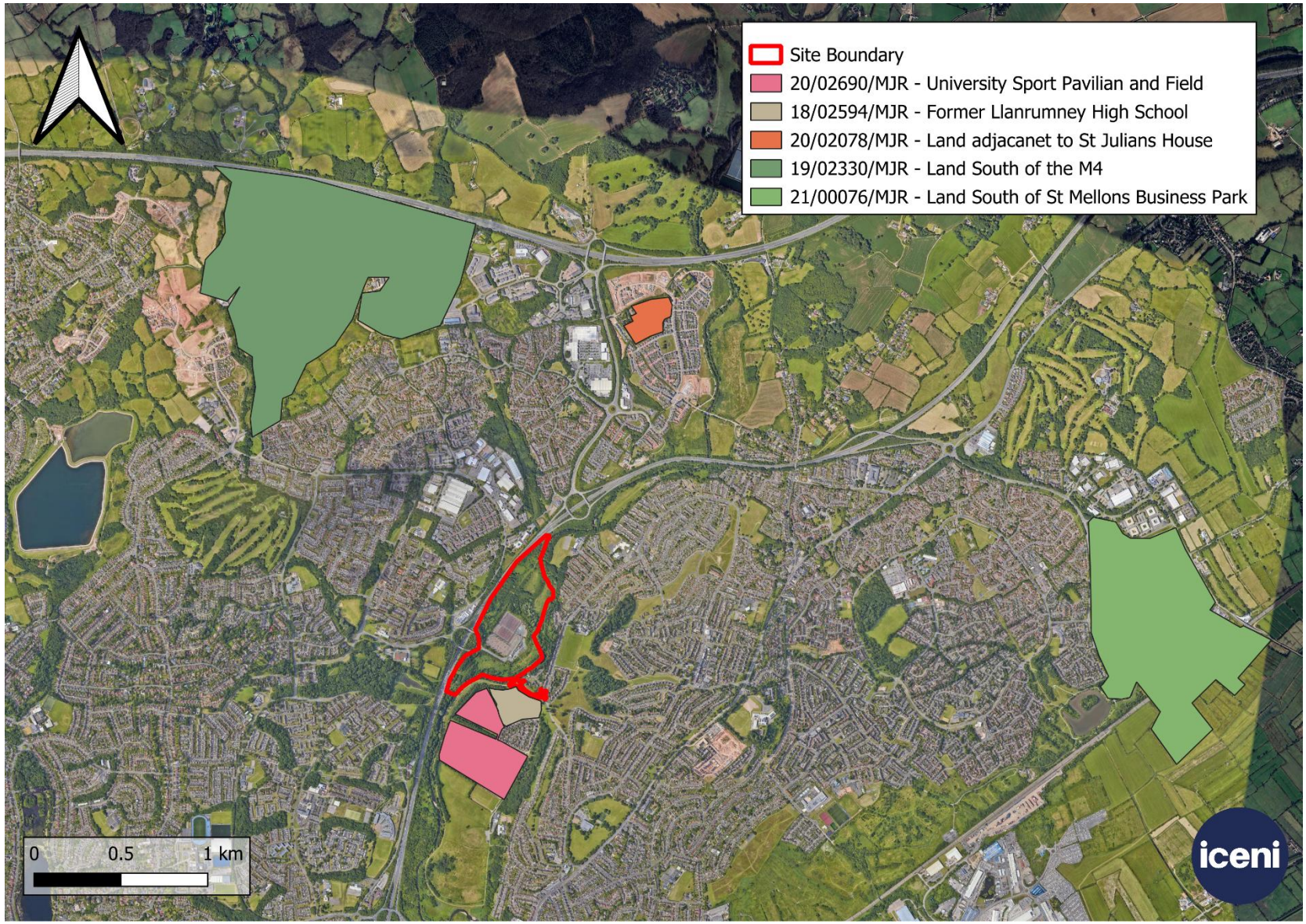
The above list is not an exhaustive list of requirements for the planning application. If further advice is required in relation to the planning application, a pre-application enquiry should be submitted to the Local Planning Authority.

APPENDIX 1.3 CUMULATIVE SCHEMES

Table 1: Cumulative schemes (within 3km as the Site)

Application Reference and Address	Description	Status	Distance from Site
20/02690/MJR – University Sport Pavilion and Field, Mendip Road, Llanrumney, Cardiff, CF3 4JN	Construction of sports academy building and community clubhouse together with new 3G pitches with floodlighting and amendments to car parking.	Approved (May 2022) Under construction	Immediately adjacent to the south of the Site
18/02594/MJR – Former Llanrummey High School, Ball Road, Llanrummney, Cardiff, CF3 4YW	Development of 98 residential dwellings (use class C3, including affordable housing), vehicular and pedestrian access, landscaping, drainage, related infrastructure and engineering works	Approved (August 2019) Under construction	Immediately adjacent to the south west of the Site
20/02078/MJR – Land Adjacent To St Julians House Bridge Road Old St Mellons Cardiff	Residential development of up to 160 units with associated demolition, infrastructure, landscaping and access.	Approved (August 2021) Under construction	1.3km to the north east of the Site

19/02330/MJR – Land South Of The M4 To The East Of Lisvane West Of Pontprennau And North Of Cyncoed Cardiff	An outline application (appearance, landscaping, layout and scale reserved) for a mixed use development of up to 2,500 new homes, to include affordable housing; land for employment use (B1); district centre and mixed use areas accommodating uses within classes A1-A3 (shops; financial and professional services; and food and drink outlets), B1 (business), C1 (residential institutions, including care accommodation), C3 (dwellings), D1 (non-residential institutions, including medical and health services, creches, library, conference centre, community centres and places of worship), D2 (assembly and leisure, including indoor sports facilities); one 2 FE primary school and land for a secondary school (10 FE & 6th form) comprising a total of 10 hectares; green infrastructure including formal and informal open space comprising green corridors, amenity green space, play areas, semi-natural/natural open space, woodland, allotments/community orchards and civic spaces and surface water attenuation features; highway, cycle and pedestrian routes including partial diversion/creation of public rights of way; car parking; drainage and utilities infrastructure, including diversion of the 132kv and 11 overhead electricity tramsmission lines traversing the site and removal of pylon structures; engineering works including ground remodelling; demolition site reclamation and removal of structures; approval is also sought for the formation of new accesses from Lisvane Road, Ty Draw Road, and Heol Glandulais/St. Mellons Road.	Approved (July 2024) Construction not yet commenced	1.4km to the north west of the Site
21/00076/MJR – Land South Of St Mellons Business Park And Bounded By Fortran Road/Cobol Road To The North Cypress Drive To The West St Mellons Cardiff	Construction of a business park (up to 90,000m2 - use classes B1, B2 and B8), ancillary uses and infrastructure associated with; biodiversity; landscape; drainage; walking, cycling and other transport modes. Together with the construction of a new transport hub facility, comprising railway station buildings (up to 2,500m2 - use class sui generis) including ancillary uses; 4 no. Platforms; surface car park (up to 650 no. Spaces) and associated infrastructure works	Approved (January 2025) Construction not yet commenced	3km to the east of the Site


Site Boundary
20/02690/MJR - University Sport Pavilian and Field
18/02594/MJR - Former Llanrumney High School
20/02078/MJR - Land adjacanet to St Julians House
19/02330/MJR - Land South of the M4
21/00076/MJR - Land South of St Mellons Business Park
0
0.5
1 km
iceni

Cardiff East Park and Ride, Llanrumney
Environmental Statement
Appendix 1.4: Competency Statement

Iceni Projects Limited on
behalf of Curtis Hall Limited
(Ltd)

November 2025

Iceni Projects Ltd.
Da Vinci House, 44 Saffron Hill, London, ECN1 8FH
T: 020 3640 8508 **F:** 020 3435 4228 **W:** iceniprojects.com

Background

Directive 2014/52/EU of the European Parliament requires that, for all developments considered to constitute an Environmental Impact Assessment development ('EIA development'), the EIA report (i.e. the Environmental Statement) is prepared by 'competent experts'. In addition, the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)[1] section 18 (5)(b) states that *"the Environmental Statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts".*

As such, this Statement of Competence has been prepared by Iceni Projects, as lead EIA Coordinator for the Proposed Development, to outline the capability of the company and the competency of the individuals responsible for undertaking and reporting the EIA.

Iceni Projects

Iceni Projects ('Iceni') is a registrant of the Institute of Sustainability and Environment Professionals ('ISEP') EIA Quality Mark programme, and the certificate is located on page 4 of this document. Iceni is a leading provider of environmental services with a thorough understanding of the UK town and country planning system and the EIA Regulations, which enables us to ensure that we deliver comprehensive and robust Environmental Statements. Iceni have managed numerous EIA projects across the UK and we clearly and concisely understand the impact of development on the environment.

Competent Experts

Summaries of the qualifications and experience of the EIA Project Manager, responsible for the checking and review of the Environmental Statement, and the EIA Project Management Team, responsible for the coordination of the EIA are presented below.

EIA Project Manager, MRTPI, PISEP

The EIA Project Manager is a Director within the Strategic Planning Team at Iceni Projects with over 12 years' professional experience, specialising in EIA and is a practitioner member of ISEP.

The EIA Manager has experience in the preparation and coordination of EIAs for a range of residential, commercial, mixed-used and infrastructure projects around the UK.

EIA Project Coordinator, GradISEP

The EIA Project Coordinator is an EIA Consultant within the Strategic Planning Team with over two years' professional experience specialising in EIA and is a Graduate member of ISEP, working towards Practitioner membership. The EIA Coordinator has experience in the preparation and coordination of EIAs for a range of projects around the UK.

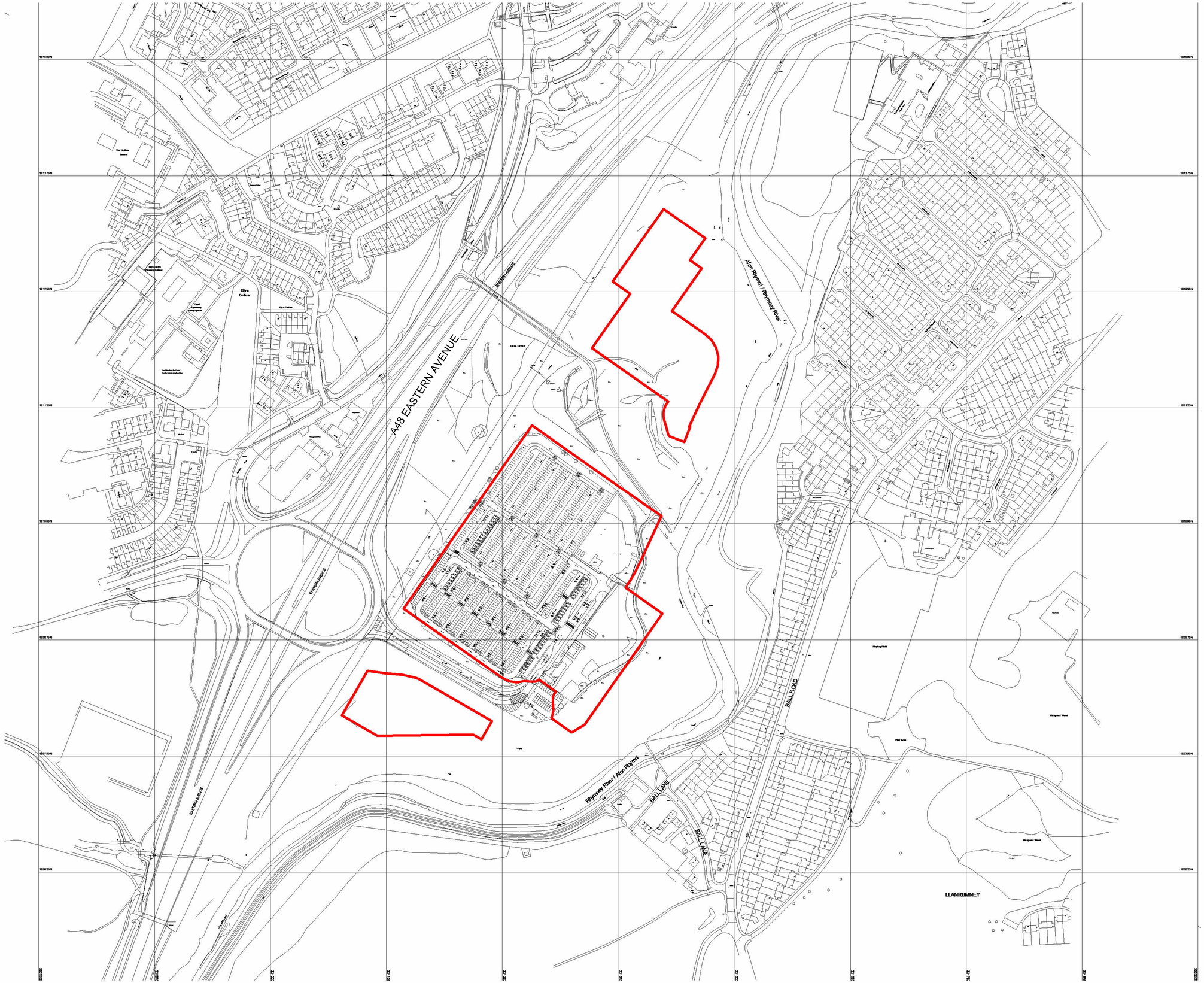
EIA Technical Consultants

EIA Technical Discipline	Consultant	Summary
Air Quality	Tetratech	EIA Author: Emma Longhurst BSc, MSc, AMIEnvSc, MIAQM, Senior Environmental Consultant – Emma is a Senior Environmental Consultant at Tetra Tech. She has six years of experience in the industry. Emma has worked on a range of residential, commercial, industrial and road/property projects along with a range of air quality monitoring projects, and has authored multiple reports in support of EIA planning applications. Emma has worked on projects across the UK and other countries and has advised on air quality matters associated with masterplanning and planning applications. EIA Reviewer: Joe Shaw BSc, MIEnvSc, MIAQM, Senior Environmental Consultant – Joe is a Senior Environmental Consultant at Tetra Tech. He has eight years of experience in the industry. He has worked on a range of large residential, industrial and commercial development projects across the UK. Joe has extensive experience of authoring Air Quality Assessments (AQA) in accordance with IAQM criteria and other relevant guidance authorities. EIA Verifier: Matthew Smith BSc (Hons), AMIEnvsc, AMIAQM Associate Environmental Consultant – Matthew has over eight years-experience in the industry. Matthew provides support to the Air Quality, Odour and Lighting teams within NALO team at Tetra Tech and helps to advise on environmental issues to inform planning applications and input into EIA reports. Matthew has verified numerous Air Quality Assessments (AQA) in accordance with IAQM criteria and other relevant guidance for projects throughout the UK and across Europe.
Ecology and Biodiversity		This chapter was prepared by a consultant who holds a MSc in Environmental Science, has over five years of professional experience, and is a qualifying member of

EIA Technical Discipline	Consultant	Summary
		the Chartered Institute of Ecology and Environmental Management (CIEEM). The author has extensive experience in ecological assessment, including PEA, Ecological Impact Assessment (EcIA), and Habitats Regulations Assessment (HRA) for a range of major infrastructure and development projects. This includes survey planning and coordination, ecological field data interpretation, technical reporting, and ensuring compliance with industry standards and regulatory requirements. This chapter was reviewed and authorised by consultants who hold relevant ecological/zoological undergraduate degrees and the authoriser holds a post graduate degree. The consultants have over 10 years and 25 years of experience in EcIA respectively. Both are Full Members of the Chartered Institute of Ecology and Environmental Management (CIEEM).
Landscape and Visual Impact	BCA Design	This chapter was prepared by Mark Bodman of BCA Design. Mark is a Chartered Landscape Architect and was elected as a member of the Landscape Institute in 2009. He holds a Degree in Landscape Architecture (2001) and a Graduate Diploma in Landscape Design (2002), from Cheltenham and Gloucester. He is a Director at BCA Design where he has worked since 2002. During the last 23 years he has been involved with a significant number of strategic distribution projects throughout the UK. In addition to the design and implementation of these projects he has also worked extensively on the production of Landscape and Visual Impact Assessments. BCA Design is a Registered Practice with the Landscape Institute, providing services within the Landscape Architecture category of membership. The practice was established in 1993, primary areas of activity are the design and management of external

EIA Technical Discipline	Consultant	Summary
		areas and the preparation of Landscape and Visual Impact Assessments.
Socio-Economics	Iceni Projects	This assessment has been undertaken by a Senior Consultant with over seven years' experience, including three years in development economics. Their relevant qualifications include a BA in Economics, Politics and Public Policy and an MSc in Economics. It has been reviewed by a Director who has 8 years technical experience and is a Member of the Institute of Economic Development (MIED). Iceni Projects holds the ISEP QMark.
Water Environment and Flood Risk	WSP	
Transport and Access	SLR / Vectos	This chapter has been prepared by SLR Consulting Ltd. who are considered to be 'competent experts' as per the requirements of the 2017 EIA Regulations. The author of this chapter has over 10 years transport planning experience and has been involved in the preparation of transport and access chapters for numerous Environmental Impact Assessments for a wide range of large developments.
Climate Change	Iceni Projects	This chapter has been prepared by an Associate (BSc, MSc, AISEP) within Iceni Projects' Strategic Planning Team. The Associate has 6 years' post-qualification experience and has worked on a number of assessments for EIA Development across England, for a variety of residential, commercial and mixed-use schemes.

A48 EASTERN AVENUE
EASTERN AVENUE
EASTERN AVENUE
Afon Rhymni / Rhymney River
Rhymney River / Afon Rhymni
BALL ROAD
BALL LANE
BALL LANE
LLANRUMNEY
Glyn Collins
Glyn Collins
Glyn Collins



1 Site Location Plan - Outline

1 : 2000

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

LOCATION PLAN LEGEND

Site Boundary

NOTES:

OS Map & Site survey information used has been provided by others.

0 20 40 60 80 100 125 150 200

1:2000 Meters

N

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:

Cardiff East

Data Centre

Drawing Title:

Site Location Plan - Outline

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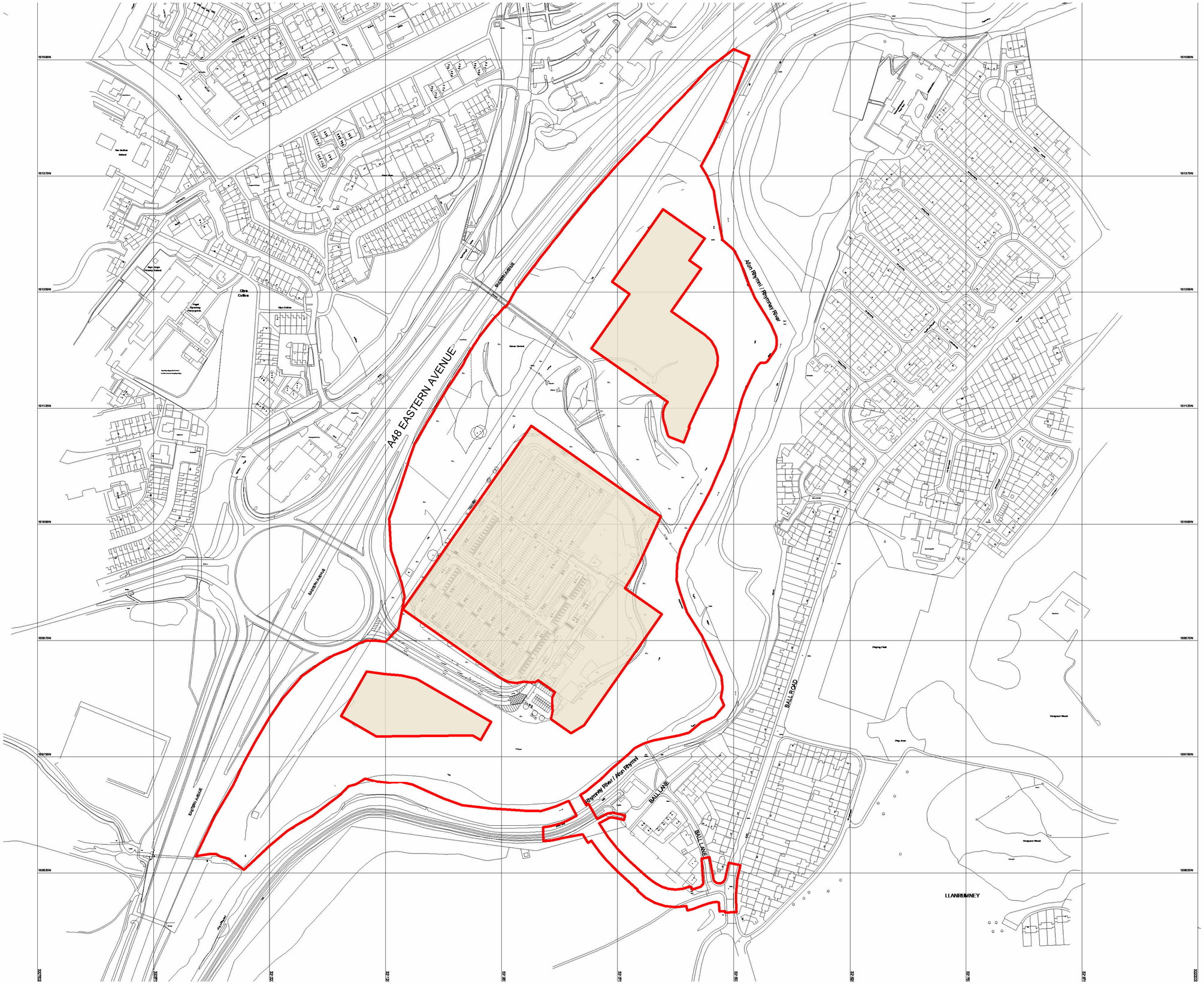

1 Site Location Plan - Detailed

1 : 2000

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LOCATION PLAN LEGEND

Site Boundary

Outline Elements

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Site Location Plan - Detailed

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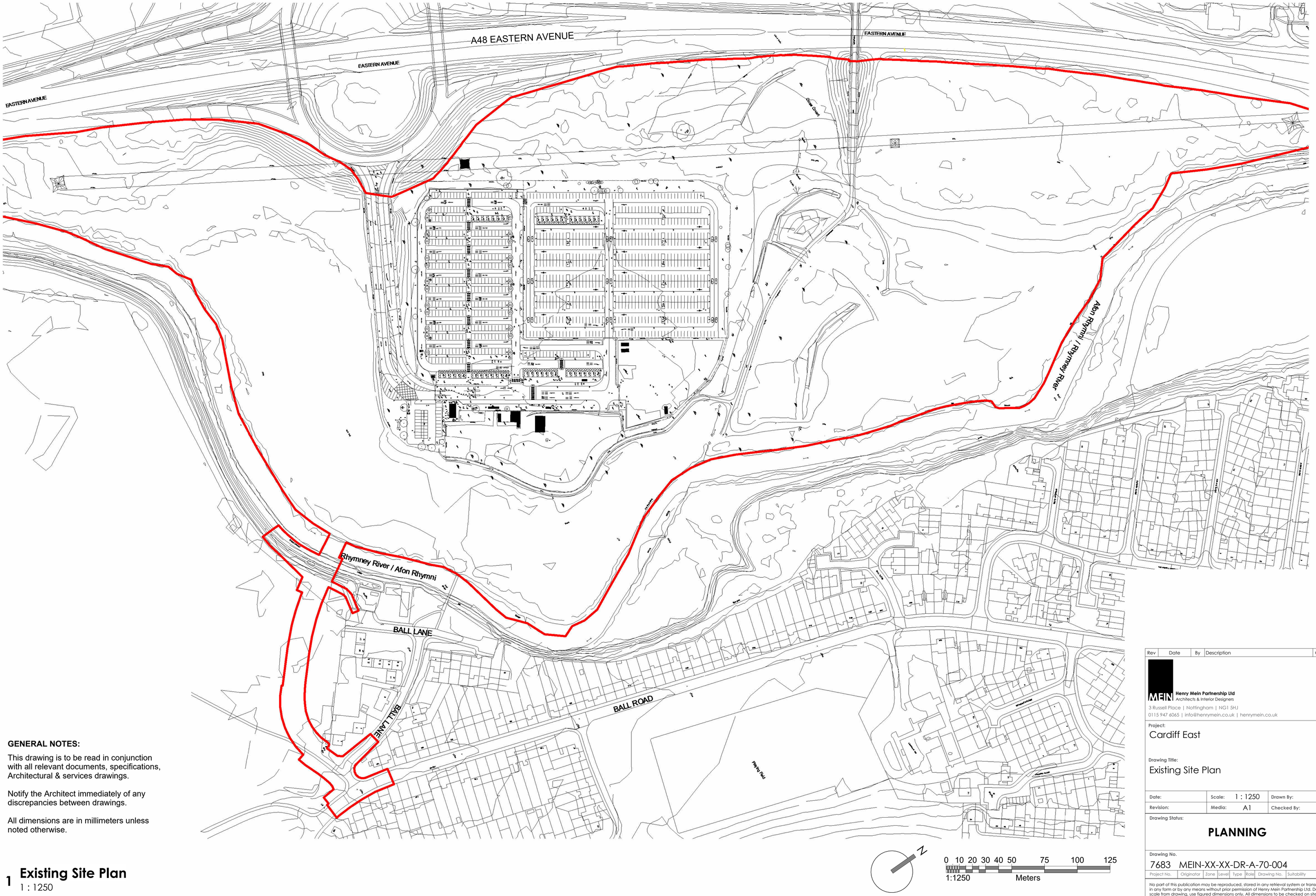

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1 Existing Site Plan
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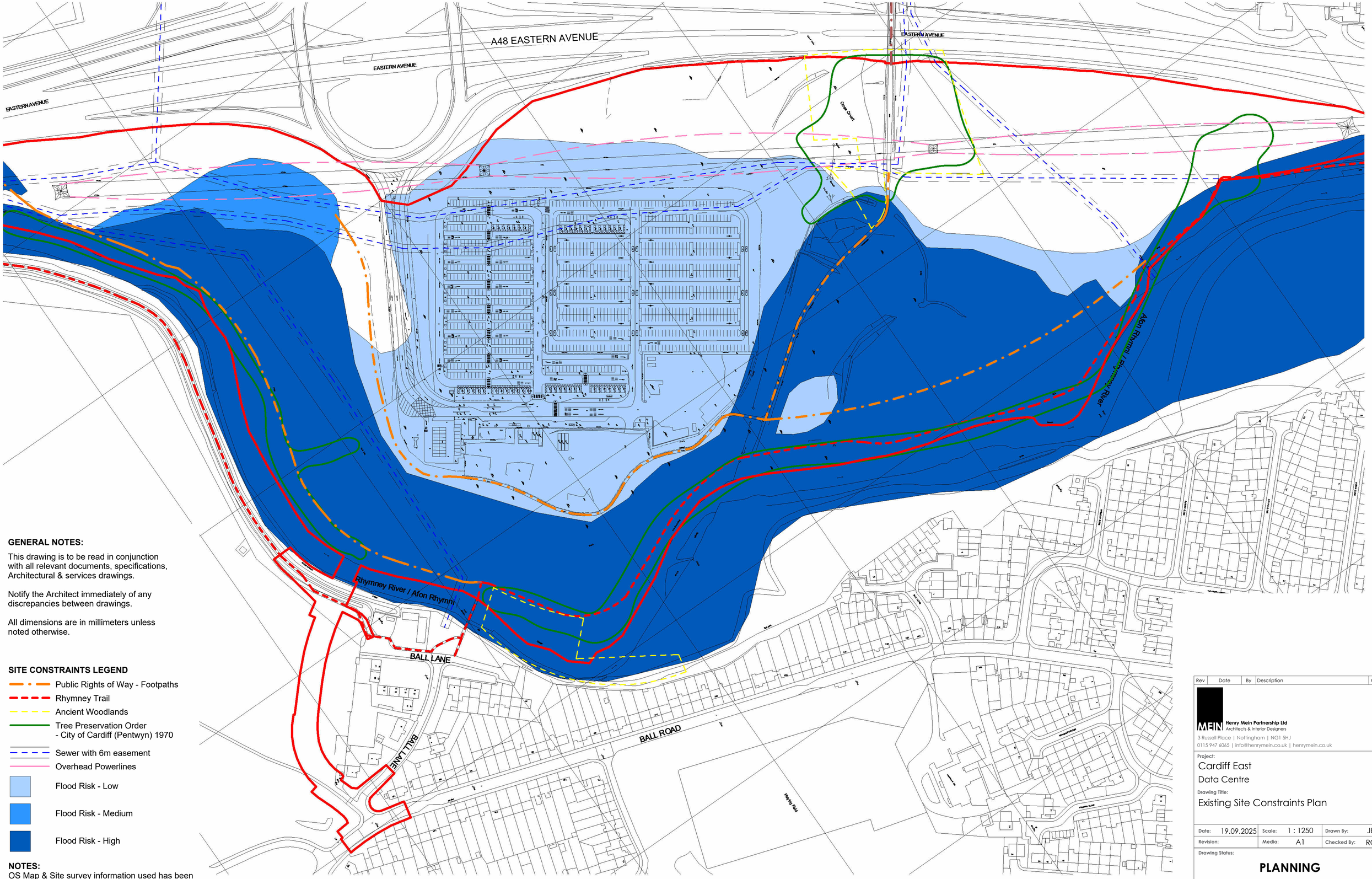

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SITE CONSTRAINTS LEGEND

- Public Rights of Way - Footpaths
- Rhymney Trail
- Ancient Woodlands
- Tree Preservation Order - City of Cardiff (Pentwyn) 1970
- Sewer with 6m easement
- Overhead Powerlines
- Flood Risk - Low
- Flood Risk - Medium
- Flood Risk - High

NOTES:
OS Map & Site survey information used has been provided by others.

1 Existing Site Constraints Plan
1 : 1250

0 10 20 30 40 50 75 100 125
1:1250 Meters

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Project:
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Data Centre

Drawing Title:
Existing Site Constraints Plan

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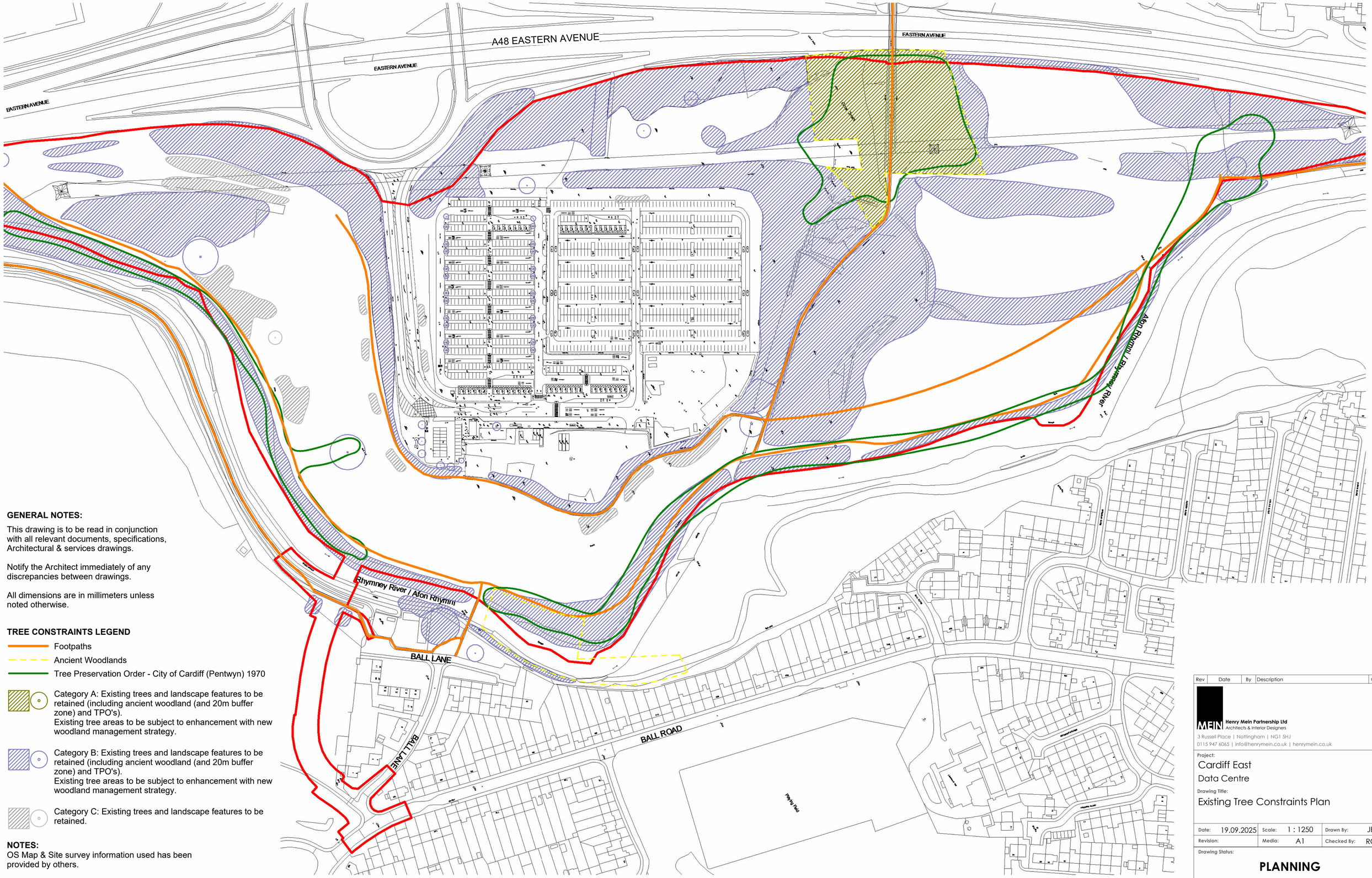

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TREE CONSTRAINTS LEGEND

- Footpaths
- Ancient Woodlands
- Tree Preservation Order - City of Cardiff (Pentwyn) 1970

Category A: Existing trees and landscape features to be retained (including ancient woodland (and 20m buffer zone) and TPO's).
Existing tree areas to be subject to enhancement with new woodland management strategy.

Category B: Existing trees and landscape features to be retained (including ancient woodland (and 20m buffer zone) and TPO's).
Existing tree areas to be subject to enhancement with new woodland management strategy.

Category C: Existing trees and landscape features to be retained.

NOTES:
OS Map & Site survey information used has been provided by others.

1 Existing Tree Constraints Plan
1 : 1250

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Project:
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Existing Tree Constraints Plan

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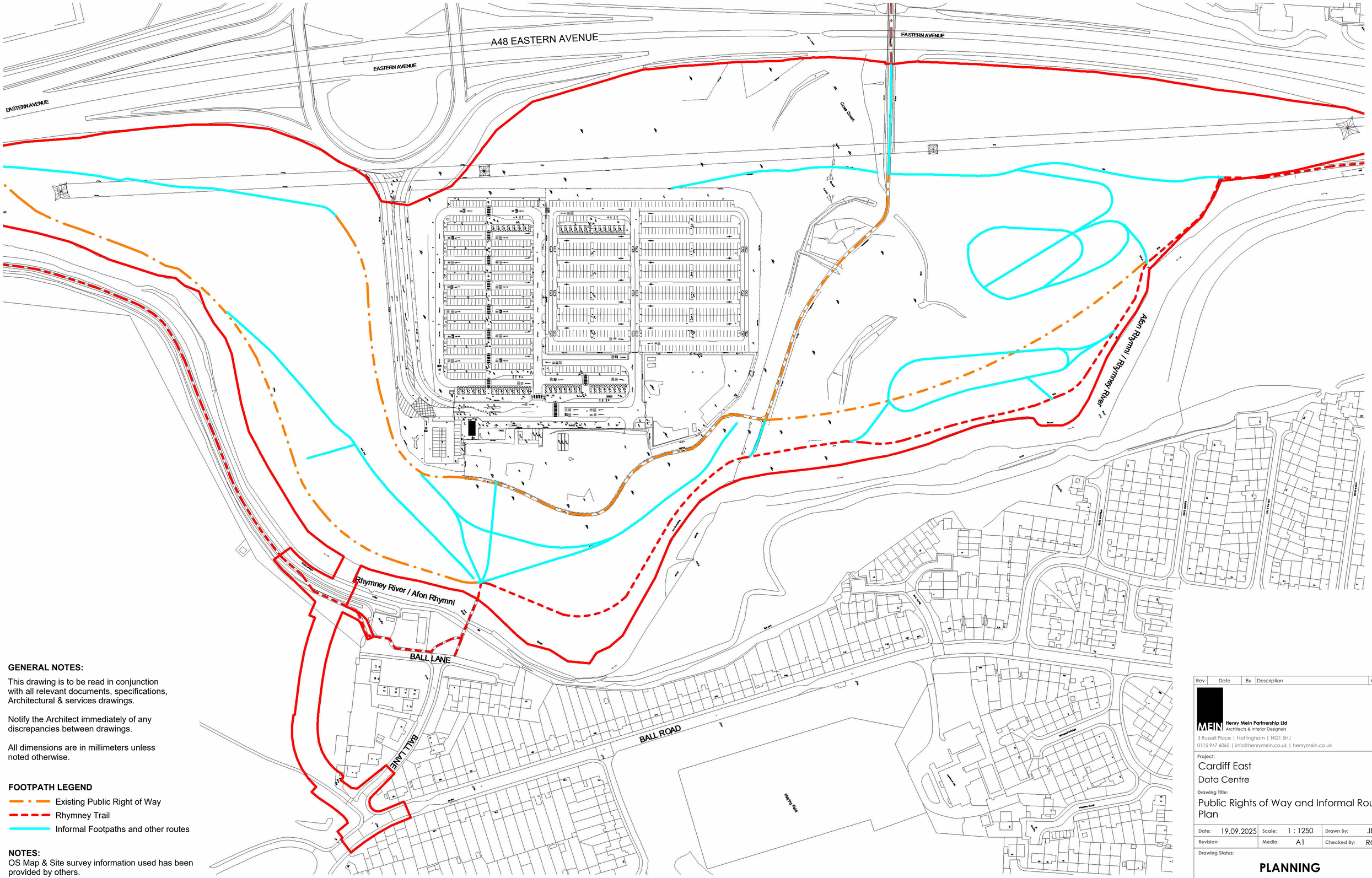

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FOOTPATH LEGEND

- Existing Public Right of Way
- Rhymney Trail
- Informal Footpaths and other routes

NOTES:
OS Map & Site survey information used has been provided by others.

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0 10 20 30 40 50 75 100 125
1:1250 Meters

1 Existing Public Rights of Way and Informal Routes Plan
1 : 1250

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Project:
Cardiff East
Data Centre

Drawing Title:
Public Rights of Way and Informal Routes Plan

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Revision:		Media:	A1	Checked By:	RC

Drawing Status:
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Drawing No.
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Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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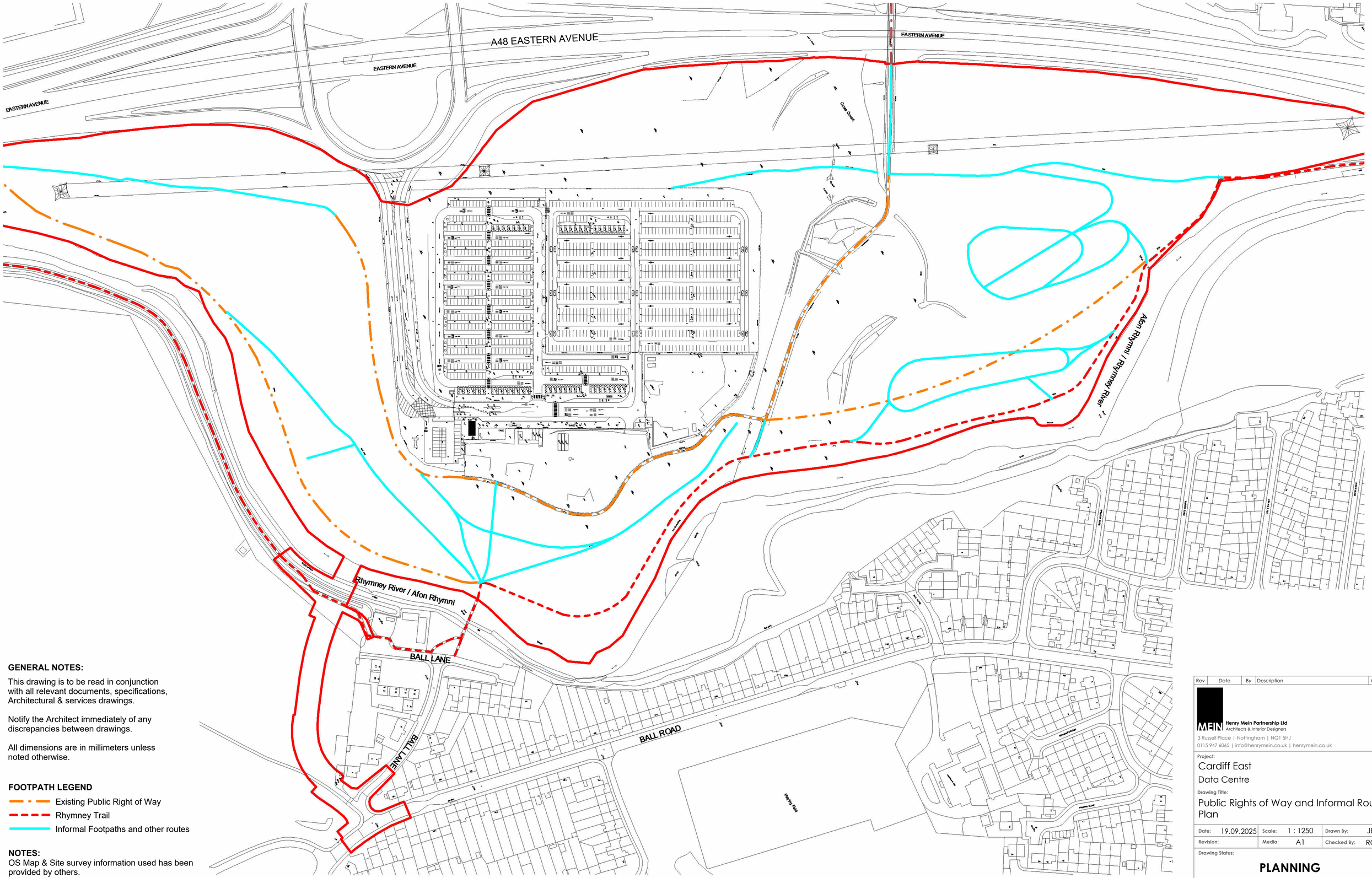

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Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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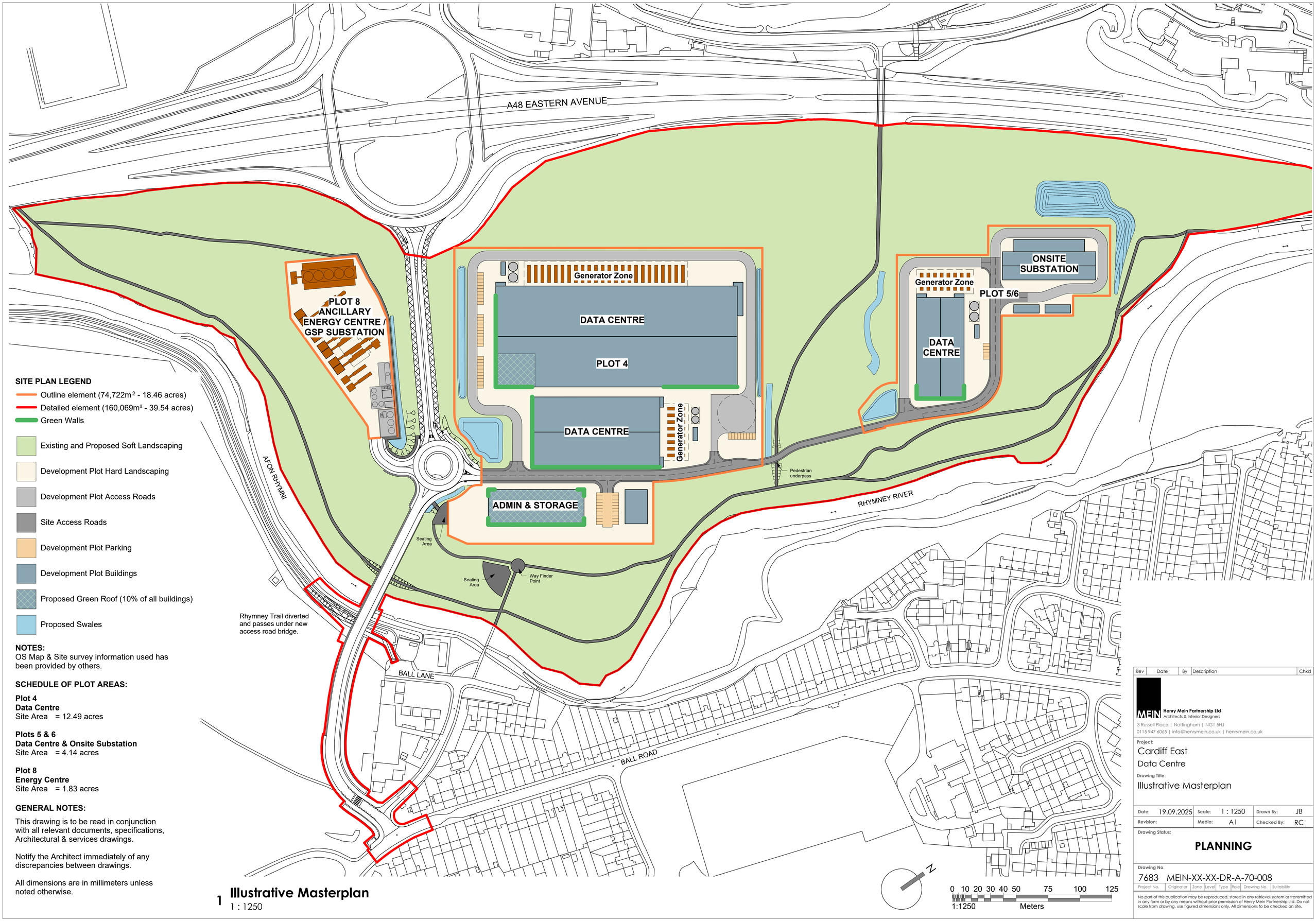

SITE PLAN LEGEND

- Outline element (74,722m² - 18.46 acres)
- Detailed element (160,069m² - 39.54 acres)
- Green Walls
- Existing and Proposed Soft Landscaping
- Development Plot Hard Landscaping
- Development Plot Access Roads
- Site Access Roads
- Development Plot Parking
- Development Plot Buildings
- Proposed Green Roof (10% of all buildings)
- Proposed Swales

NOTES:
OS Map & Site survey information used has been provided by others.

SCHEDULE OF PLOT AREAS:

Plot 4
Data Centre
Site Area = 12.49 acres

Plots 5 & 6
Data Centre & Onsite Substation
Site Area = 4.14 acres

Plot 8
Energy Centre
Site Area = 1.83 acres

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Illustrative Masterplan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Illustrative Masterplan

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-008

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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A48 EASTERN AVENUE

PLOT 8

PLOT 4

PLOT 5

PLOT 6

AFON RHYMNI

RHYMNEY RIVER

Pedestrian underpass

Seating Area

Seating Area

Way Finder Point

Rhymney Trail diverted and passes under new access road bridge.

BALL LANE

BALL ROAD

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

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TREE RETENTION LEGEND

- Footpaths
- Ancient Woodlands
- Tree Preservation Order - City of Cardiff (Pentwyn) 1970

Category A: Existing trees and landscape features to be retained (including ancient woodland (and 20m buffer zone) and TPO's).
Existing tree areas to be subject to enhancement with new woodland management strategy.

Category B: Existing trees and landscape features to be retained (including ancient woodland (and 20m buffer zone) and TPO's).
Existing tree areas to be subject to enhancement with new woodland management strategy.

Category C: Existing trees and landscape features to be retained.

Existing trees to be removed fall with Category B and C.

NOTES:
OS Map & Site survey information used has been provided by others.

N

0 10 20 30 40 50 75 100 125
1:1250 Meters

1 Tree Retention Plan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East

Drawing Title:
Tree Retention Plan

Date:	21.08.2025	Scale:	1 : 1250	Drawn By:
Revision:		Media:	A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-009

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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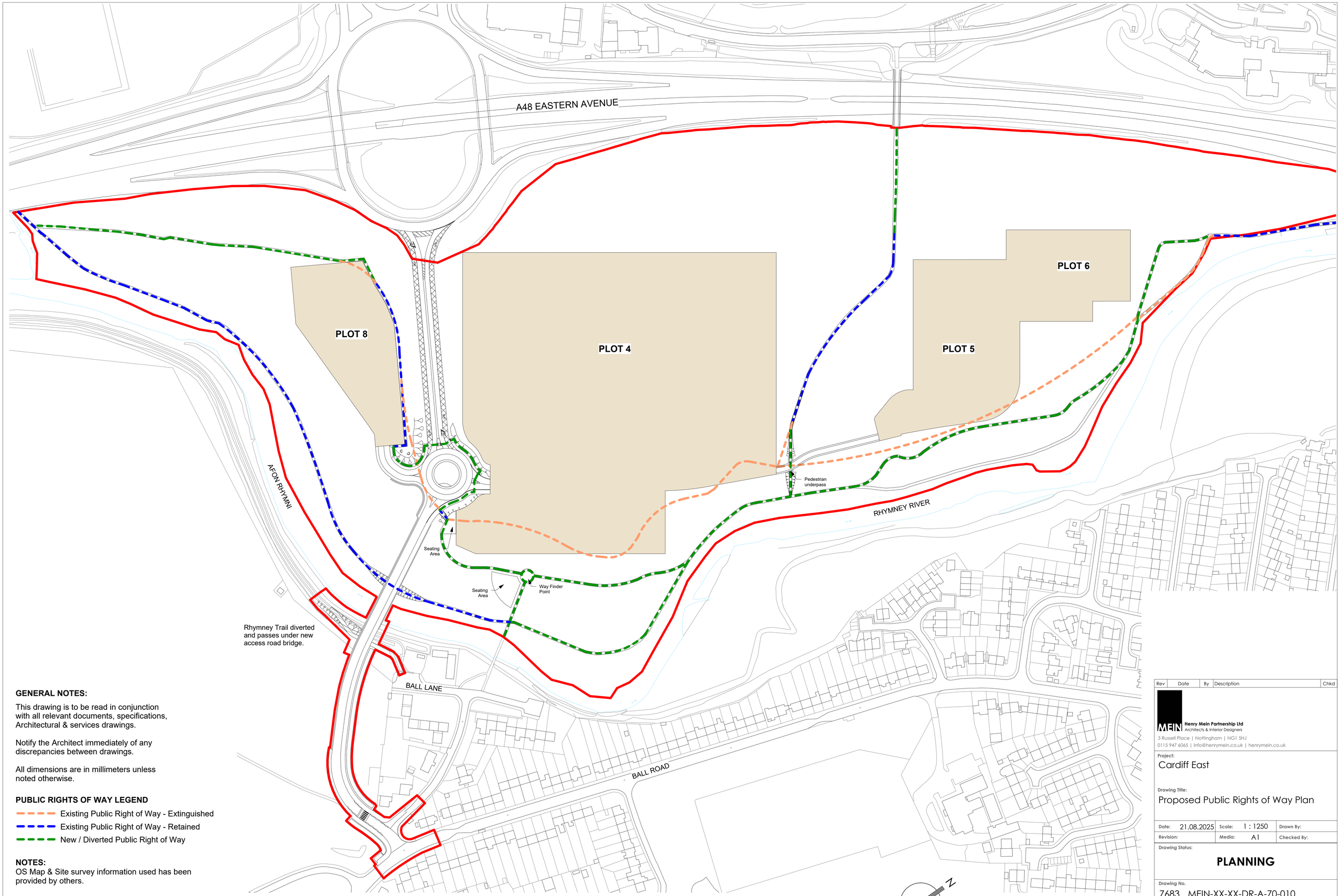

GENERAL NOTES:

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Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

PUBLIC RIGHTS OF WAY LEGEND

- Existing Public Right of Way - Extinguished
- Existing Public Right of Way - Retained
- New / Diverted Public Right of Way

NOTES:
OS Map & Site survey information used has been provided by others.

1 Proposed Public Rights of Way Plan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East

Drawing Title:
Proposed Public Rights of Way Plan

Date:	21.08.2025	Scale:	1 : 1250	Drawn By:
Revision:		Media:	A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-010

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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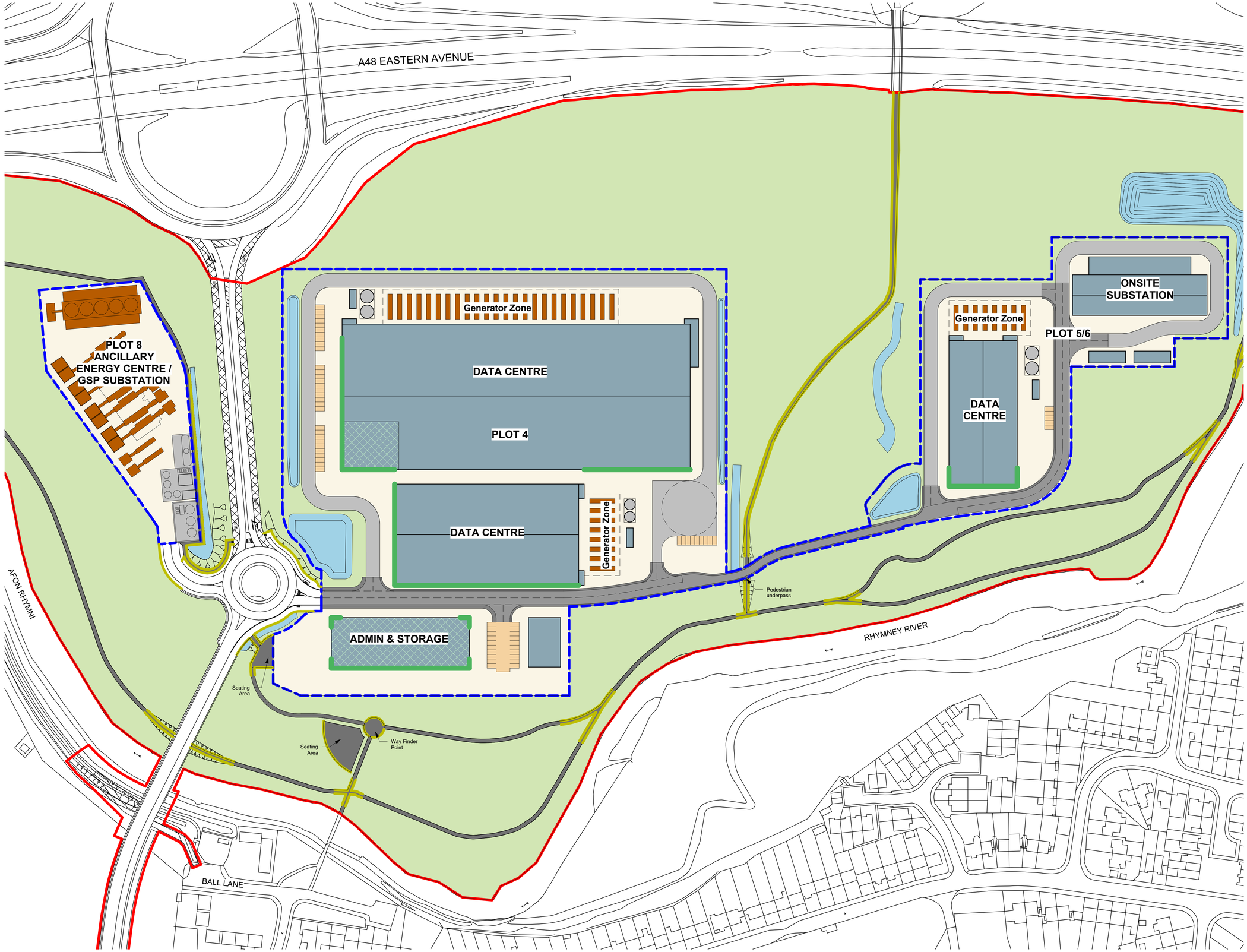

GENERAL NOTES:

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LANDSCAPE AND BOUNDARIES LEGEND

- **Denotes 3.0m high metal fence**
  3.0m high Paladin panel fence and posts with compatible site entrance gates. Colour RAL 9006 Black.
- **Denotes 450mm high knee rail fence**
  450mm high knee rail fence with posts maximum 1.5m centres.
- **Denotes Green Walls**
  Vertical garden living walls to specialist design. Indicative position shown.
- **Denotes grass / vegetation space**
  To specialist design.
- **Denotes Concrete Paving Slabs**
  To engineers details.
- **Denotes Concrete Turning Area**
  To engineers details.
- **Denotes Tarmac Road**
  To engineers details.
- **Denotes Block Paved Parking Bays**
  Permeable paving to engineers details.
- **Denotes Tarmac Footpaths**
  To engineers details.
- **Proposed Green Roof**
  10% of all buildings to specialist design.
- **Denotes Attenuation Swales and Basins**
  To specialist design.

NOTES:
OS Map & Site survey information used has been provided by others.

1 Proposed Landscaping and Boundaries Plan
1 : 1000

N

0 10 20 30 40 50 75 100 125
1:1000 Meters

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Proposed Landscaping and Boundaries

Date: 19.09.2025	Scale: As indicated	Drawn By:	JB
Revision:	Media: A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-011

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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1 On and Offsite Supplementary Habitat Planting

1 : 2500

ON AND OFFSITE HABITAT PLANTING LEGEND

- Site Boundary - 23 ha
- Ancient Woodlands
- Supplementary Dormouse Habitat Planting - 1.11 acres / 0.45 ha
- Offsite Dormouse Habitat Planting - 11.89 acres / 4.81 ha
- Loss of suitable habitat

SCHEDULE OF AREAS

Plot 4
Lost Habitat Area = 3,636m² / 0.89 acres

Plot 5/6
Lost Habitat Area = 8,961m² / 2.21 acres

Plot 8
Lost Habitat Area = 6,010m² / 1.48 acres

Access and Bridge Infrastructure
Lost Habitat Area = 2,321m² / 0.57 acres

Total
Lost Habitat Area = 20,928m² / 5.17 acres

N

0 50 100 150 200 300

1:2500 Meters

GENERAL NOTES:

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Rev	Date	By	Description	Chkd

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Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
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Project:
Cardiff East

Drawing Title:
On and Offsite Supplementary Habitat Planting

Date: 21.08.2025	Scale: As indicated	Drawn By:
Revision:	Media: A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-012

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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1 On and Offsite Supplementary Habitat Planting

1 : 2500

ON AND OFFSITE HABITAT PLANTING LEGEND

- Site Boundary - 23 ha
- Ancient Woodlands
- Supplementary Dormouse Habitat Planting - 1.11 acres / 0.45 ha
- Offsite Dormouse Habitat Planting - 11.89 acres / 4.81 ha
- Loss of suitable habitat

SCHEDULE OF AREAS

Plot 4
Lost Habitat Area = 3,636m² / 0.89 acres

Plot 5/6
Lost Habitat Area = 8,961m² / 2.21 acres

Plot 8
Lost Habitat Area = 6,010m² / 1.48 acres

Access and Bridge Infrastructure
Lost Habitat Area = 2,321m² / 0.57 acres

Total
Lost Habitat Area = 20,928m² / 5.17 acres

N

0 50 100 150 200 300

1:2500 Meters

GENERAL NOTES:

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Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

Rev	Date	By	Description	Chkd

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Project:
Cardiff East

Drawing Title:
On and Offsite Supplementary Habitat Planting

Date: 21.08.2025	Scale: As indicated	Drawn By:
Revision:	Media: A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-012

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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LEGEND

- Application Boundary
- Land under same ownership
- Public Open Space / Landscaping
- Development Plots - Use Class B8 (Data Centre), associated parking, services, ancillary buildings and structures, drainage and landscaping.

NOTES:
OS Map & Site survey information used has been provided by others.

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Land Use
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Parameter Plan - Land Use

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-013

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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A48 EASTERN AVENUE

AFON RHYMNI

RHYMNEY RIVER

BALL LANE

BALL ROAD

LEGEND

- Application Boundary
- Land under same ownership
- Primary Access Routes
- Indicative Secondary Access Routes
- Existing Public Right of Way - Extinguished
- Existing Public Right of Way - Retained
- New / Diverted Public Right of Way

NOTES:
OS Map & Site survey information used has been provided by others.

GENERAL NOTES:

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Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Access
1 : 1250

0 10 20 30 40 50 75 100 125
1:1250 Meters

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Parameter Plan - Access

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-014

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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A48 EASTERN AVENUE

ZONE A

FFL = 11.3m AOD
FFL to Ridge/Parapet
= 19.3m AOD

ZONE B

FFL = 13.2m AOD
FFL to Ridge/Parapet = 34.2m AOD

ZONE C

FFL = 13.55m AOD
FFL to Ridge/Parapet
= 34.55m AOD

ZONE D

FFL = 13.55m AOD
FFL to Ridge/Parapet
= 21.55m AOD

ZONE E

FFL = 12.544m AOD
FFL to Ridge/Parapet
= 22.544m AOD

LEGEND

- Application Boundary
- Land under same ownership
- Height Zone 1 - Up to 21 metres
- Height Zone 2 - Up to 10 metres
- Height Zone 3 - Up to 8 metres
- Height Zone 4 - Up to 3 metres

Heights +/- 2m AOD

NOTES:
OS Map & Site survey information used has been provided by others.

GENERAL NOTES:

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Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Building Heights
1 : 1250

N

0 10 20 30 40 50 75 100 125
1:1250 Meters

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Parameter Plan - Building Heights

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-015

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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A48 EASTERN AVENUE

PLOT 8
ANCILLARY
ENERGY CENTRE /
GSP SUBSTATION

Generator Zone

DATA CENTRE

PLOT 4

DATA CENTRE

Generator Zone

ADMIN & STORAGE

Pedestrian
underpass

ONSITE
SUBSTATION

Generator Zone

PLOT 5/6

DATA
CENTRE

AFON RHYMNI

RHYMNEY RIVER

Seating
Area

Seating
Area

Way Finder
Point

Rhymney Trail diverted
and passes under new
access road bridge.

BALL LANE

BALL ROAD

SITE PLAN LEGEND

- Detailed element (160,069m² - 39.54 acres)
- Existing and Proposed Soft Landscaping
  Refer to BCA detailed scheme.
- Outline Development Plots
- Site Access Roads
- Existing and Proposed Footpaths
- Proposed Swales

NOTES:
OS Map & Site survey information used has been provided by others.

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Proposed Site Layout - Detailed
1 : 1250

0 10 20 30 40 50 75 100 125
1:1250 Meters

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Proposed Site Layout (Detailed)

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-017

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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Construction Environmental Management Plan

Cardiff East Park and Ride Commercial Park

Issue/revision	1	2		
Remarks				
Date	11 April 2022	21 September 2022		
Prepared by	Ben Hall	Charlie Elliott		
Signature		*C.Elliott*		

Construction Environmental Management Plan

CONTENTS **PAGE**

1	Introduction	1
2	Environmental Policy	1
3	Environmental Management System	4
4	Project Specific Measures	6

Appendix A Curtis Hall Environmental Policy

Appendix B Construction Traffic Routing

Appendix C Anticipated Construction Programme

Appendix D Curtis Hall Site Waste Management Plan

Construction Environmental Management Plan

1 Introduction

1.1 This Construction Environmental Management Plan has been prepared to accompany the planning application for the Cardiff East Park and Ride commercial park to ensure that the potential impacts that may arise from the construction of the proposed development are actively managed and minimised. The actions set out in this plan are intended to act as a guide and a tool for anticipating, recording and ameliorating any impacts that may arise.

1.2 It is anticipated that the Construction Management Plan will evolve as the project progresses to ensure that its content reflects the current construction programme. Each revision of the plan shall be submitted to Cardiff Council for its prior written approval to any changes unless they are urgently necessary in the interests of health and safety, or pollution control.

1.3 The recommendations for the control of noise and vibration on construction and open sites in the approved code of Practice BS 5228 will be adopted.

2 Environmental Policy

2.1 A copy of Curtis Hall Limited's Environmental Policy Statement is provided in **Appendix A** of this report.

2.2 Curtis Hall Limited recognises the environmental impacts associated with this project and is committed to continually improving its environmental performance. The policy statement sets out the aims of the environmental plan for the construction of the proposed development, the various aims are summarised below:

- To meet the requirements of all relevant environmental legislation, agreements, authorisations and commitments.
- To ensure that all environmental undertakings and obligations of Curtis Hall Limited are fulfilled.

- To adopt working practices that will achieve good environmental practice on site.
- To ensure that sub-contractors and suppliers are aware of the environmental constraints and opportunities of the site and follow any necessary procedures in order to ensure good environmental practice.
- To identify the responsibilities of staff and contractors in achieving good environmental practice on site.
- To mitigate the effects of the construction works on businesses, highway users and the general public.
- To assist in the development of the company environmental management system, not only for the requirements of this project but for future use.

2.3 All personnel are required to understand and implement the requirements of this Construction Environmental Management Plan.

3 Environmental Management System

3.1 The principal requirement of the Construction Environmental Management Plan for the Construction Phase of the project is to provide a management framework to address all the environmental aspects identified for the construction of the proposed development to ensure that the obligations set out in this Construction Environmental Management Plan are implemented, an Environmental Co-ordinator (including Community Liaison) will be appointed by Curtis Hall Limited. The Environmental Co-ordinator will be based on the site and will act as focal point for the distillation of the contractor's responsibilities with respect to the environment and for queries/complaints from the controlling authorities and general public. The duties required of the Environmental Co-ordinator are set out below.

Role and Responsibilities of the Environmental Co-ordinator

3.2 The Environmental Co-ordinator is responsible for all environmental activities on the project and will report to the Operations Manager. The duties involve the following:

- Overall management of the environmental component of the project.
- Manage day to day activities to ensure significant environmental effects are avoided.
- Review and update the site Construction Environmental Management Plan.
- To act as the main point of contact between the regulatory authorities (Environment Agency and Local Authorities) and the project on environmental issues.
- Liaison with the ecological consultant to the project
- To act as the main point of contact between the local populace and the project.
- Development and delivery of environmental training (induction and toolbox talks) for site personnel and sub-contractors.
- Ensure Best Practice is promoted at all times.
- Assisting with the development of procedures that highlight the emergency response to environmental incidents.
- Management of the monitoring programme, including noise, dust and water quality.

- Environmental incident monitoring and reporting.

The Environmental Co-ordinator will be as Curtis Hall's Project Manager throughout the project.

Assessment of Significant Environmental Aspects

3.3 The environmental aspects identified should be evaluated in terms of significance to ensure that resources are targeted appropriately and effectively. The environmental aspects determined to be of most significance are the activities of the project that require managing and should be subject to improvement in performance.

3.4 An Environmental Aspects Register is contained within the Curtis Hall Environmental Management System which will be available for inspection on site at all times and will be structured in the following way.

Environmental Aspects Register						
Activity	Aspect	Impact(s)	Legislation	Significance	Management response	Comments

Legal Requirements

3.5 For each significant environmental aspect the relevant applicable environmental legislation and regulations will be identified. A complete and up to date legal Register is contained within the Curtis Hall Environmental Management System.

4 Project Specific Measures

4.01 This chapter of the Construction Environmental Management Plan contains details of the measures to minimise the potential effects from the construction works, which will be implemented throughout the works. It is envisaged that this Construction Environmental Management Plan will be a live document that will be updated as necessary to include consideration of evolving aspects of the construction works.

4.02 Any material revision of the Construction Management Plan shall be communicated to **Cardiff** Council**.** Wherever possible, amendments to the plan shall be discussed with prior to incorporation into the document.

4.03 A programme of works for the construction of the proposed development is provided in the Construction Method Statement, submitted as part of this planning application, with key dates highlighted in order to show critical areas of the development.

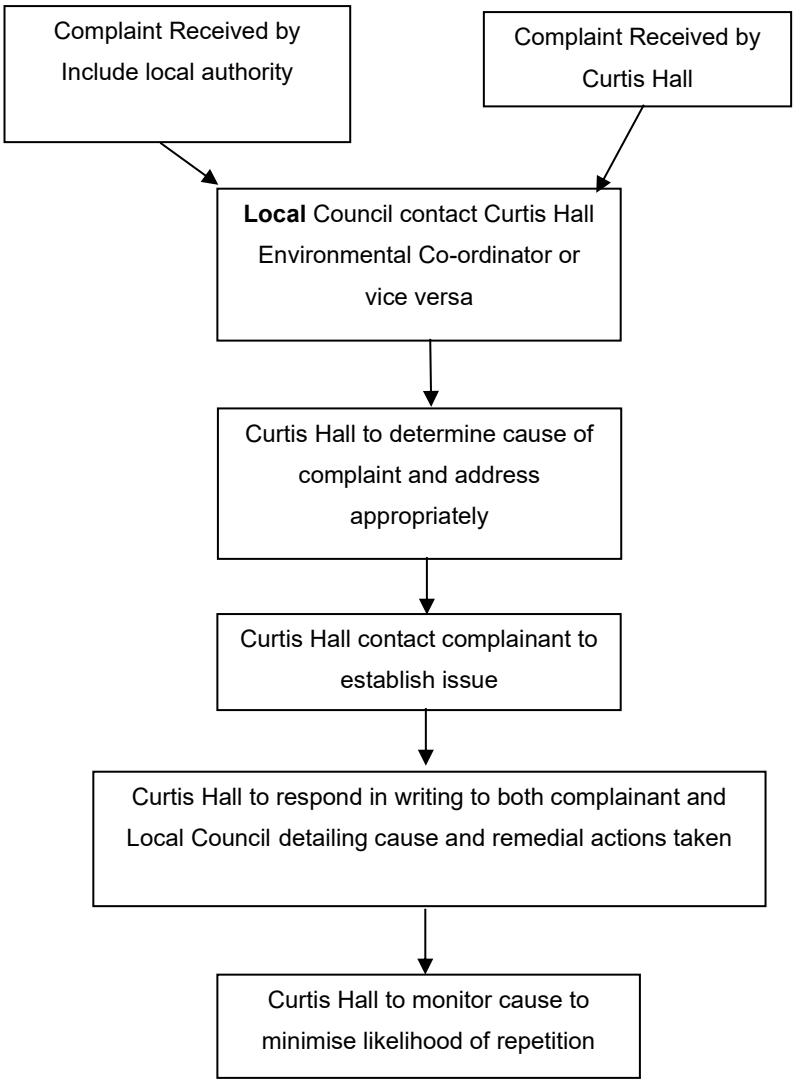
Consideration and Responsibility

4.04 All works will be carried out with positive consideration towards our neighbours and the environment. Should any works be deemed likely to cause an impact to our neighbours will be advertised through a mechanism to be agreed with Cardiff Council**.** This mechanism may be door to door leafleting of nearby properties, advertising in a local paper, posters in prominent locations etc. and will address issues relating to programme, activities and likely effects, duration and points of contact.

4.05 Curtis Hall Limited will ensure that all site personnel, specialist sub-contractors, delivery drivers and any other persons working on or visiting the site fully understand and implement the obligations of the Construction Environmental Management Plan and monitor their compliance with it. This will be achieved by including the Construction Environmental Management Plan and its obligations in the safety induction that everyone attending on site will attend. The inductees will be required to sign a statement stating that they have understood and will abide by the content of the Construction Environmental Management Plan.

4.06 The Site Manager, as the senior representative of Curtis Hall Limited will act as a central contact point for discussions with both Cardiff Council and other interested parties, including local businesses. Details of how to contact the Project Manager will be lodged with the client representatives and advertised through a suitable medium, should any complaints arise during the course of the works. A broad procedure for dealing with them is set out in Figure 1 below.

Figure 1 Complaints Procedure



Contact details for the Curtis Hall Environmental Co-ordinator are given below:

Curtis Hall Environmental Co-ordinator **Benjamin Hall**

4.1 Storage of fuel and chemicals

To reduce the risk of fuel and chemical pollution in watercourses, a comprehensive fuel and chemical storage strategy will be implemented, incorporating specific measures for containment, site management, and personnel training.

All fuels, oils, and chemicals will be stored in appropriate containers within a secure bunded compound. This compound will be constructed of an impermeable hard standing and comply with good site practices and Environment Agency guidelines, such as Pollution Prevention Guidance Note 6 ‘Working at Construction and Demolition Sites’ and GPP 1: A general guide to preventing pollution.

Oil drums and containers of chemicals will be placed on proprietary secondary containment systems. These systems must be capable of containing 110% of the contents of the largest container, or 25% of the total volume stored, whichever is greater.

• Storage for Smaller Containers: Oils and other chemicals in containers with a capacity of less than 200 liters will be kept within a locked store on drip trays. Access to this store will be restricted to authorized personnel only.

• No storage of these materials will be permitted within 10 meters of surface water drains on site. Additionally, environmental awareness toolbox talks emphasize storing all fuels, oils, and other potential pollutants away from root systems of retained trees and hedgerows.

• Subcontractor Agreement: The location and procedures for subcontractors' oil storage areas must be agreed upon with Site Management prior to any deliveries.

• Emergency Response: In the event of any accidental contamination of the ground or surface water, clean-up will be conducted in accordance with appropriate Environment Agency guidelines, and all contaminated materials will be removed off-site by a licensed waste contractor.

4.2 Prevention of silt pollution

• Silty water will only be discharged into designated settlement systems.
• Monitoring Site Drainage: Site drainage and settlement systems will be regularly checked for effective operation. Discoloration in the water will be treated as an indicator of high pollution load, requiring immediate action.

A settlement tank for holding silt contaminated water.

• Immediate Action on Problems: If a problem with silty water arises, pumping operations will stop immediately, and a line manager will be contacted.
• Site Cleanliness: All hard standings on site will be kept clean. If any area becomes silty or muddy, a line manager will be notified. The existing concrete hard standings will be maintained as much as possible during earthworks to ensure vehicles travel over clean surfaces, and will be replaced by stone cappings to avoid exposing bare earth.

• Road Sweeping and Wheel Washing: A manned jet wash and wheel wash facility will be installed at the entrance for cleaning vehicle wheels.

Internal site roads pose a particular risk as a pathway to silt contamination entering the water course. Internal roads are to be kept clean by brushing and scraping the road surface to minimise the risk of silt entering the road gulleys.

Wheel wash station at the site exit to clean wagons prior to leaving the site

Road sweepers will be used for the site compound and local roads, with their frequency managed based on weather conditions and site activities.
Water from the wheel washing point is to be discharged into a settlement tank and then into a settlement pond. Permission will be sought to discharge into the existing drainage system.
• Protection of Watercourses and Drains: If silty water is observed entering a watercourse or drain, site personnel will notify a line manager immediately and take steps to stop or divert it, for example, by using sandbags.
• **Weather Monitoring**: **Weather forecasts will be monitored** to allow for proactive planning of work activities, especially during periods susceptible to increased runoff.

• Runoff Control Measures: Cut-off trenches or silt fences will be considered and installed as appropriate to prevent silty surface runoff from reaching watercourses.

Geotextile silt barriers to be erected prior to earthworks commencing

• **Regular Watercourse Checks**: Watercourses potentially affected by dewatering operations or rainwater runoff will be **regularly inspected**.

• **Drain Cleaning Procedures**: Systems will be in place during drain cleaning operations to **intercept polluted water** effectively.

3. Training and Awareness

• **Environmental Awareness Toolbox Talks**: All site personnel, including subcontractors, will receive **regular toolbox talks** focused on environmental awareness. These sessions will specifically educate staff on the causes and prevention of **chemical pollution** and **silt pollution**, highlighting potential environmental harm, legal penalties, and the practical measures required to minimize impact. This ensures that everyone on site understands preventative measures and knows how to react to a spill.

4.3 SuDS

Sustainable Drainage Systems (SuDS) are an approach to managing surface water runoff that aims to control and manage water as close to its origin as practicable.

SuDS are crucial for treating lightly contaminated water runoff, such as that from car parks, by trapping and helping to break down pollutants. They offer a range of important environmental advantages:

• **Flood Risk Reduction** They reduce the risk of downstream flooding by slowing down runoff that enters the water environment.

• **Pollution Control** SuDS minimize diffuse pollution originating from surface water runoff and reduce the risk of pollution to groundwater. They achieve pollution removal through processes like sedimentation, adsorption, absorption, filtration, and microbial action.

• **Environmental Protection and Enhancement** These systems help minimize environmental damage, such as bank erosion and harm to habitats. They can also maintain or restore the natural flow regime of receiving watercourses, maintain groundwater recharge, and enhance wildlife habitats, amenity, and landscape quality

Project specific SuDS systems

Retention basins are a permanent part of the project and will be constructed as a priority as the primary SuDS drainage component. Rainwater run off and silt contaminated water will be discharged into the retention basins.

Infiltration trenches. Another permanent feature of the project, infiltration trenches will be installed next to the on-site roads to allow run off to divert into the trench and filter into the subsoil

Swales. The project includes a number of existing swales which form an integral part of the SuDS design.

4.4 Earthworks and Material Handling

Site stripping and vegetation removal at the start of a project can increase the volume of contaminated surface water run off. It can also reduce the area of vegetated land available for disposal of silty water. Forward planning for prologued wet weather and heavy downpours is essential.

Site clearance

Vegetation stripping in areas of thinning or development should occur independently and prior to topsoil stripping in order to avoid contaminating stockpiled topsoil. Removal of vegetation can destabilize topsoil and subsoils, particularly near river banks, it is be removed as required in line with scheduled works and not in large areas all at once. All waste vegetation is to be removed off-site and disposed of in line with

Hardcore and stockpiled materials

Stripped hardcore, concrete or planings should be stockpiled or stored away from other soils, maintaining a minimum 15m stand-off between hardcore and natural soils. If hardcore must be stockpiled on natural ground, matting is required.

Topsoil

Topsoil should be identified and stockpiled in areas where contamination will be minimal, avoiding wet conditions during stockpiling. Suggested locations include unused car parking areas, grass areas, or areas for renewed landscaping.

Topsoil stockpiles are to be quarantined by fencing or matting to prevent contamination. If stored on car park surfaces, cleaning or matting is necessary.

Topsoil are not be stored adjacent to rivers to prevent it from washing into the water, and a buffer must be maintained to allow for recoverable runoff.

Topsoiling operations must adhere to BS 3882:2015 specifications. Before topsoiling, subsoil needs to be thoroughly 'ripped' mechanically to relieve compaction. Topsoiling depths are specified for shrub/hedgerow beds and lawned areas.

Subsoil

All subsoiling operations are to comply with BS 8601:2013 specifications, and existing subsoil should be used where possible and broken up according to this standard. Imported subsoil must be installed to specified depths for different landscaping types. the source of imported subsoil must be confirmed and tested for contaminants to ensure compliance with screening values.

Subsoil at the base of tree pits must be thoroughly broken up to a depth of 200mm prior to planting.

Dust and Erosion Control

Finished ground/road surfaces will be laid down as early as feasible to seal the ground and minimize dust generation.

Surfaced and unsurfaced site access roads will be maintained and watered as needed using a water bowser, with daily monitoring during dry weather.

Exposed soil or material stockpiles are to be damped using sprinklers and hoses. A windsock will indicate prevailing winds, guiding targeted damping efforts near sensitive receptors.

All completed earthworks areas not subject to subsequent drainage will receive a stone capping layer, which will then be covered by permanent building works. Areas not permanently covered will be topsoiled and vegetated as soon as practicable.

Visual inspection of the site perimeter will be carried out weekly/daily during dry periods to monitor dust deposition.

◦ Site runoff of water or mud is to be avoided.

◦ Wheel washing systems (with rumble grids) should be implemented for vehicles leaving the site, with an adequate hard-surfaced road area between the wash and the exit.

◦ On-site haul routes will be inspected and repaired, and hard-surfaced routes will be regularly damped and cleaned.

◦ Earthworks and exposed soil stockpiles should be re-vegetated to stabilize surfaces as soon as practicable. If re-vegetation is not possible, Hessian, mulches, or trackifiers will be used.

◦ Only small areas of cover should be removed during work, not all at once.

• Ecological Considerations

◦ Excavation within 7m of an invasive species will not occur without an ecologist's advice.

◦ Soil or material potentially containing seeds or other plant materials from invasive species should not be moved or stockpiled without an ecologist's advice

4.8 Waste

Legal waste storage and disposal are essential for effective pollution control. Duty of Care legislation dictates any waste produced in the course of the project does not escape our control. Waste must be transferred to an authorised and registered waste carrier and disposed of lawfully. Checks are to be made on the destination of the waste to confirm it is authorised to receive it.

As part of the Construction Environmental Management Plan minimising and reducing waste during the construction stage is a key priority and the following core principles will be maintained throughout the construction process:

- Toolbox Talk briefing sessions.
- Adopting good on-site working practices.
- Reducing wastage on site.

- Ensuring adequate waste storage facilities are provided.
- Ensuring adequate security measures are in place.
- Appropriate waste disposal routes.

The above will all be managed and recorded in the Curtis Hall Site Waste Management Plan - SWMP (Pro-forma plan is contained in Appendix D)

4.5 Further details of good site practices include the following:

- All construction personnel including sub-contractors will be briefed through toolbox talks regarding the importance of minimising, segregating and recycling wastes during the construction process.
- Guidance will be provided on the segregation of certain waste streams such as aggregates, excavated materials, metal, wood, cardboard and polythene packaging waste.
- The objectives of the toolbox talks will be to maximise opportunities for recycling and minimise waste to landfill.
- Deliveries will be on a 'just-in-time' basis to minimise potential damage and wastage of materials.
- Clearly labelled waste skips will be provided at the site for the segregation of waste streams for recycling and for general waste to be disposed of to landfill. The skips will be stored in a secure location on-site to prevent waste nuisance issues arising.
- Fuels, oils and chemicals will be stored in appropriate containers within secure bunded compound constructed of an impermeable hard standing and in accordance with good site practices and Environment Agency guidelines (Pollution Prevention Guidance Note 6 'Working at Construction and Demolition Sites').
- Construction materials will be stored in a secure compound to prevent the potential for vandalism and theft of material.
- Segregated waste for recycling will be removed from site by a licensed contractor to an appropriate Materials Recycling Facility (MRF).
- Wastes that cannot be recycled will be removed from site by a licensed waste contractor to an appropriate licensed landfill facility ensuring adherence to the Environmental Protection (Duty of Care) Regulations.

- Waste will only be placed in the approved locations to minimise litter and pollution.

4.6 In summary, the following construction best practice (Construction Industry Research and Information Association – 'Environmental Good Practice On Site' will be followed:

Ordering	**Delivery**
Avoid: - • Over ordering (order "just-on-time") • Ordering standard lengths rather than lengths required (e.g. Plasterboard) • Ordering for delivering at the wrong time (update programme regularly)	*Avoid:* - • Damage during unloading • Delivery to inappropriate areas of the site • Accepting incorrect deliveries, specification or quantity
Storage	**Handling**
Avoid: - • Damage to materials from incorrect storage • Loss, theft or vandalism through secure storage and on-site security	*Avoid:* - • Damage or spillage through incorrect or repetitive handling

4.7 The Environmental Co-ordinator will liaise with the ecological consultant to the project to ensure that the surrounding environment is respected throughout the works. This will be reinforced through the toolbox talks, which will include an ecology-specific briefing.

4.8 Any accidental contamination of the ground or surface water will be cleaned-up in accordance with the appropriate Environment Agency guidelines and removed off-site by the appropriate licensed waste contractor.

4.9 Any protected species identified during the works will be notified to the ecological consultant to the project, who will advise an appropriate course of action, if necessary, in conjunction with Include local authority.

4.10 Until an appropriate course of action is identified, no further works will take place in the area identified as having a protected species.

4.11 Surplus material, rubbish etc. shall not be allowed to accumulate on the site or over-spill to the surrounding environment.

Noise

4.12 Construction noise emissions have been identified as a potential source of annoyance to the local population. Specific consideration will be given to the Neighbouring residential properties situated to the rear of the site,

4.13 Working Hours; the works carried out on site will be from the hours of **07:00 to 18:00 hours Monday to Friday, 07:00 to 13:00 hours on Saturdays. Sundays and Bank Holidays to be agreed with the Local Authority.**

4.14 Standard Construction Plant/Equipment will be used during all phases of the construction process.

4.15 Piling - 10:00 to 16:00 Monday to Friday only which is estimated to take no more than around 10 working days to complete for Plots 5 and 6

4.16 Typical mobile plant will include Excavators, Rollers, Cranes, Dumpers, Scissor Lifts, and Cherry Pickers.

4.17 On site noise levels will be monitored continuously in accordance with Annex G BS 5228 – Part 1: 2009 with a constant noise monitoring station on the southern boundary and potentially at other positions around the site.

4.18 All plant items will be properly maintained and operated in accordance with the manufacturers' recommendations, so that excessive noise is minimised. Rattling noises will be controlled by tightening loose parts and by fixing resilient materials between the surfaces in contact.

4.19 Plant known to emit noise strongly in one direction should, where possible, will be orientated so that the noise is directed away from noise sensitive areas.

4.20 Acoustic covers will be kept closed when engines are in use and idling. Compressors that have effective noise enclosures and are designed to operate when their access panels will be used.

4.21 Materials will be lowered where practicable and not dropped.

4.22 Stationary plant such as compressors and generators will be positioned away from sensitive locations within the confines of the operational use of the equipment.

4.23 Where reasonably practical, noisy plant or processes will be replaced by less noisy alternatives (BPM). Annex B of BS5228: Part1:

Maintenance

4.24 Regular and effective maintenance of machinery and noise control measures, by trained personnel is essential and will assist in reducing potential noise. Increases in plant noise are often indicative of future mechanical failure and will be responded to be the Environmental Co-ordinator.

4.25 Noise caused by vibrating machinery having rotating parts can be reduced by proper attention to balancing.

4.26 Frictional noise will be reduced by tools being well maintained and kept sharp.

4.27 Lubrication of parts will also reduce noise.

Training

4.28 All employees and contractors will need to be informed about the need to minimise noise. As part of on-site training they will be advised regularly of the following:

- The proper use and maintenance of tools and equipment.
- The positioning of machinery on site to reduce the emission of noise to the neighbourhood and to site personnel.
- Avoidance of unnecessary noise when carrying out operations, and when operating plant and equipment.
- Using and maintaining measures adopted for noise control.
- By reporting defective noise control equipment.
- Managers and supervisors recognising the need for employees to make proper use of measure to minimise noise.

- Machines in intermittent use will be shut down in intervening periods of non-use or, where this is impracticable, they will be throttled down to a minimum.

Emissions to Air

4.29 Finished ground/road surfaces will be set down as early as is feasible to seal the ground to ensure that the generation of dust is kept to a minimum.

4.30 Surfaced and unsurfaced site access roads will be kept in good order and will be watered as necessary using a water bowser. This will be monitored on a daily basis during hot, dry weather.

4.31 A water supply will be maintained across the site to ensure that dusty surfaces and activities can be damped as appropriate.

4.32 Any exposed soil or material stockpiles will be appropriately damped, if necessary, using sprinklers and hoses. A windsock will be located on the site and where this indicates a prevailing wind toward sensitive receptors, particular attention will be given to the damping of exposed soil and material stockpiles.

4.33 All areas of completed earthworks that are not subject to subsequent works such as drainage will have a stone capping layer placed on them, which will be covered with permanent building works. Areas not covered with permanent building works will be covered with topsoil and vegetated as soon as is practicable.

4.34 Screening monitoring through a visual inspection of the site perimeter will be carried out weekly during dry periods to check for dust deposition (evident as soiling and marking) on vegetation, cars and other objects.

4.35 The following good practice mitigation measures presented in the below tables will be adopted as detailed in the Air Quality Assessment:

Table 4.1 IAQM Guidance on the Assessment of Dust from Demolition and Construction **'Highly Recommended'** Mitigation Measures

Communications
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
Display the head or regional office contact information.
Dust Management
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
Make the complaints log available to the local authority when asked.
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
Avoid site runoff of water or mud.
Keep site fencing, barriers and scaffolding clean using wet methods.
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
Cover, seed or fence stockpiles to prevent wind whipping.
Ensure all vehicles switch off engines when stationary - no idling vehicles.
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.

Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
Use enclosed chutes and conveyors and covered skips.
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Avoid bonfires and burning of waste materials.
Earthworks
No Action Required.
Construction
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
Avoid dry sweeping of large areas.
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
Record all inspections of haul routes and any subsequent action in a site log book.
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
Access gates to be located at least 10m from receptors where possible.

Table 4.2 IAQM Guidance on the Assessment of Dust from Demolition and Construction **‘Desirable’** Mitigation Measures

Communications
No Action Required.
Dust Management
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Earthworks
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
Only remove the cover in small areas during work and not all at once.
Construction
Avoid scabbling (roughening of concrete surfaces) if possible.
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout
No Action Required.

Vehicles

4.36 The cleanliness of the site access road will be assessed on a daily basis. Road sweeping will be undertaken as necessary should it be required.

Vehicle Routing

4.37 Care has been taken during the design process and thought has been given to minimise the need for HGV movements.

4.38 The proposed routing map will be contained in **Appendix B**.

4.39 This route will be communicated to all Specialist Subcontractors and Material Suppliers.

4.40 Temporary signs will be erected. This will ensure that drivers are directed to the site and do not inadvertently use minor local roads.

4.41 Anticipated vehicle movements will be small in number and infrequent.

4.42 The programme of works has been sequenced such that any deliveries to site will either be onto a stone capping layer or hard surfacing again minimising the risk of any mud or debris being deposited on the Public Highway. The surrounding area will be monitored at all times and if necessary and as required Road Sweeping plant will be on hand to deal with any debris/mud on the Highway.

Lighting

4.43 During the construction phase the temporary site lighting will adhere to the best practice guidance outlined in Guidance Notes for the Reduction of Light Pollution (Institution of Lighting Engineers, 2000), including the following:

- Lighting will be switched off when not required for safety or security;
- Temporary lighting will be directed into the site away from residential areas;
- Wherever possible lighting will be directed downwards to illuminate the target area to reduce spill light to a minimum;
- Specifically designed lighting equipment will be installed to minimise the spread of light near to or above the horizontal;
- To keep glare to a minimum, the main beam angle of all lights directed towards any potential observer will be kept below 70 degrees. Higher mountings used for the lighting will lower the main beam angle reducing potential glare;

- Wherever practicable, floodlights with asymmetric beams will be used.

4.44 In order to mitigate against the impact of artificial lighting on bats, their roosting, migration, and feeding patterns, further stipulations were imposed and are demonstrated within the lighting design for the proposed Development: -

- The use of lights utilising light emitting diodes (LED) without UV elements, therefore reducing the attraction of invertebrates to the lights.

- Only luminaires with 0% upward light ratio should be used and fitted on the horizontal to avoid excessive up-lighting, back lighting and light spill onto boundary hedgerows and trees.

- A warm white spectrum (between 2000-3000 degrees Kelvin) should be used in order to reduce blue light component, therefore reducing the number of invertebrates attracted to the lights.

- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.

- Ideally the Site boundary lux level should be between 0 and 2 as this is within the range of natural moonlight.

- The vegetation planted on Site and any roosting habitats should be unlit.

Ecology

4.45 Statutory and Non-statutory Designated Sites

Mitigation measures to be implemented during the construction phase in relation to Severn Estuary SAC, SPA and Ramsar, Rhymney River Section SSSI, Howardian LNR, River Rhymney SINC, Llanedeyrn Woodlands Complex SINC and Pontprennau Wood SINC are as follows:

- Standard environmental best practice measures will be implemented, including measures to control dust, and to prevent pollution.

- A 15-20 m buffer will be maintained from the watercourse, which will limit any impacts to the watercourse during construction of the footpath, warehouse, parking, storage areas, access roads, and other hard landscaping.

4.46 Habitats

Mitigation measures to be implemented during the construction phase in relation to habitats are as follows:

- Trees and woodland to be retained following the development will receive appropriate protection during the construction phase of works through the use of tree root protection zones and barriers in accordance with BS5837: 2012 Trees in relation to design, demolition, and construction, where appropriate.

- Standard environmental best practice measures will be implemented, including measures to control dust, and to prevent pollution.

- Sections of the site are subject to a TPO, so any tree work or felling in these protected areas will require permission from Cardiff Council. Proposed thinning will also require felling permission.

4.47 Birds

Mitigation measures to be implemented during the construction phase in relation to birds are as follows:

- Where practicable, clearance of the Site will be undertaken outside of the main nesting bird season (i.e. clearance carried out between September and February inclusive).

- If these works cannot be restricted to within this period, an Ecological Watching Brief will be maintained during the main bird breeding season to ensure that no nesting birds are adversely affected. This will entail a check of all suitable

habitat for nesting birds due to be removed, and a buffer of at least 10 m beyond that area by a suitably qualified ecologist prior to the commencement of works.

- If, during the Ecological Watching Brief, birds are found to be within the area due to be cleared or the buffer zone, measures to prevent any disturbance to breeding birds, including the cessation of tree and vegetation clearance, or construction works in areas close to breeding sites until the birds have completed breeding, will be put in place until the chicks have fledged.

4.48 Bats

Mitigation measures to be implemented during the construction phase in relation to bats are as follows:

- All retained trees and vegetated corridors on-Site and immediately adjacent to the Site will be protected during the construction phase in accordance with BS5837:2012 Trees in relation to design, demolition, and construction. This will also create a buffer to vehicular movement, reducing the impacts of noise and vibration.

- Sensitive lighting will be adopted on-Site to minimise disturbance to bats and other nocturnal species, avoiding significant illumination of suitable habitat during the night.

- Any trees identified to have bat roost potential in the Delta-Simons Ecological Impact Assessment report that require removal will first be subject to further surveys to inform the need for and extent of any mitigation and/or compensation.

4.49 Badgers

Mitigation measures to be implemented during the construction phase in relation to badgers are as follows:

- Prior to construction, a pre-commencement badger check of the Site should be undertaken to ensure no new setts have been created.

- During the construction phase of works, no open pits or trenches will be left uncovered or, alternatively, without a mammal escape ramp overnight.

4.50 Otter

Mitigation measures to be implemented during the construction phase in relation to otters are as follows:

- During the construction phase, no open pits or trenches will be left uncovered or, alternatively, without a mammal ramp overnight.

- Implementation of a landscape buffer of 15-20 m at the edge of the Site where it bounds the River will ensure that any disturbance to this corridor is minimised.

- An otter ledge positioned above the water level will be incorporated into the new bridge to avoid the need for otters to travel onto the road above the bridge.

4.51 Hedgehog

Mitigation measures to be implemented during the construction phase in relation to hedgehogs are as follows:

- During the construction phase, no open pits or trenches will be left uncovered or, alternatively, without a mammal ramp overnight.

4.52 Dormouse

Mitigation measures to be implemented during the construction phase in relation to dormice are as follows:

- A toolbox talk will be given to all site contractors explaining the presence of dormouse on-Site, measures being taken to protect them, and what to do if one is discovered unexpectedly during works.

- Planned works will avoid the main dormouse mid-summer breeding season (June to August, inclusive) and will also be undertaken during the active period for dormice (i.e. avoiding November – March, inclusive).

- All works to on-Site habitat that could impact this species will be covered by, and carried out in accordance with, a European Protected Species Licence from Natural Resources Wales.

- Sensitive lighting will be adopted on-Site during the construction phase to minimise disturbance to dormice and other nocturnal species, avoiding significant illumination of suitable habitat during the night.

4.53 Invasive species

One of the objectives of the twenty-five year Woodland Management Plan prepared for the site is the eradication of all invasive species in particular Japanese Knot Weed (*Reynoutria japonica var. japonica)* and Himalayan Balsam (*Impatiens glandulifera*). The aim is to begin the control measures in the first year of the plan with complete eradication by year five. However, ongoing control of any new infestation will be continued throughout the plan period. Specific control methods for the two primary species of concern are given below:

4.59.1 Japanese Knotweed

In year one of the plan, the areas of Knotweed will be carefully plotted using GPS equipment and the areas measured, after which specialist contractors will be invited to quote for the eradication of this species from site. It is likely that a combination of glyphosate treatment in areas away from the water course and excavation and removal from site will be required with the aim of eradication in the first five years of the plan. The contractor appointed will be expected to provide a detailed Method Statement demonstrating how the requirements of the Environmental Protection Act 1990 will be met prior to commencement. The Method Statement will need to be approved by the Local Planning Authority and the project Ecologist and Arboricultural Consultant before commencement.

4.59.2 Himalayan Balsam

To avoid the use of pesticides on the riparian parts of the site, hand pulling and cutting will be the primary method of control using a volunteer workforce. This will be a continuous control method and will be subject to onsite monitoring with ongoing treatment of balsam growth as and when it is found. The whole plant will be pulled out along with the root; by grasping the stem firmly and drawing upwards deliberately to prevent the stem breaking above the 1st stem node. The work will be timed when plants are large enough that the plant can be pulled out of the ground intact (c.50cm tall) from March/April to August with ongoing treatment to minimise flowering and seed pod formation. If it becomes difficult to get sufficient volunteer help, hand or machine cutting to prevent seeding will be utilised.

4.59.3 Other Species

While the two most invasive species will be a priority other non-native species and garden escapes will be removed particularly from the Ancient Woodland areas. This will be incorporated into routine maintenance and thinning of natural regeneration.

References

Nov D Jones D (2022) Public information on invasive species in Wales: Himalayan balsam. Welsh Government.ec Treatment 2: Physical management systems - Labour-based hand pulling & cutting.

Jones D (2020) Public information on invasive species in Wales: Japanese knotweed. Welsh Government.

Aquatic ecology

Prevention and mitigation measures as follows:

4.54 All operatives would be made aware of the need to protect the watercourse from contamination, including any NRW and CIRIA guidance and legal obligations.

4.55 Appropriate measures to protect the aquatic environment should be implemented during the construction phase of the Proposed Development in order to eliminate or minimise risk to aquatic flora and fauna.

4.56 Such measures include best environmental practice outlined in Construction Industry Research and Information Association (CIRIA) guidance (CIRIA, 2015).

4.57 To prevent fine sediment entering the watercourses, construction activities should occur away from the watercourses, where possible, with appropriate application of silt/sediment control measures. A 15 m minimum buffer zone has been indicated for the Proposed Development.

4.58 When construction activities, including stock piling and plant and vehicle washing, occur near a watercourse they should be separated from the watercourse with barriers (e.g. sediment fences) to prevent surface runoff from these sites entering the watercourse. Ideally, construction activities should be at least 8m from the bank top of a watercourse.

4.59 Geotextile-material silt fences should be installed to filter suspended solids from runoff.

4.60 The extent of vegetation clearance should be limited as far as practicable near to watercourses.

4.61 The works should be carried out in accordance with established best practice.

4.62 Chemicals and fuels must be stored in secure containers located away from water bodies.

4.63 No refuelling of plant or machinery should take place near water bodies.

4.64 Pollution spill kits should be kept on site. In the event of an incident these will be used.

4.65 Any soils contaminated will be removed immediately to a suitable landfill site.

4.66 Bins should be provided on site for debris.

4.67 Cleaning of tools and shuttering would be carried out in water not draining directly to the watercourse.

4.68 In any event of expected heavy rain, pouring concrete, and other activities which increase the risk of contaminating runoff, should not be undertaken.

4.69 Timing of construction works should ideally be planned to avoid the migratory period in salmonids, to avoid the obstruction of passage or disturbance to fish moving to upstream reaches for spawning.

4.70 Sensitivity (to noise and vibration) of those fish species present should be considered to ensure that appropriate construction methods can be implemented to minimise and avoid disturbance or avoidance behaviour.

4.71 Lighting used for construction must be switched-off when not in use and, where possible, positioned so as not to spill on to watercourses. A dark corridor should always be maintained within the watercourse to allow fish passage.

4.72 Sediment management and water quality monitoring should be included in the CEMP and be implemented during any construction works with the potential to affect the watercourse, and plan for appropriate remediation measures to ameliorate any adverse effects should they occur.

Soil resource

4.73 The following strategy is to ensure that construction on site considers both the resource of the soil and the river to preserve the horticultural, ecological and structural condition of the site.

- A Pollution Prevention Plan should be in place for the site to prevent silting and pollution of the river prior to any works commencing on site. This could include soil bunds to prevent runoff, silt traps and fencing, hay bales down slope or in places of enhanced surface water runoff.
- Fly tipped waste and any other anthropogenic materials are to be cleared and appropriately removed off-site.
- Vegetation stripping in areas of thinning or development to happen independent of, and prior to, topsoil stripping. Waste vegetation is to be removed off-site to an appropriate waste management source.
- Remediation of contaminated strata on site.

- Stripped hardcore or pavements to be stockpiled or stored away from any other soils. A minimum of 15m stand-off should be maintained between stockpiles of hardcore and natural soils.
- Stripped hardcore is not to be stored immediately on top of natural soils. If hardcore is require to be stockpiled in areas where natural ground is present, matting is required.

4.74 In areas where any soft landscaping is to be stripped, permanently or temporarily, topsoil is to be identified and stockpiled in an area safe to do so, where contamination will be minimal. Stockpiling of the soil when wet should be avoided. Suggested locations for the stockpiles include:

- Areas of car parking not being used or undergoing development at the time of topsoil stockpiling in the west of the site.

- Areas of grass in the north of the site.

- Areas of soft landscaping, where a renewed landscaping plan is proposed

4.75 To prevent contamination of the topsoil during construction, the stockpile is to be quarantined by fencing or by matting. If topsoil is being stored on car parking surfaces, cleaning or matting is required.

4.76 Topsoil is not to be stored in the east of the site, adjacent to the river. This is to prevent washing of the topsoil into the river. As topsoil cannot be compacted, to preserve horticultural benefit, the topsoil must have a buffer to allow recoverable runoff from any stockpiles.

4.77 If any imported soils are required, the source will need to be confirmed, and the material tested for the attached suite of contaminants, to comply with the maximum screening values listed. The frequency is to be congruent with the site remedial strategy.

4.78 The landscaping plan includes for removal of vegetation to improve the woodlands and parklands planned to be preserved on site. However, removal of vegetation can destabilise topsoil and to a lesser extent subsoils. This will be

particularly relevant in areas where the soils are wet or in the banks of the river, where removal will take away the root systems that help bind together the pedogenic systems of the soils.

Flood Risk

4.79 The site has been assessed as being at risk of flooding from rivers, therefore the following mitigation measures will be implemented as minimum:

- High risk/vulnerable activities (e.g. stockpiling, welfare, etc) to be sited on higher ground and/or above design flood level as defined in FCA where possible

- All chemicals, fuels or materials that could cause pollution to be stored in a way that can be easily moved in the event of a flood

- Detailed procedures set out in a flood action plan for securing the site (and plant etc) prior to a flood event

- Checking the Met Office and NRW Flood Warning service to ensure readiness and appropriate response to anticipated weather events.

- Runoff rate will not increase during the construction phase to avoid increasing flood risk.

APPENDIX A

Curtis Hall Ltd Environmental Policy

APPENDIX B

Construction Traffic Routing
(To be developed)

APPENDIX C

Anticipated Construction Programme
(To be developed)

APPENDIX D

Site Waste Management Plan Template

(To be developed)

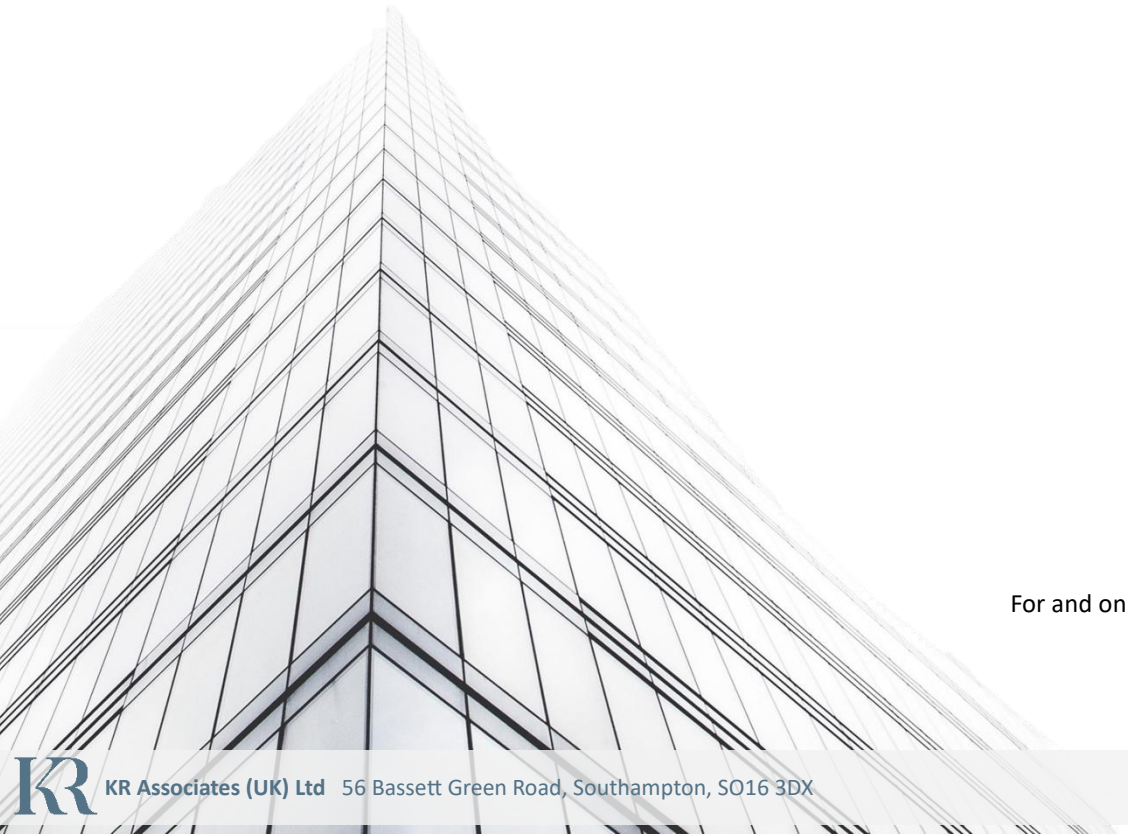
Our Goal…
We believe there is a more exciting way to help our customers deliver better projects…

Our Passion…
Innovate to make life simpler, drive **quality** so the detail is clear and **communicate** so everyone understands…

Noise Impact Assessment

Cardiff East Park and Ride, Eastern Avenue, Llanrumney, Cardiff. CF23 8HH.

Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works.



KR07942

Version: 1.0

1st December 2025

Mr. R. M. Scrivener, MSc, MIOA

For and on behalf of KR Associates (UK) Ltd

Quietly Confident…

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1 Executive Summary

1.1 Introduction and Scope of Report

1.1.1 KR Associates (UK) Ltd have been instructed to prepare a noise impact assessment at Cardiff East Park and Ride, Eastern Avenue, Old St Mellons in Cardiff to support the hybrid planning application for the following development.

> *"Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works."*

1.2 Previous Planning Application

1.2.1 Cardiff Council granted planning permission in June 2024 under application number 22/02673/FUL for the following development.

> *"Demolition of existing structures and redevelopment of the site to provide commercial floorspace (Use classes B1, B2, B8 and A3 and/or ancillary Class A1); associated drive-thru and car parking; the reprovision of the park and ride; a bridge across the Rhymney River; site wide landscaping and associated works."*

1.2.2 The approved planning application was supported by a previous KR Associates (UK) Ltd report reference KR06922 v1.9 dated June 2024. The Local Authority accepted the findings of the original report.

1.3 Discussion with Local Authority

1.3.1 KR Associates (UK) Ltd have discussed the current planning application with Rhys Morgan of Cardiff Council. It was agreed that in terms of the detailed portion of the planning application the noise generating activities of the proposed scheme will have a similar or less of an impact on the existing residential dwellings as the original scheme.

- The road layout, entrances and exits to the site and the bridge have remained unchanged.
- The proposed data centre will be likely to generate significantly less traffic than the original scheme.
- The removal of the park and ride and drive-thru elements will reduce the traffic noise from the site.

1.3.2 It was agreed that the specific details of the data centre which are within the outline section of the application are not yet known. However, it was agreed that an assessment would be undertaken in line with the original noise impact assessment to determine if the principle of a data centre on this site could be supported in terms of the impact of noise.

1.4 Executive Summary

1.4.1 The following provides a non-technical summary of the above sections to provide an overview of the impact of noise and vibration from the construction and operation of the proposed development

1.4.2 Noise Sensitive Properties

Residential	Group	Address and Description
NSP1	Group 1	246 Bryn Celyn – 2 Storey semi-detached residential dwelling
NSP2	Group 2	3 Ball Lane – 1st floor residential flat
NSP3	Group 3	10 Ball Close – 2 storey detached residential dwelling

1.4.3 Existing Background Noise Levels

The following table shows the background noise level results that were measured at position 1 on the eastern boundary of the site adjacent to the A48 and position 2 on the western boundary adjacent to the residential dwellings around Ball Lane.

Background Position		07:00 to 23:00	23:00 to 07:00	Commentary
Position 1	Measured	$L_{Aeq,\ 16\ hour}$ 66 dB	$L_{Aeq,\ 8\ hour}$ 60 dB	Measured levels are compared against the levels from the 2017 Strategic Noise Maps.
Position 2	Measured	$L_{Aeq,\ 16\ hour}$ 57 dB	$L_{Aeq,\ 8\ hour}$ 52 dB	

1.4.4 Key Legislative and Policy Criterion (Section 1.6)

The Welsh Government Planning Policy Wales ("PPW") Edition 11 was fully adopted in February 2021 including Chapter 6 entitled *''Distinctive and Natural Places''*. The Planning Guidance (Wales), Technical Advice Note (Wales) 11 entitled *"Noise"* was published in October 1997 but is due to be replaced to bring it in line with the PPW. In terms of local policy, the development will need to comply with policy EN13 entitled *''Air, Noise, Night Pollution and Land Contamination''* of the current Cardiff Local Development Plan.

1.4.5 Summary of Report

The assessments indicate that the principle of a large data centre on this site will be acceptable in terms of the likely noise emissions and the impact on existing residential dwellings. The development complies with policy EN13 entitled *''Air, Noise, Night Pollution and Land Contamination''* of the current Cardiff Local Development Plan and all other material considerations. The scheme is unlikely to give rise to any adverse impact on local residential occupiers as a result of the likely noise emissions from the data centres.

1.5 Layout of the Site

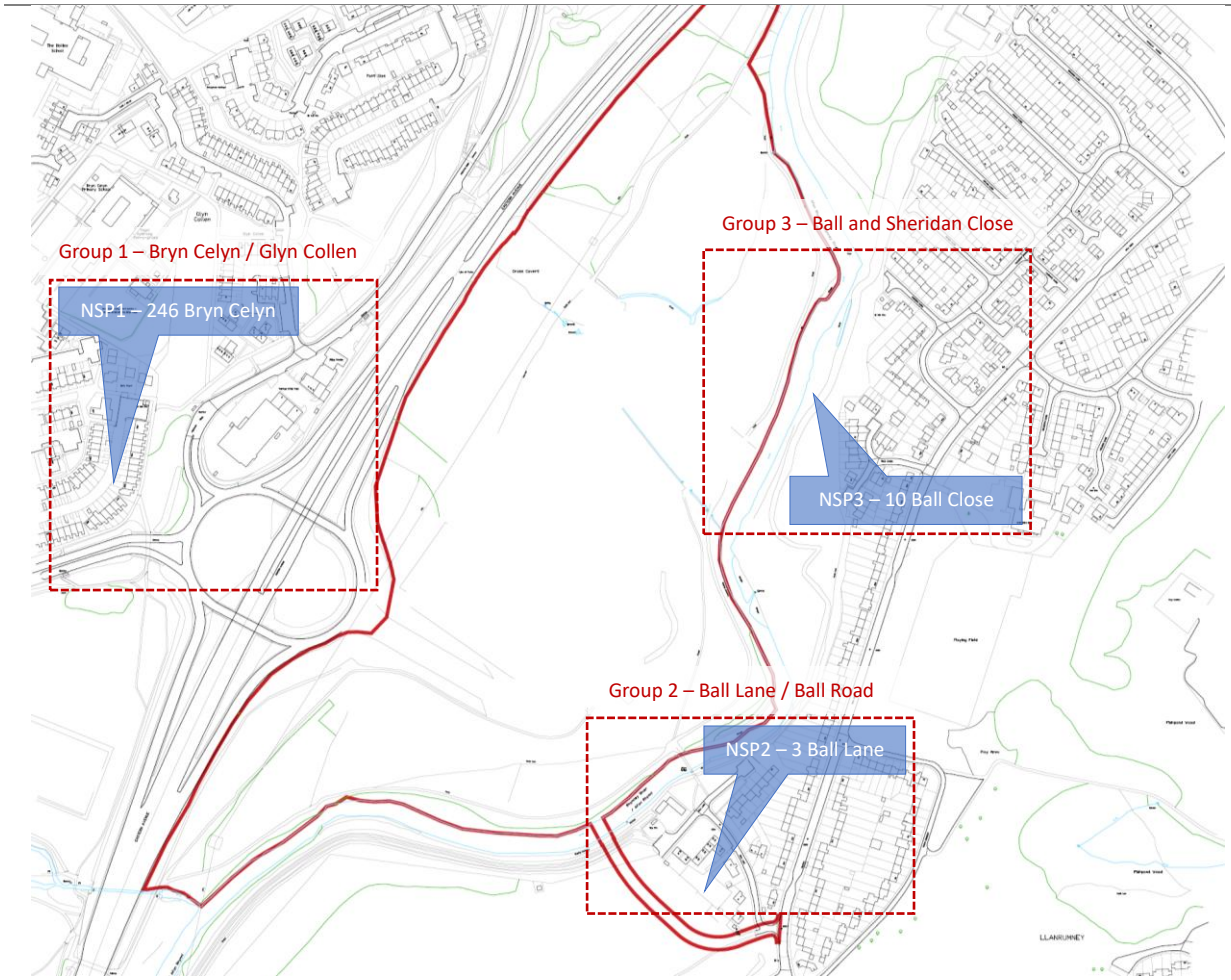
1.5.1 The Site encompasses approximately 23.4 hectares of land within the existing Cardiff Park and Ride East, located inside the administrative boundary of Cardiff City Council. The current Park and Ride facility occupies a hard-surfaced area of 4.9 hectares and provides approximately 900 car parking spaces, along with bus drop-off and pick-up points, an office/amenity building, and various service compounds. Access to the Site is via the A48 (Eastern Avenue).

1.5.2 Beyond the Park and Ride infrastructure, the Site includes areas of woodland and scrubland, interspersed with public rights of way and informal footpaths. The total developed area, including the Park and Ride, would comprise approximately 7.4 hectares. The Rhymney River forms the southern boundary of the Site, with the Rhymney Trail running parallel to the river. The Trail crosses the river via an existing footbridge located to the south of the Site.

1.5.3 The Site is not allocated for any specific use on the Council's adopted proposals map. However, it does include notable planning designations, such as areas of ancient woodland to the north and a smaller section to the south, as well as several trees protected by Tree Preservation Orders (TPOs). The northern portion of the Site and a corridor along the Rhymney River fall within an area of high flood risk, while the remainder of the Site is classified as low flood risk. The Site lies within the River Rhymney corridor.

1.5.4 Immediately northwest of the Site is the A48 dual carriageway, which connects southward toward Cardiff City Centre. Beyond this lies the residential area of Pentwyn, while Llanrumney is situated to the east. To the south, across the river, planning permission for a residential development comprising 98 units was granted under application reference 18/02594/MJR, and construction on that scheme is largely complete.

1.5.5 The following shows the existing plan of the Cardiff East Park and Ride site. The site is currently accessed from the roundabout over the A48 to the south western side of the site. There are three groups of existing residential dwellings that have the potential to be impacted by the development. Group 1 are the residential dwellings on Bryn Celyn and Glyn Collen on the western side of the development. Group 2 are the residential dwellings within Ball Lane off Ball Road to the south eastern side of the development. Group 3 are the residential dwellings within Ball Close and Sheridan Close on the eastern boundary.



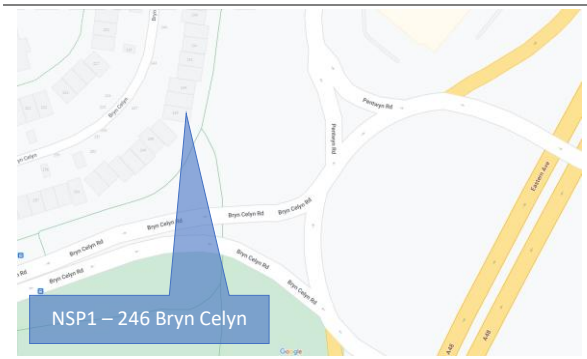
1.6 Noise Sensitive Properties

1.6.1 For the purposes of the assessments within this chapter the following dwellings are considered the most sensitive properties within each group.

Residential	Group	Address and Description
NSP1	Group 1	246 Bryn Celyn – 2 Storey semi-detached residential dwelling
NSP2	Group 2	3 Ball Lane – 1st floor residential flat
NSP3	Group 3	10 Ball Close – 2 storey detached residential dwelling

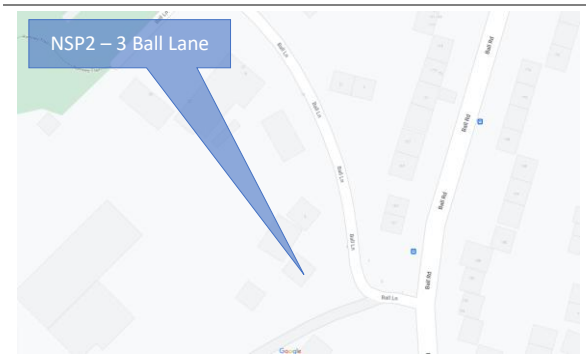
1.6.2 Noise Sensitive Property 1 – 246 Bryn Celyn

The residential dwelling at 246 Bryn Celyn could be impacted by the noise from the additional traffic using the roundabout above the A48.



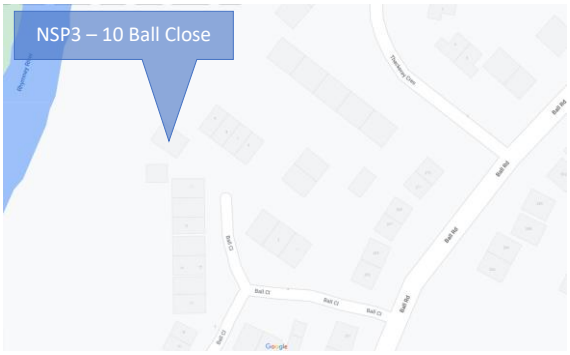
1.6.3 Noise Sensitive Property 2 – 3 Ball Lane

The residential dwelling at 3 Ball Lane could be impacted by traffic noise generated on the new link road which will connect the development to Ball Road generally to the south east of the development.



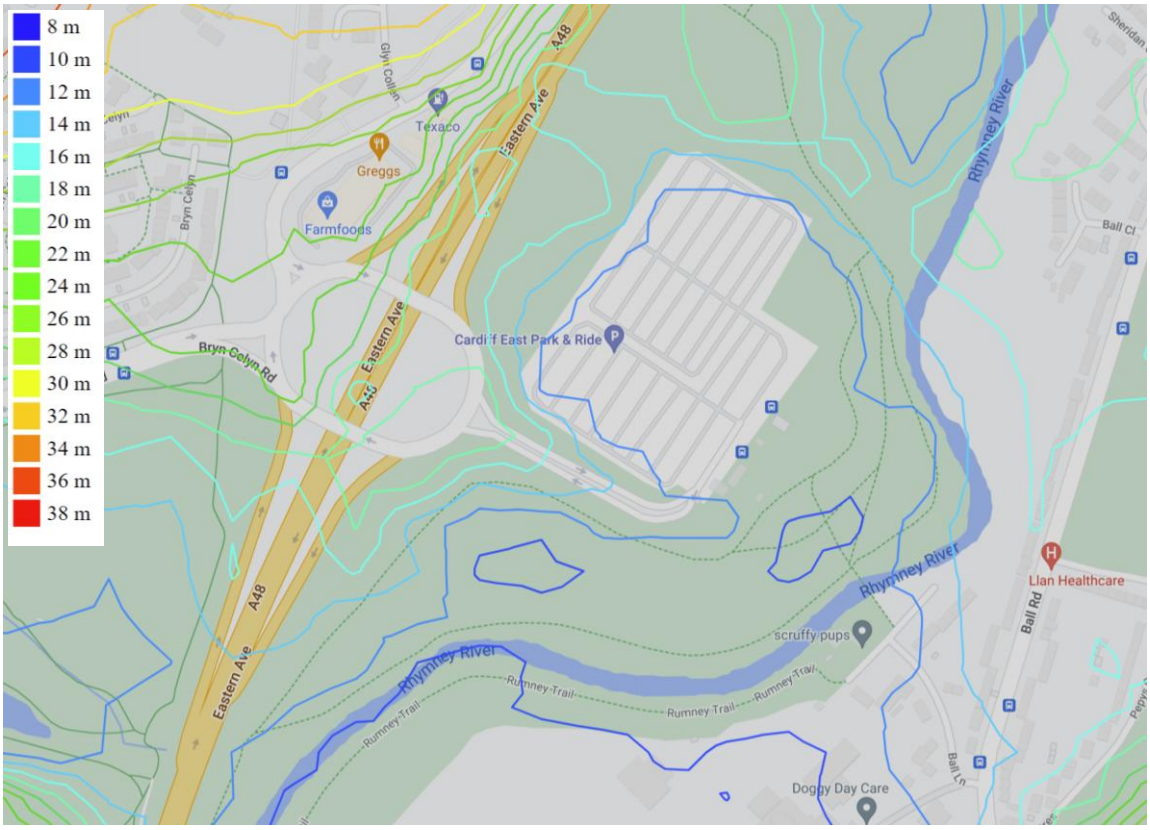
1.6.4 Noise Sensitive Property 3 – 10 Ball Close

The residential dwelling at 10 Ball Close could be impacted by the addition of the commercial units generally on the north eastern side of the proposed development.



1.7 Topographical Layout of Site

1.7.1 The existing park and ride car parking area is roughly between 11 and 12m above sea level with the access road to the south rising to around 19m on the roundabout above the A48 which is roughly at 15m. The residential dwelling at 246 Bryn Celyn (NSP1) is 24m above sea level, the residential flat at 3 Ball Lane (NSP2) is around 12m above sea level and the residential house at 10 Ball close is 19m above sea level.

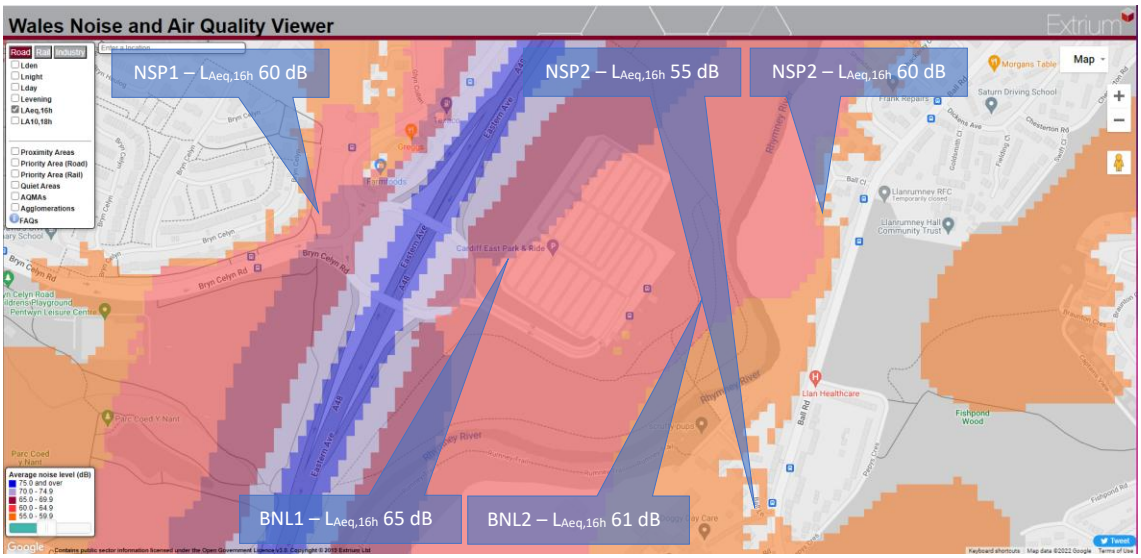


1.7.2 Rhymney river flows generally adjacent to the north east boundary of the site at a height of around 14m above sea level to the southern side of the site before it turns southwards to run parallel to the A48 at a height of 8m above sea level.

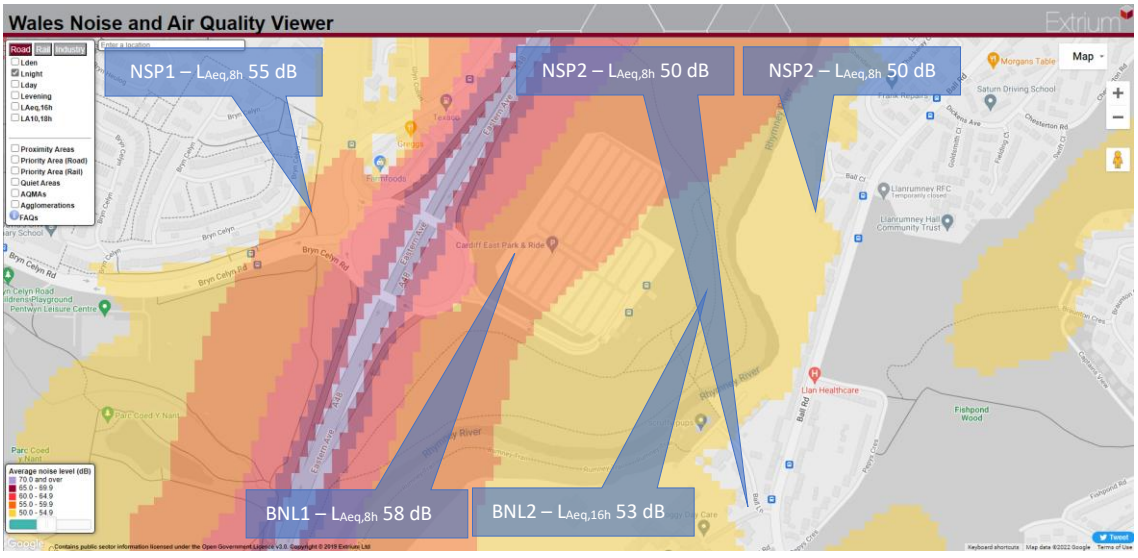
1.8 Strategic Noise Maps

1.8.1 Strategic noise maps of Wales are produced under the Environmental Noise (Wales) Regulations, 2006 (as amended) ("Regulations"). The Regulations transpose Directive 2002/49/EC (aka the Environmental Noise Directive, or END) into law. The noise maps are produced using detailed 3-dimensional geographic models of Wales. The 3-dimensional data is overlaid with transport models of relevant parts of the road and railway network, which details vehicle types, speed, etc.

1.8.2 Existing Day Time Noise Levels – Strategic Noise Maps

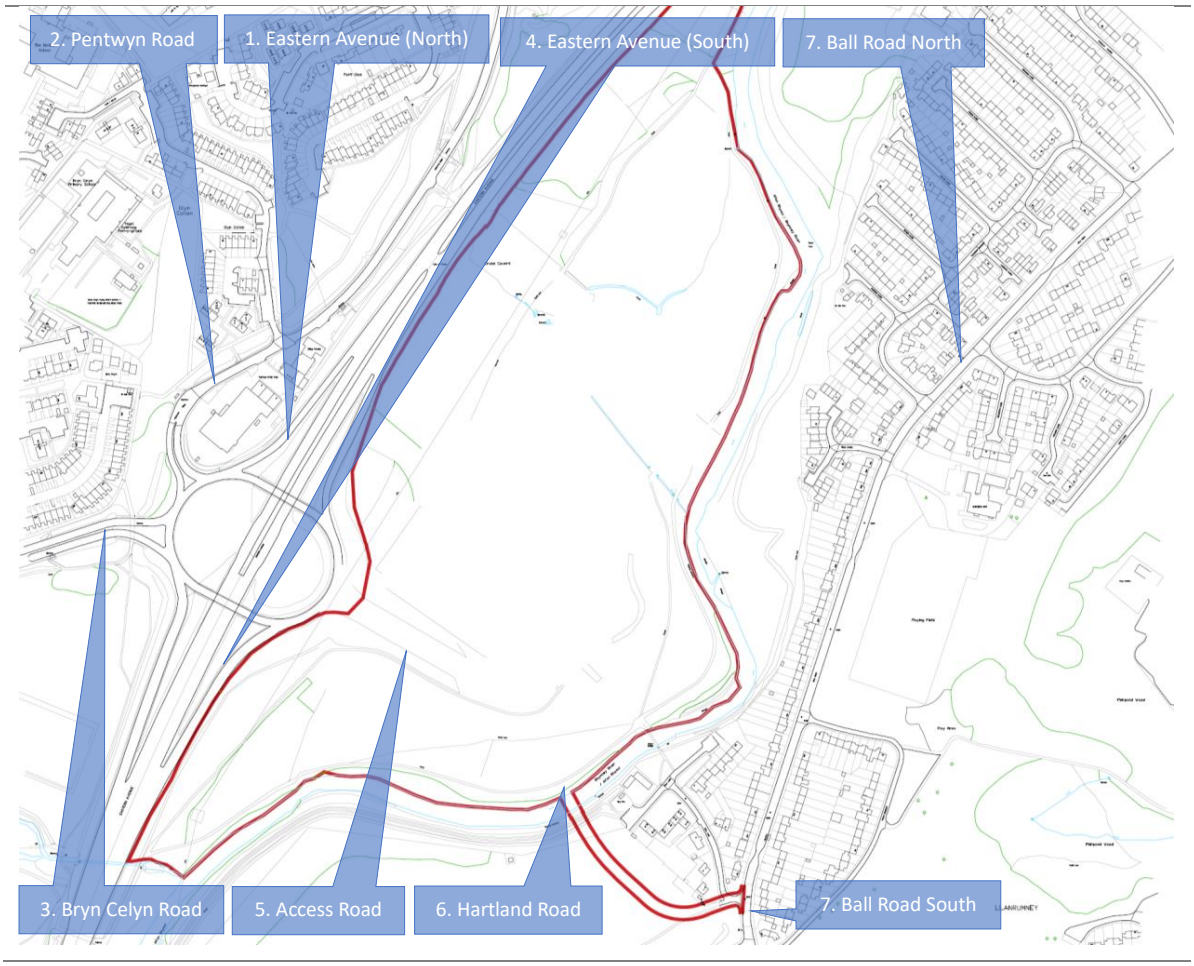


1.8.3 Existing Night Time Noise Levels – Strategic Noise Maps



1.8.4 It should be noted that the above noise maps do not include the noise from the existing park and ride facility in terms of cars and buses using the access road and parking in the car park.

1.9 Layout of Roads and Existing Traffic Flows



1.9.1 Existing and Proposed Traffic Flows

The following table provides the total 24-hour Annual Average Daily Traffic ("AADT") flows for all vehicles and the percentage of vehicles that are considered HGV.

Ref	Road Name	Speed Limit	Current Baseline Position (2025)	
			Total Vehicles	% HGV
1	Eastern Avenue Slip Road (North)	50 mph	10,802	2.8%
2	Pentwyn Road	30 mph	12,885	3.7%
3	Bryn Celyn Road	30 mph	12,207	2.0%
4	Eastern Avenue Slip Road (South)	50 mph	11,959	3.4%
5	Park and Ride Access Road	30 mph	2,006	11.0%
6	Hartland Road (New Link Road)	20 mph	480	3.6%
7	Ball Road North	20 mph	3,918	2.9%
8	Ball Road South	20 mph	3,918	2.9%

2 Noise Criterion

2.1 Determination of Application in line with the Local Development Plan

2.1.1 Section 38 (6) of the Planning and Compulsory Purchase Act 2004 and section 70 (2) of the Town and Country Planning Act 1990 requires the following when determining planning applications.

> *"Section 38 Development Plan*
>
> *(6) If regard is to be had to the development plan for the purpose of any determination to be made under the planning Acts the determination must be made in accordance with the plan unless material considerations indicate otherwise.*
>
> *Section 70 Determination of applications: general considerations*
>
> *(2) In dealing with an application for planning permission or permissions in principle the authority shall have regard to:*
>
> *(a) the provisions of the development plan, so far as material to the application,*
> *(c) any other material consideration."*

2.2 Environmental Protection Act 1990 (Amended 1993)

2.2.1 The Environmental Protection Act 1990 as amended by the 1993 Noise and Statutory Nuisance Act 1993 includes section 79 (1) in Part III entitled *"Statutory Nuisance and Clean Air"* which describes Statutory Nuisance as *"g) noise emitted from premises as to be prejudicial to health or a nuisance".* Should the site cause a nuisance to its neighbours the Local Authority have a duty to serve an Abatement Notice under section 80(1). Failure to comply with the requirements of the Abatement Notice will result in the operators of the site committing a criminal offence and upon successful prosecution which could make them liable for fines to Level 5, which are currently unlimited.

2.3 Control of Pollution Act 1974

2.3.1 The key legislation in dealing with the noise and vibration from construction is the remaining parts of the Control of Pollution Act 1974. Under section 60, the Local Authority can serve a notice, often referred to as a "Section 60 Prohibition Notice" which can impose conditions, restrict, or stop construction works that are creating excessive noise and vibration and disturbing nearby noise sensitive properties. An application for prior approval for construction works can be made under Section 61 and if the methods and type of working are adhered to the Local Authority can't serve a section 60 notice. The Act also introduces the principle of Best Practical Means as a defence.

2.4 Environmental Noise (Wales) Regulations 2006 (Amended 2009)

2.4.1 The European Union Directive 2002/49/EC known as the Environmental Noise Directive ("END") still applies in Wales as it is currently enacted by the Environmental Noise (Wales) Regulations 2006 (Amended 2009). The END provides a common approach to avoid, prevent, and reduce the harmful effects of environmental noise. In the main this involves the creation of strategic noise maps for large agglomerations of more than 100,000 inhabitants and providing access to the general public on environmental noise and its adverse impacts.

2.5 Planning Policy Wales Edition 11

2.5.1 The Welsh Government Planning Policy Wales (PPW) Edition 11 was fully adopted in February 2021 including Chapter 6 entitled *''Distinctive and Natural Places''*. Paragraph 6.7.4 entitled "*Framework for Addressing Air quality and Soundscape"* reducing the population exposure to air and noise pollution.

> "*The planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.''*

2.5.2 Paragraph 6.7.5 discusses the agent of change principal.

> *''In taking forward these broad objectives the key planning policy principle is to consider the effects which proposed developments may have on air or soundscape quality and the effects which existing air or soundscape quality may have on proposed developments……..*
>
> *The agent of change principle says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.''*

2.5.3 Paragraph 6.7.6 refers to considerations for new development.

> *''In proposing new development, planning authorities and developers must, therefore:*
>
> *address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors;*
>
> *not create areas of poor air quality or inappropriate soundscape; and*
>
> *seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.''*

2.5.4 Paragraph 6.7.7 confirms what is required by the Planning authority to assist decision making.

> *''To assist decision making it will be important that the most appropriate level of information is provided and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.''*

2.6 Technical Advice Note 11 (TAN 11) 1997

2.6.1 The Planning Guidance (Wales), Technical Advice Note (Wales) 11 entitled *"Noise"* was published in October 1997. This document includes the Noise Exposure Categories A to D within Appendix A which provides absolute noise levels for road traffic and combined sources. Paragraph 8 provides the following advice under section 8 entitled *"Noise Generating Development"*:

> *"Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions."*

2.7 Consultation on Technical Advice Note 11

2.7.1 The Welsh Government published a consultation document on 10th February 2020 ahead of the proposed update to TAN11. The amendments will provide updated details on soundscapes and noise pollution to align with the Planning Policy Wales Edition 11. It is likely that this consultation will remove the Noise Exposure Categories currently provided in Appendix A.

2.8 Policy EN13 of Cardiff Council Local Development Plan 2006 – 2026

2.8.1 The Cardiff Council Local Development Plan was fully adopted in January 2016 including policy EN13 entitled *''Air, Noise, Night Pollution and Land Contamination.''*

> *''Development will not be permitted where it would cause or result in unacceptable harm to health, local amenity, ….. because of ….. noise….''*

2.9 Policy 33 of the Future of Wales National Plan 2040

2.9.1 The Future Wales National Plan 2040 was fully adopted in February 2021 including Policy 33 entitled *'' National Growth Area – Cardiff, Newport, and the Valleys.''*

> *''Cardiff, Newport, and the Valleys will be the main focus for growth and investment in the South East region. Strategic and Local Development Plans should recognise the National Growth Area as the focus for strategic economic and housing growth; essential services and facilities; advanced manufacturing; transport and digital infrastructure. The Welsh Government will work with regional bodies and local authorities in the region and in neighbouring regions of England to promote and enhance Cardiff, Newport and the Valleys' strategic role and ensure key investment decisions support places in the National Growth Area and the wider region. The Welsh Government supports Cardiff's status as an internationally competitive city and a core city*

on the UK stage. Cardiff will retain and extend its role as the primary national centre for culture, sport, leisure, media, the night time economy and finance…"

2.10 British Standard 4142: 2014 (Amended A1: 2019)

2.10.1 British Standard 4142: 2014 + A1: 2019 provides a method for assessing the likely effects of sound from industrial or commercial nature on *"people who might be inside or outside a dwelling used for residential purposes"*.

"This British Standard describes the methods for rating and assessing sound of a…. commercial nature, which includes:

b) sound from fixed installations which comprise mechanical and electrical plant and equipment."

2.10.2 The standard may be used to establish the following:

"This standard is applicable to the determination of the following levels at outdoor locations:

a) rating levels for sources of sound of a …. commercial nature.

b) ambient, background and residual noise levels.

For the purposes of:

…2) assessing sound from proposed, new….source(s) of sound of a …. Commercial nature."

2.10.3 <u>Feature Correction - Subjective Method</u>

The standard provides the following commentary on the subjective assessment of tonality, impulsivity, character, and intermittency.

Feature Correction	Perceptibility of specific noise at assessment position against residual noise			
	Not	Just	Clearly	Highly
Tonality	+0 dB	+2 dB	+4 dB	+6 dB
Impulsivity	+0 dB	+3 dB	+6 dB	+ dB
Character	+0 dB	+3 dB		
Intermittency	+0 dB	+3 dB		

2.10.4 Initial Estimate of Impact

The initial estimate of the adverse impact can indicate the following:

"a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

d) Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

2.11 Night Noise Guidelines 2009

2.11.1 The aim of the *Night Noise Guidelines* (4) published in 2009 was to update the *WHO – Guidelines for Community Noise* (5) published in 1999 and provides health-based guidelines for acceptable night time noise levels following the work previously undertaken for the *European Union Directive 2002/49/EC* (6) known as the Environmental Noise Directive. The report goes on to recommend the following thresholds based on the relationship between the night-time noise levels and the effect on the person sleeping.

Effect	Health Effects Observed in the Population	$L_{night, outside}$
NOEL	Up to this level no biological effects are observed	30 dB
LOAEL	Effects on sleep, body movements, awakening	40 dB
SOAEL	Significant adverse health effects	> 55 dB

3 Background Noise Levels

3.1 Measurement Period

3.1.1 The background noise measurements were measured at two positions between Monday 13th September 2021 and Wednesday 22nd September 2021 as shown on the map below. The meters were installed on lamp posts within the site and set to record continuously in 1/3rd octave for the measurement duration.

Position	Latitude	Longitude	Height
Measurement Position 1	51.521641°	-3.137800°	12m + 4m = 16m
Measurement Position 2	51.521280°	-3.134348°	11m + 4m = 15m

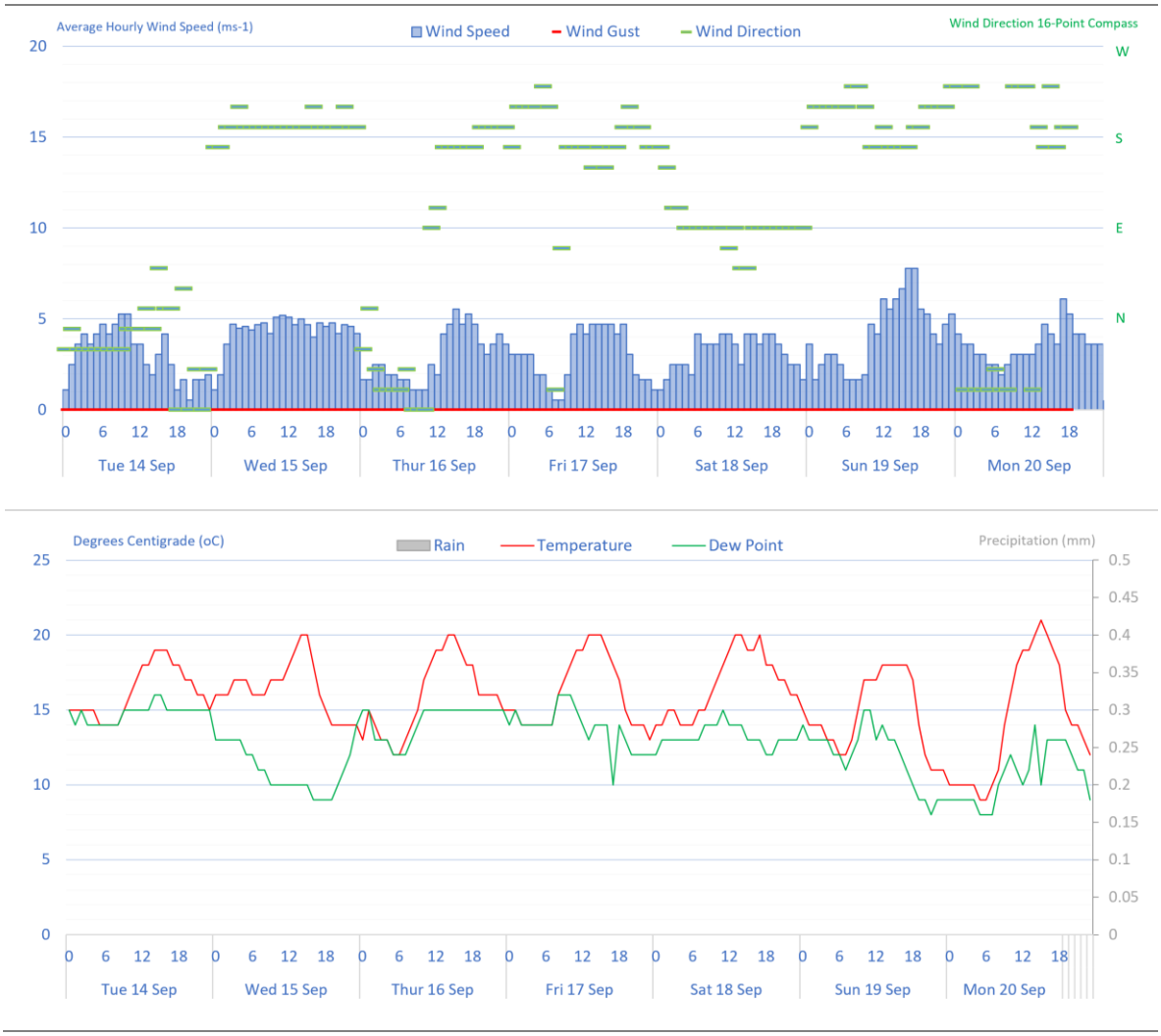
3.2 Measurement Equipment

3.2.1 The following measurement equipment was used to undertake the background noise measurements.

Equipment Type	Sound Level Meter		Microphone		Calibrator	
Equipment Reference	KRE/07	KRE/08	KRE/07	KRE/08	KRE/07	KRE/08
Background Position	1	2	1	2	1	2
Manufacturer / Model	Casella / CEL-633C1		Casella / CEL-251		Casella - CEL-120/1	
Serial Number	2206846	2145391	00663	00598	5231002	5231003
Certificate Number	U38258	U36902	38257	36901	U38256	U36900
Calibration Date	28/06/21	28/01/21	28/06/21	28/01/21	28/06/21	28/01/21

3.3 Weather Conditions

3.3.1 The following graphs show the prevailing weather conditions during the measurement period. In general terms the weather did not impact the background noise measurements.

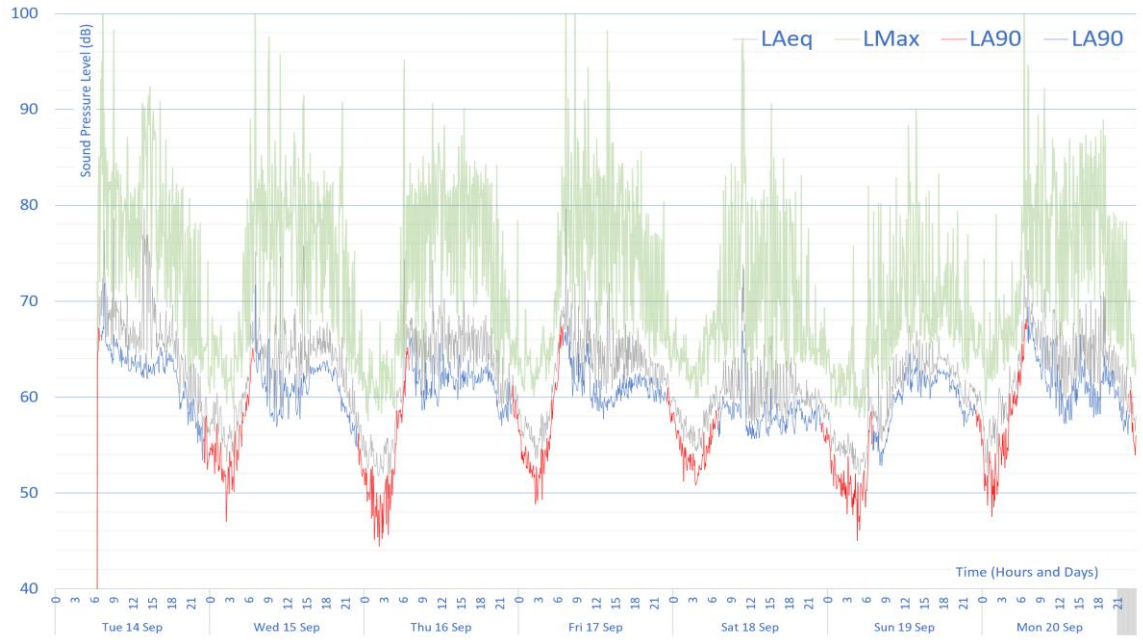


3.4 Comparison with Levels from Strategic Noise Map

3.4.1 The following table details the approximate levels which have been derived from the strategic noise maps. These are used only as a reference point to ensure the background noise levels recorded at the two positions are representative.

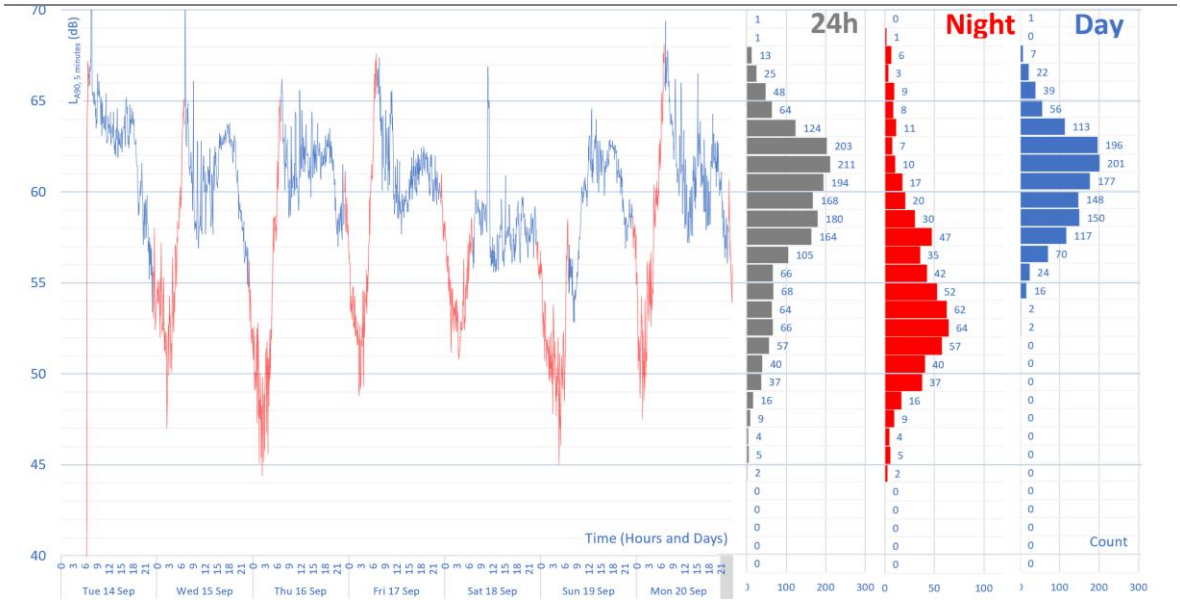
Background Position	07:00 to 23:00	23:00 to 07:00	Commentary
Positiion 1	$L_{Aeq,\ 16\ hour}$ 65 dB	$L_{Aeq,\ 8\ hour}$ 61 dB	Strategic Noise Map Traffic Noise Only
Position 2	$L_{Aeq,\ 16\ hour}$ 58 dB	$L_{Aeq,\ 8\ hour}$ 53 dB	

3.5 Background Noise Levels Measured at Position 1



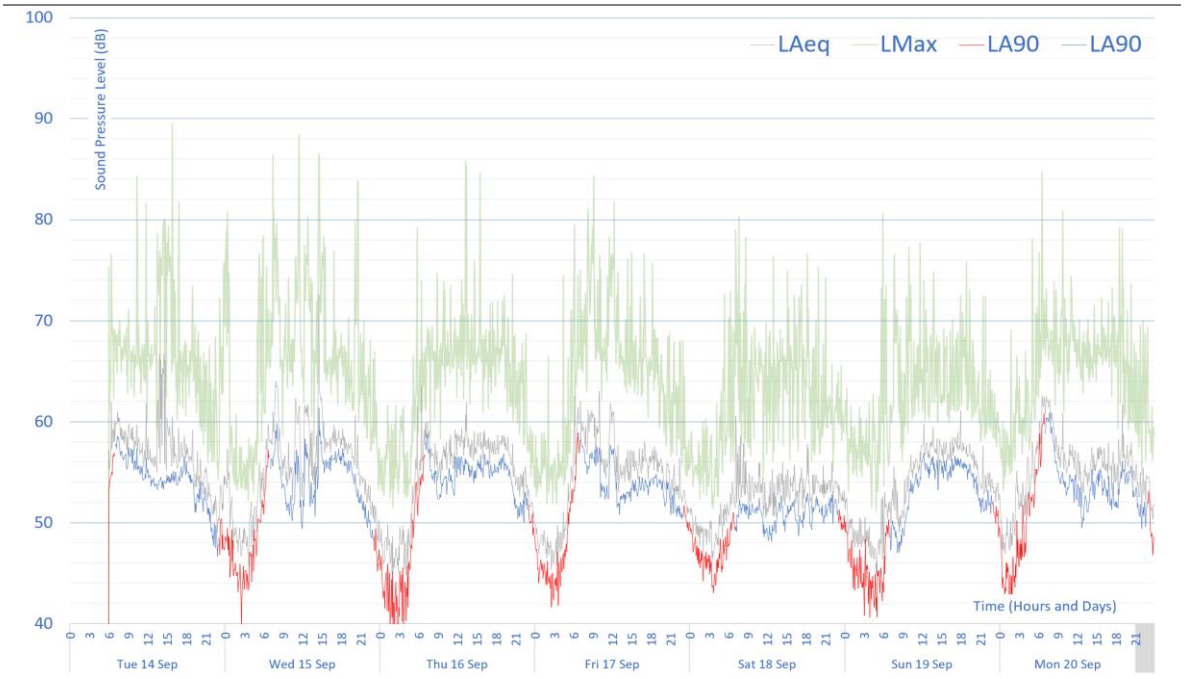
Day Time (07:00 to 23:00)			Night Time (23:00 to 07:00)		
$L_{Amax,\ 5\ minutes}$	$L_{Aeq,\ 5\ minutes}$	$L_{A90,\ 5\ minutes}$	$L_{Amax,\ 5\ minutes}$	$L_{Aeq,\ 5\ minutes}$	$L_{A90,\ 5\ minutes}$
61 – 109 dB	55 – 80 dB	53 – 72 dB	58 – 81 dB	49 – 65 dB	44 – 63 dB
Sound Pressure Level (dB) – Reference 2 x 10^{-5} Nm^{-2}					

3.5.1 Modal Analysis and Average Noise Levels at Measurement Position 1



Day Time (07:00 to 23:00)		Night Time (23:00 to 07:00)	
Minimum Modal $L_{A90,\ 1\ hour}$	44 dB	Modal $L_{A90,\ 15\ minutes}$	54 dB
Average $L_{Aeq,\ 16\ hour}$	66 dB	Average $L_{Aeq,\ 8\ hour}$	60 dB

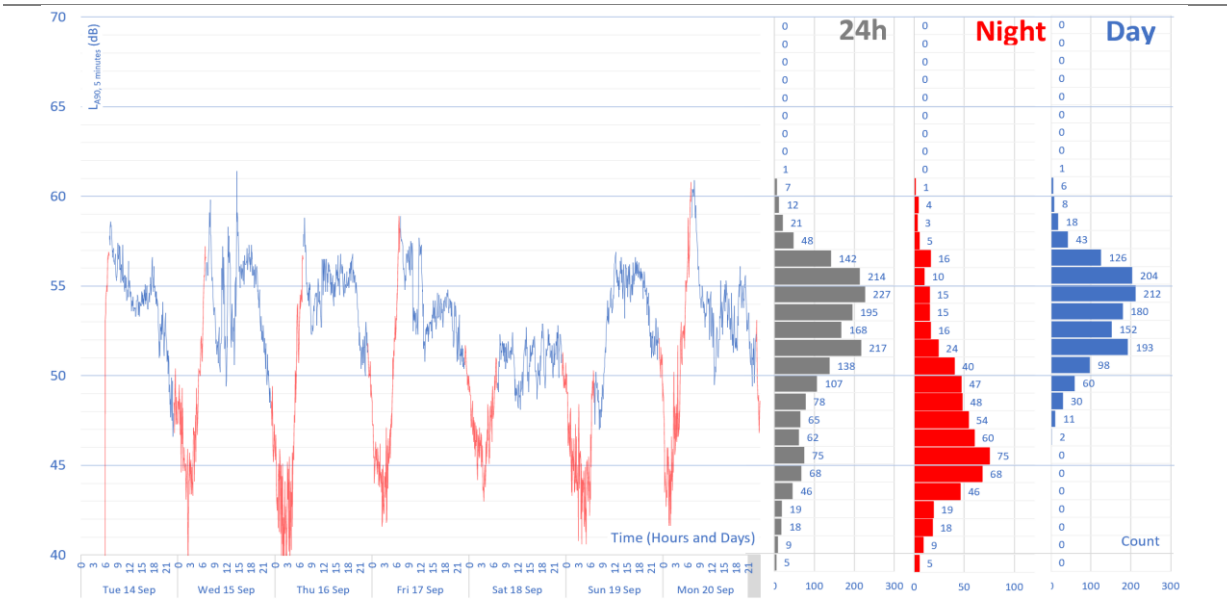
3.6 Background Noise Levels Measured at Position 2



Day Time (07:00 to 23:00)			Night Time (23:00 to 07:00)		
$L_{Amax,\ 5\ minutes}$	$L_{Aeq,\ 5\ minutes}$	$L_{A90,\ 5\ minutes}$	$L_{Amax,\ 5\ minutes}$	$L_{Aeq,\ 5\ minutes}$	$L_{A90,\ 5\ minutes}$
54 – 90 dB	49 – 73 dB	47 – 61 dB	51 – 81 dB	45 – 61 dB	38 – 55 dB

Sound Pressure Level (dB) – Reference 2 x 10^{-5} Nm^{-2}

3.6.1 Modal Analysis and Average Noise Levels at Measurement Position 2



Day Time (07:00 to 23:00)		Night Time (23:00 to 07:00)	
Minimum Modal $L_{A90,\ 1\ hour}$	43 dB	Modal $L_{A90,\ 15\ minutes}$	39 dB
Average $L_{Aeq,\ 16\ hour}$	57 dB	Average $L_{Aeq,\ 8\ hour}$	52 dB

3.7 Summary of Background Noise Levels

3.7.1 The following table shows the measured 16-hour day time and 8-hour average noise levels measured at position 1 and 2 correlate nearly perfectly with the levels extrapolated from the strategic noise maps.

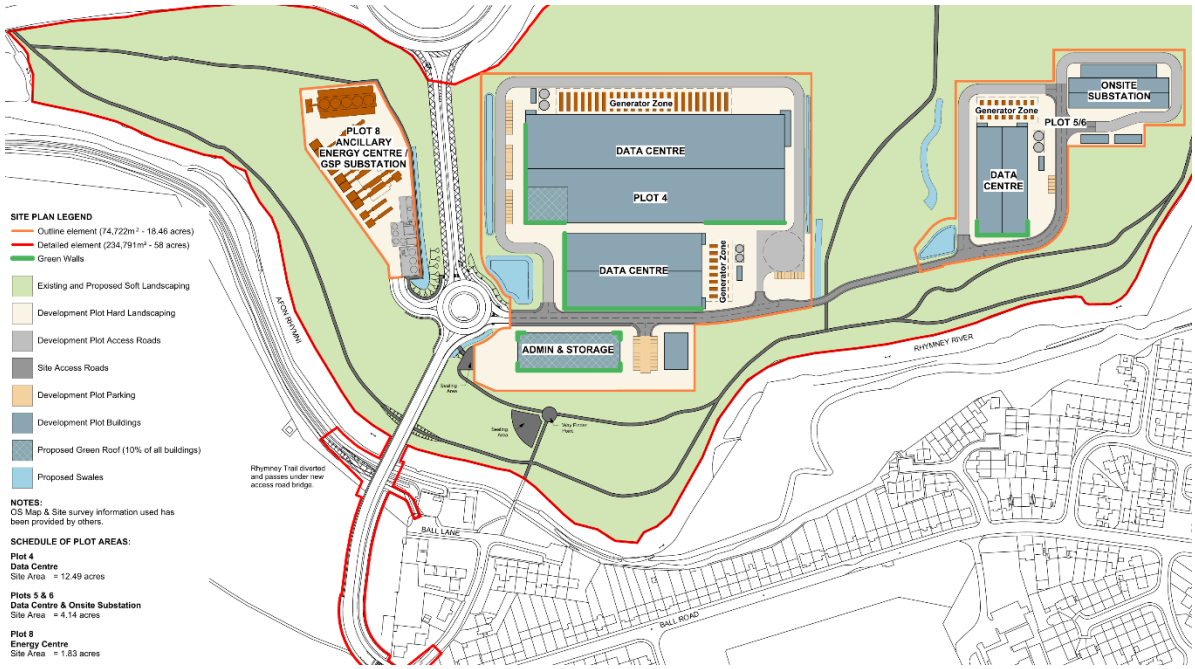
Background Position		07:00 to 23:00	23:00 to 07:00	Commentary
Position 1	Measured	$L_{Aeq,\ 16\ hour}$ 66 dB	$L_{Aeq,\ 8\ hour}$ 60 dB	Measured levels are compared against the levels from the 2017 Strategic Noise Maps.
	Noise Map	$L_{Aeq,\ 16\ hour}$ 65 dB	$L_{Aeq,\ 8\ hour}$ 61 dB	
	Difference	+1 dB	-1 dB	
Position 2	Measured	$L_{Aeq,\ 16\ hour}$ 57 dB	$L_{Aeq,\ 8\ hour}$ 52 dB	
	Noise Map	$L_{Aeq,\ 16\ hour}$ 58 dB	$L_{Aeq,\ 8\ hour}$ 53 dB	
	Difference	-1 dB	-1 dB	

3.7.2 The above table indicates that the prevailing weather did not impact the background noise measurements and that the traffic flows were similar to those used to create the Strategic Noise maps in 2017. The fact that the average noise levels were 1 dB below the Strategic Noise map figures could indicate that the traffic flows were slightly less, but it may not be possible to draw that conclusion due to the uncertainty in the measurements. The slight increase at position 1 during the day time may indicate the contribution from cars using the park and ride, though again due to the uncertainty in the measurements no reliance is placed on this assumption.

4 Proposed Development

4.1 Proposed Site Location Plan

4.1.1 The following details the layout of the site showing the areas which will be subject to the outline portion of the application. This is where the data and energy centres will be located.



4.2 Electricity Supply

4.2.1 The data centre is expected to require around 150 MW of to run under normal conditions. The available connection in terms of available supply and time scales for connection is not yet known. It is expected that the energy centre on plot 8 will generate around 49 MW including temporary energy and backup generators.

4.2.2 It is understood that the temporary power will provided by 7-No PGM70 gas turbines with a combined capacity of around 49 MW. These will be provided in a packaged form and it is understood they will have an overall sound power level of around $L_{w(A)}$ 95 dB.

4.2.3 The main substation will be a Grid Supply Point which convert the proportion of the data centre 150 MW requirement from the main transmission network. This will likely consist of a number of 50 MVA transformers which tend to have a sound power level of around $L_{w(A)}$ 90 dB. There is often a built-in redundancy of N+1 or N+2 depending on the configuration of the substation. For the purposes of the outline application it is assumed there will be 8 - No transformers on the substation.

4.2.4 It is understood that the standby generators will be similar to the Cummins C2500D5A 2500 kVA 50 Hz 3 phase open diesel generators. These are expected to have a sound power levels of around $L_{w(A)}$ 116 dB. In terms of the outline design there are expected to be 32-No generators on Plot 4 and 8-No generators on Plot 5 / 6. It should be noted that the standby generators will only operate between 10:00 and 16:00 on weekdays with a total annual run time of less the 72 hours.

4.3 Data Centre Cooling

4.3.1 The ASHRAE TC 9.9 Technical guidelines provide details of the maximum allowable internal temperatures for different classes of data centres from A1 which recommended not to exceed 27oC to Class A4 which is not recommended to exceed 45°C.

4.3.2 It is not known how the end user will cool the data centre but if we assume a system running on R744 (CO2) with a GWP of around 1, the system would require around 90 No Gas Coolers each measuring around 5m long x 2.0m wide with around 6 plate fans running at 800 rpm each moving around 43 m3s-1 of air on the hottest summers day. These would likely have a maximum sound power level of around $L_{w(A)}$ 88 dB(A). In terms of the outline planning application this is an absolute worst-case scenario.

4.4 Assumed Individual Sound Power Levels

4.4.1 For the purposes of assessing the proposed outline proposal for the 150 MW data centre the following are likely to be the typical number and rating of the noise sources that could impact the residential dwellings.

Ref	Detailed Description of Source	Octave Band Centre Frequency (Hz)								$L_{w(A)}$
		63	125	250	500	1K	2K	4K	8K	
1	7-No 8MW Gas Turbines *Equivalent Sound Pressure Level 62 dB(A) at 10m*	84	88	90	91	90	88	85	82	95
2	8-No 50 MW Transformers *Equivalent Sound Pressure Level 57 dB(A) at 10m*	92	94	90	89	83	79	73	66	90
3	90-No Twin gas cooler (cooling) *Equivalent Sound Pressure Level 55 dB(A) at 10m*	79	68	88	69	83	85	68	60	88
4	40 No Cummins C2500D5A Generators *Equivalent Sound Pressure Level 83 dB(A) at 10m*	101	120	118	113	110	106	103	101	116

Sound Power Level, dB – reference 1 x 10^{-12} watts

4.4.2 It should be noted that during the details designed stage equipment should be selected to meet the above requirements. It may be necessary depending on the final customers requirements to include acoustic screening around the gas turbines, substation and possibly some or all of the temporary generators.

5 Assessment of Noise Levels

5.1 Assessment of the Significance of Noise

5.1.1 Uncertainty of Assessment

Section 10 of British Standard 4142: 2014 entitled *"Uncertainty"* requires the following:

> *"Consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, take reasonably practicable steps to reduce the level of uncertainty. Report the level and potential effects of uncertainty."*

5.1.2 Uncertainty of Measured Values

Reference	Source of Uncertainty Section 10.2 British Standard 4142: 2014	Value dB(A)	Distribution (Divisor)	Uncertainty dB(A)
a	Variability and complexity of sound source	0.50	$\sqrt{2}$	0.35
b	Variability and complexity of residual sound	0.00	$\sqrt{3}$	0.00
c	Residual sound present in specific sound	0.00	$\sqrt{3}$	0.00
d	Background noise position selection	0.10	$\sqrt{3}$	0.06
e	Distance between source and receiver	0.15	$\sqrt{2}$	0.11
f	Number of measurements taken (Days)	0.10	$\sqrt{3}$	0.06
g	Measurement time interval variation	0.00	$\sqrt{2}$	0.00
h	Range of times measurements taken	0.10	$\sqrt{3}$	0.06
i	Suitable weather conditions during measurements	0.20	$\sqrt{3}$	0.12
j	Application of British Standard 4142: 2014	0.10	$\sqrt{2}$	0.07
k	Rounding of each measurement	0.05	$\sqrt{3}$	0.03
l	Instrumentation – Calibration	1.20	$\sqrt{3}$	0.69
Reported Expanded Uncertainty (95% confidence, convergence k = 2)				1.61

5.1.3 Uncertainty in Calculations

Reference	Source of Uncertainty Section 10.2 British Standard 4142: 2014	Value dB(A)	Distribution (Divisor)	Uncertainty dB(A)
a	Impact of measured sound level on calculations	0.00	$\sqrt{2}$	0.00
b	Assumption on sound power level of source	0.00	$\sqrt{3}$	0.00
c	Uncertainty of calculation method (ISO 9613)	0.20	$\sqrt{3}$	0.12
d	Model fit against real world conditions	0.10	$\sqrt{3}$	0.06
e	Error in the calculation process	0.15	$\sqrt{2}$	0.11
Reported Expanded Uncertainty (95% confidence, convergence k = 2)				0.33

5.1.4 Uncertainty from Other Factors

Reference	Source of Uncertainty Section 10.2 British Standard 4142: 2014	Value dB(A)	Distribution (Divisor)	Uncertainty dB(A)
a	Standing waves or interference patterns	0.15	$\sqrt{3}$	0.09
b	Approximation of sound source to a point source	0.10	$\sqrt{3}$	0.06
c	Maintenance and repair of source over 15 years	0.50	$\sqrt{3}$	0.29
Reported Expanded Uncertainty (95% confidence, convergence k = 2)				0.61

5.1.5 Combined Reported Expanded Uncertainty

Reference	Source of Uncertainty Section 10.2 British Standard 4142: 2014	Value dB(A)	Distribution (Divisor)	Uncertainty dB(A)
a	Section 7.1.2. Uncertainty of measured values	2.7	$\sqrt{2}$	1.14
b	Section 7.1.3. Uncertainty of calculations	2.7	$\sqrt{2}$	0.23
c	Section 7.1.4. Uncertainty from other factors	2.7	$\sqrt{2}$	0.43
Combined Reported Expanded Uncertainty (95% confidence, convergence k = 2)				2.5

5.2 Assessment of Noise Levels at NSP1 - 246 Bryn Celyn

5.2.1 The following table provides an initial estimate of the impact on residents both inside and outside the residential dwellings from the proposed development based on the outdoor sound incident on the building.

Results	Day Time	Night Time	Commentary
Specific	$L_{Aeq,\ 1\ hour}$ 35 dB	$L_{Aeq,\ 15\ min}$ 35 dB	7.3.6 – Calculated levels
Feature	+0 dB	+0 dB	9.2 - Subjective corrections
Rating	$L_{Aeq,\ 1\ hour}$ 35 dB	$L_{Aeq,\ 15\ min}$ 35 dB	9.2 - Worst case scenario
Background	$L_{A90,\ 1\ hour}$ 60 dB	$L_{A90,\ 15\ min}$ 51 dB	8 - No correction for residual
Assessment	-25 dB	-16 dB	11 - Rating Level – Background Level
Uncertainty	+- 2.5 dB		10 – 95% Confidence, k = 2

5.3 Assessment of Noise Levels at NSP2 - 3 Ball Lane

5.3.1 The following table provides an initial estimate of the impact on residents both inside and outside the residential dwellings from the proposed development based on the outdoor sound incident on the building.

Results	Day Time	Night Time	Commentary
Specific	$L_{Aeq, 1\ hour}$ 29 dB	$L_{Aeq, 15\ min}$ 29 dB	7.3.6 – Calculated levels
Feature	+0 dB	+0 dB	9.2 - Subjective corrections
Rating	$L_{Aeq, 1\ hour}$ 29 dB	$L_{Aeq, 15\ min}$ 29 dB	9.2 - Worst case scenario
Background	$L_{A90, 1\ hour}$ 49 dB	$L_{A90, 15\ min}$ 40 dB	8 - No correction for residual
Assessment	-20 dB	-11 dB	11 - Rating Level – Background Level
Uncertainty	+- 2.5 dB		10 – 95% Confidence, k = 2

5.3.2 Assessment of Noise Levels at NSP3 - 10 Ball Close

The following table provides an initial estimate of the impact on residents both inside and outside the residential dwellings from the proposed development based on the outdoor sound incident on the building.

Results	Day Time	Night Time	Commentary
Specific	$L_{Aeq, 1\ hour}$ 34 dB	$L_{Aeq, 15\ min}$ 34 dB	7.3.6 – Calculated levels
Feature	+0 dB	+0 dB	9.2 - Subjective corrections
Rating	$L_{Aeq, 1\ hour}$ 34 dB	$L_{Aeq, 15\ min}$ 34 dB	9.2 - Worst case scenario
Background	$L_{A90, 1\ hour}$ 46 dB	$L_{A90, 15\ min}$ 41 dB	8 - No correction for residual
Assessment	-12 dB	-7 dB	11 - Rating Level – Background Level
Uncertainty	+- 2.5 dB		10 – 95% Confidence, k = 2

5.4 Conclusions

5.4.1 The proposed development will generate noise but will not have an adverse impact on the existing noise sensitive properties. The design of the scheme has been maximised with passive mitigation measures to ensure that impact of noise and vibration is kept to a minimum.

End of Main Body of Report

A Appendix A – Relevant Material Considerations

A.1 Other Documents providing guidance on LOAEL and SOAEL

A.1.1 Aecom were commissioned by Defra to produce a document entitled *"Possible Options for the Identification of SOAEL and LOAEL in Support of NPSE"* under reference NANR 316 which was published in 2015. Table 1.1 entitled *"Summary of Outcomes"* provides an indication of numerical values for NOEL and SOAEL for various sources.

Source	Annoyance 07:00 to 23:00		Sleep Disturbance 23:00 to 07:00	
	LOAEL	SOAEL	LOAEL	SOAEL
Road	56 dB $L_{Aeq, 16\ hours}$	66 dB $L_{Aeq, 16\ hours}$	46 $L_{Aeq, 8\ hours}$	56 $L_{Aeq, 8\ hours}$
Rail	63 dB $L_{Aeq, 16\ hours}$	72 dB $L_{Aeq, 16\ hours}$	55 $L_{Aeq, 8\ hours}$	68 $L_{Aeq, 8\ hours}$
Air	52 dB $L_{Aeq, 16\ hours}$	60 dB $L_{Aeq, 16\ hours}$	41 $L_{Aeq, 8\ hours}$	53 $L_{Aeq, 8\ hours}$

A.1.2 During the planning for the High Speed 2 rail link (HS2) the factsheet entitled *"HS2 - Control of Airborne Noise"* version 3.0 dated June 2019 was produced which provided the following clarification of the absolute noise levels for LOAEL and SOAEL. Table 1 in Appendix B provided the *"Operational airborne noise impact and effects levels from altered roads and operational railway"*.

Source	Annoyance Day Time 07:00 to 23:00		Sleep Disturbance Night Time 23:00 to 07:00	
	LOAEL	SOAEL	LOAEL	SOAEL
Road and Rail	50 dB $L_{Aeq, 16\ hours}$	65 dB $L_{Aeq, 16\ hours}$	40 dB $L_{Aeq, 8\ hours}$	55 dB $L_{Aeq, 8\ hours}$
			60 dB L_{AFMax}	80 dB L_{AFMax}

A.1.3 The World Health Organisation published a document entitled *"Guidelines for Community Noise"* in 1999 which included the following guideline values in Table 1 entitled *"Guidelines values for community noise in specific environments"*.

Environment		$L_{Aeq,t}$	$L_{AMaxfast}$
Inside Dwelling	Moderate annoyance daytime and evening	35 dB $L_{Aeq, 8\ hours}$	--
	Bedrooms sleep disturbance night-time	30 dB $L_{Aeq, 8\ hours}$	45 dB L_{AFMax}
Outside	Bedrooms sleep disturbance (window open)	45 dB $L_{Aeq, 8\ hours}$	60 dB L_{AFMax}

A.1.4 The World Health Organisation then published another document entitled *"Night Noise Guidelines for Europe"* in 2009. Table 3 within the summary of the document entitled *"Effects of different levels of night noise on the populations health"* provides useful guidance on the NOEL and SOAEL thresholds.

Effect Level	Health Effects on Population	$L_{night, outside}$
NOEL	No substantial observed biological effects	30 dB $L_{Aeq, 8 hours}$
SOAEL	Situation considered increasingly dangerous for public health	above 55 dB $L_{Aeq, 8 hours}$

A.1.5 The World Health Organisation then published a document entitled "*Environmental Nosie Guidelines for the European Region – Executive Summary"* in 2018.

Source	Annoyance Day Time 07:00 to 23:00	Sleep Disturbance Night Time 23:00 to 07:00
Road	53 dB $L_{Aeq, 16 hours}$	45 dB $L_{Aeq, 8 hours}$

A.1.6 British Standard 389: Part 7: 2019 entitled *"Acoustics: Reference zero for the calibration of audiometric equipment. Reference threshold of hearing under free-field and diffuse-field listening conditions"* provides the threshold at which noise is likely to be inaudible for a young healthy adult.

Noise Source	Octave Band Centre Frequency (Hz)								Sum A	NR Curve
	63	125	250	500	1K	2K	4K	8K		
1st Floor Bedroom	45	28	17	10	8	6	5	2	21	12
Sound Pressure Levels (dB) – Reference 2 x 10^{-5} watts – Uncertainty of +- 2.5 dB (95% confidence, k=2)										

A.1.7 Napier University produced a document under reference NANR 116 entitled *"Open / Closed Window Research – Sound Insulation through ventilated domestic windows"* in April 2007. The document provided the estimated performance of a partially open window with an area of 0.2 m^2 in table 5-6 entitled *"Statistically Derived Dn,e insulation ratings for window openings (dB)"*. However, if you apply the principles of British Standard 12354 – Part 3 entitled *"Building acoustics. Estimation of acoustic performance of buildings from the performance of elements – Airborne Sound"* you can estimate the performance of an open window with an area of 1.5 m^2.

Noise Source	Octave Band Centre Frequency (Hz)								ΔSum A	R_w
	63	125	250	500	1K	2K	4K	8K		
Partially Open Window (0.2 m^2)	20	14	14	16	14	17	19	20	19	16
Fully Open Window (1.5 m^2)	5	6	7	7	7	7	7	7	5	8

Transmission Loss (dB)

A.1.8 We can therefore use the threshold of hearing and the worst-case performance of an open window derived from the methodology within BS 12354 – Part 3 to determine the No Observed Adverse Effect Level (NOEL) externally from any bedroom window.

Position	Octave Band Centre Frequency (Hz)								Sum A	NR
	63	125	250	500	1K	2K	4K	8K		
External from Habitable Room	50	34	24	17	15	13	12	9	26	18

A.2 British Standard 8233: 2014 (BS 8233)

A.2.1 British Standard 8233: 2014 entitled *"Guidance on sound insulation and noise reduction for buildings"* provides some useful criterion for internal noise levels within dwellings within section 7.7.2 entitled *"Internal ambient noise levels for dwellings"*. (CD12.5). ProPG provides a criterion for the maximum internal noise (L_{AMax}) during the night time period in figure 2 in section 2.27 (CD12.3).

Area of Development	Day Time (07:00 to 23:00)	Night Time (23:00 to 07:00)
Resting Living Room	35 dB $L_{Aeq, 16\ hours}$	--
Sleeping Bedroom	35 dB $L_{Aeq, 16\ hours}$	30 dB $L_{Aeq, 8\ hours}$
		45 dB $L_{Amax, 10\text{-}event}$
External Amenity Area	55 dB $L_{Aeq, 16\ hours}$	--

A.2.2 It should be noted that the criterion is based on sources without character as detailed in paragraph 7.7.1 .

> *"This subclause applies to external noise as it affects the internal acoustic environment from sources without a specific character, previously termed "anonymous noise". Occupants are usually more tolerant of noise without a specific character than, for example, that from neighbours which can trigger complex emotional reactions. For simplicity, only noise without character is considered in Table 4.*
>
> *NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."*

A.2.3 BS8233 provides the following advice for the assessment of industrial noise, which is often considered to have a specific character in section 6.5.2 entitled *"Assessment of Industrial Noise".*

> *"Where industrial noise affects residential or mixed residential areas, the methods for rating the noise in BS 4142 should be applied. BS 4142 describes methods for determining, at the outside of a building:*
>
> *a) noise levels from factories, industrial premises or fixed installations, or sources of an industrial nature in commercial premises; and*
>
> *b) background noise level."*

A.2.4 It is therefore considered appropriate to apply a correction to the criterion within BS 8233 to account for the character of the noise from the proposed development to establish a suitable level of LOAEL and SOAEL.

A.3 British Standard 4142: 2014 + A1: 2019 (BS 4142)

A.3.1 British Standard 4142: 2014 + A1: 2019 entitled *"Methods for rating and assessing industrial and commercial sound"* provides a methodology to determine the impact of industrial noise on occupiers of residential dwellings. The overall scope of the standard is clarified in the last paragraph of section 1.1.

> *"The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident."*

A.3.2 The 2019 amendment to the standard added the following clarification that it is not designed as a methodology to assess internal noise levels within residential dwellings from industrial sources.

> *"The methodology set out in Clauses 7, 8, and 9 of this standard is not intended to be used to assess the extent of the impact at indoor locations. Internal sound levels can be taken into account as outlined in Clause 11.*
>
> *The standard is not intended to be applied to the assessment of indoor sound levels."*

A.3.3 The assessment methodology uses the calculated specific noise levels at the assessment position and applies a feature correction to account for the specific character of the noise to determine the rating noise levels. The rating noise level is then compared against the underlying background noise levels. The assessment of the results is defined within the commentary of section 11 entitled *"Assessment of the Impacts*".

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

A.4 Approved Document O

A.4.1 The recent update to the Building Regulations came into effect on 15th June 2022 and now includes Part O of Schedule 1 entitled *"Requirement 01 overheating mitigation (regulations 40B)"*. Approved Document O entitled *"Overheating"* now includes a requirement to protect future occupants of residential dwellings by reducing the occurrence of high indoor temperatures through simplified or dynamic thermal modelling.

"01 Overheating Mitigation
(1) Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel ("residences") to—

(a) limit unwanted solar gains in summer;
(b) provide an adequate means to remove heat from the indoor environment.

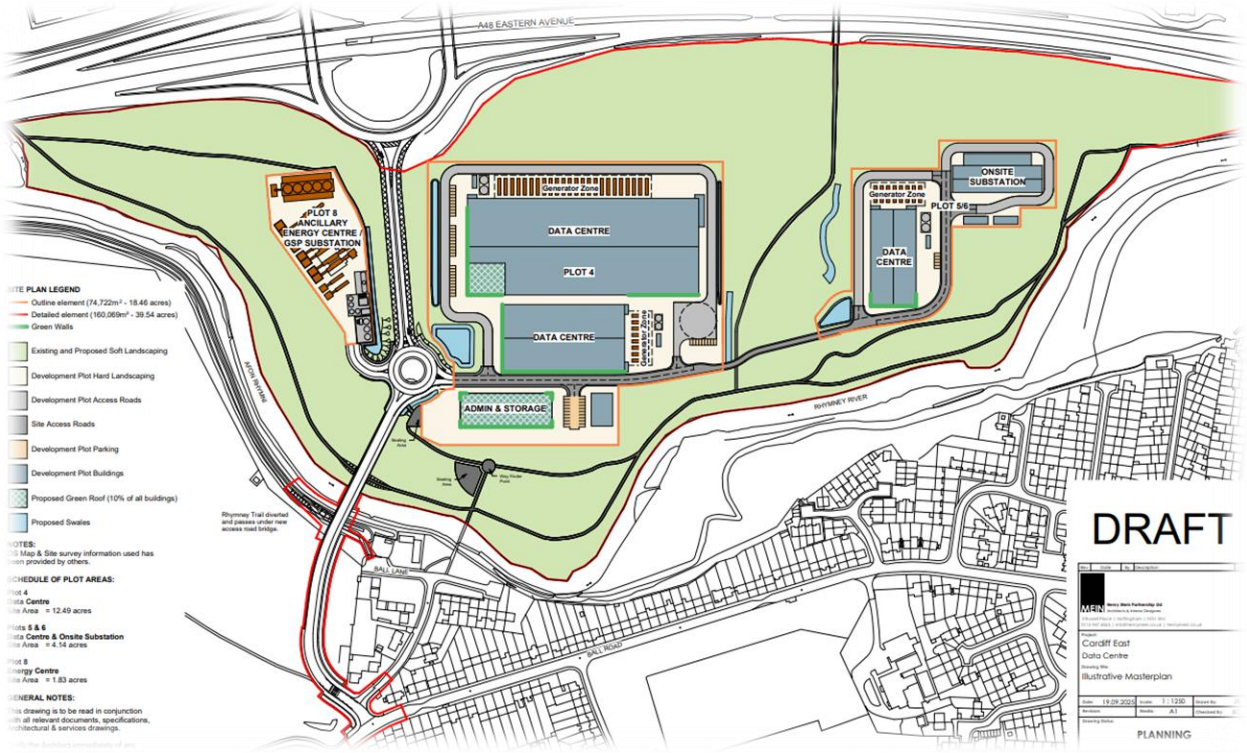
A.4.2 Section 3 entitled *"Ensuring the overheating mitigation strategy is useable"* provides details of the internal noise levels within sleeping hours within the bedrooms with the windows opened as detailed within the simplified model.

"Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB $L_{Aeq,T,}$ averaged over 8 hours (between 11pm and 7am).
b. 55dB $L_{AFmax,}$ more than 10 times a night (between 11pm and 7am)."

ASSOCIATES

Cardiff East Park and Ride, Llanrumney



Air Quality Assessment

784-B076123
23rd October 2025

PRESENTED TO

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EXECUTIVE SUMMARY

This report presents the findings of an air quality assessment undertaken to assess road traffic emission and construction dust impacts in support of a hybrid planning application (part full/part outline) for the *"demolition of existing structures and redevelopment of the site to provide a Data Centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works"* at Cardiff East Park and Ride, Cardiff, Eastern Avenue, Old St Mellons,CF23 8HH.

Construction Phase

The potential effects during the demolition and construction phases include fugitive dust emissions from site activities, such as earthworks, construction and trackout.

During the construction phase, site specific mitigation measures detailed within this assessment will be implemented. With these mitigation measures in place, the effects from the construction phase are not predicted to be significant.

Operational Phase

Detailed dispersion modelling of traffic pollutants has been undertaken for the Proposed Development. An operational year assessment for 2028 traffic emissions has been undertaken to assess the effects of the Proposed Development. The impacts during the operational phase take into account exhaust emissions from additional road traffic generated due to the Proposed Development.

The long-term (annual) assessment of the effects associated with the Proposed Development with respect to Nitrogen Dioxide (NO_2) is determined to be 'negligible'. With respect to PM_{10} and $PM_{2.5}$ exposure, the effect is determined to be 'negligible' at all identified existing sensitive receptor locations.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AADT	Annual Average Daily Traffic
ADMS	Atmospheric Dispersion Modelling Software
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Standards
CHP	Combined Heat and Power
CL	Critical Level
CO	Carbon Monoxide
DEFRA	Department for Environment Food & Rural Affairs
EAL	Environmental Assessment Limits
EC	European Commission
EFT	Emissions Factors Toolkit
EPUK	Environmental Protection UK
EU	European Union
EPAQS	Expert Panel on Air Quality Standards
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
NGR	United Kingdom National Grid Reference
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
PC	Process Contribution
MHCLG	Ministry for Housing, Communities and Local Government
NPPF	National Planning Policy Framework
OS	UK Ordnance Survey
PEC	Predicted Environment Concentration
PPG	Planning Policy Guidance
PPS	Planning Policy Statements
SAC	Special Areas of Conservation
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
VOC	Volatile organic compounds
WHO	World Health Organization
UK	United Kingdom

1.0 INTRODUCTION

This report presents the findings of an air quality assessment undertaken to assess road traffic emission and construction dust impacts in support of a hybrid planning application (part full/part outline) for the *"demolition of existing structures and redevelopment of the site to provide a Data Centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works"* at Cardiff East Park and Ride, Cardiff, Eastern Avenue, Old St Mellons,CF23 8HH.

1.1 SITE LOCATION

The site lies within two 1x1km Grid Squares; X: 321500, Y: 181500 and X: 321500, Y:180500. The application site is bounded to the north and west by the A48 Eastern Avenue which extends to the south towards Cardiff City Centre followed by commercial and then residential properties in the area of Pentwyn, bounded to the east by Rhymney River and vegetation followed by residential properties on Ball Road and side roads coming off Ball Road, and bounded to the south by the Rhymney River followed by park land and residential properties on Clovelly Crescent.

The Site comprises the existing Cardiff Park and Ride East, areas of woodland (including Ancient Woodland and TPO trees) and amenity/scrub land with Public Rights of Way (PRoW) and informal footpaths. The Site is accessed from the A48 (Eastern Avenue). The Park and Ride accommodates approximately 900 car parking spaces (with an additional 38 blue badge bays) with bus drop-off and pick-up points, an office/amenity building within the south east corner of the Site next to the entrance / exit.

Reference should be made to **Figure 1-1** for a map of the application site and surrounding area.

Figure 1-1. Satellite Image of Site and Surrounding Area

Google Imagery (2023)

1.2 CONTEXT

The primary source of the air quality associated with the proposed scheme is from vehicle movements, arriving and departing the Proposed Development. The traffic data generated by the development has been assessed at the surrounding sensitive receptors and proposed sensitive receptors.

The following assessment stages have been undertaken as part of this assessment:

- Baseline conditions evaluation;
- Assessment of potential air quality impacts during the construction phase;
- Assessment of potential air quality impacts during the operational phase;
- Identification of mitigation measures (as required).

The results of the assessment are detailed in the following sections of this report.

The construction phase assessment considers the potential effects of dust and particulate emissions from site activities and materials movement using a qualitative risk assessment method based on the Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction' document, published in 2024.

The assessment of the potential air quality impacts that are associated with the operational phase has focused on the predicted impact of changes in ambient nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}) and less than 2.5 µm ($PM_{2.5}$) as a result of the development at key local receptor locations. The changes have been referenced to EU air quality limits and UK air quality objectives and the magnitude and impact description of the changes have been referenced to non-statutory guidance issued by the IAQM and Environmental Protection UK (EPUK).

1.3 REPORT STRUCTURE

Following this introductory section, the remainder of this report is structured as follows:

- Section 2: Policy and Legislative Context
- Section 3: Assessment Methodology
- Section 4: Baseline Conditions
- Section 5: Assessment of Air Quality Impacts – Construction Phase
- Section 6: Assessment of Air Quality Impacts – Operational Phase
- Section 7: Mitigation
- Section 8: Conclusions

Technical Appendices are included at the end of this report for information.

2.0 POLICY AND LEGISLATIVE CONTEXT

2.1 DOCUMENTS CONSULTED

The following documents were consulted during the undertaking of this assessment:

Legislation and Best Practice Guidance

- Planning Policy Wales, Welsh Government, Edition 11, February 2021;
- Future Wales: The National Plan 2040, February 2021;
- The Air Quality Standards (Wales) Regulations, 2010;
- The Air Quality Standards Regulations (Amendments), 2019;
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Defra, 2007;
- The Environment Act, 1995;
- The Environment Act, 2021;
- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023;
- $PM_{2.5}$ Targets: Interim Planning Guidance (2024);
- World Health Organization (2006) WHO Air Quality Guidance for Particulate Matter, Ozone, Nitrogen Dioxide and Sulphur Dioxide: Summary of Risk Assessment;
- National Planning Policy Framework, Ministry for Housing, Communities and Local Government, Revised February 2025;
- Local Air Quality Management Technical Guidance LAQM.TG22, Defra, 2022;
- Land-Use Planning & Development Control: Planning for Air Quality, EPUK & IAQM, 2017;
- COVID-19 Supplementary Guidance – Local Air Quality Reporting in 2021, 2021;
- Well-being of Future Generations (Wales) Act, 2015;
- Guidance on the Assessment of Dust from Demolition and Construction, IAQM, Version 2.2, January 2024;
- A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Version 1.1), IAQM, May 2020;
- Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007; and,
- Ecological Assessment of Air Quality Impacts, CIEEM, Version 2, October 2023.

Websites Consulted

- Natural Resources Wales (https://naturalresources.wales)
- Google maps (maps.google.co.uk);
- Department for Transport: Road Traffic Statistics (https://roadtraffic.dft.gov.uk);
- Multi-Agency Geographic Information for the Countryside (http://magic.defra.gov.uk/);
- Welsh Government Local Air Quality Management (https://gov.wales/air-quality-management-guidance-local-authorities); and,
- Cardiff Council (https://www.cardiff.gov.uk)

Site Specific Reference Documents

- Cardiff Council 2024 Annual Air Quality Progress Report;
- Cardiff Council Adopted Local Development Plan 2006-2026; and
- Cardiff Council 2018 Managing Transport Impacts Supplementary Planning Guidance

2.2 AIR QUALITY LEGISLATIVE FRAMEWORK

European Legislation

European air quality legislation is consolidated under Directive 2008/50/EC, which came into force on 11th June 2008. This Directive consolidates previous legislation which was designed to deal with specific pollutants in a consistent manner and provides new air quality objectives for fine particulates. The consolidated Directives include:

- **Directive 1999/30/EC** – the First Air Quality 'Daughter' Directive – sets ambient air limit values for NO_2 and oxides of nitrogen, sulphur dioxide, lead and PM_{10};
- **Directive 2000/69/EC** – the Second Air Quality 'Daughter' Directive – sets ambient air limit values for benzene and carbon monoxide; and,
- **Directive 2002/3/EC** – the Third Air Quality 'Daughter' Directive – seeks to establish long-term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.

The fourth daughter Directive was not included within the consolidation and is described as:

- **Directive 2004/107/EC** – sets health-based limits on polycyclic aromatic hydrocarbons, cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

The European Commission (EC) Directive Limits, outlined above, have been transposed in the UK through the Air Quality Standards Regulations. In the UK responsibility for meeting ambient air quality limit values is devolved to the national administrations in Scotland, Wales and Northern Ireland.

The European Union (Withdrawal) Act 2018 (EUWA) provides a new framework for the continuity of 'retained EU law' in the UK. EU Directives no longer have to be implemented by the UK except to any extent agreed or decided by the UK unilaterally.

EUWA retains the domestic effect of EU Directives to the extent already implemented in UK law, by preserving the relevant domestic implementing legislation enacted in UK law before 'Implementation Period' completion day. Though the EU Directives are not retained, following the UK's departure from the EU, the EUWA converts the current framework of Air Quality targets, however the role that the EU instructions were party to are lost.

UK Legislation

The Air Quality Standards Regulations (Amendments 2019) seek to simplify air quality regulation and provide a new transposition of the Air Quality Framework Directive, First, Second and Third Daughter Directives and also transpose the Fourth Daughter Directive within the UK. The Air Quality Limit Values are transposed into

the updated Regulations as Air Quality Standards, with attainment dates in line with the European Directives. SI 2010 No. 1001, Part 7 Regulation 31 extends powers, under Section 85(5) of the Environment Act (1995), for the Secretary of State to give directions to Local Authorities (LAs) for the implementation of these Directives.

The UK Air Quality Strategy is the method for implementation of the air quality limit values in England, Scotland, Wales and Northern Ireland and provides a framework for improving air quality and protecting human health from the effects of pollution.

For each nominated pollutant, the Air Quality Strategy sets clear, measurable, outdoor air quality standards and target dates by which these must be achieved; the combined standard and target date is referred to as the Air Quality Objective (AQO) for that pollutant. Adopted national standards are based on the recommendations of the Expert Panel on Air Quality Standards (EPAQS) and have been translated into a set of Statutory Objectives within the Air Quality (England) Regulations (2000) SI 928, and subsequent amendments. The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 amends the AQO for $PM_{2.5}$ outlined within the Air Quality Standards Regulations (2010 & 2019 Amendments).

The AQOs for pollutants included within the Air Quality Strategy and assessed as part of the scope of this report are presented in **Table 2-1** and **Table 2-2** along with European Commission (EC) Directive Limits and World Health Organisation (WHO) Guidelines. The ecological levels are based on WHO and CLRTAP (Convention on Long-range Transboundary Air Pollution) guidance.

Table 2-1. Air Quality Standards, Objectives, Limits and Target Values

Pollutant	Applies	Objective	Concentration Measured as[10]	Date to be achieved and maintained thereafter	European Obligations	Date to be achieved and maintained thereafter	New or existing
PM_{10}	UK	50µg/m^3 by end of 2004 (max 35 exceedances a year)	24-hour Mean	1st January 2005	50µg/m^3 by end of 2004 (max 35 exceedances a year)	1st January 2005	Retain Existing
	UK	40µg/m^3 by end of 2004	Annual Mean	1st January 2005	40µg/m^3	1st January 2005	
$PM_{2.5}$	UK	20µg/m^3	Annual Mean	1st January 2020	-	-	Retain Existing
	UK	10 µg/m^3	Annual Mean	31st December 2040	-	-	New
NO_2	UK	200µg/m^3 not to be exceeded more than 18 times a year	1-Hour Mean	31st December 2005	200µg/m^3 not to be exceeded more than 18 times a year	1st January 2010	Retain Existing
	UK	40µg/m^3	Annual Mean	31st December 2005	40µg/m^3	1st January 2010	

Table 2-2. Ecological Air Quality Standards, Objectives, Limit and Target Values

Pollutant	Applies	Objective	Concentration Measured as:
NO_X	UK	30µg/m^3	Annual Mean

Within the context of this assessment, the annual mean objectives are those against which facades of residential receptors will be assessed and the short-term objectives apply to all other receptor locations, where people may be exposed over a short duration, both residential and non-residential such as using gardens, balconies, walking along streets, using playgrounds, footpaths or external areas of employment uses.

Local Air Quality Management

Under Section 82 of the Environment Act (1995) (Part IV) Local Authorities (LAs) are required to periodically review and assess air quality within their area of jurisdiction under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves assessing present and likely future air quality against the AQOs. If it is predicted that levels at the façade of buildings where members of the public are regularly present (normally residential properties) are likely to be exceeded, the LA is required to declare an Air Quality Management Area (AQMA).

Environment Act 2021

The Environment Act (2021) introduces a commitment to create a legally binding duty on government to reduce the concentrations of fine particulate matter ($PM_{2.5}$) in ambient air, and to set a long-term target expected to be 10 µg/m^3, a reduction from the current Air Quality objective of 20 µg/m^3 set out within the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. The Environment Act 2021 requires a draft of a statutory instrument (or drafts of statutory instruments) containing regulations setting that the $PM_{2.5}$ air quality target must come into force.

2.3 PLANNING AND POLICY GUIDANCE

National Policy

Planning Policy Wales (PPW) outlines the policies and guidance for development within Wales. In the PPW, Chapter 6 sets out the development management and ways of improving air quality in Wales, stating that:

> *"Clean air and an appropriate soundscape contribute to a positive experience of place as well as being necessary for public health, amenity and well-being. They are indicators of local environmental quality and integral qualities of place which should be protected through preventative or proactive action through the planning system. Conversely, air, noise and light pollution can have negative effects on people, biodiversity and the resilience of ecosystems and should be reduced as far as possible.*
>
> *National air quality objectives are not 'safe' levels of air pollution. Rather they represent a pragmatic threshold above which government considers the health risks associated with air pollution are unacceptable. Air just barely compliant with these objectives is not 'clean' and still carries long-term population health risks. Nitrogen dioxide and particulate matter, which are the pollutants of primary national concern from a public health perspective, currently have no safe threshold defined and therefore the lower the concentration of*

those pollutants the lower the risks of adverse health effects. It is desirable to keep levels of pollution as low as possible.

The planning system should maximise its contribution to achieving the well-being goals, and in particular a healthier Wales, by aiming to reduce average population exposure149 to air and noise pollution alongside action to tackle high pollution hotspots. In doing so, it should consider the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment and identify and pursue any opportunities to reduce, or at least, minimise population exposure to air and noise pollution, and improve soundscapes, where it is practical and feasible to do so.

In taking forward these broad objectives the key planning policy principle is to consider the effects which proposed developments may have on air or soundscape quality and the effects which existing air or soundscape quality may have on proposed developments. Air Quality and soundscape influence choice of location and distribution of development and it will be important to consider the relationship of proposed development to existing development and its surrounding area and its potential to exacerbate or create poor air quality or inappropriate soundscapes. The agent of change principle says that a business or person responsible for introducing a change is responsible for managing that change. In practice, for example, this means a developer would have to ensure that solutions to address air quality or noise from nearby pre-existing infrastructure, businesses or venues can be found and implemented as part of ensuring development is acceptable.

In proposing new development, planning authorities and developers must, therefore:

- *address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors150;*
- *not create areas of poor air quality or inappropriate soundscape; and*
- *seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.*

To assist decision making it will be important that the most appropriate level of information is provided, and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.

When proposing new strategies for development and when allocating sites in development plans it will be important to avoid instances where incremental development of infrastructure, housing, commercial and industrial development creates or exacerbate health and amenity inequalities by introducing more sensitive receptors into an area or by making existing occupiers more vulnerable to poor air quality or noise. This may particularly be the case when proposing high density developments adjacent to transport hubs or where development pressure to meet short-term needs may have detrimental long-term effects and care must be taken not to exacerbate health inequalities whilst recognising accessibility needs."

Future Wales

Future Wales National Plan 2040, published in February 2021, sets out the development for Wales up to 2040. Within the spatial strategy section, the following policy concerning air quality was identified:

> *"Policy 18: Renewable and Local Carbon Energy Developments and National Significance*
>
> *7. there are no unacceptable adverse impacts by way of shadow flicker, noise, reflected light, air quality or electromagnetic disturbance."*

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF), revised 7th February 2025 (minor revision of 12th December 2024 NPPF), principally brings together and summarises the suite of Planning Policy Statements (PPS) and Planning Policy Guidance (PPG) which previously guided planning policy making. The NPPF states that:

Paragraph 110

> *"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health. However, opportunities to maximise sustainable transport solutions will vary between urban and rural areas, and this should be taken into account in both plan-making and decision-making."*

Paragraph 187

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by: …*
>
> *…e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…"*

Paragraph 199

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any*

new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

Paragraph 201

"The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities…"

Local Policy

The Cardiff Council Local Development Plan 2006-2026 was adopted in January 2016 and is used by the Council to guide and manage development, and to determine planning applications within Cardiff. This document supersedes the Cardiff Deposit Unitary Development Plan (2003), South Glamorgan (Cardiff Area) Replacement Structure Plan, Mid Glamorgan County Structure Plan, South Glamorgan (Cardiff Area) Minerals Local Plan and City of Cardiff Local Plan.

Following a review of the Cardiff Council Adopted Local Development Plan 2006-2026 the following relevant policies concerning air quality were identified.

*"**Policy KP18: Natural Resources***

In the interested of the long-term sustainable development of Cardiff, development proposals must take full account of the need to minimize impacts on the city's natural resources and minimize pollution, in particular the following elements:

…iii. Minimising air pollution from industrial, domestic and transportation sources and managing air quality…"

*"**Policy EN13: Air, Noise, Light Pollution and Land Contamination***

Development will not be permitted where it could cause or result in unacceptable harm to health, local amenity, the character and quality of the countryside, or interests of nature conservation, landscape or built heritage importance because of air, noise, light pollution or the presence of unacceptable levels of land contamination."

3.0 ASSESSMENT METHODOLOGY

There is potential for environmental effects during the operational phase of the Proposed Development due to emissions from proposed vehicle movements. The significance of potential environmental effects is assessed according to the latest guidance produced by EPUK and IAQM in January 2017 '*Land-Use Planning & Development Control: Planning for Air Quality*', May 2020 '*A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites*' and January 2023 *'Ecological Assessment of Air Quality Impacts'*.

The EPUK and IAQM in January 2017 '*Land-Use Planning & Development Control: Planning for Air Quality*' guidance document outlines the criteria used for screening the need for an Air Quality Assessment.

Table 3-1. Indicative Criteria for Requiring an Air Quality Assessment

The Development will:	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight).	A change of LDV flows of: - more than 100 AADT within or adjacent to an AQMA. - more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight).	A change of HDV flows of: - more than 25 AADT within or adjacent to an AQMA. - more than 100 AADT elsewhere.
Realign roads, i.e. changing the proximity of receptors to traffic lanes	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station	Where bus flows will change by: - more than 25 AADT within or adjacent to an AQMA. - more than 100 AADT elsewhere.
Have an underground car park with extraction system	The ventilation extract for the car park will be within 20m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).

The methodology used to determine the potential air quality effects of the construction phase of the Proposed Development has been derived from the IAQM '*Guidance on the Assessment of the Impacts of Dust from Demolition and Construction'* document and is summarised in Section 5.0.

3.1 DETERMINING IMPACT DESCRIPTION OF THE AIR QUALITY EFFECTS

The impact description of the effects during the operational phase of the development is based on the latest guidance produced by EPUK and IAQM in January 2017. The guidance provides a basis for a consistent approach that could be used by all parties associated with the planning process to professionally judge the overall impact description of the air quality effects based on severity of air quality impacts.

The following rationale is used in determining the severity of the air quality effects at individual receptors:

1. The change in concentration of air pollutants, air quality effects, are quantified and evaluated in the context of Air Quality Action Level (AQAL). The effects are provided as a percentage of the Air Quality Objective (AQO), which may be an AQO, EU limit or target value, or an Environment Agency 'Environmental Assessment Level (EAL)';

2. The absolute concentrations are also considered in terms of the AQO and are divided into categories for long term concentration. These categories are based on the sensitivity of the individual receptor in terms of harm potential. The degree of harm potential to change increases as absolute concentrations are close to or above the AQAL;
3. Severity of the effect is described as qualitative descriptors; negligible, slight, moderate or substantial, by taking into account the combination of the harm potential and the air quality effect. This means that a small increase at a receptor which is already close to or above the AQAL will have higher severity compared to a relatively large change at a receptor which is significantly below the AQAL;
4. The effects can be adverse when pollutant concentrations increase or beneficial when concentrations decrease as a result of development;
5. The judgement of the overall impact description of the effects is then based on severity of effects on all the individual receptors considered; and,
6. Where a development is not resulting in any change in emissions itself, the impact description of effect is based on the effect of surrounding sources on new residents or users of the development, i.e., will they be exposed to levels above the AQAL.

Table 3-2. Impact Descriptors for Individual Receptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to AQAL			
	1	2-5	6-10	>10
≤75% of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109 of AQAL	Moderate	Moderate	Substantial	Substantial
≥110 of AQAL	Moderate	Substantial	Substantial	Substantial

**Air Quality Action Level – in this case the objective levels.*

In accordance with explanation note 2 of Table 6.3 of the EPUK & IAQM guidance, the Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.

The advisory note for the Ecological Assessment of Air Quality Impacts, created by the Chartered Institute of Ecology and Environmental Management (CIEEM), October 2023 outlines six steps to assessment the likelihood of negative effect of a development on ecological receptors. The six steps are;

- Step 1. Identifying the Baseline Ecological Features and Air Quality;
- Step 2. Assessing Confounding Factors, Background Pollution Trends and the Sensitivity of the Receptor;
- Step 3. Is the Critical Load or Level Exceeded?;
- Step 4. Apply Critical Loads and Critical Levels with Expert Judgement;
- Step 5. Project Duration and Seasonal Effects; and,
- Step 6. Relative Importance of Pollutant Concentration vs Deposition.

3.2 ESTIMATING HOURLY AND DAILY MEAN CONCENTRATIONS

The latest Local Air Quality Management (LAQM) Technical Guidance TG(22) has been used for predicting 1 hourly and 24-hourly pollutant concentrations.

The guidance states that the one hour mean NO_2 AQO of 200 ug/m^3 is not likely to be exceeded at any roadside locations if the annual mean concentration is below 60ug/m^3. Therefore, this assessment evaluates the likelihood of exceeding the hourly average NO_2 objective by comparing predicted annual average NO_2 concentrations at all receptors to an annual average equivalent threshold of 60 µg/m^3 NO_2. Where predicted concentrations are below this value, it can be concluded that the hourly average NO_2 objective is likely to be achieved.

Additionally, it is understood that the 24-hour PM_{10} objective could be exceeded at roadside locations where the annual mean concentration is above 32 µg/m^3. Therefore, this assessment evaluates the likelihood of exceeding the hourly average PM_{10} objective by comparing predicted annual average PM_{10} concentrations at all receptors to an annual average equivalent threshold of 32 µg/m^3 PM_{10}. Where predicted concentrations are below this value, it can be concluded that the hourly average 24-hour mean objective is likely to be achieved.

In accordance with the guidance, the short term 24 hourly PM_{10} mean concentrations can be calculated using the following equation as presented below.

$$\textbf{\textit{Number of 24 hour mean exceedances}} = \mathbf{18.5} + \mathbf{0.00145}\ \textbf{\textit{x annual mean}}^{\mathbf{3}} + \left(\frac{\mathbf{206}}{\textbf{\textit{annual mean}}}\right)$$

3.3 OTHER GUIDANCE DOCUMENTS OUTLINING KEY METHODOLOGY

COVID-19 Supplementary Guidance - Local Air Quality Reporting in 2021

This supplementary guidance document was prepared in order to inform the local authorities in England of the key changes and points of reference with respect to LAQM duties, as described in Part IV of the Environment Act 1995, for the 2021 reporting year. This document also outlines the validity of the data collected throughout COVID-19.

Guidance on the Assessment of Dust from Demolition and Construction

In January 2024, the Institute of Air Quality Management (IAQM) published a revised version (V2.2) of their updated guidance for the 'Assessment of dust from demolition and construction', which was basically a rewrite of the previously published guidance in 2014, whilst adopting the lessons learnt since. The assessment procedure follows the following framework:

- Step 1 - Screen the requirement for a more detailed assessment;
- Step 2 - Assess the risk of dust impacts of the four phases of construction (demolition, earthworks, construction and trackout), taking into account:
    - the scale and nature of the works, which determines the potential Dust Emission Magnitude (Step 2A); and
    - the sensitivity of the area (Step 2B).
    - These factors are then combined to provide the risk of dust impacts (Step 2C).

- Step 3 - Determine the site-specific mitigation for the potential activities;
- Step 4 - Examine the residual effects and determine whether or not these are significant; and
- Step 5 - Prepare the Construction Dust Assessment.

The detailed methodology for undertaking a Construction Dust Risk Assessment (CDRA) contained within the 2024 guidance document is outlined in **Appendix B** and of this report.

Land-Use Planning & Development Control: Planning for Air Quality

This document provides advice and guidance to ensure that air quality is adequately considered in the land-use planning and development control processes. This is applicable to assessing the effect of changes in exposure of members of the public resulting from residential and mixed-use developments.

4.0 BASELINE CONDITIONS

4.1 AIR QUALITY REVIEW

This section provides a review of the existing air quality in the vicinity of the application site in order to provide a benchmark against which to assess potential air quality impacts of the Proposed Development. Baseline air quality in the vicinity of the application site has been defined from several sources, as described in the following sections.

Local Air Quality Management (LAQM)

The Site falls within the jurisdiction of Cardiff Council (CC).

As required under section 82 of the Environment Act 1995, Cardiff Council (CC) has undertaken an ongoing exercise to review and assess air quality within its area of jurisdiction. The assessments have indicated that concentrations of NO_2 are above the relevant AQOs at locations of relevant public exposure within the Borough. Therefore, CC has designated four Air Quality Management Area (AQMAs) in 2023.

The assessments have indicated that concentrations of NO_2 are above the relevant AQOs at one location of relevant public exposure within CC that is shown below.

Table 4-1. Local Authority AQMA Details

AQMA	Description	Date Declared	Date Amended	Pollutants Declared
Cardiff City Centre AQMA	Former St Mary Street AQMA with the addition of Westgate Street in Cardiff City Centre	01/04/2013	N/A	Annual Mean Nitrogen Dioxide NO_2
Stephenson Court AQMA	From NE and NW boundaries of Stephenson Court, NW boundary of Burgess Court, NW and SW boundaries of Four Elms Court, SW corner of Four Elms Court south across Newport road to the junction with Orbit street, West across Newport Road to the SE corner of Stephenson Court	23/11/2010	N/A	Nitrogen Dioxide NO_2
Llandaff AQMA	Centre on Cardiff Road through Llandaff village	01/04/2013	N/A	Nitrogen Dioxide NO_2
Ely Bridge AQMA	A number of residential premises along the A48 Cowbridge Road West, Western Avenue and A4119 through Llandaff Village Cardiff Road.	01/12/2000	01/01/2007	Nitrogen Dioxide NO_2

The Site is situated 4 km to the north-east of the Stephenson Court AQMA. Due to the distance of the closest AQMA to the Site, no sensitive receptors have been assessed within an AQMA.

Air Quality Monitoring

Due to the COVID-19 pandemic, and associated governmental restrictions, monitoring years 2020, 2021 and 2022 are not considered to be representative due to the reduced emissions associated with governmental restrictions. Subsequently, as per the Covid-19 Supplementary Guidance produced by DEFRA in 2021, the data from 2020, 2021 and 2022 has not been used as reference years within this baseline evaluation. Therefore, this assessment has used 2023 data as the best representative year of post-COVID baseline concentrations and has been used to inform the baseline evaluation and ADMS-Roads model verification.

In December 2024, CC published their latest 2024 Air Quality Annual Status Report (ASR) which provides annual mean monitoring data between 2019-2023.

Monitoring of air quality within CC has been undertaken through both automatic and non-automatic monitoring methods in 2023. These have been reviewed in order to provide an indication of existing air quality in the area surrounding the application site.

Automatic Monitoring

CC undertook automatic pollution monitoring during 2023 at 3 different locations. The closest monitoring location is Cardiff Newport Road AURN, approximately 3.3 km south-south-west of the application site. The most recently available data is from 2023 which is presented in **Table 4-2**.

Table 4-2. Monitored Annual Mean NO_2 Concentrations at Automatic Monitoring Locations

Site ID	Site Type	Distance from Kerb of Nearest Road (m)	2023 NO_2 Annual Mean Concentration ($\mu g/m^3$)	2023 PM_{10} Annual Mean Concentration ($\mu g/m^3$)	2023 $PM_{2.5}$ Annual Mean Concentration ($\mu g/m^3$)
Cardiff City Centre AURN	Urban Background	200	16	16	10
Cardiff Newport Road AURN	Roadside/Urban Traffic	4.5	19	16	-
Cardiff Castle Street	Roadside/Urban Traffic	2	33	18	8

As outlined in **Table 4-2**, both monitoring locations monitored annual average NO_2 concentrations below the AQO for NO_2 (40 $\mu g/m^3$ annual mean), PM_{10} (40 $\mu g/m^3$ annual mean) and both the current and future AQO for $PM_{2.5}$ (20 $\mu g/m^3$ annual mean and 10 $\mu g/m^3$ annual mean respectively) during 2023.

Non - Automatic Monitoring

CC operates a network of passive diffusion tubes. The closest diffusion tube is diffusion tube TRO-037, which is located at Glan Y Afon Primary School, approximately 277 m north-east of the application site. The most recently available diffusion tube data is from 2023 which is presented in **Table 4-3**.

Table 4-3. Monitored Annual Mean NO_2 Concentrations at Closest Diffusion Tubes

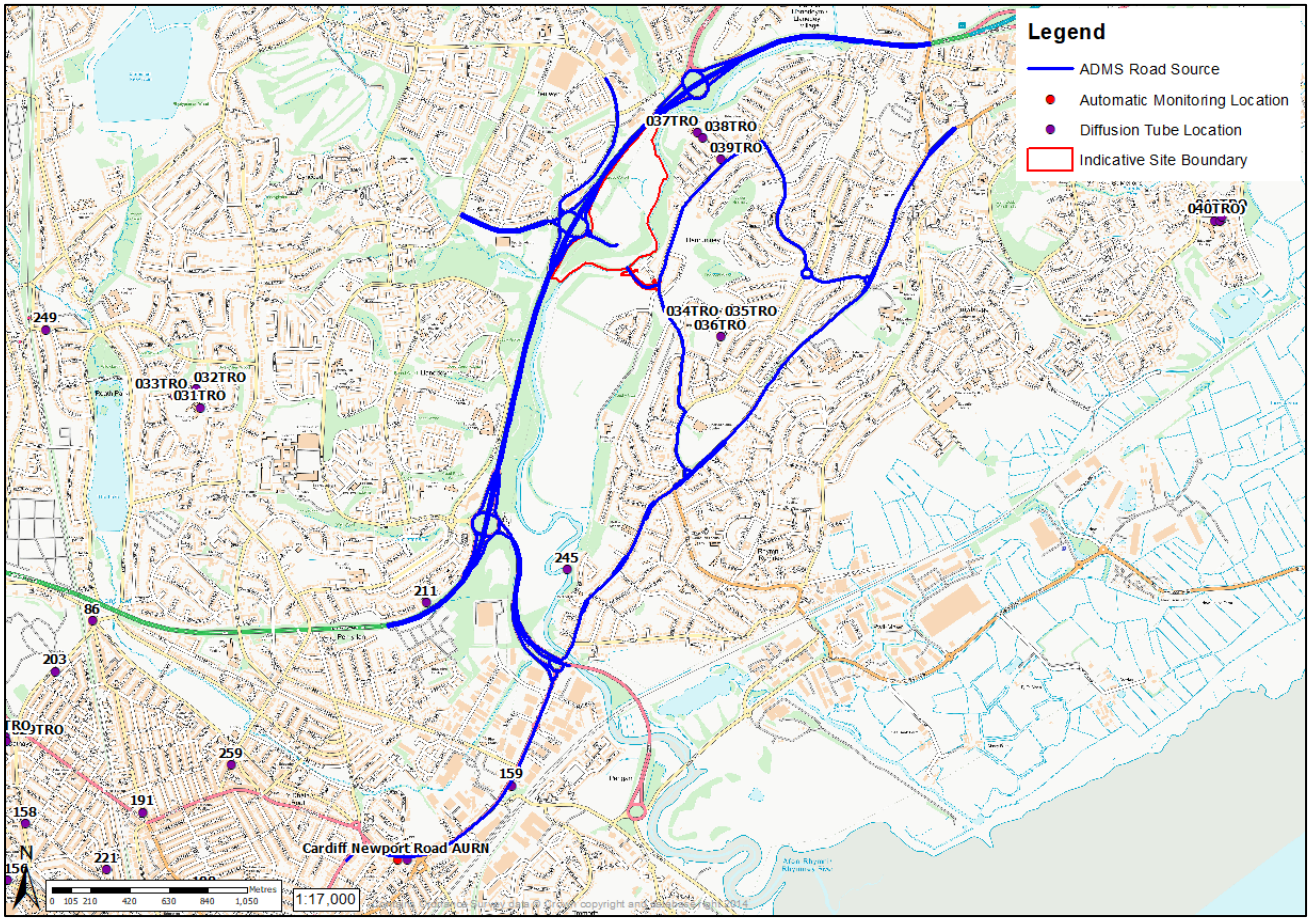
Site ID	Location	Site Type	Distance from Kerb (m)	Monitored 2023 Annual Mean NO_2 Concentration ($\mu g/m^3$)
211	19 Well Wood Close, Penylan	Roadside	28.0	17.1
245	47 Willows Ave	Urban Background	0.0	14.8
TRO-034	Bryn Hafod Primary School	Roadside	1.0	9.9
TRO-035	8 Blagdon Close	Kerbside	1.0	11.2
TRO-036	Uphill Road	Kerbside	1.0	10.8
TRO-037	Glan Y Afon Primary School	Roadside	1.0	-
TRO-038	Browning Close	Kerbside	1.0	12.0
TRO-039	Thackeray Crescent	Kerbside	1.0	12.8
TRO-061	St Mellons Primary School	Kerbside	3.0	13.4
TRO-062	Bridge Road	Kerbside	4.0	11.8
TRO-063	Church Road	Kerbside	4.0	13.5

As indicated in **Table 4-3**, all diffusion tubes located within the Air Quality Assessment area monitored annual average NO_2 concentrations below the AQO for NO_2 (40 µg/m^3 annual mean) during 2023.

It should be noted that as part of the model verification a review of diffusion tubes locations and monitoring heights was undertaken. As part of this process, the locations and monitoring heights were adjusted following desk-based review using Google Maps.

Please note that some of the non-automatic monitoring location labels within the figure below have had to be re-written into a format which is recognised by ArcGIS. Therefore, locations such as TRO-036 in **Table 4-3** become 036TRO in **Figure 4-1**.

Figure 4-1. Local Authority Monitoring Locations



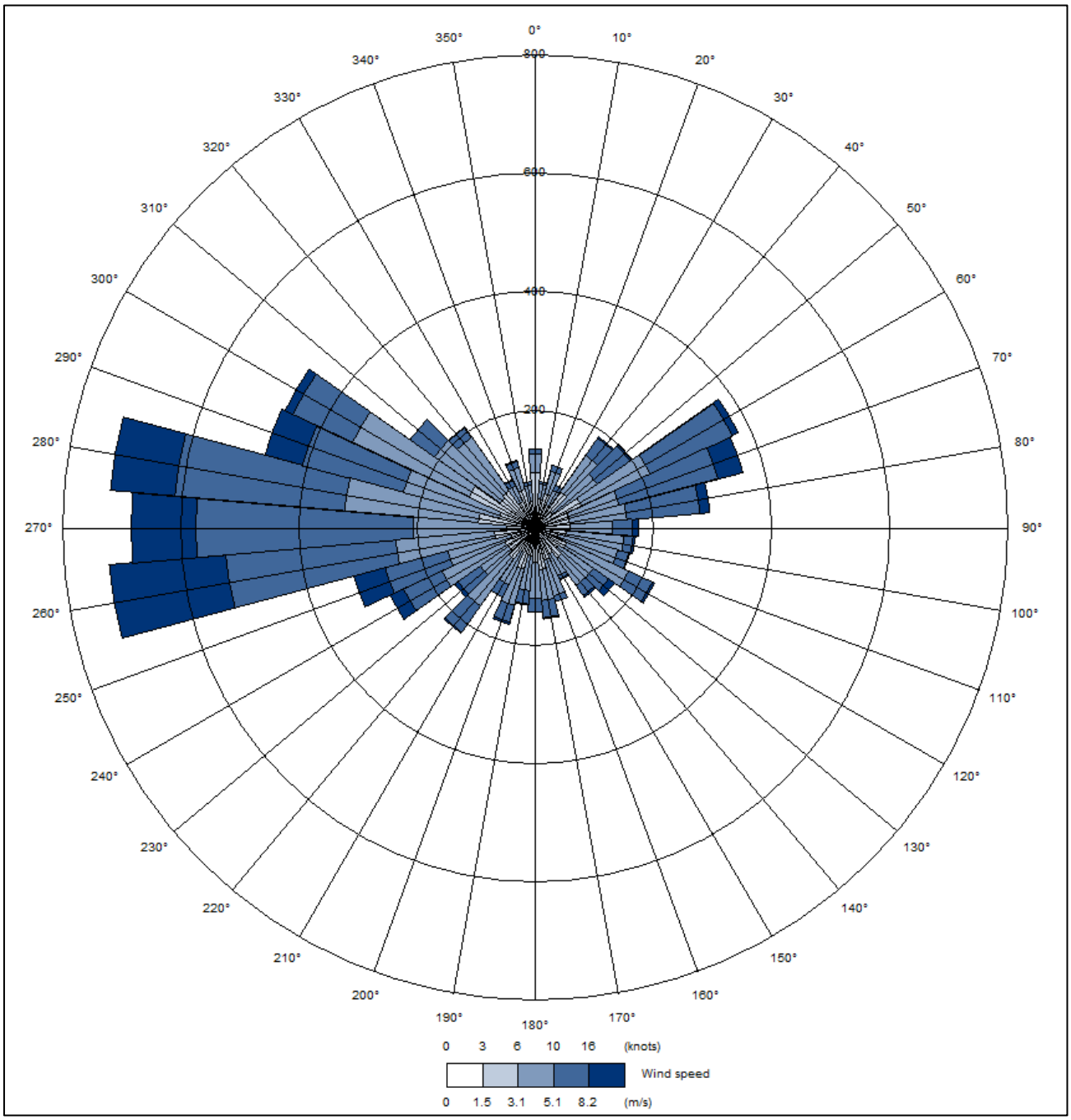
4.2 METEOROLOGY

Meteorological conditions have significant influence over air pollutant concentrations and dispersion. Pollutant levels can vary significantly from hour to hour as well as day to day, thus any air quality predictions need to be based on detailed meteorological data. The ADMS (Atmospheric Dispersion Modelling System) model calculates the dispersion of pollutants on an hourly basis using a year of local meteorological data.

The 2023 meteorological data used in the assessment is derived from the Cardiff Meteorological Station. This is the nearest meteorological station, which is considered representative of the application site, with all the

complete parameters necessary for the ADMS model. Reference should be made to **Figure 4-2** for an illustration of the prevalent wind conditions at Cardiff Meteorological Station site.

Figure 4-2. Cardiff 2023 Wind Rose



4.3 EMISSION SOURCES

A desktop assessment has identified that traffic movements are likely to be the most significant local source of pollutants affecting the site and its surroundings. The principal traffic derived pollutants likely to impact local receptors are NO_2, PM_{10} and $PM_{2.5}$.

The assessment has therefore modelled all roads within the immediate vicinity of the application site which are considered likely to experience significant changes in traffic flow as a result of the Proposed Development. Reference should be made to **Figure A-1** for a graphical representation of the traffic data utilised within the ADMS Roads 5.0.1.3 model.

It should be noted that the pollutant contribution of minor roads and rail sources that are not included within the dispersion model is considered to be accounted for via the use of background air quality levels.

4.4 SENSITIVE RECEPTORS

Receptors that are considered as part of the air quality assessment are primarily those existing receptors that are situated along routes predicted to experience significant changes in traffic flow as a result of the Proposed Development.

The existing receptor locations are summarised in **Table 4-4** and the spatial locations of all of the receptors are illustrated in **Figure 4-3**.

Table 4-4. Modelled Sensitive Receptor Locations

	Existing Sensitive Receptor	X	Y	Receptor Height (m)
R1	Glan-Yr-Afon Primary School	321659	181431	1.5
R2	247 Bryn Celyn Road	320902	180992	1.5
R3	St Cadoc's RC Primary School	321940	181474	1.5
R4	263 Ball Road	321619	181033	1.5
R5	6 Ball Lane	321446	180712	1.5
R6	Bryn Hafod Primary School	321706	180431	1.5
R7	St Teilo's Church in Wales High School	320608	179799	1.5
R8	20 King Wood Close	320299	178935	1.5
R9	2 Seaview Cottages Newport Road	322895	181246	1.5
R10	Quarry Hill Care Home	322772	180625	1.5
R11	850 Newport Road	321754	179644	1.5
R12	Medical Care	321088	178932	1.5
R13	611 Newport Road	321024	178711	1.5
R14	11 Pant Glass	321185	181330	1.5

Fourteen existing sensitive receptors have been assessed to determine the effect of air quality, associated with the Proposed Development. The locations of the receptor are identified on **Figure 4-3**.

4.5 ECOLOGICAL RECEPTORS

Air quality impacts associated with the proposed re-development have the potential to impact on receptors of ecological sensitivity within the vicinity of the site. The IAQM guidance on ‘Air Quality Impacts on Designated Nature Conservation Sites’ (2020) outlines the types of designated nature sites within 2 km of the Proposed Development which require air quality assessment. These are inclusive of:

- Sites of Special Scientific Interest (SSSIs);
- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs);

- Ramsar Sites;
- Areas of Special Scientific Interest (ASSIs);
- National Nature Reserves (NNRs);
- Local Nature Reserves (LNRs);
- Local Wildlife Sites (LWSs); and,
- Areas of Ancient Woodland (AW).

The Conservation of Habitats and Species Regulations (2019) additionally requires competent authorities to review planning applications and consents that have the potential to impact on European designated sites (e.g. Special Protection Areas).

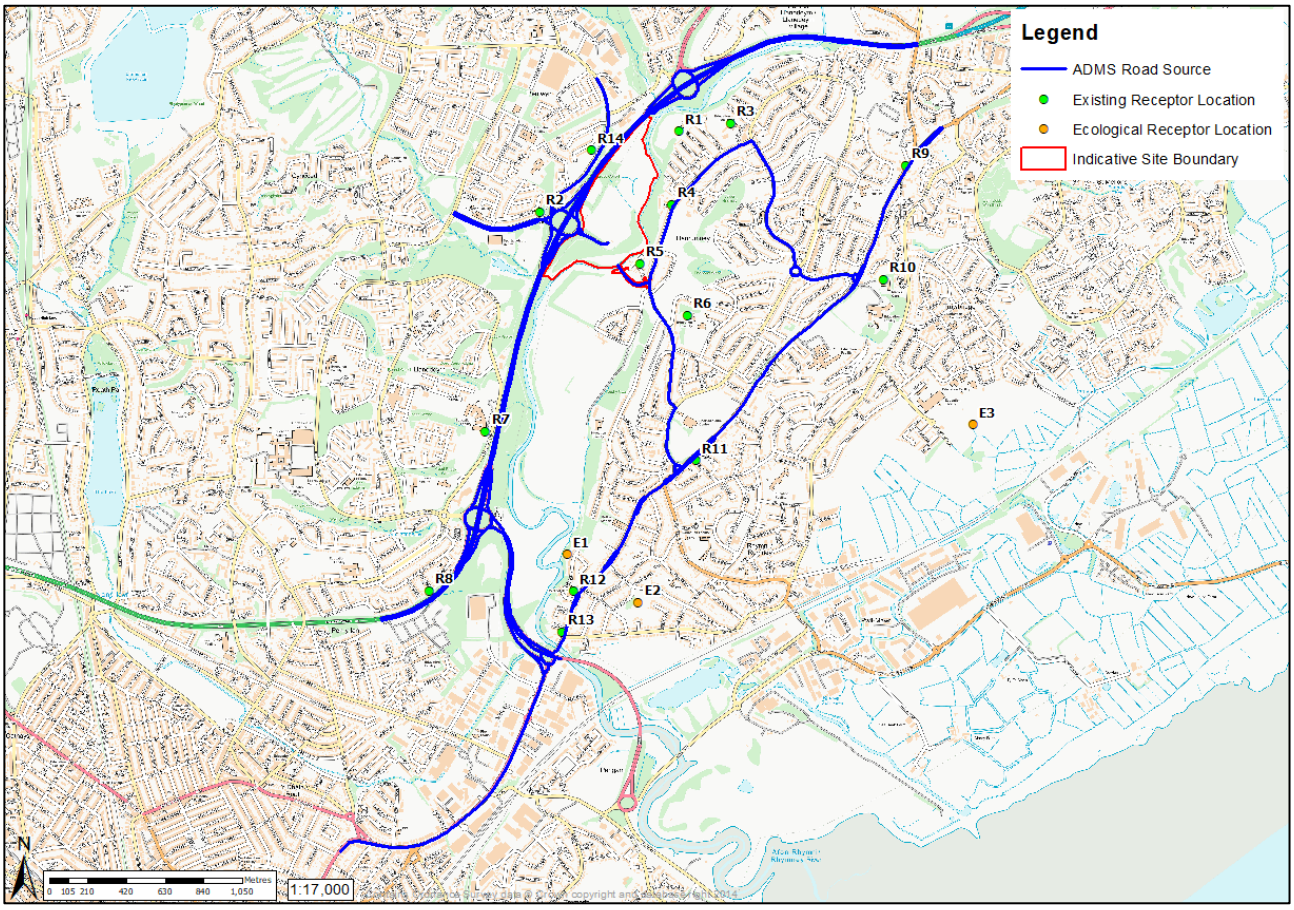
A study was undertaken to identify any statutory designated sites of ecological or nature conservation importance within the extents of the dispersion modelling assessment. This was completed using the Multi-Agency Geographic Information for the Countryside (MAGIC) web-based interactive mapping service, which draws together information on key environmental schemes and designations. Following a search within a 2 km radius of the site boundary, the following ecological receptors were identified as shown in **Table 4-5**.

Table 4-5. Ecological Sensitive Receptor Locations

Site ID	Site	Designation	UK NGR (m)		Distance from Site (km)	Distance from Nearest Affected Road (m)
			X	Y		
E1	Rhymney River Section	SSSI	321051	179132	1.8	100
E2	Rumney Quarry	SSSI	321438	178870	1.5	270
E3	Gwent Levels – Rumney and Peterstone	SSSI	323260	179838	1.9	1,040

It should be noted that the IAQM Guidance only requires the assessment of ecological receptors which are located within 200 m of the affected road network. Therefore, Rumney Quarry SSSI (E2) and Gwent Levels – Rumney and Peterstone SSSI (E3) have both been scoped out of this assessment.

Figure 4-3. Sensitive Receptor Locations



5.0 ASSESSMENT OF AIR QUALITY IMPACTS - CONSTRUCTION PHASE

5.1 POLLUTANT SOURCES

The main emissions during construction are likely to be dust and particulate matter generated during earth moving (particularly during dry months) or from construction materials. The main potential effects of dust and particulate matter are:

- Visual - dust plume, reduced visibility, coating and soiling of surfaces leading to annoyance, loss of amenity, the need to clean surfaces;
- Physical and/or chemical contamination and corrosion of artefacts;
- Coating of vegetation and soil contamination; and,
- Health effects due to inhalation e.g. asthma or irritation of the eyes.

A number of other factors such as the amount of precipitation and other meteorological conditions will also greatly influence the amount of particulate matter generated.

Construction activities can give rise to short-term elevated dust/PM_{10} concentrations in neighbouring areas. This may arise from vehicle movements, soiling of the public highway, demolition or windblown stockpiles.

5.2 PARTICULATE MATTER (PM_{10})

The UK Air Quality Standards seek to control the health implications of respirable PM_{10}. However, the majority of particles released from construction will be greater than this in size.

Construction works on site have the potential to elevate localised PM_{10} concentrations in the area. On this basis, mitigation measures should still be taken to minimise these emissions as part of good site practice.

5.3 DUST

Particles greater than 10µm are likely to settle out relatively quickly and may cause annoyance due to their soiling capability. Although there are no formal standards or criteria for nuisance caused by deposited particles, the IAQM 'Guidance on Monitoring in the Vicinity of Demolition and Construction Sites' (October 2018) and the Environment Agency Technical Guidance Note (TGN) M17 states that dust is usually compared with a 'complaints likely' guideline of 200mg/m^2/day. Therefore, a deposition rate of 200mg/m^2/day is often presented as a threshold for serious nuisance though this is usually only applied to long term exposure as people are generally more tolerant of dust for a short or defined period. Significant nuisance is likely when the dust coverage of surfaces is visible in contrast with adjacent clean areas, especially when it happens regularly. Severe dust nuisance occurs when the dust is perceptible without a clean reference surface.

Construction activities have the potential to suspend dust, which could result in annoyance of residents surrounding the site. Measures will be taken to minimise the emissions of dust as part of good site practice.

Recommended mitigation measures proportionate to the risk associated with the development and based on best practice guidance are discussed in the following sections.

5.4 METHODOLOGY

The construction phase assessment utilises the IAQM Guidance on the Assessment of Dust from Demolition and Construction document published in January 2024.

Three construction processes are considered; these are earthworks, construction and trackout. For each of these phases, the impact description of the potential dust impacts is derived following the determination of a dust emission magnitude and the distance of activities to the nearest sensitive receptor, therefore assessing worst case impacts. A full explanation of the methodology is contained in Appendix B.

5.5 ASSESSMENT RESULTS

Based on the methodology detailed in Appendix B, the scale of the anticipated works has determined the potential dust emission magnitude for each process, as presented in the **Table 5-1** below.

Table 5-1. Dust Emission Magnitude

Construction Process	Site Criteria	Dust Emission Magnitude
Demolition	Assumed Total Demolition/site clearance Volume: <18,000 m^3	Small
Earthworks	Total Site Area: >110,000 m^2	Large
Construction	Total Building Volume >75,000 m^3	Large
Trackout	Assumed 20 - 50 HDV outward movements in any one day	Medium

The sensitivity of the surrounding area to each construction process has been determined following stage 2B of the IAQM guidance. The assessment has determined the area sensitivities as shown in the **Table 5-2**.

The sensitivity of the ecological receptors is considered not applicable within the construction phase assessment due to the distance from the application site which is greater than 250m. This is in accordance with Table 4 of the IAQM Guidance.

Table 5-2. Sensitivity of the Area

Source	Area Sensitivity					
	Dust Soiling	Site Sensitivity Criteria	Health Effects of PM_{10}	Site Sensitivity Criteria	Ecological	Site Sensitivity Criteria
Demolition	High	10-100 Highly Sensitive Receptors within 20m	Low	Annual Mean of <24 ug/m^3 for PM_{10} 10-100 Highly Sensitive Receptors within 20m	N/A	>50 m from site boundary
Earthworks	High		Low		N/A	
Construction	High		Low		N/A	
Trackout	High	10-100 Highly Sensitive Receptors within 50m of roads within 250m of site	Low	Annual Mean of <24 ug/m^3 for PM_{10} 10-100 Highly Sensitive Receptors within 50m of roads within 250m of site	N/A	>50 m from roads within 250 m from site boundary

The dust emission magnitude determined in **Table 5-1** has been combined with the sensitivity of the area determined in **Table 5-2**, to determine the risk of impacts prior to the implementation of appropriate mitigation measures. The potential impact significance of dust emissions associated with the development, without mitigation, is presented in **Table 5-3**.

Table 5-3. Impact Description of Construction Activities without Mitigation

Source	Summary Risk of Impacts Prior to Mitigation		
	Dust Soiling	Health Effects of PM_{10}	Ecological
Demolition	Medium	Negligible	N/A
Earthworks	High	Low	N/A
Construction	High	Low	N/A
Trackout	Medium	Low	N/A

Appropriate mitigation measures are detailed and presented in Section 7. Following the adoption of these measures, the subsequent impact significance of the construction phase is not predicted to be significant.

6.0 ASSESSMENT OF AIR QUALITY IMPACTS - OPERATIONAL PHASE

In the context of the Proposed Development, road traffic is identified as the dominant emission source that is likely to cause potential risk of exposure of air pollutants at receptors.

The operational phase assessment therefore consists of the quantified predictions of the change in NO_2, PM_{10} and $PM_{2.5}$ for the operational phase of the development due to changes in traffic movement. Predictions of air quality at the site have been undertaken for the operational phase of the development using ADMS Roads.

In accordance with the provided traffic data, the operational phase assessment has been undertaken with an operational opening year of 2028 The assessment scenarios are therefore:

- 2023 Baseline = Existing Baseline Conditions (2023);
- 2028 'Do Minimum' = Baseline Conditions + Committed Development Flows (through local growth factor); and,
- 2028 'Do Something' = Baseline Conditions + Committed Development Flows (through local growth factor) + Proposed Development.

6.1 EXISTING AND PREDICTED TRAFFIC FLOWS

Baseline 2023 traffic data, projected 2028 'Do Minimum' and 'Do Something' traffic data, and average vehicle speeds have been obtained for the operational phase assessment in the form of Annual Average Daily Traffic figures (AADT).

Traffic data for all scenarios, inclusive of HDV numbers and average speeds have been provided by SLR Consulting Limited for all links except the A48, A4232, Newport Road, Llanrumney Avenue, Burnham Avenue, Mount Pleasant Avenue and A4161. Baseline 2023 data for the A48, A4232, Newport Road, Llanrumney Avenue, Burnham Avenue, Mount Pleasant Avenue and A4161 was downloaded from the Department for Transport (DfT) road statistic database.

The Proposed Development opening year is to be 2028. To determine the traffic flows for the 2028 'Do Minimum' traffic flows, a TEMPro factor of 1.0409 has been applied to the 2023 Baseline traffic data.

Predicted development flows have been combined with 2028 'Do Minimum' traffic flows to determine the 'Do Something' 2028 scenario traffic flows.

To calculate the 2028 'Do Something' operational year traffic flows, the Proposed Development traffic flows have been distributed across the model area and have been added onto the 2028 'Do Minimum' scenario flows.

Emission factors for the 2023 baseline and 2028 projected 'Do Minimum' and 'Do Something' scenarios have been calculated using the Emission Factor Toolkit (EFT) Version 13.1 (March 2025).

It is assumed the average vehicle speeds on the local road network in an opening year of 2028 will be broadly the same as the ones in 2023. A 50 m 20 km/hr slow down phase is included on each link at every junction and roundabout within the assessment. All of the roads within the dispersion model are illustrated in **Figure A-1**. Detailed traffic figures are provided in the **Table 6-1**.

Table 6-1. Traffic Data

Link	Speed (km/h)	2023 Baseline		2028 Do Minimum		2028 Do Something	
		AADT	HDV %	AADT	HDV %	AADT	HDV %
P&R existing road	48	2,071	10.58	2,184	10.58	2,876	29.96
A48 north of R1	112	73,773	4.27	76,790	4.27	77,194	4.32
Northbound slip road, north of R1	80	5,221	2.38	5,505	2.38	5,675	5.05
Southbound slip road, north of R1	80	5,558	3.15	5,861	3.15	6,033	5.62
A48 through R1	80	73,773	4.27	76,790	4.27	77,194	4.32
Northbound slip road south of R1	80	5,715	3.80	6,027	3.80	6,153	5.58
Southbound slip road, south of R1	80	6,195	2.99	6,533	2.99	6,658	4.65
A48 north of R2	80	73,773	4.29	76,790	4.29	77,597	4.38
Northbound slip road, north of R2	80	5,221	2.38	5,505	2.38	5,675	5.05
Southbound slip road, north of R2	80	5,558	3.15	5,861	3.15	6,033	5.62
A48 through R2	80	73,773	4.27	76,790	4.27	76,790	4.27
Northbound slip road, south of R2	80	5,715	3.80	6,027	3.80	6,153	5.58
Southbound slip road, South of R2	80	6,195	2.99	6,533	2.99	6,658	4.65
A48 south of R2	80	77,359	4.75	80,523	4.75	81,183	4.81
Southbound slip road, north of R3	80	5,558	3.15	5,861	3.15	6,033	5.62
A48 through R3	80	77,359	4.75	80,523	4.75	80,853	4.78
Northbound slip road, north of R3	80	5,221	2.38	5,505	2.38	5,675	5.05
Northbound slip road, south of R3	80	5,715	3.80	6,027	3.80	6,153	5.58
Southbound slip road, south of R3	80	6,195	2.99	6,533	2.99	6,658	4.65
A48 south of R3	80	30,579	9.96	31,830	9.96	32,160	9.98
A4232	80	60,102	5.58	62,560	5.58	62,890	5.61
A4232 slip road south	80	15,026	5.58	15,640	5.58	15,970	5.70
A4232 slip road north	80	15,026	5.58	15,640	5.58	15,970	5.70
Newport Road south of Llanrumney Avenue	48	23,817	0.53	24,791	0.53	24,841	0.57
Newport Road north of Llanrumney Avenue	48	9,919	1.19	10,325	1.19	10,375	1.27
Llanrumney Avenue	48	5,202	0.40	5,414	0.40	5,464	0.56
Ball Road	48	4,278	2.67	4,511	2.67	4,541	3.25
Burnham Avenue	48	2,000	0.15	2,082	0.15	2,132	0.57
Mount Pleasant Avenue	48	5,202	0.40	5,414	0.40	5,464	0.56
Pentwyn Road	48	12,816	3.70	13,514	3.70	13,546	3.91
Bryn Celyn Road	48	12,143	2.01	12,805	2.01	12,872	2.48
New Link Road	48	554	3.10	584	3.10	645	11.31
A48 Roundabout north of site	20	11,274	3.48	11,888	3.48	12,186	5.60
A48 Roundabout west of site	20	11,274	3.48	11,888	3.48	12,186	5.60
A48 Roundabout south of site	20	11,274	3.48	11,888	3.48	12,186	5.60
A4232/Newport Road Roundabout	20	30,051	5.58	31,280	5.58	31,940	5.70
Burnham Avenue/Mount Pleasant Avenue Roundabout	20	5,202	0.40	5,414	0.40	5,464	0.56
A4161	48	32,313	2.18	33,635	2.18	33,635	2.18

6.2 BACKGROUND CONCENTRATIONS

The use of background concentrations within the modelling process ensures that pollutant sources other than traffic are represented appropriately. Background sources of pollutants include industrial, domestic and rail

emissions within the vicinity of the study site. Several sources have been used to obtain representative background levels as discussed below.

The background concentrations used within the assessment have been determined with reference to the IAQM Guidance and Technical Guidance (TG) (22).

The IAQM Guidance states:

> "*A matter of judgement should take into account the background and future background air quality and whether it is likely to approach or exceed the value of the AQO.*"

Additionally, TG (22) states:

> "*Typically, only the process contributions from local sources are represented within an output by the dispersion model. In these circumstances, it is necessary to add an appropriate background concentration(s) to the modelled source contributions to derive the total pollutant concentrations.*"

Defra Published Background Concentrations for 2023

The background concentrations shown in **Table 6-2** were referenced from the UK National Air Quality Information Archive database based on the National Grid Co-ordinates of 1 x 1 km grid squares nearest to the application site. In November 2024, Defra issued revised 2021 based background maps for nitrogen oxide (NO_X), NO_2, PM_{10} and $PM_{2.5}$.

Table 6-2. Published Background Air Quality Levels (µg/m^3)

Receptor Location		2023			
		NO_X	NO_2	PM_{10}	$PM_{2.5}$
Proposed Site					
321500	180500	14.82	11.26	13.07	8.39
321500	181500	17.09	12.82	14.53	8.62
Local Authority Monitoring					
159		19.85	14.61	14.86	9.43
195		20.37	14.97	14.91	9.65
211		18.38	13.68	14.26	9.16
TRO-039		14.82	11.26	13.07	8.39
Cardiff Newport Road AURN		20.37	14.97	14.91	9.65
Existing Sensitive Receptors					
R1		14.82	11.26	13.07	8.39
R2		15.91	12.02	13.91	8.66
R3		14.82	11.26	13.07	8.39
R4		14.82	11.26	13.07	8.39
R5		15.91	12.02	13.91	8.66
R6		15.96	12.04	13.21	8.54
R7		17.59	13.15	14.45	8.68
R8		18.38	13.68	14.26	9.16
R9		15.34	11.61	13.50	8.76
R10		15.34	11.61	13.50	8.76
R11		15.96	12.04	13.21	8.54
R12		18.98	14.07	15.07	8.87
R13		18.98	14.07	15.07	8.87
R14		15.91	12.02	13.91	8.66
Ecological Sensitive Receptors					
E1		-	-	15.07	8.87

All the Defra background concentrations detailed in **Table 6-2** for 2023, show that the background levels are predicted to be below the relevant AQO within the study area.

A breakdown of the background source apportionment of NO_X concentrations at each monitoring location and receptor is shown in **Table 6-3**.

Table 6-3. Pollutant Source Apportionment of NO_X ($\mu g/m^3$)

Receptor Location	2023						
	Total NO_x	% of NO_X from Road Sources	% of NO_X from Industrial Sources	% of NO_X from Domestic Sources	% of NO_X from Aircraft Sources	% of NO_X from Rail Sources	% of NO_X from Other Sources
Local Authority Monitoring							
159	19.85	38.45	11.52	11.71	0.08	4.85	33.39
195	20.37	44.38	9.04	15.02	0.08	3.37	28.11
211	18.38	46.90	7.99	13.03	0.09	2.94	29.05
TRO-039	14.82	42.16	8.87	10.36	0.10	2.47	36.04
Cardiff Newport Road AURN	20.37	44.38	9.04	15.02	0.08	3.37	28.11
Existing Sensitive Receptors							
R1	14.82	42.16	8.87	10.36	0.10	2.47	36.04
R2	15.91	46.37	7.88	10.50	0.09	2.31	32.85
R3	14.82	42.16	8.87	10.36	0.10	2.47	36.04
R4	14.82	42.16	8.87	10.36	0.10	2.47	36.04
R5	15.91	46.37	7.88	10.50	0.09	2.31	32.85
R6	15.96	41.55	9.30	10.81	0.09	2.91	35.34
R7	17.59	48.63	0.03	9.89	0.09	2.42	38.93
R8	18.38	46.90	7.99	13.03	0.09	2.94	29.05
R9	15.34	41.96	8.88	10.90	0.00	2.54	35.72
R10	15.34	41.96	8.88	10.90	0.00	2.54	35.72
R11	15.96	41.55	9.30	10.81	0.09	2.91	35.34
R12	18.98	46.15	9.03	10.69	0.08	3.08	30.96
R13	18.98	46.15	9.03	10.69	0.08	3.08	30.96
R14	15.91	46.37	7.88	10.50	0.09	2.31	32.85
Ecological Sensitive Receptors							
E1	18.98	46.15	9.03	10.69	0.08	3.08	30.96

Table 6-3 shows that the major background source of NO_X at the monitoring, sensitive receptor locations where sources have been identified are mainly comprised of road sources.

A review of the Defra background site has determined that they are in line with the Local Authority monitoring within CC.

Table 6-4 shows the background concentrations utilised within the assessment.

Table 6-4. Utilised Background Concentrations (µg/m^3)

Receptor Location	2023		Source
	NO_x	NO_2	
Local Authority Monitoring			
159	19.85	14.61	Defra Background Maps
195	20.37	14.97	
211	18.38	13.68	
TRO-039	14.82	11.26	
Cardiff Newport Road AURN	20.37	14.97	
Existing Sensitive Receptors			
R1	14.82	11.26	Defra Background Maps
R2	15.91	12.02	
R3	14.82	11.26	
R4	14.82	11.26	
R5	15.91	12.02	
R6	15.96	12.04	
R7	17.59	13.15	
R8	18.38	13.68	
R9	15.34	11.61	
R10	15.34	11.61	
R11	15.96	12.04	
R12	18.98	14.07	
R13	18.98	14.07	
R14	15.91	12.02	
Ecological Sensitive Receptors			
E1	20.90	-	APIS

6.3 MODEL VERIFICATION

Model verification involves the comparison of modelled data to monitored data in order to gain the best possible representation of current pollutant concentrations for the assessment years. The verification process is in general accordance with that contained in Section 7 of the TG22 guidance note and uses the most recently available diffusion tube monitoring data to best represent this.

The verification process consists of using the monitoring data and the published background air quality data in the UK National Air Quality Information Archive to calculate the road traffic contribution of NO_X at the monitoring locations. Outputs from the ADMS Roads model are provided as predicted road traffic contribution NO_X emissions. These are converted into predicted roadside contribution NO_2 exposure at the relevant receptor locations based on the updated approach to deriving NO_2 from NO_X for road traffic sources published in Local Air Quality Management TG22. The calculation was derived using the NO_X to NO_2 worksheet in the online LAQM tools website hosted by Defra. **Table 6-5** summarises the final model/monitored data correlation following the application of the model correction factor.

Table 6-5. Comparison of Roadside Modelling & Monitoring Results for NO_2

Monitoring Site	NO_2 µg/m^3		
	Monitored NO_2	Modelled NO_2	Difference (%)
159	**26.70**	21.59	-19.14
195	**22.10**	24.14	9.21
211	**17.10**	16.55	-3.22
TRO-039	**12.80**	12.94	1.06
Cardiff Newport Road AURN	**19.00**	21.72	14.32

The final model produced data at the monitoring locations to within 25% of the monitoring results at all of the verification points, as required by TG22 guidance.

Ten monitoring locations were considered for verification; 159, 195, 211, TRO-034, TRO-035, TRO-036, TRO-037, TRO-038, TRO-039 and Cardiff Newport Road AURN. Locations TRO-034, TRO-035, TRO-036, TRO-037 and TRO-038 were all removed due to there being no traffic data for the road they were situated on.

The verification was undertaken using the diffusion tube coordinates as recorded in the LAQM report. Diffusion tube TRO-039 is the closest monitoring location to the Proposed Development, and Diffusion Tube 159 recorded the highest monitoring NO_2 result in 2023. Therefore, during the verification process additional focus has been given to these two monitoring locations as they are most representative of the development site and worst case, respectively.

The results of the verification showed that diffusion tube 159 was underpredicting by -19.14%, 195 was overpredicting by 9.21%, 211 was underpredicting by -3.22%, TRO-039 was overpredicting by 1.06% and Cardiff Newport Road AURN was overpredicting by 14.32%. This resulted in a primary adjustment factor of 2.18 and a secondary adjustment factor of 0.99.

The final verification model correlation coefficient (representing the model uncertainty) is 0.99. This was achieved by applying a model correction factor of 2.18 to roadside predicted NO_X concentrations before converting to NO_2. This figure demonstrates that the model predictions were in line with the road traffic emissions at the monitoring locations.

Since there is only one verification point which monitors for PM_{10} (Cardiff Newport Road AURN), this is not considered enough points for verification purposes.

It should be noted that TG(22) states that in the absence of sufficient Particulate Matter (PM_{10} and $PM_{2.5}$) monitoring data for verification, it may be appropriate to apply the NO_X-NO_2 adjustment factor to the modelled Particulate Matter.

TG(22) also states that care needs to be taken when applying model adjustment based on one monitoring site only as the adjustment may not be representative of other locations.

As there is no suitable PM_{10} or $PM_{2.5}$ monitoring data within the study area, it is not possible to perform a model verification for these pollutants. As such, the NO_2 adjustment factor has also been applied to the PM_{10} and $PM_{2.5}$ modelled results, in accordance with LAQM.TG(22).

6.4 ADMS-ROADS MODEL INPUTS

Table 6-6. Summary of ADMS Roads Model Inputs

Parameter	Description	Input Value
Chemistry	A facility within ADMS-Roads to calculate the chemical reactions in the atmosphere between Nitric Oxide (NO), NO_2, Ozone (O_3) and Volatile organic compounds (VOCs).	No atmospheric chemistry parameters included
Meteorology	Representative meteorological data from a local source	**Cardiff 2023 Meteorological Station**, hourly sequential data
Surface Roughness	A setting to define the surface roughness of the model area based upon its location.	**1m** representing a typical surface roughness for **Cities and Woodlands** was used for the Site **0.5m** representing a typical surface roughness for **Parkland and Open Suburbia** for the met. Measurement site.
Latitude	Allows the location of the model area to be set	United Kingdom = **51.5**
Monin-Obukhov Length	This allows a measure of the stability of the atmosphere within the model area to be specified depending upon its character.	Cities and Large Towns= **30m** was used for the Site Small Towns = 1**0m** was used for the met. Measurement site.
Elevation of Road	Allows the height of the road link above ground level to be specified.	The three raised roundabouts along the A48 were set at **10m**. All other road links were set at ground level = **0m**.
Road Width	Allows the width of the road link to be specified.	Road width used depended on data obtained from OS map data for the specific road link
Topography	This enables complex terrain data to be included within the model in order to account for turbulence and plume spread effects of topography	No topographical information used
Time Varied Emissions	This enables daily, weekly or monthly variations in emissions to be applied to road sources	No time varied emissions used
Road Type	Allows the effect of different types of roads to be assessed.	**Wales (Urban)** settings were used for the relevant links
Road Speeds	Enables individual road speeds to be added for each road link	Based on national speed limits
Canyon Height	Allows the model to take account turbulent flow patterns occurring inside a street with relatively tall buildings on both sides, known as a 'street canyon'.	No canyons used within the model
Road Source Emissions	Road source emission rates are calculated from traffic flow data using the in-built EFT database of traffic emission factors.	The **EFT** Version **13.1 (2025)** dataset was used.
Year	Predicted EFT emissions rates depend on the year of emission.	**2023** data for verification and baseline Operational Phase Assessment. **2028** data for the Operational Phase Traffic Assessment.

6.5 ADMS MODELLING RESULTS

6.5.1 Traffic Assessment

The ADMS Model has predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ at relevant receptor locations adjacent to roads likely to be affected by the development, as summarised in the following tables. Only receptors close to roads where there is predicted to be a change in emissions have been assessed.

6.5.2 Assessment Scenarios

For the operational year of 2028, assessment of the effects of emissions from the proposed traffic associated with the scheme, has been undertaken using the Emissions Factor Toolkit (EFT) 2028 emissions rates which take into account of the rate of reduction in emission from road vehicles into the future with the following factors:

- 2023 Baseline = Existing Baseline conditions;
- 2028 'Do Minimum' = 2028 Baseline + Committed Development Flows (through local growth factor); and,
- 2028 'Do Something' = 2028 Baseline + Committed Development Flows (through local growth factor) + Development Traffic Flows.

6.5.3 Long-Term Operational Traffic Assessment

Nitrogen Dioxide

Table 6-7 presents a summary of the predicted change in NO_2 concentrations at relevant receptor locations, due to changes in traffic flow associated with the Proposed Development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-7. Predicted Annual Average Concentrations of NO_2 at Receptor Locations

Receptor		NO_2 (µg/m^3)			
		2023 Baseline	2028 Do Minimum	2028 Do Something	Development Contribution
R1	Glan-Yr-Afon Primary School	13.71	12.74	12.76	0.02
R2	247 Bryn Celyn Road	15.49	14.09	14.14	0.05
R3	St Cadoc's RC Primary School	12.94	12.26	12.28	0.02
R4	263 Ball Road	13.16	12.40	12.43	0.03
R5	6 Ball Lane	13.37	12.82	12.86	0.04
R6	Bryn Hafod Primary School	12.88	12.54	12.55	0.01
R7	St Teilo's Church in Wales High School	17.19	15.60	15.63	0.03
R8	20 King Wood Close	16.84	15.57	15.59	0.02
R9	2 Seaview Cottages Newport Road	14.21	13.15	13.17	0.02
R10	Quarry Hill Care Home	12.39	12.07	12.08	0.01
R11	850 Newport Road	14.66	13.60	13.61	0.01
R12	Medical Care	17.17	15.93	15.94	0.01
R13	611 Newport Road	19.11	17.09	17.11	0.02
R14	11 Pant Glass	15.82	14.31	14.34	0.03
Annual Mean AQO		**40 µg/m^3**			

All modelled existing receptors are predicted to be below the AQO for NO_2 in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-7**, the maximum predicted increase in annual average exposure to NO_2 at any existing receptor, due to changes in traffic movements associated with the Proposed Development is likely to be 0.05 µg/m^3 at 247 Bryn Celyn Road (R2).

The predicted long-term NO_2 concentrations at all existing receptors are well below 60 µg/m^3 in all scenarios. Therefore, it is unlikely there will be any exceedances for the short-term NO_2 AQO at all modelled receptors as outlined in LAQM TG22 technical guidance.

Figure 6-1, **Figure 6-2** and **Figure 6-3**, below, illustrate the total long term annual average Nitrogen Dioxide (NO_2) Contribution and Concentration at the Proposed Development (µg/m^3).

Figure 6-1. Annual Average Long-Term Nitrogen Dioxide (NO_2) Contribution from Proposed Development ($\mu g/m^3$)

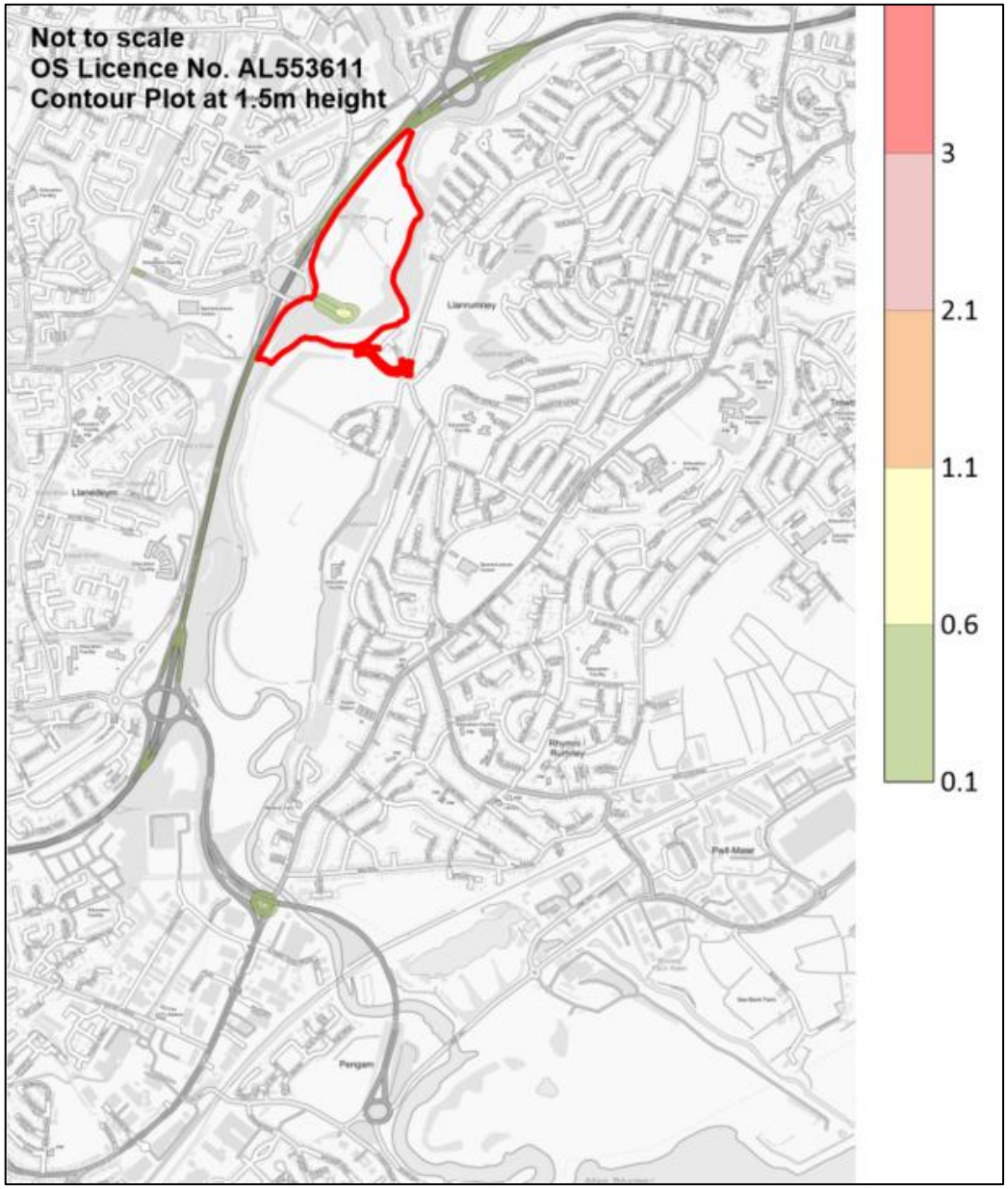


Figure 6-2. Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration at Proposed Development ($\mu g/m^3$)

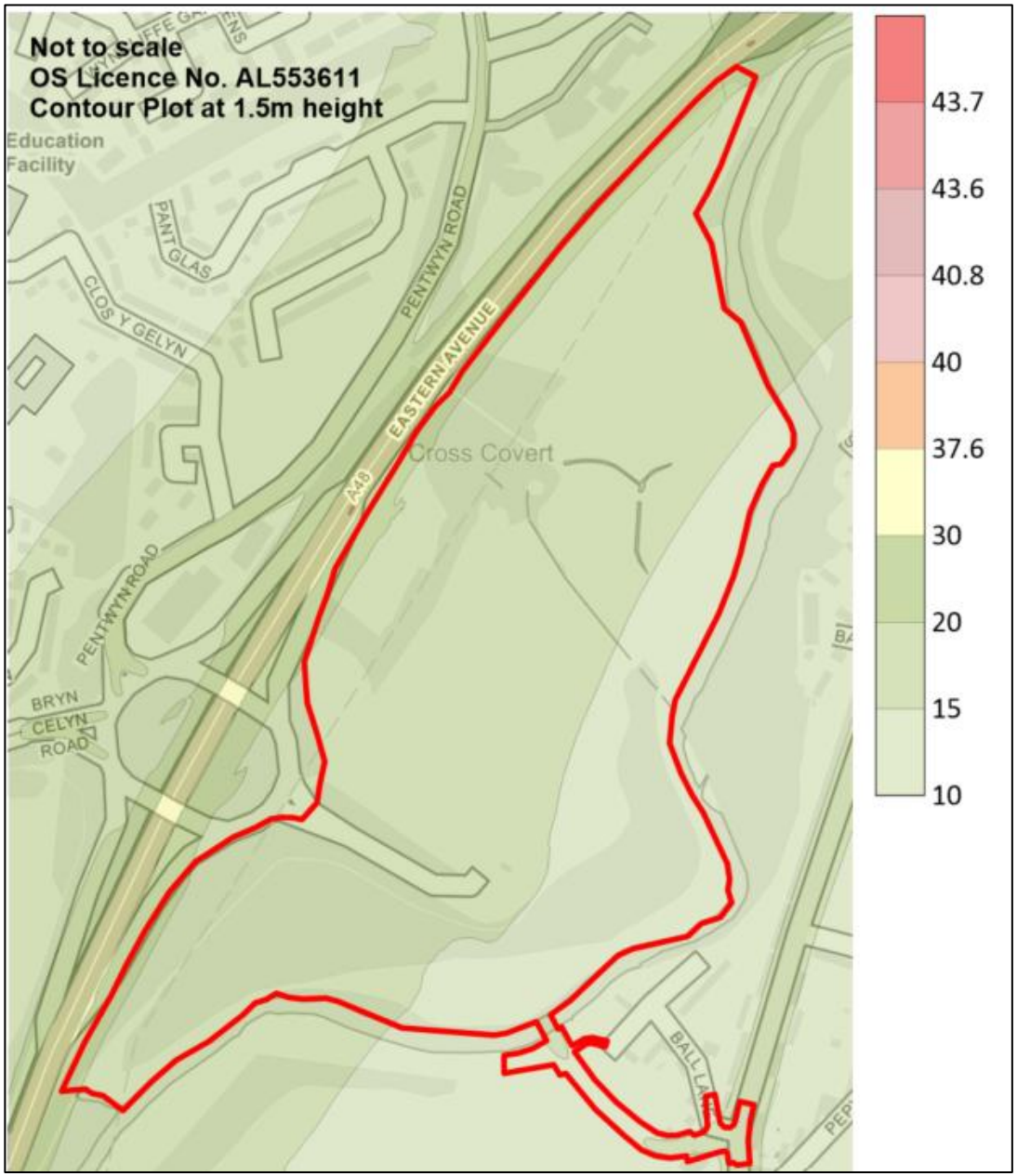
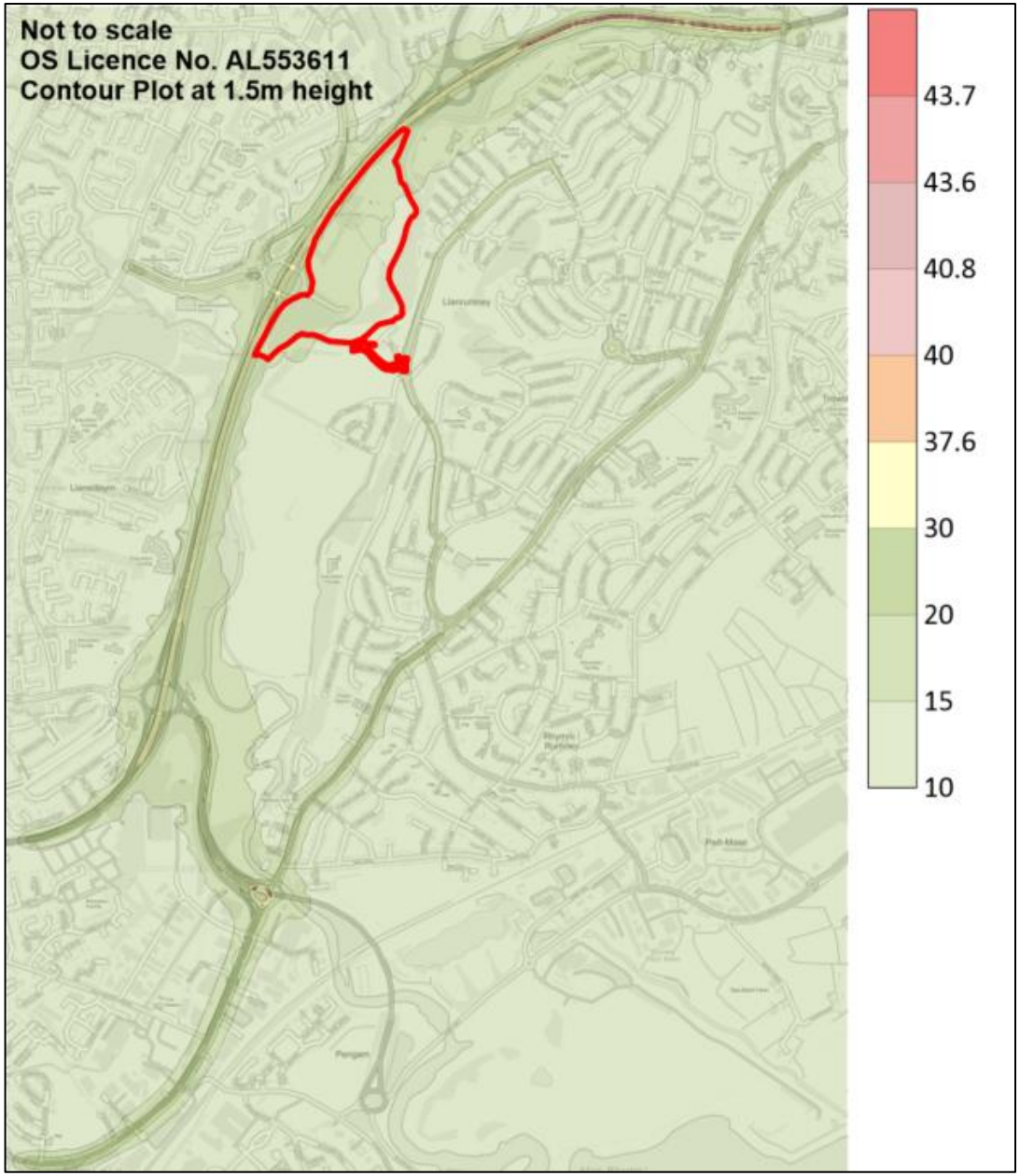


Figure 6-3. Total Long Term Annual Average Nitrogen Dioxide (NO_2) Concentration Across the Study Area ($\mu g/m^3$)



The impact description of changes in traffic flow associated with the Proposed Development with respect to annual mean NO_2 exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-8**.

Table 6-8. Impact Description of Effects at Key Receptors (NO_2)

Impact Description of NO_2 Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.02	0.05	0%	≤75% of AQO	Negligible
R2	0.05	0.13	0%	≤75% of AQO	Negligible
R3	0.02	0.05	0%	≤75% of AQO	Negligible
R4	0.03	0.07	0%	≤75% of AQO	Negligible
R5	0.04	0.10	0%	≤75% of AQO	Negligible
R6	0.01	0.03	0%	≤75% of AQO	Negligible
R7	0.03	0.08	0%	≤75% of AQO	Negligible
R8	0.02	0.05	0%	≤75% of AQO	Negligible
R9	0.02	0.05	0%	≤75% of AQO	Negligible
R10	0.01	0.02	0%	≤75% of AQO	Negligible
R11	0.01	0.02	0%	≤75% of AQO	Negligible
R12	0.01	0.02	0%	≤75% of AQO	Negligible
R13	0.02	0.05	0%	≤75% of AQO	Negligible
R14	0.03	0.07	0%	≤75% of AQO	Negligible
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic flow as a result of the Proposed Development, with respect to NO_2 exposure for existing receptors, is determined to be 'negligible' at all modelled receptors. This is based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter (PM_{10})

Table 6-9 presents a summary of the predicted change in annual mean PM_{10} concentrations at relevant receptor locations, due to changes in traffic flow associated with the Proposed Development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-9. Predicted Annual Average Concentrations of PM_{10} at Receptor Locations

Receptor		PM_{10} (µg/m³)			
		2023 Baseline	2028 Do Minimum	2028 Do Something	Development Contribution
R1	Glan-Yr-Afon Primary School	13.58	13.55	13.56	0.01
R2	247 Bryn Celyn Road	14.71	14.67	14.68	0.01
R3	St Cadoc's RC Primary School	13.40	13.38	13.39	0.01
R4	263 Ball Road	13.53	13.51	13.52	0.01
R5	6 Ball Lane	14.21	14.20	14.20	<0.01
R6	Bryn Hafod Primary School	13.40	13.39	13.39	<0.01
R7	St Teilo's Church in Wales High School	15.32	15.28	15.29	0.01
R8	20 King Wood Close	14.96	14.92	14.93	0.01
R9	2 Seaview Cottages Newport Road	14.20	14.17	14.17	<0.01
R10	Quarry Hill Care Home	13.69	13.68	13.68	<0.01
R11	850 Newport Road	13.94	13.91	13.91	<0.01
R12	Medical Care	15.91	15.87	15.88	0.01
R13	611 Newport Road	16.46	16.39	16.40	0.01
R14	11 Pant Glass	14.79	14.75	14.76	0.01
Annual Mean AQO		**40 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for PM_{10} in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-9**, the maximum predicted increase in annual average exposure to PM_{10} at any existing receptor, due to changes in traffic movements associated with the Proposed Development is 0.01 µg/m³ at Glan-Yr-Afon Primary School (R1), 247 Bryn Celyn Road (R2), St Cadoc's RC Primary School (R3), 263 Ball Road (R4), St Teilo's Church in Wales High School (R7), 20 King Wood Close (R8), Medical Care (R12), 611 Newport Road (R13) and 11 Pant Glass (R14).

The impact description of changes in traffic flow associated with the Proposed Development with respect to annual mean PM_{10} exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-10**.

Table 6-10. Impact Description of Effects at Key Receptors (PM_{10})

Impact Description of PM_{10} Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	0.01	0.02	0%	≤75% of AQO	Negligible
R2	0.01	0.02	0%	≤75% of AQO	Negligible
R3	0.01	0.02	0%	≤75% of AQO	Negligible
R4	0.01	0.02	0%	≤75% of AQO	Negligible
R5	<0.01	<0.01	0%	≤75% of AQO	Negligible
R6	<0.01	<0.01	0%	≤75% of AQO	Negligible
R7	0.01	0.02	0%	≤75% of AQO	Negligible
R8	0.01	0.02	0%	≤75% of AQO	Negligible
R9	<0.01	<0.01	0%	≤75% of AQO	Negligible
R10	<0.01	<0.01	0%	≤75% of AQO	Negligible
R11	<0.01	<0.01	0%	≤75% of AQO	Negligible
R12	0.01	0.03	0%	≤75% of AQO	Negligible
R13	0.01	0.02	0%	≤75% of AQO	Negligible
R14	0.01	0.02	0%	≤75% of AQO	Negligible
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Proposed Development, with respect to annual mean PM_{10} exposure for existing receptors is determined to be 'negligible' based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

Particulate Matter ($PM_{2.5}$)

Table 6-11 presents a summary of the predicted change in annual mean $PM_{2.5}$ concentrations at relevant receptor locations, due to changes in traffic flow associated with the Proposed Development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-11. Predicted Annual Average Concentrations of $PM_{2.5}$ at Receptor Locations

Receptor		$PM_{2.5}$ (µg/m³)			
		2023 Baseline	2028 Do Minimum	2028 Do Something	Development Contribution
R1	Glan-Yr-Afon Primary School	8.68	8.66	8.66	<0.01
R2	247 Bryn Celyn Road	9.11	9.07	9.08	0.01
R3	St Cadoc's RC Primary School	8.58	8.56	8.56	<0.01
R4	263 Ball Road	8.64	8.62	8.63	0.01
R5	6 Ball Lane	8.83	8.82	8.82	<0.01
R6	Bryn Hafod Primary School	8.65	8.64	8.64	<0.01
R7	St Teilo's Church in Wales High School	9.20	9.15	9.16	0.01
R8	20 King Wood Close	9.57	9.53	9.53	<0.01
R9	2 Seaview Cottages Newport Road	9.14	9.11	9.12	0.01
R10	Quarry Hill Care Home	8.86	8.85	8.85	<0.01
R11	850 Newport Road	8.94	8.91	8.91	<0.01
R12	Medical Care	9.34	9.30	9.30	<0.01
R13	611 Newport Road	9.64	9.58	9.58	<0.01
R14	11 Pant Glass	9.16	9.12	9.13	0.01
Annual Mean AQO		**Current AQO = 20 µg/m³, Future AQO = 10 µg/m³**			

All modelled existing receptors are predicted to be below the AQO for $PM_{2.5}$ in both the 'Do Minimum' and 'Do Something' scenarios.

As indicated in **Table 6-11**, the maximum predicted increase in annual average exposure to $PM_{2.5}$ at any existing receptor, due to changes in traffic movements associated with the Proposed Development is 0.01 µg/m³ at 247 Bryn Celyn Road (R2), 283 Ball Road (R4), St Teilo's Church in Wales High School (R7), 2 Seaview Cottages Newport Road (R9) and 11 Paint Glass (R14).

The impact description of changes in traffic flow associated with the Proposed Development with respect to annual mean $PM_{2.5}$ exposure has been assessed with reference to the criteria in Section 3. The outcomes of the assessment are summarised in **Table 6-12**.

Table 6-12. Impact Description of Effects at Key Receptors ($PM_{2.5}$)

Impact Description of $PM_{2.5}$ Effects at Key Receptors					
Receptor	**Change Due to Development (DS-DM) (µg/m³)**	**Change due to Development (% of AQO)**	**% Change in Concentration Relative to AQO**	**% Annual Mean Concentration in Assessment Year**	**Impact Description**
R1	<0.01	<0.01	0%	76-94% of AQO	Negligible
R2	0.01	0.10	0%	76-94% of AQO	Negligible
R3	<0.01	<0.01	0%	76-94% of AQO	Negligible
R4	0.01	0.10	0%	76-94% of AQO	Negligible
R5	<0.01	<0.01	0%	76-94% of AQO	Negligible
R6	<0.01	<0.01	0%	76-94% of AQO	Negligible
R7	0.01	0.10	0%	76-94% of AQO	Negligible
R8	<0.01	<0.01	0%	95-102% of AQO	Negligible
R9	0.01	0.10	0%	76-94% of AQO	Negligible
R10	<0.01	<0.01	0%	76-94% of AQO	Negligible
R11	<0.01	<0.01	0%	76-94% of AQO	Negligible
R12	<0.01	<0.01	0%	76-94% of AQO	Negligible
R13	<0.01	<0.01	0%	95-102% of AQO	Negligible
R14	0.01	0.10	0%	76-94% of AQO	Negligible
+0% means a change of <0.5% as per explanatory note 2 of table 6.3 of the EPUK IAQM Guidance.					

The impact description of the effects of changes in traffic as a result of the Proposed Development, with respect to annual mean PM_{10} exposure for existing receptors is determined to be 'negligible' based on the methodology outlined in section 3. Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

6.5.4 Ecological Sensitive Receptor Locations

Background concentrations at each of the ecologically sensitive sites were determined through a review of the NO_X pollutants published on the APIS website.

The below assessment has been undertaken in accordance with A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites (IAQM, 2020).

Nitrogen Oxide

Table 6-13 presents a summary of the predicted change in NO_X concentrations at relevant receptor locations, due to changes in traffic flow associated with the development, based on modelled 'Do Minimum' and 'Do Something' scenarios.

Table 6-13. Predicted Annual Average Concentrations of NO_X at Ecological Receptor Locations

Ecological Receptor		**Predicted Maximum Annual Mean Concentration (µg/m³)**				
		Do Minimum 2023 NO_X	**Do Something 2023 NO_X**	**Process Contribution (PC)**	**PC as %age of AQO**	**Background**
E1	Rhymney River Section (SSSI)	23.05	23.08	0.03	0.09	20.90
Annual Mean AQO/Critical Level (CL)		**30 µg/m³**				

As indicated in **Table 6-13**, the maximum predicted increase in the annual average exposure to NO_X at any ecological receptor, due to changes in traffic movements associated with the development, is 0.03 µg/m³ at Rhymney River Section (SSSI) (E1).

Section 5.5.4.1 of *A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020 states:

> *"Where the assessment indicates that changes in annual mean NO_x concentrations within a designated site cannot be dismissed as imperceptible (i.e. an increase of over 0.4 µg/m³) and the NO_x critical level is exceeded, then changes in nutrient nitrogen deposition should be calculated as supporting information to further assist in the evaluation of significance."*

The maximum predicted increase in the annual average exposure to NO_x at the identified ecological receptor, due to changes in traffic movements associated with the development, is 0.03 µg/m^3 at Rhymney River Section (SSSI) (E1) which is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020.

As a result, no further assessment is required and the impact at Rhymney River Section (SSSI) (E1) as this is considered to be negligible.

7.0 MITIGATION

7.1 CONSTRUCTION PHASE

The dust risk categories have been determined in Section 5 for each of the four construction activities. The assessment has determined that the potential impact description of dust emissions associated with the construction phase of the Proposed Development is 'high risk' at the worst affected receptors.

Using the methodology described in Appendix B, appropriate site-specific mitigation measures associated with the determined level of risk can be found in Section 8.2 of the 'IAQM Guidance on the Assessment of Dust from Demolition and Construction'.

The mitigation measures have been divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and trackout. They are categorised into 'highly recommended' and 'desirable' measures.

The mitigation measures for the Proposed Development are detailed in **Table 7-1**.

Table 7-1. IAQM Guidance on the Assessment of Dust from Demolition and Construction

Mitigation measure	Low Risk	Medium Risk	High Risk
Communications			
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
Display the head or regional office contact information.	H	H	H
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.	D	H	H
Site Management			
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H	H	H
Make the complaints log available to the local authority when asked.	H	H	H
Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.	H	H	H
Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter	N	N	H

Mitigation measure	Low Risk	Medium Risk	High Risk
emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.			
Monitoring			
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.	D	D	H
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	H	H	H
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	H	H	H
Preparing and maintaining the site			
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	D	H	H
Avoid site runoff of water or mud.	H	H	H
Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	D	H	H
Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	H	H	H
Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H

Mitigation measure	Low Risk	Medium Risk	High Risk
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D	D	H
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	N	H
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	N	D	H
Operations			
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate	H	H	H
Use enclosed chutes and conveyors and covered skips.	H	H	H
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H
Waste management			
Avoid bonfires and burning of waste materials.	H	H	H
Demolition			
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	H	H	H
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
Bag and remove any biological debris or damp down such material before demolition.	H	H	H
Earthworks			
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	N	D	H
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	N	D	H

Mitigation measure	Low Risk	Medium Risk	High Risk
Only remove the cover in small areas during work and not all at once.	N	D	H
Construction			
Avoid scabbling (roughening of concrete surfaces) if possible.	D	D	H
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	D	H	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	N	D	H
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D
Trackout			
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	D	H	H
Avoid dry sweeping of large areas.	D	H	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	N	H	H
Access gates to be located at least 10 m from receptors where possible.	N	H	H

H = Highly Recommended D = Desirable N = Not Required

Following the implementation of the mitigation measures detailed in the table above, the impact description of the construction phase is not considered to be significant.

7.2 OPERATIONAL PHASE

All modelled proposed residential receptors are predicted to be below the annual average AQO for NO_2, PM_{10} and $PM_{2.5}$, and the impact description of the effects of changes in traffic flow as a result of the Proposed Development, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, is determined to be 'negligible' at all existing receptors. Therefore, no further mitigation is required.

8.0 CONCLUSIONS

This report presents the findings of an air quality assessment undertaken to assess road traffic emission and construction dust impacts in support of a hybrid planning application (part full/part outline) for the *"demolition of existing structures and redevelopment of the site to provide a Data Centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works"* at Cardiff East Park and Ride, Cardiff, Eastern Avenue, Old St Mellons,CF23 8HH.

Construction Phase

Prior to the implementation of appropriate mitigation measures, the potential impact description of dust emissions associated with the construction phase of the Proposed Development is 'high risk' at the worst affected receptors without mitigation. However, appropriate site-specific mitigation measures have been proposed based on Section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition, Earthworks, Construction and Trackout. It is anticipated that with these appropriate mitigation measures in place, the risk of adverse effects due to dust emissions from the construction phase will not be significant.

Operational Assessment

The 2023 assessment of the effect of emissions from traffic associated with the scheme, has determined that the maximum predicted increase in the annual average exposure to NO_2 at any existing receptor is likely to be 0.05 µg/m^3 at 247 Bryn Celyn Road (R2).

For PM_{10}, the maximum predicted increase in the annual average exposure is likely to be 0.01 µg/m^3 at Glan-Yr-Afon Primary School (R1), 247 Bryn Celyn Road (R2), St Cadoc's RC Primary School (R3), 263 Ball Road (R4), St Teilo's Church in Wales High School (R7), 20 King Wood Close (R8), Medical Care (R12), 611 Newport Road (R13) and 11 Pant Glass (R14).

For $PM_{2.5}$, the maximum predicted increase in the annual average exposure is likely to be 0.01 µg/m^3 at 247 Bryn Celyn Road (R2), 283 Ball Road (R4), St Teilo's Church in Wales High School (R7), 2 Seaview Cottages Newport Road (R9) and 11 Paint Glass (R14).

The impact description of the effects of changes in traffic flow as a result of the Proposed Development, with respect to NO_2, PM_{10} and $PM_{2.5}$ exposure, is determined to be 'negligible' at all existing receptors.

Operational Assessment – Ecology

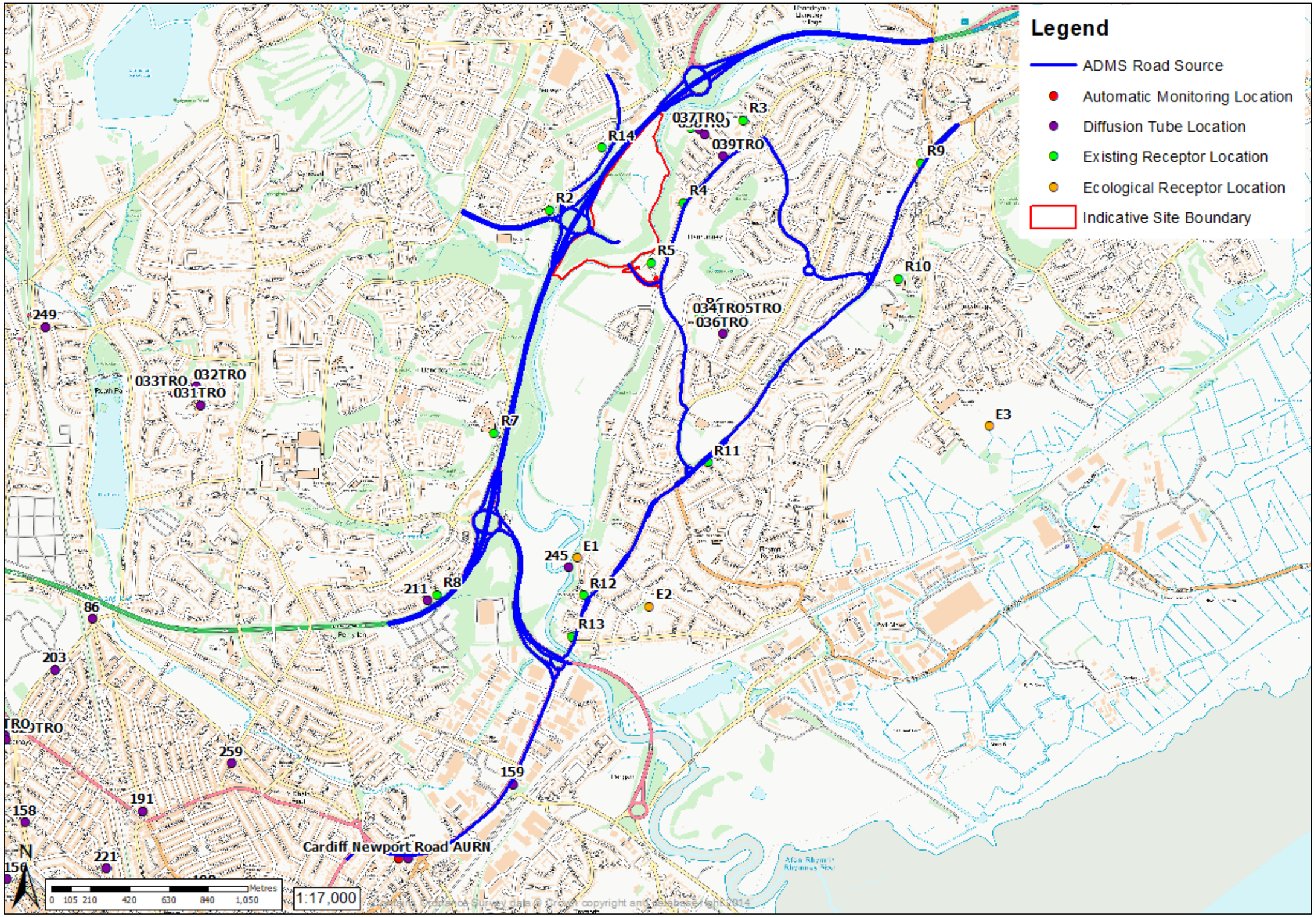
The maximum predicted increase in the annual average exposure to NO_X at the identified ecological receptor, due to changes in traffic movements associated with the development, is 0.03 µg/m^3 at Rhymney River Section (SSSI) (E1) which is below the 0.40 µg/m^3 development contribution stated within the guidance of '*A Guide to the Assessment of Air Quality Impacts in Designated Nature Conservation Sites*', IAQM 2020. As a result, no further assessment is required and the impact at Rhymney River Section (SSSI) (E1) as this is considered to be negligible.

Given the quantitative nature of the assessment and the verification of the air quality dispersion model, the level of accuracy of the assessment results is considered to be 'high'.

In conclusion, the development is not considered to be contrary to any of the national and local planning policies regarding air quality.

APPENDIX A - FIGURES

Figure A-1. Air Quality Assessment Area



APPENDIX B - CONSTRUCTION PHASE ASSESSMENT METHODOLOGY

The following information sets out the adopted approach to the construction phase impact assessment in accordance with the aforementioned IAQM guidance[1].

Step 1 – Screen the Requirement for a more Detailed Assessment

An assessment will normally be required where there is:

- a 'human receptor' within:
  - 250 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- an 'ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

For specific (high risk) schemes the planning authority may require dust assessment despite the proposed site falling outside the distances above.

Step 2A – Define the Potential Dust Emission Magnitude

Demolition

The dust emission magnitude for the demolition phase has been determined based on the below criteria:

- *Large*: Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level;
- *Medium*: Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- *Small*: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.

Earthworks

The dust emission magnitude for the planned earthworks has been determined based on the below criteria:

- *Large*: Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height;
- *Medium*: Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height; and
- *Small*: Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.

Construction

The dust emission magnitude for the construction phase has been determined based on the below criteria:

- *Large*: Total building volume >75,000 m^3, on site concrete batching, sandblasting;
- *Medium*: Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- *Small*: Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout

The dust emission magnitude for trackout has been determined based on the below criteria:

- *Large*: >50 HDV (>3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;
- *Medium*: 20-50 HDV (>3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and
- *Small*: <20 HDV (>3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

It should be noted that a vehicle movement is a one-way journey. i.e. from A to B, and excludes the return journey. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

[1] Institute of Air Quality Management 2024. *Guidance on the assessment of dust from demolition and construction version 2.2.*

Step 2B - Defining the Sensitivity of the Area

Sensitivities of People to Dust Soiling Effects

- *High:*
  - users can reasonably expect enjoyment of a high level of amenity;
  - the appearance, aesthetics or value of their property would be diminished by soiling;
  - the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land;
  - indicative examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.
- *Medium:*
  - users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - the appearance, aesthetics or value of their property could be diminished by soiling;
  - the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land;
  - indicative examples include parks and places of work.
- *Low:*
  - The enjoyment of amenity would not reasonably be expected;
  - property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
  - there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land;
  - indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-1. Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note - For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivities of People to the Health Effects of PM_{10}

- *High:*
  - locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).
  - indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.
- *Medium:*
  - locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).
  - indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- *Low:*
  - locations where human exposure is transient.
  - indicative examples include public footpaths, playing fields, parks and shopping streets.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-2. Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m³ (>18 µg/m³ in Scotland)	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28 – 32 µg/m³ (16 – 18 µg/m³ in Scotland)	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24 – 28 µg/m³ (14 – 16 µg/m³ in Scotland)	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m³ (<14 µg/m³ in Scotland)	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m³ (>18 µg/m³ in Scotland)	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28 – 32 µg/m³ (16 – 18 µg/m³ in Scotland)	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24 – 28 µg/m³ (14 – 16 µg/m³ in Scotland)	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m³ (<14 µg/m³ in Scotland)	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Note - For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivities of Receptors to Ecological Effects

- *High:*
  - locations with an international or national designation and the designated features may be affected by dust soiling; or
  - locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain.
  - indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- *Medium:*
  - locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or
  - locations with a national designation where the features may be affected by dust deposition.
  - indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- *Low:*
  - locations with a local designation where the features may be affected by dust deposition.
  - indicative example is a local Nature Reserve with dust sensitive features.

The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout, using the following table:

Table B-3. Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Note - For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Step 2C - Defining the Risk of Impacts

The risk of impacts with no mitigation is determined by combining the dust emission magnitude determined in Step 2A and the sensitivity of the area determined in Step 2B.

The following tables provide a method of assigning the level of risk for each activity.

Demolition

Table B-4. Risk of Dust Impacts, Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Earthworks

Table B-5. Risk of Dust Impacts, Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Table B-6. Risk of Dust Impacts, Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Trackout

Table B-7. Risk of Dust Impacts, Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Step 3 – Site Specific Mitigation

The dust risk categories for each of the four activities determined in Step 2C should be used to define the appropriate, site-specific mitigation measures to be adopted.

These mitigation measures are contained within section 8.2 of the IAQM Guidance on the Assessment of Dust from Demolition and Construction.

Cardiff East Park and Ride, Llanrumney
Environmental Statement
Chapter 5: Ecological Impact Assessment

WSP on behalf of Curtis Hall Ltd

November 2025

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5. ECOLOGICAL IMPACT ASSESSMENT

Introduction

5.1 This chapter of the ES has been prepared by WSP and presents an assessment of the likely significant effects of the Proposed Development with respect to Ecological Impact Assessment. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and/or enhance likely beneficial effects. Taking into account the mitigation measures, the nature and significance of the likely residual effects are reported

5.2 This chapter is supported by the following technical appendices:

- **Appendix 5.1**: Preliminary Ecological Appraisal (PEA) Report;
- **Appendix 5.2**: Bat Report;
- **Appendix 5.3**: Otter Survey Report;
- **Appendix 5.4**: Reptile Mitigation Strategy;
- **Appendix 5.5**: Habitats Regulations Assessment (HRA);
- **Appendix 5.6**: Hazel Dormouse Impact Assessment;
- **Appendix 5.7**: Woodland Management Plan (WMP);
- **Appendix 5.8**: Invasive Non-Native Species Survey & Management Plan (ISMP); and
- **Appendix 5.9**: River Rhymney Aquatic Habitat Appraisal.

Competence

5.3 For a summary of the competence of the authors of this chapter, please refer to **Appendix 1.4**.

Legislation and Policy Context

Legislation Context

5.4 The following legislation is relevant to the Proposed Development:

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside Rights of Way Act 2000;
- The Town and Countryside (Environmental Impact Assessment) (Wales) Regulations 2017;

- The Wild Mammals (Protection) Act 1996;
- The Environment (Wales) Act 2016;
- The Wellbeing of Future Generations (Wales) Act 2015;
- The Natural Environment and Rural Communities Act 2006;
- The Hedgerow Regulations 1997; and
- The Protection of Badgers Act 1992.

National Planning Policy

5.5 The following national planning policy is relevant to the Proposed Development:

- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- UK Biodiversity Action Plan (UKBAP)[1];
- Technical Advice Note 5 (TAN5) Nature Conservation and Planning (2009);
- Planning Policy Wales (PPW) (Edition 12) 2024;
- Future Wales: The National Plan 2040;
- Planning Policy Wales – Stepwise approach; and
- Planning Policy Wales – DECCA Framework.

Regional Planning Policy

5.6 The following regional planning policies are relevant to the Proposed Development:

- Cardiff Capital Region Strategic Development Plan (SDP).

Local Planning Policy

5.7 The following local planning policies are relevant to the Proposed Development

- Cardiff Local Biodiversity Action Plan (LBAP); and
- Cardiff Local Development Plan (2006–2026).

Guidance

5.8 The following guidance is relevant to the Proposed Development:

[1] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

- Guidelines for Ecological Report Writing – Chartered Institute of Ecology and Environmental Management (CIEEM, 2017[i]);
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[ii]);
- British Standard Code of Practice for Biodiversity and Development (BS42020:2013) (British Standards Institute, 2013[iii]); and
- In addition, relevant guidance and methodologies contained within the supporting documents listed in Section 5.2, including the PEA, species-specific survey reports, mitigation strategies, management plans, and the HRA, have been considered where applicable. These collectively provide the technical evidence base underpinning this assessment.

Compliance with Policy

5.9 To ensure compliance with PPW (2024), it is necessary to demonstrate that the Proposed Development will achieve a Net benefit for Biodiversity (NBB) by following both the stepwise approach and the DECCA framework.

The Stepwise Approach

5.10 The stepwise approach, as mentioned in the PPW (2024), entails firstly avoiding, then minimising, mitigating and, as a last resort, compensating for adverse impacts on the environment that occur as part of a development. Therefore, compensation should only be considered as a last resort, where it has been demonstrated clearly that adverse effects on the environment cannot be avoided or fully mitigated. If compensation is necessary, this must be delivered on-site where possible but off-site compensation can be sought if demonstrated that this is not possible.

The DECCA Framework

5.11 PPW (2024) instructs planning authorities to take account, and promote the resilience, of ecosystems when assessing planning applications.

5.12 Natural Resources Wales (NRW) has developed a framework for evaluating ecosystem resilience based on five attributes and properties specified in the Environment (Wales) Act 2016. This is referred to as DECCA and comprises the objectives listed:

- Diversity – maintaining and enhancing diversity at every scale, including genetic, structural, habitat and between-habitat levels. This supports the complexity of ecosystem functions and interactions that deliver services and benefits;
- Extent – incorporating measures which maintain and increase the area of semi-natural habitat/features and linkages between habitats. In general, smaller ecosystems have reduced capacity to adapt, recover or resist disturbance;

- Condition – the condition of an ecosystem is affected by multiple and complex pressures acting both as short term and longer-term types of disturbance. Both direct and wider impacts should be considered, for example avoiding or mitigating pressures such as climate change, pollution, invasive species, land management neglect etc; and
- Connectivity – this refers to the links between and within habitats which may take the form of physical corridors, stepping stones in the landscape, or patches of the same or related vegetation types that together create a network that enables the flow or movement of genes, species and natural resources. Developments should take opportunities to develop functional habitat and ecological networks within and between ecosystems, building on existing connectivity.

5.13 Ecosystem resilience is a product of the above four attributes. Adaptability, recovery and resistance to/from a disturbance are defining features of ecosystem resilience. NRW define ecosystem resilience as “An environment that can respond to pressures by resisting, recovering or adapting to change, and is able to continue to provide natural resources and benefits to people”.

5.14 NRW has a duty to ensure that the environment and natural resources of Wales are sustainably maintained, sustainably enhanced and sustainably used. Article 4 of the Natural Resource Body for Wales (Establishment) Order 2012 (Welsh Government, 2012) sets a general purpose for NRW to pursue the Sustainable Management of Natural Resources (SMNR) in the exercise of its functions. In order to achieve this, NRW applies a set of nine principles: adaptive management, scale, collaboration and engagement, public participation, evidence, multiple benefits, long term (consequences of actions), preventative action, and building resilience.

5.15 The objective of the SMNR is to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing, meet the needs of present generations of people without compromising the ability of future generations to meet their need, and contribute to the achievement of the well-being goals of the Well-being of Future Generations Act 2015.

5.16 As per policy guidance, habitat loss will be minimised as far as possible and will be replaced as soon as possible. Trees removed will be replaced at a 3:1 ratio.

5.17 Wildflower creation areas will be incorporated into the design. These areas will be focused on recreating lost habitat on a like-for-like basis. This will include wildflower planting to produce a species rich mosaic which will support a range of species.

5.18 Some retained habitats will be enhanced for biodiversity. This will include the enhancement of ancient woodland habitat with plug planting ancient woodland indicator species, using species-rich seed mixes and managing appropriately to maintain botanical diversity. The benefits will be realised during the operational phase and offset the short-term adverse effects.

Assessment Methodology and Significance Criteria

5.19 This section presents the methodology used to assess the potential effects of the Proposed Development in relation to EcIA.

5.20 The Council's Ecologist was consulted on the overall scheme. Their review provided a detailed response requesting further information and clarification on several ecological aspects of the Proposed Development.

5.21 The scope of this EcIA is informed by both existing and updated ecological documents, as outlined in Section 5.2. The woodland strategy and dormouse mitigation strategy originate from the extant planning permission, while the reptile mitigation strategy was prepared following the granting of that permission to discharge relevant planning conditions. All other ecological reports have been updated to reflect the Proposed Development and current best practice.

Consultation

5.22 **Table 5.1** presents a summary of the comments raised in discussions with the Council and other relevant consultees.

Table 5.1 Summary of Comments Raised

Consultee	Comment	Response
County Ecologist	Call with County Ecologist	Email response suggesting enhancements and mitigation, and repeat survey requirements.

Study Area and Scope

Study Area

5.23 The study area for this EcIA encompasses the application boundary and the wider area considered relevant to assess potential ecological effects arising from the Proposed Development. The spatial scope reflects standard good practice and is consistent with the PEA (**Appendix 5.1**). It includes:

- 'The Site' within the Proposed Development boundary;
- Records of legally protected and notable species (from the South East Wales Biodiversity Records Centre ((SEWBReC) within 2 km;
- International and European statutory designated sites (Special Area of Conservation (SAC), Special Protection Area (SPA), and Ramsar)) within 10 km, extended to 30 km to include designated sites supporting bat populations, consulted from freely downloadable datasets (available from Natural Resources Wales (NRW)). Consideration was also given to any designated sites that might be hydrologically connected and located beyond 10 km hydrological connectivity;

- Nationally and locally designated sites[2] within 2 km of the Site, consulted from freely downloadable datasets (available from NRW);
- Records of non-statutory designated sites (from SEWBReC) within 1km of the Site;
- Priority Habitats[3] and AWI[4] sites within 1 km, consulted from freely downloadable datasets (available from NRW); and
- Waterbodies and ponds within 500 m of the Site were identified using open source 1:25,000 Ordnance Survey mapping.

5.24 For the purposes of the assessment, the baseline is informed by survey data collected within the past two years (2024/25), supplemented by desk-based records from SEWBReC covering up to the past ten years. The assessment assumes a construction period of up to four years, commencing in 2026, with a completed development year of 2029/30.

Scope

5.25 The following aspects are not considered in the ES because potential effects on these receptors are not likely to be significant:

- Water vole *Arvicola terrestris*.

Assessment Methodology

Impact Areas

5.26 The EcIA has been undertaken in accordance with the Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[ii]). The assessment follows a structured approach to identify and evaluate potential effects of the Proposed Development on ecological features.

5.27 The process involved:

- Collating and reviewing existing baseline information from the PEA and supporting protected species reports;

[2] Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

[3] Priority Habitats as listed under Section 7 of the Environment (Wales) Act 2016. Inventories of Priority Habitats have been prepared by a variety of organisations and at a national (NRW priority habitat inventory) and local scale (e.g. by local records centres). In some instances, these are primarily based on aerial photograph analysis rather than field survey.

[4] The ancient woodland inventory in Wales lists areas over two hectares in size which have been continuously wooded since at least 1600.

- Identifying and valuing Important Ecological Features (IEFs) based on their conservation status at international, national, regional, and local levels;
- Predicting potential direct, indirect, and cumulative impacts during construction and operation;
- Considering embedded mitigation measures already incorporated within the design, such as good construction practice and pollution prevention;
- Identifying any additional targeted avoidance, mitigation, compensation, or enhancement measures required; and
- Assessing residual effects and determining their significance.

5.28 It is impractical and inappropriate for an ecological assessment to consider every species and habitat that may be affected. The assessment therefore follows CIEEM guidance by reviewing ecological features within the Zone of Influence (ZoI) to identify those that could, in principle, experience significant effects. Features of County value or above, or those subject to specific legal protection, were treated as potential IEFs for the purposes of this screening step. Features assessed as being of Local value were not identified as IEFs at this stage. However, they remain fully considered within the assessment to ensure compliance with wildlife legislation and the application of proportionate, good-practice mitigation. Features of Site or Negligible value were scoped out of the significance evaluation.

5.29 This approach enables the assessment to focus on features where significant effects may reasonably occur, while ensuring that all other ecological features recorded in the baseline continue to inform the assessment and associated mitigation.

5.30 The assessment applies professional ecological judgement in line with CIEEM guidance, taking into account the nature, magnitude, duration, timing, and reversibility of potential effects. Quantitative modelling has not been required, as the evaluation is based on existing ecological survey data, mitigation strategies, and licence commitments relevant to the extant permission and revised proposals.

Significance Criteria

5.31 The scale attributed to each effect has been determined based on the sensitivity of the receptor and magnitude of impact arising as a result of the Proposed Development. Professional judgement and experience have been drawn upon to assess the scale and significance.

Receptors and Receptor Sensitivity

5.32 The sensitivity of each receptor was evaluated as being high, medium, low or negligible based on a review of the baseline position of each receptor and its performance against benchmark areas. The receptors and the definition of sensitivity of a receptor (high, medium, low) is based on a scale set out in **Table 5.1**.

Table 5.2 Ecological Receptor Value and Sensitivity[5]

Sensitivity	Description
High	Receptor of high ecological importance, supporting rare, declining, or irreplaceable habitats or species, or large and functionally critical populations; highly sensitive to change.
Medium	Receptor of moderate ecological importance, supporting locally significant species, habitats with limited resilience, or moderate habitat diversity; some recovery possible.
Low	Receptor of local ecological importance with common or widespread habitats or species; generally tolerant or capable of recovery following disturbance.
Very Low	Receptor with limited ecological value (e.g. modified or degraded habitats, common species) and high resilience to change.

Magnitude of Impact

5.33 The magnitude of impact to a receptor has been determined by considering the estimated deviation from baseline conditions both before, and, if required, after mitigation. The scale used for determining the magnitude of an impact has been based on **Table 5.3**.

Table 5.3 Magnitude[6] of Impact Description

Impact Magnitude	Description
High	Major, long-term or irreversible change resulting in a complete or near-complete alteration of a habitat, population, or key ecological function (either positive or negative).
Medium	Noticeable change to a habitat, population, or ecological process; effects are potentially recoverable over time but may substantially alter ecological integrity in the short to medium term (positive or negative).
Low	Small-scale or short-term alteration in habitat quality, species abundance, or ecological function, with limited influence on overall structure or performance; recovery expected (positive or negative).
Very Low	Minimal or imperceptible change compared with baseline conditions; no measurable ecological consequence.

Assessing Significance

5.34 **Table 5.4** provide a matrix for determining the significance of an effect based on the sensitivity of the receptor and the magnitude of impact.

[5] Sensitivity has been informed by the ecological importance of features in accordance with CIEEM (2018) Section 4.6, considering rarity, diversity, resilience, and habitat function.

[6] Magnitude represents the scale or degree of ecological change relative to baseline conditions, considering factors such as extent, duration, reversibility, and timing in accordance with CIEEM (2018) Section 5.9.

Table 5.4 Significance of Effect Matrix

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major Beneficial / Adverse	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse
Medium	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible
Low	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible	Negligible
Very Low	Minor Beneficial / Adverse	Negligible	Negligible	Negligible

5.35 Effects classified as major or moderate are considered 'significant'. Effects classified as minor are considered non-significant, while those classified as negligible are regarded as the effects that are so minimal that they are inappreciable, with no measurable or noticeable impact on the receptor. Due to their limited scale, such effects cannot act cumulatively with other effects to become significant.

Limitations and Assumptions

5.36 Every effort has been made to ensure that this EcIA is based on the best available information. The assessment draws on a suite of recent and historic ecological reports, including the PEA, protected species surveys, mitigation strategies, and management plans prepared for the Site. The following limitations are noted:

- The EcIA relies on existing ecological survey data, some of which were collected for the previously consented scheme. Ecological data are typically considered valid for up to two years unless site conditions or management have changed substantially.
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, an absence of records does not necessarily demonstrate an absence of species, it may simply indicate a gap in recording coverage.
- Certain habitats, such as dense woodland areas, were not fully accessible during PEA walkover; however, these were reviewed using aerial imagery and adjacent observations, which are considered sufficient to confirm habitat types and extents.
- Invasive Non-native Plant Species (INNS) were recorded where observed during surveys, but full distribution mapping of all INNS was beyond the scope of the commission.

- The extended Phase 1 Habitat survey was carried out over two consecutive days from 24 to 25 August. As such, only a selection of all species that occur within the Site may have been recorded due to seasonality and/or random chance. However, through use of desk study information to supplement Site survey data, it is considered that an accurate assessment of the Site's potential for protected species or those of conservation concern was possible and this has not affected the overall conclusions of the appraisal.
- Survey effort for automated static detector surveys, Nighttime Bat Walkovers (NBWs), and the Ground-Level Tree Assessment (GLTA) was undertaken in line with current best practice (Collins, 2023) and is considered sufficient to characterise bat activity and identify trees with potential roosting features. However, as bats are highly mobile and may use different roosts seasonally, it remains possible that individual bats or flightlines were not detected during the survey period.
- One static detector (Static 1) experienced a technical fault in July and did not record. This is not considered a significant limitation, as the remaining static detectors recorded five nights of data in September and complete datasets were obtained for Static 1 for all other months. Overall, this provided sufficient information to enable a robust assessment of bat activity across the site.
- During reptile surveys undertaken by Delta-Simons in 2021 (Delta-Simons, 2021), two refugia were lost form the Site during the survey. The survey did not cover the entire Site and excluded some habitats potentially suitable for reptiles. An update reptile survey was completed by WSP between May and July 2024. A positive result was returned from one location on Site; an adult female slow worm Anguis fragilis. It was possible to concluded from this result the Site is likely to support 'Low' numbers of common reptiles (Froglife, 19992).
- Dormouse surveys were undertaken only within the northern extent of the Site, as the Site's boundary was extended to include additional land to the south mid-way through the survey period. Due to high levels of anthropogenic disturbance in the southern area, it was considered unsafe to deploy monitoring equipment there because of the risk of tampering or theft. This limitation is not considered to invalidate the surveys, as habitats within the southern extent were judged to be a continuation of those in the north.

Baseline Conditions

Establishing Baseline Conditions

5.37 Baseline ecological conditions have been established through a review of existing ecological information prepared to inform both the extant planning permission and the revised development proposals. Data sources include the PEA, species-specific survey reports (including bats, otter *Lutra lutra*, dormouse *Muscardinus avellanarius*, badger *Meles meles* and reptiles), the Dormouse Impact Assessment and associated mitigation documentation, Reptile Mitigation Strategy, HRA, WMP, and the River Rhymney Aquatic Habitat Appraisal.

5.38 These documents collectively provide the most up-to-date and comprehensive description of habitats, species, and ecological features relevant to the Site. Together, this information provides an evidence-based understanding of the existing ecological baseline against which potential impacts of the Proposed Development have been assessed. Full details of survey methods and results are provided within the supporting technical appendices (Appendices 5.1-5.9).

Baseline Conditions

5.39 The Site is situated in the eastern part of Cardiff, specifically within the Pentwyn area at its upper eastern boundary. It is positioned between the residential neighbourhood of Pentwyn and the suburb of Llanrumney. The A48 road forms the western boundary of the Site, while the eastern boundary is defined by the Rhymney River.

Statutory Designated and Non-statutory Designated Sites

5.40 The desk study identified four International and European sites within 10 km of the Site, which were the Severn Estuary Special Area for Conservation (SAC), Special Protection Area (SPA) and Ramsar, and Cardiff Beech Woods SAC. The search area was extended to 30 km for designated bat sites and further where hydrological connectivity warranted inclusion for fish and aquatic receptors. Three additional International/European designated sites were identified within the extended search area, which were Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC. These sites are of International Importance. Full details of these sites, including distances, features of interest, and sensitivities, are provided in **Appendix 5.5**.

5.41 One nationally statutory designated site, Gwent Levels – Rumney and Peterstone Sites of Special Scientific Interest (SSSI), and one local statutory designated site, Howardian Local Nature Reserves (LNR) were identified within 2 km.

5.42 Within 1km of the Site, 9 non-statutory designation sites were identified, including one Site of Importance for Nature Conservation (SINC), the Rhynmey River SINC, located on Site, and two being within 200m of the Site, which were Llanedeyrn Woodlands Complex SINC and Coed-y-Cwar SINC. These designations are considered to be of Local Importance, reflecting their contribution to ecological connectivity in the wider landscape. Full details are provided in **Appendix 5.1**.

Habitats

5.43 The Site supports a mosaic of habitats including semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees, watercourse and poor semi-improved grassland. Within the central area, a hardstanding car park and distinct pathways and access routes are present, with hardstanding footpaths also running through the southern and eastern extents. Several informal paths cross the Site. These habitats are of Local Importance, providing foraging

and commuting opportunities for a range of fauna. Full habitat descriptions are presented in **Appendix 5.1**.

5.44 Two parcels of Ancient Semi Natural Woodland (ASNW) also fall within the Site. Parcels of ASNW were also identified within 50m of the Proposed Development. These are irreplaceable habitats of National Importance due to their age, structure and biodiversity value.

Protected and Notable Species

5.45 The Site was assessed to be suitable for bats, birds, otter, reptiles, badger, dormouse, hedgehog, great crested newt (GCN) *Triturus cristatus*, amphibians (excluding GCN), invertebrates, and INNS.

Bats

5.46 A total of 15 trees within the Site were identified as having potential roost features (PRFs), including one being potentially suitable for multiple bats or maternity colony. Woodland edges, scrub, grassland margins, and the river corridor were identified as key features for bat activity. Static detector and transect data confirmed regular use of the Site by commuting and foraging bats, with species diversity typical of the local landscape. The habitats on Site are considered to be of Local Importance for commuting and foraging bats. Survey details and bat activity data are provided in **Appendix 5.2**.

Birds

5.47 During the Phase 1 Habitat Survey, a kingfisher *Alcedo atthis* was observed commuting along the river, confirming the river as a commuting route for riparian species. The linear woodland, scrub, scattered trees, and grassland habitats within the Site provide suitable nesting and foraging opportunities for a range of common and widespread bird species. Given the presence of suitable breeding and foraging habitats, the birds are considered to be of Local Importance. The kingfisher, as a Schedule 1 WCA (as amended) species, increases the sensitivity of the riparian corridor but does not elevate the overall bird species' value above the Local level.

Otter

5.48 Suitable resting, foraging, and commuting habitat for otter is present along the Rhymney River that runs adjacent to the Site. No direct evidence (spraints, footprints, or holts) was recorded, although the habitat is likely to be used intermittently for commuting and foraging. Potential resting suitability is low and no holts were identified. The Rhymney River SINC itself is known to support otter and suitable prey species such as brown trout *Salmo trutta*. While resting suitability is low and no breeding sites were identified, transient use by commuting individuals cannot be ruled out. Overall, otter presence within the Site is assessed as low and of Local Importance. Full otter survey details are presented in **Appendix 5.3**.

Reptiles

5.49 A single slow worm was recorded within the Proposed Development's footprint. Although no other species were confirmed, the Site's grassland, scrub, and edge habitats offer suitable conditions for a low reptile population. Reptiles are therefore considered of Local Importance. Survey data and constraints are detailed in **Appendix 5.4**.

Badger

5.50 Evidence of foraging, commuting, and sett-building was recorded within the Survey Area, confirming badger presence. Two outlier setts were identified, one located on the Site and the other situated within 30m of the Site, both showing intermittent use based on evidence of one having spoil heap and claw marks, and the other having fresh loose spoil, footprints and badger hairs. Given the confirmed but limited activity and the availability of suitable habitat in form of grassland, scrub, and woodland habitat, badgers are considered of Local Importance. Survey information is detailed in **Appendix 5.1**.

Dormouse

5.51 Dormouse presence was previously confirmed under the extant planning permission. This record remains valid under current guidance, as it falls within the five-year threshold (Wells et al., 2025[iv]). The Site and surrounding woodland continue to provide suitable scrub and woodland habitat supporting dormouse populations. Dormice are therefore assumed to remain present and are of County Importance. Survey findings and rationale are presented in **Appendix 5.6**.

Hedgehog

5.52 The Site supports suitable habitat for foraging and commuting hedgehog *Erinaceus europaeus* in the form of connected woodland edges, scrub, and grassland, which link into the wider parkland and urban green space network. As a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016, hedgehog presence is of Local Importance, reflecting both its conservation status and the availability of similar habitats in the surrounding landscape.

GCN

5.53 No ponds were recorded within the Site. A waterbody was present within 500m of the Site (Pentwyn Lakes). The A48 road and River Rhymney forms a considerable barrier to the dispersal of GCN to the Site. The Pentwyn Lakes waterbody is unlikely to support GCN as it is stocked with fish and used as a fishing late. The Site is considered unsuitable for GCN, and the species is not regarded as a constraint to the Proposed Development.

Amphibians (excluding GCN)

5.54 During the Phase 1 habitat survey, one common toad *Bufo bufo* was recorded on Site. The linear woodland, scrub, and grassland habitats within the Site offer suitable foraging and hibernation opportunities for common amphibians. No waterbodies were recorded within the Site. These features

indicate limited breeding potential on-site but possible use of terrestrial habitats by mobile individuals. The amphibian species are therefore considered to be of Local Importance.

Invertebrates

5.55 The woodland, scrub, and grassland habitats that make up the majority of the Site provide suitable resources for common and widespread invertebrates. However, no habitats of specific or exceptional value for rare or specialist invertebrate species were identified. The invertebrates within the Site are assessed as being of Local Importance.

Aquatic and Riverine Features

5.56 The proposed bridge construction area does not support suitable spawning habitat for fish or aquatic invertebrates, though the river provides connectivity to the wider catchment. No aquatic species of conservation concern were identified. Given the limited extent of suitable habitat, these features are assessed as being of Local Importance. Supporting information is included in **Appendix 5.9**.

INNS

5.57 Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera* were recorded as abundant across parts of the Site during the PEA. Their presence contributes to the overall assessment of habitat quality and management considerations associated with the Site.

Receptors

5.58 A list of existing and future receptors is included in **Table 5.5**.

Table 5.5 Existing and Future Sensitive Receptors

Receptor	Sensitivity
Existing Receptors	
Severn Estuary SAC, SPA and Ramsar, Cardiff Beech Woods SAC, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC	High
Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR	High
Rhymney River SINC, Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC	High
ASNW	High
Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland	Medium
Bats	High
Birds	Medium

Receptor	Sensitivity
Existing Receptors	
Otter	Medium
Reptiles	Medium
Badger	Medium
Dormouse	High
Hedgehog	Medium (due to low numbers and declining population)
GCN	Very low
Amphibians (excluding GCN)	Low
Invertebrates	Low
Aquatic and Riverine Features	Medium
INNS	N/A
Future Receptors	
Severn Estuary SAC, SPA and Ramsar, and Cardiff Beech Woods SAC	High
Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR	High
Rhymney River SINC, Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC	High
ASNW	High
Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland	Medium
Bats	High
Birds	Medium
Otter	Medium
Reptiles	Medium
Badger	Medium
Dormouse	High
Hedgehog	Medium
GCN	Very low
Amphibians (excluding GCN)	Low
Invertebrates	Low
Aquatic and Riverine Features	Medium
INNS	N/A

Future Baseline

5.59 In the absence of the Proposed Development, the Site and surrounding area would be expected to remain largely in their current condition, subject to natural ecological processes and limited external influence from surrounding transport and developed infrastructure located beyond the Rhymney River and A48 road. Over the next 5 -10 years, habitats within the Site would likely continue to mature and gradually succeed, with scrub encroaching into areas of semi-improved grassland and woodland canopy cover slowly increasing.

5.60 Woodland edges and scrub habitats would remain suitable for locally common bird species, small mammals such as hedgehog, and foraging and commuting bats. Amphibians and reptiles would continue to use available mosaic habitats, and invertebrates associated with the existing habitat diversity would continue to be present on the Site.

5.61 The dormouse population confirmed is assumed to remain present within suitable woodland habitats, with no change in overall habitat connectivity in the absence of the Proposed Development. The Rhymney River and associated riparian habitats would continue to provide foraging and commuting opportunities for otter and support aquatic species.

5.62 INNS, including Japanese knotweed and Himalayan balsam, would be expected to persist and spread further in the absence of targeted control measures.

Assessment of Effects (Construction and Operational)

Environmental Design and Management

5.63 The assessment of potential ecological effects has taken into account mitigation and management measures developed as part of the design of the Proposed Development. The Construction Environmental Management Plan (CEMP) has been prepared to support the implementation of the Proposed Development in line with current best practice.

5.64 The industry best practice measures are considered embedded mitigation, meaning that impacts avoided or reduced by their implementation are reflected in the initial assessment of potential effects. Any further measures required to address residual effects beyond those already embedded will be considered separately in subsequent sections of the EcIA.

Effects During Construction

Statutory Designated Sites – International and European

5.65 For International/European designated sites, the HRA identified a likely significant effect (LSE) on fish qualifying features (salmon Salmo salar, sea trout S. trutta, and eel Anguilla anguilla) of the Severn Estuary Ramsar due to temporary in-channel noise and vibration from the bridge works.

These effects have been assessed separately through the HRA process and are therefore not repeated here.

Statutory Designated Sites – National and Local

5.66 The Gwent Levels – Rumney and Peterstone SSSI, and Howardian LNR are located distances exceeding 1.5 km form the Proposed Development. Due to their considerable separation from the Site, there is minimal likelihood of these designated sites experiencing any direct or indirect impacts arising from the Proposed Development. Consequently, the potential effects on both sites are assessed as negligible.

Non-Statutory Designated Sites

5.67 The Rhymney River SINC lies adjacent to the Site and will be retained without direct physical disturbance. There is potential of water quality impact on this SINC. There will also be very minimal vegetation clearance required for bridge works, however, the extent of this clearance is anticipated to be extremely limited and is not considered significant when evaluated in the context of the overall Rhymney River SINC area. The minimal nature of the works ensures that any ecological impact remains negligible, with the integrity of the wider SINC habitat retained throughout the development process. Llanedeyrn Woodlands Complex SINC, and Coed-y-Cwar SINC are over 50m and 100m respectively. Based on the nature, size and type of works, it is unlikely that there will be any impact of any of these two sites. Given the considerable separation of both sites from the construction area, and taking into account the nature, scale, and type of the works involved, it is considered highly unlikely that either site will experience any direct or indirect impacts. Given that there is no pathway of risk due to embedded CEMP measures, including 15m buffer zones, silt control, and pollution prevention (fuel storage and chemical handling restrictions), effects are assessed as negligible.

Habitats

5.68 A significant proportion of semi-natural broadleaved woodland and associated scrub and grassland will be retained; however, habitat loss will occur where development infrastructure replaces woodland, scrub, and grassland within the development footprint. Medium sensitivity of these habitats and the medium magnitude of permanent loss, and incidental effects from dust, machinery, or pollution leads to a moderate adverse effect.

5.69 ASNW on the Site will be fully retained, with no direct loss of irreplaceable habitat. Given the high sensitivity and very low magnitude of potential edge disturbance from construction activity due to retention and protection measures (e.g., root protection zones, adherence to BS5837:2012), the effect is assessed as minor adverse.

Bats

5.70 Construction will require removal of commuting and foraging habitats, including woodland edges, scrub, and grassland. Works near the river and increased lighting, noise, and vibration can also

cause temporary disturbance. Bats are primarily active during nocturnal periods and are therefore not expected to overlap with construction operating hours. Construction lighting is typically not required to facilitate the Proposed Development during the primary bat activity period, which extends from April to October inclusive. However, there are specific circumstances, such as during late autumn or early spring when daylight hours are reduced but environmental conditions remain favourable for bat activity, where a brief temporal overlap between bat movements and on-site construction works may occur. In these instances, it may be necessary to implement temporary construction lighting to support ongoing works during periods of limited natural light, along with some construction security lighting as well. With mostly no night-time works and with predictable daytime activity controlled through the CEMP measures, construction noise does not present a mechanism for disturbance to foraging, commuting or roosting activity.

5.71 One individual tree (Tree 8 (T8)) with potential roost features will require removal. T9 to T13 may be indirectly affected by vibrations from piling during bridge construction. Although works are expected to avoid the main bat activity period where practicable, lighting during the construction phase could cause local disturbance. Given the high sensitivity of bats and the medium magnitude of habitat and disturbance effects, the overall effect is assessed as major adverse. Protection of retained corridor under CEMP will reduce risk of harm, but habitat loss, tree felling, and some disturbance from lighting will still occur, and therefore effect is assessed as major adverse.

Birds

5.72 The loss of trees, scrub, and grassland will result in the direct removal of nesting and foraging opportunities for common and locally breeding bird species. Noise and vibration from construction machinery may also discourage nesting in adjacent retained habitat. With the embedded noise controls applied, construction noise will remain predictable, limited to standard daytime hours and without impulsive events. Birds may detect and respond behaviourally to construction activity within nearby habitats, but the controlled noise environment avoids sudden or atypical acoustic disturbance. Any responses are expected to be limited to transient behavioural adjustments rather than sustained disruption. On this basis, and given their medium sensitivity and medium magnitude of effect, the impact is assessed as moderate adverse.

Otter

5.73 A small section of riparian habitat will be affected, and construction near the river could temporarily disturb otters if present. The potential exists for temporary disturbance from lighting and noise or accidental ingress of individuals into open excavations. The embedded CEMP controls prevent sudden or irregular noise peaks and restrict works to daytime. Given the largely nocturnal activity patterns of otters, the potential for disturbance is limited to daytime awareness rather than interference with key behaviours. There is also a potential that individual otters might cross the bridge construction area. Given the River Rhymney SINC is being retained and protected, the medium

sensitivity of the receptor and low magnitude of potential disturbance, the effect is assessed as minor adverse.

Reptiles

5.74 Vegetation clearance will result in the loss of suitable foraging and refuge habitat, and there is a potential for direct killing or injury of individuals. Embedded CEMP measures, including phased clearance and ecological supervision, will help manage risk but cannot prevent habitat loss. Reptiles might be impacted due to construction noise. Reptiles have low sensitivity to airborne noise. With the embedded CEMP measures preventing abrupt or atypical noise peaks, construction noise is not expected to influence reptile behaviour or habitat use within retained areas. Given the medium sensitivity of reptiles and the medium magnitude of habitat loss, the effect is assessed as moderate adverse.

Badger

5.75 The on-site outlier sett and foraging activity indicate a moderate sensitivity receptor. While direct sett damage is unlikely, foraging badgers may be at risk of accidental injury during construction. There is risk of some disturbance from construction noise, vibration and lighting. Badgers foraging in retained habitats may be aware of daytime construction activity. Embedded measures with the CEMP will ensure noise outputs are maintained at predictable levels and occur only during daytime. The potential for disturbance is therefore limited to short-term awareness responses rather than prolonged behavioural displacement. There would also be some loss of potential commuting and foraging habitat of badgers, and risk of potential disturbance to commuting and foraging badgers from lighting. Given the medium sensitivity of the species and low magnitude of potential effects, the impact is assessed as minor adverse.

Dormouse

5.76 Some suitable dormouse habitat will be lost, particularly along woodland and scrub corridors. This represents a reduction in habitat extent and potential connectivity. There is also potential of disturbance from lighting. Given the high sensitivity of dormouse populations and the medium magnitude of habitat loss, the effect is assessed as major adverse.

Hedgehog

5.77 Construction activity poses a risk of accidental killing or injury during vegetation clearance and ground works, as well as habitat loss. There is also potential of disturbance from noise, vibration and lighting. Hedgehogs are active predominantly during night-time hours and therefore do not overlap with the construction period. With works limited to the daytime and noise outputs controlled, construction noise does not create a pathway for disturbance to this species. Given their medium sensitivity and medium magnitude of potential effects, the impact is assessed as moderate adverse.

GCN

5.78 No suitable ponds occur within 500 m of the Site, and dispersal to the waterbody recorded within 500 m of the Site is constrained by the A48 and the Rhymney River, both acting as major barriers. The species is therefore not considered a constraint, and no effects are predicted.

Amphibians (excluding GCN)

5.79 Amphibians may utilise woodland and scrub for hibernation and grassland for foraging. Although no waterbodies are present within the Site, the terrestrial habitat loss and risk of incidental mortality during clearance could occur. Given the low sensitivity of the receptor and low magnitude of effect, the impact is assessed as negligible.

Invertebrates

5.80 The woodland, scrub, and grassland mosaic supports common and widespread invertebrates. Habitat loss will marginally reduce available resources, but the community is expected to recolonise retained areas. CEMP measures to manage dust and protect retained vegetation will help maintain local habitat quality. Given low sensitivity and low magnitude, the effect is negligible.

Aquatic and Riverine Features

5.81 Aquatic species will utilise the River Rhymney, adjacent to the Site. Construction could cause sedimentation or pollution if runoff enters the River Rhymney SINC. Aquatic species might be disturbed by construction noise. While aquatic species may be more sensitive to vibration, the embedded construction controls in CEMP, including restricted piling hours, equipment maintenance and avoidance of impulsive noise, limit the potential for perceptible substrate-borne disturbance. Noise itself is not anticipated to influence aquatic fauna behaviour. With the embedded CEMP controls, including silt fencing, sediment traps, fuel storage restrictions, and 15 m buffer zones, impacts are highly unlikely. Fuel storage and chemical handling restrictions further reduce the risk potential. Given medium sensitivity of aquatic features, the very low magnitude of potential effect leads to negligible significance.

5.82 There is a potential for impacts on migratory species listed under Annex II, however, these considerations are addressed in detail within the HRA.

INNS

5.83 Two INNS (Himalayan balsam and Japanese knotweed) were recorded. While they will be managed through standard site practice, these species may still have the potential to spread during vegetation clearance or earthworks. Although sensitivity is considered N/A for these as receptors, INNS can have significant effect on biodiversity if they spread.

Effects Once the Proposed Development is Operational

5.84 During operation, external lighting (including security lighting) could affect nocturnal species such as bats, dormice, badger, hedgehog, and otter. The lighting strategy embedded within the design incorporates directional, low-spill, warm-spectrum fittings and maintains boundary lux levels of about 1, equivalent to natural moonlight. The medium magnitude of potential disturbance to high sensitivity receptors leads to a major adverse effect for bats and dormice, and a moderate adverse effect for other nocturnal species.

5.85 Some sensitive ecological receptors, including bats, breeding birds, and dormice, may be present immediately adjacent to the data centre, for example in nearby trees or vegetation. At this proximity, steady broadband noise and low-frequency tonal noise (a persistent hum) from standard air-cooled plant may be audible and could cause minor, temporary behavioural responses, such as brief avoidance or modification of calling or foraging activity. The detailed design has not yet been confirmed however, it is understood that the updated CEMP will incorporate standard embedded measures, such as low-noise plant specification, acoustic screening, and careful siting of units, which are standard practice for data centres and do not constitute targeted mitigation. With these measures in place, any residual effects from the operation of Proposed Development are considered negligible, and the overall ecological impact is expected to be negligible. As such, this effect will not be discussed further in this chapter.

5.86 There is a potential risk to the environment arising from emergency firewater runoff. In the event of a fire, contaminated water used for firefighting could enter surrounding habitats or river, leading to possible pollution and ecological harm. The high magnitude of potential firewater runoff results in major adverse effects to high and medium sensitive receptors, moderate adverse effects to low sensitive receptors, and minor adverse effects to very low sensitive receptors.

5.87 In the absence of mitigation, if management is lacking, woodland layers may be lost due to competition and overshading, and grassland could become scrubland. This loss of woodland and valuable habitats would significantly reduce the site's biodiversity, resulting in a moderate adverse effect.

Mitigation Measures

Mitigation During Construction

Statutory Designated Sites

5.88 Mitigation measures relevant to Severn Estuary Ramsar have been addressed comprehensively within the accompanying HRA. The HRA has concluded that, with the implementation of the identified mitigation and avoidance measures, the Proposed Development will not result in any Adverse Effect on Site Integrity (AEoI), either alone or in combination with other plans or projects. As these measures are secured through the HRA process, they are not repeated here.

Habitats

5.89 Retained areas of woodland (including ASNW), scrub, and grassland will be protected with tree root protection zones, barriers in accordance with BS5837:2012, and adherence to permissions for trees subject to Tree Protection Orders (TPOs). Dust and pollution controls, including dampening of exposed surfaces, wheel washing, and chemical handling restrictions, will minimise indirect impacts on retained habitats. Where vegetation is removed, phasing will be used to maintain connectivity where possible.

5.90 The 20 m buffer around ancient woodland will be maintained, with native hedgerow planting to discourage access and provide additional edge habitat. A total of 0.45 hectares of new planting will be established on Site, complemented by 4.81 hectares of remedial tree and woody shrub planting on a neighbouring site located to the southwest, across the river. This comprehensive approach ensures both immediate and wider landscape enhancement. These measures, detailed under the WMP (**Appendix 5.7**), reduce previously identified moderate effects for natural habitats to negligible along with compensating for habitat loss.

5.91 A Green Infrastructure and Landscape Ecological Management Plan (GILEMP) will be written for the Proposed Development which will detail ecological and landscape measures to be implemented.

Bats

5.92 Retained trees and habitat corridors along the Rhymney River will be protected. T8, T9, T12 and T13 require further surveys, to be carried out by a qualified and appropriately licensed ecologist to identify the presence or likely absence of roosting bats (**Appendix 5.2**). Should bats be identified during further surveys of T8, T9, T12 and T13 or during pre-work checks of T8 to T13, works will be postponed and NRW will be consulted for licensing. Actions which are prohibited by Schedule 5 of the WCA (as amended), can be made lawful on the approval and granting of a licence from NRW, subject to conditions.

5.93 Construction lighting will follow recognised best practice, including limiting lighting to times when it is required for safety or security, directing all temporary lighting into the Site, using downlighting wherever possible, and selecting luminaires designed to minimise upward and horizontal spill and glare. Beam angles will be kept below 70° and asymmetric beam fittings will be used where practicable. Importantly, no temporary lighting will be directed towards trees with Potential Roost Features, hedgerows, woodland edges or the river corridor. With these measures in place, construction lighting is considered sufficient to avoid disturbance to bats (**Appendix 5.2**). Further enhancement is provided through the installation of bat boxes across suitable retained trees and structures, creating supplementary roosting opportunities that complement retained habitat and the lighting strategy. These features contribute to securing long-term roosting resource within and adjacent to the Site and align with the wider woodland management actions. Together with WMP retention of trees, these measures reduce previously major effects to negligible.

Birds

5.94 Vegetation clearance will avoid the main breeding season (March-August) where practicable. However, some birds can breed at any time of year. Therefore, a pre-works check by an Ecological Clerk of Works (ECoW) should be conducted within the 48 hours prior to beginning of vegetation clearance to ensure nesting birds are absent. If the works cannot be completed outside of the breeding bird season, the risk of encountering active bird nests will be higher. Where works occur during breeding season, they should proceed under a Precautionary Method of Works (PMoW) and a more detailed pre-works check by an ECoW will be required immediately prior to works commencing to confirm that no nesting birds will be affected by the Proposed Development, and works would then need to proceed within the following 24 hours. Additionally, buffer demarcation will ensure any existing nests are protected. To increase nesting opportunities within retained and newly established habitat, bird boxes of varying designs will be installed on suitable trees and structures across the Site. These features supplement natural nesting resource and form part of the habitat enhancement measures associated with the wider landscape and woodland management proposals. These measures reduce moderate effects to negligible levels.

Otter

5.95 A 15-20 m exclusion buffer will be maintained at the edge of the Site where it bounds the river, within which no activities such as groundworks, storage, lighting or vehicle movements will be permitted. This buffer is intended to protect the riparian corridor, ensuring that disturbance, encroachment and potential pollution risks are minimised. An otter ledge integrated into bridge works to avoid the need for otters to travel onto the road above the bridge and hence prevent incidental harm. No open pits or trenches will be left uncovered or, alternatively, without a mammal ramp overnight. Various lighting measures implemented for bats would also be applicable for otter, ensuring that any potential effect will be reduced to negligible. Where suitable habitats are proposed for direct impact including removal, it is recommended that works are carried out under a PMoW. This should include a pre-works check by a suitably qualified ECoW, which should be carried out immediately prior to any works being undertaken. If otter are found to be present within or close to an area to be affected by the Proposed Development, additional mitigation and consultation with NRW may be required. With these measures in place, minor adverse effects will be well-controlled and potentially reduced to negligible level.

Reptiles

5.96 Retained woodland and dense scrub will be protected, with vegetation clearance implemented under a PMoW and in the presence of an ECoW. Pre-clearance mat deployment, hand searches, and destructive searches prior to topsoil removal will prevent killing or injury. Refugia and glade creation will enhance habitat quality, while rotational cutting and long-term habitat management under the reptile mitigation strategy (**Appendix 5.4**) will maintain suitable conditions for supporting reptiles. As such, previously moderate effects are reduced to negligible.

Badger

5.97 Exclusion zones around the setts should be installed to avoid impacts. Prior to construction, a pre-commencement badger check of the Site will be undertaken to ensure no new setts have been created. Various lighting measures implemented for bats would also be applicable for badger, ensuring that any potential effect will be reduced to negligible. As mentioned above for otters, during the construction, no open pits or trenches will be left uncovered or, alternatively, without a mammal escape ramp overnight. Enhancement of retained habitats, and on-site habitat creation for to dormouse will also support commuting and foraging badgers. Therefore, minor adverse effect will be reduced to negligible.

Dormouse

5.98 Sensitive design of the development layout will keep the footprint away from key habitats, and retained scrub and woodland will be enhanced through infill planting. New on-site dormouse habitat will be created with additional trees, scrub, and hedgerows. Various lighting measures implemented for bats would also be applicable for dormouse, ensuring that any potential effect will be reduced to negligible. Off-site Dormouse Habitat Planting Area includes habitat creation connected by three dormouse bridges to link retained habitats across the river, further enhancing connectivity. Timing of the planned works will avoid the main dormice mid-summer breeding season (June to August).

5.99 Fifty dormouse nest boxes will be installed within retained woodland on the northern and western parts of the Site and within an Off-site Dormouse Habitat Planting Area and linked via the proposed dormouse bridges. Habitat condition will be monitored annually between May and June from 2026 to 2042, with additional checks during the growing season (April-August) and post-planting maintenance in winter (November-February). Management practices will be reviewed every five years to ensure the habitats remain suitable for dormice, with any updates submitted to NRW as required. Nest boxes will be checked twice per year (May-September) in years 1, 2, 3, 4, 5, 7, 10, and 15. Full details of the methods will be provided in the dormouse European Protected Species Licence (EPSL) application.

5.100 Dormice are sensitive to clearance works during the breeding season and hibernation. Therefore, vegetation clearance will be timed with appropriate methodologies to minimise disturbance to dormice. Between November to March vegetation will be cleared to 300mm only, which is outside both the dormouse active season and the main bird breeding season. This will minimise any impacts to hibernating dormice. Vegetation will be cleared to ground level during mid-April to May when dormice have emerged from hibernation and are considered active. Root balls and stumps can be removed during this mid-April to May window. A further clearance window to ground level, after breeding has finished, will take place between mid-September to the end of October. This will reduce any impacts to hibernating dormice. Details are provided in Appendix 5.6. A toolbox talk will be provided to all site contractors to inform them about the presence of dormice on site, outline the

protective measures in place, and explain the steps to take if a dormouse is unexpectedly found during work. These measures reduce the previously assessed major adverse effect to negligible.

Hedgehog

5.101 A pre-works check will be undertaken to confirm presence or absence of hedgehogs prior to vegetation clearance. Any individuals found will be moved to safe retained habitats under ecological supervision. Various lighting measures implemented for bats would also be applicable for hedgehog, ensuring that any potential effect will be reduced to negligible. Open excavations will be covered or fitted with escape ramps overnight to prevent entrapment. The WMP will enhance foraging and shelter opportunities through hedgerow and scrub planting. With these measures in place, effects are considered negligible.

INNS

5.102 Biosecurity measures will prevent spread of Himalayan balsam and Japanese knotweed during construction, following Check, Clean, Dry principles. CEMP measures to avoid the spread of INNS include restrictions on excavation within 7m of an INNS, subject to an ecologist's advice. Soil or material potentially containing seeds or other plant materials from INNS should not be moved or stockpiled without an ecologist's advice. Further measures to reduce the risk of spread will include controlled excavation and removal of INNS affected soil, fencing of infested areas and toolbox talks for all Site personnel (**Appendix 5.8**). These measures minimise potential impacts to negligible.

Mitigation Once the Proposed Development is Operational

5.103 Through habitat infill, selective thinning, and management of INNS, woodland quality will be enhanced. The existing open spaces and their associated ecotones will be carefully maintained through regular mowing and the removal of cuttings. This approach will effectively prevent these areas from reverting to scrub or woodland, thereby safeguarding their ecological value and maintaining habitat diversity. These measures are detailed under the 25 years WMP (**Appendix 5.7**). To ensure effective management of INNS, an ISMP (**Appendix 5.8**) will be implemented, which would be a comprehensive 5-year plan. The ISMP will be subject to regular review to maintain its relevance and effectiveness in response to evolving site conditions and best practice guidance. Specifically, the plan will be formally reviewed and updated annually throughout the five-year period, allowing for timely incorporation of any new issues, regulatory changes, or successful mitigation strategies identified during monitoring or site works to reduce previously identified moderate adverse effect on woodland to negligible.

5.104 Sensitive lighting will be incorporated into the operational design. This will include warm-white spectrum (between 2000-3000 degrees Kelvin), with minimal UV output, zero upward light ratio, and luminaires that will use peak wavelengths above 550 nm to reduce the types of light that are most disruptive to bats and other nocturnal species. Avoidance of the river corridor will involve limiting light spill to 0.1 lux in limited areas, maintaining commuting and foraging routes. Off-site Dormouse

Habitat Planting Area and under-bridge scrub planting will further enhance connectivity. The external lighting system will be fully automated, with dimming and switching. In winter, lights will dim to 10% at 16:00 and turn off from 23:30 to 05:30. Motion sensors will activate full brightness only where needed, keeping other areas dark.

5.105 Nightworks shall be avoided where practicable; but where unavoidable, such as security lighting, lighting shall operate only during active works or safety-critical periods. Automatic timers and PIR motion sensors shall control non-essential lighting to minimise the duration of illumination. Where lighting is required beyond operational hours, dimming protocols will reduce output to 20%, or below, of normal operating levels, if safety allows. Localised low-level task lighting shall be used and directed away from any sensitive habitats. This would minimise the potential effect to negligible. Detail on lighting during operation is detailed in the Lighting Strategy.

5.106 Operational mitigation will be secured to ensure that fire-water generated during an emergency incident is fully contained, treated and managed on-site so that no uncontrolled release can affect ecological receptors. The following measures will be implemented:

- Fire-water capture and containment – A sealed containment and lagoon system will be installed to provide complete capture of all fire-water runoff generated during a credible emergency scenario. The system will include sufficient capacity to accommodate both fire-water and rainfall associated with an extreme storm event. The design will prevent any uncontrolled or untreated release to surrounding habitats, surface waters or groundwater.
- Treatment of collected fire-water – Water collected within the lagoon system will undergo treatment to remove pollutants associated with emergency incidents, including hydrocarbons, suspended solids, battery-related contaminants, metals, nitrogen species and combustion by-products. Treatment will reduce contaminant levels to thresholds suitable for controlled release or, where required, for safe removal off-site.
- Controlled discharge or off-site removal – No discharge will occur unless water quality monitoring confirms that protective thresholds have been achieved. Discharge flow rates will be actively controlled to avoid hydraulic disturbance of the receiving water environment. If treated water does not meet the required standards, it will be removed off-site by a licensed contractor for specialist treatment and disposal.
- Monitoring and operational safeguards – Automated monitoring and fail-safe devices will ensure that discharge cannot occur unless compliance with water-quality thresholds has been verified. Operation and maintenance procedures will ensure that the system continues to function effectively throughout the lifetime of the development.

5.107 These measures will ensure that fire-water generated during emergency incidents is managed to minimise adverse effects on ecological receptors during operation to negligible.

Residual Effects and Monitoring

5.108 The residual effects arising from the Proposed Development are summarised in **Table 5.5** below.

Table 5.6 Summary of Residual Effects

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Construction Effects						
Determined through HRA	Severn Estuary SAC, SPA and Ramsar, Cardiff Beech Woods SAC, Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC (High)	International	High	Major adverse	Mitigation identified as a result of the Stage 2 (Appropriate Assessment) of HRA	Negligible
Changes to water quality	Rhymney River SINC (High)	Local	Very low	Negligible	Adherence to CEMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Indirect habitat impact from dust and pollution; Damage to tree roots and from accidental access; Spread of INNS	ASNW (High)	National	Very low	Minor adverse	Adherence to the CEMP, including TPOs; Implementation of WMP and ISMP.	Negligible
Habitat loss; Impact from dust and pollution; Damage to habitat structure and tree roots.	Natural habitats on Site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland (Medium)	Local	Medium	Moderate adverse	Adherence to the CEMP, including TPOs; Implementation of WMP and ISMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Disturbance from lighting, noise and vibration.	Bats (High)	Local	Medium	Major adverse	Additional surveys of T8, T9, T12 and T13; Pre-works checks by an ECoW; Adherence to the CEMP, including TPOs; Implementation of WMP; Installation of bat boxes.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Disturbance from noise and vibration.	Birds (Medium)	Local	Medium	Moderate adverse	Pre-works check within 48 hours prior to vegetation clearance (if outside main breeding season); Detailed pre-works check prior to works, with work to proceed within following 24 hours, Adherence to the CEMP, including TPOs; Implementation of WMP; Installation of bird boxes (adherence to the future Green infrastructure and Landscape Ecological Management Plan GILEMP).	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Killing/injury due to falling in open excavations or while crossing bridge construction area; Temporary disturbance from lighting and noise	Otter (Medium)	Local	Low	Minor adverse	Pre-works check to be carried immediately prior to works; Adherence to the PMoW; Adherence to the CEMP; Implementation of WMP; Installation of otter ledges; Adherence to the GILEMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Direct killing/injury.	Reptiles (Medium)	Local	Medium	Moderate adverse	Vegetation clearance in the presence of an ECoW; Adherence to the PMoW; Pre-clearance mat deployment, hand searches, and destructive searches prior to topsoil removal; Adherence to the CEMP; Implementation of WMP and Reptile Mitigation Strategy.	Negligible
Habitat loss; Direct killing/injury; Disturbance from lighting, noise and vibration.	Badger (Medium)	Local	Low	Minor adverse	Exclusion zones around the setts; Pre-works check; Adherence to the CEMP; Adherence to the PMoW; Implementation of WMP.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Habitat loss; Direct killing/injury; Disturbance from lighting, noise and vibration.	Dormouse (High)	County	Medium	Moderate adverse	Off-Site Dormouse Habitat Planting Area along with 50 dormouse nest boxes, dormouse bridges, vegetation clearance in accordance with dormouse EPSL; Long term habitat and dormouse monitoring; Adherence to WMP/GILEMP.	Negligible
Accidental killing/injury; Potential habitat loss; Disturbance from lighting, noise and vibration.	Hedgehog (Medium)	Local	Medium	Moderate adverse	Pre-works check; Adherence to the CEMP; Adherence to the PMoW; Adherence to the GILEMP; Implementation of WMP.	Negligible
N/A (not a constraint)	GCN (Very Low)	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Incidental mortality	Amphibians (excluding GCN) (Low)	Local	Low	Negligible	Adherence to the PMoW.	Negligible
Habitat loss	Invertebrates (Low)	Local	Low	Negligible	Adherence to the GILEMP (e.g. species rich habitat mosaics to provide a resource for a range of species).	Negligible
Change in water quality	Aquatic and Riverine Features (Medium)	Local	Very low	Negligible	Adherence to the CEMP.	Negligible
Spread of INNS in other habitats	INNS (N/A)	Local	N/A	Moderate adverse	Adherence to the CEMP; Adherence to the PMoW; Implementation of WMP and ISMP.	Negligible
Operational Effects						

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Determined through HRA	Severn Estuary SAC, SPA and Ramsar, and Cardiff Beech Woods SAC (High)	International	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event	Rhymney River SINC (High)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event; Ecological succession leading to habitat degradation and reduced biodiversity	ASNW (High)	National	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of WMP and dormouse EPSL.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event; Ecological succession leading to habitat degradation and reduced biodiversity	Natural habitats on site – semi-natural broadleaved woodland, dense scrub, scattered scrub, broadleaved parkland / scattered trees and poor semi-improved grassland (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of WMP, GILEMP, dormouse EPSL and Reptile Mitigation Strategy.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Bats (High)	Local	High (due to fire water runoff); Medium	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Birds (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Otter (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy.	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Reptiles (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Sensitive habitat management during operation – adherence to the Reptile Mitigation Strategy.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Badger (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event; Disturbance due to external lighting	Dormouse (High)	Local	High (due to fire water runoff); Medium	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy; Implementation of WMP and dormouse EPSL.	Negligible
Fire water runoff during emergency event; Disturbance due to external lighting	Hedgehog (Medium)	Local	High (due to fire water runoff); Medium	Major adverse (due to fire water runoff); Moderate adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; Implementation of Lighting Strategy	Negligible
N/A (not a constraint)	GCN (Very Low)	Local	N/A (not a constraint)	N/A (not a constraint)	N/A (not a constraint)	Negligible

Effect	Receptor (Sensitivity)	Nature of Effect and Geographic Scale	Magnitude of Impact*	Classification of Effect (Statement of Significance BEFORE mitigation)	Mitigation and Monitoring	Residual Effect
Fire water runoff during emergency event	Amphibians (excluding GCN) (Low)	N/A (not a constraint)	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Fire water runoff during emergency event	Invertebrates (Low)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Fire water runoff during emergency event	Aquatic and Riverine Features (Medium)	Local	High	Major adverse	On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release.	Negligible
Spread of INNS in other habitats	INNS (N/A)	Local	Medium	Moderate adverse	Adherence to the CEMP; Implementation of WMP and ISMP.	Negligible

Notes: * incorporating environmental design and management, ** incorporating mitigation and monitoring measures

Likely Significant Environmental Effects

5.109 Following implementation of all embedded and additional mitigation, including those measures secured through the CEMP, WMP, GILEMP and species-specific mitigation and compensation, no significant adverse residual effects are predicted on habitats or species receptors.

5.110 The mitigation hierarchy has been successfully applied - avoidance, minimisation, and compensation, ensuring that effects identified during construction and operation are fully addressed. The sensitive design layout, establishment of buffer zones, habitat restoration, and long-term management under the WMP and GILEMP collectively ensure the protection and enhancement of biodiversity features within and around the Site.

5.111 In addition, the on-site and off-site habitat creation and enhancement, including new woodland, scrub, and hedgerow planting, and Off-site Dormouse Habitat Planting Area with connectivity bridges, will result in net ecological gain over the long term. These measures are expected to deliver a permanent improvement in the quality and extent of habitats for dormouse, bats, reptiles, and birds, alongside strengthened ecological connectivity across the wider landscape. Accordingly, post-mitigation effects are assessed as neutral to minor beneficial overall.

Net Benefit for Biodiversity

5.112 To achieve a NBB, removed trees will be replaced at a 3:1 ratio. Enhancement of existing habitats will be undertaken to increase their conservation value. Wildflower seeding will take place in habitats with low species-diversity to promote invertebrate diversity and abundance. These enhancements will incorporate species rich habitat mosaics and tree planting within landscaping, using native species. Ancient woodland ground floral plug planting or seeding will take place within the woodland mosaic, where existing trees are removed or impacted. Installation of invertebrate hotels, and creation of habitat piles to provide refuge for reptiles, amphibians and hedgehog. Habitat management Long-term habitat monitoring of reinstated habitats will ensure that the Project achieves a NBB in the long-term and when the Project is in its operational phase. Preliminary mitigation and enhancement measures are provided in Appendix 5.1.

Summary and Conclusions

5.113 The EcIA has identified and evaluated potential ecological effects associated with the Proposed Development during both the construction and operational phases. A robust suite of embedded design measures and further targeted mitigation has been incorporated, addressing all potential ecological receptors, including habitats, protected species, and designated sites.

5.114 Construction-phase controls under the CEMP, combined with pollution prevention, dust suppression, and lighting management, will effectively minimise short-term impacts. Long-term ecological value

will be secured through the WMP, dormouse EPSL and GILEMP, with species-specific management plans, and ongoing habitat maintenance and monitoring.

5.115 As a result of this integrated approach, no significant adverse ecological effects are anticipated. Instead, through habitat creation, restoration, and long-term management, the Proposed Development is expected to deliver lasting biodiversity enhancements both on-site and within the wider ecological network.

5.116 As the assessment concludes no residual effects on ecological receptors, no cumulative assessment has been undertaken.

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Curtis Hall Ltd

CARDIFF EAST PARK AND RIDE, LLANRUMNEY

Preliminary Ecological Appraisal (PEA) Report

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CARDIFF EAST PARK AND RIDE, LLANRUMNEY

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EXECUTIVE SUMMARY

WSP UK Limited ('WSP') was commissioned by Curtis Hall Ltd to undertake a Preliminary Ecological Appraisal (PEA) of the habitats within and in proximity of land situated off Eastern Avenue, west of Llanrumney in Cardiff, Wales (central National Grid Reference: ST 21287 80932) hereafter referred to as the 'Site'. The PEA is required to inform the potential future redevelopment of the Site and these proposals are hereafter referred to as the 'Proposed Development'.

The purpose of this PEA is to provide sufficient information to assess the ecological baseline of the Site to inform the considerations for biodiversity associated with the Proposed Development.

This PEA, undertaken in August 2025, is based on an ecological desk study, a habitat survey and a protected/notable species assessment. It has been compiled with reference to relevant nature conservation legislation, planning policy and the UK Biodiversity Framework.

A desk study was undertaken in September 2025. The desk study identified two Special Areas of Conservation (SACs) within 10km of the Site. One Statutory Designated Site of Local Importance, and nine non-statutory nature conservation sites were identified within 1km of the Site. Blocks of Ancient Woodland Inventory woodland were also identified within and near the Site. The South East Wales Biological Records Centre (SEWBReC) returned records of multiple protected and notable species within 2km of the Site in the last 10 years.

The habitat survey, undertaken on the 24 and 25 August 2025, identified eight Phase 1 habitat types in addition to hardstanding within the Site. Two Priority Habitats were identified: 'lowland mixed deciduous woodland' and 'rivers'. The Site is known to support the hazel dormouse *Muscardinus avellanarius*, and was assessed as suitable to support otter, other mammals, birds, amphibians, reptiles, invertebrates and invasive non-native plant species (INNS).

The following recommendations have been outlined in this report:

- As the Proposed Development may impact the Severn Estuary statutory designated sites there is a requirement for a Stage 1: Habitat Regulations Screening Assessment (HRSA).
- A European Protected Species Licence (EPSL) for dormouse must be obtained from Natural Resources Wales in regard to proposed habitat clearance on the Site.
- Works are to be carried out as per environmental best practice to avoid direct and indirect impacts to Wildlife Sites/Sites of Importance for Nature Conservation (SINCs), Ancient Woodland Inventory woodlands, and Priority Habitats. If this is not possible, consultation with Local Authorities will be required to agree appropriate compensation.
- Further bat surveys are recommended (as outlined in a separate report) and further checks prior to commencement of Site clearance for otter, badger and nesting birds.
- Ecological supervision and implementation of a Precautionary Method of Works (PMoW) to minimise the potential for harm to the following species that may be within the Site: bats, great crested newt, otter, dormouse, badger, other mammals, birds, common amphibians and reptiles and measures to avoid the spread of INNS.

- Environmental best practices to be implemented, to include measures such as prevention of pollution, covering of excavations, and protection of retained trees, vegetation and aquatic habitats.
- Biodiversity enhancement of the Site to be implemented, including measures to increase habitat diversity and provision of nesting sites and refugia for a range of species.

1. INTRODUCTION

1.1. BACKGROUND

PROJECT BACKGROUND

1.1.1. WSP UK limited (hereafter referred to as 'WSP') was commissioned by Curtis Hall Ltd to undertake an Preliminary Ecological Appraisal (PEA) of the habitats within and in proximity of land situated off Eastern Avenue, west of Llanrumney, Cardiff, (central British National Grid: ST 21287 80932); hereafter referred to as the 'Site' (shown as the Site Boundary on Figure 1).

1.1.2. The PEA is required to support a hybrid planning application for the redevelopment of the Site. The application seeks:

- Outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

1.1.3. These proposals are hereafter referred to as the 'Proposed Development'.

1.1.4. The Site is in the east of Cardiff between the villages of Pentwyn and Llanrumney. The A48 road runs along the western edge of the Site. The Site is a mosaic of poor semi-improved grassland and scrub habitats with areas of semi-natural broadleaved woodland. Several footpaths extend across the Site. The centre of the Site is dominated by hard standing, previously used as a 'Park and Ride' carpark. To the south of the Site, on the south-eastern side of the River Rhymney, is an area that will be used for the off-Site creation of hazel dormouse *Muscardinus avellanarius* habitat, as shown in Figure 1 and hereafter referred to as the 'Off-Site Dormouse Habitat Planting Area'.

ECOLOGICAL BACKGROUND

1.1.5. The Site and surrounding area have been subject to several ecological surveys and assessments for a previous planning application (22/02673/FUL), including the following:

- Delta-Simons (2021) Cardiff East Park and Ride Preliminary Ecological Appraisal;
- Delta-Simons (2023) Cardiff East Park and Ride. Dormouse Impact Assessment; and
- A.T. Coombes Associates Ltd (2023) Cardiff East Park and Ride. Arboricultural Impact Assessment.

1.2. SCOPE OF REPORT

1.2.1. In 2025 Curtis Hall Ltd commissioned WSP to complete an updated PEA.

1.2.2. The brief included the following:

- To provide baseline ecological information about the Site and Off-Site Dormouse Habitat Planting Area with particular reference to whether legally protected and notable sites, species or habitats were present or likely to be present;
- To provide recommendations to enable compliance with relevant nature conservation legislation and planning policy; and
- if necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and /or further ecological surveys.

1.3. RELEVANT LEGISLATION AND POLICY

1.3.1. The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in Wales. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details are presented in Appendix A.

LEGISLATION

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside Rights of Way Act 2000;
- The Town and Countryside (Environmental Impact Assessment) (Wales) Regulations 2017;
- The Protection of Badgers Act 1992;
- The Wild Mammals (Protection) Act 1996;
- The Hedgerow Regulations 1997;
- Environment (Wales) Act 2016; and
- The Wellbeing of Future Generations (Wales) Act 2015.

POLICY

- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- UK Biodiversity Action Plan (UKBAP)[1];
- Planning Policy Wales (PPW) (Edition 12) 2024;
- Future Wales: The National Plan 2040;

[1] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

- Technical Advice Note 5; Nature Conservation and Planning 2009;
- Local Nature Partnership Cardiff (2019) Wales Biodiversity Partnership; and
- The Cardiff Local Development Plan 2006-2026 (Adopted Plan) (Cardiff Council, 2016).

2. METHODS

2.1. OVERVIEW

2.1.1. This appraisal has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2017a and 2017b), Joint Nature Conservation Committee (JNCC, 2016); and guidance contained in the British Standard - Code of Practice for Biodiversity and Development BS42020:2013 (British Standards Institute, 2013).

2.1.2. This PEA is based on the following data sources:

- An ecological desk study;
- a Phase 1 habitat survey; and
- a protected / and notable species assessment.

2.2. DESK STUDY

2.2.1. The desk study was undertaken in September 2025 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within various radii around the Site. This approach is consistent with current good practice guidance published by CIEEM, (2017a and 2017b). To provide the baseline data for the ecological desk study, the following information was requested from South East Wales Biodiversity Records Centre (SEWBReC):

- Records of legally protected and notable species within 2km of the Site;
- Records of statutory sites designated for nature conservation of national or local importance within 2km of the Site;
- Records of non-statutory designated sites within 1km of the Site; and
- records of protected habitats (including Priority Habitats[2] and Ancient Woodland Inventory (AWI)[3]) within 1km of the Site.

2.2.1. Freely downloadable datasets (available from Natural Resources Wales (NRW)) were consulted for information regarding:

- Natura 2000 sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) of European importance and internationally designated Ramsar sites within 10km of the Site; and
- SACs within 30km of the Site, where bat species are a qualifying interest feature (given the wide foraging ranges of bats.

2.2.2. In addition, open source 1:25,000 Ordnance Survey mapping was used to identify any mapped water bodies and watercourses within 500m of the Site.

[2] Habitat types considered of key significance to sustain and improve biodiversity in relation to Wales in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these habitats when carrying out their functions.

[3] The ancient woodland inventory in Wales lists areas over two hectares in size which have been continuously wooded for 400 years or more.

2.2.3. The findings of the desk study for the Site have been incorporated within Section 3 and Appendix B of this report and are shown on Figure 2, Figure 3 and Figure 4.

2.2.4. The ecological desk study was carried out by a suitably experienced ecologist who is a member of CIEEM, and has considerable experience in undertaking similar desk studies.

2.3. HABITAT SURVEY

A Phase 1 habitat survey was carried out on the 27 and 28 August 2025 to classify and map habitats present. The survey covered the entire Site and an Off-Site Dormouse Habitat Planting Area including boundary features, and is hereafter referred to as the 'Survey Area' (see Figure 1). The Off-Site Dormouse Habitat Planting Area was visited during the survey to add context to the assessment results. However, the Off-Site Dormouse Habitat Planting Area is located outside the Proposed Development Red Line Boundary (RLB), therefore the Phase 1 habitat areas are not quantified in this report. The Phase 1 habitat survey was carried out by competent ecologists with experience of undertaking surveys of similar habitats.

2.3.1. Habitats were described and mapped following the standard Phase 1 habitat survey methodology (JNCC, 2016). Phase 1 habitat survey is a standard technique for classifying and mapping British habitats. The dominant plant species are recorded, and habitats classified according to their vegetation types. Where appropriate, consideration was given to whether habitats qualify, or could qualify, as Priority Habitat under the provision of the Environment (Wales) Act 2016.

2.3.2. A list of plant species was compiled (Appendix C), with relative plant species abundance estimated using the DAFOR scale[4]. The scientific names for plant species follow those in the New Flora of the British Isles (Stace, 2019) and are also listed in Appendix C.

2.3.3. Habitats were marked on a mobile mapping computer and were subsequently digitised using a Geographical Information System (GIS).

2.3.4. Any invasive non-native plant species (INNS) listed on Schedule 9 of the WCA 1981 (as amended) which were evident during the Phase 1 habitat survey were also recorded. Detailed mapping of such species; or a full survey of the Survey Area for all INNS was beyond the scope of this commission.

2.4. PROTECTED SPECIES ASSESSMENT

2.4.1. The Phase 1 habitat survey was extended to include an assessment of the potential for the Survey Area to support legally protected and notable species. This assessment was supplemented by using the desk study results in combination with field observations made during the Phase 1 habitat survey. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement. This was supplemented by standard sources of guidance on habitat suitability assessment for key faunal groups including: birds (Gilbert *et al.*, 1998 and Bibby *et al.*, 2000), great crested newt *Triturus cristatus* (Gent and Gibson, 2003 and English Nature, 2001);water vole *Arvicola amphibius* (Strachan *et al.,* 2011); reptiles (Froglife, 1999 and Gent and Gibson, 2003); bats *Chiroptera* (Collins, 2023 and Reason, P.F and Wray, S, dormouse

[4] The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

Muscardinus avellanarius (Bullion *et al*., 2025); badger *Meles meles* (Harris *et al*., 1991 and Roper, 2010); otter *Lutra lutra* (Chanin, 2003); and invertebrates (Drake *et al*., 2007 and Kirby, P, 2001).

2.5. NOTES AND LIMITATIONS

2.5.1. Every effort has been made to provide a comprehensive description of the Survey Area; however, the following limitations apply to this assessment:

2.5.2. Ecological survey data is typically valid for 18 months from the date of survey unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management (CIEEM, 2019).

2.5.3. Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.

2.5.4. Some areas of woodland within the Survey Area could not be directly accessed due to the density of vegetation. These areas were observed from adjacent habitats where practicable. Aerial imagery was subsequently used to identify which habitats were present where 'on-site' visual determination was not possible. It is therefore considered that habitat types and their distribution were accurately identified.

2.5.5. As previously noted, INNS were recorded when encountered during the PEA survey but a full survey for INNS and their distribution through the Survey Area was beyond the scope of the commission.

2.5.6. The extended Phase 1 Habitat survey was carried out over two consecutive days, therefore it is likely that only a sample of all species that occur within the Survey Area will have been recorded. However, through use of desk study information to supplement Site survey data, it is considered that an accurate assessment of the potential for the Survey Area to support protected and notable species was possible, and that enough plant species were recorded to accurately determine Phase 1 habitat types.

2.5.7. The extended Phase 1 habitat map (Figure 45) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a PEA, the maps are not intended to provide exact locations of habitats.

3. RESULTS

3.1. DESIGNATED SITES

STATUTORY SITES

3.1.1. Four international statutory designated sites were identified within 10km of the Site. These comprised Cardiff Beech Woods Special Area of Conservation (SAC), and the Severn Estuary SAC, Special Protection Area (SPA) and Ramsar site. Descriptions of these sites are provided in Table 3-1 and the sites are shown in Figure 2.

3.1.2. The Wye Valley and Forest of Dean Bat Sites SAC was identified approximately 30km to the northeast of the Site. Additional international statutory designated sites identified within the extended search area, which were Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC.

3.1.3. One statutory site of national importance for nature was identified within 2km of the Site, a Site of Special Scientific Interest (SSSI), as detailed in Table 3-2, and shown in Figure 3.

3.1.4. One statutory designated site of local importance was identified within 2km of the Site, Howardian Local Nature Reserve (LNR), detailed in Table 3-3 and shown in Figure 3.

NON-STATUTORY SITES

3.1.5. The desk study identified 9 non-statutory sites within 1km of the Site, including a B-line, and two Sites of Interest for Nature Conservation (SINCs) within the Site boundary (Rhymney River Valley Complex SINC and River Rhymney SINC). Descriptions of non-statutory sites are detailed in Table 3-4, and shown in Figure 4.

Table 3-1 - Statutory Designated Sites of International Importance

Site Name	Designation	Size (ha)	Approximate Distance and Orientation from Site	Description
Severn Estuary	SAC	26769.88	3.1km south	Annex I habitats that are a primary reason for site selection are: ▪ 1130 Estuaries ▪ 1140 Mudflats and sandflats not covered by sea water at low tide ▪ 1330 Atlantic salt meadows *Glauco-Puccinellietalia maritimae* Annex I habitats present as a qualifying feature, but not a primary reason for site selection are: ▪ 1110 Sandbanks which are slightly covered by sea water all the time ▪ 1170 Reefs Annex II species that are a primary reason for selection of this site: ▪ 1095 Sea lamprey *Petromyzon marinus* ▪ 1099 River lamprey *Lampetra fluviatilis* ▪ 1103 Twaite shad *Alosa fallax*
Severn Estuary	SPA	26769.88	3.1km south	The Severn Estuary SPA qualifies under Article 4.1 of the Birds Directive by regularly supporting an internationally important wintering population of the Annex I species Bewick's swan *Cygnus columbianus bewickii*. The SPA also qualifies under Article 4.2 by regularly supporting internationally important numbers of wintering migratory wildfowl including European white-fronted goose *Anser albifrons albifrons*, shelduck *Tadorna tadorna*, gadwall *Anas strepera*, dunlin *Calidris alpina* and redshank *Tringa totanus*.

Site Name	Designation	Size (ha)	Approximate Distance and Orientation from Site	Description
				The SPA also supports nationally important populations of bird species including wintering populations, birds on passage including ringed plover *Charadrius hiaticula* and breeding populations of lesser black-backed gull *Larus fuscus.*
Severn Estuary	Ramsar	26769.88	3.1km south	The Severn Estuary has the second largest tidal range in the world resulting in plant floral and faunal communities which are typical of extreme conditions, e.g., high densities of ragworm *Hediste diversicolor* and lugworm *Arenicola marina* which provide important food sources for passage and wintering birds. The Severn Estuary also has an extensive tidal zone comprising mudflats, sand banks, shingle and rocky platforms. Ramsar criterion 1: Immense tidal range affecting both physical environment and biological communities. Ramsar criterion 3: Unusual estuarine communities, reduced diversity and high productivity. Ramsar criterion 4 and 8: Importance for migratory fish including salmon *Salmo salar*, sea trout *Salmo trutta*, sea lamprey, river lamprey, allis shad *Alosa alosa*, twaite shad and European eel *Anguilla anguilla*. Important for migratory birds in spring and autumn. Ramsar criterion 5 and 6: Assemblages of bird species of international importance.
Cardiff Beech Woods	SAC	114.45	6.82km north-west	Annex I habitats that are a primary reason for selection of this site are: ■ 9130 *Asperulo-Fagetum* beech forests Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site are: ■ 9180 Tilio-Acerion forests of slopes, screes and ravines

Table 3-2 - Statutory Designated Sites of National Importance

Site Name	Designation	Size (ha)	Approximate distance and orientation from Site	Description
Gwent Levels – Rumney and Peterstone	SSSI	969.3	1.92km south-east	The largest area of reclaimed wet pasture in Wales. Rich in aquatic plant species including brackish water-crowfoot *Ranunculus baudotii* and the pondweeds *Potamogeton obtusifolius* and *P. berchtoldii*. Supports a diversity of aquatic invertebrates including water-beetles, snails, marsh-flies and dragonflies.

Table 3-3 - Statutory Designated Sites of Local Importance

Site Name	Designation	Size (ha)	Approximate distance and orientation from Site	Description
Howardian	LNR	4.17	1.7km south	A good network of paths connects a variety of habitats including woodland, wildflower meadow, ponds and reedbeds. Dormouse *Muscardinus avellanarius* is present on Site, along with a wide variety of fauna and flora.

Table 3-4 - Non-statutory Designated Sites of Local Importance

Site Name	Designation	Distance and orientation from Site	Description
River Rhymney	SINC	Within the Site	River Rhymney SINC encompasses the entire stretch of the River Rhymney within the county borough, along with its adjacent semi-natural habitats. As one of the borough's three main watercourses, it forms a vital linear wildlife corridor. The designation includes the river itself, its banks, and surrounding habitats—such as woodland, wetland, hedgerows, and species-rich grassland—to maintain ecological connectivity and functionality throughout the river corridor.

Site Name	Designation	Distance and orientation from Site	Description
Llanedeyrn Woodlands Complex	SINC	52m south-west	The Llanedeyrn Woodlands Complex SINC is located in the Pentwyn ward of Cardiff, it covers 28.95 hectares, making it one of the most significant woodland conservation areas in the region. It is characterised by semi-natural broadleaved woodland and supports a range of indicator species that include ancient woodland elements.
Coed-y-Cwar	SINC	124m south-east	An area of semi-natural woodland with ponds. Habitats on site include wetlands and woodlands. The habitat supports a wide range of species including dormice.
Pontprennau Wood	SINC	210m north	The wood is classified as a SINC due to its semi-natural broadleaved woodland, which supports a variety of native tree species, dense scrub, scattered broadleaved trees, and an underlayer of bracken and grassland. It forms part of the wider Rhymney River SINC corridor.
Fishpond Wood	SINC	241m east	Fishpond Wood SINC forms part of a network of local green spaces that include other nearby areas such as Trowbridge Meadow and Howardian Local Nature Reserve (LNR). The woodland acts as an important ecological corridor amid urban development, providing essential foraging and shelter for local fauna.
Lower Rookery Wood	SINC	269m east	Lower Rookery Wood SINC is a semi-natural woodland area offering habitat for a variety of native tree species, plants, and wildlife typical of such environments in South Wales. It acts as an important ecological corridor, supporting species movement and providing shelter and foraging resource for local fauna.
Nant Glandulais	SINC	609m west	Nant Glandulais SINC is a small tributary stream feeding into the River Rhymney, in the South East Valleys river basin district of Wales. It is an ecologically important area that supports a range of wildlife and natural habitats. It features calcareous geology and mostly improved grassland in its catchment area, contributing to its biodiversity value.
Rhymney River Valley Complex	SINC	850m south	Rhymney River Valley Complex SINC covers nearly the entire catchment of the Nant Bargod Rhymni, along with adjacent semi-natural habitats. It includes the Darran Valley and Parc Cwm Darran joining the River Rhymney at the Bargoed viaduct. The designation includes the stream channel, banks, and surrounding habitats such as woodland, wetland, hedgerows, and species-rich grassland, ensuring ecological connectivity and maintaining the corridor's ecological functionality.

Site Name	Designation	Distance and orientation from Site	Description
B-lines	B-lines	Within the Site	B-Lines are a series of ‘insect pathways’ running through the countryside and towns, along which a series of wildflower-rich habitat stepping stones are being restored and created. They link existing wildlife areas together, creating a network, like a railway, which will weave across the British landscape (Buglife, [Website accessed September 2025]).,

OTHER HABITATS OF CONSERVATION IMPORTANCE

3.1.6. A total of 56 Ancient Semi Natural Woodland (ASNW) sites, five Restored Ancient Woodland Sites (RAWS) and one Plantation on Ancient Woodland Site (PAWS) (which was also identified as a Natural Resources Wales (NRW) Priority Area – PAWS) were within 1km of the Site (Figure 6).

3.1.7. The closest parcels to the Site were two parcels of ASNW which were within the northern and southeast boundaries of the Site (Figure 6). Three ASNW were recorded within 50m of the Site.

3.1.8. One waterbody was identified within 500m of the Site during the desk study, Pentwyn Lake, which is a fishing lake stocked with fish and located at ST 20710 80696.

3.2. PHASE 1 HABITAT SURVEY

OVERVIEW

3.2.1. The following account summarises the findings of the Phase 1 habitat survey within the RLB. A total of eight Phase 1 habitat types were identified within the Site, with an additional category of hardstanding added. They are mapped on Figure 5 and are listed in Table 3-2 along with areas in hectares (or length for linear features). A description of the dominant and notable species, the composition and management of each habitat is provided as follows, and an indicative species list is provided in Appendix C. Target notes are provided in Appendix D and photographs in Appendix E. Alpha-numeric codes used in this section cross-refer to the JNCC Phase 1 habitat survey classification (JNCC, 2016). The order of the habitat descriptions below reflects their ordering in the Phase 1 habitat survey manual and does not reflect habitat importance. Please note that the Off-Site Mitigation Area was surveyed during the Phase 1 habitat survey, however as it is located outside the RLB the results are not included in Table 3-4 below.

Table 3-2 - Phase 1 Habitat Area

Phase 1 Habitat	Area (ha)	Length (m)	% of Site Area
A1.1.2 – Semi-natural broadleaved woodland	10.16		43.88
A2.1 – Dense/continuous scrub	3.54		15.27
A2.2 – Scrub - scattered	0.42		1.81
A3.1 - Broadleaved parkland/scattered trees		32.44	
B6 – Poor semi-improved grassland	3.30		14.23
C1.1 - Bracken - continuous	0.04		0.20
G2 - Running water	0.02		0.09
J3.6 – Buildings	0.01		0.05

Phase 1 Habitat	Area (ha)	Length (m)	% of Site Area
Hardstanding (no alpha-numeric code)	5.67		24.48
TOTAL	23.16		100

A1.1.1 – SEMI-NATURAL BROADLEAVED WOODLAND

3.2.2. Semi-natural broadleaved plantation woodland comprised the majority of the habitat within the Site. The broadleaved woodland within the Site was well established and predominantly mature, comprising a wide diversity of native tree and shrub species, including ash *Fraxinus excelsior*, pedunculate oak *Quercus robur*, silver birch *Betula pendula*, and hawthorn *Crataegus monogyna.* Among the native species listed, there were also species which are described as naturalised, including species which are not native but introduced to Britain before 1492, such as sycamore *Acer pseudoplatanus*. The understory was sparse with bramble *Rubus fruticosus* agg. dominating. Distinct pathways and access routes were present throughout the woodland.

3.2.3. Semi-natural broadleaved plantation woodland is classified as Priority Habitat - 'Lowland mixed deciduous woodland' – under Section 7 of the Environment (Wales) Act 2016.

A2.1 – DENSE/CONTINUOUS SCRUB

3.2.4. Dense scrub bordered most of the broadleaved woodland in the southern and northern parts of the Site, with large swathes dominated by bramble and Indian balsam *Impatiens glandulifera* with occasional areas of gorse *Ulex europaeus* and bracken *Pteridium aquilinum*. On the northwestern edge of the Site, Japanese knotweed *Reynoutria japonica* dominated in areas adjacent to the treeline.

A2.2 – SCRUB - SCATTERED

3.2.5. Pockets of scattered scrub, dominated by bracken and bramble were present in the northern part of the Site.

A3.1 – BROADLEAVED PARKLAND/SCATTERED TREES

3.2.6. Standalone scattered trees were recorded within the southern part of the Site. These included three mature pedunculate oak and mature hazel *Corylus avellana* recorded within an area of poor semi-improved grassland.

B6 – POOR SEMI-IMPROVED GRASSLAND

3.2.7. Several parcels of poor semi-improved grassland were present within Site. These parcels had a sward height of approximately 20cm. The parcels were dominated by Indian balsam and Yorkshire fog *Holcus lanatus*, with frequently occurring common knapweed *Centaurea nigra*, abundant creeping buttercup *Ranunculus repens*, and occasionally occurring cock's- foot *Dactylis glomerata*. Scattered trees were present within the southern parcel as previously described.

G2 - RUNNING WATER

3.2.8. Running water (the River Rhymney) lies adjacent to the Site. This habitat was flanked by scattered trees of varying ages and parcels of scrub. INNS were noted within the habitats located along the

edge of the river. The river is relatively fast flowing and silty, therefore the riverbed substrate could not be viewed during the survey. Silt banks were visible along some sections of the river.

3.2.9. The River Rhymney is classified as Priority Habitat - 'River' – under Section 7 of the Environment (Wales) Act 2016.

C1.1 - BRACKEN – CONTINUOUS

3.2.10. A parcel of bracken was recorded within the Site, flaking the broadleaved plantation woodland.

J3.6 – BUILDINGS

3.2.11. A commercial one-storey building was located within the Site. The building was small in size with roofing and wall cladding constructed of corrugated metal. The building had negligible potential for roosting bats and is not discussed further in this report.

HARDSTANDING

3.2.12. The park and ride area was surfaced with tarmacadam that appeared to be in good condition. Hardstanding tarmacadam footpaths were present throughout the southern and eastern extents of the Site. There were several 'informal' footpaths criss-crossing the Site.

3.3. PROTECTED AND NOTABLE SPECIES ASSESSMENT

3.3.1. The potential for the Site to support legally protected and notable species has been assessed using desk study results, and field observations made during the Phase 1 habitat survey. A summary of desk study information is included in Appendix B. Desk study records were only considered if they were recent (2015-2025) and/or they related to species that may be supported by habitats within the Site. The Site is known to support dormouse (Delta-Simons 2023a). Habitats present within the Site were suitable for the following species; further consideration is given to the likelihood for these species to be present within the Site:

- Bats;
- Great crested newt;
- Otter;
- Badger;
- Hedgehog *Erinaceus europaeus*;
- Reptiles;
- Amphibians;
- Birds;
- Invertebrates; and
- INNS.

3.3.2. The Site was not considered to provide suitable habitat for other protected or notable species and other species, beyond those listed above, and therefore no other species will be considered in this report.

BATS

3.3.3. Five records of bats were provided within 1km of the Site, with no roost sites identified. The closest record was of a noctule bat *Nyctalus noctula* observed 763m south of the Site.

3.3.4. Bats are likely to be present within the Site. During the Phase 1 habitat survey, habitats suitable for commuting and foraging activities included the linear woodland and lines of trees within the Site. The trees within these habitats may also provide suitable roosting opportunities. The River Rhymney provided a suitable commuting and foraging corridor for bats.

3.3.5. Full results for bats are presented in a separate bat report (WSP, 2025a).

GREAT CRESTED NEWT (GCN)

3.3.6. No records of GCN were returned from the desk study.

3.3.7. An assessment of aerial imagery and OS maps during the desk study showed a waterbody present within 500m of the Site (Pentwyn Lakes). The A48 forms a significant barrier to the dispersal of GCN to the Site. Further, the waterbody is unlikely to support GCN as it is stocked with fish and used as a fishing lake.

3.3.8. The Site is within the known range of GCN in Wales (French *et al.*, 2014), however the Site is isolated from the wider landscape by the A48 to the northeast and the River Rhymney to the southeast, both significant obstacles to the terrestrial movement of GCN.

3.3.9. The absence of records from the data search, the presence of significant barriers to dispersal, and the isolated nature of the Site from the wider landscape led to the conclusion that GCN is unlikely to be present. However, their presence cannot be completely ruled out as habitat such as woodland, grassland and scrub within the Site provided suitability for GCN in the terrestrial life stage.

DORMOUSE

3.3.10. One record of dormouse was provided within 1km of the Site. The record was 544m southwest of the Site. This was a combined submission to SEWBReC of five records of field signs recorded in 2023.

3.3.11. Dormouse presence has been confirmed on the Site during nest tube surveys undertaken in 2021 by Delta-Simons, where a peak count of seven dormice was identified (Delta-Simons, 2023).

3.3.12. During the Phase 1 habitat survey it was determined that the linear woodland and scrub habitats within the Site had optimal suitability to support dormouse. The highly connective nature of the woodland habitats to the wider woodland network provided ideal commuting corridors for dormice.

OTTER

3.3.13. No records of otter were returned within 1km of the Site.

3.3.14. An otter survey conducted in August 2025 (WSP, 2025b), provided no evidence of otter within the Site. However, it is assumed that otters are likely to commute along the river.

3.3.15. During the Phase 1 habitat survey it was determined that the River Rhymney, linear woodland and scrub habitats within the Site had optimal suitability for otter. The river and woodland habitats provided ideal commuting corridors for otter. Dense scrub areas offered suitable habitat for otter to rest, although the Site did appear to be frequently used by the public, including dog walkers, which may deter otter from using the Site for this purpose.

BADGER

3.3.16. One record of badger was returned from the data search within 1km of the Site; a field record of a deceased individual, approximately 690m west of the Site.

3.3.17. During the survey, two outlier badger setts were identified within the Survey Area, as well as a snuffle hole and a push through. The locations of the two badger setts are shown on Figure 5 (Target Note ((TN) 1 & 2) with photos in Appendix E. Further details are summarised below:

- A partially used outlier sett was recorded at TN1 (Figure 5), located within dense scrub habitat to the southwest of the Site. Two entrances were recorded with evidence of recent digging in the spoil heap and claw marks. The sett did not appear to be heavily used as leaf litter was recorded in the entrance.
- A partially used outlier sett was recorded at TN2 (Figure 5), located within semi-improved grassland, adjacent to broadleaved woodland. It was situated within the Off-Site Dormouse Habitat Planting Area. One entrance was recorded with fresh loose spoilt and footprints. Badger hairs were also identified. Some leaf litter was present within the worn entrance.
- A snuffle hole was recorded southwest of the outlier sett shown at TN2 (Figure 5). This confirms foraging behaviour.
- A push through was recorded southwest of the outlier sett recorded at TN2. The push through was located under a mesh metal fence leading into the Off-Site Dormouse Habitat Planting Area. There were no badger hairs or any other definitive signs of badger use, however, this feature may have been caused by commuting badgers.

3.3.18. The linear woodland habitats within the Site had suitability to support badger, including sett building activities. The well-connected woodland habitats within the Site, and linking to the wider landscape, provided optimal commuting corridors for badgers within habitat likely to be relatively undisturbed.

3.3.19. The combination of suitable habitats, and the presence of setts recorded during the Phase 1 survey indicated that badgers are likely to be present within the Site.

HEDGEHOG

3.3.20. A total of six records of hedgehog were returned by the desk study. The closest record was a field observation 521m south of the Site.

3.3.21. The Site provided suitable habitat for foraging and commuting hedgehog in the form of linear and connected woodland habitat and scrub, which linked into the wider woodland network and parkland habitat.

REPTILES

3.3.22. No records of common reptile species were returned from the desk study.

3.3.23. Reptile surveys at the Site have been undertaken by Delta-Simons in 2021 where no reptiles were recorded within the Site (Delta-Simons, 2021). However, the survey did not cover the entire Site and excluded some habitats potentially suitable for reptiles. Furthermore, some refugia were damaged or removed by member of the public.

3.3.24. An updated reptile survey was completed by WSP between May and July 2024. A positive result was returned from one location on Site; an adult female slow worm *Anguis fragilis* was recorded on

two separate visits in June 2024 (WSP, 2025c). It was concluded from this result the Site is likely to support 'Low' numbers of common reptiles (Froglife, 19992).

3.3.25. During the Phase 1 habitat survey it was determined that linear woodland habitats and scrub within the Site had suitability to support reptiles, particularly hibernating potential, whilst basking, commuting and foraging reptiles may be present in the grassland habitats.

AMPHIBIANS

3.3.26. One record of common frog *Rana temporaria* was returned within 1km of the Site, 237m to the south.

3.3.27. There were no waterbodies recorded within the Site during the Phase 1 habitat survey. However, it was determined that the linear and scrub woodland habitats within the Site had suitability to support amphibians, particularly hibernating potential. Amphibians may also be present in the grassland habitats.

3.3.28. During the Phase 1 survey one common toad *Bufo bufo* was recorded.

BIRDS

3.3.29. The desk study returned records of 270 legally protected/notable bird species within 2km of the Site. Notable records for bird species listed on Schedule 1 of the WCA include Cetti's warbler *Cettia cetti*, fieldfare *Turdus pilaris*, greenshank *Tringa nebularia*, hobby *Falco subbuteo*, kingfisher *Alcedo atthis*, little ringed plover *Charadrius dubius*, peregrine *Falco peregrinus*, quail *Coturnix coturnix*, red kite *Milvus milvus*, and redwing *Turdus iliacus*.

3.3.30. During the Phase 1 survey kingfisher was observed commuting on the River Rhymney.

3.3.31. Habitats within the Site are suitable for supporting nesting birds, including the linear woodland, scrub, scattered tree and grassland habitats.

INVERTEBRATES

3.3.32. A total of eight protected and/or notable invertebrate species were identified within the desk study. This included two records of small heath butterfly *Coenonympha pamphilus* which is listed as a Priority Species under the Environment (Wales) Act 2026. The closest record was approximately 200m east of the Site. Two invertebrate species, the purple hairstreak butterfly *Favonius quercus,* and banded demoiselle damselfly *Calopteryx splendens* are listed in the Local Biodiversity Action Plan for Cardiff. Three other species were listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. These are listed in Appendix B.

3.3.33. During the Phase 1 habitat survey it was determined that the linear woodland, scrub and grassland habitats, comprising the majority of the Site, had suitability to support common and widespread invertebrates.

INVASIVE NON-NATIVE PLANT SPECIES (INNS)

3.3.34. Seven species of INNS were returned from the desk study, with three species listed on Schedule 9 of the WCA. These comprised three-cornered garlic *Allium triquetrum*, montbretia Cr*ocosmia x crocosmiiflora (C. aurea x pottsii*) and Indian balsam.

3.3.35. During the Phase 1 habitat survey, Japanese knotweed and Indian balsam were abundant across the Site.

4. DISCUSSION AND RECOMMENDATIONS

4.1.1. This section considers the potential for effects on designated sites, legally protected species, notable species and notable habitats as a consequence of the Proposed Development. Where further surveys or detailed assessment of potential effects are required in order to design suitable mitigation this is identified.

4.2. STATUTORY DESIGNATED SITES

4.2.1. The Habitats Regulations provide strict protection to sites of international importance. This includes requiring projects or plans to be screened for Likely Significant Effects (LSEs) upon Special Protection Areas (SPA), SACs and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsar sites to be subject to the same assessment.

4.2.2. Four international sites were identified within 10km of the Site. These were Cardiff Beech Woods SAC, and the Severn Estuary SAC, SPA and Ramsar. The River Rhymney discharges into the Severn Estuary SAC, SPA and Ramsar, approximately 3.5km downstream.

4.2.3. The Wye Valley and Forest of Dean Bat Sites SAC was identified approximately 30km to the northeast of the Site. In addition, the Mendip Limestone Grasslands SAC and North Somerset and Mendip Bats SAC were identified approximately 30km to the southwest of the Site. The Severn Estuary is located between the Proposed Development and these sites located to the southwest. Impacts to bat species using these statutory designated sites from the Proposed Development are not expected to result, therefore they are not considered further in this report.

4.2.4. The River Rhymney is located adjacent to the Site. The river is functionally linked to the Severn Estuary, and the Proposed Development and associated works may impact the Severn Estuary statutory designated sites and therefore requires a Stage 1: Habitat Regulations Screening Assessment (HRSA). This assessment should be produced and reviewed in agreement with the Local Planning Authority (LPA) and NRW. Should Likely Significant Effects (LSE) be identified in the HRSA, this would trigger a Stage 2: Appropriate Assessment.

4.2.5. Due to the proximity of the River Rhymney which is functionally linked to sites of international importance, environmental best practice will be followed, and measures secured through a Construction Environmental Management Plan (CEMP).

4.2.6. One national site was identified within 2km of the Site. This was the Gwent Levels – Rumney and Peterstone SSSI located 1.92km south-east of the Site. As with international sites, environmental best practice will be followed with protection measures secured through a CEMP. Following the application of these measures, no effects are anticipated for this site.

4.2.7. One statutory designated site of local importance was identified within 1km of the Site, the Howardian LNR located 380m southwest of the Site. The LNR is unlikely to be impacted by works as it is physically separated from the Site by a major road (Southern Way) and is not hydrologically connected to it.

4.3. NON-STATUTORY DESIGNATED SITES

4.3.1. A total of nine non-statutory designated sites were identified within 1km of the Site, including two SINCs (River Rhymney SINC and Rhymney River Valley Complex SINC).

4.3.2. These SINCs may be impacted by water and air-borne pollution and the introduction of INNS, as they are within the Site. The Proposed Development should seek to avoid any direct or indirect impacts to B-lines that are within the Site. As a B-Line covers the entirety of the Site, it is considered likely that the B-Line will be affected by the Proposed Development. Therefore, enhancements for invertebrates should be considered within the design.

4.3.3. Recommendations are proposed in Section 4.6.

4.4. HABITATS

4.4.1. Of the 56 AWI parcels identified within 1km of the Site, two parcels of ASNW were recorded within the Site. There is potential for direct loss of woodland and impact to tree root protection zones (RPZ). Mitigation measures are provided in Section 4.6.

4.4.2. Lowland mixed deciduous woodland was recorded within the Site, which is listed as a Priority Habitat under the Environment (Wales) Act 2016. It is recommended that where possible this habitat is retained and protected during the Proposed Development as far as practicable. Where habitat loss is proposed, mitigation measures are provided in Section 4.6.

4.4.3. The River Rhymney is listed as a Priority Habitat under the Environment (Wales) Act 2016. The river flows on the western boundary of the Site, and a section is included within the footprint for the Proposed Development. General environmental protection measures should be implemented during the construction phase of the Proposed Development. Mitigation measures are provided in Section 4.6.

4.4.4. To comply with planning policy, there would be a need to demonstrate that there would be no significant loss of Priority Habitat as a result of the Proposed Development.

4.4.5. The Proposed Development should seek to avoid loss of these habitats through sensitive scheme design. If loss is not feasible, consultation with the LPA should be completed as part of design development.

4.4.6. All other habitats identified within the Phase 1 habitat survey are considered to be of relatively low ecological value. Impacts upon these habitats arising from the Proposed Development are therefore unlikely to lead to significant detrimental effects on biodiversity. To ensure measurable Net Benefits for Biodiversity (NBB) and ecosystem resilience are achieved in accordance with Section 6 of the Environment (Wales) Act 2016, specific ecological mitigation measures for loss of habitat, impact to protected and notable species and relevant enhancement measures are outlined in Table 4-1 and Section 4.8.

4.5. PROTECTED AND NOTABLE SPECIES

4.5.1. The results of the desk study, and field observations during the Phase 1 habitat survey highlight the potential presence of several protected species or species of conservation concern within the Site. These include bats, great crested newt, dormouse, otter, badger, hedgehog, common and widespread reptiles and amphibians, birds and invertebrates. INNS were also recorded within the Site in the form of Japanese knotweed and Indian balsam. The DECCA Framework (as outlined in Planning Policy Wales Edition 12 (PPW, 2024)) should be considered alongside the requirements of the Proposed Development to ensure that there will be no significant adverse effect on the resilience of protected habitats and species, other than in scenarios outlined by the Local Development Plan

(LDP). The legal protection afforded to these species is outlined as follows and, where appropriate, the requirement for further survey and/or mitigation measures is identified.

BATS

4.5.2. All species of bats recorded in the UK are protected from killing, injury and disturbance[5] and their roosts protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural Resources Wales for certain purposes.

4.5.1. Certain species of bats, including Bechstein's *Myotis bechsteinii* bat, greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe *Rhinolophus hipposideros* bats, noctule bat, brown long-eared bat *Plecotus auritus* and soprano pipistrelle *Pipistellus pygmaeus* bat are also listed as Priority Species for the conservation of biodiversity in Wales in accordance with Section 7 of the Environment (Wales) Act 2016. Section 7 obliges public bodies (including local planning authorities) to have regard for the conservation of biodiversity (including Priority Species) when discharging their duties (including determining planning applications).

4.5.2. Habitats within the Site were assessed as having high suitability for commuting and foraging bats as per Collins (2023), which were likely to be using linear woodland, scrub, and lines of trees within the Site (WSP, 2025a). There was also suitability for bats such as Daubenton's *Myotis daubentonii* to be using the River Rhymney corridor to feed and commute. The Site was also connected to suitable habitats in the wider landscape which offered additional commuting and foraging habitat.

4.5.3. As some of these habitats are likely to be removed, fragmented or severed, further surveys have been undertaken in relation to bats as detailed in Section 4.6 (Table 4-1). Full details in regard to the Proposed Development and bats are provided in a separate bat report (WSP, 2025a).

GREAT CRESTED NEWT (GCN)

4.5.4. GCN are a European Protected Species, and their breeding/resting sites are strictly protected by a range of legislation. GCN are listed under Schedule 2 of the Habitats Regulations. They are also fully protected under Schedule 5 of the WCA. This legislation provides protection against killing, injury, disturbance, capture, taking, sale, and their breeding sites/resting places and places used for shelter/protection are also fully protected.

4.5.5. GCN are also listed under Section 7 of the Environment Wales Act (2016) as of "principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales".

4.5.6. The Phase 1 habitat survey determined that terrestrial habitats on Site had suitability for the species in the terrestrial life phase, however, targeted presence/likely absence surveys are not considered necessary due to the lack of suitable breeding ponds within 500m of the Site and the relatively isolated nature of the Site. However, as a precaution, ecological mitigation measures are outlined in Section 4.6 (Table 4-1).

[5] Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

DORMOUSE

4.5.7. Dormice are protected from killing, injury and disturbance and their places of rest or shelter (occupied habitat) protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

4.5.8. Dormouse is listed as a Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

4.5.9. Optimal habitat for nesting and foraging dormouse such as dense scrub was identified on Site, which was well connected to areas of likely optimal off-Site dormouse habitat, such as extensive woodland with connectivity to known populations of dormice. Presence of dormice within the Site was recorded during surveys undertaken by Delta-Simons in 2021 (Delta-Simons, 2023).

4.5.10. Where possible, it is recommended that woodland parcels and connectivity of woodland habitat/tree lines will be retained and protected. As scrub and tree removal is required as part of the Proposed Development this could result in the disturbance, killing or injury of dormouse and/or destruction of their nests.

4.5.11. A EPS licence for dormice will be required for habitats that will be impacted by the Proposed Development. Details of specific mitigation requirements are provided in Table 4-1, with enhancement measures recommended in Section 4.8.

OTTER

4.5.12. Otter is protected from killing, injury and disturbance and its place of rest or shelter (resting site) is protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the WCA with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

4.5.13. Otters are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

4.5.14. Otters are known to be present within the River Rhymney which is adjacent to the western boundary of the Site. No evidence of otter, including no field signs, or potential/confirmed resting sites, were identified within an otter survey undertaken in August 2025 (WSP, 2025b). However, it is assumed that otters are likely to commute along the river. The River Rhymney has functional habitat connectivity to woodland parcels which are present within the Site. These woodland parcels provide suitable habitat for otter resting activities. For these reasons, impacts to the River Rhymney and the associated woodland, should be avoided wherever practicable and works should be carried out as per environmental best practice (Section 4.7) to avoid impact to river habitat.

4.5.15. Ecological avoidance, mitigation and compensation requirements to minimise impact on otter are described in Section 4.6. Full details in regard to the Proposed Development and otters are provided in a separate report (WSP, 2025b).

4.5.16. Specific ecological mitigation and relevant enhancement measures are recommended in Section 4.8.

4.5.17. BADGER

4.5.18. The Protection of Badgers Act 1992 makes it illegal to wilfully kill, injure or take any badger, or attempt to do so. It also makes it an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett. Activities that would otherwise constitute an offence under this legislation may be licensed by NRW for certain purposes.

4.5.19. The Survey Area has suitability for badgers for commuting, foraging, and sett building activities. Two outlier setts were identified during the habitat survey. Badgers are a mobile species able to quickly build new setts in new locations.

4.5.20. Based on the current design, the Proposed Development is unlikely to result in the disturbance or destruction of badger setts. It is recommended that suitable habitat for badger is avoided where possible. Further survey requirements and mitigation and compensation requirements to minimise effects on badgers are described in Table 4-1.

4.5.21. Specific ecological mitigation and relevant enhancement measures are recommended in Section 4.8.

HEDGEHOG

4.5.22. Hedgehog is listed on Schedule 6 of the WCA which makes it illegal to kill or capture wild hedgehogs and is listed under the Wild Mammals Protection Act (1996), which prohibits cruel treatment of the species. The species is also listed as a Priority species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

4.5.23. It is likely that hedgehog is present and will use the Site to forage, nest, rest and commute. Therefore, there may be an adverse impact on hedgehog such as killing and injury as a result of the Proposed Development e.g., during vegetation clearance/ other intrusive activities. Details outlining recommended further measures are described in Table 4-1, along with relevant enhancement measures in Section 4.8.

REPTILES

4.5.24. Native widespread reptile species (common lizard, adder *Vipera berus*, grass snake *Natrix helvetica helvetica* and slow worm) are partially protected under Schedule 5 of the WCA. This includes protection from killing and injury.

4.5.25. All reptile species are listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

4.5.26. The habitats within the Site are known to support reptiles. A single slow worm was found during surveys in 2024, (Reptile Mitigation Strategy (WSP, 2025c), therefore, where possible, it is recommended that suitable habitats are retained and protected as far as practicable. This would be inclusive of log piles or similar which provide suitable natural refugia for hibernating reptiles. As these habitats are likely to be impacted as a result of the Proposed Development, details describing recommended further measures are outlined in Table 4-1. Relevant enhancement measures are

outlined in Section 4.8. Further detail on mitigation and enhancement measures is provided within the Reptile Mitigation Strategy (WSP, 2025c).

AMPHIBIANS

4.5.27. Common toad is listed as a Priority species in accordance with Section 7 of the Environment (Wales) Act 2016. Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

4.5.28. It is likely that the habitats within the Site support common and widespread amphibians during their terrestrial life phase. There is a low risk of the presence of GCN in their terrestrial life phase.

4.5.29. It is recommended that suitable habitats retained and protected as far as practicable. This would be inclusive or log piles or similar which provide suitable natural refugia for hibernating amphibians. As these habitats are likely to be impacted to some extent as a result of the Proposed Development, details describing recommended further measures are outlined in Table 4-1. Relevant enhancement measures are outlined in Section 4.8.

BIRDS

4.5.30. The Habitats Regulations 2017 Part 1 Regulation 10(2) & (3) state that local authorities '*must take such steps in the exercise of their functions as they consider appropriate to contribute to…the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK including by means of the upkeep, management and creation of such habitat…*'. The legislation outlines that economic and recreation requirements must be taken into account in considering which measures are appropriate.

4.5.31. Under the WCA all wild birds are protected from killing and injury, and their nests and eggs protected from taking, damage and destruction whilst in use. Additional protection is extended to species listed under Schedule 1 of the WCA, meaning it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.

4.5.32. Various bird species are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016.

4.5.33. Most of the habitat on Site was suitable for nesting birds, including woodland and scrub which comprised the majority of the Site. As these habitats are likely to be impacted as a result of the Proposed Development, details of recommended further measures are described in Table 4-1 along with relevant enhancement measures in Section 4.8.

INVERTEBRATES

4.5.34. The Phase 1 habitat survey determined that the linear woodland habitats comprising the majority of the Site had suitability to support common and widespread invertebrates. Targeted presence/likely absence surveys are not considered necessary; however, further details describing recommended further measures are outlined in Table 4-1. Relevant enhancement measures are outlined in Section 4.8.

INVASIVE NON-NATIVE PLANT SPECIES

4.5.35. Certain plant species are listed on Schedule 9 of the WCA. It is an offence to plant or otherwise cause these species to grow in the wild. Japanese knotweed and Indian balsam were identified within the Site during the Phase 1 habitat survey.

4.5.36. Details of survey requirements and mitigation are provided in Table 4-1. Relevant enhancement measures are recommended in Section 4.8.

4.6. ECOLOGICAL CONSIDERATIONS AND FURTHER SURVEY REQUIREMENTS

4.6.1. Potential ecological considerations and further surveys are required to ensure legal and planning policy compliance are outlined in Table 4-1.

Table 4-1 - Key Ecological Considerations and Further Survey Requirements

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
Statutory designated sites	The Severn Estuary SAC, SPA and Ramsar.	Development proposals for the Site would require a HRSA with respect to the International Sites. This assessment should be produced and reviewed in agreement with the LPA and NRW. If the Proposed Works are found to trigger LSE in the absence of mitigation during the HRSA, a Stage 2: Appropriate Assessment would also be required.	N/A
AWI woodland. Priority Habitat - Lowland mixed deciduous woodland.	Loss of woodland or damage to trees within the woodland.	**AWI woodland** - the desk study identified two parcels of ASNW within the Site. All trees within these parcels should be protected and retained where practicable. If any trees are to be removed, consultation with the LPA will be required before any tree removal takes place. A Method Statement (MS) should be produced for working adjacent to AWI woodlands, provided within a CEMP. An appropriate tree root protection zone should be established for each tree. Any trees that are to be lost should be replaced on at least a 3:1 ratio. General environmental protection measures should be implemented during the construction phase of the Proposed Development. **Priority Habitat** - Priority Habitats lost to the Proposed Development are to be replaced on at least a 1:1 ratio. Tree removal should be minimised as far as practically possible. A root protection buffer zone of 15 m should be established per tree. The stepwise approach recommends retaining and protecting habitats where possible, or if this is not possible, reinstating habitats after completion of works to a higher ecological value.	N/A

[6] A Green Infrastructure and Landscape Ecological Management Plan (GILEMP) will be produced for the Site. This, in part, will detail how to protect the biodiversity features of the Site, and as appropriate those of functionally linked land, along with mitigation measures to ensure legal compliance during construction, and operation. It will further identify biodiversity enhancements.

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
		An appropriate MS should also be produced for working adjacent to Priority Habitats, provided in a CEMP. Incorporation of woodland and hedgerow creation into the Proposed Development using native species of local provenance.	
Priority Habitat – Rivers / streams (running water).	Potential impacts to the River Rhymney from habitat loss and pollution during construction.	To include the production of an appropriate MS for working in proximity to a river, incorporated in a CEMP, and including the following: ▪ Design and siting of storage facilities for all fuels, oils and chemicals; ▪ Details on any water features / sensitive habitats on Site and how they will be protected including from dust deposition from construction; ▪ Full details of how any watercourses will be crossed or confirmation that this is not applicable; and ▪ Any sources of pollution (including silt). Potential pathways for that pollution to enter the watercourse or waterbodies and appropriate pollution control measures to be implemented on Site. The Proposed Development is to be screened against the Habitats Regulations as outlined for Statutory Designated sites in Table 3-1. The effects on the Rhymney River would be considered concurrently.	N/A
Bats	Clearance of trees, resulting in the destruction or damage of roosts. Disturbance during construction and operational phase.	Further surveys for bats have been undertaken comprising bat activity surveys in the form of automated static detector surveys, Night-time Bat Walkovers (NBWs) to assess the suitability of the Site for commuting and foraging bats, and a Ground Level Tree Assessment (GLTA) to identify trees which have suitability to support roosting bats. Full details in regard to bat survey and mitigation requirements are outlined in the bat survey report (WSP, 2025a). These are summarised below: ▪ Permanent removal of habitat suitable for commuting, foraging and roosting should be avoided and/or minimised as far as possible. ▪ Trees with bat roosting potential to be retained where possible. The Proposed Development design allows for the retention of the majority of the trees identified with bat roosting potential, however, requires the removal of one tree. Four other trees	Details of bat survey timings are provided in a separate bat report

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
		with roosting potential could be subject to indirect impacts from disturbance during piling (to be determined) of the foundations of the road bridge to the south-east of the Site. Further surveys in the form of an aerial inspection survey of the tree to be removed is recommended which is to be carried out by an appropriately licensed ecologist to identify the presence or likely absence of roosting bats. It will be determined as to whether the other trees require survey due to risk of disturbance during the future proposed works. If bats are found a European Protected Species Licence would be sought. ■ In the event that bats are found to be present during aerial inspection survey as part of immediate pre-check works, works would be postponed, and advice sought from NRW. ■ Light spill on habitats suitable for supporting roosting or commuting bats to be avoided. Detailed measures on avoidance of impacts to bats from lighting will be secured through a CEMP. Details on measures to avoid bats during operation to be detailed in a Lighting Strategy. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	
Badger	Two setts were recorded during the Phase 1 survey. Suitable commuting, foraging and sett building habitat was recorded.	Clearance of suitable habitat should be checked in advance by a suitably qualified ecologist to minimise the risk of disturbance and injury / killing. Specific mitigation measures will require safeguarding by the implementation of a Precautionary Method of Works (PMoW) and Ecological Clerk of Works (ECoW). If significant land take / habitat clearance of suitable badger habitat is required, a pre-works check for badger is recommended due to the ability of badger to create new setts in a short space of time. The check should be carried out a minimum of two weeks in advance of works. Where badgers are found to be present, avoid impacts to potential setts by setting up exclusion zones. If disturbance to / destruction of setts cannot be avoided, then they must be excluded and closed under licence. Further surveys would be required to characterise the setts on Site and where access is possible, in the wider area.	Licences to exclude and close setts are only issued between 1st July and 30th November.

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
		GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	
Dormouse	Suitable nesting and foraging habitats were present within the Survey Area. Presence of dormouse recorded at the Site during surveys.	As significant land take / habitat clearance of suitable dormouse habitat is likely, a EPS licence should be sought from NRW, with a MS and appropriate mitigation prior to commencement of the Proposed Development. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	N/A
Otter	Risk of disturbance to otters and/or their resting places. Potential for loss of suitable habitat. Risk of indirect effects to river habitat such as pollution run-off.	An otter survey conducted on the River Rhymney found no evidence of otter or resting sites. It is assumed otter use the river corridor for commuting / foraging. If disturbance results to any resting sites or the Proposed Development results in resting sites being damaged/destroyed an EPS licence will need to be obtained to allow the work to proceed lawfully. Specific precautionary mitigation measures will require safeguarding by the implementation of a PMoW and ECoW. This would likely include a pre-works check to identify any new resting places/holts in proximity to the Proposed Development prior to works commencing. Detailed mitigation measures are provided in the Otter Survey Report (WSP, 2025b) and Habitats Regulations Assessment (WSP, 2025d). GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	N/A
Birds	Suitable habitats for foraging, commuting and nesting birds were identified within the Survey Area.	Where possible, any vegetation clearance should be carried out outside of the breeding bird season (i.e., work should be carried out between September and February inclusive). Where vegetation clearance must occur within the breeding bird season, work should proceed under a PMoW and ECoW. All vegetation should be checked by a suitably qualified ecologist immediately prior to removal.	Vegetation removal should be avoided from March to August in order to avoid impacts to breeding birds. Some birds breed

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
		Any active bird nests discovered would need to be demarcated with a suitable buffer and left undisturbed until nestlings have fledged or the nest becomes otherwise inactive. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	year-round no matter the season.
Reptiles	Suitable reptile habitat for commuting, basking and refuge was present within the Survey Area. Slow worm presence identified during surveys	Suitable habitat to be cleared should be checked in advance by a suitably qualified ecologist to minimise the risk of disturbance and injury / killing. Avoidance of vegetation clearance during the hibernation season, if possible. Specific mitigation measures will require safeguarding by the implementation of a PMoW and ECoW. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works. Detailed mitigation measures are provided in the Reptile mitigation Strategy (WSP, 2025c).	Any removal of vegetation or excavation work should be carried out in the active season (March until October) to avoid any hibernating reptiles.
Amphibians (including GCN)	Common / widespread species of amphibians may be present within Survey Area and its surrounding terrestrial habitat. There is a low risk of GCN to being present on Site.	Suitable terrestrial habitat to be cleared should be checked in advance by a suitably qualified ecologist to minimise the risk of disturbance and injury / killing. Specific mitigation measures will require safeguarding by the implementation of a PMoW and ECoW. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	Any removal of vegetation or excavation work should be carried out in the active season (March until October) to avoid any hibernating amphibians.
Hedgehog	Killing / injury of hedgehog through vegetation clearance / construction works.	Suitable habitat to be cleared should be checked in advance by a suitably qualified ecologist to minimise the risk of disturbance and injury / killing. Avoidance of vegetation clearance during the hibernation season, if possible. Specific mitigation measures will require safeguarding by the implementation of a PMoW and ECoW.	Hibernation period – October / November through to March / April.

Ecological Receptor	Potential Considerations	Further Survey / Mitigation Requirements*[6]	Seasonal Considerations
		GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	
Invertebrates	The Survey Area contained habitats suitable for common and widespread invertebrates.	It is recommended that enhancement measures for invertebrates are built into the Proposed Development and that habitats of value previously described are protected and retained where possible. GILEMP and CEMP to be produced in agreement with the LPA and employed throughout construction works.	N/A
INNS	Spread of Schedule 9 WCA plant species.	The areas where INNS are present should be avoided if possible. If land take and / or habitat clearance is required, targeted INNS mapping is recommended to map the extent of INNS throughout the Site. Specific measures targeted to preventing the spread of INNS should be designed by a specialist contractor prior to construction. A management plan should be written and implemented as part of the Proposed Development; this should include biosecurity measures to control the spread of INNS.	N/A

4.7. ENVIRONMENTAL BEST PRACTICE

4.7.1. General environmental protection measures must be implemented during the construction phase of the Proposed Development. Such measures include best environmental practice guidance outlined in the NRW Guidance for Pollution Prevention (NRW, 2018) and those outlined by the Construction Industry Research and Information Association guidance (CIRIA, 2023). The following minimum standards must be adhered to prevent ecological impacts beyond the Site boundary:

- Measures must be taken to prevent dust and other emissions from construction affecting land beyond the Site;
- Chemicals and fuels must be stored in secure containers located away from watercourses or water bodies. Spill kits must be available;
- Excavations must be covered or securely fenced (with no potential access points beneath fencing) when the Site is closed (e.g. overnight) to prevent entrapment of animals;
- Retained trees must be protected in accordance with BS5837 (British Standards Institution, 2012);
- Noise and vibration must be controlled and kept to the minimum necessary; and
- Lighting used for construction must be switched-off when not in use and positioned so as not to spill on to adjacent land or retained vegetation within the Site.

4.8. ECOLOGICAL ENHANCEMENT OPPORTUNITIES

4.8.1. PPW (Edition 12, 2024) states:

4.8.2. "*A Resilient Wales can be supported by protecting and providing sufficient scale, extent, diversity and connectivity within, and between, landscapes and habitats to maintain and enhance biodiversity and the resilience of ecosystems. This support will enable them to withstand the pressures of change, to tackle pollution, to protect and enhance water resources, to protect soils and to enable flood mitigation, the creation of carbon sinks (especially in urban areas), and to promote opportunities for social and economic activity based on valuing and enabling access to the natural, historic and built environment.*"

4.8.3. One of the seven goals of the Well-being of Future Generations (Wales) Act (2015) is to create a resilient Wales. This includes maintaining and enhancing 'a biodiverse natural environment with healthy functioning ecosystems that support…ecological resilience'.

4.8.4. NBB in association with development is encouraged by PPW (2024) and under Section 5.1.4 of Part 1 of the Environment (Wales) Act. NBB is achieved where a development can demonstrate that it has maintained and enhanced biodiversity and created resilient ecological networks (CIEEM, 2022). The following recommendations could deliver NBB and enable the Proposed Scheme to comply with PPW, the Environment (Wales) Act 2016 and the Wellbeing of Future Generations (Wales) Act 2015 with respect to biodiversity. By engaging with these recommendations in the early stages of the Proposed Scheme, it is hoped that ecosystem resilience and wider ecosystem benefits can be achieved. This approach would support local authorities in achieving their Section 5.1.4 duty to "promote the resilience of ecosystems" when determining planning applications.

4.8.5. The following measures are recommended for inclusion within the Proposed Development; where possible:

- Planting of a variety of native species as part of landscaping to promote invertebrate diversity and abundance. To incorporate species rich habitat mosaics and tree planting within landscaping, using native species.
- Ancient woodland ground floral plug planting or seeding within the woodland mosaic, where existing trees are removed or impacted by the Proposed Development.
- Installation of bird and bat boxes both in suitable mature trees and integrated in newly constructed structures to provide additional refuge sites for these species' groups.
- The incorporation of wildflower areas to provide additional habitat that is biodiverse and will provide resources for a range of species (e.g., nectar for butterflies and bees).
- Consideration of the inclusion of biodiverse green infrastructure within the Proposed Development (e.g. green roofs / green walls and bee banks).
- Retaining walls to be planted with native climbers such as ivy *Hedera helix*, honeysuckle *Lonicera periclymenum* and traveller's-joy *Clematis vitalba.*
- Sustainable Urban Drainage Systems (SUDS) to include features to include amphibians such as common toad.
- Installation of invertebrate hotels, and creation of habitat piles to provide refuge for reptiles, amphibians and hedgehog.
- Good horticultural practice should be employed, including the use of peat-free composts, mulches and soil conditioners and favouring native plants of local provenance in landscaping.
- Do not use of plant INNS listed on Schedule 9 of the WCA in the planting.

5. CONCLUSIONS

5.1.1. The Site predominantly comprises semi-natural broadleaved woodland, scrub, and grassland, with the River Rhymney flowing along the eastern boundary of the Site.

5.1.2. Four international sites were identified within 10km of the Site. These were Cardiff Beech Woods SAC, and the Severn Estuary SAC, SPA and Ramsar. The River Rhymney discharges into the Severn Estuary SAC, SPA and Ramsar, approximately 3.5km downstream.

5.1.3. The River Rhymney is located adjacent to the Site. The river is functionally linked to the Severn Estuary and therefore the Proposed Development and associated works may impact the Severn Estuary statutory designated sites, and therefore requires a Stage 1: HRSA. This assessment should be produced and reviewed in agreement with the LPA and NRW. Should Likely Significant Effects (LSE) be identified in the HRSA, this would trigger a Stage 2: Appropriate Assessment.

5.1.4. A total of nine non-statutory designated sites were identified within 1km of the Site, including one which was within the Site; a B-Line. Mitigation measures for SINCs are required to be agreed with the LPA. Production of an appropriate Method Statement for working within B-Lines, to be produced as part of a CEMP will be required.

5.1.5. Further surveys, avoidance and a Precautionary Method of Working (PMoW) to minimise adverse impacts has been recommended for sensitive habitats and species, including bats, GCN, badger, reptiles, amphibians, birds, and INNPS listed on Schedule 9 of the WCA. These measures will require safeguarding by the implementation of anGILEMP and CEMP throughout the development.

5.1.6. A EPS licence for dormice will be required for habitats that will be affected by the Proposed Development

5.1.7. Ecological enhancements are recommended, such as retention / creation of habitats e.g. wildflower areas and bird and bat box installation to increase the value of the Site for biodiversity. These will ensure a measurable NBB is achieved, ensuring the Proposed Development aligns with PPW (2024).

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7. FIGURES

Figure 1 - Site Location Plan

Figure 2 - International Statutory Designated Sites

Figure 3 - National Statutory Designated Sites

Figure 4 - Non-Statutory Designated Sites

Figure 5 - Phase 1 Habitat Map

Figure 6 – Ancient Woodland within 1km

Client:

Curtis Hall Ltd.

Project:

Cardiff East Park and Ride

Title

Site Location Map

Drawing No:	Figure 1	Drawn:	LT
Date:	19/11/2025	Checked:	GH
Scale:	8,000 @ A3	Approved:	GH

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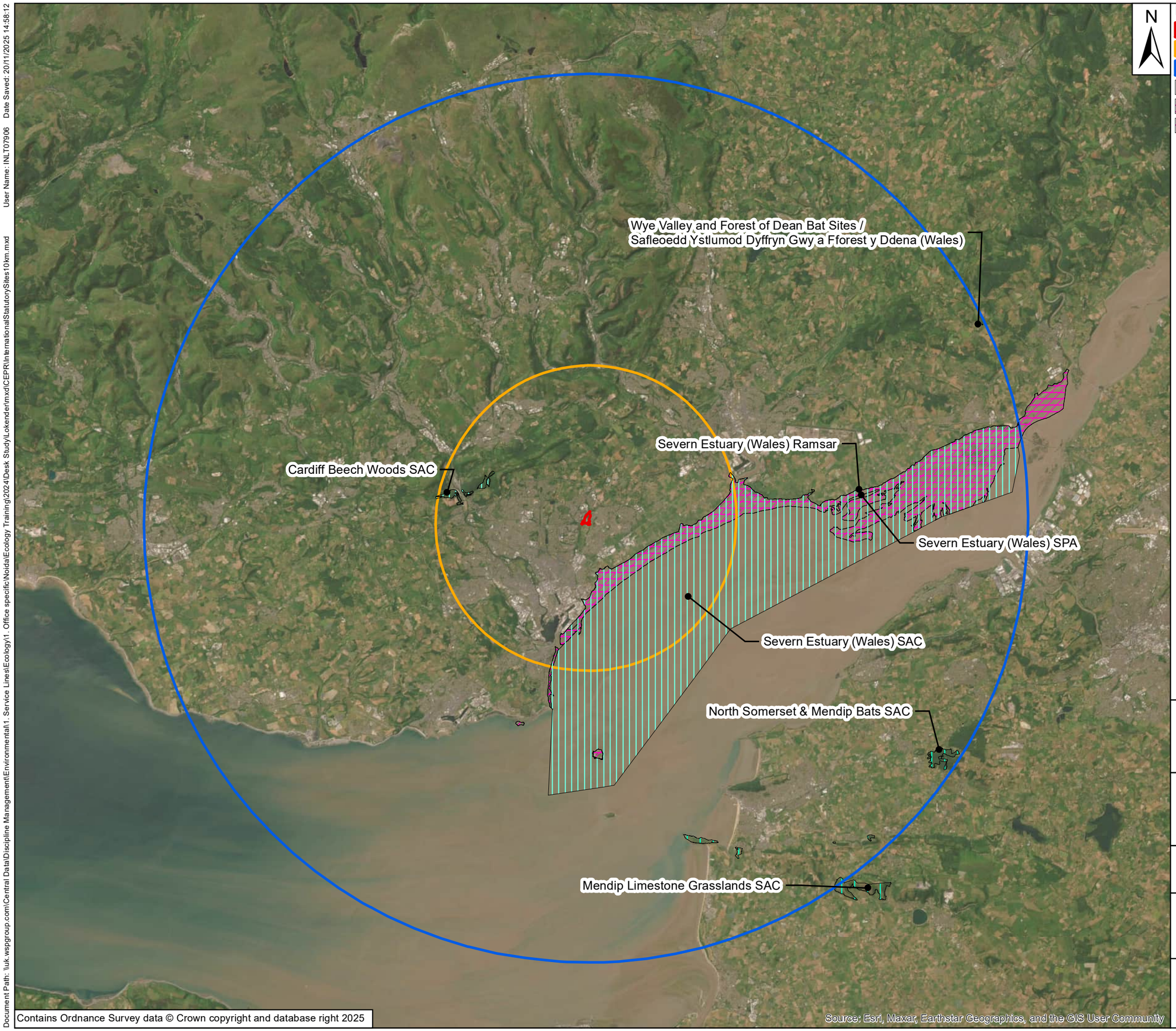

Key

- RLB
- 10km Buffer
- 30km Buffer
- Special Area of Conservation (SAC)
- Special Protection Areas (SPA)
- Ramsar Site

0 5 10
Kilometers

Client: Curtis Hall Ltd.

Project: Cardiff East Park and Ride

Title: International Statutory Designated Sites within 10km of the Site and Site designated for bats within 30km of the Site

Drawing No:	Figure 2	Drawn:	LT
Date:	20/11/2025	Checked:	GH
Scale:	250,000 @ A3	Approved:	KHF

N

Key

- Site Boundary
- 2km Buffer
- Local Nature Reserve (LNR)
- Site of Special Scientific Interest (SSSI)

0 400 800

Meters

wsp

Client: Curtis Hall Ltd.

Project: Cardiff East Park and Ride

Title: National Statutory Designated Sites within 2km of the Site

Drawing No: Figure 3 | Drawn: LT

Date: 20/11/2025 | Checked: GH

Scale: 21,000 @ A3 | Approved: GH

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Key

- Site Boundary
- 1kmRLBBuffer
- Buglife B-Lines
- Wildlife Site / SINC

0 400 800
Meters

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

wsp

Client: Curtis Hall Ltd.

Project: Cardiff East Park and Ride

Title: Non-Statutory Designated Sites within 1km of the Site

Drawing No:	Figure 4	Drawn:	LT
Date:	20/11/2025	Checked:	GH
Scale:	15,000 @ A3	Approved:	GH

N

Key

- Site Boundary
- OffSite Dormouse Habitat Planting Area

Phase 1 Habitat

- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- Scrub - scattered
- Poor semi-improved grassland
- Bracken - continuous
- Running water
- Hard standing
- Broadleaved parkland/scattered trees
- Fence
- Building

Target Notes

- TN1 & TN2 - Active outlier badger sett

0 250 500
Meters

Client: Curtis Hall Ltd.

Project: Cardiff East Park and Ride

Title: Phase 1 Habitat Map

Drawing No: Figure 5
Date: 20/11/2025
Scale: 8,000 @ A3
Drawn: LT
Checked: GH
Approved: GH

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wsp

Client:
Curtis Hall Ltd.

Project:
Cardiff East Park and Ride

Title
Ancient Woodlands
within 1km of the Site

Drawing No: Figure 6
Date: 20/11/2025
Scale: 15,000 @ A3
Drawn: LT
Checked: GH
Approved: GH

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Appendix A

RELEVANT LEGISLATION AND PLANNING POLICY

Public

ENGLAND & WALES LEGISLATION AND POLICY CONTEXT

This report has been compiled with reference to relevant wildlife legislation, planning policy and the UK Biodiversity Framework. An overview and context of relevant legislation is provided, with the relevant protection each species groups or species receives summarised in Table 1.

The Wildlife and Countryside Act 1981, (as amended) (WCA)

Protected birds, animals and plants are listed under Schedules 1, 5, 8 respectively of the WCA, while Schedule 9 lists non-native and/or invasive species the spread of which in the wild is prohibited by the WCA. A description of these Schedules and their meaning is provided below.

Under the WCA (England and Wales) all birds, their nests and eggs (with exception of species listed under Schedule 2) are protected by the WCA. It is an offence to:

- Intentionally kill, injure, or take any wild bird;
- Take or destroy an egg of any wild bird; and
- Damage or destroy the nest of any wild bird (whilst being built, or in use). Under the WCA the clearance of vegetation within the Site boundary, or immediately adjacent to the Site during the bird nesting season could result in an offence occurring by the disruption or destruction of nest sites. The bird breeding season can be taken to occur between March - August inclusive, although is subject to variations based on species, geographical and seasonal factors.

Schedule 1

Birds listed under Schedule 1 of the WCA[7] are afforded additional protection with regard to intentional or reckless disturbance whilst nest-building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Schedule 5

Species listed in Schedule 5 can either be fully protected or be partially protected under Section 9, which makes it unlawful to intentionally:

- Part 1: kill, injure or take;
- Part 2: possess or control (live or dead animal, part or derivative);
- Part 4 (a): damage or destruct any structure used for shelter or protection;
- Part 4 (b): disturb them in a place of shelter or protection;
- Part 4 (c): obstruct access to place of shelter or protection;
- Part 5 (a): sell, offer for sale, possess or transport for the purpose of sale (live or dead animal, part or derivative); and
- Part 5 (b): advertise for buying or selling.

[7] To view the current list of Schedule 1 listed birds visit: http://www.legislation.gov.uk/ukpga/1981/69/schedule/1 [Accessed 14/04/23].

Schedule 8

The Act makes it an offence (subject to exceptions) to pick, uproot, trade in, or possess (for the purposes of trade) any wild plant listed in Schedule 8, and prohibits the unauthorised intentional uprooting of such plants.

Schedule 9

Invasive species listed under Schedule 9 are prohibited from release into the wild and the Act prohibits planting or "causing to grow" in the wild of any plant species listed in Schedule 9. It should be noted that certain bird species listed on Schedule 1 of the WCA are also listed on Schedule 9 to prevent release of non-native and captive individuals, this includes barn owl, red kite, goshawk and corncrake.

Countryside Rights of Way Act 2000 (CRoW Act)

The CRoW Act has amended the WCA in England and Wales strengthening the protection afforded to Sites of Special Scientific Interest (SSSI) and the legal protection for threatened species. It adds the word 'reckless' to the wording of the offences listed under Section 9(4) of the WCA. This alteration makes it an offence to recklessly commit an offence, where previously an offence had to be intentional to result in a breach of legislation.

The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 (http://www.legislation.gov.uk/anaw/2016/3/contents/enacted) puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and cohesive way. Section 7 replaces the duty in Section 42 of the Natira; Environment and Rural Communities (NERC) Act 2006, and it places a duty on the Welsh Ministers to publish, review and revise lists of living organisms and types of habitats which they consider are of key significance to sustain and improve biodiversity in Wales. The species and habitat lists are identical to those in Section 42, but it should be noted it is currently under review (23.03.2017).

The Protection of Badgers Act (1992)

It is an offence to wilfully take, kill, injure, possess or ill-treat a badger. Under the Act their setts are protected against intentional or reckless interference. Sett interference includes damaging or destroying a sett, obstructing access to any part of the sett, or disturbance of a badger whilst it is occupying a sett. The Act defines a badger sett as 'any structure or place, which displays signs indicating the current use by a badger' and Natural England (NE) takes this definition to include seasonally used setts that are not occupied but that show sign of recent use by badgers (Natural England, 2009[8]).

If impacts to badgers or their setts are unavoidable then authorised sett disturbance requires a licence.

The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012)

This Framework lists the UK's most threatened species and habitats and sets out targets and objectives for their management and recovery. The UK Biodiversity Action Plan (BAP) process is delivered nationally, regionally and locally and should be used as a guide for decision-makers to

[8] Natural England, June 2009, Protection of Badgers Act 1992 (as amended), Guidance on 'Current Use' in the definition of a Badger Sett WMLG17, Natural England, Peterborough.

have regards for the targets set by the framework and the goals they aim to achieve. The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant (UK Post-2010 Biodiversity Framework, 2012[9]).

The Conservation of Habitats and Species Regulations 2017 (as amended)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. They also transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations came into force on 30th November 2017 and extend to England and Wales (including the adjacent territorial sea) and to a limited extent in Scotland (reserved matters) and Northern Ireland (excepted matters). In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transpose the Habitats Directive in relation to Northern Ireland.

All species listed under Annex IV of the Habitats Directive require strict protection and are known as European Protected Species (EPS). Under Regulation 42 of the Habitats Regulations it is unlawful to:

- Deliberately kill, capture or disturb;
- Deliberately take or destroy the eggs of; and
- Damage or destroy the breeding site/resting place of any species protected under this legislation.

If the Ecologist determines that impacts to an EPS are unavoidable then the works may need to be carried out under a site specific mitigation licence from Natural England (NE) or Natural Resources Wales (NRW). Low Impact Class licences are also available in both England and Wales for bats and great crested newts. This enables Registered Low Impact Consultants to undertake certain low impact activities reducing the EPS application paperwork and process length.

Certain EPS are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation. This means these species are a relevant consideration in a Habitats Regulations Assessment (HRA).

The Birds Directive seeks to maintain populations of all wild bird species across their natural range (Article 2). All bird species listed under Annex I[10] of the Birds Directive are rare or vulnerable and afforded protection by the classification of Special Protection Areas (SPAs), these are also designated under all regularly occurring migratory species, with regard to the protection of wetlands of international importance (Article 4). This means these bird species and communities are a relevant consideration in HRA.

[9] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), July 2012, UK Post-2010 Biodiversity Framework, Available from: http://jncc.defra.gov.uk/pdf/UK_Post2010_Bio-Fwork.pdf [Accessed 14/04/23].

[10] To view birds listed under Annex I visit: http://ec.europa.eu/environment/nature/conservation/wildbirds/threatened/index_en.htm [accessed 14/04/23].

Table A-1 - Key Species and National Wildlife Legislation, Policy and Biodiversity Framework Applicable in England & Wales

Species	Legislation, Planning Policy and UK Biodiversity Framework							
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of /Habitats and Species Regulations 2010 (as amended) (Habitats Regulations) - Regulation 41	The Environment (Wales) Act (2016)	The Protection of Badgers Act 1992	The UK Post-2010 Biodiversity Framework 2011-2020 (JNCC and DEFRA, 2012)
	Schedule1	Schedule 5	Schedule 8	Schedule 9	European Protected Species (Annex IV of the EC Habitats Directive),			
Badger							✓	
Bats		✓[11](part)			✓[12]	✓[13]		✓[14]
Hazel Dormouse		✓5(part)			✓	✓		✓
Otter		✓5(part)			✓	✓		✓
Water vole		✓[15](full)				✓		✓
Birds	✓			✓[16]		✓[17]		✓[18]
Reptiles		✓[19](part)		✓[9]	✓[20]	✓[21]		✓[22]

[11] These species are partially protected under section 9(4)(b), (4)(c) and (5).

[12] Only Barbastelle (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteinii*), greater horseshoe bat (*Rhinolophus ferrumequinum*) and lesser horseshoe bat (*Rhinolophus hipposideros*) are listed on Annex II of the Habitats Directive.

[13] Greater horseshoe bat, lesser horseshoe bat, Bechstein's bat, noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*) and barbastelle are listed as Species of Principal Importance in England with the addition of common pipistrelle (*Pipistrellus pipistrellus*) in Wales listed under
Section 7 of the Environment (Wales) Act (2016) http://www.legislation.gov.uk/ukpga/2006/16/contents.

[14] Barbastelle bat, Bechstein's bat, noctule, soprano pipistrelle, brown long-eared bat, greater horseshoe bat, lesser horseshoe bat are listed as UK BAP species of bat.

[15] Class Licences are available to Registered Consultants to intentionally disturb, damage or destroy water vole burrows or to displace water voles from their burrows in relation to a development proposal where the licensed action provides a conservation benefit for water voles. Certain displacement operations may be carried out under a Class licence by a registered person in England, however in Wales all displacement operations must be carried out under a site specific licence.

[16] To view plants and animals listed on Schedule 9 Part 1 visit http://www.legislation.gov.uk/ukpga/1981/69/schedule/9 [accessed 6 April 2017]

[17] There are 49 species of birds listed as Species of Principal Importance in England in Section 41 of the NERC Act 2006 and 51 species in Wales under Section 7 of the Environment (Wales) Act (2016) http://www.legislation.gov.uk/ukpga/2006/16/contents.

[18] To view the current list of UK BAP priority birds visit: http://jncc.defra.gov.uk/page-5163 [Accessed 14/04/23].

[19] The four common reptile species, Adder (*Vipera berus*), Grass snake (*Natrix natrix*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5). The rarer UK reptile species (Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*)) are partially protected under section 9(4)(b) and (c) and (5).

[20] Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*) are the only reptiles to be designated as European Protected Species.

[21] All 6 reptile species are listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 5 species, excluding smooth snake, listed under Section 7 of the Environment (Wales) Act (2016) http://www.legislation.gov.uk/ukpga/2006/16/contents.

[22] To view the current list of UK BAP priority herptile species visit: http://jncc.defra.gov.uk/page-5166 [Accessed 14/04/23].

Species	Legislation, Planning Policy and UK Biodiversity Framework							
	Wildlife and Countryside Act 1981 (as amended), (WCA)				The Conservation of /Habitats and Species Regulations 2010 (as amended) (Habitats Regulations) - Regulation 41	The Environment (Wales) Act (2016)	The Protection of Badgers Act 1992	The UK Post-2010 Biodiversity Framework 2011-2020 (JNCC and DEFRA, 2012)
	Schedule1	Schedule 5	Schedule 8	Schedule 9	European Protected Species (Annex IV of the EC Habitats Directive),			
Amphibians		✓[23](part)		✓[24]	✓[25],[26]	✓[27]		
White-clawed Crayfish		✓[28](partial)			✓[29]	✓		✓
Invertebrates		✓[30](full/part)		✓	✓[31],[32]	✓[33]		✓[34]
Fish		✓[35](full/part)		✓[9]	✓[36],[37]	✓[38]		✓[39]
Plants			✓[40]	✓[9]	✓[41],[42]	✓[43]		✓[44]

[23] The four common reptile species, Adder (*Vipera berus*), Grass snake (*Natrix natrix*), Common lizard (*Zootoca vivipara*) and Slow worm (*Anguis fragilis*) are offered partial protection under section 9(5). The rarer UK reptile species (Smooth snake (*Coronella austriaca*) and Sand lizard (*Lacerta agilis*)) are partially protected under section 9(4)(b) and (c) and (5).

[24] Common frog (*Rana temporaria*), Common toad (*Bufo bufo*), Smooth newt (*Lissotriton vulgaris*) and Palmate newt (*Lissotriton helveticus*) are offered partial protection under section 9(5). Great crested newt (*Triturus cristatus*) and Natterjack toad (*Epidalea calamita*) are offered partial protection under section 9(4)(b) and (c) and (5). Pool frog (*Pelophylax lessonae*) is offered partial protection under section 9(4)(b) and (c)(1) only and with respect to England only.

[25] Great crested newt, Natterjack toad and Pool frog are the only amphibians to be designated European Protected Species.

[26] Great crested newt is the only amphibian listed on Annex II of the Habitats Directive.

[27] Great crested newt, Natterjack toad and Common toad are listed as Species of Principal Importance in England in Section 41 of the NERC Act 2006 and under Section 7 of the Environment (Wales) Act (2016) http://www.legislation.gov.uk/ukpga/2006/16/contents.

[28] Under the Wildlife and Countryside Act it is illegal to take or sell white clawed crayfish under the WCA. A licence is required to survey (hand net or trap) for the species. To undertake work within WCC inhabited rivers a Class Licence maybe issued by the relevant authority to move WCC away from harm prior to works. Although WCC are not protected from killing or injury Natural England state in their Class licence that due to declining numbers all efforts should be made to conserve the species.

[29] White clawed crayfish are listed under Annex II and V of the Habitats Directive.

[30] To view the current list of invertebrates that are protected under this Act either in part or full visit: http://www.legislation.gov.uk/ukpga/1981/69/schedule/5 [Accessed 14/04/23].

[31] The Large blue butterfly (*Maculinea arion*), Fisher's estuarine moth (*Gortyna borelii lunata*) and Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) are the only invertebrates to be designated European Protected Species.

[32] There are currently twelve invertebrates listed in Annex II of the Habitats Directive; White-clawed crayfish (*Austropotamobius pallipes*), Southern damselfly (*Coenagrion mercuriale*), Marsh fritillary butterfly (*Eurodryas aurinia*), Violet click beetle (*Limoniscus violaceus*), Stag beetle (*Lucanus cervus*), Freshwater pearl mussel (*Margaritifera margaritifera*), Narrow-mouthed whorl snail (*Vertigo angustior*), Round-mouthed whorl snail (*Vertigo genesii*), Geyer's whorl snail (*Vertigo geyeri*), Desmoulin's whorl snail (*Vertigo moulinsiana*), Lesser whirlpool ram's-horn snail (*Anisus vorticulus*) and Fisher's estuarine moth (*Gortyna borelii lunata*).

[33] There are currently 379 invertebrate species (not including marine species) listed as Species of Principal Importance in England http://www.google.co.uk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwivvu7J9trSAhXiCsAKHX4TBGcQFggvMAM&url=http%3A%2F%2Fpublications.naturalengland.org.uk%2Ffile%2F6518755878240256&usg=AFQjCNEpiUWYuOqhVcfSDvi_3iK2TJytfQ and 188 species in Wales http://www.eryri-npa.gov.uk/__data/assets/pdf_file/0003/486156/SpeciesList.pdf listed under Section 41 of the NERC Act 2006 and listed under Section 7 of the of the Environment (Wales) Act 2016. [Accessed 14/04/23]

[34] To view the current list of UK BAP priority invertebrates visit: http://jncc.defra.gov.uk/page-5169 [Accessed 14/04/23].

[35] To view the current list of fish either part or fully protected under the Act visit: http://www.legislation.gov.uk/ukpga/1981/69/schedule/5 [Accessed 14/04/23].

[36] Sturgeon (*Acipenser sturio*) is the only fish to be designated a European Protected Species.

[37] There are eight fish species listed on Annex II of the Habitats Directive. To view the current list visit: http://jncc.defra.gov.uk/page-1523 [Accessed 14/04/23].

[38] There are 35 species of fish listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 10 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.

[39] To view the current list of UK BAP priority fish visit: http://jncc.defra.gov.uk/page-5164 [Accessed 14/04/23].

[40] To view the current list of Schedule 8 listed plants visit: http://www.legislation.gov.uk/ukpga/1981/69/schedule/8 [Accessed 14/04/23].

[41] There are nine plant species designated as European Protected Species. To view the current list visit: http://www.legislation.gov.uk/uksi/2010/490/schedule/5/made [Accessed 14/04/23].

[42] To view the current list of plant species on Annex II of the Habitats Directive visit: http://jncc.defra.gov.uk/page-1523 [Accessed 14/04/23].

[43] There are currently 152 vascular plants listed as Species of Principal Importance in England listed under Section 41 of the NERC Act 2006 and 77 species in Wales listed under Section 7 of the Environment (Wales) Act 2016.[31] To view the current list of UK BAP priority plants visit: http://jncc.defra.gov.uk/page-5171 and http://jncc.defra.gov.uk/page-5168 [Accessed 14/04/23].

[44] To view the current list of UK BAP priority plants visit: http://jncc.defra.gov.uk/page-5171 and http://jncc.defra.gov.uk/page-5168 [Accessed 14/04/23].

Appendix B

SUMMARY OF ECOLOGICAL DESK STUDY DATA

Public

Table B-1 - Protected and notable species of terrestrial mammals for which records have been identified within 1km of the Site

Species Common Name	Species Latin Name	No. of Records	Distance and Orientation from Centre of Site	Legal / Conservation Status [45]
Badger	*Meles meles*	1	694m southwest	PBA,
Brown Long-eared Bat	*Plecotus auritus*	1	797m west	EPS, HDir, WCA5, S7, RDB2(UK)
Common Pipistrelle	*Pipistrellus pipistrellus*	1	795m west	EPS, HDir, WCA5, S7, RDB2(UK),
Grey Squirrel	*Sciurus carolinensis*	2	251m south	WCA9, INNS
Hazel Dormouse	*Muscardinus avellanarius*	2	544m south	EPS, HDir, WCA5, S7, RDB2(UK),
Hedgehog	*Erinaceus europaeus*	3	251m south	S7
Noctule	*Nyctalus noctula*	2	763m south	EPS, HDir, WCA5, S7, RDB2(UK)
Soprano Pipistrelle	*Pipistrellus pygmaeus*	1	796m west	EPS, HDir, WCA5, S7, RDB2(UK)

Table B-2 - Protected and notable species of reptiles and amphibians for which records have been identified within 1km of the Site

Species Common Name	Species Latin Name	No. of Records	Distance and Orientation from Centre of Site	Legal / Conservation Status [46]
Common frog	*Rana temporaria*	1	237m south	HDir, WCA5, Bern

Table B-2 - Protected and Notable Birds for which records have been Identified within 2km of the Centre of the Site

[45] HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 41 Natural Environment and Rural Communities Act (2006), LBAP = Local Biodiversity Action Plan, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce).

[46] HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 41 Natural Environment and Rural Communities Act (2006), LBAP = Local Biodiversity Action Plan, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce).

Species Common Name	Species Latin Name	No. of records	Distance from Centre of Site	Legal / Conservation Status [47]
Black-headed Gull	*Chroicocephalus ridibundus*	2	521m west	BDir22, S7
Bullfinch	*Pyrrhula pyrrhula*	1	994m south	S7, WBR(RSPB),
Canada Goose	*Branta canadensis*	2	694m southwest	BDir21, WCA9, INNS
Coot	*Fulica atra*	7	490m west	BDir21, WBAm(RSPB)
Cormorant	*Phalacrocorax carbo*	2	694m southwest	WBAm(RSPB)
Dipper	*Cinclus cinclus*	1	694m southwest	Bern, WBAm(RSPB)
Dunnock	*Prunella modularis*	4	523m southwest	S7, Bern
Goldcrest	*Regulus regulus*	3	Within the Site	Bern, WBAm(RSPB)
Green Woodpecker	*Picus viridis*	5	Within the Site	Bern, WBAm(RSPB)
Greenfinch	*Chloris chloris*	1	994m south	Bern, WBAm(RSPB)
Grey Heron	*Ardea cinerea*	2	694m west	WBAm(RSPB)
Grey Wagtail	*Motacilla cinerea*	3	694m west	Bern, WBAm(RSPB), UKBR(RSPB)
Herring Gull	*Larus argentatus*	2	694m west	BDir22, S7, WBR(RSPB), UKBR(RSPB)
House Sparrow	*Passer domesticus*	4	338m east	S7, WBAm(RSPB), UKBR(RSPB)
Kingfisher	*Alcedo atthis*	3	Within the Site	BDir1, WCA1, Bern, WBAm(RSPB)
Lesser Black-backed Gull	*Larus fuscus*	6	230m south	BDir22, WBAm(RSPB)
Linnet	*Linaria cannabina*	1	994m south	S7, Bern, WBR(RSPB), UKBR(RSPB),

[47] HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 41 Natural Environment and Rural Communities Act (2006), LBAP = Local Biodiversity Action Plan, BoCC Red = Birds of Conservation Concern Red List, BoCC Amber = Birds of Conservation Amber List.

Species Common Name	Species Latin Name	No. of records	Distance from Centre of Site	Legal / Conservation Status [47]
Long-tailed Tit	*Aegithalos caudatus*	5	523m west	WBAm(RSPB)
Mallard	*Anas platyrhynchos*	5	521m west	BDir21, WBAm(RSPB)
Meadow Pipit	*Anthus pratensis*	1	994m west	Bern, WBAm(RSPB)
Mistle Thrush	*Turdus viscivorus*	6	694m west	BDir22, Bern, WBAm(RSPB), UKBR(RSPB)
Oystercatcher	*Haematopus ostralegus*	1	994m west	BDir22, WBAm(RSPB)
Peregrine	*Falco peregrinus*	3	694m west	BDir1, WCA1, Bern, CITES
Redwing	*Turdus iliacus*	1	994m west	BDir22, WCA1, WBAm(RSPB), UKBR(RSPB)
Reed Bunting	*Emberiza schoeniclus*	1	994m west	S7, Bern, WBAm(RSPB)
Sand Martin	*Riparia riparia*	1	994m west	Bern, WBAm(RSPB)
Snipe	*Gallinago gallinago*	1	994m west	BDir21, WBAm(RSPB)
Song Thrush	*Turdus philomelos*	5	251m south	BDir22, S7, Bern, WBAm(RSPB), UKBR(RSPB)
Starling	*Sturnus vulgaris*	1	694m west	BDir22, S7, Bern, WBR(RSPB), UKBR(RSPB)
Swallow	*Hirundo rustica*	4	199m south	Bern, WBAm(RSPB)
Swift	*Apus apus*	5	448m south	WBAm(RSPB)
Whitethroat	*Curruca communis*	1	994m west	WBR(RSPB)
Wigeon	*Mareca penelope*	1	994m west	BDir21, CITES, WBAm(RSPB)

Table B-3 - Protected and Notable Invertebrates for which records have been identified within 2km of the Centre of the Site

Species Common Name	Species Latin Name	No. of records	Legal / Conservation Status [48]
Banded Demoiselle	*Calopteryx splendens*	1	
Beautiful Demoiselle	*Calopteryx virgo*	2	
Cinnabar	*Tyria jacobaeae*	4	S7
Long-winged Cone-head	*Conocephalus fuscus*	2	
Purple Hairstreak	*Favonius quercus*	2	LBAP
Red-eyed Damselfly	*Erythromma najas*	1	
Small Heath	*Coenonympha pamphilus*	2	S7, RDB1(UK) - NT
Small Pearl-bordered Fritillary	*Boloria selene*	1	S7, RDB1(UK) - NT

Table B-4 - Notable Plant Species for which records have been identified within 2km of the Centre of the Site

Species Common Name	Species Latin Name	No. of Records	Legal / Conservation Status [49]
Alder Buckthorn	*Frangula alnus*	1	
Bluebell	*Hyacinthoides non-scripta*	3	WCA8,
Butterfly-bush	*Buddleja davidii*	1	INNS
Corn Marigold	*Glebionis segetum*	1	RDB1(UK) - VU
Cornflower	*Centaurea cyanus*	1	S7, RDB1(Wales) - CR
Greater Pond-sedge	*Carex riparia*	1	
Grey Field-speedwell	*Veronica polita*	1	
Himalayan Balsam	*Impatiens glandulifera*	2	WCA9, INNS

[48] HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 41 Natural Environment and Rural Communities Act (2006), LBAP = Local Biodiversity Action Plan, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce).

[49] HabReg = Conservation of Habitats and Species Regulations (2017), W&CA = Wildlife and Countryside Act (1981), NERC = Schedule 41 Natural Environment and Rural Communities Act (2006), LBAP = Local Biodiversity Action Plan, RD1 (UK) = UK Red Data Book listing based on IUCN guidelines, RD2 (UK) = UK Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce).

Species Common Name	Species Latin Name	No. of Records	Legal / Conservation Status [49]
Himalayan Honeysuckle	*Leycesteria formosa*	1	INNS
Hyacinthoides non-scripta x hispanica = H. x massartiana	*Hyacinthoides non-scripta x hispanica = H. x massartiana*	1	INNS
Montbretia	*Crocosmia aurea x pottsii = C. x crocosmiiflora*	1	WCA9, INNS
Scots Pine	*Pinus sylvestris*	1	RDB2 (UK) - S
Small-flowered Crane's-bill	*Geranium pusillum*	1	
Snowberry	*Symphoricarpos albus*	2	INNS
Spanish Bluebell	*Hyacinthoides hispanica*	1	INNS
Thin-spiked Wood-sedge	*Carex strigosa*	1	
Three-cornered Garlic	*Allium triquetrum*	1	WCA9, INNS
White Stonecrop	*Sedum album*	1	INNS

Appendix C

PLANT SPECIES RECORDED

Common Name	Latin Name	Frequency (DAFOR)
A1.1.1 Broadleaved woodland – semi-natural		
Ash	*Fraxinus excelsior*	F
Apple	*Malus sylvestris*	R
Bracken	*Pteridium aquilinum*	F
Bramble	*Rubus fructicosus* agg.	A to R
Foxglove	*Digitalis purpurea*	R
Goat willow	*Salix caprea*	D
Hard shield-fern	*Polystichum aculeatum*	O
Hazel	*Corylus avellana*	A to R
Indian balsam	*Impatiens glandulifera*	F
Holly	*Ilex aquifolium*	R
Nettle	*Urtica dioica*	R
Rosebay willowherb	*Chamaenerion angustifolium*	R
Sessile oak	*Quercus petraea*	A
Silver birch	*Betula pendula*	R
Soft rush	*Juncus effusus*	F
Soft shield-fern	*Polystichum setiferum*	O
Willow species	*Salix* sp.	R
A2.1 – Scrub – dense/continuous		
Beech	*Fagus sylvatica*	R
Bracken	*Pteridium aquilinum*	F
Bramble	*Rubus fructicosus* agg.	F to R
Gorse	*Ulex europaeus*	D to R
Hogweed	*Heracleum sphondylium*	F
Japanese knotweed	*Reynoutria japonica*	O
Meadow buttercup	*Ranunculus acris*	R
Red clover	*Trifolium pratense*	O

Common Name	Latin Name	Frequency (DAFOR)
Ribwort plantain	*Plantago lanceolata*	R
Soft rush	*Juncus effusus*	R
Tufted vetch	*Vicia cracca*	R
Yorkshire-fog	*Holcus lanatus*	O
A2.2 – Scrub - scattered		
Gorse	*Ulex europaeus*	F
Himalayan balsam	*Impatiens glandulifera*	F
Willow	*Salix* sp.	F
A3.1 – Broadleaved parkland/scattered trees		
Ash	*Fraxinus excelsior*	F to O
Sessile oak	*Quercus petraea*	D to R
Sycamore	*Acer pseudoplatanus*	O to R
Willow species	*Salix* sp.	F to R
B6 – POOR SEMI-IMPROVED GRASSLAND		
Bilberry	*Vaccinium myrtillus*	R
Common bent	*Agrostis capillaris*	A to R
Common sorrel	*Rumex acetosa*	R
Gorse	*Ulex europaeus*	R, LF
Himalayan balsam	*Impatiens glandulifera*	F
Marsh thistle	*Cirsium palustre*	R
Nettle	*Urtica dioica*	R
Perennial rye-grass	*Lolium perenne*	LA
Purple moor-grass	*Molinia caerulea*	F to O
Sheep's fescue	*Festuca ovina*	O
Soft rush	*Juncus effusus*	O, LD
Sweet vernal-grass	*Anthoxanthum odoratum*	O to R

Common Name	Latin Name	Frequency (DAFOR)
Yorkshire-fog	*Holcus lanatus*	D

Appendix D

TARGET NOTES

Table D-1 - Target Notes

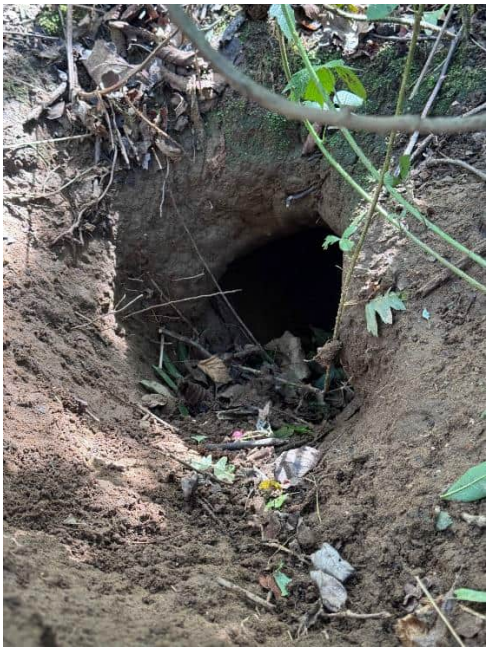
Target Note	Description
TN1	Partially used outlier within dense scrub habitat in the southwest of the Site.
TN2	Partially used outlier within semi-improved grassland, adjacent to broadleaved woodland, Off-Site.

Appendix E

PHOTOGRAPHS

Table E-1 - Photographs - Phase 1 Habitat Survey

Photographs and descriptions	
E1 – Broadleaved woodland within the Site.	E2 – Dense continuous scrub within the Site
E3 – Scattered scrub within the Site	E4 - Scattered trees within the Site.
E5 – Poor semi-improved grassland within the Site	E6 – Pathways that cross the Site.



E7 – Partially used outlier badger sett.

E8 – Partially used outlier badger sett.

E9 – The River Rhymney.

E10 – Scattered scrub and grassland within the off-Site Dormouse Habitat Planing Area.

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Curtis Hall Ltd

CARDIFF EAST PARK AND RIDE, LLANRUMNEY

BAT REPORT

ECO_BATS
DECEMBER 2025

PUBLIC

Curtis Hall Ltd

CARDIFF EAST PARK AND RIDE

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APPENDIX A

BAT ACTIVITY SURVEY DATA

APPENDIX B

PHOTOGRAPHS

EXECUTIVE SUMMARY

WSP UK Ltd (WSP) was commissioned by Curtis Hall Ltd to undertake bat surveys in support of the proposed redevelopment of land off Eastern Avenue, west of Llanrumney in Cardiff (central National Grid Reference: ST 21287 80932) hereafter referred to the 'Site'. These surveys were designed to inform the ecological assessment of the Site and provide evidence to support the planning process of the demolition and redevelopment proposals as outlined within this report (the 'Proposed Development').

The surveys carried out included bat activity surveys in the form of automated static detector surveys Day-time and Night-time Bat Walkovers (DBW & NBWs) to assess the suitability of the Site for commuting and foraging bats, and a Ground Level Tree Assessment (GLTA) of the Site to identify trees which have suitability to support roosting bats.

Overall, bat activity surveys within the Site recorded at least eleven bat species including: barbastelle *Barbastella barbastellus*; brown long-eared *Plecotus auritus*; common pipistrelle *Pipistrellus pipistrellus*; Daubenton's bat *Myotis daubentonii*; greater horseshoe *Rhinolophus ferrumequinum*; Leisler's bat *Nyctalus leisleri*; lesser horseshoe *Rhinolophus hipposideros*; myotis bat species *Myotis spp.*; Nathusius' pipistrelle *Pipistrellus nathusii*; noctule *Nyctalus noctula*; serotine *Cnephaeus serotinus*; and soprano pipistrelle *Pipistrellus pygmaeus*.

Automated static detector surveys and NBWs identified that linear habitats such as woodland/grassland edges and scrub are important for bat activity across the Site. The River Rhymney also provided an evident commuting corridor, as supported by results from Static 3. According to current design, the Proposed Development largely retains commuting and foraging corridors for bats within the Site by retaining suitable and connected habitat around the perimeter of the Site. However, vegetation clearance for the installation of the proposed road bridge may cause minimal and non-significant fragmentation to these corridors.

15 trees were identified as having Potential Roost Features (PRFs) during the GLTA. Only T8 was scheduled for removal with T9 – T13 located within 60 to 100m of the potential driven piling activities associated with the bridge construction.

Recommendations are outlined within this report follow a step-wise approach of avoiding habitats and features sensitive to bats in the first instance. Additional measures include:

- Where habitat loss is anticipated, habitat replacement and enhancement is proposed in accordance with the existing Woodland Management Plan (WMP) (A. T. Coombes Associates Ltd., 2025) and the forthcoming dormouse licence application (2025) for this Site;
- adherence to the external lighting strategy for security lighting during construction and operation, and following sensitive lighting measures as secured through a CEMP during limited construction periods;
- further survey of T8, and potentially T9, T10, T12 and T13 if deemed required depending on piling requirements;
- pre-works checks of any trees identified as having bat roosting suitability which will be impacted by the Proposed Development; and
- ecological enhancement opportunities in relation to landscape, bolstering of existing commuting and foraging routes for bats and provision of future roosting opportunities.

1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. WSP UK Ltd (hereafter referred to as 'WSP') was commissioned by Curtis Hall Ltd to undertake bat surveys in support of the proposed redevelopment of land off Eastern Avenue, west of Llanrumney in Cardiff (central National Grid Reference: ST 21287 80932); hereafter referred to as the 'Site', as shown in Figure 1. These surveys were designed to inform the ecological assessment of the Site and provide evidence to support the planning process.

1.1.2. The proposals are as follows, and are hereafter referred to as the 'Proposed Development';

> *'Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works.'*

1.1.3. The proposed works on the Site will be conducted under a dormouse licence which is currently being prepared. Three dormouse bridges crossing the River Rhymney off-Site will be incorporated into the Proposed Development and are required under the planning application ref: 22/02673/FUL.

1.1.4. The Site is located in the east of Cardiff between the villages of Pentwyn and Llanrumney. The A48 runs along the western edge of the Site within land to the north-west of Whitchurch Village and is surrounded by residential areas on all sides except to the north. The Site comprises a mosaic of poor semi-improved grassland, scrub, and areas of semi-natural broadleaved woodland, interspersed with hardstanding associated with the former 'Cardiff East Park and Ride' car park. The surrounding landscape includes residential areas, linear tree belts, and the River Rhymney corridor which flows along the southern and eastern boundaries of the Site. These landscape features provide potential habitat connectivity for commuting and foraging bats.

1.1.5. The purpose of this report is to present the findings of targeted bat surveys undertaken by WSP between April and October 2025. These comprised automated static detector surveys, Night-time Bat Walkovers (NBWs), Day-time Bat Walkover (DBW) and Ground Level Tree Assessment (GLTA). The surveys were undertaken to characterise activity levels across the Site and bat roosting suitability, and to inform the assessment of potential impacts associated with the Proposed Development.

1.2. ECOLOGICAL BACKGROUND

1.2.1. A Preliminary Ecological Appraisal (PEA) report was produced by WSP in December 2025 (WSP, 2025) to establish the ecological baseline for the Site. This updated and supplemented earlier ecological assessments undertaken by Delta-Simons, including a PEA (Delta-Simons, 2021). The assessment identified habitats of ecological interest and evaluated the potential of the Site to support protected and notable species, including roosting, commuting and foraging bats.

1.2.2. The 2021 PEA identified foraging habitat of moderate suitability in the form of woodland, scrub, grassland and the River Rhymney corridor. The report also identified that there were no buildings within the Site with Potential Roost Features (PRFs), however, four trees were identified with PRFs.

Two were assessed as having low potential, one with moderate and one with high bat roosting potential[1]. These locations are shown as T1, T4, T5 and T6 on Figure 2.

1.2.3. Following on from this visit a Bat Roost Potential (BRP) survey was carried out by Delta-Simons in 2022 (Delta-Simons, 2023). This survey identified a further two trees (T2 and T3) and a group of trees (T7) with PRFs, all with low potential. The locations of these trees are also shown on Figure 2.

1.2.4. To further support these findings, a Preliminary Arboricultural Impact Assessment (AIA) (A.T. Coombes Associates Ltd., 2025) and associated tree surveys were carried out at the Cardiff Park and Ride East site to inform development planning. The site was described as comprising a mix of woodland, tree groups, and open ground, including areas designated as Ancient Semi-Natural Woodland (ASNW) along the River Rhymney. The surveys identified individual trees, tree groups, and woodland parcels with high-quality riparian and linear woodland habitat suitable for wildlife, including bats.

1.2.5. Finally, an incidental record of a tree with a PRF of low potential was identified in 2024 during a Site visit with the client and a WSP ecologist. This is shown as T8 on Figure 2.

1.2.6. The desk study associated with the 2025 PEA returned five bat records within 1km of the Site, with no confirmed roost sites. The closest record was of a noctule bat *Nyctalus noctula*, observed approximately 763m south of the Site. While the dataset was limited, the records indicate the presence of bats within the local landscape.

1.2.7. The Phase 1 habitat survey and DBW which was carried out alongside the 2025 PEA, identified habitats suitable for commuting and foraging bats, particularly the linear woodland, lines of trees, scrub, and the River Rhymney corridor, which was deemed to provide suitable habitat for species such as Daubenton's bat *Myotis daubentonii*. These habitats were considered to offer valuable foraging resources and flight lines within the local landscape.

1.2.8. This data provides useful context for understanding the current baseline for bats within the Site and assessing potential impacts associated with the Proposed Development.

1.3. BRIEF AND OBJECTIVES

1.3.1. Based on this ecological baseline, Curtis Hall Ltd commissioned WSP to undertake targeted bat surveys of the Site to gather further data to appropriately inform the Proposed Development. The objectives of these surveys were to:

- Carry out bat activity surveys in the form of automated static detector surveys and NBWs to assess the suitability of the Site for commuting and foraging bats;
- Carry out a GLTA of the trees identified during DBW as having suitability to support roosting bats;
- Provide baseline ecological information regarding the presence or likely presence of bats and other protected or notable species within the Site and surrounding habitats; and
- Provide recommendations to enable compliance with relevant nature conservation legislation and planning policy, including avoidance, mitigation, or enhancement measures where required.

[1] Measuring bat roosting potential of trees as 'low', 'moderate' and 'high', is based on the previous version of best practice guidance for carrying out this type of tree assessment (Collins, 2016). This would have been the most updated version of the guidance at the time of the survey. See '2. Methods' of this report, for details of most up to date methodology.

2. METHODS

2.1. BAT ACTIVITY SURVEYS

AUTOMATED STATIC DETECTOR SURVEY

2.1.1. In order to characterise and understand bat activity across the Site, three automated static detectors (Song Meter Mini Bat 2's) were installed at pre-determined locations across the Site. These locations are shown in Figure 1 and are also listed below:

- Static 1, //festivity.tables.left, ST 21402 81187.
- Static 2, //outer.thus.neck, ST 21101 80784.
- Static 3, //union.issued.cried, ST 21329 80712.

2.1.2. Detectors were deployed for monthly survey periods from April to October 2025. Each deployment ran for a minimum of five consecutive nights, unless specified in the limitations; section 2.4.

2.1.3. The detectors were set to commence recording at least 30 minutes before sunset and cease recording 30 minutes after sunrise. The recordings of bat echolocation calls collected during the surveys were analysed using specialist computer software (Kaleidoscope Pro V5.6.0), details are provided below.

2.1.4. Automated static detector surveys were carried out following good practice guidance (Collins, 2023).

NIGHT-TIME BAT WALKOVER

2.1.5. Three NBW were undertaken at the Site to supplement the automated static detector data. The surveys were carried out on 27 June, 26 August, and 7 October 2025. Each survey involved two experienced ecologists walking pre-determined transects, with the survey teams varying between dates, following good practice guidance (Collins, 2023).

2.1.6. The transect route was designed to focus survey effort along habitats considered suitable for commuting and foraging bats, including linear woodland, lines of trees, and the River Rhymney corridor. It was designed to incorporate a representative sample of suitable habitats for bats within the Site. The transect incorporated listening points incorporated at regular intervals. The transect route and listening points are shown on Figure 1.

2.1.7. During each transect the surveyors noted the bat species which had been heard and seen, including the time, location, and, where possible behaviour type and direction of flight. Surveyors started the survey 10-15 minutes before sunset, from the first listening point, taking observations. The ecologists surveyed from this point, until at least 30 minutes after sunset before beginning the walking transect. After this, surveyors stopped at the pre-determined listening points for approximately 5 minutes per stop. The survey continued until approximately two hours after sunset.

2.1.8. Surveyors were equipped with a Elekon Batlogger M2 bat detector to listen to and record bat activity. Calls registered by the bat detectors were recorded for later analysis using Kaleidoscope Pro, details are provided below.

DATA ANALYSIS

2.1.9. The recordings of bat echolocation calls collected during the surveys were analysed using Kaleidoscope Pro. The analysis enabled confirmation of species or species group based on call parameters, and the relative activity of different species of bats by counting the minimum number of

bats recorded within discrete sound files. Once triggered by ultrasound, the Batlogger detectors record sound files with a duration of up to 15 seconds, which may contain a number of individual bat calls (or passes), or discrete groups of ultrasound 'pulses'.

2.1.10. It should be recognised that a series of separate sound files may represent a series of different bats commuting within the range of an automated detector, or a smaller number of bats repeatedly triggering the detector (e.g. bats making repeated foraging passes within the range of a detector).

2.1.11. Where possible, bat calls are identified to species level. However, if present, species of the genus *Myotis* are grouped together in most cases as their calls are similar in structure and have overlapping call parameters, making species identification problematic (Russ, 2013). For *Pipistrellus* species the following criteria based on measurements of peak frequency are used to classify calls:

- Common pipistrelle *Pipistrellus pipistrellus* ≥42 and <49KHz;
- Soprano pipistrelle *Pipistrellus pygmaeus* ≥51KHz;
- Nathusius' pipistrelle *Pipistrellus nathusii* <39KHz;
- Common/soprano pipistrelle ≥49 and <51KHz; and
- Common/Nathusius pipistrelle ≥39 and <42KHz.

2.1.12. In addition, the following categories are used for calls which cannot be identified with confidence due to the overlap in call characteristics between species or species groups:

- *Myotis/Plecotus* sp.;
- *Nyctalus* sp. (either Leisler's *Nyctalus leisleri* bat or noctule *Nyctalus noctula*);
- Serotine *Cnephaeus serotinus*/Leisler's; and
- Serotine/*Plecotus* sp.

2.2. DAY-TIME BAT WALKOVER

2.2.1. A DBW survey was undertaken on the 27 and 28 August 2025 to assess whether the findings of the PEA (Delta-Simons, 2021) and its subsequent recommendations remained appropriate relative to the updated survey guidance (Collins, 2023).

2.2.2. The DBW included an assessment of the suitability of the Site for commuting and foraging bats by identifying potential flightpaths and foraging habitats (Collins, 2023). The Site and the habitats within it could then be defined in five broad terms of potential suitability as summarised below:

- None – No habitat features on site likely to be used by foraging or commuting bats at any time of year;
- Negligible – No obvious habitat features on site likely to be used as flightpaths or by foraging bats; however, uncertainty remains to account for non-standard bat behaviour;
- Low – Habitat that could be used by small numbers of bats for foraging or flight paths but is isolated;
- Moderate – Continuous habitat connected to the wider landscape that could be used by bats for flightpaths or foraging; and,
- High – Continuous high-quality habitat that is well connected to the wider landscape that is likely regularly used by bats for flightpaths and foraging, such as river valleys, streams, hedgerows, lines of trees and woodland edges.

2.2.3. In addition to assessing foraging and commuting suitability, all trees within the survey area were inspected for potential roosting features and classified into one of the following categories:

- None – Either no PRFs in the tree or highly unlikely to be any;
- Further Assessment Required (FAR) – Further assessment required as it was not possible to confidently say there were no PRFs due to size, structure or obstructions;
- PRF – A tree with at least one PRF present.

2.2.4. To ensure efficiency and to avoid any duplication of survey, trees identified as PRF during the DBW were immediately subject to further assessment under GLTA (see Section 2.3 below). This allowed both surveys to be conducted simultaneously while still remaining distinct in methodology.

2.3. GROUND LEVEL TREE ASSESSMENT

2.3.1. A GLTA was carried out, in line with best practice guidance (Collins, 2023), for all trees identified as having PRFs or FAR status during the DBW, with further classification provided for those trees proposed to be impacted by the Proposed Development.

2.3.2. These assessments were led by an experienced ecologist on the 6 August 2025, and also concurrently with the 2025 PEA on 27 and 28 August 2025.

2.3.3. Inspections were undertaken from ground level, using binoculars where necessary, to search for PRFs and/or for any evidence of bat presence which are evident from the exterior of the tree. Each tree was assigned an overall suitability grading in accordance with best practice guidance. These grades are detailed in Table 2-1 below. This grading helps to establish the requirement for follow up surveys for each tree, should it be impacted by the Proposed Development.

Table 2-1 - PRF Suitability Further Categorisation (Collins, 2023)

Category	Description
FAR	Further assessment required to establish if PRFs are present in the tree.
PRF-I	PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
PRF-M	PRF is suitable for multiple bats and may therefore be used by a maternity colony.

2.4. NOTES AND LIMITATIONS

- The ecological survey data collected as part of these reports is considered valid for 18-24 months (CIEEM, 2019) unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management.
- Survey effort for automated static detector surveys, NBWs, and the GLTA was undertaken in line with current best practice as much as practicable (Collins, 2023) and is considered sufficient to characterise bat activity and identify trees with PRF.
- NBW were undertaken in the summer and autumn periods, but missed the spring (April/May) periods. This is not considered a limitation as two NBW were completed in the summer survey periods (June-August) and is considered sufficient to provide a representative sample of bat activity across the Site, in addition to the automated static surveys.
- Static 2 and Static 3 recorded two nights and three nights of data in July respectively. This is not considered a significant limitation as Static 1 recorded five nights of data during July and a full set

of data has been collected for Static 2 and 3 for all other months. This has provided enough data to enable a thorough assessment of the bat activity on Site.

- Static 1 in September did not record due to a technical fault. Static 1 also comprises August data for four nights. This is not considered a significant limitation as both other statics recorded five nights of data during September, and a full set of data has been collected at Static 1 for every other month. This provided enough data to enable a thorough assessment of the bat activity on Site.
- All Static detectors for the month of May were set out and collected data for more than five nights. This has also reduced the limitations of any data not being captured over other survey months. Static 1, Static 2 and Static 3 collected data for 22, 20 and 8 days, respectively.
- For the month of May, where additional static data was captured, date ranges for select 5 nights of data are as follows: Static 1 – 1st May to 6th May, Static 2 – 5th to 10th May and Static 3 – 24th to 30th May.
- In June, Static 2 and Static 3 were deployed beyond the minimum of 5 nights, for 17 and 12 nights respectively. This data has also been analysed and reviewed. Additional data has been recorded and analysed to support the distribution trend noticed in the other survey months.
- For June, date ranges for Static 2 and Static 3, where additional data was recorded is from 5th June to 10th June.
- NBWs are constrained by observer visibility, transect coverage, and prevailing conditions, meaning some commuting or foraging routes may have been missed. This is not deemed a significant limitation as the survey methodology is designed to record a representative sample of bats present, rather than every bat on Site. By carrying out a total of three NBWs, and deploying automated static detectors, it is considered that sufficient data has been collected to understand the baseline of bat activity present on Site.
- The GLTA methodology is designed to provide an assessment of trees with PRFs present within the Site. This type of survey does not involve a detailed internal inspection of PRFs in trees. The recommendations within this report reflect this limitation, detailing proportionate and appropriate mitigation/measures.

3. RESULTS

3.1. BAT ACTIVITY SURVEYS

3.1.1. Across all the bat activity surveys at least eleven bat species were recorded within the Site. These species included:

- Barbastelle *Barbastella barbastellus*;
- Brown long-eared *Plecotus auritus*;
- Common pipistrelle;
- Daubenton's bat;
- Greater horseshoe *Rhinolophus ferrumequinum*;
- Leisler's bat;
- Lesser horseshoe *Rhinolophus hipposideros*;
- Myotis bat species *Myotis spp.*;
- Nathusius' pipistrelle;
- Noctule;
- Serotine;
- Soprano pipistrelle.

3.1.2. All of these species were recorded during the automated detector surveys, whilst only a proportion of these were recorded during the NBW.

3.1.3. Further surveys results are provided below specific to each activity survey.

AUTOMATED DETECTOR SURVEY

3.1.4. During the surveys ranging from April to October, the highest bat activity was recorded on Static 3, located near the river within broadleaved woodland and poor semi-improved grassland, while the lowest activity was recorded on Static 1, situated within broadleaved woodland towards the northeast of the Site. Common pipistrelle was the most frequently recorded species at Static 1 and soprano pipistrelle at Static 2, whereas *Myotis* bat species dominated activity at Static 3, followed by soprano pipistrelle.

3.1.5. Occasional records of *Myotis* bat species and noctule bats were noted at Static 1, although these comprised a small proportion of overall activity. Scarce records of barbastelle, serotine, Leisler's, Nathusius's pipistrelle and brown long-eared bat were noted at Static 1.

3.1.6. During the surveys ranging over the seven months, rare records of brown long-eared, Nathusius's pipistrelle and greater horseshoe bats were observed at Static 2, representing a very minor proportion of overall activity. Static 2 also had occasional records of *Myotis* bat species and noctule bats.

3.1.7. Static 3 had the most diversity with regards to bat records over the span of the survey. There were occasional records for noctule and Nathusius's pipistrelle with very infrequent records of brown long-eared bats, greater horseshoe, lesser horseshoe, barbastelle, serotine and Leisler's bats.

3.1.8. Over the range of survey months, July had a noticeably higher number of bat recordings compared to other months over the five nights of data gathered for each month. October had the lowest number of bat calls recorded across the 3 Static detectors.

3.1.9. Common pipistrelle and soprano pipistrelles were recorded frequently across all the statics. Common pipistrelle bats were the most frequent species recorded on Static 1, whilst Soprano pipistrelle was the most frequent bat species recorded on Static 2 and Static 3. Daubenton's bats were recorded frequently, with Daubenton's social calls recorded at Static 3, situated alongside the River Rhymney.

3.1.10. The bat data recorded during the static monitoring periods each month are summarised in Appendix A. A visual summary of the results of the automated static detectors (Static 1 – 3; inclusive) across April – October is shown on Figure 3.

NIGHT-TIME BAT WALKOVER

3.1.11. A total of 718 bat recordings were obtained from the three NBWs undertaken on 27 June, 26 August and 07 October 2025. Of these, 178 recordings were recorded in June, 314 in August and 226 in October. Some of the recordings contained calls from multiple species. The species recorded included common pipistrelle, soprano pipistrelle, noctule, and Myotis spp. In October one brown long-eared call was recorded. Common pipistrelle and soprano pipistrelle accounted for the majority of recordings, with species of myotis bats and noctule recorded in lower numbers.

3.1.12. Bat activity was highest in the southwest of the Site, and particularly along the River Rhymney, however, the surveys confirmed bat activity across the Site and provided evidence of commuting and foraging within woodland/grassland edges and scrub habitat features.

3.1.13. The bat data recorded during the NBW are summarised in Appendix A.

3.2. DAY-TIME BAT WALKOVER

3.2.1. The DBW conducted on the 27 and 28 August 2025 identified key habitat features relevant to commuting and foraging bats as being present on Site, including semi-natural broadleaved woodland, dense/continuous scrub, broadleaved parkland/scattered trees, poor semi-improved grassland and running water, which provide potential flightpaths and foraging areas. Based on these features, and in accordance with current guidance, the Site has been classified as moderate suitability for commuting and foraging bats. A total of 15 trees were identified during the DBW of the Site

3.3. GROUND LEVEL TREE ASSESSMENT

3.3.1. 15 trees were identified during the GLTA with potential suitability to support roosting bats. Details of the assessment of all 15 trees are provided in Table 3-1 below. Locations of these trees (T1 – T15) are shown on Figure 2.

Table 3-1 – GLTA Results

Tree Ref	Description	Bat Roosting Potential	Proposed to be felled?	Photo reference
T1	Mature oak supporting woodpecker holes.	PRF-I	No	N/A
T2	Mature oak supporting one dead limb and rot.	PRF-I	No	N/A
T3	Dead tree with ivy cladding.	PRF-I	No	N/A
T4	Mature oak supporting rot holes, lifted bark, fissures and ivy cladding.	PRF-M	No	N/A
T5	Mature oak supporting broken limbs and branches, a large rot hole and ivy cladding.	PRF-M	No	N/A
T6	Mature oak supporting a large fissure, ivy cladding, broken limbs and branches, and lifted bark.	PRF-M	No	N/A
T7 (Group)	Group of trees with minor ivy coverage.	PRF-I	No	N/A
T8	A mature oak, approximately 14m tall, exhibited multiple features including dead limbs with small lateral cracks at around 4m and a large limb overhanging the water at 6m, potentially containing rot holes. The surrounding habitat is high-quality riparian woodland with good connectivity.	FAR	Yes	Photo 1
T9	A mature sycamore, approximately 15m tall, with a cavity on the north side of the main trunk approximately 5m above the base. The full extent of the cavity could not be determined, and there was no evidence of bat use. The surrounding habitat comprises high-quality riparian woodland with good connectivity along the woodland edge.	FAR	No	Photo 2

Tree Ref	Description	Bat Roosting Potential	Proposed to be felled?	Photo reference
T10	A mature sycamore, approximately 17m tall, contained a knot hole on the southwest side of the trunk at around 6m above the base, which may be subject to rainfall ingress. The surrounding habitat comprises high-quality riparian woodland with good connectivity.	FAR	No	Photo 3
T11	A mature oak, approximately 12m tall, contained a snapped limb at around 4m with small open fissures facing west. The surrounding habitat comprises high-quality riparian woodland. The features may support transitional or summer roosting. Minor branch removal may occur but is not expected to significantly impact roosting potential.	PRF-I	No	Photo 4
T12	An over-mature oak, approximately 15m tall, contained multiple features, including a rot hole at 2m on the north side and fractures in large limbs between 7–14 m. The surrounding habitat is high-quality riparian woodland with good connectivity. These features may support transitional or summer roosts, and potentially maternity use, although the extent of the voids could not be fully determined.	PRF-M	No	Photo 5
T13	A semi-mature oak, approximately 10m tall, contained a rot hole at 1m above river level on the north-facing side. The full extent of the feature could not be determined due to limited visibility. The surrounding habitat comprises high-quality riparian woodland with good connectivity.	FAR	No	Photo 6
T14	Mature oak supporting a dead limb at approximately 10m on the southern side. There was also a potential cavity between the dead limb and the branch.	FAR	No	Photo 7
T15	Mature oak with a decaying trunk on eastern side and cavities 3m off the ground leading upwards under the bark.	FAR	No	Photo 8

4. IMPLICATIONS FOR DEVELOPMENT

4.1. OVERVIEW

COMMUTING AND FORAGING BATS

4.1.1. Automated static detector surveys and NBWs identified that linear habitats such as woodland/grassland edges and scrub are important for bat activity across the Site. The River Rhymney also provided an evident commuting corridor, as supported by results from Static 3, which was situated at the riverside and produced the highest frequency of bat activity recordings. Commuting and foraging activity was highest in the southwest of the site in general, particularly along the River Rhymney.

4.1.2. Species recorded include barbastelle, brown long-eared, common pipistrelle, Daubenton's bats, greater horseshoe, Leisler's bat, lesser horseshoe, species of myotis bats, Nathusius' pipistrelle, noctule, serotine and soprano pipistrelle.

4.1.3. Whilst the surveys identified barbastelle, greater horseshoe and lesser horseshoe activity within the Site, their activity was very low in comparison to the activity levels of the other species. No greater than ten calls for each species were recorded across all months of the automated detector surveys This indicates that these species were visitors to the Site but were present infrequently and in low numbers.

4.1.4. To support the Proposed Development, targeted tree felling will be required, as well as removal of grassland and scrub habitat. Furthermore, targeted tree felling and habitat removal alongside the River Rhymney will be required for the installation of the proposed river bridge.

4.1.5. According to current design, retained trees provide a commuting corridor for bats around most of the perimeter of the Site, as well as corridors running through the Site into larger parcels of woodland. Furthermore, with commuting and foraging activity being highest in the southwest of the site, tree removal/commuting route fragmentation is largely focused in areas where activity levels are lower.

4.1.6. External lighting is also proposed across the Proposed Development, although this has been carefully managed through an external lighting strategy (Hydrock KTA, 2023). This strategy is discussed further in section 5.3.

4.1.7. The Proposed Development largely retains commuting and foraging corridors for bats within the Site by retaining a commuting route around the perimeter of the Site. However, vegetation clearance for the installation of the proposed road bridge may cause fragmentation to these corridors. Further recommendations are provided below to strengthen and bolster commuting and foraging routes for bats within the Site.

TREES

4.1.8. With the exception of one tree located in the northern part of the Site, all trees identified as having PRFs or as FAR were situated either in the south or southwest sections of the Site.

4.1.9. T8 was identified to be the only tree scheduled for removal. This tree requires further assessment to determine whether it provides suitable conditions for roosting bats. There is a potential for the Proposed Development to impact roosting bats, should any be present in T8. It should be noted that any tree removal methods and protection measures will be aligned with the Woodland Management

Plan for the Site (A.T. Coombes Associates (2025). Woodland Management Plan at Cardiff East Park and Ride, Eastern Avenue, Pentwyn. Additionally, there is a possibility of indirect impacts affecting any bats potentially roosting in T9 – T13, which all are within 60m to 100m of the potential driven piling activities associated with the bridge construction. To avoid adverse effects, robust mitigation measures must be implemented. Further recommendations are provided in the following section.

4.2. LEGAL COMPLIANCE

4.2.1. The legislation and planning policy relevant to bats and their roosts is set out below. Recommendations as to how the legislation and planning policy may be satisfied are set out in Section 5.

4.2.2. Bats and their roosts are afforded a high level of protection under The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations) (HMSO, 2019), the legislation means that it is an offence to:

- Deliberately capture, injure or kill a wild bat;
- Deliberately disturb wild bats; '*disturbance of animals includes in particular any disturbance which is likely:*
  (a) to impair their ability; —
  (i) to survive, to breed or reproduce, or to rear or nurture their young; or
  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
  (b) to affect significantly the local distribution or abundance of the species to which they belong.'; and
- Damage or destroy a breeding site or resting place used by this species.

4.2.3. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) with respect to disturbance of animals when using places of shelter, and obstruction of access to places of shelter.

4.2.4. Due to the high level of protection afforded to bats and their habitat, mitigation for this species is governed by a strict licensing procedure administered by Natural Resources Wales (NRW) (normally, planning permission must be obtained before a licence can be sought). Licencing is subject to three tests, as defined under the Habitat Regulations, these must also be applied by the planning authority before granting permission for activities affecting bats. For permission to be granted the following criteria must be satisfied:

- The proposal is necessary for '*preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'*;
- '*There is no satisfactory alternative'*; and
- The proposals '*will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range'*.

4.2.5. Certain species of bats including the barbastelle bat, Bechstein's bat *Myotis bechsteinii*, noctule bat, brown long-eared bat, common pipistrelle, soprano pipistrelle bat, greater and lesser horseshoe bat are also listed as Priority Species under Section 7 of the Environment (Wales) Act 2016 (Welsh Government, 2016). Under Section 7 of the Environment (Wales) Act 2016, Welsh Ministers must

take all reasonable steps to maintain and enhance the living organisms and types of habitats included on any list published under this section and encourage others to take such steps.

4.3. PLANNING POLICY COMPLIANCE

4.3.1. PPW (Edition 12 – Welsh Government, 2024) states:

> *"A Resilient Wales can be supported by protecting and providing sufficient scale, extent, diversity and connectivity within, and between, landscapes and habitats to maintain and enhance biodiversity and the resilience of ecosystems. This support will enable them to withstand the pressures of change, to tackle pollution, to protect and enhance water resources, to protect soils and to enable flood mitigation, the creation of carbon sinks (especially in urban areas), and to promote opportunities for social and economic activity based on valuing and enabling access to the natural, historic and built environment."*

4.3.2. The PPW sets out, amongst other points, how at an overview level the '*planning system should contribute to and enhance the national and local environment by*:

- *…recognising… the wider benefits of ecosystem services*; and
- *minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures…*'.

4.3.3. A list of principles which local planning authorities should follow when determining planning applications is included in the PPW, and includes the following:

- '*if significant harm resulting from a development cannot be avoided…adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*;
- *…opportunities to incorporate biodiversity in and around developments should be encourage*d; and
- *planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland…unless the need for, and benefits of, the development in that location clearly outweigh the loss…*'.

4.3.4. Mitigation, compensation and enhancement measures are recommended in Section 5 to enable the Proposed Development to be compliant with the above legislation and planning policy.

5. RECOMMENDATIONS

5.1. AVOIDANCE MEASURES

5.1.1. Overall, permanent removal of habitat suitable for commuting, foraging and roosting should be avoided and/or minimised as far as possible. The Proposed Development design requires removal of suitable commuting and foraging habitat, in the form of woodland/grassland edges and scrub as well as targeted tree felling and habitat removal alongside the River Rhymney.

5.1.2. Where habitat loss is anticipated, habitat replacement and enhancement is proposed as outlined in Section 5.4. These proposals work to prevent fragmentation of bat commuting corridors within the Site.

5.1.3. Furthermore, trees with bat roosting potential should be retained where possible. The Proposed Development design has allowed for the retention of the majority of the trees identified with bat roosting potential, however, requires the removal of T8 to accommodate the construction of the new road bridge.

5.1.4. Where trees with bat roosting potential cannot be avoided, further measures are outlined within Section 5.2 – Precautionary Methods.

5.1.5. An artificial light spill strategy has been produced, with further information set out in Section 5.3.

5.2. FURTHER SURVEYS AND PRECAUTIONARY METHODS

TREES

5.2.1. T8 is proposed for removal to support to Proposed Development. T9 – T13 may also be subject to indirect effects resulting from piling activities associated with the bridge works. Further surveys of T8 and potentially T9, T12 and T13 (depending on determination of piling requirements) are recommended to be carried out by a qualified and appropriately licensed ecologist to identify the presence or likely absence of roosting bats.

5.2.2. These surveys can be carried out at any time of year; however, it is recommended that these are carried out as soon as possible as these surveys may inform further recommendations.

5.2.3. In the event that bats are found to be present during these further surveys, works would be postponed and advice sought from NRW. It may be necessary to apply for a licence from NRW to allow the lawful removal of T8 and/or disturb potential roosting bats in T9, T10, T12 and T13 (depending on the need for piling of the foundations of the road bridge).

5.2.4. For trees identified as PRF-I, it is recommended that pre-works checks are undertaken if they are to be felled as part of the Proposed Development. This means that prior to any works affecting these trees, a qualified and appropriately licensed ecologist should carry out thorough inspections to assess the presence or likely absence of roosting bats. These checks should follow current best practice, including close visual assessments and, where necessary, the use of endoscopes or other suitable equipment. If bats or signs of bat activity are found, works must be postponed and advice sought from NRW, to ensure compliance with legal requirements and to avoid harm to bats or their roosts.

5.3. LIGHTING

5.3.1. Construction lighting is not generally required to support the Proposed Development during the main bat active season (April – October, inclusive). In certain circumstances i.e. in late autumn or early spring when daylight hours are limited but weather conditions may be suitable for bats to be active, there may be a brief overlap between bat activity and on-Site construction works and at these periods lighting may be required. During these limited periods, sensitive lighting will be adopted to avoid significant illumination of suitable habitats. This will be secured through a Construction Environmental Management Plan (CEMP). Temporary construction lighting will follow best-practice guidance (Institution of Lighting Engineers, 2000), including:

- Lighting switched off when not required for safety or security.
- All lighting directed into the Site and away from residential areas.
- Downlighting used wherever possible to minimise spill.
- Lighting equipment selected to minimise horizontal and upward light spill.
- Beam angles kept below 70° to reduce glare.
- Asymmetric beam floodlights used where practicable.
- No construction lighting will be directed towards trees with PRFs, hedgerows, woodland edges or the river corridor.

5.3.2. These measures are sufficient to avoid significant lighting disturbance during construction, provided they are implemented fully.

5.3.3. Operational lighting is proposed in the form of external lighting. Without sensitive design, external lighting could impact commuting and foraging bats by casting either direct light or light spill over suitable habitats, deterring bats from using these corridors. It could also impact roosting bats, should light spill over trees with PRFs identified within the Site. To mitigate this, Hydrock KTA (2023) have produced an external lighting strategy in line with best practice lighting design and ecological principles.

5.3.4. The strategy includes the following measures:

- Avoiding the use of unnecessary lighting, and only using lighting where it has a clear purpose;
- Use of sensitive colour temperatures at 2,000-3,000 kelvin. Lighting <4,200 kelvin produces a warm/neutral colour temperature lighting (Bat Conservation Trust (BCT), 2018) which affects a lower range of bat species as opposed to a shorter wavelength blue light;
- No use of light sources that emit ultra-violet light to avoid attracting night-flying invertebrate species which in turn may attract bats to the light;
- Use of peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats; and
- Fitting luminaries with 0% upward light ratio to the horizontal to avoid excessive up-lighting, back lighting and light spill onto retained suitable habitat, i.e., woodland/grassland edges, scrub and the River Rhymney. Ideally the Site boundary lux level should be between 0-2 lux as this is within the range of natural moonlight. The vegetation planted on Site and any roosting habitats should be unlit.
- Vegetation, bat-sensitive habitat and any potential roost features left unlit.

5.3.5. It should also be noted that, the River Rhymney corridor is proposed to remain unlit during operation, with no light spill above 1 lux. This is as a result of the proposed sensitive lighting design (Drawing no. 10341-EXT-104).

5.4. HABITAT FRAGMENTATION AND REPLACEMENT

5.4.1. The Proposed Development will follow a Woodland Management Plan (WMP) as produced in 2025 (A. T. Coombes Associates Ltd., 2025).

5.4.2. The WMP sets out a long-term vision over a 25-year period and was originally set out to mitigate against losses in dormouse habitat, however, the plan stipulates the replacement of permanently lost trees and the retention of existing trees.

5.4.3. This proposed plan ensures retention of commuting routes for bats around the perimeter of the Site and along the majority of the River Rhymney corridor. It also ensures retention of ancient woodland. Retention and replanting trees strategically in this way will support in bolstering existing commuting and foraging routes for bats within and surrounding the Site.

5.4.4. Furthermore, proposed off-site planting, which will be set out within the forthcoming dormouse licence application, will create new commuting routes for bats where currently woodland/trees lines are more fragmented.

5.4.5. Where fragmentation is proposed for the installation of the road bridge in the southwest of the Site, it is recommended that underbridge planting is incorporated to include scrub species, thereby maintaining the commuting route for bats along the river. Artificial hedges such as those detailed in UK Bat Mitigation Guidelines (CIEEM, 2025) will be installed for the short-term whilst created habitat linkages are establishing.

5.5. ECOLOGICAL ENHANCEMENT MEASURES

5.5.1. Net Benefit for Biodiversity (NBB) in association with development is required by PPW (Edition 12 – Welsh Government, 2024) and required under Section 6 of Part 1 of the Environment (Wales) Act 2016. The below recommendations aim to comply with a NBB approach, in the way of delivering an overall improvement in biodiversity with the absence of a metric. By engaging with these recommendations in the early stages of the Proposed Development, it is hoped that ecosystem resilience and wider ecosystem benefits can be achieved. This approach will support local authorities in achieving their Section 6 duty to “promote the resilience of ecosystems” when determining planning applications.

- Tree replacement of permanently removed trees will be replaced at a greater than 3:1 ratio. This is secured through the WMP (as discussed above) and will contribute to bolstering of existing commuting and foraging routes for bats and also will create new routes, improving the connectivity within the Site and surroundings for bats;
- installing of bat boxes on suitable retained trees and structures within the Site to provide additional roosting opportunities. Bat box design should be selected based on species recorded on site during the activity surveys; and
- inclusion of nectar-rich and species rich planting in soft landscaping areas that are attractive to night-flying insects to enhance foraging opportunities for bats.

6. CONCLUSIONS

6.1.1. Overall, bat activity surveys within the Site recorded at least eleven bat species including:

- Barbastelle;
- Brown long-eared;
- Common pipistrelle;
- Daubenton's bat;
- Greater horseshoe;
- Leisler's bat;
- Lesser horseshoe;
- Myotis bat species;
- Nathusius' pipistrelle;
- Noctule;
- Serotine; and
- Soprano pipistrelle.

6.1.2. Automated static detector surveys and NBWs identified that linear habitats such as woodland/grassland edges and scrub are important for bat activity across the Site. The River Rhymney also provides an evident commuting corridor, with the highest bat activity recorded at Static 3, which was situated on a tree overhanging the riverside. Commuting and foraging activity was highest in the southwest of the site in general, particularly along the River Rhymney, with less activity recorded in the east. According to current designs, the Proposed Development largely retains commuting and foraging corridors for bats within the Site by retaining a commuting route around the perimeter of the Site. Furthermore, tree removal/commuting route fragmentation is largely focused in areas where activity levels are lower. However, vegetation clearance for the installation of the proposed road bridge may cause fragmentation to these corridors.

6.1.3. Seven additional trees were identified as having PRFs during the GLTA, bringing the total to 15 trees with PRFs within the Site. Of these trees, T8 was identified as being scheduled for removal and was further categorised to having PRF-M suitability. Due to the potential for T8 to support roosting bats, the Proposed Development has potential to effect roosting bats if robust mitigation is not implemented.

6.1.4. Recommendations are outlined within this report which follow a step-wise approach of avoiding habitats and features sensitive to bats in the first instance. A summary of additional measures is provided below:

- Where habitat loss is anticipated, habitat replacement and enhancement is proposed as outlined in Section 5.4 and in accordance with the WMP and forthcoming dormouse licence application;
- Avoidance of artificial light spill on to habitats suitable for commuting and foraging bats by adhering to the external lighting strategy for operational lighting as discussed in Section 5.3. During limited construction periods sensitive lighting as secured through a CEMP will be followed;
- Further surveys of T8, and potentially T9, T10, T12, and T13 (depending on piling requirements associated with the road bridge) are recommended to be carried out by a qualified and appropriately licensed ecologist to identify the presence or likely absence of roosting bats; and
- Ecological enhancement opportunities in relation to landscape, bolstering of existing commuting and foraging routes for bats and provision of future roosting opportunities.

7. REFERENCES

PROJECT REFERENCES

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8. FIGURES

Figure 1 – Site Location and Bat Survey Locations

Figure 2 – Ground Level Tree Assessment Results

Figure 3 –Bat Activity Survey Results

N

Key

- Site Boundary
- Transect Route
- Static Locations
- Listening Points

0 100 200

Metres

wsp

Client: CARDIFF COUNCIL

Project: CARDIFF EAST PARK AND RIDE

Title: SITE LOCATION AND BAT SURVEY LOCATIONS

Drawing No: FIGURE 1
Date: 27/11/2025
Scale: 4,000 @ A3
Drawn: US/LT
Checked: AM
Approved: KF

Contains Ordnance Survey data © Crown copyright and database right 2025

Document Path: \\uk.wspgroup.com\central data\Projects\70121xxx\70121803 - Cardiff East Park and Ride\03 WIP\GIS\MXD\Figure 1 – Site Location and Bat Survey Locations.mxd User Name: INLT07906 Date Saved: 29/10/2025 09:47:24

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Document Path: \\uk.wspgroup.com\central data\Projects\70121xxx\70121803 - Cardiff East Park and Ride\03 WIP\GIS\Mxd\Figure 3 – Ground Level Tree Assessment Results.mxd

N

Key

Site Boundary

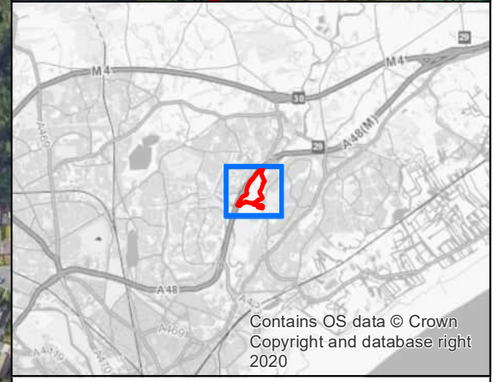
Area of tree removal

Overall Suitability Assessment

FAR

PRF-I

PRF-M



0 100 200

Metres

wsp

Client: CARDIFF COUNCIL

Project: CARDIFF EAST PARK AND RIDE

Title: GROUND LEVEL TREE ASSESSMENT RESULTS

Drawing No:	FIGURE 2	Drawn:	US/LT
Date:	27/11/2025	Checked:	AM
Scale:	4,000 @ A3	Approved:	KF

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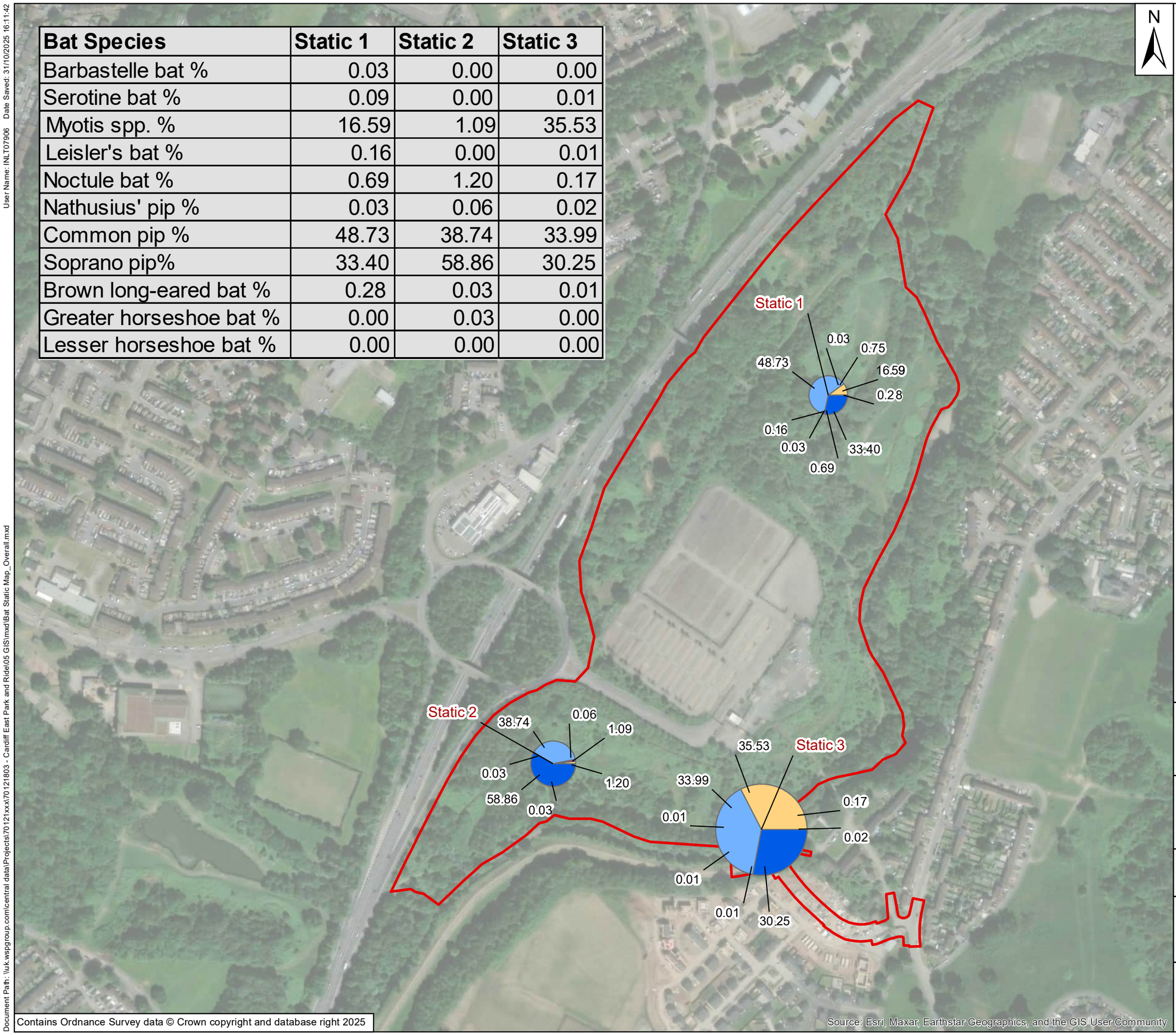
Bat Species	Static 1	Static 2	Static 3
Barbastelle bat %	0.03	0.00	0.00
Serotine bat %	0.09	0.00	0.01
Myotis spp. %	16.59	1.09	35.53
Leisler's bat %	0.16	0.00	0.01
Noctule bat %	0.69	1.20	0.17
Nathusius' pip %	0.03	0.06	0.02
Common pip %	48.73	38.74	33.99
Soprano pip%	33.40	58.86	30.25
Brown long-eared bat %	0.28	0.03	0.01
Greater horseshoe bat %	0.00	0.03	0.00
Lesser horseshoe bat %	0.00	0.00	0.00



N

Key

Site Boundary

Total calls

6,100

Barbastelle bat

Serotine bat

Myotis species

Leisler's bat

Noctule bat

Nathusius' pipistrelle

Common pipistrelle

Soprano pipistrelle

Brown long-eared bat

Greater horseshoe bat

Lesser horseshoe bat

0 100 200

Metres

Client: CURTIS HALL LTD.

Project: CARDIFF EAST PARK AND RIDE

Title: Bat Activity Survey Results

Drawing No: FIGURE 3
Date: 27/11/2025
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Appendix A

BAT ACTIVITY SURVEY DATA

Public

Table A-1 – Summary of Bat Species Recorded during Automated Detector Survey April to October 2025

Static Location	NGR	Species	Call numbers	Total Calls
Static 1	**ST 21402 81187**	BARBAR	1	**3201**
		EPTSER	3	
		MYOSP	531	
		NYCLEI	5	
		NYCNOC	22	
		PIPNAT	1	
		PIPPIP	1560	
		PIPPYG	1069	
		PLEAUR	9	
Static 2	**ST 21101 80784**	MYOSP	38	**3495**
		NYCNOC	42	
		PIPNAT	2	
		PIPPIP	1354	
		PIPPYG	2057	
		PLEAUR	1	
		RHIFER	1	
Static 3	**ST 21329 80712**	BARBAR	1	**27713**
		EPTSER	2	
		MYOSP	9634	
		NYCLEI	2	
		NYCNOC	46	
		PIPNAT	6	
		PIPPIP	9216	
		PIPPYG	8202	
		PLEAUR	2	
		RHIFER	1	
		RHIHIP	1	

Table A-8 – Summary of Bat Species Recorded during NBW – June

Species	No. of calls
MYOSP	13
NYCNOC	6
PIPPIP	108
PIPPYG	88
Total	178*

*Total number of recordings do not total the number of species as some on occasion multiple species were recorded in the same recording.

Table A-8 – Summary of Bat Species Recorded during NBW – August

Species	No. of calls
MYOSP	13
NYCNOC	6
PIPPIP	95
PIPPYG	238
Total	314*

*Total number of recordings do not total the number of species as some on occasion multiple species were recorded in the same recording.

Table A-8 – Summary of Bat Species Recorded during NBW – October

Species	No. of calls
MYOSP	12
PIPPIP	134
PIPPYG	128
PLEAUR	1
Total	226*

*Total number of recordings do not total the number of species as some on occasion multiple species were recorded in the same recording.

Appendix B

PHOTOGRAPHS

Public

Table B-1 – Photographs of trees identified during the GLTA

Photo 1 – T8	Photo 2 – T9	Photo 3 – T10
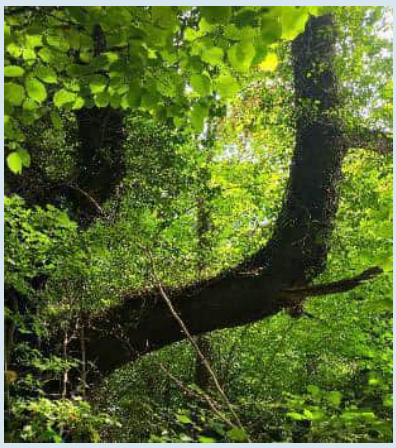		
Photo 4 – T11	**Photo 5 – T12**	**Photo 6 – T13**
Photo 7 – T14	**Photo 8 – T15**	

1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

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Document Path: \\uk.wspgroup.com\central data\Projects\70121xxx\70121803 - Cardiff East Park and Ride\03 WIP\GIS\MxdFigure 1 – Site Location and Bat Survey Locations.mxd

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N

Key

- Site Boundary
- Transect Route
- Static Locations
- Listening Points

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0 100 200

Metres

wsp

Client:

CARDIFF COUNCIL

Project:

CARDIFF EAST PARK AND RIDE

Title

SITE LOCATION AND
BAT SURVEY LOCATIONS

Drawing No:	FIGURE 1	Drawn:	US/LT
Date:	27/11/2025	Checked:	AM
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Document Path: \\uk.wspgroup.com\central data\Projects\70121xxx\70121803 - Cardiff East Park and Ride\03 WIP\GIS\Mxd\Figure 3 – Ground Level Tree Assessment Results.mxd

N

Key

Site Boundary

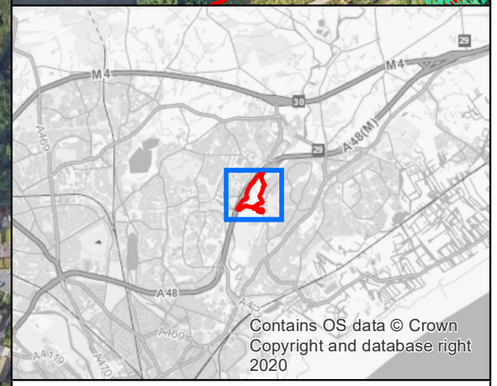
Area of tree removal

Overall Suitability Assessment

FAR

PRF-I

PRF-M



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Client: CARDIFF COUNCIL

Project: CARDIFF EAST PARK AND RIDE

Title: GROUND LEVEL TREE ASSESSMENT RESULTS

Drawing No:	FIGURE 2	Drawn:	US/LT
Date:	27/11/2025	Checked:	AM
Scale:	4,000 @ A3	Approved:	KF

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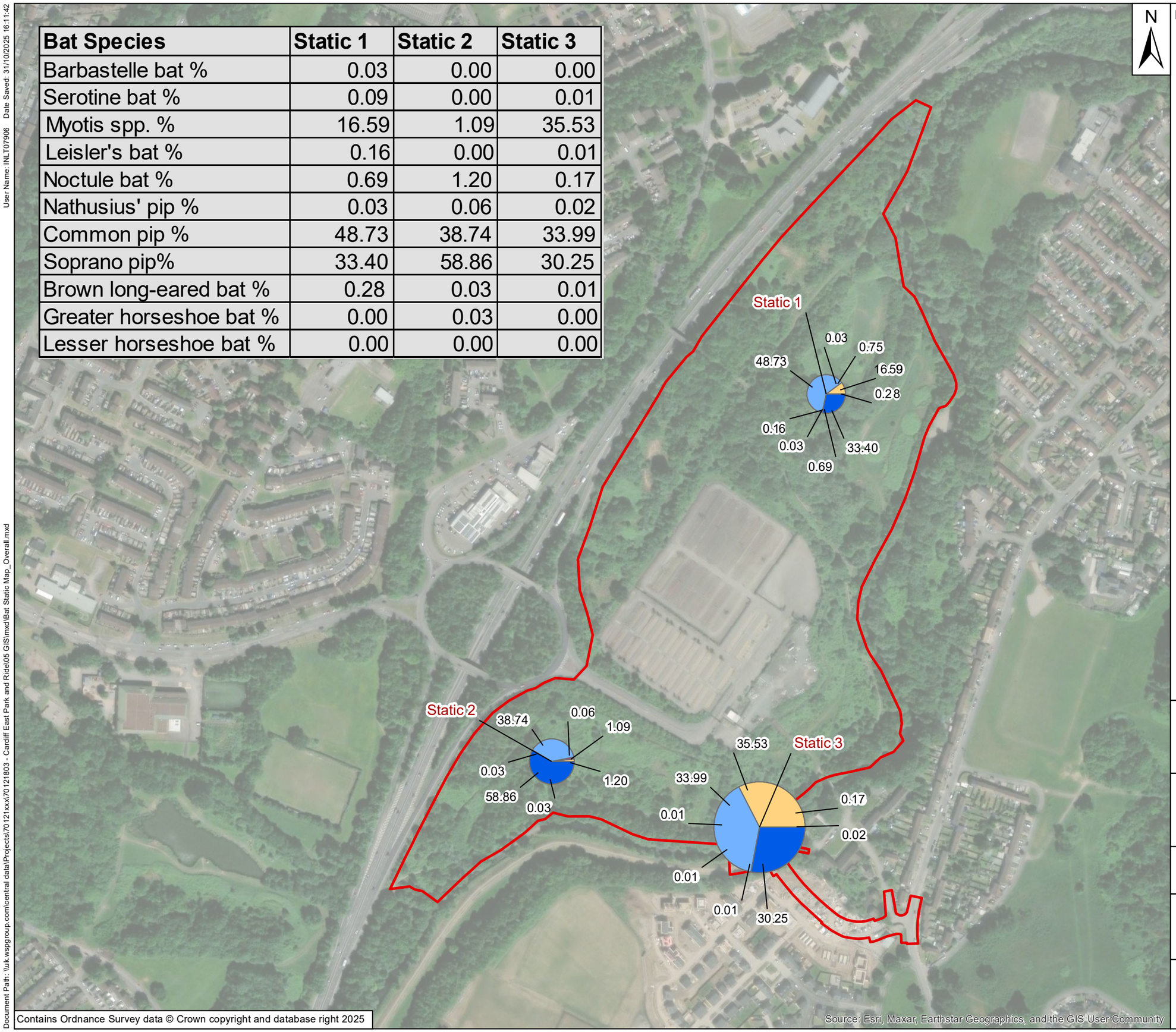
Bat Species	Static 1	Static 2	Static 3
Barbastelle bat %	0.03	0.00	0.00
Serotine bat %	0.09	0.00	0.01
Myotis spp. %	16.59	1.09	35.53
Leisler's bat %	0.16	0.00	0.01
Noctule bat %	0.69	1.20	0.17
Nathusius' pip %	0.03	0.06	0.02
Common pip %	48.73	38.74	33.99
Soprano pip%	33.40	58.86	30.25
Brown long-eared bat %	0.28	0.03	0.01
Greater horseshoe bat %	0.00	0.03	0.00
Lesser horseshoe bat %	0.00	0.00	0.00



N

Key

Site Boundary

Total calls

6,100

Barbastelle bat

Serotine bat

Myotis species

Leisler's bat

Noctule bat

Nathusius' pipistrelle

Common pipistrelle

Soprano pipistrelle

Brown long-eared bat

Greater horseshoe bat

Lesser horseshoe bat

0 100 200

Metres

wsp

Client: CURTIS HALL LTD.

Project: CARDIFF EAST PARK AND RIDE

Title: Bat Activity Survey Results

Drawing No: FIGURE 3
Date: 27/11/2025
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DATE:	28 November 2025	**CONFIDENTIALITY:**	Public
SUBJECT:	Otter Survey Report		
PROJECT:	Cardiff East Park and Ride	**AUTHOR:**	Amber Martin
CHECKED:	Gabrielle Horup	**APPROVED:**	Katharine Fisher

INTRODUCTION

Project Background

WSP UK Ltd. was commissioned by Curtis Hall Ltd to conduct an ecological assessment to support a hybrid planning application for redevelopment at Cardiff East Park & Ride, west of Llanrumney in Cardiff, Wales (central National Grid Reference: ST 21287 80932) hereafter referred to as the 'Site'.

The application seeks:

- outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

The proposals are hereafter referred to as the 'Proposed Development'.

In addition to the proposals associated with the Proposed Development, including the main access bridge referenced above, three dormouse bridges (Dormouse Bridges 2, 3 and 6) will be installed across the Rhymney River and are subject to a separate planning application (whilst being linked to planning application ref: 22/02673/FUL). All Dormouse Bridges are designed to cross the Rhymney River along the south eastern boundary of the Site and further south off-site. Localised vegetation clearance along the river banksides and adjoining habitat is proposed to support these installations. No in-channel working is required for the installation of the main access bridge or Dormouse Bridges 2 and 3. In-channel working is anticipated for Dormouse Bridge 6 as it will be retrofitted onto an existing bridge structure.

The Site is located in the east of Cardiff between the villages of Pentwyn and Llanrumney. The A48 runs along the western edge of the Proposed Development within land to the north-west of Whitchurch Village and is surrounded by residential areas on all sides except to the north. The area is a mosaic of poor semi-improved grassland and scrub habitat with areas of semi-natural broadleaved woodland. Several footpaths transect the Site through these habitats. The centre of the Site is dominated by hardstanding, previously used as a 'Park and Ride' carpark.

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Ecological Background

The Site and surrounding area have been subject to several ecological surveys and assessments, including a Preliminary Ecological Appraisal (PEA) and an Ecological Impact Assessment (EcIA) carried out by Delta-Simons (Delta-Simons, 2021[a]; Delta-Simons, 2023), as well as an Arboricultural Impact Assessment carried out by A.T. Coombes Associates Ltd, later in 2023 (A.T. Coombes Associates Ltd, 2023).

Most recently, WSP carried out a PEA (WSP, 2025[a]), which identified habitats within the Site and within 10m from the Site boundary (hereafter referred to as the 'PEA Survey Area') which had suitability to support otter *Lutra lutra* and otter resting sites.

As part of the PEA, a Phase 1 habitat survey was carried out which determined that the Rhymney River, which runs through the Site, and the associated linear woodland and scrub provides suitable habitats to support foraging, commuting and resting otter.

The highly connective nature of the river and woodland habitats provides ideal commuting corridors for otter. It was noted, however, that the area is subject to high levels of disturbance from the local community. Furthermore, no evidence of otter or presence or their resting sites were recorded during the Phase 1 habitat survey. In this report, and in line with guidance (NIEA, 2011), the terminology 'resting site' is used as a collective term which refers to otter holts, couches and dens, and refers a place where otters sleep.

Furthermore, a desk study was carried out to support the PEA. This identified that the section of the Rhymney River within the Site forms part of the Rhymney River Site of Interest for Nature Conservation (SINC). Otters are a qualifying feature of this SINC, as well as species of fish which are suitable for foraging.

Due to the Rhymney River SINC's connectivity with the Severn Estuary Special Area of Conservation (SAC) and Ramsar and related aquatic surveys, we know there to be suitability for European eel *Anguilla anguilla* and the ammocoetes of river lamprey *Lampetra fluviatilis* and sea lamprey *Petromyzon marinus* within the section of the Rhymney River associated with the Site. The Rhymney River is also considered a good commuting route for salmon *Salmo salar* and sea trout *S. trutta.* European eel, river lamprey and sea lamprey are listed as Annex II species within the SAC designations, whilst salmon and sea trout are listed as protected under the Ramsar designation. Further detail is provided in the Habitats Regulation Assessment (HRA) report (WSP, 2025[b]).

An Ecological Impact Assessment (EcIA) of the dormouse bridge installation was issued in July 2025 (amended and updated in November 2025) described the section of the Rhymney River which flows through the Site (WSP, 2025[c]). The river was described as flowing southwards and approximately 12–16m wide at the bridge locations. The riverbanks were steep, up to approximately 1m above the water level and comprised of earth. The substrate of the river channel and the depth of the water could not be determined due to the turbidity of the water, however during the PEA carried out in 2021, the substrate was described

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as also being composed of earth (Delta-Simons, 2021[a]). Photographs of the Rhymney River are provided at the end of this report.

Brief and objectives

Curtis Hall Ltd commissioned WSP to complete one otter survey in accordance with good practice guidance (Chanin, 2003) to:

- establish whether potential/confirmed otter resting sites were present within the Site and surrounding habitats off-site; and
- evaluate the importance of the Site and surrounding habitat for otter and make recommendations as to how the Proposed Development should account for these species with respect to legislation, planning and biodiversity policy.

METHODS

Overview

To establish whether otter resting sites were present within the Site, one otter survey was conducted. This was carried out on all suitable habitats[1] within 200m up and downstream[2] from the Site boundary along the Rhymney River (where accessed allowed). The section of the Rhymney River surveyed started from the approximate Grid Reference ST 21537 81498 and extended southwest-ward to approximate Grid Reference ST 20754 79640. This is hereafter referred to as the 'Otter Survey Area' – refer to Figure 1. The survey methodology followed current good practice guidance (Chanin, 2003).

Whilst the surveys were focused on establishing presence of otter resting sites, a visual inspection of suitable habitats for other definitive otter field signs was also carried out where appropriate. Otter surveys can be carried out at any time of year; it is best practice to avoid carrying out surveys following a spell of heavy rain as this may limit the otter field signs available (Chanin, 2003).

Field signs for otter include: animals (alive or dead), feeding/prey remains, spraints, other secretions, pathways, slides, footprints and resting sites. Features that have high potential to be attractive to otter were examined, including bases of large trees, dense vegetation and culverts.

Information was recorded using a handheld device with installed Geographical Information System (GIS) software. This was used to record the location of each field sign or feature and further details.

[1] As identified during the PEA, suitable habitats for resting otter included the Rhymney River, its banks and associated linear woodland and scrub habitat.
[2] In accordance with guidance (Nature Scot, n.d.)

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Dates of survey

The otter survey was led by a member of the Chartered Institute of Ecology and Environmental Management (CIEEM) with suitable experience of carrying out otter surveys. The survey was carried out on the 27 and 28 August 2025.

Notes and limitations

- Presence of dense vegetation along the Rhymney River prevented access in certain locations, particularly in the northern section of the Otter Survey Area. There was also no access into the associated woodland to the west of the Rhymney River in the southern section of the Otter Survey Area. To mitigate this, vantage points were taken and binoculars used to visually access areas which could not be accessed on foot. Furthermore, all areas proposed to be directly impacted by the Proposed Development, i.e., proposed installation sites of the access bridge and the three dormouse bridges, have been accessed fully, and therefore, this limitation is not considered to significantly impact the robustness of the recommendations provided.

RESULT

Overview

Otters are likely to commute through the Otter Survey Area and/or use the section for foraging. This is because the Otter Survey Area lies within the Rhymney River SINC designation, which is known to support otters, as well as fish which are suitable for foraging by otter.

Previous surveys have identified that the section of the Rhymney River which flows through the Site and associated habitats have suitability to support resting, foraging and commuting otter. The targeted otter survey offered no further evidence of otter presence.

No field signs, or potential/confirmed resting sites, were identified within the Otter Survey Area during the otter surveys, however, due to the suitability of habitats presence, the future presence of resting sites, specifically couches, cannot be ruled out.

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DISCUSSION

Overview

The habitats present within the Otter Survey Area provided suitable habitat for resting, foraging and commuting otter.

No field signs were identified, however as the Otter Survey Area lies within the Rhymney River SINC, otter are likely to use the section for commuting and foraging. The Rhymney River SINC designation is known to support otters as well as species suitable for foraging, including brown trout *Salmo trutta*. Furthermore, due to the Rhymney River SINC's connectivity with the Severn Estuary SAC and Ramsar and related aquatic surveys, suitable habitats for the following additional species have been identified within the Otter Survey Area; European eel, ammocoetes of river lamprey and sea lamprey and commuting salmon and sea trout. European eel, river lamprey and sea lamprey are listed as Annex II species within the SAC designations, whilst salmon and sea trout are listed as protected under the Ramsar designation. Further detail is provided in the HRA report (WSP, 2025[b]).

The banksides of the Rhymney River and associated linear woodland and scrub are suitable to support resting otter. However, it should be noted that the wider area surrounding the Site is urban and residential which creates a level of anthropogenic disturbance, which is likely to lower this suitability. No potential or confirmed resting sites were identified during the otter survey, however, the future presence of couches cannot be ruled out. Couches are a daytime otter resting sites which are typically located above ground and are uncovered. They are often inconspicuous but can sometimes be identified by flattened vegetation. These sites do not offer any protection from disturbance; however, these are not breeding sites and are often an opportunistic stop over for a single commuting otter. Overall, the otter survey found that resting suitability within the Otter Survey Area is low, with no potential for holt or natal den sites identified, however the presence of couches cannot be ruled out entirely.

With no potential or confirmed resting sites identified within the Otter Survey Area, no targeted monitoring is required. However, due to the suitability for commuting and foraging otter, as well as low resting suitability, avoidance, mitigation and enhancement measures are set out in the following section.

Otters are protected from killing, injury and disturbance under European and UK legislation; in addition, planning policy affords further protection within the planning system, as described below. A summary of the legislation and planning policy is given below.

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Legal compliance

Otter are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) (HMSO, 1981) and Countryside Rights of Way Act 2000 (HMSO, 2000).

Otter are also listed as Priority Species in accordance with Section 7 of the Environment (Wales) Act 2016 (HMSO, 2016). Public bodies have an obligation under Section 7 to have regard for these species when carrying out their functions.

The European Commission (EC) Habitats Directive and EC Birds Directive is transposed into UK law via the Conservation of Habitats and Species Regulations 2017 (as amended) (HMSO, 2019), commonly referred to as the Habitats Regulations. Otter is listed under Annex IV of the Habitats Directive and therefore requires strict protection, and is known as a European Protected Species (EPS).

Otter are also listed under Annex II of the Habitats Directive and are afforded protection by the establishment of core areas of habitat known as Special Areas of Conservation (SPA). This means this species are a relevant consideration in a Habitats Regulations Assessment (HRA) where they are a qualifying species. See HRA report (WSP, 2025[b]).

Planning policy compliance

At the national level the Planning Policy Wales (PPW) (Welsh Government, 2024) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including protected species such as otter.

PPW (Edition 12, 2024) states:

"A Resilient Wales can be supported by protecting and providing sufficient scale, extent, diversity and connectivity within, and between, landscapes and habitats to maintain and enhance biodiversity and the resilience of ecosystems. This support will enable them to withstand the pressures of change, to tackle pollution, to protect and enhance water resources, to protect soils and to enable flood mitigation, the creation of carbon sinks (especially in urban areas), and to promote opportunities for social and economic activity based on valuing and enabling access to the natural, historic and built environment."

The PPW sets out, amongst other points, how at an overview level the 'planning system should contribute to and enhance the national and local environment by:

- …recognising… the wider benefits of ecosystem services; and
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures…'.

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A list of principles which local planning authorities should follow when determining planning applications is included in the PPW, and includes the following:

- 'if significant harm resulting from a development cannot be avoided…adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- …opportunities to incorporate biodiversity in and around developments should be encouraged; and
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland…unless the need for, and benefits of, the development in that location clearly outweigh the loss…'.

Mitigation, compensation and enhancement measures are recommended in the below section to enable the Proposed Development to be compliant with the above legislation and planning policy.

RECOMMENDATIONS

Avoidance and mitigation measures

No potential or confirmed resting sites, nor any field signs indicating otter presence were identified within the Otter Survey Area. However, due to the presence of suitable habitats for commuting and foraging otter as well as low suitability of habitats for resting otter (i.e. couches), it is recommended that any impacts to habitats (including direct removal) should be minimised during the Proposed Development works as far as practicable. This is inclusive of the linear woodland and scrub habitat associated with the Rhymney River.

Mitigation measures have been recommended to address the Likely Significant Effects (LSEs) as identified in the HRA report (WSP, 2025[b]). These include avoiding in-channel works at Bridge 2 where there is suitable habitat for European eel and the ammocoetes of river lamprey and sea lamprey. No in-channel works will be conducted at Bridge 3. The in-channel works required at Bridge 6 will be timed to avoid the main migration period of salmon and sea trout. Detailed mitigation measures can be sought from the HRA report (WSP, 2025[b]). Further measures to mitigate the impacts of the installation of the three dormouse bridges have been identified under the EcIA of Dormouse Bridges (WSP, 2025[c]).

Where suitable habitats are proposed for direct impact including removal, it is recommended that works are carried out under a Precautionary Method of Works (PMoW). The PMoW is recommended to include a pre-works check of the section of the Rhymney River proposed to be impacted as well as of adjoining riparian habitat within 30m where it is suitable for resting otter[3]. The check should be carried out by a suitably qualified Ecological Clerk of Works (ECoW). This should be carried out immediately prior to any works being undertaken.

[3] As according to the guidance produced by Northern Ireland Environment Agency (NIEA) (2011) referring to establishing protection zones for otters during development.

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Construction mitigation for the Proposed Development will be fulfilled through a Construction Environmental Management Plan (CEMP). The CEMP is likely to include (but not be limited to) night working restrictions i.e., no night working within 30m of the River Rhymney, pollution prevention measures and minimising noise. Furthermore, no open pits or trenches will be left uncovered or, alternatively, without a mammal escape ramp overnight. to prevent entrapment of animals including otter.

Otters are most active during dawn and dusk. As no constructional/night-time lighting is proposed within 30m of the River Rhymney there will be no disturbance to commuting and foraging otter due to constructional lighting. This measure will also prevent disturbance to nighttime European eel and adult lamprey migration. Furthermore, the river corridor is also proposed to remain unlit during operation, with no light spill above 1 lux. This is as a result of the proposed sensitive lighting design (Drawing no. 10341-EXT-104). This design ensures that the Proposed Development will not create lighting-related disturbance to otter.

Ecological enhancement measures

Net Benefit for Biodiversity (NBB) in association with development is encouraged by PPW (Edition 12, 2024) and required under Section 6 of Part 1 of the Environment (Wales) Act 2016. Incorporating ecological enhancements into the final design would support the Proposed Development's compliance with an NBB approach and the DECCA framework[4], in the way of delivering an overall improvement in biodiversity and ecosystem resilience with the absence of a metric.

Otter ledges are proposed to be installed on the main access bridge to access otters access into and across the Rhymney River from underneath the proposed structure during periods of high water flow.

By engaging with such recommendations in the early stages of the Proposed Development, it is hoped that ecosystem resilience and wider ecosystem benefits can be achieved. This approach will support local authorities in achieving their Section 6 duty to "promote the resilience of ecosystems" when determining planning applications.

[4] As outlined in PPW (2024).

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CONCLUSIONS

Overall, the habitats present within the Otter Survey Area provided suitable habitat for resting, foraging and commuting otter. Furthermore, the Otter Survey Area lies within the Rhymney River SINC, which is known to support otter as well as fish species suitable for foraging (including designated species from the hydrologically connected Severn Estuary SAC and Ramsar). Previous surveys have identified that the section of the Rhymney River which flows through the Site and associated habitats have suitability to support resting, foraging and commuting otter.

No field signs, or potential/confirmed resting sites, were identified within the Otter Survey Area during the otter surveys, however, due to the suitability of habitats presence, the future presence of resting sites, specifically couches, cannot be ruled out.

With no potential or confirmed resting sites identified within the Otter Survey Area, no targeted monitoring is required. However, due to the suitability for commuting and foraging otter, as well as low resting suitability, avoidance, mitigation and enhancement measures have been set out within this report and are summarised below;

- All impacts on suitable habitats (including direct removal) should be minimised during the Proposed Development works as far as practicable;
- In-channel works to be avoided during the installation of Dormouse Bridge 2, and Bridge 3. The remaining in-channel works at Bridge 6 will be timed to avoid the main migration period of salmon and sea trout. As described in further detail in the HRA report (WSP, 2025[b]).;
- Where suitable habitats are proposed for direct impact including removal, it is recommended that works are carried out under a PMoW. This should include a pre-works check by a suitably qualified ECoW, which should be carried out immediately prior to any works being undertaken; and
- Construction mitigation to reduce the disturbance to commuting and foraging otter will be fulfilled through a CEMP. The CEMP is likely to include (but not be limited to) no night working within 30m of the River Rhymney, pollution prevention measures and minimising noise. Furthermore, no open pits or trenches will be left uncovered or, alternatively, without a mammal escape ramp overnight. to prevent entrapment of animals including otter.

Otter ledges are proposed for installation on the main access bridge to access otters access into and across the Rhymney River from underneath the proposed structure during periods of high water flow. This measure works towards supporting the Proposed Development in achieving NBB as is outlined as a requirement in policy.

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Project references

- Delta-Simons. (2021[a]) – Preliminary Ecological Appraisal. Cardiff East Park and Ride. Version 2. August 2021.
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Curtis Hall Ltd – Cardiff East Park and Ride Ecological reporting – Otter survey report 2025

DATE:	28 November 2025	**CONFIDENTIALITY:**	Public
SUBJECT:	Otter Survey Report		
PROJECT:	Cardiff East Park and Ride	**AUTHOR:**	Amber Martin
CHECKED:	Gabrielle Horup	**APPROVED:**	Katharine Fisher

PHOTOGRAPHS

Photographs of the Rhymney River within the Otter Survey Area

wsp

Client:

Curtis Hall Ltd.

Project:

Cardiff East Park and Ride

Title

Otter Survey Site and Survey Area

Drawing No:	Figure 1	Drawn:	LT
Date:	27/11/2025	Checked:	GH
Scale:	8,000 @ A3	Approved:	KF

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CARDIFF EAST PARK AND RIDE – REPTILE MITIGATION STRATEGY

DATE:	04 November 2025	**CONFIDENTIALITY:**	Confidential
SUBJECT:	Cardiff East Park and Ride - Reptile Mitigation Strategy – updated November 2025		
PROJECT:	70121803	**AUTHOR 2024:**	Matt Mott-Dowling
AMENDMENTS AND REVIEW 2025:	Kate Fisher	**APPROVED 2025:**	Gabrielle Horup

1 – INTRODUCTION

1.1 – PROJECT BACKGROUND

WSP UK LTD (WSP) was commissioned by Curtis Hall Ltd to provide ecological support in their application for full planning permission for a Park and Ride development in Cardiff East, hereafter referred to as the 'Proposed Development'. The Proposed Development is centred at Ordnance Survey (OS) grid reference ST 21306 80951, west of Llanrumney in Cardiff, Wales, and is hereafter referred to as the 'Site'. The Site location is shown on Figure 1.

The Proposed Development will comprise the demolition of existing structures within the Site and redevelopment to provide commercial spaces with associated drive-throughs and car parks; the re-development of the existing park and ride; a bridge across the Rhymney River; landscaping and associated works. The Proposed Development will involve vegetation clearance and earthworks activities within habitat suitable for supporting reptiles. These activities are planned within Plot 2, 3, 4, 5, 6, and 8 within the Site. The development plan (7528 MEIN-XX-XX-DR-A-70-025) in Figure 2 shows a conceptual plan for the Proposed Development and each of the Plots listed above, a combined footprint of these areas is shown in Figure 1 (the 'Development Footprint').

1.2 – ECOLOGICAL BACKGROUND

A desk study for the was undertaken in January 2021, which searched for designated sites and records of protected and notable species, including reptile species. The search returned eight records of slow worm *Anguis fragilis*, with the closest record identified 1.2km south-east of the Site in 2020.

A Preliminary Habitat Assessment (PHA) of the Site was carried out by a Delta-Simons ecologist on the 26th January 2021 and again on the 28th July 2021[1]. The Site was assessed as having suitable habitat for reptiles in the form of woodland edges, poor semi-improved grassland, a ditch and scrub habitat, which formed a mosaic of habitats suitable for reptiles.

Following the PHA, a refugia survey was carried out within the Site. A total of 96 artificial refugia were placed across the western extent of the northern woodland. These were checked seven times between 18th May and 18th June 2021, along with a search of natural refugia found within the Site. During these surveys, no reptiles were found. Although the reptile survey conducted by Delta Simons in 2021 did not identify any

[1] Delta-Simons, December 2023. Ecological Impact Assessment. Cardiff East Park and Ride.

reptiles on Site, their survey did not cover the entire Site and excluded habitats potentially suitable for reptiles, which are currently proposed for removal. Furthermore, some of the refugia were damaged and / or removed by members of the public.

An updated reptile survey was completed by WSP between May and July 2024 (Froglife, 1999[2] and Gent and Gibson, 2003[3])[4]. The survey comprised seven survey visits to the Site and a potential Receptor Site (Figure 3), each incorporating a survey of artificial refugia; and visual observation of habitats and natural refugia present. Site photographs are provided in Appendix A.

A mixture of materials sized approximately 0.5m x 0.5m or 0.5m x 1m were used as artificial refugia, included bitumen felt, corrugated metal and corrugated bitumen. Refugia were sited in suitable basking spots, close to cover, within habitat parcels identified to provide suitable conditions for reptiles during an initial site walkover.

A total of 50 refugia were deployed across both the Site and the potential Receptor Site. 20 reptile mats were deployed within suitable habitat across the Site and 30 refugia within a potential Receptor Site on the 20th May 2024 (Figure 3). The refugia were allowed to bed down for two weeks prior to the beginning of the survey visits. The refugia were checked a total of seven times during the survey period. A positive result was returned from one location on Site; an adult female slow worm was found under mat 46 on two separate visits (3rd and 19th June 2024). It has been concluded from this result the Site is likely to support 'Low' numbers of common reptiles (Froglife, 1999[2]).

The Local Planning Authority (LPA), Cardiff Council, mandated a condition of a reptile mitigation strategy to avoid and minimise the risk to any reptiles (Cardiff Council, 2022. Ref 22/02673/FUL[5]). A discussion took place with the LPA ecologist on the 25th July 2024 where it was agreed that owing to the 'Low' numbers of reptiles likely to be using the Site, the vegetation clearance did not warrant the use of a Receptor Site. Therefore, the Receptor Site will not be used during vegetation clearance, with appropriate methods being utilised to encourage reptiles into existing habitat located around the Site. A further conversation was held between WSP Ecologists and the LPA ecologist on the 4th November 2025. It was agreed that should 5 reptiles or more be found the LPA ecologist would be contacted and a conversation would be had around the best way forward which, depending on the numbers found, would consider use of a reptile receptor site. A monitoring programme (which should be proportionate to numbers found) would be agreed with the LPA ecologist should more than 5 reptiles be located).

It was noted at the time of originally writing this Reptile Mitigation Strategy in 2024 that there were other ecological receptors with potential to be present within the Site include bats, badger *Meles meles*, dormice *Muscardinus avellanarius*, otter *Lutra lutra*, nesting birds and Invasive Non-Native Species (INNS). During 2025 an update Preliminary Ecological Appraisal and species surveys have been conducted across the site. Bat activity has been recorded on the site, badger activity has been recorded on and off site, no otter activity has been recorded on site and immediately upstream and downstream. Assumed presence for dormouse will apply to this site. A European Protected Species Licence (EPSL) application (not yet granted) for dormice and Toolbox Talks (TBTs) for these ecological receptors will be adhered to during

[2] Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice sheet 10. Froglife, Halesworth
[3] Gent, A and Gibson, S. (2003) Herpetofauna Workers Manual, Joint Nature Conservation Committee, Peterborough.
[4] Please note there is no standalone survey report.
[5] Cardiff Council (2022). Council's approval letter for planning permission to Curtis Hall Ltd. – DRAFT. 21 November. [Letter] Application number: 22/02673/FUL

vegetation clearance. This will include information regarding associated legislation, possible habitats and locations that could be encountered and steps to ensure risk of killing, injury and/or disturbance is minimised.

1.3 – BRIEF AND OBJECTIVES

WSP UK Ltd have been commissioned to produce a Reptile Mitigation Strategy that fulfils the requirements within the full wording of the Planning Permission condition (Cardiff Council, 2022. Ref 22/02673/FUL). The mitigation strategy aims to set out specific mitigation measures to minimise negative impacts to reptiles caused by the Proposed Development. It will include:

- Avoidance measures, to minimise the loss of suitable reptile habitat; and
- a Precautionary Method of Working (PMoW) during vegetation clearance and earthworks.

2 – LEGISLATION AND PLANNING POLICY

Reptile species which may be encountered within the Site include common lizard *Zootoca vivipara*, adder *Vipera berus*, slow worm and grass snake *Natrix helvetica*.

In the absence of mitigation, the Proposed Development has potential to affect reptiles in the following ways:

- Habitat loss and fragmentation; and
- Killing, injury or disturbance of individuals during the during site clearance.

Therefore, the following legislation and planning policy is relevant.

2.1 – LEGAL COMPLIANCE

Native, widespread reptile species (common or viviparous lizard, adder, grass snake and slow worm) are partially protected via their inclusion in Schedule 5 of The Wildlife and Countryside Act (1981)[6], under part of Section 9(1) and all of Section 9(5). As such it is an offence to:

- 'Intentionally or recklessly kill or injure' an individual of these species; or
- 'Sell, offer or expose for sale, or [have in] possession or transport for the purpose of sale, any live or dead [individual] or any part of, or anything derived from' an individual of these species'.

All widespread, native reptile species are listed as a priority species in accordance with Section 7 of the Environment (Wales) Act 2016[7] and are also listed on the Cardiff Local Development Plan (2006-2026)[8]. The Cardiff Local Development Plan seeks to retain, manage, and enhance important features of natural and built heritage, including maintaining the favourable conservation status of protected species such as reptiles.

2.2 – PLANNING POLICY COMPLIANCE

At the national level, Planning Policy Wales' (Edition 12; 2024)[9] Biodiversity and Resilience of Ecosystems Duty (Section 6 Environment (Wales) Act 2016 Duty) states that 'Planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any

[6] HMSO (Her Majesty's Stationary Office) (1981). Wildlife and Countryside Act (as amended by the Countryside and Rights of Way Act 2000). HMSO, Norwich
[7] Welsh Government. (2016). Environment (Wales) Act. Available at: https://www.legislation.gov.uk/anaw/2016/3/contents/enacted
[8] Cardiff Cite Council. (2016). Cardiff Local Development Plan 2006-2026 Adopted Plan. Available at: https://www.cardiffldp.co.uk/adopted-local-development-plan/
[9] Welsh Government. (2024). Planning Policy Wales; Edition 12. Feb 2024. Available at: https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf

significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity'.

2.3 – Net Benefit for Biodiversity

Net Benefit for Biodiversity (NBB) in association with development is encouraged by PPW (Edition 12, 2024) and under Section 6 of Part 1 of the Environment (Wales) Act 2016. PPW (2024) states:
'*By protecting, maintaining and enhancing biodiversity, increasing the resilience of ecosystems and our natural environment more generally, it will be possible to future proof economic assets in response to the challenges presented by the climate emergency, to promote low carbon and appropriate resource choices which address the causes of climate change and to provide cost effective ecosystems services such as clean air and water*.'

Ecological enhancement recommendations provided in this Reptile Mitigation Strategy aim to comply with a NBB approach, in the way of delivering an overall improvement in biodiversity with the absence of a metric. By engaging with these recommendations in the early stages of the Proposed Development, it is hoped that ecosystem resilience and wider ecosystem benefits can be achieved.

3 – MITIGATION STRATEGY

3.1 – MINIMISING RISK OF MORTALITY AND/OR INJURY

In order to avoid risk of mortality and/or injury to reptiles during the Proposed Development the key measures are as follows:

- Minimising loss of suitable reptile habitat; and
- clearance of vegetation in a directional manner under a PMoW.

3.1.1 – MINIMISING LOSS OF SUITABLE REPTILE HABITAT

Wherever possible, suitable habitat for reptile species should be retained throughout the duration of the Proposed Development (Figure 4). These habitats include scrub, poor semi-improved grassland, bracken *Pteridium aquilinum*, woodland edges and the ditch in the north of the Site.

The Proposed Development is currently designed so that the majority of woodland will not be impacted and therefore will be retained and protected. This includes the area of ancient woodland which is present in the northwest of the Site.

Where habitat with reptile suitability must be cleared (Figure 4), measures will be implemented to prevent killing and/or injury to reptile species. These measures include clearance of suitable reptile habitat under a PMoW and should it be required.

3.1.2 – PRECAUTIONARY METHOD OF WORKS (PMOW)

A PMoW should be followed during the vegetation clearance and earthwork activities to minimise potential negative impacts on reptiles. A method statement is detailed below covering reptile mat deployment, vegetation clearance and a destructive search. In the event that reptiles are encountered during the vegetation or earthworks activities, appropriate measures are included below.

Pre-clearance Mat Deployment

In order to minimise the potential for injury/killing of reptiles during vegetation clearance it is proposed that reptile mats* will be deployed across the Site to improve the success in capturing and moving reptiles prior to clearance. The following approach will be employed:

- Mats will be placed a minimum of 30 days prior to clearance;
- Mats will be located within or immediately adjacent to habitats to be cleared;
- Mats will be deployed to a minimum of 10 per hectare;
- Mats will be from a mixture of materials and sized approximately 0.5m x 0.5m or 0.5m x 1m; and
- Prior to clearance mats will be checked by a suitably qualified ecologist with any reptiles being moved into areas of retained habitat on Site.

* The pre-clearance mat deployment will be prior to the Stage 2 dormouse vegetation cut down to ground level following Stage 1 cut down to 300mm end of January. The stage 2 veg clearance will be conducted in mid-April to mid-May, and mid-September to the end of October if required, so as to align with the Dormouse Licence Method Statement (licence yet to be granted). All vegetation clearance is temperature dependent.

Vegetation Clearance

Vegetation clearance should be carried out under a PMoW and in the presence of a suitability experienced Ecological Clerk of Works (ECoW). Prior to the commencement of clearance works, the attending ECoW would carry out a pre-works check. This would be carried out in the morning of each working day that vegetation clearance is proposed within the Site and would involve a hand search of habitat with reptile suitability proposed for vegetation clearance. Should reptiles be discovered, individuals will be carefully moved into retained habitat.

Once the pre-check is completed, the ECoW, will deliver a Toolbox Talk (TBT) to the vegetation and site clearance contractors. The TBT would include advice on the presence of reptiles on Site, possible habitats and locations that they could be encountered and steps to ensure risk of killing and/or injury to reptiles is minimised. As this Reptile Mitigation Strategy document covers all of this information, it can be also provided as a TBT. A signing sheet is provided in Appendix C, all contractors will be asked to sign to certify that they have received and understood the TBT.

Once the TBT has been delivered, clearance activities can commence:

1. All clearance works must be carried out in a directional manner towards retained habitat. This will allow any remaining reptiles time to move into retained habitat.
2. Vegetation would be cut in two ~~stages~~ phases* using hand-held machinery (i.e., strimmers or brush cutters).
    i. First cut to a minimum height of 150mm.
    ii. Following the first cut, vegetation can then be cut to ground level no sooner than 48 hours after the first cut.
3. No cuttings, chippings or other piles of vegetation should be left within the Development Footprint.

* The vegetation clearance methods will follow that stated in the Dormouse Licence Method Statement (licence yet to be granted) – see above for timings of Stage 1 and Stage 2 for vegetation clearance for dormice.

Destructive Search

As earthworks are proposed as part of the Proposed Development, a destructive search is recommended following the vegetation clearance and before the removal of topsoil. Removing the topsoil has the advantage that it reduces vegetation regrowth and maintains the construction area as being unsuitable for reptiles, however, reptiles such slow worm commonly use the top layer of soil as shelter.

Reptiles using the top layer of soil as shelter within the clearance areas are at risk of injury or mortality at this stage of the clearance, moreover, there is more of a chance of them being missed in the earlier vegetation clearance. The following methodology is recommended:

1. An initial hand search of the ground should be carried out by an ECoW prior to the removal of topsoil.
2. The top 150mm of soil can be removed using a tracked excavator with a small, toothed bucket and low ground pressure. This can be used to carefully scrape back soil and any remaining debris or cut vegetation.

3. The contractors, including the operator of the excavator, will work with the ECoW to remove topsoil a few metres at a time, with the ECoW checking the ground prior to each scrape of the excavator.
4. As with the vegetation clearance methodology, removal of the topsoil will be carried out in a directional manner, towards the retained habitat.

This type of search is known as a destructive search. If reptiles are found during the destructive search, they will be moved to refugia created within retained habitat (see section 3.2). The logging of actions taken and species type and numbers will be recorded during the works.

Please note a specific method statement ~~has been~~ is being prepared for dormice in the European Protected Species Licence (EPSL) Application (not yet granted). This should be referred to for detailed information on methods of vegetation clearance relating to this species. A Method Statement for INNS has also been prepared and should be referred to for detailed information on methods of clearance relating to INNS.

3.2 – HABITAT ENHANCEMENT

To comply with Planning Policy Wales (Edition 12; 2024)[10] and the Biodiversity and Resilience of Ecosystems Duty (Section 6 Environment (Wales) Act 2016 Duty), the following measures have been identified as potential enhancement measures for reptiles and their suitable habitat. These measures will ensure that there are suitable habitats available for reptiles within wider Site prior to translocation.

Habitat Creation

Large areas of retained habitat within the Site (Figure 4) are covered in dense bramble. Whilst a valuable resource for reptiles, the largely homogeneous composition of dense bramble across large areas of the Site reduces the suitability for reptiles.

Large areas of dense scrub will be opened up by cutting glades into the bramble at chosen locations and managed as to encourage the formation of grassland habitats[11], once established these habitats will be incorporated and manged as per section 3.3. Detail of the management of the dense scrub / glade creation for reptile species will be provide in the overall landscape management plan / GILEMP for the site.

Refugia

In order to provide additional cover for reptiles ~~a minimum of~~ 5 hibernacula (Appendix B) will be constructed across retained habitats within the Site:

- The reptile refugia would comprise of brash and log piles, with the material sourced from the vegetation clearance on the Site;
- The piles should be placed in sunny locations, but nearby to scrub cover. The central core of the pile should be compact, while the outer layers are laid more loosely on top;
- The logs used should be a mixture of sizes and shapes; and
- A hibernaculum should be at least 1.5m long by 1.5m wide and 0.5m deep/high but can be larger.

[10] Welsh Government. (2024). Planning Policy Wales; Edition 12. Feb 2024. Available at: https://www.gov.wales/sites/default/files/publications/2024-02/planning-policy-wales-edition-12_1.pdf

[11] Scrub clearance and grassland creation will need to be compliant with any dormouse licence requirements.

3.3 – LONG-TERM HABITAT MEASURES

To ensure long term maintenance of reptile population on Site, an ongoing management regime is to be carried out in areas of retained habitat within the Site. This would follow good practice[12] and involve:

- Repeated cutting of herbaceous vegetation in order to control succession to woody vegetation and encourage a mosaic of diverse grassland habitats to form;
- Retained habitats suitable for reptiles will be split into three separate plots, with each plot being cut in rotation as to avoid all plots being cut to a similar height at the same time;
- To maintain a diverse tussocky structure on rough grassland and prevent succession to scrub, plots should be cut on a rotation of no shorter than three years; and
- when cutting takes place within the active season (March and October inclusive) a minimum sward height of 150mm will be required as to avoid risk of killing/injury to reptiles.

A drawing of the rotational cuts with clear details will be provided to the contractors so they are fully aware of the management objectives.

The details of the required management will be provided in the landscape management plan / GILEMP for the site.

[12] Edgar, P., Foster, J. and Baker, J. (2010). Reptile Habitat Management Handbook. Amphibian and Reptile Conservation, Bournemouth.

4 – TIMINGS FOR KEY WORKS, MANAGEMENT AND MONITORING

Table 4-1 – Timings for key works, management and monitoring

Activity	Timing
ECOW Presence for *1st Stage cut down to 300mm as per Dormouse Licence Method Statement (yet to be granted)	End of January 2026
Deployment of pre-clearance reptile mats	Spring 2026 (mid-Feb / March) and Summer 2026 (if required)
~~1st~~ *2nd stage vegetation clearance to stump height with vegetation stump and root-ball removal after 48 hours	Spring 2026* in suitable weather conditions with temperatures as a minimum above 6ºC overnight and 10ºC or greater during the day.
2nd stage vegetation stump and root-ball removal (if not all achieved in Spring 2026)	Summer 2026 in suitable weather conditions with temperatures as a minimum above 6ºC overnight and 10ºC or greater during the day.
Habitat management and enhancement Site**	Mowing regime, in three plots on a rotational basis, once a year between August and October.
A monitoring programme, which should be proportionate to numbers found, would be agreed with the LPA ecologist should more than 5 reptiles be located.	To be decided following discussion with LPA ecologist as relevant.

*The start date of the 1st and 2nd stage vegetation clearance is dependent on granting of the dormouse European Protected Species (EPSL).

** More detail will be provided in the overall Landscape Management Plan / GILEMP for the site.

5 – CONCLUSION

The measures identified in this reptile mitigation strategy are deemed proportionate to the Low reptile population established from the 2024 reptile survey.

Mitigation and PMOW methods proposed within the Site will reduce the risk of mortality to reptiles within the Site during clearance and ensure reptiles are not harmed during any vegetation.

If more than 5 reptiles or more are found the LPA ecologist will be contacted and a conversation would be had around the best way forward which, depending on the numbers, would consider use of a reptile receptor site. A monitoring programme, which should be proportionate to numbers found, would be agreed with the LPA ecologist should more than 5 reptiles be located.

The habitat enhancement and management measures proposed within Site will support the reptile population within the Proposed Development.

5 – FIGURES

Figure 1 – Site Map

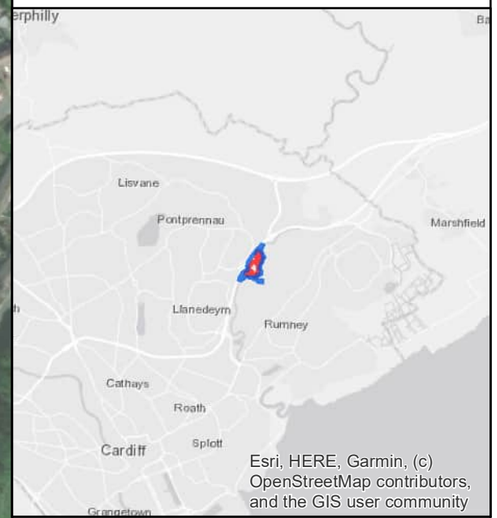
Figure 2 – Development Plan

Figure 3 – Reptile Survey Results

Figure 4 – Reptile Habitat

Legend

- Site Boundary
- Development Footprint



Client:
CURTIS HALL LTD

Project:
CARDIFF EAST PARK AND RIDE

Title
SITE MAP

Drawing No:	FIGURE 1	Drawn:	AM
Date:	8/7/2024	Checked:	MMD
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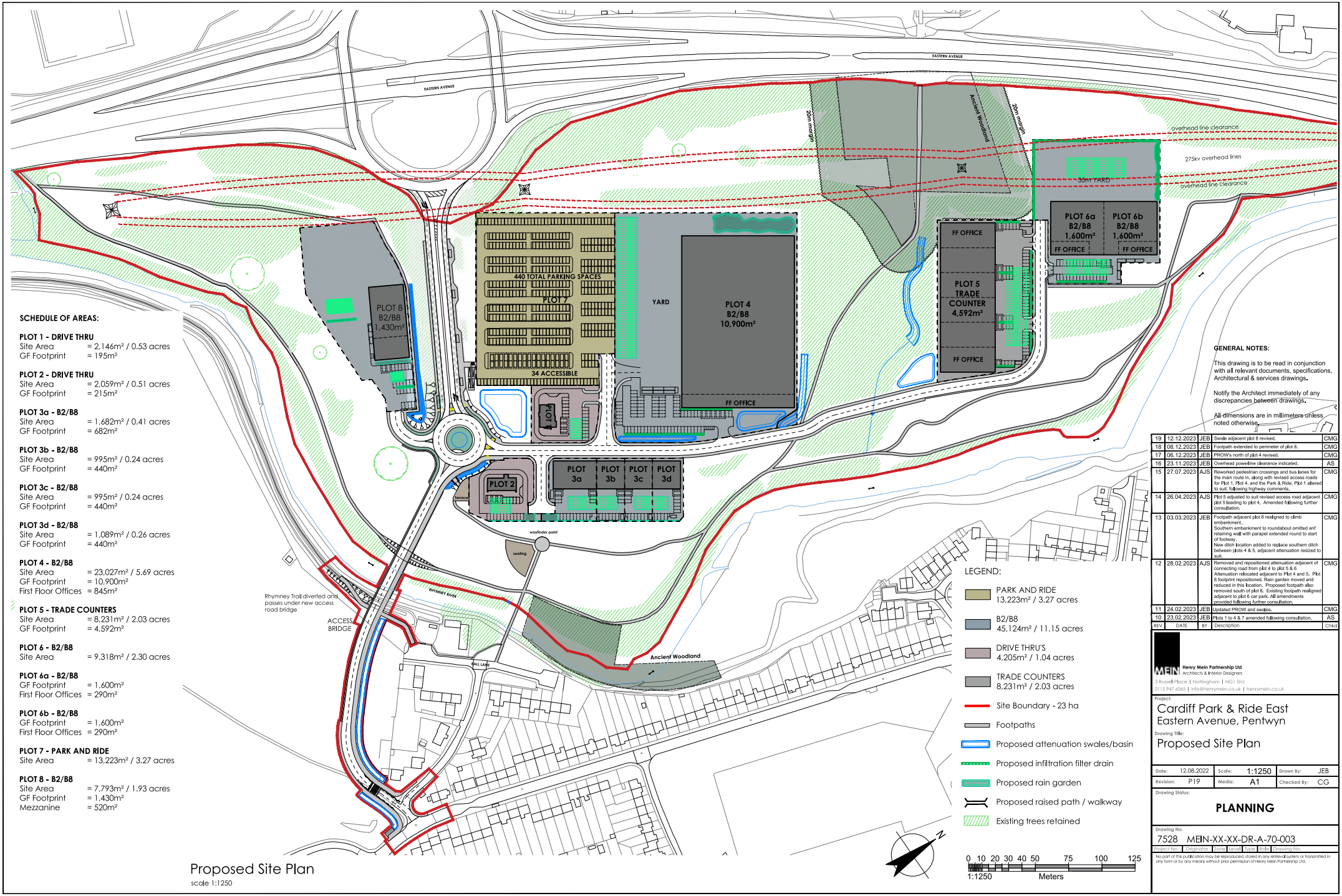
User Name: UKAMM009 Date Saved: 8/7/2024 3:59:12 PM



SCHEDULE OF AREAS:

PLOT 1 - DRIVE THRU
Site Area = 2,146m² / 0.53 acres
GF Footprint = 195m²

PLOT 2 - DRIVE THRU
Site Area = 2,059m² / 0.51 acres
GF Footprint = 215m²

PLOT 3a - B2/B8
Site Area = 1,682m² / 0.41 acres
GF Footprint = 682m²

PLOT 3b - B2/B8
Site Area = 995m² / 0.24 acres
GF Footprint = 440m²

PLOT 3c - B2/B8
Site Area = 995m² / 0.24 acres
GF Footprint = 440m²

PLOT 3d - B2/B8
Site Area = 1,089m² / 0.26 acres
GF Footprint = 440m²

PLOT 4 - B2/B8
Site Area = 23,027m² / 5.69 acres
GF Footprint = 10,900m²
First Floor Offices = 845m²

PLOT 5 - TRADE COUNTERS
Site Area = 8,231m² / 2.03 acres
GF Footprint = 4,592m²

PLOT 6 - B2/B8
Site Area = 9,318m² / 2.30 acres

PLOT 6a - B2/B8
GF Footprint = 1,600m²
First Floor Offices = 290m²

PLOT 6b - B2/B8
GF Footprint = 1,600m²
First Floor Offices = 290m²

PLOT 7 - PARK AND RIDE
Site Area = 13,223m² / 3.27 acres

PLOT 8 - B2/B8
Site Area = 7,793m² / 1.93 acres
GF Footprint = 1,430m²
Mezzanine = 520m²

LEGEND:

- PARK AND RIDE 13,223m² / 3.27 acres
- B2/B8 45,124m² / 11.15 acres
- DRIVE THRU'S 4,205m² / 1.04 acres
- TRADE COUNTERS 8,231m² / 2.03 acres
- Site Boundary - 23 ha
- Footpaths
- Proposed attenuation swales/basin
- Proposed infiltration filter drain
- Proposed rain garden
- Proposed raised path / walkway
- Existing trees retained

0 10 20 30 40 50 75 100 125
1:1250 Meters

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

REV	DATE	BY	Description	Chkd
19	12.12.2023	JEB	Swale adjacent plot 8 revised.	CMG
18	08.12.2023	JEB	Footpath extended to perimeter of plot 8.	CMG
17	06.12.2023	JEB	PROW's north of plot 4 revised.	CMG
16	23.11.2023	JEB	Overhead powerline clearance indicated.	AS
15	27.07.2023	AJS	Reworked pedestrian crossings and bus lanes for the main route in, along with revised access roads for Plot 1, Plot 4, and the Park & Ride. Plot 1 altered to suit, following highway comments.	CMG
14	26.04.2023	AJS	Plot 5 adjusted to suit revised access road adjacent plot 5 leading to plot 4. Amended following further consultation.	CMG
13	03.03.2023	JEB	Footpath adjacent plot 8 realigned to climb embankment. Southern embankment to roundabout omitted and retaining wall with parapet extended round to start of footway. New ditch location added to replace southern ditch between plots 4 & 5, adjacent attenuation resized to suit.	CMG
12	28.02.2023	AJS	Removed and repositioned attenuation adjacent of connecting road from plot 4 to plot 5 & 6 Attenuation relocated adjacent to Plot 4 and 5. Plot 8 footprint repositioned. Rain garden moved and reduced in this location. Proposed footpath also removed south of plot 8. Existing footpath realigned adjacent to plot 6 car park. All amendments provided following further consultation.	CMG
11	24.02.2023	JEB	Updated PROW and swales.	CMG
10	23.02.2023	JEB	Plots 1 to 4 & 7 amended following consultation.	AS

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Project:
Cardiff Park & Ride East
Eastern Avenue, Pentwyn

Drawing Title:
Proposed Site Plan

Date:	12.08.2022	Scale:	1:1250	Drawn By:	JEB
Revision:	P19	Media:	A1	Checked By:	CG

Drawing Status:
PLANNING

Drawing No.
7528 MEIN-XX-XX-DR-A-70-003

Project No. | Originator | Zone | Level | Type | Role | Drawing No.

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Proposed Site Plan
scale 1:1250

Key

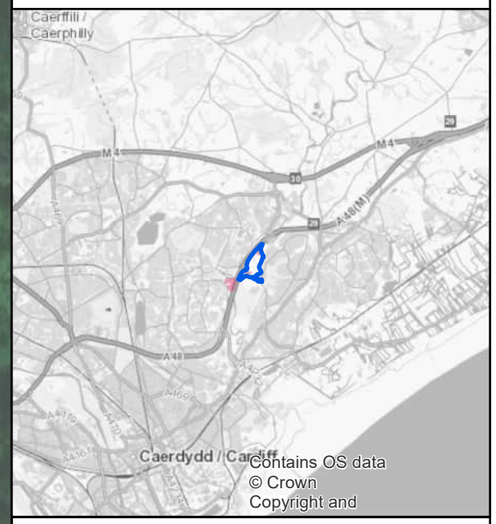
Site Boundary

Reptile Receptor Site

Reptile Presence

No presence recorded

Presence confirmed



wsp

Client: CURTIS HALL LTD

Project: CARDIFF EAST PARK AND RIDE

Title: Reptile Survey Results

Drawing No: FIGURE 3
Date: 11/09/2024
Scale: 1,000 @ A3
Drawn: LT
Checked: HG
Approved: KF

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Key

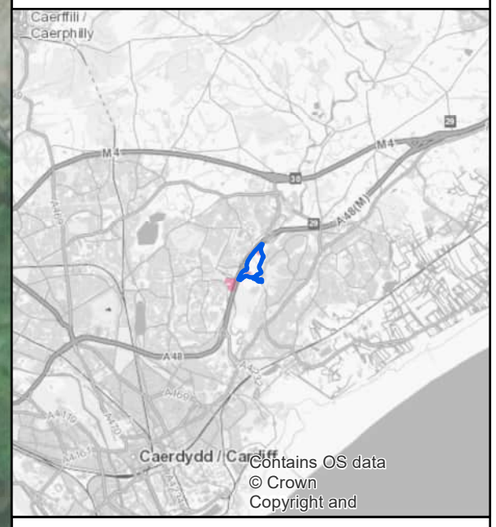
Site Boundary

Reptile Receptor Site

Reptile Presence

No presence recorded

Presence confirmed



wsp

Client: CURTIS HALL LTD

Project: CARDIFF EAST PARK AND RIDE

Title: Reptile Survey Results

Drawing No:	FIGURE 3	Drawn:	LT
Date:	11/09/2024	Checked:	HG
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N

Key

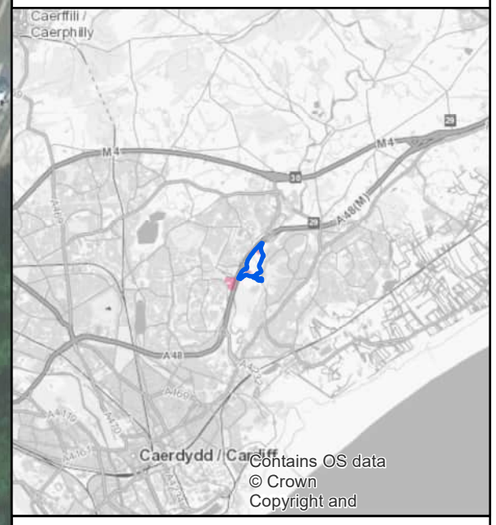
Site Boundary

Reptile Receptor Site

Reptile Presence

No presence recorded

Presence confirmed



0 50 100 Metres

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

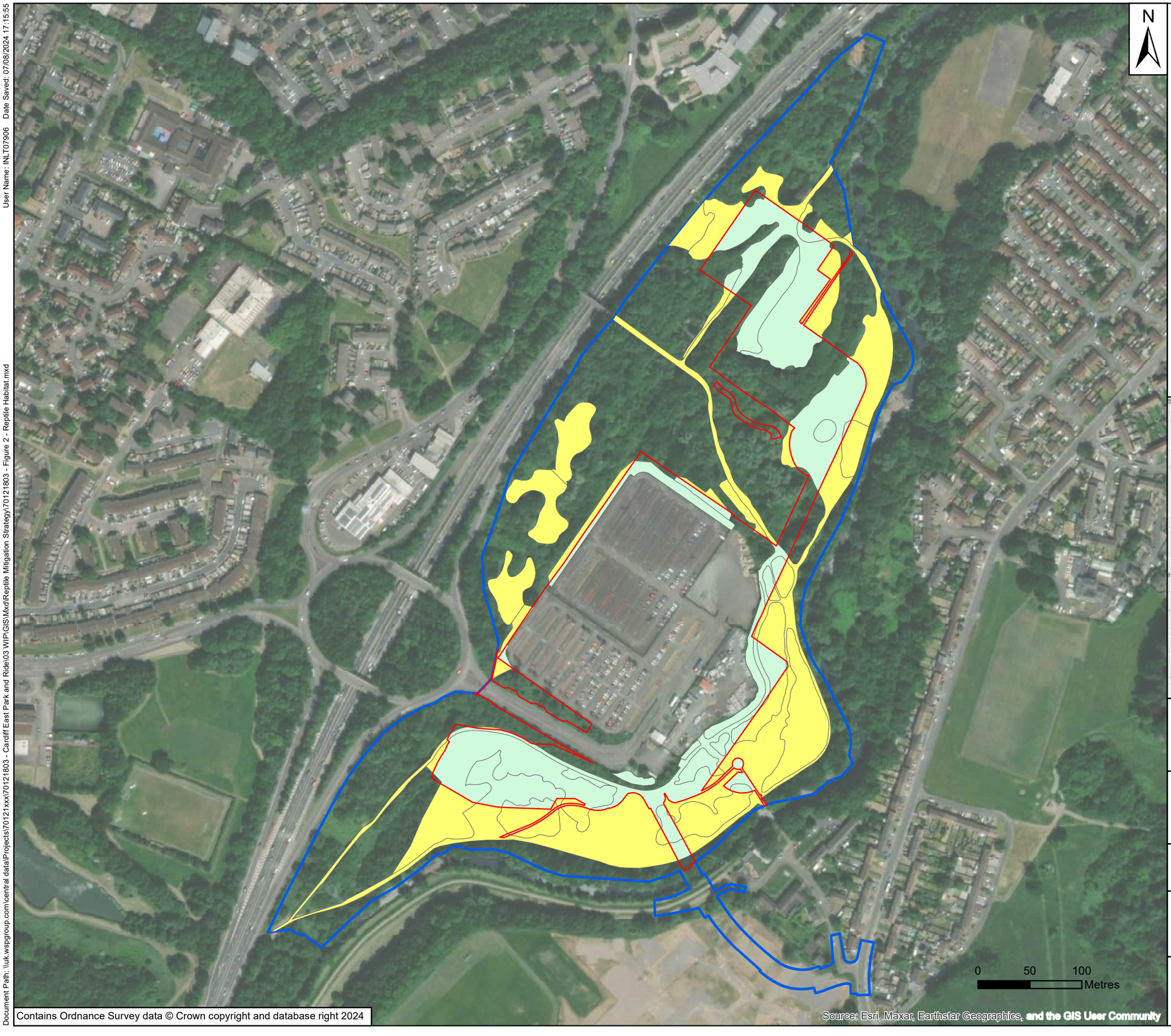
wsp

Client: CURTIS HALL LTD

Project: CARDIFF EAST PARK AND RIDE

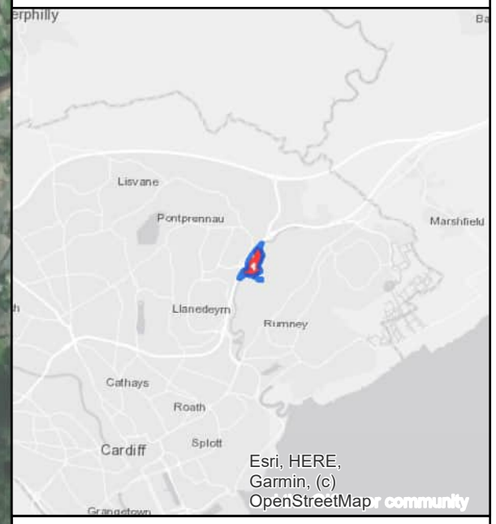
Title: Reptile Survey Results

Drawing No:	FIGURE 3	Drawn:	LT
Date:	11/09/2024	Checked:	HG
Scale:	1,000 @ A3	Approved:	KF



Legend

- Site Boundary
- Development Footprint
- Reptile Habitat within Development Footprint
- Reptile Habitat outside the Development Footprint



wsp

Client: CURTIS HALL LTD

Project: CARDIFF EAST PARK AND RIDE

Title: REPTILE HABITAT

Drawing No:	Figure 4	Drawn:	LT
Date:	11/09/2024	Checked:	HG
Scale:	3,500 @ A3	Approved:	KF

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APPENDIX A – SITE PHOTOGRAPHS

Reptile habitat to be lost on Site:

Photograph 1. Bramble scrub to be lost on Site

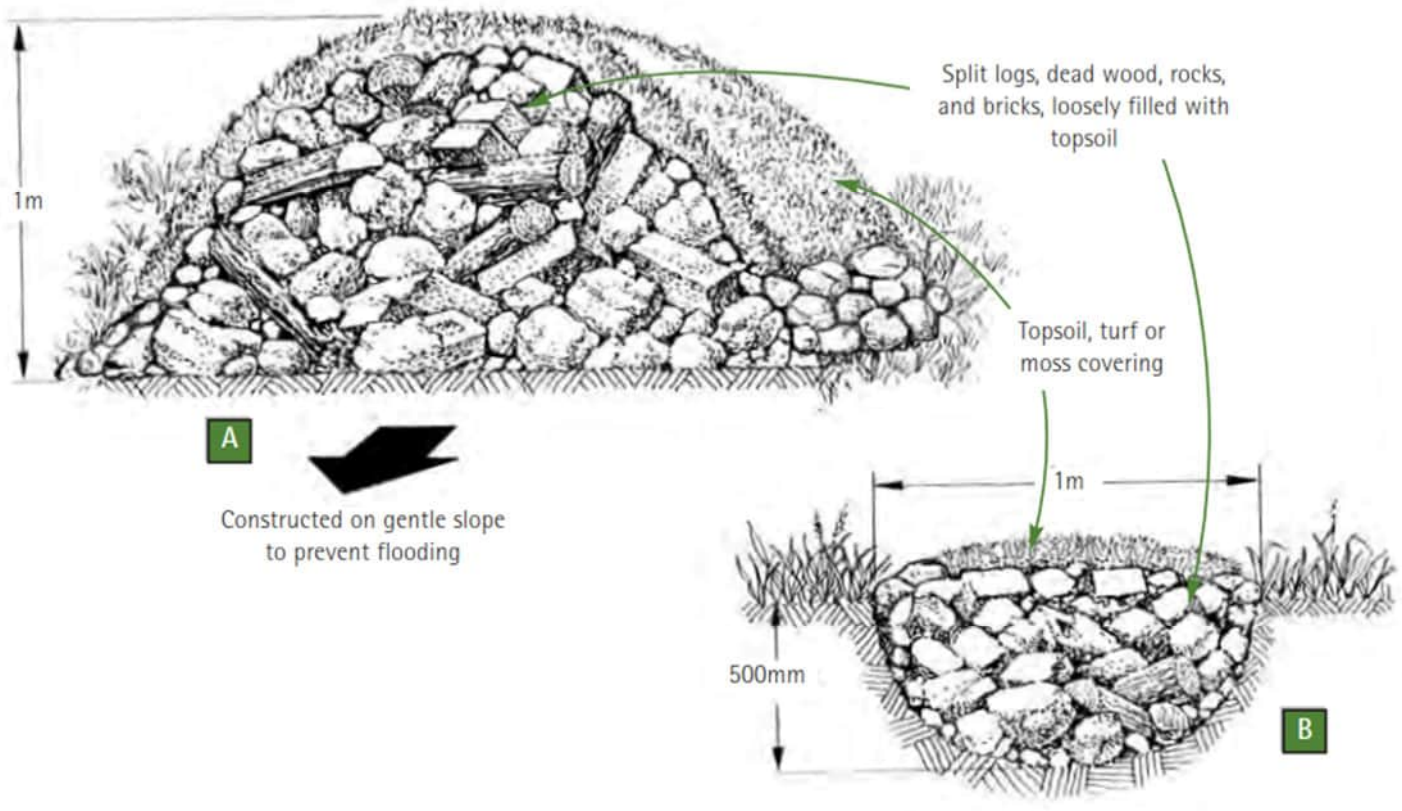
Photograph 2. Bramble scrub and semi-improved grassland to be lost on Site

Photograph 3. Semi-improved grassland to be lost on Site

Photograph 4. Bramble scrub and semi-improved grassland to be lost on Site

APPENDIX B – REPTILE HIBERNACULUM DESIGN

The below diagram is from the Great Crested Newt Conservation Handbook[13] and is considered a suitable hibernacula for both reptile and amphibian species.



[13] Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

APPENDIX C – SIGNING SHEET

Toolbox Talk – Signing Sheet

By signing this form, the contractor representative certifies that he/she has understood the prescribed methods required for the Proposed Works detailed in this PMoW:

Name	Company	Date	Signature

Curtis Hall Ltd

Cardiff Park and Ride East, Llanrumney

Information to Inform Habitats Regulations Assessment

UK0041515-HRA
December 2025

Public

Curtis Hall Ltd

Cardiff Park and Ride East, Llanrumney

Information to Inform Habitats Regulations Assessment

Type of document (version) Public

Project no. UK0041515

Our Ref. No. UK0041515-HRA

Date: December 2025

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Checked by	Gabrielle Horup			
Signature				
Authorised by	Katharine Fisher			
Signature				
Project number	UK0041515			
Report number	UK0041515-HRA			
File reference	\\uk.wspgroup.com\central data\Projects\70121xxx\70121803 - Cardiff East Park and Ride\03 WIP\3d - Reporting\HRA			

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Appendix A

Outstanding Information

Executive Summary

WSP UK Ltd. was commissioned by Curtis Hall Ltd to provide information to inform a Habitats Regulations Assessment (HRA), to support a hybrid planning application for redevelopment at Cardiff East Park & Ride, west of Llanrumney in Cardiff, Wales (central National Grid Reference: ST 21265 80953) (the 'Proposed Development').

The application seeks:

- outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

Outline elements of the application will be confirmed via a future reserved matters application.

Under the requirements of the European Council Directives 92/43/EEC 'Habitats Directive' and 2009/147/EC 'Birds Directive' it is necessary to consider whether the proposed project may have significant effects upon areas of nature conservation importance designated/classified under the Directives. This requirement is translated into UK law through the Conservation of Habitats and Species Regulations 2017 (as amended) 'The Habitats Regulations'. The UK government has set out the step wise approach which should be followed to enable Competent Authorities to discharge their duties under The Habitats Regulations. The Habitats Regulations Assessment (HRA) process is usually summarised in four distinct stages of assessment, and this report presents information to enable the assessment required as part of Stage 1 and Stage 2 of that process. The scope of this report is therefore to establish whether the project will hav`e Likely Significant Effects (LSE) upon sites of European importance[1] and Ramsar sites, which are, for the purpose of this assessment, collectively referred to as the 'Habitats Sites'. Ramsar sites are treated as if they were European Sites by virtue of government policy.

The Proposed Development is hydrologically connected to the Severn Estuary Special Area of Conservation (SAC), Special Protection Area (SPA), and Ramsar site. The Proposed Development is also located within 30km of three bat SACs: Mendip Limestone Grasslands SAC, North Somerset and Mendip Bats SAC, and Wye Valley and Forest of Dean Bat Sites SAC.

This HRA concluded that no LSEs are anticipated on any Habitats Sites from the Proposed Development as a result of changes in water quality during construction, the spread of Invasive Non-Native Plant Species (INNS), impact on fish qualifying features due to increased shading, or impact on the bat qualifying features from any of the bat SACs during construction, with no residual effects or potential for in-combination impacts. However, potential LSE has been identified as a result of

[1] Sites of European importance include Special Areas of Conservation (SAC), Special Protection Areas (SPA), candidate SACs and potential SPAs. It is also a matter of government policy that Ramsar sites and potential SACs and SPAs are given the same protection as other European Sites in the HRA process, as described in para 6.4.30 of the Planning Policy Wales (PPW). In that context, Ramsar sites have also been considered in this report where applicable.

noise and vibrational disturbance to fish qualifying features of the Severn Estuary Ramsar during construction.

In accordance with case law, People Over Wind and Sweetman v Coillte Teoranta (Case-323/17), mitigation measures cannot be considered when screening for LSE. In the absence of details for the fire-water management, an outline element of the application, including containment, treatment, and discharge system, a precautionary LSE is identified. As a result, the Proposed Development has proceeded to Stage 2: Appropriate Assessment to assess its effect on the integrity of the Severn Estuary SAC, SPA and Ramsar.

In Stage 2, mitigation measures have been recommended to address the LSE, including seasonal and time restrictions on piling activities to avoid effects on salmon *Salmo salar*, sea trout *S. trutta* and eel *Anguilla anguilla* of Severn Estuary Ramsar, as well as measures for the management of fire-water runoff. As detailed design of the fire-water containment, treatment and discharge system is not yet available, the HRA has assessed a reasonable worst-case scenario and identified functional performance standards necessary to ensure protection of the designated sites. These standards require full capture, containment and treatment of fire-water, with discharge restricted to quality-verified flows that avoid hydraulic disturbance.

On the basis that these mitigation measures and performance standards will be delivered, it has been concluded that there will be no adverse effects upon the integrity of the Severn Estuary SAC, SPA and Ramsar resulting from the Proposed Development.

It is understood that the bridge design remains unchanged from the extant planning permission, and the assessment has been completed on that basis. Details of the proposed fire-water runoff management system is currently unavailable. In the absence of these details, the assessment has been based on the functional performance standards that the final system will need to achieve, reflecting recognised best industry practice and relevant pollution-prevention principles.

1 Introduction

1.1.1. WSP UK Ltd was commissioned by Curtis Hall Ltd to provide information to inform a Habitats Regulations Assessment (HRA), to support a hybrid planning application for redevelopment at Cardiff East Park & Ride, west of Llanrumney in Cardiff, Wales (central National Grid Reference: ST 21287 80932) (the 'Proposed Development'). The 'Site', as referred to within this report, is shown by both, the red line boundary and the off-site mitigation / compensation area together in **Figure 1**.

1.1.2. The application seeks:

- outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

1.1.3. The Proposed Development follows the same principles and ecological mitigation framework as the extant planning permission (Ref. 22/02673/FUL) previously granted for the Cardiff East Park and Ride. The Proposed Development has evolved through extensive pre-application consultation with the Council and other key stakeholders. The Proposed Development provides the opportunity to provide for critical national digital and economic infrastructure and related employment. The Proposed Development would also facilitate a new bridge connecting the Site with Llanrumney.

1.1.4. Under the requirements of the European Council Directive 92/43/EEC 'Habitats Directive' and the Council Directive 2009/147/EC 'Birds Directive' it is necessary to consider whether the Proposed Development may have significant effects upon areas of nature conservation importance designated/classified under the Directives. This requirement is translated into UK law through the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations').

1.1.5. The Habitats Regulations place a duty upon 'Competent Authorities' (potentially Cardiff Council in this instance) to consider Likely Significant Effects (LSE) upon sites of European importance[2] prior to granting consent for projects or plans. Should LSE be identified by the initial screening process, it is necessary to further consider the effects by way of an 'Appropriate Assessment' including consideration of avoidance and mitigation measures that may be required. Any plan or project that would lead to Adverse Effects on Integrity (AEoI) of these sites cannot be permitted without meeting strict additional tests. Overall, this process of assessment is known as Habitats Regulations Assessment (HRA). Further details of the applicable legislative context are summarised within **Section 1.2**, and a summary of the overall HRA process is provided in **Section 1.3**.

1.1.6. For the purpose of this assessment, Special Areas of Conservation (SAC), Special Protection Areas (SPA), and Ramsar site will be hereafter collectively referred to as the 'Habitats Sites'.

[2] Sites of European importance include Special Areas of Conservation (SAC), Special Protection Areas (SPA), candidate SACs and potential SPAs. It is also a matter of government policy that Ramsar sites and potential SACs and SPAs are given the same protection as other European Sites in the HRA process, as described in para 6.4.30 of the Planning Policy Wales (PPW). In that context, Ramsar sites have also been considered in this report where applicable.

1.1.7. This document provides information to enable the Competent Authority to both screen the Proposed Development for LSEs and undertake an Appropriate Assessment of any LSEs identified, including whether mitigation can be used to avoid or reduce the significance of any AEoI. It will also determine whether further HRA stages need to be applied to achieve compliance with legislation. It covers the following elements:

- determining whether the project is directly connected with or necessary for the management of the Habitats Sites;
- describing the project that may lead to LSEs on Habitats Sites;
- undertaking an initial scoping for potential direct and indirect impacts upon Habitats Sites;
- assessing the LSEs identified as resulting from these impacts, both alone and in-combination with other plans and projects;
- excluding sites where it can be objectively concluded that there will be no likely significant effects;
- undertaking a detailed assessment to determine if LSEs would result in AEoI of the Habitats Sites and require mitigation; and
- determine whether residual effects would remain following the application of mitigation and whether further HRA stages are required.

1.1.8. A description of the designated sites identified are provided within **Section 3**. Consideration of potential effects of the Proposed Development upon the designated sites and whether these are likely to be significant is provided within **Section 5**, including an assessment of potential in-combination effects.

1.2 Habitats Regulations Assessment Context

Legislative Context

1.2.1. The Habitats Directive is translated into UK law through the Habitats Regulations; Regulation 63 (1) states that *'A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which—*

(a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and

(b) is not directly connected with or necessary to the management of that site,

—must make an Appropriate Assessment of the implications for that site in view of that site's conservation objective.

63 (5) in the light of the conclusions of the assessment, and subject to regulation 64 (considerations of overriding public interest), the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European off shore marine site (as the case may be)'

1.2.2. Like the Habitats Directive, the Habitats Regulations also make allowance for projects or plans to be completed if they satisfy '*imperative reasons of overriding public interest (IROPI)*'[3]. Regulations 64 and 68 relate to such situations.

[3] '*(a) reasons relating to human health, public safety or beneficial consequences of primary importance to the environment; or . (b) any other reasons which the competent authority, having due regard to the opinion of the European Commission, consider to be imperative reasons of overriding public interest.*'

1.2.3. Following the UK's departure from the European Union, the UK Government has issued guidance (Defra, 2021) on the implementation of these regulations, providing detailed instructions on implementing the regulations and conducting assessments, to ensure continuity in habitat protection despite the departure from the EU. This guidance clarifies that:

"*SACs and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes:*

- *existing SACs and SPAs*
- *new SACs and SPAs designated under these Regulations*.

Any references to Natura 2000 in the 2017 Regulations and in guidance now refers to the new national site network.
Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to:

- *fulfil the commitment made by government to maintain environmental protections; and*
- *continue to meet our international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions".*

Policy Context

1.2.4. Planning Policy Wales (PPW) Edition 12 (Welsh Government, 2024), provides the overarching national planning policy framework for Wales. PPW policies guide the planning process and HRAs are a specific assessment that must be carried out when plans or projects could affect European sites.

1.2.5. It is a matter of Welsh Government policy (PPW - paragraphs 6.4.29 and 6.4.30) that sites designated under the 1971 Ramsar Convention for their internationally important wetlands (commonly known as Ramsar sites), and proposed SACs (pSAC) and proposed SPAs (pSPA) are also considered in the same way as SACs and SPAs.

Case Law Context

1.2.6. In HRA, case law plays a crucial role in defining how the regulations should be interpreted and applied. It outline the legal standards and procedural requirements that must be followed during the assessment process.

1.2.7. For example, the People Over Wind case (C-323/17) (People Over Wind, Peter Sweetman v Coillte Teoranta, 2018) clarified an important point in the HRA process: mitigation measures cannot be considered during the initial screening stage. This means that when determining whether a project or plan is likely to have a significant effect on a Habitats Site, one must assess the potential impacts without factoring in any measures that might be taken to reduce those impacts.

1.3 Stages of Habitats Regulations Assessment

1.3.1. Guidance on the Habitats Directive (European Commission, n.d.) sets out the step wise approach which should be followed to enable Competent Authorities to discharge their duties under the Habitats Directive and provides further clarity on the interpretation of Articles 6 (3) and 6 (4). The

process used is usually summarised in four distinct stages of assessment. These stages are outlined as follows:

- **Screening (Stage 1)**: the process to identify the likely effects of a plan or project upon the qualifying features and conservation objectives of a Natura 2000 site, either alone or in combination with other plans or projects and consider whether there will be an LSE.
- **Appropriate Assessment (Stage 2)**: detailed consideration of LSEs and whether they would lead to significant AEoI of the Natura 2000 site, either alone or in combination with other plans and projects. Where there are adverse effects, mitigation is considered to avoid or offset them. If these mitigation options cannot avoid adverse effects, then development consent can only be given if Stages 3 and 4 are followed.
- **Assessment of Alternative Solutions (Stage 3)**: the process which examines alternative ways of achieving the objectives of the plan or project that avoid or have lesser AEoI of the Natura 2000 site.
- **Imperative Reasons of Overriding Public Interest (IROPI) (Stage 4)**: the assessment where no alternative solutions exist and where adverse effects remain: an assessment of whether the development is necessary for IROPI and, if so, of the compensatory measures needed to maintain the overall coherence of the site or integrity of the Natura 2000 site.

1.4 Habitats Regulations Assessment Methodology

1.4.1. The precautionary principle is applied at all stages of the HRA process. In relation to screening (Stage 1) this means that projects or plans where effects are considered likely and those where uncertainty exists as to whether effects are likely to be significant must subject to further stages in HRA process. The screening process is wide-ranging and takes into consideration the sensitivity and mobility of Habitats Sites' Qualifying Features, e.g. marine mammal and bat species, as well as the nature of the proposed works and working methods.

1.4.2. Appropriate Assessment (Stage 2) follows screening and is the subject of this report. LSEs identified within Stage 1 are subject to detailed examination to determine whether they would have AEoI of Habitats Sites, either alone or in combination with other plans or projects, in view of the Habitats Site's conservation objectives.

Integrity

1.4.3. The currently applied definition of integrity in relation to Habitats Sites comes from Office of the Deputy Prime Minister Circular (OPDM, 2005) which states: 'the coherence of the site's ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated. In addition, European Commission guidance (European Commission, n.d.) on managing Habitats Sites emphasises that site integrity involves its ecological structure, function and ecological processes and that the assessment of adverse effects should focus on, and be limited to, the site's conservation objectives.

Adverse effects

1.4.4. An AEoI is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation. In addition, an adverse effect would be one which caused a detectable reduction of the features for which a site was designated, at the scale of the site rather than at the scale of the location of the impact.

1.4.5. Guidance defines the conservation status of species as ‘favourable’ when:

- Population dynamics of the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is predicted to maintained for the foreseeable future; and
- There is, and will probably continue to be, a sufficient habitat to maintain its populations on a long-term basis.

1.4.6. ‘Favourable’ conservation status of habitats is defined in guidance as occurring when:

- Its natural range and areas it covers within that range are stable or increasing; and
- The species structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.

1.4.7. European Commission guidance also recommends that, when considering the ‘integrity of the site’, it is important to take account of the possibility that effects can manifest over the short, medium or long-term.

1.4.8. Where examination reveals adverse effects would arise as a result of the Proposed Development, mitigation options are considered that would avoid or offset effects and maintain the integrity of the Habitats Site and its Qualifying Features.

1.5 Further HRA Stages (Stage 3 and 4)

1.5.1. These are outside of the purpose of this report, but the findings of the Appropriate Assessment would define the scope of any assessment of alternative solutions to the Proposed Development (Stage 3) that would be undertaken, and also inform arguments at Stage 4. If mitigation options identified at Stage 2 cannot avoid or offset adverse effects, then development consent can only be given if Stages 3 and 4 are followed.

1.6 Consultation

1.6.1. The Council’s Ecologist was consulted on the overall scheme, including the HRA. Their review confirmed that the embedded measures for the Proposed Development, reflecting recognised industry best practices for the prevention of water pollution, were sufficient to conclude that there would be no LSE on Habitats Sites in terms of change in water quality during construction, consistent with the findings of the previous HRA undertaken for the extant application. However, a reassessment needs to be undertaken to ensure that any new considerations were appropriately addressed, particularly in relation to the potential effects of climate change and the storage of fuels and chemicals associated with the data centre, including the risk of contaminants entering the river in the event of a fire or similar incident. No formal consultation with other key engagement groups (NRW or Welsh Government) has been undertaken in respect to the Proposed Development as part of the HRA at the time of writing.

2 Project Description

2.1 Site Description

2.1.1. The Site comprises approximately 23.4ha of land at the existing Cardiff Park and Ride East and 4.76ha of off-site area within the administrative boundary of Cardiff City Council. The existing Park and Ride contains a hard-surfaced area of 4.9ha with approximately 900 car parking spaces, as well bus drop-off and pick-up points, an office/amenity building and various compounds. The off-site mitigation / compensation area comprises predominantly regularly maintained amenity grassland, primarily utilised as sports pitches. To the south of these pitches, adjacent to the River Rhymney, there is an area of poor semi-improved grassland that is subject to less management. In the southern section of the off-site area, scattered hawthorn and naturally regenerated oak saplings are present. The Site is accessed from the A48, Eastern Avenue.

2.1.2. In addition to the park and ride, the Site features areas of woodland and scrub land with public rights of way and informal footpaths. The total developed site area would comprise 7.4ha (including the park and ride). The Rhymney River runs along the southern boundary of the Site, with the Rhymney Trail running parallel to the river. The Rhymney Trail crosses the river via an existing footbridge to the south of the Site.

2.1.3. The Site is not shown on the Council's adopted proposals map to be allocated for any specific use. However, in terms of other planning designations, the Site features an area of ancient woodland to the north and a small area of ancient woodland to the south, in addition to a number of Tree Preservation Order (TPO) trees. The north of the Site and a corridor along the Rhymney River lies in an area of high flood risk and the rest of the Site lies in a low flood risk area. The Site lies within the Rhymney River corridor.

2.1.4. Immediately to the north-west lies the dual carriageway (A48) which extends to the south towards Cardiff City centre. Beyond this lies the residential area of Pentwyn, while to the east lies the residential area of Llanrumney. To the south, on the opposing side of the river, planning permission for a residential scheme of 98 residential units was permitted under application ref:18/02594/MJR. Construction on that site has been largely completed.

2.2 Work Details including Method of Works (see Appendix A: Outstanding Information)

2.2.1. While outline elements of the detailed design, remain to be confirmed through future reserved matters applications, a worst-case scenario assessment has been conducted in accordance with the precautionary principle under the Habitats Regulations. This approach is deemed appropriate and sufficient to meet the requirements of this report.

Bridge Construction

2.2.2. It is envisaged that the construction of the bridge will involve three piers on the Proposed Development side which will have localised foundations created using tracked machinery. The Pier on the east (last one before the river) is to be set back from the river bank by approximately 10m. The pre-cast concrete beams (~21m) for the three spans on the Proposed Development side will be swung into place via a crane. A temporary works design has facilitated that the crane will then relocate to the first span and swing into place the second span beams and so on with the third span.

2.2.3. The concrete abutment and head wall to the Rhymney side is set back from the back by some 7.5m and will be accessed and constructed through the 'Wates development'. The main precast beams (29.6m) for the river span will be lifted into place from the Rhymney side of the river.

Fire-water runoff management

2.2.4. For the purposes of this HRA, the assessment of the lagoon system and fire-water management is based on the functional requirements and performance standards. For further details and limitations regarding these elements, please see **Appendix B**.

3 Identifying Relevant Habitats Sites

3.1 Study Area

3.1.1. This defines the geographic limits from the Proposed Development used to identify Habitats Sites to be considered within the HRA process and be screened for LSEs. The study area reflects the high sensitivity of qualifying features of Habitats Sites and the fact they often support species that are mobile and widely ranging, such as bats, birds and fish. The Habitats Sites are therefore within the Zone of Influence (ZoI) of the Proposed Development, meaning they could potentially be affected by the activities included in the Proposed Development.

3.1.2. The study area was defined as a buffer of 10km surrounding the Proposed Development, consideration was also given to any Habitats Sites that might be hydrologically connected and located beyond 10km. This distance was extended to 30km for any SAC where bat species are a qualifying interest feature, given their wider foraging ranges.

3.2 Sites Identified

3.2.1. Four Habitats Sites within 10km of this study area were identified, three of which are downstream (following the course of the River Rhymney) from the Proposed Development, and three Habitats Site having bat species as qualifying interest feature was identified within 30km of the Proposed Development. Identified Habitat Sites are:

- Severn Estuary/ Môr Hafren SAC (3.1km south at its nearest point & 5.07km for hydrological connection);
- Severn Estuary SPA (3.1km south at its nearest point & 5.07km for hydrological connection);
- Severn Estuary Ramsar (3.1km south at its nearest point & 5.07km for hydrological connection);
- Cardiff Beech Woods SAC (6.82km north-west);
- Mendip Limestone Grasslands SAC (21.4km south-east);
- North Somerset and Mendip Bats SAC (26.9km south-east); and
- Wye Valley and Forest of Dean Bat Sites SAC (29.8km north-west).

3.2.2. The Severn Estuary is the largest example of a coastal plain estuary in the United Kingdom and one of the largest estuaries in Europe. Roughly two thirds of the total area is composed of subtidal habitats (stable sandbanks and shifting sediments of gravel, sand and mud) and one third is composed of intertidal habitats (tide washed mud and sand, saltmarshes and rocky shores). The estuary supports a wide array of habitats and species of international importance for nature conservation. Sediment flows and fluxes affecting the estuary are of particular importance for estuarine processes and ecology and the morphology of the estuary is constantly changing due to the complex hydrodynamics. Sediment deposits provide essential material to maintain the mudflats, sandflats and saltmarsh (NE and CCW, 2009).

3.2.3. Cardiff Beech Woods SAC represents an area of semi-natural broadleaved woodland dominated by beech *Fagus sylvatica*. Cardiff Beech Woods is considered to be one of the best areas in the United Kingdom for *Asperulo-Fagetum* beech forests. The site contains one of the largest concentrations of *Asperulo-Fagetum* in Wales, and represents the habitat close to the western limit of its past native range in both UK and Europe. The SAC is well connected to other woodland and to some extent other semi-natural habitat. It sits within a significant functional woodland network, extending onto the

coalfield, although this becomes more fragmented in the countryside south and south-west of the SAC (NRW, 2014).

3.2.4. Mendip Limestone Grasslands SAC comprises coastal and inland sections of the Carboniferous Limestone outcrops of the Mendips. It contains a wide range of habitats including ancient and secondary semi-natural broadleaved woodland, unimproved calcareous grassland and a complex mosaic of calcareous grassland and acidic dry dwarf-shrub heath. The coastal headland and inland hills support the largest area of sheep's-fescue – carline-thistle (*Festuca ovina – Carlina vulgaris*) grassland in England, including two sub-types (the dwarf sedge *Carex humilis* and honewort *Trinia glauca* sub-communities) known from no other site in the UK. Areas of short-turf sheep's-fescue – meadow oat-grass *Helictotrichon pratense* grassland also occur inland. The site is exceptional in that it supports a number of rare and scarce vascular plants typical of the oceanic southern temperate and Mediterranean elements of the British flora (English Nature, 2005a).

3.2.5. North Somerset and Mendip Bats SAC has the Cheddar complex and Wookey Hole areas that support a wide range of habitats which provide feeding grounds for bats. These include semi-natural dry grasslands of which the principal community present is sheep's-fescue – meadow oat-grass grassland which occurs on rock ledges and on steep slopes with shallow limestone soil, especially in the dry valleys and gorges and on the south-facing scarp of the Mendips. King's Wood and Urchin Wood have developed over limestone which outcrops in parts of the site and forms a steep scarp to the south-east. There is mostly oak *Quercus robur* and ash *Fraxinus excelsior* woodland, though some areas are dominated by small-leaved lime *Tilia cordata* with both maiden and coppice trees. Other canopy trees include yew *Taxus baccata*, cherry *Prunus avium* and wild service tree *Sorbus torminalis*. There is a rich ground flora including many ferns and mosses. The limestone caves and mines of the Mendips and the north Somerset hills provide a range of important breeding and hibernation sites for lesser horseshoe bat *Rhinolophus hipposideros* and greater horseshoe bat *Rhinolophus ferrumequinum* (English Nature, 2005b).

3.2.6. The Wye Valley and Forest of Dean Bat SAC is a cross border site, straddling the Welsh/English Border. It is made up of thirteen component SSSIs, of which four are in Wales: Llangovan Church, Mwyngloddfa Mynydd-bach, Newton Court Stable Block and Wye Valley Lesser Horseshoe Bats SSSIs. Wye Valley Lesser Horseshoe Bats SSSI is actually four separate summer bat roosts, consisting of Penallt Old Church, The Priory at Llandogo, Itton Court Stud and Tregeiriog Farm. During the summer it is possible to see large numbers of bats coming and going from the roosts at dusk and dawn. Species numbers will vary slightly from year to year, but Penallt Old Church supports at least 250 adult lesser horseshoe bats; The Priory, Llandogo supports at least 350 adult lesser horseshoe bats; Itton Court Stud supports at least 80 adult lesser horseshoe bats; and Tregeiriog Farm supports at least 80 adult lesser horseshoe bats. Newton Court Stable Block should support a summer population of greater horseshoe bats of at least 55 adult bats and 30 juveniles. Mwyngloddfa Mynydd-bach continues to support a hibernation roost, with at least 60 adult lesser horseshoe bats (NRW, 2008).

3.2.7. All seven Habitats Sites are detailed in **Table 3-1** and shown on **Figure 2.**

3.2.8. With regard to the qualifying features listed in **Table 3-1**, the conservation objectives for the Severn Estuary SAC and SPA (NE and CCW, 2009), Cardiff Beech Woods SAC (NRW, 2014), and The Wye Valley and Forest of Dean Bat SAC (NRW, 2008) are as follows:

Favourable conservation status as defined in Article 1 of the Habitats Directive.

Conservation status of a natural habitat *means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.*

The conservative [sic] status of a natural habitat will be taken as 'favourable' when:

- *its natural range and the areas it covers within that range are stable or increasing, and*
- *the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and*
- *conservation status of typical species is favourable as defined in [Article] 1(i).*

Conservation status of a species *means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2;*

The conservation status of a species will be taken as 'favourable' when:

- *population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.*

3.2.9. With regard to the qualifying features listed in **Table 3-1**, the conservation objectives for the Mendip Limestone Grasslands SAC (NE, 2018a), and North Somerset and Mendip Bats SAC (NE, 2018b) are as follows:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- *The extent and distribution of qualifying natural habitats and habitats of qualifying species*
- *The structure and function (including typical species) of qualifying natural habitats*
- *The structure and function of the habitats of qualifying species*
- *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely*
- *The populations of qualifying species, and,*
- *The distribution of qualifying species within the site.*

3.2.10. Ramsar sites do not have conservation objectives. Since the Ramsar criteria of the Severn Estuary Ramsar is largely similar to those of the Severn Estuary SAC and SPA, the SAC and SPA's conservation objectives are considered broadly applicable and useful for the assessment of the Severn Estuary Ramsar site.

Table 3-1 - Relevant Habitats Sites

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
Severn Estuary SAC (UK0013030)	73,714.11	The Severn Estuary has been designated a SAC on the basis that it supports occurrences of habitat types and species listed in **Annexes I** and **II** respectively of the Nature Directives. The site qualifies for the following habitats listed in **Annex I** (NE and CCW, 2009): ■ Estuaries ■ Sandbanks which are slightly covered by sea water all the time (Subtidal sandbanks) ■ Mudflats and sandflats not covered by seawater at low tide (Intertidal mudflats and sandflats) ■ Atlantic salt meadows *Glauco-Puccinellietalia maritimae* ■ Reefs The site qualifies for the following species listed in **Annex II**: ■ Sea lamprey *Petromyzon marinus* ■ River lamprey *Lampetra fluviatilis* ■ Twaite shad *Alosa fallax*	Factors (NE and CCW, 2009): ■ Physical loss ■ Physical damage ■ Toxic contamination ■ Non-toxic contamination ■ Biological disturbance ■ Non-physical disturbance	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015a) form are: Negative Impacts ■ *A02* - Modification of cultivation practices ■ *E06* - Other urbanisation, industrial and similar activities ■ *G01* - Outdoor sports and leisure activities, recreational activities ■ *J02* - Human induced changes in hydraulic conditions ■ *M01* - Changes in abiotic conditions Positive Impacts ■ *A02* - Modification of cultivation practices ■ *A04* – Grazing ■ *D05* - Improved access to site ■ *G03* - Interpretative centres

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
Severn Estuary SPA (UK9015022)	24,487.91	The Severn Estuary SPA is designated on the basis that it supports populations of species that are of importance under the Directive (2009/27/EC). The Severn Estuary SPA qualifies for internationally important populations of regularly occurring species as mentioned below (NE and CCW, 2009): ■ Bewick's swan *Cygnus columbianus bewickii* ■ Common redshank *Tringa totanus* ■ Common shelduck *Tadorna tadorna* ■ Dunlin *Calidris alpina alpina* ■ Gadwall *Anas strepera* ■ European white-fronted goose *Anser albifrons albifrons* ■ Internationally important assemblage of waterfowl (wildfowl & waders) - in addition to the above, the area supports assemblage of various species of waterbirds including wigeon *Anas Penelo*pe, teal *Anas crecca*, pintail *Anas acute*, pochard *Aythya farina*, tufted duck *Aythya fuligula*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, curlew *Numenius aquata* and whimbrel *Numenius phaeopus*.	Factors (NE and CCW, 2009): ■ Physical loss ■ Physical damage ■ Toxic contamination ■ Non-toxic contamination ■ Biological disturbance ■ Non-physical disturbance	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015b) form are: <u>Negative Impacts</u> ■ *A02* - Modification of cultivation practices ■ *E06* - Other urbanisation, industrial and similar activities ■ *G01* - Outdoor sports and leisure activities, recreational activities ■ *J02* - Human induced changes in hydraulic conditions ■ *M01* - Changes in abiotic conditions <u>Positive Impacts</u> ■ *A02* - Modification of cultivation practices ■ *A04* – Grazing ■ *D05* - Improved access to site ■ *G03* - Interpretative centre
Severn Estuary Ramsar	24,701	The Severn Estuary Ramsar is designated on the basis that it supports habitats and populations of species, especially waterbird habitats, that are of importance under the Ramsar Convention on	As the Severn Estuary Ramsar coincides with the Severn Estuary SPA, the operations which may affect the Severn	From the Severn Estuary RIS (JNCC, 2008), factors (past, present or potential) adversely affecting the site's ecological

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
(UK11081)		Wetlands of International Importance. From the Severn Estuary Ramsar Information Sheet (RIS) (JNCC, 2008), the criteria applied to the designation of the Severn Estuary Ramsar are: ▪ **Ramsar criterion 1** - Due to the immense tidal range (second largest in world), this affects both the physical environment and biological communities. Habitats Directive **Annex I** features include: • H1110 Sandbanks which are slightly covered by sea water all the time • H1130 Estuaries • H1140 Mudflats and sandflats not covered by seawater at low tide • H1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) ▪ **Ramsar criterion 3** - Due to unusual estuarine communities, reduced diversity and high productivity. ▪ **Ramsar criterion 4** - This site is important for the run of migratory fish between sea and river via estuary. Species include: • Salmon *Salmo salar* • Sea trout *S. trutta* • Sea lamprey • River lamprey • Allis shad *Alosa alosa* • Twaite shad • Eel *Anguilla anguilla*.	Estuary SPA would also have some relevance for the Severn Estuary Ramsar. Hence, the threats to both the designations are considered similar.	character, including changes in land (including water) use and development projects are: ▪ Dredging ▪ Erosion ▪ Recreational/tourism disturbance

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
		It is also of particular importance for migratory birds during spring and autumn. ■ **Ramsar criterion 5 –** Assemblage of international importance (water birds). ■ **Ramsar criterion 6 –** Qualifying species/populations occurring at levels of international importance including: • Bewick's swan • European white-fronted goose • Common shelduck • Gadwall • Dunlin • Common redshank ■ **Ramsar criterion 8** – The fish of the whole estuarine and river system are one of the most diverse in Britain, with over 110 species recorded including salmon, sea trout, sea lamprey, river lamprey, allis shad, twaite shad and eel, which use the Severn Estuary as a key migration route to their spawning grounds in the many tributaries which flow in the Severn Estuary.		
Cardiff Beech Woods SAC (UK0030109)	115.62	The Cardiff Beech Woods have been designated a SAC on the basis that it supports occurrences of the following habitat types listed in **Annex I**: ■ *Asperulo-Fagetum* beech forests ■ *Tilio-Acerion* forests of slopes, screes and ravines	Factors (NRW, 2014): ■ Recreation ■ Grazing/browsing ■ Air pollution	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015c) form are: Negative Impacts

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
				▪ *G01* - Outdoor sports and leisure activities, recreational activities ▪ *I02* - Invasive non-native species ▪ *K01* - Interspecific floral relations <u>Positive Impacts</u> ▪ *K02* - Biocenotic evolution, succession
Mendip Limestone Grasslands SAC (UK0030203)	415.24	The Mendip Limestone Grasslands has been designated a SAC on the basis that it supports occurrences of habitat types and species listed in **Annexes I** and **II** respectively of the Nature Directives. The site qualifies for the following habitats listed in **Annex I**: ▪ Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); ▪ European dry heaths ▪ Caves not open to the public ▪ *Tilio-Acerion* forests of slopes, screes and ravines;	Factors (NE, 2015a): ▪ Inappropriate scrub control ▪ Change in land management ▪ Disease ▪ Air Pollution: Impact of atmospheric nitrogen deposition	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015d) form are: <u>Negative Impacts</u> ▪ *A02* – Modification of cultivation practices ▪ *H04* – Air pollution, air-borne pollutants ▪ *K02* – Biocenotic evolution, succession ▪ *K04* – Interspecific floral relations <u>Positive Impacts</u>

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
		The site qualifies for the following species listed in **Annex II**: ■ Greater horseshoe bat		■ *A02* – Modification of cultivation practices ■ *A04* – Grazing ■ *B02* – Forest and Plantation management & use
North Somerset and Mendip Bats SAC (UK0030052)	555.93	The North Somerset and Mendip Bats has been designated a SAC on the basis that it supports occurrences of habitat types and species listed in **Annexes I** and **II** respectively of the Nature Directives. The site qualifies for the following habitats listed in **Annex I**: ■ Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*); ■ *Tilio-Acerion* forests of slopes, screes, and ravines;(Mixed woodland on base-rich soils associated with rocky slopes) ■ Caves do not open to the public The site qualifies for the following species listed in **Annex II**: ■ Lesser horseshoe bat ■ Greater horseshoe bat	Factors (NE, 2015b): ■ Under grazing ■ Planning Permission: general ■ Change to site conditions ■ Forestry and woodland management ■ Disease ■ Air Pollution: impact of atmospheric nitrogen deposition	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015e) form are: <u>Negative Impacts</u> ■ *A04 – Grazing* ■ *B02 – Forest and Plantation management & use* ■ *E06 – Other urbanisation, industrial and similar activities* ■ *K04 – Interspecific floral relations* ■ *U – Unknown threat or pressure* <u>Positive Impacts</u> ■ *A02 – Modification of cultivation practices* ■ *A04 – Grazing*

Site Name	Site Size (ha)	Reasons for designation summarised	Factor which may cause deterioration or disturbance / Threat or Pressure	Activities with greatest effect upon the sites, as listen on Natura 2000 standard data form
				▪ *B02 – Forest and Plantation management & use*
Wye Valley and Forest of Dean Bat Sites SAC (UK0014794)	144.82	This complex of sites are on the border between England and Wales and contain, at the time of listing, by far the greatest concentration of lesser horseshoe bat Rhinolophus hipposideros in the UK, totalling about 26% of the national population. In addition, the site also supports large numbers of greater horseshoe bats Rhinolophus ferrumequinum. The entire site supports an exceptional breeding population of both species as the majority of sites within the complex are maternity roosts. The site also includes several disused mines which are used as hibernation roosts. The North Somerset and Mendip Bats has been designated a SAC on the basis that it supports lesser horseshoe bat and greater horseshoe bat, which are listed in **Annex II** of the Nature Directives.	Factors (NRW, 2008): ▪ Structure Condition ▪ Habitat Management ▪ Disturbance ▪ Interruption to flight lines ▪ Mortality from predation or vehicle collision	Activities with greatest effect upon the site, as listed on Natura 2000 standard data (JNCC, 2015f) form are: <u>Negative Impacts:</u> ▪ *G01* – Outdoor sports and leisure activities, recreational activities ▪ *J02* – Human induced changes in hydraulic conditions ▪ *J03* – Other ecosystem modifications <u>Positive Impacts:</u> ▪ *A02* – Modification of cultivation practices ▪ *D05* – Improved access to site ▪ *E04* – Structures, buildings in the landscape

4 Impact Pathways and Zones of Influence

4.1 Overview

4.1.1. This section of the report discusses the impact pathways through which the Proposed Development could lead to 'a conceivable risk of harm' (David Tyldesley Associates, 2025) to the Habitats Sites. A range of work-related impact pathways have been identified for consideration. These pathways are set out below to inform the assessment:

- the specific impact pathways associated with the Proposed Development that could potentially result in adverse effects on the Habitats Site(s); and
- the spatial extent over which these impact pathways may have a material effect on the qualifying interests (i.e. reasons for designation) of the Habitats Site(s).

4.2 Identification of Impact Pathways

4.2.1. Work-related impact pathways that have been identified and could be relevant to Habitats Sites in relation to the Proposed Development include:

Demolition and Construction

- Changes in water quality – although the Severn Estuary lies approximately 5.07km downstream from the closest point of the Proposed Development and 6.41km from the furthest point, changes in water quality resulting from the potential riverbank damage and/or accidental spillage during construction may affect fish interest features that use Rhymney River for migration or spawning. Such impacts could also have downstream consequences for bird and habitat interest features of the Severn Estuary SAC, SPA and Ramsar.
- Spread of Invasive Non-Native Plant Species (INNS) – this can potentially arise from vegetation clearance, excavation works, via runoff or wind dispersal, which could alter aquatic habitats and indirectly affect fish, bird, and habitat interest features of the Severn Estuary SAC, SPA and Ramsar downstream.
- Increased noise, vibrational and lighting disturbance for qualifying fish species – construction activities for the bridge crossing, such as piling, may lead to in-channel levels of noise and vibration that could affect the SAC qualifying interest fish species, delaying or disrupting normal fish behaviour and migration. There may also be nighttime works, so there is a potential of disturbance to fish species of interest due to artificial lighting.
- Increased noise, vibrational and lighting disturbance for qualifying bat species – the use of machinery for demolition, vegetation clearance, and construction could cause disturbance to roosting bats forming part of the SAC populations, if present.
- Loss or alteration of habitats within Functionally Linked Land4 (FLL) might impact species of interest commuting and/or foraging within the Site. This includes both temporary and permanent changes to FLL, such as physical habitat loss and air quality related degradation.
- Direct killing or injury of qualifying bat species – demolition and/or vegetation clearance activities might result in killing of or injury to qualifying interest features that might be commuting and foraging within the Site.

[4] Functionally linked land refers to areas outside a Habitats Site that support key ecological functions of the site's qualifying features – for example, feeding, roosting, or commuting habitat used by species for which the site is designated.

Operation

- Changes in water quality – there is potential for an impact on water quality of Rhymney River during operation due to fire-water runoff in an emergency event.
- Increased lighting disturbance for qualifying bat species – the use of security lighting could cause disturbance to roosting bats forming part of the SAC populations, if present.
- Increased shading – permanent shading beneath the bridge could alter local light conditions and vegetation, potentially affecting fish migration or foraging.

4.2.2. A number of other potential pathways have been assessed and determined as irrelevant to any of the Habitats Sites. These are outlined below, together with the justification for their exclusion:

- Habitat loss or damage – since all the construction and operation works are more than 5km from any Habitats Site, they would not directly impact habitats within the Habitats Sites. Hence, this impact pathway can be screened out.
- Changes to air quality – the Institute for Air Quality Management (IAQM, 2024) identifies a ZoI of 50m for dust dispersal, which may occur during the construction of a Proposed Development. The Proposed Development does not trigger the traffic scoping criteria requiring assessment as per LA105 guidance from Design Manual for Roads and Bridges (DMRB, 2024). The Severn Estuary SAC, SPA and Ramsar, and Cardiff Beech Woods SAC are not within 200m of affected road network to be affected by construction and operation traffic. This impact pathway is therefore screened out.
- Increased visual disturbance for fish qualifying features – no visual impact is applicable to the qualifying fish features of the Severn Estuary SAC, SPA and Ramsar using the FLL nearby the Proposed Development. Given the ecology and sensory limitations of these species, visual disturbance from personnel or machinery nearby the riverbank is highly unlikely to result in significant disturbance. As such, this impact pathway can be screened out.
- Direct injury, mortality or entrapment of fish – no in-channel works, coffer-dams or flow diversions are proposed, and all permanent and temporary structures (including piling rigs and crane platforms) will be located on dry land at least 7-10m landward of the riverbank. There will be no dewatering, impoundment or isolation of river section during the Proposed Development, and no requirement for fish rescue or relocation. As such, there is no plausible impact pathway by which fish qualifying features of the Severn Estuary SAC, SPA and Ramsar could be physically injured or killed through collision with machinery, entrapment within temporary works or stranding. As such, the potential for direct physical harm to fish qualifying species has been scoped out from further assessment as a potential impact pathway.
- Increased noise, vibrational, visual and lighting disturbance for qualifying bird species – the Severn Estuary SPA and Ramsar are over 3km (in a straight line) from the Site and the habitats on the Site, broadleaved woodland, dense/continuous scrub, scattered scrub, broadleaved parkland/scattered trees, and poor semi-improved grassland, are considered unsuitable for the bird qualifying species interest of the SPA and Ramsar. Although parkland and semi-improved grassland could potentially be used by some species, these areas are largely overgrown with scrub, making foraging or grazing highly unlikely. The nearest intertidal mudflats are approximately 3.2km downstream (NRW, 2019) from the Proposed Development. Hence, these impact pathways can be screened out.
- Cardiff Beech Woods SAC is situated inland, over 5km from the Proposed Development, and has no hydrological connections with the Proposed Development. As such, there is no risk of

spreading INNS in the Cardiff Beech Woods SAC, and no risk of spread of pollution due to accidental spillage or any other construction or operation from the Proposed Development.

4.2.3. Given the above, there is no requirement for the **Annex I** habitats (Directive 92/43/EEC) of interest of Cardiff Beech Woods SAC to be considered further in this report due to lack of impact pathways.

4.2.4. Climate Change – as identified in the Chapter 10: Climate Chapter of Environmental Statement (Iceni, 2025), the main driver of climate change for the Proposed Development is electricity consumption and associated greenhouse gas emissions. This demand will be reduced through adoption of the Royal Institute of British Architects' '2030 Climate Change[5]' benchmarks (RIBA, 2021). A 'fabric first[6]' approach (Eyre et al., 2023) will be employed to reduce energy demand, including low u-value, high air tightness and minimised thermal bridging. Highly efficient all electric systems, integration of renewable and low-carbon technologies will further reduce emissions. These factors are recognised as drivers of global climate change, but they do not constitute a site-specific pathway to Habitats Sites and are included here for contextual awareness only.

4.3 Zones of Influence of Impact Pathways

4.3.1. The maximum ZoI of the relevant impact pathways are considered to be as follows:

Demolition and Construction

- Changes to water quality – 10km;
- Spread of INNS – 10km;
- Increased noise, vibrational and lighting disturbance for qualifying fish species – 200m.
- Increased noise, vibrational and lighting disturbance for qualifying bat species within FLL – approximately 200m on precautionary basis.
- Loss or disruption of habitats within FLL – within the Site.
- Direct killing / injury – within the Site.

Operation

- Changes to water quality – 10km.
- Increased lighting disturbance for qualifying bat species within FLL – approximately 200m on precautionary basis.
- Increased shading – immediately below and/or next to the bridge.

[5] The benchmarks set be RIBA requiring new buildings to minimise energy demand and associate greenhouse gas emissions.

[6] A design strategy that priorities improving the buildings envelope (floors, roof, walls, windows) to reduce energy demand for heating and cooling.

5 Stage 1: Screening of Potential Effects

5.1 Overview

5.1.1. This section of the report sets out the findings of the Stage 1. LSE (or the absence of them) are considered in light of the impact pathways and their ZoI, as set out above. Consideration is also given to the ecology of the qualifying interests of the Habitats Sites and how the identified impacts arising from the Proposed Development may therefore affect them. Where potential effects are identified, these are considered against the conservation objectives for the relevant qualifying interest feature(s).

5.1.2. The Proposed Development is not directly connected with or necessary for the management of any of the Habitats Sites mentioned above. It has not been conceived solely to further the conservation of the site(s) and nor is it essential to the management of the site(s). Therefore, further consideration of the Proposed Development within the HRA process is required.

5.2 Consideration of Effects Alone

5.2.1. The Proposed Development has been screened to identify whether potential impact pathways are likely to result in significant effects upon the Habitats Sites, see **Table 5-1** below.

Table 5-1 - High Level Assessment of LSE for Severn Estuary SAC, SPA and Ramsar

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
Demolition and Construction Phase			
Severn Estuary SAC	N	Changes to water quality	Silt could be introduced into the Rhymney River due to earthworks. Sediments, in excess amount, can fill habitat refugia, and have potential to suffocate the fish species using the Rhymney River as FLL, given the potential migration pathways between the Site and the SAC. Given the distance from the Habitats Sites, nature and scope of works, along with the resilience of habitat features of interest, significant effects on these habitats are highly unlikely: any impacts will be short-lived and would quickly become indiscernible from background levels due to the existing heavy silt load of the Severn Estuary. However, silt can still have effect on FLL, which is the Rhymney River, being potentially used by qualifying fish species. In addition to silt, the proximity of the Site to the Rhymney River increases the likelihood of other pollutants from accidental spillage of chemical, fuels or other harmful substances being carried downstream, leading to potentially significant degradation of the Severn Estuary SAC habitats. Some habitats of the Severn Estuary are sensitive to pollution, particularly from contaminants that can reduce water quality. Other aquatic life could also be affected, including prey of qualifying interest fish species, and habitats of the protected species which are downstream of the Proposed Development. However, the Proposed Development includes embedded design measures, outlined in Construction Environmental Management Plan (CEMP) (Curtis Hall, 2025), to prevent pollution and protect water quality regardless of connectivity to Habitats Sites. As these measures are integral to the Proposed Development and are not explicitly brought forward as protective measures for Habitats Sites, they are therefore not considered to constitute mitigation in the context of this HRA. **Fuel, Oil and Chemical Storage** The measures outlined in the CEMP include storage of fuels, oils and chemicals in appropriate containers within secure bunded compounds constructed of an

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			impermeable hard standing in accordance with good site practices and Environment Agency guidelines. Subcontractor storage areas must be agreed with Site Management prior to delivery and any accidental contamination of the ground or surface water will be cleaned-up in accordance with appropriate Environment Agency guidelines and removed off-site by a licensed waste contractor. No storage of these materials will be allowed within 10m of surface water drains on the Site. **Silt and Sediment Control** Notwithstanding that effects from silt and sediment are considered to be short lived, silt and sediment control will nonetheless be implemented, including the use of settlement systems, monitoring site drainage, cut-off trenches, silt fences, geotextile-material filters and regular inspection of watercourses. Earthworks, topsoil, subsoil and stockpiled materials will be managed to prevent runoff into watercourses, including maintaining buffers from watercourse, fencing or matting stockpiles and applying stone capping or vegetation cover where appropriate. **Surface Water and Drainage Management** Sustainable Drainage Systems are included in the design to manage surface water runoff and treat lightly contaminated water, including retention basins, infiltration trenches and swales. **Pollution Prevention** All construction works will follow established best practice and Pollution Prevention Plans to prevent silting or pollution of the river, including avoidance of refuelling near water bodies, use of spill kits and proper cleaning of tools. **Flood Risk Management** Flood risk is addressed through the placement of high-risk activities above the design flood level, storage of chemicals and fuels for easy relocation, and implementation of a flood action plan with reference to Met Office and NRW Flood Warning services. Given the comprehensive measures for storage, runoff, sediment, earthworks, and flood risk, and adherence to best practice throughout the demolition and construction phases, no LSEs on water quality are anticipated.

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			As such, **LSE can be ruled out** alone and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary SAC	N	Spread of INNS	The risk of introducing or spreading INNS could arise during vegetation clearance, potentially facilitating their spread into the Rhymney River and the Severn Estuary SAC habitats. INNS The Proposed Development includes embedded design measures to prevent spread of INNS regardless of connectivity to Habitats Sites. As these measures are integral to the Proposed Development and are not explicitly brought forward as protective measures for Habitats Sites, they are therefore not considered to constitute mitigation in the context of this HRA. The CEMP includes measures for the control and eradication of INNS on Site. Japanese knotweed *Reynoutria japonica* and Himalayan balsam *Impatiens glandulifera* will be managed according to the twenty-five year Woodland Management Plan (Curtis Hall Ltd., 2025). Japanese knotweed areas will be plotted using GPS and specialist contractors will likely apply glyphosate treatment in areas away from the water course and, excavation and removal from site will be required with the aim to achieve eradication within first five years. Himalayan balsam will be primarily controlled through hand-pulling and cutting, with ongoing monitoring and treatment to prevent flowering and seed formation. Other non-native species and garden escapes will be removed from ancient woodland areas as part of routine maintenance. All works will be carried out with the oversight of the ecological consultant, following detailed Method Statements approved by the Local Planning Authority, and staff will be briefed via toolbox talks on appropriate control methods. Given these measures, no likely significant effects from INNS are anticipated during demolition and construction. INNS protocols, such as wheel washing, will be implemented during the works. These measures will be carried out in a designated area away from the Rhymney River and any drainage features, to prevent potential runoff and ensure no risk of spreading INNS, in line with best practice for biosecurity management. This forms part of standard legal responsibilities relating to species listed under Schedule 9 of the Wildlife and

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			Countryside Act (as amended) (HMSO, 1981), rather than being a measure required specifically for this HRA. As such, **LSE can be ruled out** alone and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary SAC	N	Increased noise, vibrational and lighting disturbance for qualifying fish species	Construction works for the bridge crossing, such as piling and temporary lighting, have the potential to impact the qualifying fish species that are sensitive to noise, vibration and artificial light, which can cause behavioural changes. Behavioural disturbance can lead to avoidance of migratory routes and temporary displacement. High intensity impulsive sound and vibration may cause physical injury or mortality. Vibration may also displace the buried lamprey larvae or abandoning of spawning site. Artificial lighting may disrupt behavioural patterns and nocturnal movements. The proposed bridge construction will be undertaken entirely from the terrestrial bank, with abutments set back approximately 7.5m from the Rhymney River and there will be no in-channel works. Continuous Flight Auger (CFA) piling (screw piling) may be technically feasible and is incorporated into the design of the Proposed Development as the preferred piling method, as it produces minimal vibration and airborne noise. However, due to the proximity of the Rhymney River and the potential for high groundwater pressures, CFA piling may not be practicable across all locations. In locations where CFA piling is not practicable, limited driven piling may be required to achieve engineering stability. At the bridge location, the Rhymney River is around 12m wide, with depths of roughly 0.4m along the right-hand bank and just over 1m in the centre. The bed consists mainly of cobble with patches of silt, algae and occasional gravel (WSP, 2025b). CFA piling generates very low levels of ground-borne vibration and does not produce impulsive underwater noise. Accordingly, if CFA piling is feasible throughout, no plausible pathway exists for vibration or noise-related effects on qualifying fish species, and **LSE can be ruled out**. However, if driven piling is required, vibration could transmit through the substrate into the river margin, potentially disturbing qualifying fish species.

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			Sea and river lamprey require clean gravels and adjacent sand or silt beds for spawning and larval burrows, while shad typically spawn in deeper gravelly reaches closer to the tidal limit. None of these features are present at the bridge construction location, so this section of the Rhymney River functions primarily as a migration corridor rather than a breeding or nursery area. Lamprey are less sensitive to vibration due to the absence of swim bladders, which are the primary organ though which most fish detect and amplify particle motion. Given this reduced sensitivity, it is unlikely that substrate vibration generated during piling would result in any physiological or behavioural effects. Twaite shad are typically confined to the lower estuarine reaches and are unlikely to occur this far upstream. The nearest intertidal mudflats habitat is approximately 3.2km downstream of the Proposed Development based on Marine Habitats dataset (NRW, 2019), while a review of recent satellite (Google) imagery indicates that silt deposition may begin slightly further upstream, at about 2.2km downstream of the Proposed Development. No such habitats are present at the location of construction of bridge (WSP, 2025b). Given the absence of suitable spawning or foraging habitat, the distance from the tidal influence, and limited likelihood of migratory individuals occurring this far upstream, twaite shad are unlikely to be present in the vicinity of the Proposed Development. It is therefore concluded that there is no realistic potential for noise and vibrational disturbance to impact twaite shad. **LSE can therefore be ruled out** for sea lamprey, river lamprey, and twaite shad under both CFA and driven piling scenarios. Construction lighting will be directional and used only when necessary for safety, with lights switched off when not in use and positioned to avoid spill onto the river. A dark corridor will be maintained along the watercourse to facilitate nocturnal wildlife movement, which will also prevent potential light-related disturbance to migratory fish qualifying features. These measures form part of the embedded design for the Proposed Development and are included regardless of the present of Habitats Sites downstream. As such, **LSE** due to increased noise, vibrational and lighting disturbance for qualifying fish species of the Severn Estuary SAC **can be ruled out** and there would be no ‘residual’ non-significant effects that could act in-combination.

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
Severn Estuary SPA	N	Changes to water quality	A potential pollution event can lead to degradation of the habitats that the qualifying birds rely on for feeding, breeding, and resting. Key invertebrate and aquatic plant species, which serve as food sources for numerous bird species and are essential for their survival, may also be impacted during a pollution event. The assessment as described above for the Severn Estuary SAC is also relevant to the Severn Estuary SPA. As such, **LSE on water quality can be ruled out** and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary SPA	N	Spread of INNS	The assessment as described above for the Severn Estuary SAC is also relevant to the Severn Estuary SPA. As such, **LSE due to spread of INNS can be ruled out** and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary Ramsar	N	Changes to water quality	The assessment as described above for the Severn Estuary SAC is also relevant to the Severn Estuary Ramsar. As such, **LSE on water quality can be ruled out** and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary Ramsar	N	Spread of INNS	The assessment as described above for the Severn Estuary SAC is also relevant to the Severn Estuary Ramsar. As such, **LSE due to spread of INNS can be ruled out** and there would be no 'residual' non-significant effects that could act in-combination.
Severn Estuary Ramsar	Y	Increased noise, vibrational and lighting disturbance for qualifying fish species	The assessment as described above for the Severn Estuary SAC is also relevant to fish qualifying features of the Severn Estuary Ramsar, such as sea lamprey, river lamprey, twaite shad, and also to allis shad, which shares similar ecological preferences with twaite shad. As described for the Severn Estuary SAC, the lighting measures in place will prevent LSE due to lighting disturbance on fish qualifying features of the Severn Estuary Ramsar. However, salmon, sea trout and eel are known to migrate through the Rhymney River as per National Biodiversity Network (NBN) Atlas Wales (NBN, 2025) and Freshwater Fish Surveys dataset (NRW, 2025). These species are listed on the Severn Estuary Ramsar criterion 4.

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			These species possess swim bladders that make them more responsive to low-frequency vibration and pressure changes. Although the piling activities would take place outside the Rhymney River and vibrations would be substantially dampened before entering the water, salmon, sea trout and eel are known to react to relatively small acoustic or substrate disturbances. Their migrations also occur over a longer period, with repeated movements that could overlap with the piling works. Should driven piling be required, there is a potential for short-term behavioural disturbance during migration periods. Hence, **LSE is predicted for salmon, sea trout and eel qualifying species** due to increased noise and vibrational disturbance.
Mendip Limestone Grasslands SAC; North Somerset and Mendip Bats SAC; and Wye Valley and Forest of Dean Bat Sites SAC	N	Increased noise, vibrational and lighting disturbance for qualifying bat species Loss or disruption of habitats within FLL Direct killing / injury within FLL	The bat report for the Proposed Development (WSP, 2025a) concluded that habitats on Site are not well-used by greater or lesser horseshoe bats. Static bat activity surveys were undertaken between April and October using three static detectors across the Site. Lesser horseshoe bat activity was extremely limited, with only one pass recorded at Static 3 in April. Greater horseshoe bat activity was also low, with nine passes at Static 2 in May and one pass at Static 3 in August. These results indicate that presence of these species is infrequent and incidental, and the Site does not serve as a significant foraging area or commuting corridor. The bat assemblage is considered locally important primarily for other, more active species. The core sustenance zone for greater horseshoe bats is generally within 3 km of a roost, and for lesser horseshoe bats within 2 km (BCT, 2016). The Proposed Development is located approximately 21.4 km from Mendip Limestone Grasslands SAC, 26.9 km from North Somerset and Mendip Bats SAC, both on the opposite side of the estuary, and 29.8 km from Wye Valley and Forest of Dean Bat Sites SAC. The Site therefore has a negligible functional link to these SACs, and the low and incidental bat activity observed on Site indicates negligible use by SAC populations. In addition, the off-site mitigation / compensation area will support foraging and commuting activities for individuals of any bat species listed as Annex II qualifying features. Although construction will result in habitat loss, dust, noise, and vibration, the limited use of the Site by SAC species, combined with distance from roosts and negligible functional connectivity, means there is no credible pathway for the Proposed Development to affect the conservation objectives of the SACs. Habitat retention, management, and compensation measures will be implemented to offset local habitat

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			loss and impact on other fauna, these measures are not relied upon to avoid LSE on the SACs. CEMP will incorporate controls for dust, noise, lighting, and vibration. These measures are primarily targeted at other bat species and fauna, and are not relied upon to prevent LSE on the greater or lesser horseshoe bat SACs. Given the distance from SACs, low and incidental activity on Site, absence of functional connectivity, and design, any potential disturbance to individual greater or lesser horseshoe bats would be incidental and will not result in a Likely Significant Effect. It is therefore concluded that the **Proposed Development will not result in LSE of greater or lesser horseshoe bat SACs** and no residual effects are anticipated that could act in-combination.
	Operation		
Severn Estuary SAC, SPA, and Ramsar	Y	Changes in water quality	In the event of fire, there is potential for impact on water quality of the Rhymney River during the operational phase. As the Proposed Development will store electronics, batteries and other equipment, a fire could require the use of significant volumes of water or fire suppression agents. This may result in contaminated fire-water runoff containing chemicals, heavy metals or other battery-related pollutants. If not managed properly, such runoff could carry these hazardous substances into the Rhymney River, posing risks to qualifying habitats and species of the Severn Estuary SAC, SPA and Ramsar. Given that detailed lagoon and fire-water treatment designs are not yet confirmed, there is a pathway for LSE. In accordance with People Over Wind, **LSE** on water quality due to fire-water run-off during operation **cannot be ruled** out at this stage.
Severn Estuary SAC, and Ramsar	N	Increased shading	The Proposed Development will result in permanent shading beneath the bridge. The river at this location is approximately 12 m wide, with shallow margins (~0.4 m) and deeper flow in the centre (>1 m). Only a narrow portion of the channel directly beneath the bridge will be affected by reduced light. Salmonids, eels, and lampreys may use the river for migration and foraging. The limited spatial extent of shading, combined with the absence of suitable refuge habitat beneath

Habitats Site	LSE? (Y/N)	Impact Pathway	Likely Significant Effects
			the bridge, means that fish can continue to move freely through the channel without restriction. Shaded areas will not impede access to suitable habitat elsewhere in the river. Vegetation beneath the bridge may shift over time to more shade-tolerant species. However, such changes would be highly localised and are not linked to the key ecological requirements of the qualifying fish species. Fish do not rely on specific plant communities at this location for migration, or foraging, so any change in plant composition will not create a credible pathway for potential effects. Twaite and allis shad are unlikely to occur at this upstream location, and shading would therefore not affect their spawning, migration, or foraging. Consequently, permanent shading from the bridge does not create a credible pathway for potential effects on adult or juvenile fish species, including salmon, sea trout, eels, and lampreys, and **no LSE are anticipated.**
Mendip Limestone Grasslands SAC; North Somerset and Mendip Bats SAC; and Wye Valley and Forest of Dean Bat Sites SAC	N	Increased lighting disturbance for qualifying bat species	The assessment as described above for the Mendip Limestone Grasslands SAC; North Somerset and Mendip Bats SAC; and Wye Valley and Forest of Dean Bat Sites SAC at the construction phase is also relevant to the operational phase. As such, **LSE due to increased lighting disturbance can be ruled out** and there would be no 'residual' non-significant effects that could act in-combination.

5.3 Potential In-Combination Effects

5.3.1. When determining the potential implications of a plan or project in light of the conservation objectives for a Habitats Site (i.e., assessing the potential for LSE and ascertaining the potential for effect on site integrity), it is necessary to consider the potential for in-combination effects with other plans and projects on the designated interest features/conservation on the site. This should include:

- Approved but yet uncompleted plans or projects;
- Permitted on-going activities such as discharge consents of abstraction licences; and
- Plans and projects for which an application has been made and which are currently under consideration but not yet approved by competent authorities.

5.3.2. An in-combination assessment considers the potential for each plan or project to influence the Habitats Site. In order for an in-combination effect to arise, the nature of two effects does not necessarily have to be the same. The in-combination assessment, therefore, focuses on the overall implications for Habitats Site conservation objectives regardless of the type of effect.

5.3.3. As LSE have either been screened out, with no residual impacts or have been screened in, alone, for further assessment, an in-combination assessment is not required at this stage.

5.4 Assessment of LSE / Summary of HRA Screening

5.4.1. On the basis established in Sections 4.2 and 5.2, the risk of LSE on the Habitats Sites is due to:

- the risk of increased noise, and vibrational disturbance for salmon, sea trout, and eel, which are qualifying fish species of the Severn Estuary Ramsar.
- the risk of potential fire-water runoff during an emergency event for qualifying features of Severn Estuary SAC, SPA and Ramsar.

5.4.2. No other LSEs are predicted to arise to the identified Habitats Sites.

6 Stage 2: Information to Inform Appropriate Assessment

6.1.1. This Section provides information to inform an Appropriate Assessment as per Regulation 63 of the Habitats Regulations, should Cardiff Council deem such an assessment is required in their role as Competent Authority.

6.1.2. The 'Appropriate Assessment' information presented here considers the LSE identified at the HRA screening stage in more detail. For each of the identified impact pathways leading to LSE, an assessment is made as to whether they would result in AEoI of the relevant Habitats Site.

6.1.3. The assessment as to whether AEoI would arise is made with consideration to mitigation measures that may be applied to avoid or, reduce the significance of potential effects of the Proposed Development. Such measures, where they are developed to address effects on Habitats Sites, may only be considered at the Appropriate Assessment stage. This follows the 'People Over Wind' ruling (People Over Wind, Peter Sweetman v Coillte Teoranta, 2018), as noted in Section 1.2.6.

6.1.4. The mitigation measures that have been put in place to avoid or reduce the effect pathways identified at Stage 1 Screening are set out below.

6.2 Potential for Adverse Effects on Integrity Pre-Mitigation

6.2.1. The potential for LSE in relation to increased noise and vibrational disturbance has been identified for salmon, sea trout and eel species only, which are a qualifying feature of the Severn Estuary Ramsar, and the potential for LSE in relation to fire-water runoff has been identified for all qualifying features of Severn Estuary SAC, SPA, and Ramsar.

6.2.2. The Appropriate Assessment focuses on driven piling, which represents the only construction method capable of generating impulsive vibration or notable airborne noise. Works would be undertaken from a terrestrial platform approximately 7.5m from the riverbank, with piles installed into unsaturated ground. Under these conditions, vibration energy may propagate through the substrate and into the adjacent river margin. Although attenuation due to distance from piling and the intervening ground means that vibration levels reaching the main channel are expected to be minimal, this may result in temporary, localised behavioural responses in migratory fish during active piling. Adult salmon and sea trout migrate upstream between October and March, with downstream smolt migration occurring from April to June. Eels migrate primarily at night, adult eels (silver stage) descending between August and November and juvenile elvers ascending between May and August. In the absence of mitigation, there remains potential for piling during these periods to cause avoidance behaviour or short-term delay to migration. Consequently, an AEoI cannot be ruled out, in the absence of mitigation.

6.2.3. In the absence of detailed design information for the proposed fire-water runoff containment, treatment and discharge system, and applying a reasonable worst-case scenario, the potential exists for contaminated fire-water generated during an emergency incident to reach the adjacent hydrological network. Fire-water has the potential to mobilise pollutants associated with the Proposed Development (including hydrocarbons, oils, battery electrolytes, suspended solids and combustion residues), and could also be generated in volumes sufficient to exceed the receiving environment's capacity to dilute or assimilate contaminants if discharged in an uncontrolled manner. Without appropriate control, these contaminants could enter the river and threaten the ecological features and species for which the Severn Estuary SAC, SPA and Ramsar are designated.

6.3 Mitigation Measures

6.3.1. Mitigation will be implemented only if driven piling is required. The following measures will be secured through the CEMP –

- Seasonal restrictions: Driven piling will, be undertaken outside the main salmonid migration period (October to March) to avoid disturbance to adult upstream movement.
- Eel and smolts protection: Silver eels migrate during hours of darkness, September to November, while juvenile elvers ascend between May and August. Salmonid smolts undertake downstream migration primarily during low-light conditions, mostly at night, in spring (April and May). To prevent potential disturbance to these qualifying fish species, driven piling activities, if required, will be restricted to daylight hours for April to November. Limited marginal cover was observed at the bridge location, which is not considered to provide suitable refuge habitat. Daytime working will therefore effectively avoid periods of peak migratory activity, ensuring that no direct or indirect disturbance arises to smolts or eels. However, there remains a potential for disturbance within precautionary 300m buffer around the works, in line with BS 5228 (BSI, 2018), and the following mitigation measures have been implemented:
    - Vibration management: Piling operations will comply with BS 5228-2 (BSI, 2018), and hammer energy and duration will be limited to the minimum required for engineering stability.
    - Soft-start procedure: As a precaution, each piling session will begin at a reduced hammer energy to allow fish to move away before full-power operation.
    - Supervision: An Ecological Clerk of Works (ECoW) will be present during the key activities of the piling programme to monitor for any signs of fish distress or unusual behaviour. Should such effects be observed, piling will temporarily cease and further advice will be sought from the ECoW before resuming.

6.3.2. The Proposed Development incorporates a series of measures to avoid adverse effects on the Severn Estuary SAC, SPA and Ramsar arising from the generation, containment, treatment of fire-water and its controlled discharge, formed as performance standards and functional requirements that the final design must achieve. These measures are intended to ensure that fire-water is fully captured, contained, treated and discharged in a manner that protects the qualifying features of the Severn Estuary SAC, SPA and Ramsar, even under the worst-case conditions.

Containment and Storage

- 100% capture of all fire-water runoff arising from the maximum credible emergency event.
- Provision of sufficient lagoon capacity to accommodate the combined volumes of:
    - fire-water generation during a suppression event, and
    - a 1-in-100-year rainfall event plus appropriate climate change uplift.
- No uncontrolled release to surface waters, soils or groundwater.

Treatment Requirements

- Treatment processes capable of achieving concentrations compliant with relevant environmental quality standards or site-specific thresholds protective of the Habitats Sites.
- Treatment must address pollutants including hydrocarbons, suspended solids, battery-related contaminants, nitrogen compounds, chemical oxygen demand, metals and any combustion by-products.

- Sufficient retention time within the lagoon/treatment system to ensure performance under peak contamination scenarios.

Controlled Discharge Requirements

- Any discharge must occur only following verification that water quality meets the agreed protective thresholds.
- Discharge flow rates must be restricted ("throttled") to a level demonstrated to avoid hydraulic disturbance of the receiving waterbody during low-flow conditions.
- The system must enable staged or intermittent discharge where required to avoid peak-flow impacts.
- Continuous monitoring and fail-safe mechanisms must ensure that discharge cannot occur if water quality is non-compliant.

6.4 Potential for Adverse Effects on Integrity Post-Mitigation, both Alone and In-combination

6.4.1. Subject to the full implementation of the above mitigation measures, the pathways identified in the pre-mitigation assessment would be effectively removed. Seasonal and nighttime restrictions, vibration management, soft-start piling, supervision by ECoW, full capture and controlled, quality-verified discharge at restricted flow rates would avoid contamination, hydraulic disruption and any deterioration of water quality relevant to the SAC, SPA and Ramsar site qualifying features.

6.4.2. Accordingly, and conditional on all of the above mitigation requirements being met, the Appropriate Assessment concludes that the Proposed Development would not result in AEoI of the Habitats Sites, either alone or in-combination.

6.4.3. Detailed design at reserved matters will adhere to all of the functional requirements specified above to conclude that no AEoI of the Severn Estuary SAC, SPA and Ramsar due to the Proposed Development alone and there would be no 'residual' non-significant effects that could act in-combination and adversely affect the integrity of the Severn Estuary SAC, SPA and Ramsar. However, if the Proposed Scheme, at reserved matters, is not able to demonstrate compliance with the functional requirements specified above, then the fire-water would, although still be collected, but will be taken for off-site disposal by third party contractors, removing any potential of adverse effect on the integrity of the Severn Estuary SAC, SPA and Ramsar.

6.5 Appropriate Assessment Conclusion

6.5.1. The HRA screening presented earlier in this report the identified LSE as set out in Section 5.4.

6.5.2. Mitigation measures are set out in Section 6.3 to address the identified LSE. Based on the mitigation measures, notably the seasonal timing of construction, and functional requirements and performance standards for management of fire-water management, it has been concluded there would be no AEoI of the Severn Estuary Ramsar.

6.5.3. This conclusion is based on the functional performance standards that the final lagoon and treatment system must achieve, covering water quality, discharge rate limits, flow-control requirements and hydraulic compatibility with the receiving environment.

7 Discussion and Conclusion

7.1.1. The Proposed Development is adjacent to the Rhymney River, which is a tributary of the Severn Estuary and hence is directly connected to the Severn Estuary SAC, SPA and Ramsar. Notably, the fish qualifying features of the Severn Estuary SAC and Ramsar potentially use the Rhymney River as FLL.

7.1.2. The screening stage identified the potential for short term LSE upon the salmon, sea trout and eel fish features of the Severn Estuary Ramsar, resulting from increased noise and vibrational disturbance. During construction, the primary risk identified was the impact from vibration disturbance from piling to these sensitive fish species using the Rhymney River as FLL adjacent to the bridge construction location. While it is understood that vibration attenuation will reduce its impact over distance, there is still potential that it could impact behaviour and migration pattern of the fish species of interest. During operation, an LSE due to firewater runoff has been identified due to absence of detailed design, which will be confirmed at reserved matters.

7.1.3. Mitigation measures are outlined in the Appropriate Assessment section to avoid AEoI of the qualifying features of the Severn Estuary SAC, SPA and Ramsar. On the basis that all measures are tried-and-tested and will be implemented, notably the seasonal timing of piling and firewater runoff management, it is concluded that the Proposed Development on its own or in combination with other plans and projects, will have not have AEoI of the Severn Estuary SAC, SPA and Ramsar.

7.1.4. Given that no adverse effects upon the integrity of Habitats Sites are anticipated further assessment under Stage 3 and 4 of HRA is not necessary.

7.1.5. This HRA has been carried out based on the functional requirements and performance standards established for the lagoon system and fire-water management associated with the Proposed Development. These standards form the basis of the assessment and are designed to avoid any AEoI of the Severn Estuary SAC, SPA and Ramsar, both alone and in-combination with other plans or projects.

7.1.6. At this stage, the detailed design of the lagoon system and treatment processes will be confirmed at the reserved matters stage. The Competent Authority will need to confirm at the reserved-matters stage that the detailed design and operational controls meet these functional standards as set out in this HRA. In worst case if the final design cannot meet the necessary water-quality or flow-control requirements, then the firewater would be taken for offsite disposal by third party contractor. This information is provided for transparency and does not affect the conclusion of this HRA: when the functional requirements and performance standards are implemented, no AEoI of the Severn Estuary SAC, SPA and Ramsar is predicted.

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9 Figures

Figure 1 - Site Location Plan

Figure 2 - Relevant Habitats Sites

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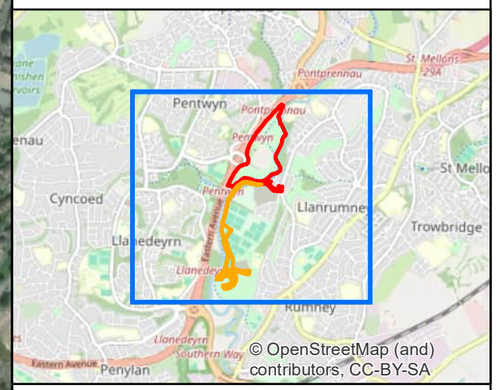
Key

- Red Line Boundary
- Off-site Compensation Area



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Meters

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Client:

Curtis Hall Ltd.

Project:

Cardif East Park and Ride (CEPR)

Title:

Figure 1 - Site Location Plan

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Scale:	8,000 @ A3	Approved:	KF

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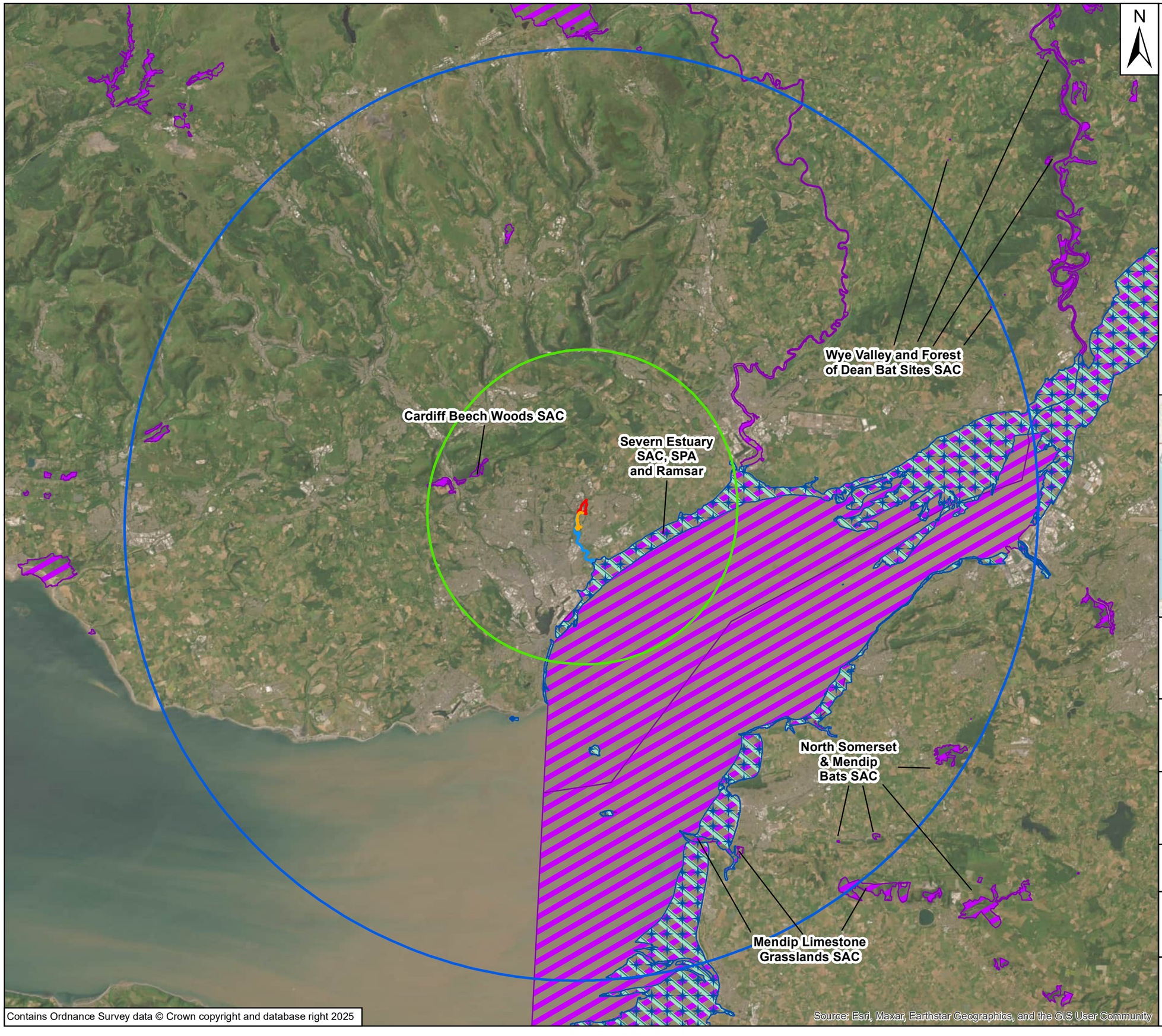

Key

- Red Line Boundary
- Off-site Compensation Area
- 10km Study Area
- 30km Study Area
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Ramsar
- Downstream Connection

0 5 10

Kilometers

wsp

Client: Curtis Hall Ltd.

Project: Cardif East Park and Ride (CEPR)

Title: Figure 2 - Relevant Designated Sites

Drawing No:	UK0041515-HRA-002	Drawn:	MS
Date:	18/11/2025	Checked:	GH
Scale:	242,000 @ A3	Approved:	KF

Appendix A

Outstanding Information

Public

At the time of assessment, some design and operational details were not available. Consequently, the HRA has been completed based on the information as summarised below.

It is understood that the bridge design remains unchanged from the extant planning permission. Accordingly, key parameters such as span arrangement, abutment set-back, and construction methodology have been drawn from the extant planning permission. The current assessment has therefore been undertaken on the basis of the previously approved design information, and the conclusions are considered to remain valid provided that the final detailed design does not materially alter the construction footprint, working methods, or environmental controls described therein.

Detailed information on the fire-water containment, treatment and controlled-discharge system is not available at this stage of the hybrid application. No outline-level design parameters, engineering specifications or treatment performance information have been provided. As a result, the screening stage cannot rule out LSE, and the matter is taken forward to Appropriate Assessment. In the absence of detailed design, the Appropriate Assessment identifies the functional performance standards that any future fire-water management system must achieve in order to avoid adverse effects on the integrity of the Habitats Sites. These standards include full capture of fire-water runoff, no uncontrolled release, capacity to accommodate a combined incident and extreme rainfall event, treatment to a water-quality standard protective of Habitats Sites' features prior to any controlled discharge, along with release of treated water at specific quality, volume, and flow to avoid harmful contamination or hydrological changes. These requirements apply to all stages of fire-water management, which are, capture, storage, treatment and the discharge process itself.

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Hazel Dormouse Impact Assessment

Cardiff East Park and Ride

Presented to: Curtis Hall Ltd

Issued: December 2023

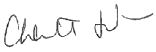
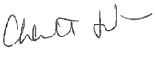
Delta-Simons Project No: 20-0981.07 / 89106.548885

Protecting people and planet

Report Details

Client	Curtis Hall Ltd
Report Title	Hazel Dormouse Impact Assessment
Site Address	Cardiff East Park and Ride
Project No.	20-0981.07 / 89106.548885
Delta-Simons Contact	Jonathan Spencer (jonathan.spencer@deltasimons.com)

Quality Assurance

Issue No.	Status	Issue Date	Comments	Author	Technical Review	Authorised
10	Final	15th December 2023	Updated Drawings	pp		
				Jonathan Spencer Associate Ecologist	Charlotte Sanderson-Lewis Associate Director	Charlotte Sanderson-Lewis Associate Director

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Protecting people and planet

INOGEN ALLIANCE

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1.0 Introduction

1.1 Purpose and Scope of the Survey

Delta-Simons Ltd was instructed by Curtis Hall Ltd (the 'Client') to prepare a hazel dormouse impact assessment of land off Eastern Avenue, west of Llanrumney in Cardiff, Wales (hereafter referred to as the 'Site' and see Figure 1 for location). The impact assessment is required following comments from National Resource Wales (NRW) that requested the following:

"(Therefore,) we advise that given the presence of dormice, an assessment of the impacts on dormice and a dormouse conservation plan will be required to support any planning application. This should include the following:

- *An assessment of the impacts on dormice, to include a quantitative and qualitative assessment of the habitats to be lost, retained and/or created. Please include descriptions of the value of the habitats on site for dormice, their likely carrying capacity and other impacts as appropriate.*
- *A plan showing the extent and quality of habitat to be lost, habitat to be created and areas to be retained.*
- *Measures to ensure connectivity is retained across the site and to wider areas off site.*
- *Demonstration of how habitat loss will be minimised.*
- *Details of protective measures to be taken to minimise the impacts on dormice.*
- *Timetable for implementation demonstrating that works are aligned with the proposed phasing of the development.*
- *Details of initial aftercare of any newly planted material; and*
- *Principles of long-term management and maintenance, monitoring of habitats, to include a mechanism for delivery and finances to deliver long-term management of ecology areas, for a minimum of 25 years."*

This impact assessment aims to ensure that impacts on hazel dormice are adequately mitigated or compensated for during development. This Report describes measures to avoid, reduce, mitigate and compensate for likely adverse effects on hazel dormice resulting from the construction and operational phases of the proposed development.

This document has been written based upon information provided by the Client, and the results and recommendations reported within the Ecological Impact Assessment (EcIA) and Environmental Statement (ES) submitted as part of the planning application. This document sets out the baseline conditions for hazel dormice and describes the mitigation measures proposed.

1.2 Site Description

The Site is centred at Ordnance Survey (OS) grid reference ST 21306 80951, west of Llanrumney in Cardiff, Wales. The Site covers an area of approximately 23.69 ha and comprised an expanse of broadleaved semi-natural woodland with large areas of dense scrub and bracken and several footpaths running through. In the central area of the Site was a hardstanding car park used as a park and ride, with scattered scrub, and a security building. An area of bare ground was to the east of the car park. Poor semi-improved grassland was present in the eastern, southern and northern areas of the Site.

The Site lies with a green corridor between the main city of Cardiff and the eastern district of Trowbridge. An unnamed road lies to the south of the Site and the busy A48 lies to the west of the Site. North of the Site lies a continuation of the on-Site woodland with footpaths adjacent to the A48. A section of the River Rhymney corridor spans the eastern Site boundary, with half falling on-Site and the other half running adjacent to the boundary.

The Site layout is shown in Figures 2 a-b.

1.3 Proposed Development

The Proposed Development will comprise the demolition of existing structures and redevelopment of the Site to provide commercial floorspace (Use Classes B2, B8, E(b)) and/or ancillary Class E), associated drive-thru and car parking; the re-provision of the park and ride; a bridge across the Rhymney River; site wide landscaping and associated works. The indicative development plan is shown in Drawing 1.

2.0 Legislation

2.1 The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 puts in place the legislation needed to plan and manage Wales' natural resources in a proactive and sustainable way. Part 1 of the act relates to the sustainable management of natural resources. Therefore, ensuring that the use of and the impacts on natural resources do not result in long-term decline.

Section 7 of the act replaces the duty in Section 42 of the NERC Act 2006 and it places a duty on the Welsh Ministers to publish, review and revise lists of living organisms and types of habitats which are considered of principle importance in maintaining and enhancing biodiversity in Wales.

2.2 The Conservation of Habitats and Species Regulations 2017, as amended

The Conservation of Habitats and Species Regulations 2017, as amended, are the British response to the Habitats & Species Directive 1992 and consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law.

The Regulations for the protection of European Protected Species (EPS) have been amended and consolidated with key changes including the removal of most of the defences from Regulation 40 and Regulation 43 including the removal of the 'incidental result of an otherwise lawful operation' defence, and the increase in the threshold for the offence of deliberately disturbing a EPS. Proposals that will affect European protected species may require a licence from Natural Resources Wales (NRW) to allow an otherwise unlawful act. In the 2009 a new offence of 'breaching condition of an EPS licence' was added to the regulations. The licensing process is separate from and planning process. European protected species include all species of bats, great crested newt *Triturus cristatus*, dormouse *Muscardinus avellanarius*, and European otter *Lutra lutra*, amongst others.

3.0 Baseline Data

3.1 Baseline Habitats

Delta-Simons completed a Preliminary Ecological Appraisal (PEA) survey of the Site on in February 2021, which was updated in August 2021, the results were prepared as an Ecological Impact Assessment (EcIA) (Report ref. 20-0981.07).

The Site covers an area of approximately 23.69 ha and comprised an expanse of broadleaved semi-natural woodland with large areas of dense scrub and bracken, and several footpaths running through. In the central area of the Site was a hardstanding car park used as a park and ride, with scattered scrub, and a security building.

Table 1 – Approximate areas of habitats suitable for dormouse within the Site (ha)

Habitat	**Total area within Site prior to development**	**Total area of suitable dormouse habitat**
Woodland	7.34	6.25
Ancient Woodland	2.3	2.3
Scrub	3.76	3.4
Grassland	4.65	N/A
Bracken	0.4	0.4
Standing Water	0.04	N/A
Built environment (hardstanding/buildings)	5.2	N/A
Totals	**23.69**	**12.35**

The total area of suitable dormice habitat equates to 12.35 ha, provided by woodland, scrub and bracken, see Figure 3. The scrub and bracken provide cover and may aid connectivity and dispersal through the Site and to the wider area, with woodland habitat(s) to the N/S/E/W providing a continuation of suitable habitats off-Site.

The woodland contained areas of ancient and semi-mature hazel coppice, and other food sources such as hawthorn and cherry were abundant throughout.

It is understood that a dormice mitigation licence ref. WAG 1279 was granted in 2008 for the development of the original park and ride scheme. As a requirement of this licence, newly created habitats suitable for dormice were included as compensation as well as retention enhancement and translocation of existing habitats, as below:

- Planting undertaken in 2007 – 0.1 ha;
- Receptor area for translocated hazel – 1.8 ha;
- Additional Planting 2008 – 0.6 ha;
- Retained woodland and hedgerows – 5.3 ha;
- Planting to re-instate temporary access track 0.05 ha; and

- Planting to be undertaken in Autumn 2009 – 1.6 ha

3.2 Dormouse Population

3.2.1 Data search

The data search included 37 recent records of hazel dormouse, the closest of which was located 690 m north-east of the Site in 2017. A large proportion of the recent dormouse records were from Howardian Local Nature Reserve (LNR) 1.29 km south of the Site boundary. The data search also included 16 historic records of dormouse, of which, three were recorded on-Site in 2007 and 2008.

Surveys were undertaken in 2007 and found a peak count of three male dormice in August 2007. It is understood that approximately 0.98 ha of suitable dormouse habitat was impacted on for the original proposals for the park and ride scheme. Monitoring as part of the licence WAG 1279 was undertaken in 2008 and 2009, with a peak count of 41 individuals recorded in September 2009.

During the February 2021 PEA visit, four old previously used dormouse boxes, with one containing whole oak leaves, and one empty dormouse box were noted on-Site.

3.2.2 Dormouse Survey

A small population of dormouse was recorded as present within the areas of woodland in the western extent of the Site in autumn 2021.

During the first survey multiple dormice, including young, were recorded in nests in both Boxes 6 and 8, located at the central extent of the northern broadleaved semi-natural woodland.

An empty dormouse nest was recorded during the fifth survey visit in Tube 16, located at the western Site boundary within the northern broadleaved semi-natural woodland. Individual dormice were recorded during the fourth and fifth survey visits within nests in Tube 45, located within the broadleaved semi-natural woodland at the northern Site extent.

A summary of the evidence of dormouse recorded is given in Table 2, below, and Figure 4.

Table 2 – Summary of Dormouse Survey Results

Nest tube/box reference	Location of the nest tube/box	Date of Survey	Comment
Tube 5	Central extent of northern broadleaved semi-natural woodland	27/09/21	Start of a nest, unconfirmed species
Tube 12	Central extent of northern broadleaved semi-natural woodland	27/09/21	Start of a nest, unconfirmed species
Tube 16	Western boundary of northern broadleaved semi-natural woodland	27/09/21	Dormouse nest - empty
Tube 42	Between dense scrub and woodland at northern extent of northern broadleaved semi-natural woodland	26/05/21	Small droppings, unconfirmed species
Tube 45	Northern extent of northern broadleaved semi-natural woodland	23/08/21	1 x large juvenile in dormouse nest (woven with brown leaves)
		27/09/21	1 x adult dormouse in dormouse nest

Box 6	Central extent of northern broadleaved semi-natural woodland	26/05/21	5 dormice (4 grey eyes shut and 1 adult) in nest
Box 8	Central extent of northern broadleaved semi-natural woodland	26/05/21	2 dormice (pinks) in nest

The geographic level of value of hazel dormice is considered to be Local.

4.0 Impact Assessment

4.1 Impacts

The development proposals will result in the permanent loss of approximately 2.54 ha of suitable dormouse habitat (equating to circa 20.6% of total suitable dormouse habitat present on-Site as shown in Figure 5).

The development will also result in the loss of small areas of the compensatory habitat that was created as part of the previous 2008 licence.

Without mitigation in place, clearance of habitat proposed across the Site has the potential to kill, injure and/or disturb any dormice that are present. Habitat losses will also result in minor fragmentation of dormouse habitat on-Site. However, retained woodland habitats within the northern and western extents of the Site remain connected through the Site as well as to suitable dormouse habitats off -Site.

The Site will be subject to increased levels of lighting, vehicular movements and noise/vibrational disturbance during the construction and operational phase of the development.

The potential impacts to hazel dormice during the construction and operational phases of works in the absence of mitigation are considered to have moderate adverse effect which is significant at the local level.

4.2 Habitat Loss to Development

Total estimated losses of suitable dormouse habitat because of the Proposed Development are listed below.

Table 3 – Approximate areas of habitats suitable for dormouse within the Site in ha (please note that unsuitable habitats are not included in the below)

Habitat	Total area of suitable dormouse within Site prior to development	Total area of suitable dormouse habitat (hectares) to be lost
Woodland	6.25	1.23
Ancient woodland	2.3	0
Scrub	3.4	1.35
Bracken	0.4	0.05
Totals	**12.35**	**2.63**

It is acknowledged that the aeras of habitat that were created and/or enhanced under the previous NRW mitigation licence will be lost. However, these areas have degraded due to the encroachment of invasive weeds such as Japanese knotweed and Himalayan balsam and large stands of bramble scrub. Of new areas that were created under the previous licence 0.88 ha of this will be lost, whilst 0.76 ha of the habitat that was due to be retained and enhanced under the previous licence will be lost. In addition, 0.98 ha of the translocated hazel will be lost. These habitat losses are summarised in Table 5 below.

Table 4 – Areas of previously created/enhanced habitats under licence WAG 1279 to be lost or retained

Habitats created/enhanced under licence WAG 1279	Sum of Hectares		
	Proposed under original licence (ha)	Lost (ha)	Retained (ha)
Additional planting 2008	0.6	0.09	0.51
Planting to be undertaken in Autumn 2009	1.6	0.80	0.80
Planting to re-instate temporary access track	0.05	0.00	0.05
Planting undertaken 2007	0.11	0.00	0.11
Receptor areas for translocated hazel trees	1.8	0.98	0.82
Retained woodland hedgerows & scrub	5.3	0.7	4.54
Total areas	**9.46**	**2.63**	**6.83**

4.3 Retained Habitats

Of the total 12.35 ha of habitat considered suitable for dormice on-Site, 2.63 ha will be lost, the majority being woodland (approximately 19.7% of woodland (not ancient and areas of Japanese knotweed and Himalayan balsam) and 39.5% scrub (predominately bramble scrub) leaving a total of 9.73 ha retained suitable habitat on Site as green spaces within the completed development.

Table 5 – Total retained and habitat loss suitable to support the hazel dormouse (ha)

Habitat	Total area within site prior to development	Suitable dormouse habitat to be retained		Habitat loss	
		Area a retained	% to be retained	Area to be lost	% of total
Woodland	6.25	5.02	80.3%	1.23	19.7%
Ancient woodland	2.3	2.3	100%	N/A	
Scrub	3.4	2.06	60.5%	1.35	39.5%
Bracken	0.4	0.33	82.5%	0.05	12.5%
Totals	**12.35**	**9.73**		**2.63**	

4.4 Fragmentation of Habitats

Due to the nature of the Site and the layout of the proposed development, fragmentation is not considered have a significant impact on the on the local dormouse population, as the amount of retained woodland, ancient woodland and associated habitats still provide connective habitats both through, and to the north

and south of the Site. Also, the inclusion of hedgerow planting and further scrub land planting will also aid in connectivity, see Drawing 1.

4.5 Lighting

The proposed lighting scheme is functional and directional and leaves the retained woodland vegetation and River Rhymney corridor unlit.

The External Lighting Plans (Drawing 3, 10341-EXT-100, Drawing 4, 10341-EXT-101 & Drawing 5, 10341-EXT-104) and External Lighting Strategy Report (Hydrock KTA, 2023) outline the external lighting strategy for the Site. The External Lighting Plans do not include any obstructions, landscaping or changes in topology; and are therefore considered 'worst-case'. Despite this limitation, the strategy for the Site meets all specified ecological design principles as outlined below and is in line with current guidance (BCT and ILP, 2023);

- The use of lights utilising light emitting diodes (LED) without UV elements, therefore reducing the attraction of invertebrates to the lights;
- Only luminaires with 0% upward light ratio should be used and fitted on the horizontal to avoid excessive up-lighting, back lighting and light spill onto boundary hedgerows and trees;
- A warm white spectrum (between 2000-3000 degrees Kelvin) should be used in order to reduce blue light component, therefore reducing the number of invertebrates attracted to the lights;
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats;
- Ideally the Site boundary lux level should be between 0 and 2 as this is within the range of natural moonlight; and
- The vegetation planted on Site and any roosting habitats should be unlit.
- Light spill onto the River Rhymney is limited to 0.1 lux in limited areas. As outlined above, the External Lighting Plans do not including any obstructions, landscaping, and changes in topology and in reality the 1 lux line would be obscured by the would be obscured by mitigation measures such as hedges, vegetation, fencing and differences in ground levels, further reducing penetrating light in these areas.

The proposed external lighting scheme allows for the full automation of the lights, such as dimming and switching. It is proposed that during winter months external luminaires are to dim down to 10% power at 16:00 and switch off entirely between 23:30 and 05:30. Drawing 6 shows the proposed external lighting scheme with pathway lighting at 10% power. External luminaires are to be activated by motion sensors, so that lights dim up or switch on to full brightness in the section where there is activity, leaving the remainder of the site dark. This anticipated to limit any potential residual negative impacts of lighting on dormice.

The lighting strategy drawings are indicative. The scheme will be refined during the design/construction stage and further steps will be taken to ensure the limitation of light spill on sensitive habitats.

5.0 Mitigation and Compensation

5.1 Compensation

Given the confirmed presence of dormice on-Site, the proposed scheme has been designed to retain, protect and enhance key dormouse habitat (see Figure 6), in addition to creating new dormouse habitat within the scheme as far as possible. This has been achieved through the following design measures:

- The retention of existing woodland, scrub and bracken habitats present along the northern, eastern, southern and western boundaries of the Application Site (approximately 9.81 ha), to minimise impacts of habitat fragmentation, whilst maintaining existing habitat connectivity along the edge of the Site to the wider landscape;
- The sensitive design of the development layout, ensuring the development footprint is located away from sensitive habitats, such as the area of ancient woodland;
- The enhancement / infill planting of existing and retained scrub habitat;
- The creation of new on-Site dormouse habitat to compensate for habitat losses, includes additional tree, scrub and hedgerow planting;
- A 25 year Woodland Management Plan (WMP) will be put in place that will improve and enhance both the areas of retained woodland and ancient woodland, increasing their suitability for dormice; and
- Installation of 50 dormouse nest boxes as described in Section 5.3.1, below.

As part of the EPSL there will be a commitment to the advanced planting of suitable dormouse habitat in the appropriate locations. It is also anticipated that this will be conditioned.

Details of the area of habitats that will be provided as compensation for losses of habitat are outlined below, whilst an overview of where these habitats will be planted has been provided in Drawing 1.

Planting will include a diversity of native species of local provenance considered to be favourable to dormice, chosen to maximise structural and species diversity, fruiting/flowering potential and seasonal availability, and designed to create natural woodland edges and shrubby glades. Species composition is listed in Table 6, below.

Table 6 – Infill and Supplementary Dormice Habitat on site (approximately 0.46ha)

Scientific name	Common Name	Quantity
Corylus avellana	Hazel	400
Crataegus monogyna	Hawthorn	10
Cytisus scoparius	Broom	10
Lonicera periclymenum	Honeysuckle	16
Rosa cannina	Dog rose	10
Sambucus nigra	Elder	10
Sorbus aucuparia	Rowan	10
Taxus baccata	Yew	10

Viburnum lantana	Wayfaring tree	10
Ilex aquifolium	Holly	5
Quercus robur	Pedunculate oak	10
Prunus spinosa	Blackthorn	5
	Total	**506**

In addition to the above, approximately 2.2 km of native hedgerows will be created at the Site, therefore, strengthening connectivity and also providing further dormouse habitat. Species proposed are listed below:

Hedgerow Planting Mix - 2.2 km

- Dogwood *Cornus sanguinea;*
- Hazel *Corylus avellana;*
- Hawthorn *Crataegus monogyna;*
- Spindle *Euonymus europaea;*
- Holly *Ilex aquifolium;*
- Guelder rose *Viburnum opulus;*
- Blackthorn *Prunus spinosa;*
- Elder *Sambucus nigra;*
- Dog rose *Rosa canina;*
- Privet *Ligustrum vulgare; and*
- Hornbeam *Carpinus betulus*.

As part of the proposed 25-year WMP, a further 6,000 trees will be planted in the areas of retained woodland as whilst natural regeneration occurs, with appropriate management, this will ensure a range of species and their associated statures and maturity, providing additional opportunities for dormice, and other species. Tree species will be consistent with those listed above with the addition of the below:

- Wild cherry *Prunus avium;*
- Downy birch *Betula pubescens;*
- Pedunculate oak *Quercus robur;*
- Sessile oak *Quercus petraea; and*
- Small-leaved lime *Tilia cordata*.

A 20 m buffer zone will be retained around the ancient woodlands. In most areas this buffer zone has existing tree cover. furthermore, the 20 m buffer zone will be edged with 865 m of native mixed hedging where it meets the built environment. This will protect the ancient woodland but will also provide additional habitat foraging and connective habitat for dormice. The species proposed are consistent with the species listed above.

It is acknowledged that the proposed development will result in the loss of small areas of habitats (0.88 ha in total) that were created/enhanced as part of the previous mitigation licence. However, a significant amount of time has passed since those habitats were created and the habitats were in poor condition with large

amounts of invasive weeds present. The proposed 25-year woodland management plan, incorporating woodland coppicing, habitat creation and new dormice box installation will increase the value of these habitats. It will be applicable to all retained, enhanced and newly created dormouse habitat excluded from the development plots. All habitats will be subject to a sensitive management and maintenance regime by a Private Management Company over the lifetime of the development.

5.2 Off-Site Compensation

In addition to the proposed on -Site habitat planting and woodland management, offsetting is proposed within areas of amenity grassland and the River Rhymney Valley Complex Site of Important Nature Conservation (SINC) to the south-west of the of the Site (see Drawing 2 and Figure 7). The proposed off-Site area has been selected after a Site visit with the Cardiff Councils Ecologist and Parks and Garden and Teams, with both confirming the baseline habitats and size of the proposed area are suitable to compensate the loss of the dormouse habitats on Site.

The off-Site compensation area currently supports areas of amenity grassland currently used as sports fields, areas of poor semi-improved grassland that are subject to less management, and areas of scattered scrub and small areas of woodland.

It is proposed to plant up areas adjacent to the River Rhymney connecting up to an area of amenity grassland and poor semi improved grassland (old sports fields) which will also be subject to additional planting of species suitable to support dormice. In addition to the areas of grassland, the areas of scrub and woodland are also present and will be enhanced as part of the proposals.

The area will total approximately 4.5 ha and connect existing areas of woodland and scrub, therefore, providing additional habitat and connectivity should dormice be present in the immediate area. The species and composition proposed is shown in Table 7, whilst the location of the proposed planting areas is shown in Figure 7.

Table 7 – Species Composition of Proposed Off-Site Area

Scientific name	Common Name	Quantity
Acer campestre	Field maple	75
*Carpinus betulus**	Hornbeam	55
Corylus avellana	Hazel	3900
Crataegus monogyna	Hawthorn	200
Cytisus scoparius	Broom	100
Lonicera periclymenum	Honeysuckle	75
*Quercus petraea**	Sessile oak	25
Prunus spinosa	Black thorn	75
*Quercus robur**	Pedunculate oak	100
Rosa cannina	Dog rose	100
Sambucus nigra	Elder	100

*Tilia cordata**	Small leafed Lime	55
Sorbus aucuparia	Rowan	100
Taxus baccata	Yew	10
Viburnum lantana	Wayfaring tree	100
Viburnum opulus	Guelder rose	100
	Total	**5,170**

In addition to the above, 0.79 ha hazel planting will be planted to provide connectivity between the proposed woodland areas, see Figure 7.

As part of the EPSL there will be a commitment to the advanced planting of the off – Site compensation area. It is also anticipated that this will be conditioned.

In addition to the new habitat planting a 100 m length of new 1 to 2 m high earth bank will be constructed edging open ground. The mound will be constructed from cut tree trunks/ branches, brash and earth from the site clearance works. The location will be determined during the construction phase.

It is proposed to install five dormouse bridges, four across the river linking with the new habitat planting and one across the main access road. These bridges will connect up the habitats and aid in the dispersal of, and breeding of, dormice. The type and design have not been finalised, but it is anticipated that an Animex bridge (https://animexbridge.com/) or similar structure will be used. Indicative locations are show in Figure 7.

The bridge locations have been positioned to tie in with existing scrub / tree vegetation / additional new planting, therefore, enabling dormice to access the poles by climbing through existing scrub in order to reach the ladders and bridge.

5.3 Mitigation

5.3.1 Installation of Dormouse Boxes

Under the previous licence, 314 wooden dormouse boxes were installed throughout the retained woodland areas at the Site. However, nearly all of them are anticipated to have been subject to vandalism and have been removed. A total of 50 dormouse nest boxes will be installed approximately 20 m apart within the areas of retained woodland and ancient woodland within the northern and western extents of the Site, see Figure 8. Fifty boxes are recommended due to the size and age of the retained woodland, as it is anticipated that there will be a large number of naturally occurring cavities within the retained trees.

The nest boxes will be placed away from public footpaths and at least 2.5 m up in trees of a suitable size to reduce the risk of vandalism. In areas of dense scrub boxes were placed on posts within the scrub where they will be hidden. Boxes will not be erected in any areas of new or recent planting.

The next boxes will be installed prior to any works commencing.

The boxes will be installed by a licensed dormouse ecologist, in accordance with those requirements set out within in the EPSL. Their installation, maintenance and repair throughout the pre-construction/enabling works phase will remain the responsibility of the Client with input from the licensed dormouse ecologist.

Please note that additional dormouse boxes will be installed within the off-Site dormouse habitat creation area once the habitat becomes established. The number and exact location will be provided at a later date and will form part of the EPSL application.

5.3.2 Sensitive Vegetation Clearance

Vegetation clearance will commence following issue of the consented application, discharge of relevant planning conditions, and approval of an EPSL application from NRW.

Habitats to be lost to the development footprint include:

- The loss of 1.14 ha of broadleaved woodland that was deemed suitable to support dormice;
- The loss of 1.29 ha of scrub (brambles and hazel); and
- The loss of 0.02 ha of bracken.

The two stage (winter) clearance methodologies will be applied under the EPSL, as detailed below.

Two Stage Clearance: 1st stage November to March; 2nd stage from April – May

All remaining areas of suitable dormouse habitat (predominately woodland edges within the northern and western extents of the Site and within the central area) requiring removal will be undertaken using the two-stage winter clearance methodology. The first stage of clearance will involve above-ground vegetation clearance undertaken between November to March, inclusive, i.e. outside of the dormouse active season and main bird breeding season. The second stage of clearance will involve the removal of root balls and stumps commencing no earlier April (i.e. following dormouse full emergence from hibernation). This approach limits the extent of disturbance/destruction of hibernation habitat immediately prior to the hibernation period specifically when large areas of suitable habitat require clearance. Both stages are dependent on suitable weather conditions.

The Clearance works will be overseen by the licensed ecologist or accredited agents/SQE named within the EPSL.

A tool-box talk will be given to the vegetation clearance contractors by the licensed ecologist or accredited agents/SQE prior to commencement, with respect to the legal protection afforded to dormice, the working methodologies to be employed, identification of individuals and their nests, and procedures to be followed should any evidence of dormice. Any other ecological considerations/potential constraints will also be identified to the contractors.

A thorough pre-commencement check for dormice and their nests will be undertaken by the licensed ecologist or accredited agents/SQE immediately prior to the clearance of woodland and scrub sections.

Trees and scrub considered suitable for future translocation will be identified and marked up prior to commencement of clearance works.

In the unlikely event that a torpid dormouse is found during the works, it will be relocated by hand to a suitable, secure and protected area of retained habitat adjacent and/or to the nearest available dormouse box (maximum distance 150 m).

Should an occupied, dormouse winter nest be discovered, clearance will cease within a 10 m radius of the nest and will recommence no earlier than 1st May of the following year. Habitat connectivity between the hibernation site and area of suitable retained habitat adjacent will also be maintained with no clearance works continuing here; where necessary, brash piles will be created between the nest and retained habitat adjacent to facilitate future foraging and dispersal.

In the unlikely event that an active dormouse be encountered during the clearance works, then the individual will be given adequate time to disperse of its own accord and away from the area subject to the clearance works, and towards retained habitat adjacent, before recommencing with the clearance works.

Thereafter above-ground vegetation will be removed as follows:

- Vegetation will be removed using hand-held tools/machinery only and in a direction towards the retained woodland and scrub habitat, therefore, aiding in dispersal of dormice potentially remaining. The ecologist(s) will be present at all times working closely alongside the contractor and will sign off on specified habitat sections as being clear following completion of a thorough search prior to clearance of those specified areas commencing;
- All woody vegetation including trees and scrub to be removed will be cut down to heights of between 30 cm and 50 cm above ground level and in a direction towards retained vegetation;
- Following the above-ground clearance, any brash will remain in situ for 24 hours to aid dispersal of wildlife during this time, before being taken off site or with waste chipped and stored away from vegetated areas; and
- Vehicles will avoid tracking across areas subject to clearance, and will instead be confined to the habitat edges and areas of grass or hardstanding utilising long-reach machinery where required.

The second stage will be concerned with the removal of any stumps/root balls in the area that will be required to be removed, this will be undertaken in April/May. Stump removal will involve the lifting out of tree stumps, root balls, buried rubble, spoil etc. using a tracked excavator and undertaken in a sensitive manner to ensure no significant disturbance to soil and adjacent, retained planting. Clearance works will be supervised by the SQE (or their accredited agents) named on the EPSL and will follow those methodologies previously described in relation to summer clearance.

With respect to the translocation of suitable specimens identified, such material will be excavated to a depth appropriate to root depth during the below-ground clearance works. Identified specimens will be gently lifted to ensure the root ball is fully intact and transferred to the receptor trench for replanting at similar heights as previous. Specimens will be backfilled with topsoil ensuring no roots are left exposed, with area firmed and sufficiently watered in.

Following completion of the below-ground clearance, the Site will be released to the developer to enable construction to commence.

Dead hedging will be used during vegetation clearance where large gaps between existing/retained habitat and the area being cleared for development is present. This will be instated during the stage one clearance and removed during stage two clearance to allow any dormice safe passage to retained habitat.

6.0 Habitat Management and Maintenance

Habitat management will be on-going in the long-term. The management and maintenance of all retained, enhanced and newly created habitats will be undertaken by a Private Management Company over the lifetime of the development and will be in accordance with the proposed EPSL and WMP specifications.

The WMP and maintenance of the dormouse boxes will be funded for 25 years as part of the annual service charge for the tenants on the Site.

The WMP has been produced as part of the application; however, no specific biodiversity management plans (BMP) have been produced to date. The following principles are recommended:

6.1 Initial Aftercare

This will take place for the first five years following planting.

- Maintenance visits shall be undertaken to ensure the following performance specification is met: a weed free circle, minimum 1.0m diameter shall be maintained around the base of each new plant for the duration of the establishment maintenance period;
- All plants shall be re-firmed in position after strong winds, frost heave or other disturbance;
- All tree/shrub shelters/spirals shall be repaired, re-fixed or replaced to maintain their protection of the plant. Remove any weed growth from within the spiral/shelter;
- All plant protection fencing will be maintained intact for the duration of the establishment maintenance phase;
- All stakes and ties shall be repaired, re-fixed or replaced to ensure their support for new trees until such time as it is deemed the tree to be self-supporting. Their removal may be considered after year 2 or 3;
- When tree stakes are to be removed, the stake holes shall be infilled with lightly compacted soil; and
- Any plants that die during the course of the establishment maintenance phase shall be replaced.

6.2 Woodland and Scrub Management

- A 25-year WMP has been provided in support of this application;
- The woodlands will be thinned to allow a stronger understory to develop, including hazel to be managed as coppice, and a range of native broadleaved trees;
    - 10 % rotational coppicing will be undertaken in years 1, 5, 10, 20 and 25.
- The number of non-native species within the woodlands will be substantially reduced, and the regeneration from non-native trees and shrubs, particularly sycamore, will be controlled;
- Traditional native hedges will strengthen the buffer between built structures and the ancient woodland and provide additional food sources and shelter for dormice and wild birds;
- The variety of native species of trees and shrubs present will be increased, providing resilience against the future incidence of pests and diseases;
- The existing open spaces and associated eco-tones will be preserved by periodic mowing and raking of cuttings to avoid reversion to woodland;
- All woodland compartments will have dead wood features; and
- The ecological corridors between the woodlands will be maintained and enhanced by the planting of native woody shrubs and native hedges.

6.3 Hedgerow Maintenance

- Reinforce gappy hedgerows taking the opportunity to enhance species diversity;
- Only one third of the hedgerows across the site will be cut in any one year using appropriate equipment;
- Hedge cutting will take place in mid-late winter avoiding nesting birds and dormice; and
- Some trees will be left to develop as standards.

6.4 Dormouse Nest Boxes

A total of 50 dormouse nest boxes will be installed across the Site will be annually inspected and maintained over the required monitoring period, with damaged boxes replaced where necessary. The inspections will be undertaken by the dormouse licensed ecologist.

Please note that additional dormouse boxes will be installed within the off-Site dormouse habitat creation area once the habitat becomes established. The number and exact location will be provided at a later date and will form part of the EPSL application.

The maintenance and repair of dormouse boxes installed along the western boundaries of the Application Site remain the responsibility of the Developer, and/or the appointed Management Company.

7.0 Monitoring and Works Schedule

All 50 dormouse nest boxes installed will be subject to monitoring both during the construction period and following occupation. It is anticipated that the monitoring period will likely be between 5 – 10 years as per the licence specification, with monitoring completed during years 1, 3 and 5 and 10 following dormouse box installation by the suitably qualified ecologist (or their accredited agents) named on any future NRW EPSL.

A minimum of three checks will be completed during each monitoring year between May and November. Each check will be carried out between the 19th and 25th of the nominated month in line with national monitoring methodologies.

Evidence of dormice, including nests (active/disused) and individuals will be recorded. Individuals will be aged, sexed and weighed where appropriate to do so, before returning to the box from which it was captured.

All records will be passed to the local records centre and also any local/national dormouse conservation groups.

It is anticipated that once the monitoring, in accordance with the licence requirements, has ceased a continuation of monitoring will be undertaken by the local or national dormouse conservation group.

8.0 Disclaimer

The recommendations contained in this report represent Delta-Simons' professional opinions, based upon the information referred to in Section 1.0 of this report, exercising the duty of care required of an experienced Ecology Consultant. Delta-Simons does not warrant or guarantee that the Site is free of bats or other protected species.

The behaviour of animals can be unpredictable and may not conform to characteristics recorded in current scientific literature. This report, therefore, cannot predict with absolute certainty that animal species will or will not occur in apparently suitable locations or habitats or that they will not occur in locations or habitats that appear unsuitable.

No part of the survey included an assessment of the materials and conditions of any buildings. No part of the survey included an asbestos assessment, nor did it represent an appraisal of other deleterious materials or hazardous substances.

This report was prepared by Delta-Simons for the sole and exclusive use of the Client and for the specific purpose for which Delta-Simons was instructed as defined in Section 1.0 of this report. Nothing contained in this report shall be construed to give any rights or benefits to anyone other than the Client and Delta-Simons, and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Delta-Simons does not intend, without its written consent, for this report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Delta-Simons from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Figure 1 – Site Location Map

Legend

Site Boundary

0 250 500 750 1,000 m

N

Figure: Site Location Plan		
Job: 89106.56308		
Client: Curtis Hall Ltd		
Figure: 1	Revision: 1	Date: 02 November 2022
Drawn by: DP	Checked by: JS	Scale: 1:20,000
Job No.: 20-0981.07		

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Figure 2 – Habitat Survey Plan

Legend

- Site Boundary
- Scattered scrub
- Scattered broadleaved trees
- TNX — Target note
- Scattered Bracken
- Running water
- Fence
- Broadleaved semi-natural woodland
- Dense scrub
- SI — Poor semi-improved grassland
- Standing water
- Bare ground
- Hardstanding
- Bracken

N

0 50 100 150

Figure: Habitat survey Plan		
Job: 89106.56308		
Client: Curtis Hall Ltd		
Figure: 2a	Revision: 1	Date: 02 November 2022
Drawn by: DP	Checked by: JS	Scale: 1:2,500
Job No.: 20-0981.07		

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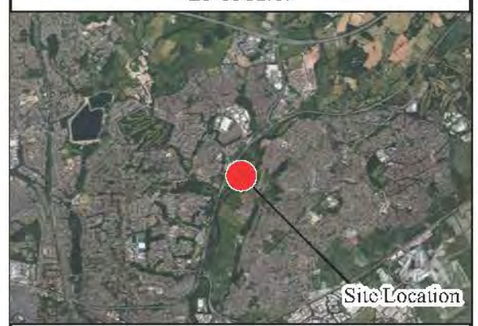
Legend

- Site Boundary
- Scattered scrub
- Scattered broadleaved trees
- TNX Target note
- Running water
- Fence
- Broadleaved semi-natural woodland
- Dense scrub
- SI Poor semi-improved grassland
- Standing water
- Running water
- Bare ground
- Buildings
- Hardstanding
- Bracken

N

0 50 100 150

Figure: Habitat survey Plan		
Job: 89106.56308		
Client: Curtis Hall Ltd		
Figure: 2b	Revision: 1	Date: 02 November 2022
Drawn by: DP	Checked by: JS	Scale: 1:2,500
Job No.: 20-0981.07		



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Legend

- Off-Site Area
- Rhymney River Valley Complex Site of Importance for Nature Conservation (SINC)
- SI — Poor Semi-Improved Grassland
- A — Amenity grassland
- Dense Scrub
- Semi-Natural Broadleaved Woodland
- Broadleaved scattered tree
- Scattered Scrub
- Target note

0 50 100 150 200 Meters

N

Figure	Off-Site Habitat Survey Plan		
Job	Cardiff Park and Ride East		
Client	Curtis Hall Ltd		
Figure No. 2c	Revision A	Date 26/06/2023	
Drawn BB	Checked CD	Scale 1:4,250 @ A3	
Job No. 20-0981.07		Central GR 321044E 180139N	

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Figure 3 – Locations of Hazel Dormice Nest Tubes and Existing Nest Boxes

Legend

- Site Boundary
- Evidence of Hazel dormouse
- Possible evidence of Hazel dormouse

N

0 50 100 150

Figure: Results of Hazel Dormouse Survey		
Job: 89106.56308		
Client: Curtis Hall Ltd		
Figure: 3	Revision: 1	Date: 11 August 2022
Drawn by: DP	Checked by: JS	Scale: 1:2,500
Job No.: 20-0981.07		

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Figure 4 – Dormouse Habitat

SI

SI

SI

SI

Legend

- Site boundary
- Suitable dormouse habitat
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- SI — Poor semi-improved grassland
- Bracken - continuous
- Standing water
- Hardstanding

0 25 50 75 100 Meters

N

Figure: Dormouse Habitat		
Job: Curtis Hall		
Client:		
Figure No.: 4	Revision: A	Date: 25/04/2023
Drawn: BB	Checked: JS	Scale: 1:3,500 @ A3
Job No.: 89106.563085		Central GR: 321250E 181050N

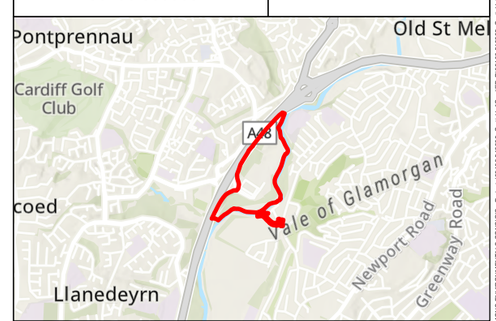

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Figure 5 - Retained & Lost Habitat

SI

SI

SI

SI

Legend

- Site boundary
- Broadleaved woodland - semi-natural
- Scrub - dense/continuous
- SI — Poor semi-improved grassland
- Bracken - continuous
- Standing water
- Hardstanding
- Lost habitat
- Retained habitat
- Suitable dormouse habitat

0 25 50 75 100 Meters

N

Figure	Retained & Lost Habitat		
Job	Curtis Hall		
Client			
Figure No. 5	Revision A	Date 10/08/2023	
Drawn BB	Checked JS	Scale 1:3,500 @ A3	
Job No. 89106.563085		Central GR 321250E 181050N	

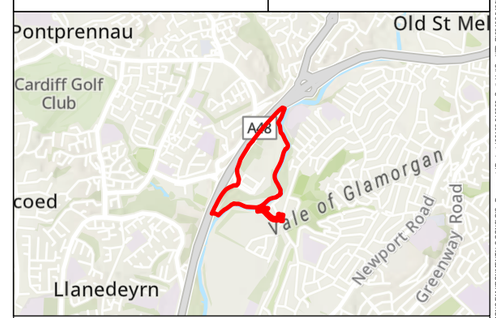

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Figure 6 – Supplementary Onsite Habitat Creation

Legend

- Site boundary
- Supplementary dormouse habitat planting

0 40 80 120 160 Meters

N

Figure	Supplementary Onsite habitat creation		
Job	Curtis Hall		
Client			
Figure No. 6	Revision A	Date 27/06/2023	
Drawn BB	Checked JS	Scale 1:3,560 @ A3	
Job No. 89106.563085		Central GR 321234E 181046N	

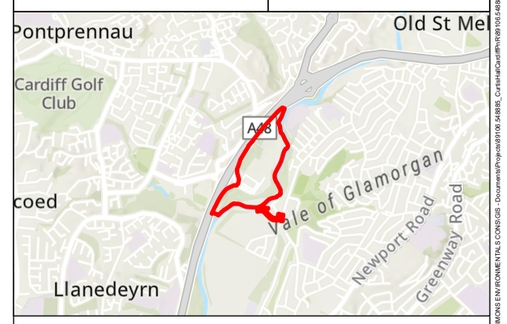

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Figure 7 – Off-Site Habitat Creation

Legend

- Site boundary
- Dormouse bridge (indicative location)
- Hazel Planting

0 70 140 210 280 Meters

N

Figure	Off-Site Habitat Creation		
Job	Curtis Hall		
Client			
Figure No. 7	Revision A	Date 14/12/2023	
Drawn BB	Checked JS	Scale 1:7,500 @ A3	
Job No. 89106.563085		Central GR 321173E 180551N	

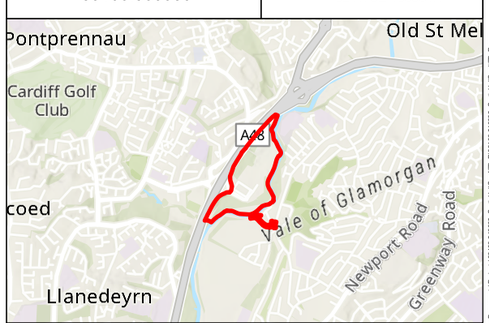

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Figure 8 – Retained Habitat & Dormouse Box Locations

Legend

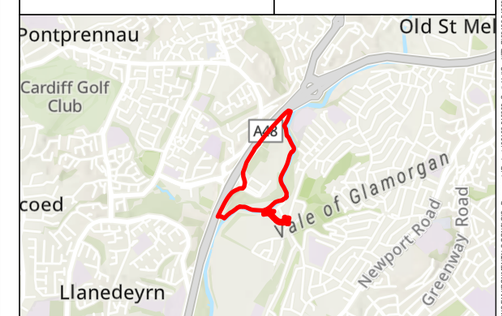
- Site boundary
- Ancient woodland 20m buffer
- Retained suitable dormouse habitat
- Retained woodland
- Thicket planting (supplementary dormouse habitat)
- Hedgerow
- Indicative Dormouse box location

0 30 60 90 120 Meters

-N-

Figure	Retained Habitat & Dormouse Box Locations
Job	Curtis Hall
Client	

Figure No. 8	Revision A	Date 10/08/2023
Drawn BB	Checked JS	Scale 1:3,500 @ A3
Job No. 89106.563085		Central GR 321250E 181050N



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Drawing 1 – Landscape General Arrangement Plan

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NORTH

SCALE 1:1000 0 25 50 75 100m

SCALE 1:1 0 10 20 30 40 50 60 70 80 90 100mm

NOTES:

- Based on Henry Mein Partenership drawing no. '7528 MEIN-XX-XX-DR-A-SL_70-003 Rev P14' - Proposed Site Plan.
- Topographical survey information provided by Greenhatch Surveys.
- All woodland, grassland and scrub management & enhancement works to be carried out in accordance with A.T coombes associates - 'Cardiff East Park and Ride 25 Year Woodland Management Plan Woodland Management Plan'.

Existing woodland areas to be retained and enhanced refer to A.T. COOMBES Woodland Management Plan for further detail.

Existing woodland areas to be retained and enhanced in accordance with A.T. COOMBES Woodland Management Plan.

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing scrubland to be infill planted where required

Existing vegetation to be infill planted where required

Proposed hedgerow to form new edge to woodland

Proposed hedgerow to form new edge to woodland

Proposed hedgerow to form new edge to woodland

Attenuation Basin

Attenuation Basin

Attenuation Basin

Attenuation Basin

Retaining structure to Engineers detail

Retaining structure to Engineers detail

Seating Area to Architects Detail

Amenity Area to Architects Detail

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing grassland & scrubland to be managed in accordance with A.T. COOMBES Woodland Management Plan

Existing woodland areas to be retained and enhanced in accordance with A.T. COOMBES Woodland Management Plan.

PLOT 4

PLOT 5

PLOT 6a

PLOT 6b

PLOT 7

PLOT 8

P1

P2

P3a

P3b

P3c

P3d

A

B

C

D

E

F

KEY

ANCIENT WOODLAND
Refer to A.T. COOMBES ASSOCIATES LTD Woodland Management Plan for further detail of existing vegetation & management strategy.

EXISTING WOODLAND
Refer to A.T. COOMBES ASSOCIATES LTD Woodland Management Plan for further detail of existing vegetation & management strategy.

EXISTING GRASSLAND & SCRUBLAND
Refer to A.T. COOMBES ASSOCIATES LTD Woodland Management Plan for further detail of existing vegetation & management strategy.

EXTRA HEAVY STANDARD TREES
(*Tree pit size: 1500x1500x900mm*)
18-20cm stem girth
4.5-5.0m height
1.8-2.1m clear stem
Rootballed

MULTI-STEM TREES
(*Tree pit size: 1000x1000x750mm*)
3.0-3.5m height
3x transplanted
Rootballed

CONIFEROUS TREES
(*Tree pit size: 1000x1000x750mm*)
2.0-2.5m height
4x transplanted
Rootballed

FEATHERED TREES
1.75-2.0m height
2x transplanted
Well furnished with lateral shoots to base
Root wrapped

SPECIMEN SHRUBS
(*300mm depth of topsoil + minimum 300mm depth subsoil*)

THICKET (WOODLAND EDGE) MIX PLANTING
(*300mm depth of topsoil + minimum 600mm depth subsoil*)
Where woodland or thicket is planted next to a hard surface/kerb/fence, it should be positioned 1m from the edge. Whips/Transplants planted in groups of 3-9 of the same species on a 1.0m grid.

Whip/Transplants

%	Species	Common Name	Size	Age	Root/Pot Size
10	Cornus sanguinea	Dogwood	600-800mm	1+1	OG
20	Corylus avellana	Hazel	600-800mm	1+2	OG
10	Crataegus monogyna	Hawthorn	600-800mm	1+1	OG
10	Euonymus europaeus	Spindle	600-800mm	1+2	OG
5	Ilex aquifolium	Holly	400-600mm		3L
15	Ligustrum vulgare	Privet	600-800mm	0/2	OG
10	Prunus spinosa	Blackthorn	600-800mm	1+1	OG
10	Rosa canina	Dog Rose	600-800mm	1+1	OG
5	Sambucus nigra	Elder	600-800mm	1+1	OG
5	Viburnum opulus	Guelder Rose	600-800mm	1+2	OG

MIXED SPECIES NATIVE HEDGEROW
(*300mm depth of topsoil + minimum 600mm depth subsoil*)
Planted at 450mm centres in a double staggered row. Rows to be 500mm apart.

%	Species	Common Name	Size	Age	Root/Pot
20	Corylus avellana	Hazel	600-800mm	1+2	OG
20	Crataegus monogyna	Hawthorn	600-800mm	1+1	OG
25	Ilex aquifolium	Holly	400-600mm		3L
10	Prunus spinosa	Blackthorn	600-800mm	1+1	OG
15	Rosa canina	Dog Rose	600-800mm	1+1	OG
10	Sambucus nigra	Elder	600-800mm	1+1	OG

ZONES OF WOODLAND ENHANCEMENT PLANTING
(includes areas of supplementary Dormice Habitat planting)
Refer to AT Coombes Woodland Management Plan (V15) for exact mixes and locations

TALL ORNAMENTAL SHRUB PLANTING
(*300mm depth of topsoil + minimum 300mm depth subsoil*)

LOW ORNAMENTAL SHRUB/HERBACEOUS PLANTING
(*300mm depth of topsoil + minimum 300mm depth subsoil*)

CLOSE MOWN GRASS SEEDED AREAS
(*150mm depth of topsoil + minimum 150mm depth subsoil*)
To be sown with DLF PM 120 'Slowgrowth' or similar approved
Sown at a rate of 35-50g/m²

SPECIES RICH GRASSLAND AREAS
(*150mm depth of topsoil + minimum 150mm depth subsoil*)
To be sown with DLF PM 120 'Slowgrowth' or similar approved
Sown at a rate of 35-50g/m²

WET GRASSLAND SEEDED AREAS
(Cultivated subsoil to a depth of 300mm)
To be sown with Emorsgate EP1 or similar approved
Sown at a rate of 4 g/m²

SWALES & BASINS
Profiles & locations all to Engineers Specificailton

RAIN GARDENS
Profiles & locations all to Engineers Specificailton.
To be planted with ornamental grassed & moisture loving shrub species.

DIVERTED PUBLIC RIGHT OF WAY
Existing route to be altered & diverted around development proposals.

RHYMNEY TRAIL
Existing route running along the watercourse & across to the residential areas east of the river.

EXISTING PUBLIC RIGHT OF WAY TO BE RETAINED
Existing route linking back to Rhymney Trail to be retained & surfaces made good where required. Benches and rest stops to be added in various locations along the route.

INFORMAL CYCLE/ WALKING ROUTES
Proposed 3m pathway running east-west through woodland areas creating links to the west of the site.

AMENITY ZONE
To Architect's Specification

PLACEMAKING
Where existing & proposed pathways join, signage, seating and waymarking will be positioned to create junctions & memorable locations along the route.

OVERHEAD POWER CABLES

SECTION LINES
Refer to BCA drawing no. 2190-21-02 for 'Illustrative Landscape Sections'

RETAINING STRUCTURES
(To Engineers detail)

SITE BOUNDARY

PLOT BOUNDARIES

REV	DESCRIPTION	BY	CKD	DATE
P22	Landscape updated to suit revised layout plan - P19	HC	MB	14-12-23
P21	Annotation amended	HC	MB	01-11-23
P20	Woodland enhancement areas updated.	HC	MB	01-11-23
P19	Woodland enhancement areas updated.	HC		18-10-23
P18	Woodland enhancement areas updated.	MB		24-08-23
P17	Landscape key updated	HC	MB	15-08-23
P16	Landscape updated to suit revised layout plan - P15	HC	MB	14-08-23
P15	Landscape updated to suit revised layout plan - P15	HC	MB	01-08-23
P14	Landscape updated to the corner of plot P2	MB		30-06-23
P13	Landscape updated to suit revised site layout plan - P13.	HC	MB	13-06-23
P12	Landscape updated to suit revised site layout plan - P13.	HC	MB	08-03-23
P11	Landscape updated to suit revised site layout plan.	HC	MB	02-03-23
P10	Landscape updated to suit revised site layout plan.	HC	MB	27-02-23
P9	Minor key update	MB		09-02-23
P8	Updated in line with revised site layout plan.	HC	MB	20-01-23
P7	Revised site boundary added to plan	HC	MB	01-11-22
P6	Rain garden areas added to strategy plan	HC	MB	28-10-22
P5	Design & brief altered to suit revised Architectural layout.	HC	MB	19-08-22
P4	Design & brief altered to suit revised Architectural layout.	HC	MB	01-08-22
P3	Layout updated following team comments	HC	MB	11-04-22
P2	Layout updated to reflect latest architectural site plan	HC	MB	07-04-22
P1	Footpath network amended	HC	MB	10-02-22

BARRY CHINN associates
Landscape Architects

CLIENT
CURTIS HALL LIMITED

PROJECT
CURTIS HALL,
CARDIFF PARK & RIDE EAST

DRAWING TITLE
INDICATIVE LANDSCAPE STRATEGY PLAN

CONTRACT NUMBER:	2190-21	DATE:	23-12-21
DRAWING STATUS:	PLANNING	CAD REFERENCE:	2190-21-01
DRAWN BY:	HC	CHECKED BY:	MB
SCALE:	1:1000	ORIGINAL SHEET:	A0

PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	NUMBER	STATUS	REV
CUR	BCA	ELS	XX	DR	L	2190-21-01	S5	P22

Barry Chinn Associates Ltd. Harbury Road, Deppers Bridge, Southam, Warwickshire, CV47 2SZ
Tel: +44 (0)1926 614031 Email: gen@bca-landscape.com Website: www.bca-landscape.com

Drawing 2 – Offsite Dormouse Habitat Landscape Plan

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KEY

HABITAT CREATION PLANTING
Where woodland or thicket is planted next to a hard surface/kerb/fence, it should be positioned 1m from the edge. Whips/Transplants planted in groups of 3-9 of the same species on a 1.0m grid.

Whip/Transplants

Species	Common Name	Size	Age	Root/Pot Size
Acer campestre	Field maple	600-800mm	1+1	OG
Carpinus betulus	Hornbeam	600-800mm	1+1	OG
Corylus avellana	Hazel	600-800mm	1+2	OG
Crataegus monogyna	Hawthorn	600-800mm	1+1	OG
Cytisus scorparius	Broom	400-600mm		3L
Lonicera periclymenum	Honey suckle			3L
Quercus petraea	Sessile Oak	600-800	1+1	OG
Prunus spinosa	Blackthorn	600-800mm	1+1	OG
Queruc robur	Pedunculate Oak	600-800mm	1+1	OG
Rosa canina	Dog Rose	600-800mm	1+1	OG
Sambucus nigra	Elder	600-800mm	1+1	OG
Tilia cordata	Lime	600-800mm	1+1	OG
Sorbus auuparia	Rowan	600-800mm	1+1	OG
Taxus baccata	Yew	600-800mm	1+1	OG
Viburnum lantana	Wayfaring Tree	600-800mm	1+1	OG
Viburnum opulus	Guelder Rose	600-800mm	1+2	OG

OFFSITE DORMICE HABITAT PLANTING
Whips/Transplants planted on a 1.0m grid.

Whip/Transplants

Species	Common Name	Size	Age	Root/Pot Size
Corylus avellana	Hazel	600-800mm	1+2	OG

PROPOSED LOCALIZED ECOLOGICAL MOUNDS
5-6m wide blocks of 25m long 2m tall. To be constructed from earth laid over a bed of logs. To be facing onto open ground.
All in accordance with the ecologist recommendations

PROPOSED DORMICE BRIDGE (indicative location only)
All in accordance with the ecologist recommendations

REV	DESCRIPTION	BY	CKD	DATE
P3	Mitigation planting altered to allow 4m zone to riverside.	HC		14-12-23
P2	Additional mitigation planting added	HC		18-10-23
P1	Updates to enhancement areas	MB		24-08-23

BCA BARRY CHINN associates
Landscape Architects

CLIENT
CURTIS HALL LIMITED

PROJECT
CURTIS HALL,
CARDIFF PARK & RIDE EAST

DRAWING TITLE
OFF SITE DORMICE HABITAT
LANDSCAPE PLAN

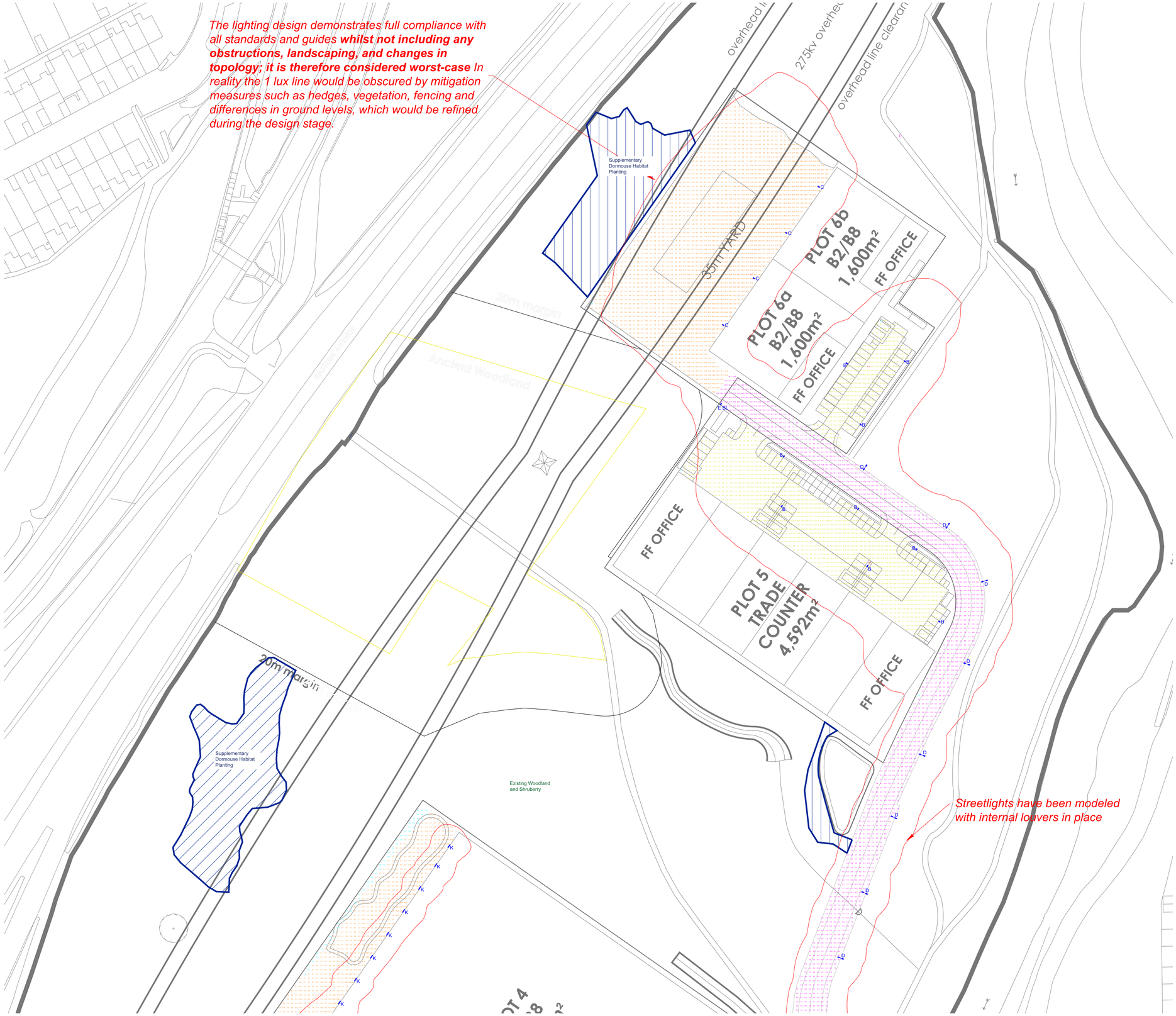
CONTRACT NUMBER:	2190-21	DATE:	14-08-23
DRAWING STATUS:	PLANNING	CAD REFERENCE:	2190-21-01
DRAWN BY:	HC	CHECKED BY:	MB
SCALE:	1:1250	ORIGINAL SHEET:	A0

PROJECT	ORIGINATOR	VOLUME	LEVEL	TYPE	ROLE	NUMBER	STATUS	REV
CUR	BCA	ELS	XX	DR	L	2190-21-07	S5	P3

Barry Chinn Associates Ltd. Harbury Road, Deppers Bridge, Southam, Warwickshire, CV47 2SZ
Tel: +44 (0)1926 614031 Email: gen@bca-landscape.com Website: www.bca-landscape.com

Drawing 3 - External Lighting Plan 1

The lighting design demonstrates full compliance with all standards and guides ***whilst not including any obstructions, landscaping, and changes in topology; it is therefore considered worst-case*** *In reality the 1 lux line would be obscured by mitigation measures such as hedges, vegetation, fencing and differences in ground levels, which would be refined during the design stage.*



All lanterns to be ordered with a lumen output 20% greater than shown below.
All Luminaires complete with CityTouch 35Lux SR node and 10 year service fee.

K
WT490C PSD L1200 1 xLED42S830 WB

1 lamp(s) per luminaire, 4000 initial lumens per lamp
Maintenance Factor = 0.800, watts per luminaire = 26
Outreach (from mounting axis to photometric center)= 0 mm
mounting height= 3 m
number locations= 9, number luminaires= 9

E BL
Luma Gen2 Medium BGP704 3000K DW50 BL2 80 LED 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 8 m
number locations= 1, number luminaires= 1

J
Luma Gen2 Medium BGP704 3000K DW50 80 LED 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
number locations= 12, number luminaires= 12

H
Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Twin Lantern

1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 600 mm
tilt angle= 5 deg
mounting height= 6 m
number locations= 28, number luminaires= 56

H
Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Single Lantern

1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 400 mm
tilt angle= 5 deg
mounting height= 6 m
number locations= 3, number luminaires= 3

D
Luma Gen2 Mini BGP703 3000K DW50 40 LED 7.0klm

1 lamp(s) per luminaire, 3600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 41
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
number locations= 27, number luminaires= 27

E
Luma Gen2 Medium BGP704 3000K DW50 80 LED 20.0klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
tilt angle= 5 deg
mounting height= 8 m
number locations= 4, number luminaires= 4

C
Clearflood Small BVP650 3000K OFA52 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 141
Outreach (from mounting axis to photometric center)= 400 mm
tilt angle= 25 deg
mounting height= 8 m
number locations= 15, number luminaires= 15

B
Luma Gen2 Mini BGP703 3000K DW50 40 LED 8.5klm
Twin Lanterns

1 lamp(s) per luminaire, 8500 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 600 mm
mounting height= 8 m
number locations= 2, number luminaires= 4

B
Luma Gen2 Mini BGP703 3000K DW50 40 LED 8.5klm
Single Lantern

1 lamp(s) per luminaire, 8500 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 8 m
number locations= 26, number luminaires= 26

A
Luma Gen2 Large BGP705 3000K DW50 180 LED 41.0klm

1 lamp(s) per luminaire, 41000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 246
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 10 m
number locations= 14, number luminaires= 14

Existing Twin Luma 1 3000K DN11 12.6klm

1 lamp(s) per luminaire, 12800 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 0
Outreach (from mounting axis to photometric center)= 900 mm
mounting height= 10 m
number locations= 1, number luminaires= 2

Bus Drop off & Roundabout (50 Lux)
2213 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	59.9
Maximum	106.2
Minimum	24.1
Min/Avg(Uo)	0.402
Min/Max	0.227
Coef Var	0.257
UnifGrad	1.27

Residential Route (P3)
1484 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	7.5
Maximum	45.1
Minimum	0.1
Min/Avg(Uo)	0.013
Min/Max	0.002
Coef Var	0.947
UnifGrad	2.12

Service Yard Plot 4 (20 Lux)
3546 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	19.9
Maximum	148.3
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	0.897
UnifGrad	N/A

Car Park Plot 5 (10 Lux)
1138 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.1
Maximum	29.8
Minimum	0.2
Min/Avg(Uo)	0.012
Min/Max	0.007
Coef Var	0.456
UnifGrad	1.67

Car Park Plot 6 (10 Lux)
303 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.0
Maximum	21.5
Minimum	6.2
Min/Avg(Uo)	0.387
Min/Max	0.288
Coef Var	0.234
UnifGrad	1.27

Service Yard Plot 6 (20 Lux)
1826 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.6
Maximum	58.7
Minimum	0.6
Min/Avg(Uo)	0.041
Min/Max	0.010
Coef Var	0.931
UnifGrad	1.79

Car Park Plot 7 (10 Lux)
5734 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	10.8
Maximum	54.1
Minimum	0.6
Min/Avg(Uo)	0.056
Min/Max	0.011
Coef Var	0.565
UnifGrad	1.62

Ind Estate Road (P3)
3053 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.7
Maximum	55.2
Minimum	1.9
Min/Avg(Uo)	0.162
Min/Max	0.034
Coef Var	0.670
UnifGrad	1.62

Car Park Plot 1 (50 Lux)
475 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	50.2
Maximum	78.3
Minimum	23.1
Min/Avg(Uo)	0.460
Min/Max	0.295
Coef Var	0.242
UnifGrad	1.31

Car Park Plot 2 (50 Lux)
363 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	57.5
Maximum	78.6
Minimum	33.8
Min/Avg(Uo)	0.588
Min/Max	0.430
Coef Var	0.162
UnifGrad	1.28

Car Park Plot 3 a/b/c (10 Lux)
916 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.4
Maximum	21.4
Minimum	7.7
Min/Avg(Uo)	0.469
Min/Max	0.360
Coef Var	0.169
UnifGrad	1.26

Car Park Plot 4 (10 Lux)
883 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	20.8
Maximum	56.1
Minimum	10.0
Min/Avg(Uo)	0.481
Min/Max	0.178
Coef Var	0.343
UnifGrad	1.30

Plot 8 Access (P3)
179 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	23.8
Maximum	44.3
Minimum	10.6
Min/Avg(Uo)	0.446
Min/Max	0.239
Coef Var	0.428
UnifGrad	1.22

Car Park Plot 8 (10 Lux)
826 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.5
Maximum	58.7
Minimum	2.4
Min/Avg(Uo)	0.165
Min/Max	0.041
Coef Var	0.753
UnifGrad	1.95

Service Yard Plot 8 (20 Lux)
1797 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.6
Maximum	60.9
Minimum	0.2
Min/Avg(Uo)	0.017
Min/Max	0.003
Coef Var	1.126
UnifGrad	2.10

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This drawing to be read in conjunction with all relevant architects, consultants, sub-contractors and specialist drawings, and should not be scaled from in any way.

Revisions

Rev.	By	Date	Description	Chk
P2	CA	14.04.22	Amended with updated lighting layout.	PRH
P3	PR	18.08.22	Amended with updated lighting layout.	PRH
P4	PR	27.10.22	Pre-App comments applied	PRH
P5	PR	02.11.22	Layout updated	PRH
P6	PR	23.01.23	Layout updated	PRH
P7	PR	07.03.23	Layout updated	PRH
P8	PR	22.03.23	Dark Areas Hatched	PRH
P9	PR	31.05.23	Layout and Lux Levels Updated	PRH
P10	PR	31.07.23	Layout Updated	PRH
P11	LM	24.10.23	Lighting Lux Levels Updated	PRH
P12	LM	30.10.23	Lighting & Lux Levels Updated	PRH
P13	LM	01.11.23	Annotation added re 1 lux line	PRH
P14	LM	05.12.23	Lighting Layout & Layout Revised Title & Scale Amended	PRH
P15	LM	13.12.23	Layout Revised	PRH

Client
CURTIS HALL
CARDIFF PARK & RIDE EAST

Architect
HENRY MEIN PARTNERSHIP
MEIN ARCHITECTS & INTERIOR DESIGNERS

Project Address
CARDIFF EAST PARK & RIDE

Drawing Title
EXTERNAL LIGHTING SEC 1/3

Hydrock KTA
ENGINEERING & ENVIRONMENTAL CONSULTANTS
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E-MAIL general@kellytaylor.net

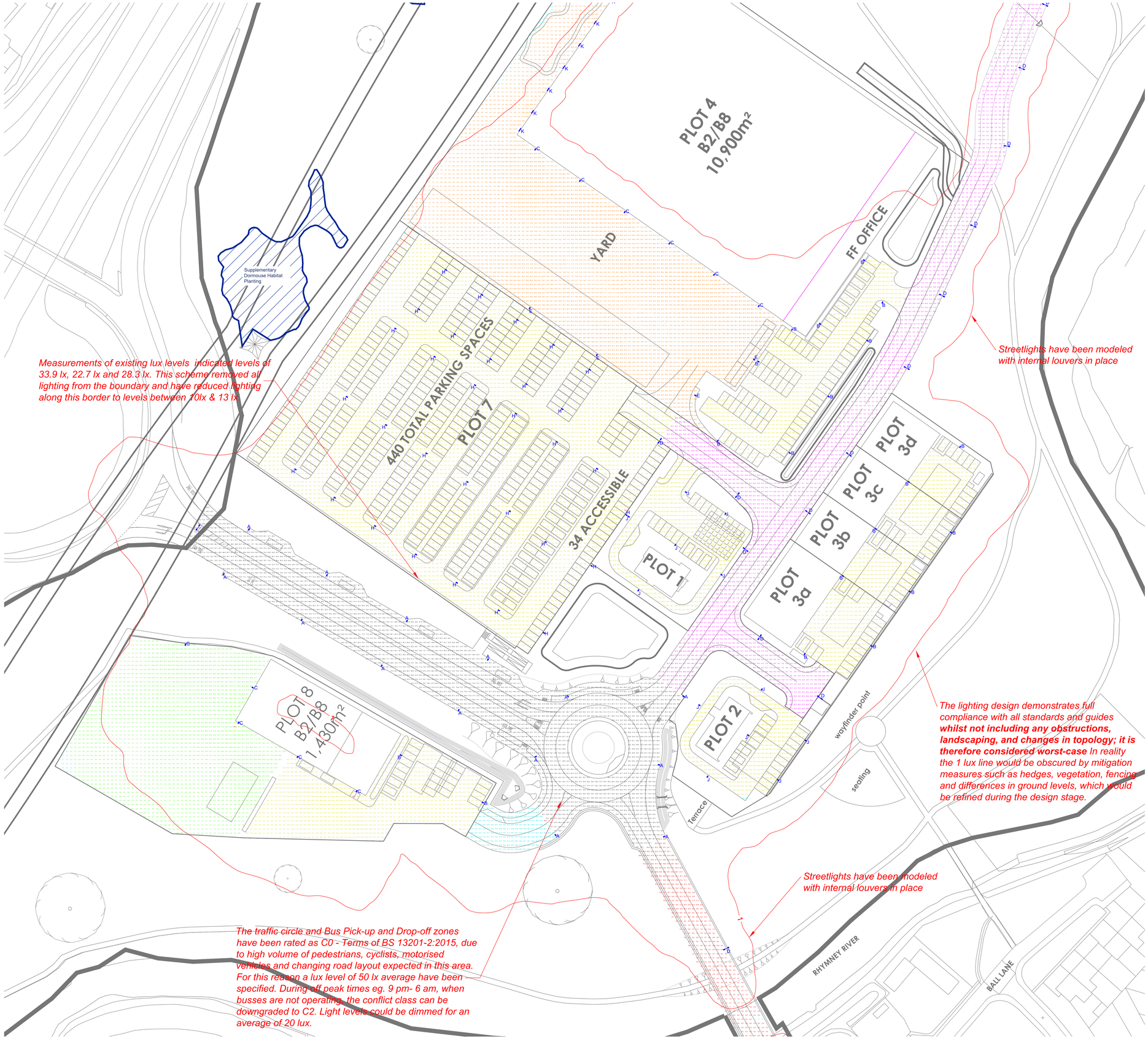
PLANNING

Drawn by	Checked by	Authorised by
CA	PRH	JDG

Scale	Size	Date
1:500	A0	MAR 2022

Drawing no. 10341-EXT-100 Rev. P15

Drawing 4 - External Lighting Plan 2



All lanterns to be ordered with a lumen output 20% greater than shown below.
All Luminaires complete with CityTouch 35Lux SR node and 10 year service fee.

K — WT490C PSD L1200 1 xLED42S830 WB

1 lamp(s) per luminaire, 4000 initial lumens per lamp
Maintenance Factor = 0.800, watts per luminaire = 26
Outreach (from mounting axis to photometric center)= 0 mm
mounting height= 3 m
number locations= 9, number luminaires= 9

E BL — Luma Gen2 Medium BGP704 3000K DW50 BL2 80 LED 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 8 m
number locations= 1, number luminaires= 1

J — Luma Gen2 Medium BGP704 3000K DW50 80 LED 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
number locations= 12, number luminaires= 12

H — Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Twin Lantern

1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 600 mm
tilt anglen= 5 deg
mounting height= 6 m
number locations= 28, number luminaires= 56

H — Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Single Lantern

1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 400 mm
tilt anglen= 5 deg
mounting height= 6 m
number locations= 3, number luminaires= 3

D — Luma Gen2 Mini BGP703 3000K DW50 40 LED 7.0klm

1 lamp(s) per luminaire, 3600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 41
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
number locations= 27, number luminaires= 27

E — Luma Gen2 Medium BGP704 3000K DW50 80 LED 20.0klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
tilt anglen= 5 deg
mounting height= 8 m
number locations= 4, number luminaires= 4

C — Clearflood Small BVP650 3000K OFA52 20klm

1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 141
Outreach (from mounting axis to photometric center)= 400 mm
tilt anglen= 25 deg
mounting height= 8 m
number locations= 15, number luminaires= 15

B — Luma Gen2 Mini BGP703 3000K DW50 40 LED 8.5klm
Twin Lanterns

1 lamp(s) per luminaire, 8500 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 600 mm
mounting height= 8 m
number locations= 2, number luminaires= 4

B — Luma Gen2 Mini BGP703 3000K DW50 40 LED 8.5klm
Single Lantern

1 lamp(s) per luminaire, 8500 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 8 m
number locations= 26, number luminaires= 26

A — Luma Gen2 Large BGP705 3000K DW50 180 LED 41.0klm

1 lamp(s) per luminaire, 41000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 246
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 10 m
number locations= 14, number luminaires= 14

A — Existing Twin Luma 1 3000K DN11 12.6klm

1 lamp(s) per luminaire, 12600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 0
Outreach (from mounting axis to photometric center)= 900 mm
mounting height= 10 m
number locations= 1, number luminaires= 2

Bus Drop off & Roundabout (50 Lux)
2213 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	59.9
Maximum	106.2
Minimum	24.1
Min/Avg(Uo)	0.402
Min/Max	0.227
Coef Var	0.257
UnifGrad	1.27

Residential Route (P3)
1484 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	7.5
Maximum	45.1
Minimum	0.1
Min/Avg(Uo)	0.013
Min/Max	0.002
Coef Var	0.947
UnifGrad	2.12

Service Yard Plot 4 (20 Lux)
3546 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	19.9
Maximum	146.3
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	0.897
UnifGrad	N/A

Car Park Plot 5 (10 Lux)
1136 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.1
Maximum	29.8
Minimum	0.2
Min/Avg(Uo)	0.012
Min/Max	0.007
Coef Var	0.456
UnifGrad	1.67

Car Park Plot 6 (10 Lux)
303 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.0
Maximum	21.5
Minimum	6.2
Min/Avg(Uo)	0.387
Min/Max	0.288
Coef Var	0.234
UnifGrad	1.27

Service Yard Plot 6 (20 Lux)
1826 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.6
Maximum	58.7
Minimum	0.6
Min/Avg(Uo)	0.041
Min/Max	0.010
Coef Var	0.931
UnifGrad	1.79

Car Park Plot 7 (10 Lux)
5734 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	10.8
Maximum	54.1
Minimum	0.6
Min/Avg(Uo)	0.056
Min/Max	0.011
Coef Var	0.565
UnifGrad	1.62

Ind Estate Road (P3)
3053 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.7
Maximum	55.2
Minimum	1.9
Min/Avg(Uo)	0.162
Min/Max	0.034
Coef Var	0.679
UnifGrad	1.62

Car Park Plot 1 (50 Lux)
475 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	50.2
Maximum	78.3
Minimum	23.1
Min/Avg(Uo)	0.460
Min/Max	0.295
Coef Var	0.242
UnifGrad	1.31

Car Park Plot 2 (50 Lux)
363 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	57.5
Maximum	78.6
Minimum	33.8
Min/Avg(Uo)	0.588
Min/Max	0.430
Coef Var	0.163
UnifGrad	1.26

Car Park Plot 3 a/b/c (10 Lux)
919 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.4
Maximum	21.4
Minimum	7.7
Min/Avg(Uo)	0.469
Min/Max	0.360
Coef Var	0.169
UnifGrad	1.26

Car Park Plot 4 (10 Lux)
883 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	20.8
Maximum	58.1
Minimum	10.0
Min/Avg(Uo)	0.481
Min/Max	0.178
Coef Var	0.343
UnifGrad	1.30

Plot 8 Access (P3)
179 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	23.8
Maximum	44.3
Minimum	10.6
Min/Avg(Uo)	0.446
Min/Max	0.239
Coef Var	0.428
UnifGrad	1.22

Car Park Plot 8 (10 Lux)
899 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.5
Maximum	58.7
Minimum	2.4
Min/Avg(Uo)	0.165
Min/Max	0.041
Coef Var	0.753
UnifGrad	1.95

Service Yard Plot 8 (20 Lux)
1797 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.6
Maximum	60.9
Minimum	0.2
Min/Avg(Uo)	0.017
Min/Max	0.003
Coef Var	1.128
UnifGrad	2.10

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Revisions

Rev.	By	Date	Description	Chk
P2	CA	14.04.22	Amended with updated lighting layout.	PRH
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P6	PR	23.01.23	Layout updated	PRH
P7	PR	07.03.23	Layout updated	PRH
P8	PR	22.03.23	Dark Areas Hatched	PRH
P9	PR	31.07.23	Layout and Lux Levels Updated	PRH
P10	PR	31.07.23	Layout updated	PRH
P11	LM	24.10.23	Layout and Lux Levels Updated	PRH
P12	LM	30.10.23	Lighting & Lux Levels Updated	PRH
P13	LM	01.11.23	Annotation added re 1 lux line	PRH
P14	LM	05.12.23	Lighting Layout & Layout Revised Title & Scale Amended	PRH
P15	LM	13.12.23	Layout Revised	PRH

Client
CURTIS HALL
CARDIFF PARK & RIDE EAST

Architect
HENRY MEIN PARTNERSHIP
MEIN ARCHITECTS & INTERIOR DESIGNERS

Project Address
CARDIFF EAST PARK & RIDE

Drawing Title
EXTERNAL LIGHTING SEC 2/3

Hydrock KTA
ENGINEERING & ENVIRONMENTAL CONSULTANTS
1 ASHLEIGH WAY, LANGAGE BUSINESS PARK,
PLYMOUTH, DEVON, PL7 5JX.
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PLANNING

Drawn by	Checked by	Authorised by
CA	PRH	JDG

Scale	Size	Date
1:500	A0	MAR 2022

Drawing no. 10341-EXT-101 Rev. P15

Drawing 5 - External Lighting 10% Power

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Revisions

Rev.	By	Date	Description	Chk

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	Watts
	ZL2	2	THORLUX Aspect 3 ZL-Lens	Column Mounted @ 6m 0° Bracket Tilt	1 x 10,130 lumens 5,700°K Colour Temp CRI80	95
	C	16	THORLUX Starbeam ECO GR5 Roadway Optic SB196730ZCC30	Column Mounted @ 6m 0° Tilt	1 x 4,000 Lumens (10%) 3,000K Colour Temp CRI70+ SmartScan Controlled	35
	C.B	43	THORLUX Starbeam ECO GR5 Roadway Optic SB196730ZCC30	Column Mounted @ 6m 0° Tilt REAR SHEILD	1 x 4,000 Lumens (10%) 3,000K Colour Temp CRI70+ SmartScan Controlled	35
	C.B-1	9	THORLUX Starbeam ECO GR5 Roadway Optic SB196730ZCC30	Column Mounted @ 6m 0° Tilt REAR SHEILD 1MF APPLIED	1 x 4,000 Lumens (10%) 3,000K Colour Temp CRI70+ SmartScan Controlled	35
	C1.B	15	THORLUX Starbeam GR5 Roadway Optic SB031R5ZZCC30	Column Mounted @ 6m 0° Tilt REAR SHEILD	1 x 3,400 Lumens 3,000K Colour Temp CRI70+	35
	C3	14	THORLUX Starbeam GR5 Roadway Optic SB031R5ZZCC30	Column Mounted @ 6m 0° Tilt	1 x 3,200 Lumens 3,000K Colour Temp CRI70+	35
	C6	8	THORLUX Starbeam GR5 Roadway Optic SB197R5ZZCC30	Column Mounted @ 8m 5° Tilt	1 x 27,338 Lumens 3,000K Colour Temp CRI70+	197
	D1.B	1	THORLUX Starbeam GA2 Roadway Optic SB062A2ZZCC30	Column Mounted @ 6m 0° Tilt REAR SHEILD	1 x 8,000 Lumens 3,000K Colour Temp CRI70+	67
	D2	18	THORLUX Starbeam GA2 Roadway Optic SB062A2ZZCC30	Column Mounted @ 6m 0° Tilt	1 x 8,060 Lumens 3,000K Colour Temp CRI70+	62
	D3	3	THORLUX Starbeam GA2 Roadway Optic SB088A2ZZCC30	Column Mounted @ 8m 0° Tilt	1 x 12,320 Lumens 3,000K Colour Temp CRI70+	88
	D3.2	12	THORLUX Starbeam GA2 Roadway Optic SB088A2ZZCC30	Column Mounted @ 8m 0° Tilt	1 x 12,320 Lumens 3,000K Colour Temp CRI70+	176
	D4	13	THORLUX Starbeam GA2 Roadway Optic SB123A2ZZCC30	Column Mounted @ 6m 0° Tilt	1 x 17,435 Lumens 3,000K Colour Temp CRI70+	123
	D6	10	THORLUX Starbeam GA2 Area Optic SB197A2ZZCC730	Column Mounted @ 8m 0° Tilt	Column Mounted @ 8m 0° Tilt	197
	D6B	10	THORLUX Starbeam GA2 Area Optic SB197A2ZZCC730	Column Mounted @ 8m 0° Tilt REAR BAFFLE	Column Mounted @ 8m 0° Tilt	197
	D2.w	14	THORLUX Starbeam GA2 Area Optic SB062A2ZZCC730	Wall Mounted @ 6m 0° Tilt	1 x 8,060 Lumens 3,000K Colour Temp CRI70+	62
	D5.w	17	THORLUX Starbeam GA2 Area Optic SB161A2ZZCC730	Column Mounted @ 8m 0° Tilt	1 x 22,135 Lumens 3,000K Colour Temp CRI70+	161

POWER DENSITY STATISTICS

Name	# Luminaires	Total Watts
Power Density Zone # 1	205	17864.0 W

STATISTICS

Description	Symbol	Max	Min
Rhymney River @ 0m AFFL	+	1 lux	0 lux
Rhymney River @ 1m AFFL	+	1 lux	0 lux
Rhymney River @ 2m AFFL	+	0 lux	0 lux

STATISTICS

Description	Symbol	Avg.	Min	Min/Avg
Bus Drop Off & Round About [50/0.40]	+	50 lux	22 lux	0.44
Park & Ride [20/0.25]	+	22 lux	8 lux	0.36
Pedestrian Route [5/0.25]	+	1 lux	0 lux	0.00
Plot 1 [50/0.4]	+	51 lux	22 lux	0.43
Plot 2 [50/0.40]	+	52 lux	24 lux	0.46
Plot 3a/b/c/d [20/0.40]	+	22 lux	9 lux	0.41
Plot 4 Office [10/0.40]	+	18 lux	6 lux	0.33
Plot 4 Yard [20/0.40]	+	22 lux	10 lux	0.45
Plot 5 [20/0.40]	+	23 lux	11 lux	0.48
Plot 6a Yard [20/0.40]	+	27 lux	11 lux	0.41
Plot 6a/b Office [10/0.40]	+	16 lux	10 lux	0.63
Plot 6b Yard [20/0.40]	+	26 lux	11 lux	0.42
Plot 8 Yard [20/0.40]	+	33 lux	14 lux	0.42
Site Road - P Crossing [10/0.60]	+	104 lux	89 lux	0.86
Site Road (South) [15/0.40]	+	14 lux	6 lux	0.43

Client
CURTIS HALL
CARDIFF PARK & RIDE EAST

Architect
HENRY MEIN PARTNERSHIP
ARCHITECTS & INTERIOR DESIGNERS

Project Address
CARDIFF EAST PARK & RIDE

Drawing Title
EXTERNAL LIGHTING
PATHWAY LIGHTING @ 10% POWER

Hydrock KTA
ENGINEERING & ENVIRONMENTAL CONSULTANTS
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PLYMOUTH, DEVON, PL7 5JX.
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E-MAIL. general@kellytaylor.net

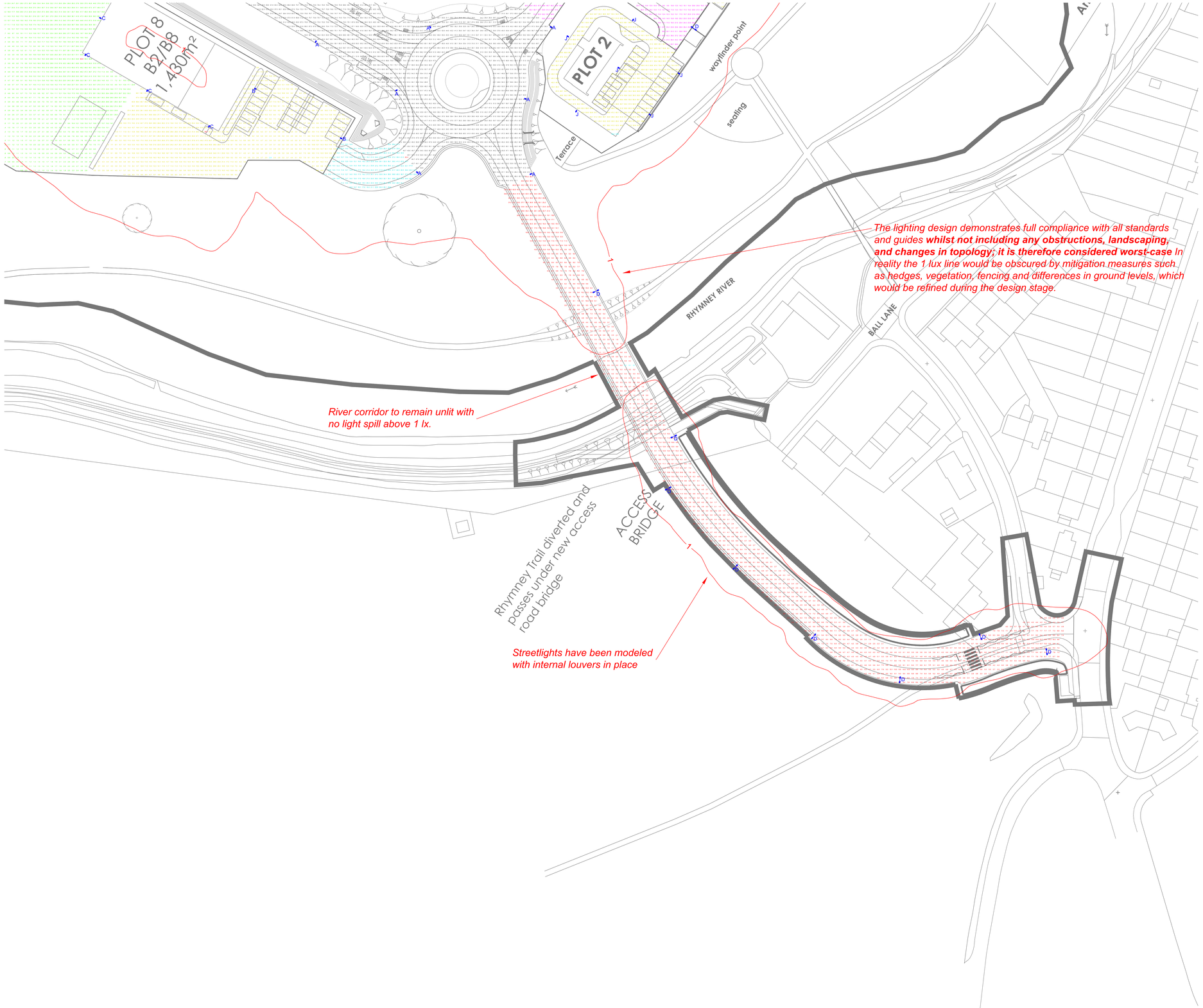
PLANNING

Drawn by	Checked by	Authorised by
LM	PRH	JDG

Scale	Size	Date
NTS	A0	OCT 2023

Drawing no.	Rev.
10341-EXT-102	P1

Drawing 6 - External Lighting SEC 3/3



All lanterns to be ordered with a lumen output 20% greater than shown below.
All Luminaires complete with CityTouch 35Lux SR node and 10 year service fee.

K — WT490C PSD L1200 1 xLED42S830 WB
1 lamp(s) per luminaire, 4000 initial lumens per lamp
Maintenance Factor = 0.800, watts per luminaire = 26
Outreach (from mounting axis to photometric center)= 0 mm
mounting height= 3 m
number locations= 9, number luminaires= 9

E BL — Luma Gen2 Medium BGP704 3000K DW50 BL2 80 LED 20klm
1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 8 m
number locations= 1, number luminaires= 1

J — Luma Gen2 Medium BGP704 3000K DW50 80 LED 20klm
1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 120
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
number locations= 12, number luminaires= 12

H — Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Twin Lantern
1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 600 mm
tilt angle= 5 deg
mounting height= 6 m
number locations= 28, number luminaires= 56

H — Luma Gen2 Micro BGP702 3000K DW50 20 LED 2.6klm
Single Lantern
1 lamp(s) per luminaire, 2600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 16
Outreach (from mounting axis to photometric center)= 400 mm
tilt angle= 5 deg
mounting height= 6 m
number locations= 3, number luminaires= 3

D — Luma Gen2 Mini BGP703 3000K DW50 40 LED 7.0klm
1 lamp(s) per luminaire, 3600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 41
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 6 m
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C — Clearflood Small BVP650 3000K OFAS2 20klm
1 lamp(s) per luminaire, 20000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 141
Outreach (from mounting axis to photometric center)= 400 mm
tilt angle= 25 deg
mounting height= 8 m
number locations= 15, number luminaires= 15

B — Luma Gen2 Mini BGP703 3000K DW50 40 LED 8.5klm
Twin Lanterns
1 lamp(s) per luminaire, 8500 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 600 mm
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Maintenance Factor = 1.000, watts per luminaire = 50
Outreach (from mounting axis to photometric center)= 400 mm
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1 lamp(s) per luminaire, 41000 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 246
Outreach (from mounting axis to photometric center)= 400 mm
mounting height= 10 m
number locations= 14, number luminaires= 14

Existing Twin Luma 1 3000K DN11 12.6klm
1 lamp(s) per luminaire, 12600 initial lumens per lamp
Maintenance Factor = 1.000, watts per luminaire = 0
Outreach (from mounting axis to photometric center)= 900 mm
mounting height= 10 m
number locations= 1, number luminaires= 2

Bus Drop off & Roundabout (50 Lux)
2213 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	59.9
Maximum	106.2
Minimum	24.1
Min/Avg(Uo)	0.402
Min/Max	0.227
Coef Var	0.257
UnifGrad	1.27

Residential Route (P3)
1484 points at z=0, sp 1.5m by 1.5m
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Average	7.5
Maximum	45.1
Minimum	0.1
Min/Avg(Uo)	0.013
Min/Max	0.002
Coef Var	0.947
UnifGrad	2.12

Service Yard Plot 4 (20 Lux)
3546 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	19.9
Maximum	146.3
Minimum	0.0
Min/Avg(Uo)	0.000
Min/Max	0.000
Coef Var	0.897
UnifGrad	N/A

Car Park Plot 5 (10 Lux)
1136 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.1
Maximum	29.8
Minimum	0.2
Min/Avg(Uo)	0.012
Min/Max	0.007
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303 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.0
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Minimum	6.2
Min/Avg(Uo)	0.387
Min/Max	0.288
Coef Var	0.234
UnifGrad	1.27

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1826 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.6
Maximum	58.7
Minimum	0.6
Min/Avg(Uo)	0.041
Min/Max	0.010
Coef Var	0.931
UnifGrad	1.79

Car Park Plot 7 (10 Lux)
5734 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	10.8
Maximum	54.1
Minimum	0.6
Min/Avg(Uo)	0.056
Min/Max	0.011
Coef Var	0.565
UnifGrad	1.62

Ind Estate Road (P3)
3053 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.7
Maximum	55.2
Minimum	1.9
Min/Avg(Uo)	0.162
Min/Max	0.034
Coef Var	0.679
UnifGrad	1.62

Car Park Plot 1 (50 Lux)
475 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	50.2
Maximum	78.3
Minimum	23.1
Min/Avg(Uo)	0.460
Min/Max	0.295
Coef Var	0.242
UnifGrad	1.31

Car Park Plot 2 (50 Lux)
363 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	57.5
Maximum	78.6
Minimum	33.8
Min/Avg(Uo)	0.588
Min/Max	0.430
Coef Var	0.162
UnifGrad	1.28

Car Park Plot 3 a/b/c (10 Lux)
919 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	16.4
Maximum	21.4
Minimum	7.7
Min/Avg(Uo)	0.469
Min/Max	0.360
Coef Var	0.169
UnifGrad	1.26

Car Park Plot 4 (10 Lux)
933 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	20.8
Maximum	56.1
Minimum	10.0
Min/Avg(Uo)	0.481
Min/Max	0.178
Coef Var	0.343
UnifGrad	1.30

Plot 8 Access (P3)
179 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	23.8
Maximum	44.3
Minimum	10.6
Min/Avg(Uo)	0.446
Min/Max	0.239
Coef Var	0.428
UnifGrad	1.22

Car Park Plot 8 (10 Lux)
899 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	14.5
Maximum	58.7
Minimum	2.4
Min/Avg(Uo)	0.165
Min/Max	0.041
Coef Var	0.753
UnifGrad	1.95

Service Yard Plot 8 (20 Lux)
1787 points at z=0, sp 1.5m by 1.5m
HORIZONTAL LUX

Average	11.6
Maximum	60.9
Minimum	0.2
Min/Avg(Uo)	0.017
Min/Max	0.003
Coef Var	1.128
UnifGrad	2.10

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WOODLAND MANAGEMENT PLAN
AT CARDIFF EAST PARK AND RIDE, EASTERN AVENUE, PENTWYN

Prepared for Curtis Hall Ltd

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Appendix 1 - Site Plan showing Ancient Semi Natural Woodland boundaries.
Appendix 2 - Plan showing Compartment boundaries.
Appendix 3 - Plan showing the extent of off-site dormice habitat creation.
Appendix 4 - Schedule of works and Timetable for Implementation.

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1. Terms of Reference

1.1 The proposed development site is centred on the existing park and ride and includes the construction of a new data centre and associated buildings. Also new access routes including a new bridge over the river Rhymney. The combined site extends to 23.0 ha in total. The plan encompasses an additional 4.5 ha of remedial tree and shrub planting both on site and on land provided by Cardiff Council to the west of the site on the opposite side of the river. In addition, a further 1.14 ha of new native woodland will be planted away from site when a suitable site or project is identified.

1.2 The clients' instructions were to produce a Woodland Management Plan to include two small areas of Ancient and Semi Natural Woodland (ASNW) and all other areas of woodland and open ground in and around the proposed development site. The plan sets out how the woodlands and open ground will be managed over a twenty-five-year period on an ecologically sound and sustainable basis. The focus of the plan is retaining and preserving important elements of the landscape and, over time, producing improved biodiversity and resilience. Also included in the plan are full details of proposed remedial planting to mitigate the loss of woodland and dormice habitat due to the development.

1.3 The Woodland Management Plan has been prepared in the light of the ecological report for the site and ecological surveys completed. The key finding of the ecological report is that the woodlands have a population of the legally protected dormice (*Muscardinus avellanarius*) and the woodland management and new planting proposed is geared to preserving and protecting their habitat and will conform to the Habitat Regulations. The proposals in respect of dormice habitat improvement will, however, be subject to obtaining a licence from Natural Resources Wales.

1.4 The woodland and open ground extend to 15.87 ha of which 7% (1.2 ha) is ASNW. A key element of the brief was to set out a system of management to preserve the integrity of the woodlands. Appendix 1 is a copy of a plan found on the Welsh Ancient Woodland Inventory website showing the extent of ancient woodland.

1.5 It has been calculated that the associated development, while respecting the ASNW, will involve the loss of approximately 1.14 ha of other woodland. In addition to the woodland lost the proposed development will take up a further 2.62 ha of ruderal vegetation. This represents a loss of dormice habitat these losses will be remediated by 0.45 ha of new planting on site and 4.81 ha of remedial tree and woody shrub planting on a nearby site to the southwest on the opposite side of the river on land made available by Cardiff Council. The area for planting was selected in consultation with the County Ecologist Justin Groves. A key aspect is that this new planting will be linked with the site by a ribbon of existing woodland supplemented by woody shrub planting along the river edge. Five dormice bridges, four over the river and one over the access road will strengthen this link. The new planting will include a high proportion of hazel in mixture with a range of other woody shrubs providing food for dormice. The lost of the 1.14 ha of woodland will be remediated by off site planting. In the local area.

1.6 In addition to the extensive remedial planting securing the future of the ASNW, improving the area for dormice and other wildlife, and preserving the local landscape character should be considered a positive biodiversity gain produced by the development. Without management the wildlife habitats across the area will become degraded by the spread of invasive species, reduction in ground flora, continued fly tipping and possibly the impact of ash dieback.

1.7 The plan conforms to the UK Forestry Standard which sets out guidelines for managing woodlands on a fully sustainable and environmentally responsible basis.

1.8 There are public footpaths across the site which run though the woodlands, including the Rhymney riverside trail.

1.9 In addition to providing management, the proposals will deal with the interface between the ASNW other woodland areas and the new development and how this can be softened and improved for wildlife. The plan will aim to retain existing open areas thus preserving valuable eco-tones between woodland and open ground.

2. Description of the Woodlands in the Landscape

2.1 The ASNW forms two separate blocks. One of the woodlands is to the north of the site near Eastern Ave, whilst the other site edges the Rhymney River close to the proposed new bridge. The ASNW woods to the north of the site are, in many places, surrounded by woodland which, while thought to be relatively recently naturally regenerated, are very similar in terms of tree size and species mix to the ASNW.

2.2 A 1945 aerial photograph of the site viewed on Google Earth Pro Historic Maps shows the two areas of ancient woodland largely surrounded by agricultural land and hedgerows. Subsequent aerial photographs of the site show the gradual spread of trees into the areas surrounding the woods which increased with the construction of the existing park and ride around 2011.

2.3 Based on research on the British Geological Survey Website, the soils in all three woods are derived from Devensian Glaciofluvial Sheet Deposits – Sand and Gravel. These superficial deposits formed up to 2 million years ago in the Quaternary Period. Soils in the surrounding areas are also derived from sand and gravel but with a higher clay and silt content.

2.4 The annual rainfall in the area, based on Met Office statistics, is 1,150 mm.

The Northern ASNW Woodland

2.5 The northern woodland near Eastern Avenue has some old hazel coppice stools, as shown in Figure 1, but is generally a mixed woodland with alder, sycamore, hawthorn, downy birch and goat willow. There are a small number of mature trees, but the majority are early mature and generally quite dense as shown in Figure 2. There are no veteran or ancient trees in the area, or trees with veteran characteristics.

Figure 1: Old hazel stools edging footpath.

Figure 2: Dense early mature trees with young sycamore natural re-generation.

2.6 There is a rich ground flora throughout the area with an understory of natural regeneration of mainly sycamore as shown in Figure 2 and Figure 3. If left unmanaged the understory and ground flora will become shaded out to the detriment of wildlife habitats including those for dormice.

2.7 At the southern end of the northern wood a power line runs west to east across the wood with an associated cleared easement of mainly hazel as shown in Figure 3.

Figure 3: The power line clearance at the southern end of the woodland

Figure 4: Naturally regenerated sycamore within dense cover

The Southern ASNW Woodland near the Rhymney River

2.8 The southern wood adjoining the Rhymney River is on both sides of the river as shown in Figure 5. The tree cover is a mixture of mature trees, some of which have been coppiced, as shown in Figure 6. Part of the woodland to the south of the river is outside the project red line but assumed to be in public ownership.

2.9 The ground flora includes wild garlic, lesser celandine, nettle, bramble and ivy. Tree cover is patchy with a number of glades. Species include silver birch (70%), ash (25%) and sycamore (5%). Most trees are early mature, around 30 years old with scattered older mature trees. There are a small number of hazel and alder coppice stools.

Figure 5: Woodland is on both sides of the Rhymney River linked by a foot bridge.

Figure 6: Old coppice stools and informal paths.

Other Woodland Areas (Not ASNW)

2.10 Beyond the ASNW boundaries are blocks of dense woodland with very similar characteristics. Figure 7 shows the edge of the ASNW to the left of the picture and the adjoining woodland to the right. The woodland outside the ancient woodland has a more species variation with less hazel coppice and more willow, ash and downy birch.

Figure 7: The transition between ASNW and younger naturally re- generated woodland.

Figure 8: Showing the Eco-tones (the graduation between different habitats) that are important for wildlife).

Open Ground within the Woodland Management Plan

2.11 Interspersed between the woodland are areas of open ground with grasses, bracken and some bramble as shown in Figure 8. These open areas provide important transitional habitats for wildlife and landscape interest.

3. The Long Term Vision

3.1 At the end of the 25-year plan period, it is expected that the woodland and open ground will be in the following condition:

a) The woodlands will be thinned to allow a stronger understory to develop, including hazel to be managed as coppice, and a range of native broadleaved trees.

b) The number of non-native species within the woodlands will be substantially reduced, and the regeneration from non-native trees and shrubs, particularly sycamore, will be controlled.

c) Traditional native hedges will strengthen the buffer between built structures and the ASNW and provide additional food sources and shelter for dormice and wild birds.

d) The variety of native species of trees and shrubs present will be increased, providing resilience against the future incidence of pests and diseases.

e) The existing open spaces and associated Eco-tones will be preserved by periodic mowing and raking of cuttings to avoid reversion to woodland.

f) Littering and fly tipping, particularly in Compartment 3 will be cleared up and a system of periodic litter control will be in place.

g) All existing public rights of way will be maintained in particular the footpath along the river Rhymney.

h) All compartments will have dead wood features both standing dead trees and dead wood at ground level.

i) Losses of dormice habitat will be remediated by on- and off-site planting of native trees and woody shrubs, predominately of hazel with scattered oak, totalling 5.29 ha which is more than double the area lost. The loss of 1.14 ha of woodland will be remediated by planting the same area of new native woodland off site.

4. Objects of Management

4.1 The objects of management, which have been carefully drafted to balance the public recreation and wildlife conservation aims, are as follows:

a) To increase the extent of coppice understory by thinning and enrichment planting with hazel.

b) To improve the biodiversity within the woodlands, with particular attention paid to dormice habitat by ensuring a varied range of cover with an increased proportion of hazel and other food plants.

c) To, as far as is practicable, remove exotic tree and shrub species and replace with a wider range of native species.

d) To preserve open spaces and existing eco-tones between woodland habitat as open ground.

e) To retain and, if necessary, create dead wood habitats both standing and on the ground.

f) To provide a buffer for the ancient woodland strengthened with native hedging.

g) To manage ash dieback within the woodland areas ensuring infected trees are removed or made safe before becoming dangerous and either planting or promoting natural regeneration of alternative native species.

h) To as far as is reasonably practicable remove and eradicate invasive plants such as Japanese knotweed and Himalayan balsam.

i) To improve access to compartment 2 with new paths to assist with conservation management.

j) To, as far as is reasonably practicable, ensure public safety from tree related hazards.

k) To promote community involvement in the conservation of the woodlands.

l) To take account of predicted climate change.

m) To provide appropriate mitigation in the form of new tree and shrub planting for both the loss of woodland and dormice habitat resulting from the development of part of the site.

5. Method of Working and General Prescriptions

5.1 The plan period will be twenty-five years from the date of commencement of the works. The plan years will run from 1st April until 31st March in the following year. Year 1 of the plan is therefore the period from 1st April 2022 to 31st March 2023.

5.2 The site has been divided into 12 compartments or management units as detailed below: -

Compartment No	Position	Area (ha)
1	Northern ASNW woodland Nr Eastern Ave	0.74
2*		0.00

3	Eastern ASNW Woodland Edging the River	0.46
4	North End of Site	0.99
5	North End of Site	0.28
6	North End of Site	0.32
7	Edging River Rhymney	1.86
8	North end of site	0.71
9	Surrounding ASNW Compartment1	2.63
10	Western edge of site near A48	0.52
11	Western edge of site near A48	1.33
12	Southern end of the site	3.33
13	Southern end of the site	2.14
	Total	**15.30**

*Note compartment 2 excluded as outside of development area

5.3 The woodlands will be managed on a continuous cover basis. Management of the trees during the plan period will aim to increase the number of native species by both natural regeneration and planting.

5.4 Natural regeneration will be the preferred method of increasing tree cover. However, this will be supplemented by enrichment planting with native broadleaved species. Where possible planting stock will be sourced from seed collected on site or in the local area. To achieve this, volunteers could be involved to collect seed and grow them on into planting stock. However, if plants from locally collected seed is unavailable, commercially produced planting stock will be used. All planted trees must have been grown in the UK for at least 12 months.

5.5 All planting of trees and woody shrubs will be maintained for a period of 5 years from the date of planting. All failures will be replaced with trees and shrubs of the same species, size, and quality. Weed growth will be controlled using mulch combined with hand cutting. stakes and tree guards will be maintained and replaced if required. Bracken is particularly vigorous and all pervasive and will require regular weed control at least two cuts during the growing season. Alternative non herbicide control methods include crushing with a roller.

5.6 In the event of drought conditions all planted trees and shrubs will be watered for as long as necessary to ensure survival, watering at least twice per week until conditions improve. All trees will be protected by tree shelters which often help survival in dry conditions by way of

the shelter they provide from drying winds and condensation running down the tubes. Mulching is specified which also helps retain moisture in the soil. For these reasons watering will only be carried out in extreme drought conditions.

6. Individual Compartment Prescriptions

Compartment 1

6.1 60% of the existing stools will be re-coppiced during the plan period, cutting 10% in year 1, 10% in year 5, 10% in year 10, 10% in Year 15, 10% in Year 20 and 10% in Year 25. Brash will be laid over the stools to protect against browsing by mammals. Cut stools will be monitored for browsing damage at least four times in the twelve months following coppicing. If browsing damage occurs, stools will be protected by temporary fencing such as Heras panels.

6.2 Areas of dense tree cover will be carefully selectively thinned to favour native species and allow light to penetrate the canopy and encourage natural regeneration on the woodland floor. No more than 1 in 3 trees will be removed in any one thinning operation. Within the plan period 50% of the area will be thinned. 25 areas of 290 m^2 will be thinned over the plan period, with one area completed per year. Non-native ground vegetation will be removed retaining any native regeneration. Enrichment planting will be carried out using 45 trees per area, with trees to be planted at approximately 2.5 m centres. The following table gives the enrichment planting species mix for one area of thinning:

Scientific name	**Common Name**	**Qty**
Acer campestre	Field maple	5
Betula pubescens	Downy birch	5
Carpinus betulus	Hornbeam	5
Corylus avellana	Hazel	15
Ilex aquifolium	Holly	5
Quercus petraea	Sessile oak	5
Tilia cordata	Small-leaved lime	5
	Total	**45**

6.3 A doubled staggered row of 140 m of hazel at 2.5 m centres will be established along the northern edge of the power line clearance as shown on Appendix 2. Ultimately this row will be managed as coppice. In addition, clumps of five hazel will be planted each side of the footpath leading to the A48 footbridge in the positions indicated on Appendix 2. The aim of this is to have pinch points to allow dormice crossing the path and make the foot path edge irregular in profile.

Compartment 3

6.4 Currently, access to this compartment is restricted by dense vegetation. It has wet ground conditions making any felling or coppicing operations difficult. No work is envisaged during the

plan period other than any essential maintenance to clear the river channel and deal with trees presenting a health and safety risk.

6.5 In year 1 the deposited rubbish will be cleared off the site and a system put in place for regular inspections followed by clearance on at least an annual basis.

6.6 Any ash infected with ash dieback will be felled and replaced on a one-for-one basis with a tree species from the list given for enrichment planting in Compartment 1.

Other Woodland (Compartments 4, 9 and 12)

6.7 Woodland outside the ASNW is similar in composition but generally very dense, to improve conditions for woodland flora this will be thinned. There are few coppice stools in this generally younger woodland so part of the enrichment planting will include 30% hazel intended as future coppice.

6.8 Areas of dense tree cover will be carefully selectively thinned to favour native species and allow light to penetrate the canopy and encourage natural regeneration on the woodland floor. No more than 1 in 5 trees will be removed in any one thinning operation. Within the plan period 50% of the area will be thinned. 25 areas of 1248 m^2 will be thinned over the plan period, with one area completed per year. Non-native ground vegetation will be removed retaining any native regeneration. Enrichment planting will be carried out using 200 trees per area, with trees to be planted at approximately 2.5 m centres. The following table gives the enrichment planting species mix for one area of thinning:

Scientific name	**Common Name**	**Qty**
Acer campestre	Field maple	40
Betula pubescens	Downy birch	20
Corylus avellana	Hazel	60
Ilex aquifolium	Holly	20
Prunus avium	Wild cherry	20
Quercus robur	Pedunculate oak	20
Tilia cordata	Small-leaved lime	20
	Total	**200**

Riparian Woodland Edging the River Compartment 7)

6.9 This compartment edges the river and there will be no thinning during the plan period other than any clearance needed for a new riverside path linking with other footpaths in the vicinity. The river edge will be kept deliberately dense with vegetation. As for the other compartments ash suffering from ash dieback will be removed if presenting a health and safety risk or blocking the river.

6.10 Any natural regeneration in the area will be managed and protected if required throughout the plan period.

Open Ground (Compartments 5, 8, 10 and 13)

6.11 The existing areas of open ground and existing woodland will be retained. To avoid the open ground becoming invaded with tree cover the areas will be mown annually cutting up to half the area in one year and the remaining vegetation the second year. The cut will be timed to avoid nesting birds and peak dormouse activity and will normally be carried out in September. Cut material will be raked off and piles as habitat for grass snakes.

6.12 The ground flora will be monitored to avoid either bramble or bracken becoming dominant if either of these species show signs of suppressing grass and other species additional control measures may become necessary.

7. Remedial Tree and Shrub Planting

7.1 To serve as a replacement for the loss of I.14 ha of woodland a new section of native mixed broadleaved woodland will be planted off site on land to be identified by Cardiff Council.

7.2 Trees be well grown bare root transplants 40 to 60 cm planted at approximate 3 m centres avoiding planting in lines. Trees to be protected by 1.2 m tree shelters supported by 1,5 m stakes 32 mm x 32 mm.

Scientific Name	**Common name**	**Qty**
Acer campestre	Field maple	50
Alnus glutinosa	Alder	50
Betula pubescens	Downy birch	50
Carpinus betulus	Hornbeam	165
Corylus avellana	Hazel	325
Ilex aquifolium	Holly	25
Quercus robur	Pedunculate oak	125
Populus tremula	Aspen	100
Quercus petraea	Sessile oak	129
Salix alba	White willow	50
Salix caprea	Goat Willow	50
Sambucus nigra	Elder	50
Sorbus aucuparia	Rowan	40
Tilia cordata	Small-leaved lime	25
Prunus avium	Wild cherry	10
Taxus baccata	Yew	10
	Total	**1254**

7.3 A suitable area has yet to be identified for this planting. However, its inclusion in the plan does constitute a commitment to either plant or fund the establishment of 1.14 ha of new native woodland planting a minimum of 1245 trees protected with suitable tree shelters when suitable area or project is found in the Cardiff area. If Cardiff Council are unable to provide a

suitable area, then local conservation organisations will be contacted to offer to plant or fund the requisite number of new trees. It is accepted this will be made a condition.

8. Dormice Habitat Restoration

8.1 The loss of dormice habitat totals 2.62 ha this will be remediated by establishing 4.81 ha of new dormouse habitat on land made available by Cardiff Council onto the southwest of the site on the opposite bank of the river. In addition, a further 0.45 ha will be planted in open areas on site.

8.2 The off-site planting area is shown on the site plan that forms Appendix 3. A narrow band of woody shrub planting, predominantly hazel, and existing trees will provide a link from the site to the new planting area. Just over half the site (2.29 Ha) consists of former sports pitches with mown grass. Beyond the pitches, near a small woodland area. Is a section of unmown grass with scattered naturally regenerating oak.

8.3 Before planting, grass will be screefed (Cut off at ground level with a sharp spade) on a radius of 500 cm from the planting hole.

8.4 The replanting area will have a 5 m managed ecotone along the edge. This will form a phased transition between woodland and grassland. Woodly re-growth will be prevented in this area.

8.5 The planting will involve planting 4620 bare rooted transplants (60 to 90 cm). Species will be planted in random mixture. However, large tree species (marked with an asterisk in the list below) will be spaced at 20 m centres with the hazel and other woody shrubs forming a matrix. Large tree species will be omitted in the narrow belt edging the new skateboard centre and a section to the south of the denser riverside woodland belt.

Offsite Dormice Habitat 4.81 ha
3 m centres, 4.5 ha 5921 plants

Scientific name	Common Name	Qty
Acer campestre	Field maple	100
*Carpinus betulus**	*Hornbeam*	85
Corylus avellana	Hazel	3750
Crataegus monogyna	Hawthorn	200
Cytisus scoparius	Broom	80
Lonicera periclymenum	Honeysuckle	105
*Quercus petraea**	Sessile oak	70
Prunus spinosa	Black thorn	85
*Quercus robur**	Pedunculate oak	120
Rosa cannina	Dog rose	120
Sambucus nigra	Elder	120
*Tilia cordata**	Small leafed Lime	78
Sorbus aucuparia	Rowan	120
Taxus baccata	Yew	18
Viburnum lantana	Wayfaring tree	120

Viburnum opulus	Guelder rose	120
	Total	**5291**

8.6 Plants will be protected by Shrub shelters (75cm) supported by treated softwood stakes (90 cm x 32 mm x 32mm). Each tree to be fitted with a biodegradable mulch mat (50 cm x 50 cm). The larger tree species shown above with an asterisk to be protected by Tree shelters (1.2 m) supported by a treated softwood stake (1.5 x 32 mm x 32 mm).

8.7 Any existing natural regeneration of oak will be retained and preserved and in the event of future browsing selected trees will be protected with Tree Shelters either 75 cm shrub shelters of 1.2m tree shelters as appropriate.

8.8 The on-site remedial planting will include seven areas of hazel and woody shrub planting in compartments 5, 8 and 13. As shown hatched in blue. Plants bare rooted transplants (60 to 90 cm). to be planted at 3 m centres in random mixture and protected as detailed in section 8.6.

Supplementary Dormice Habitat on Site 0.45 ha, 495 plants at 3 m centres,

Corylus avellana	Hazel	350
Crataegus monogyna	Hawthorn	10
Cytisus scoparius	Broom	15
Lonicera periclymenum	Honeysuckle	20
Rosa cannina	Dog rose	15
Sambucus nigra	Elder	15
Sorbus aucuparia	Rowan	15
Taxus baccata	Yew	5
Viburnum lantana	Wayfaring tree	15
Ilex aquifolium	Holly	15
Quercus robur	Pedunculate oak	5
Prunus spinosa	Blackthorn	15
	Total	**495**

9. Protecting the ASNW from the Impact of the Development

9.1 A 20 m buffer zone will be retained around the ancient woodlands. In most areas this buffer zone has existing tree cover. The 20 m zone will be edged with 865 m of native mixed hedging. where it meets the built environment. The aim of the planting will be two-fold; to prevent and discourage access to the ancient woodland and form an extended woodland fringe that will provide important woodland edge habitat for birds, dormice and other wildlife. Plants (40 to 60 cm) to be planted in random mixture in a double staggered row at 500 mm centres and protected by spiral shelters (60 cm x 50 mm) and a bamboo cane (90 cm). The table below gives the species and species mix for the hedge.

Scientific name	Common Name	% of Total
Corylus avellana	Hazel	20
Crataegus monogyna	Hawthorn	20
Ilex aquifolium	Holly	25
Prunus spinosa	Blackthorn	10
Rosa canina	Dog rose	15
Sambucus nigra	Elder	10

9.2 The hedges will be managed by annual trimming (outside of the bird nesting season) to form a hedge 2 to 3 m in height with a width of 1 to 2m. the aim will be to provide habitat for dormice but also to provide screening and a barrier to prevent easy pedestrian access into the ancient woodland.

9.3 In the case of Compartment 3, trees to the south of the river are beyond influencing distance of the development. In those areas of Compartment 3 on the development side the 20m buffer zone will be respected but hedging is not considered necessary or appropriate in this situation.

10. Protection

10.1 It is likely that deer will visit the area but given the size of the areas and level of disturbance, it seems unlikely that a resident population of the larger species will establish. High deer populations make coppicing and natural regeneration difficult due to browsing and have serious implications for ground flora. If deer browsing becomes a problem, tree guards will be extended to protect planted trees or, if necessary, temporary fencing will be erected around planting areas.

10.2 In the event of natural regeneration being browsed by deer, stems will be thinned to 2 m spacing and fitted with 1.2 m tree shelters. When coppicing, brash from the tops of trees will be piled over the stumps rather than chipped to protect against browsing. If rabbit numbers prevent any natural regeneration, selected areas may be protected by temporary rabbit proof netting or fencing where appropriate.

10.3 To prevent browsing damage by rabbits and hares, all planted trees will be fitted with individual tree shelters. A combination of 1.2 m tree shelters supported by treated timber stakes (1.2 m x 32 mm x 32 mm) and 75 cm shrub shelters supported by treated timber stakes (90 cm x 32 mm x 32 mm) will be used on hazel and woody shrubs.

10.4 Grey squirrels are present. This could have an impact on dormice food reserves and the number of nesting birds by predation on eggs and nestlings. Sycamore is particularly vulnerable to bark stripping. Control of squirrels in an urban setting on land accessible to the public is difficult and will only be attempted if monitoring shows that a high population is having a serious impact on wildlife and trees. Humane control measures will be used if needed.

10.5 The risk of fire in these fragmented woodlands is low. However, the woodlands and adjoining open areas will be open to the general public and a fire plan will be prepared and agreed with

the local fire service. This will include such matters as access, liaison with the owners, staff, water availability, erection of warning signs and measures to be taken in the event of extreme drought conditions. Any lop and top not used for dead wood piles and protecting coppice stools will be chipped or cleared to minimise the risk of fire. Given the high use of the site and range of vegetation this is considered an important measure to preserve the woodland and associated habitats, and it is expected that the production of a fire plan will be subject to a planning condition.

11. Managing the Risk of Tree Failure

11.1 To fulfill the owner's duty of care, a system of routine tree inspections will be established.

11.2 Trees within falling distance of any buildings, paths or public areas will have a professional survey in year 1 of the plan and then, subject to the condition of the trees at the time of the first inspection, at two-year intervals. Basic level checks should be carried out annually, these do not need to be completed by a professional arboriculturist, but a basic knowledge of trees would be preferable. Staff undertaking the basic surveys should, ideally, hold the LANTRA Basic Tree Inspection qualification. Results of the basic level survey will be retained along with those from the professional surveys of the site. Basic inspections should also be completed after extreme weather.

12. Measures to Accommodate Climate Change

12.1 Emissions of carbon due to human activity which exacerbate the greenhouse effect of the upper atmosphere is widely predicted to cause damaging variations in the climate.

12.2 The extent to which these potential problems will manifest themselves and over what timescale cannot be accurately predicted. The plan will have built in flexibility to, as far as is practicable, adapt to the predicted changes.

12.3 The plan will be reviewed at five-year intervals when any impacts of climate change adversely affecting progress towards the objectives can be considered and any necessary adjustments made.

12.4 Ways the plan has been designed to encompass the various aspects of climate change are described below:

Increased temperatures and drought

12.5 Some native species such as yew and beech are more susceptible to high temperatures and associated drought. Despite their usefulness as a shade bearing species, beech and yew will not be used in the enrichment planting in Compartment 1.

12.6 Natural regeneration will be encouraged to provide the widest possible genetic base which may contain individuals resistant to temperature changes.

Storms and gales

12.7 The selective thinning proposed within the plan will only cover 60% of the area and the small areas to be thinned will be distributed evenly over the area thus allowing wind to percolate through the woodlands and reduce the risk of wind damage. Increasing the quantity of young trees in the thinning areas will provide a pool of new trees in the event of extreme gale damage.

Potential for flooding

12.8 Compartments 3 and 7 edge the Rhymney River and seasonal flooding is likely to occur. However, this is unlikely to threaten the trees as these woods contain species such as alder and willow that are adapted to flooding. Retention of tree cover in the riparian zones will help control the flow of surface water off adjoining higher ground.

Changes to the carbon content of the atmosphere

12.9 Increased levels of carbon dioxide have been shown, by experiment, to boost tree growth. No specific measures have been adopted. Maintaining continuous tree cover will lock and store carbon and reduce the carbon footprint of the development.

Spread of pathogens

12.10 The northerly migration of pests and pathogens from continental Europe and other warmer regions of the world is perhaps the aspect of climate change that could have the most serious impact on the trees and woodlands. This problem is exacerbated by the world plant trade. The general health of the trees on site will be checked annually on a compartment-by-compartment basis by a trained and qualified forester or arboriculturist and the results will be recorded. Persons responsible for the day-to-day management will be trained to identify some of the exotic pests and pathogens that may extend their range into the area.

12.11 An example of a possible protection problem in the woods is ash dieback (*Hymenoscyphus fraxineus*). This is present in some of the ash on site and it is likely that trees will be killed or made unsafe by the disease. These will be removed and replanted with other broadleaved species.

13. Stakeholder Involvement

13.1 Local residents will be informed of the Management Plan and its long term aims and invited to participate in the woodland conservation and regeneration.

13.2 Any local groups interested in conserving the woodland will be invited to participate in management work. Possible partners in the management of the areas and coordinators of volunteers are TCV, RSPB, Woodland Trust and The Wildlife Trust of South and West Wales (Cardiff Group).

14. Ecological and Environmental Considerations

14.1 Given the protected status of dormice, a licence will be required for implementation of the plan from Natural Resources Wales. Full details of management and mitigation for dormice

habitat loss will be included in the licence application to be prepared by the project ecologists Delta Simmons Ltd. However, some of the main features are included below.

14.2 Timing of the planned works will avoid the main dormice mid-summer breeding season (June to August) in any year. The table in Figure 11 below gives the calendar of dormice activity.

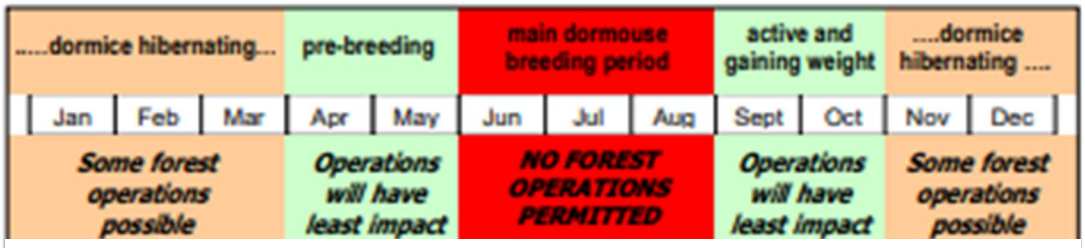


Figure 11: Taken from "Dormice Guidance Wales 2010"

14.3 The woodlands are relatively small and lend themselves to small scale working using hand tools and motor manual methods which will reduce disturbance, compaction of the soil and allow careful working. There will be opportunities for the involvement of volunteer groups.

14.4 As part of the remediation 50 boxes will be erected for dormice in the retained woodlands. These boxes will be sited, maintained, and monitored in line with the project ecologist's recommendations.

14.5 Five dormice bridges, four across the river linking with the new habitat planting and one across main access road will further improve connectivity and encourage colonisation of the new habitat created.

14.6 During construction 100 m of new 1 to 2m high earth bank will be constructed edging open ground cut tree stems and brash will be incorporated into the mound to form new wildlife habitat.

14.7 Otters have been noted in the Rhymney River and care will be taken to retain and enhance suitable habitat along the riverbank with additional understory species. Otters also protected and work will follow Natural Resources Wales Guidelines. No evidence was found of otters within the site on the initial survey, but a further survey will be completed prior to commencement. However, it is presumed they use the area, on occasions at least. The plan will keep and encourage dense cover along the riverbanks to provide suitable otter habitat.

14.8 Wherever possible, deadwood, both standing and fallen, will be retained to provide biodiversity. At least five standing dead trees will be retained in each compartment, subject to health and safety considerations. If no dead trees are present, five trees removed during thinning will be left as 4 to 5 m conservation stumps. In areas where there is a low health and safety risk ash that have been killed by ash dieback can be retained to achieve the dead wood target.

14.9 No pesticides or chemicals will be used and weed control will involve the use of biodegrade able mulch mats and woodchip mulch, some of which will be produced from thinning. The only exception is the control of invasive species particularly Japanese Knot weed where chemical control may be the only practical solution.

14.10 All tree and shrub guards will be bio gradable. When fitting, care will be taken to ensure any supporting stakes are driven below the rim of the tube to avoid access by mice and voles to the top of the tube. Tree and shrub shelters will be removed after five years and industrially composted in line with the manufacturer's recommendations. Mulch mats will be biodegradable made from organic material. All timber products used in the woodlands will be from renewable FSC certified sources.

14.11 Any chainsaws used will use bio chain oil. No fuel will be stored on site. Refuelling stations will be on a bunded pad outside the woodland area. Any powered machinery will carry a spillage control kit. Commercial battery powered chain saws or hand saws will be the preferred tools for thinning work.

15. Permissions and Constraints

15.1 As the entire area is the subject of a TPO, any tree work or felling will require permission from Cardiff Council. No work can be done until written permission has been obtained. It is hoped that the management plan will be accepted by the Council and an agreement made that any tree work or felling contained within the period of the plan will not require further permission or applications.

15.2 The proposed thinning will also require felling permission as required by the Felling Licence Regulations included in the 1967 Forestry Act (as amended). As the woods are the subject of a TPO, Natural Resources Wales will liaise with Cardiff Council regarding granting felling permission. It should be possible to obtain a 10-year felling licence based on submission of this plan.

15.3 While the work is designed to improve dormice habitat it still has the potential to impact the species and permission will be required from Natural Resources Wales.

16. Implementation and Method of Working

16.1 A schedule of works and timetable for implementation of the plan is set out in Appendix 4.

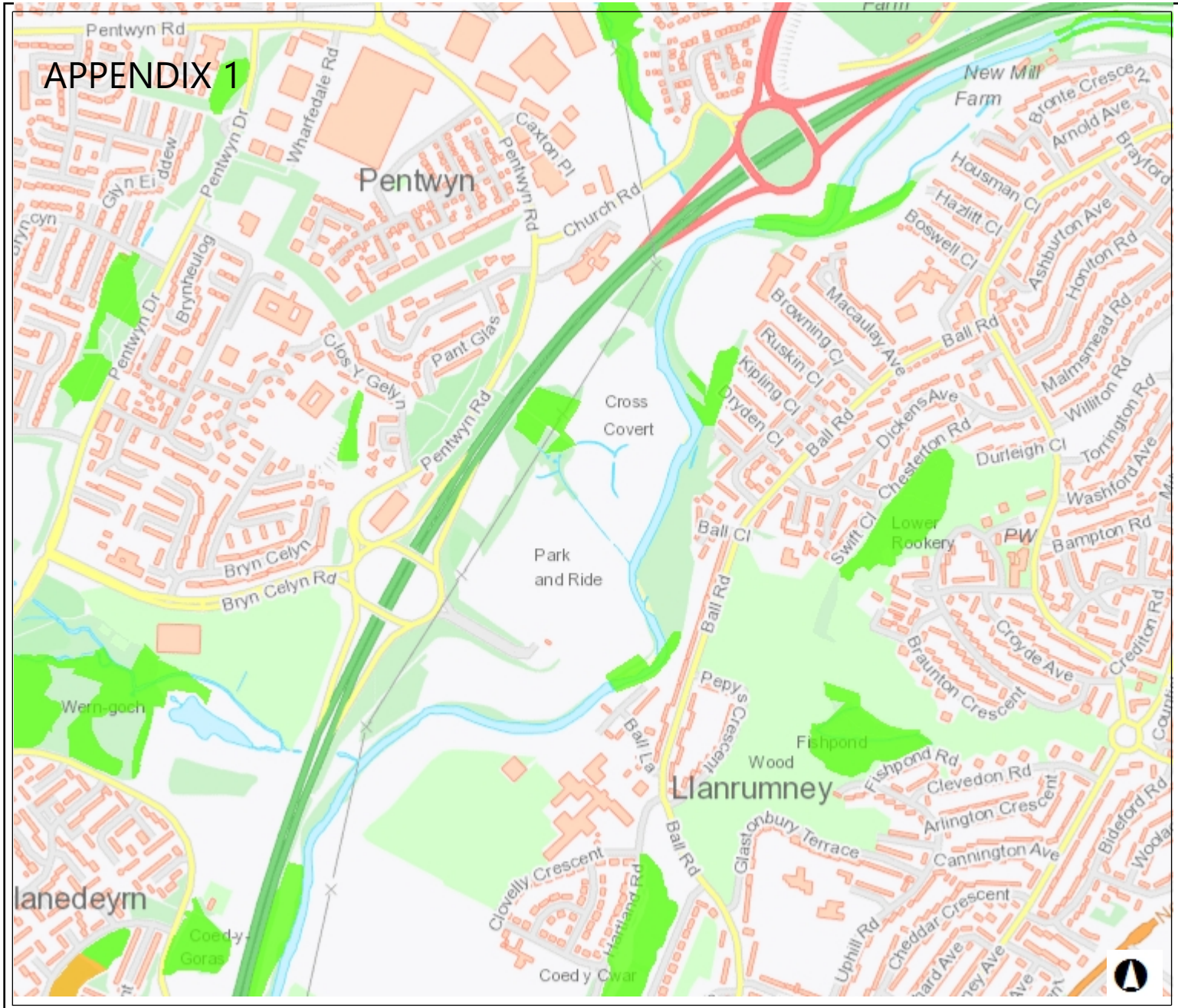
16.2 Implementing the plan including the remedial planting has been fully costed. Arrangements will be made for the long-term management of the woodland areas which will be funded by an annual charge on commercial tenants. The initial phase of work (Years 1 and 2) including all remedial planting will be undertaken using funds from the construction budget.

17. Monitoring Throughout the Plan Period

17.1 It will be necessary to monitor the impact of the implementing the proposals, in particular, to review the plan at five-year intervals to ensure the measures completed produce the planned habitat improvements. In particular assessing the impact on the dormice population. Any changes needed will be made in the next five-year period.

A. T. Coombes NDF, MSc (Arb & Urban For), PDArb (RFS), FICFor, MArborA
A.T. Coombes Associates Ltd
20 October 2025

APPENDIX 1



Cyfoeth Naturiol Cymru
Natural Resources Wales

Ancient Woodland Cardiff East Park and Ride

Allwedd / Map Key

Ancient Woodland Inventory 2021

- Ancient Semi Natural Woodland
- Ancient Woodland Site of Unknown Category
- Plantation on Ancient Woodland Site
- Restored Ancient Woodland Site

Graddfa / Scale 1: 10,000

Dyddiad / Date
08/04/2022

0.5 0 0.25 0.5

British_National_Grid Kilometers

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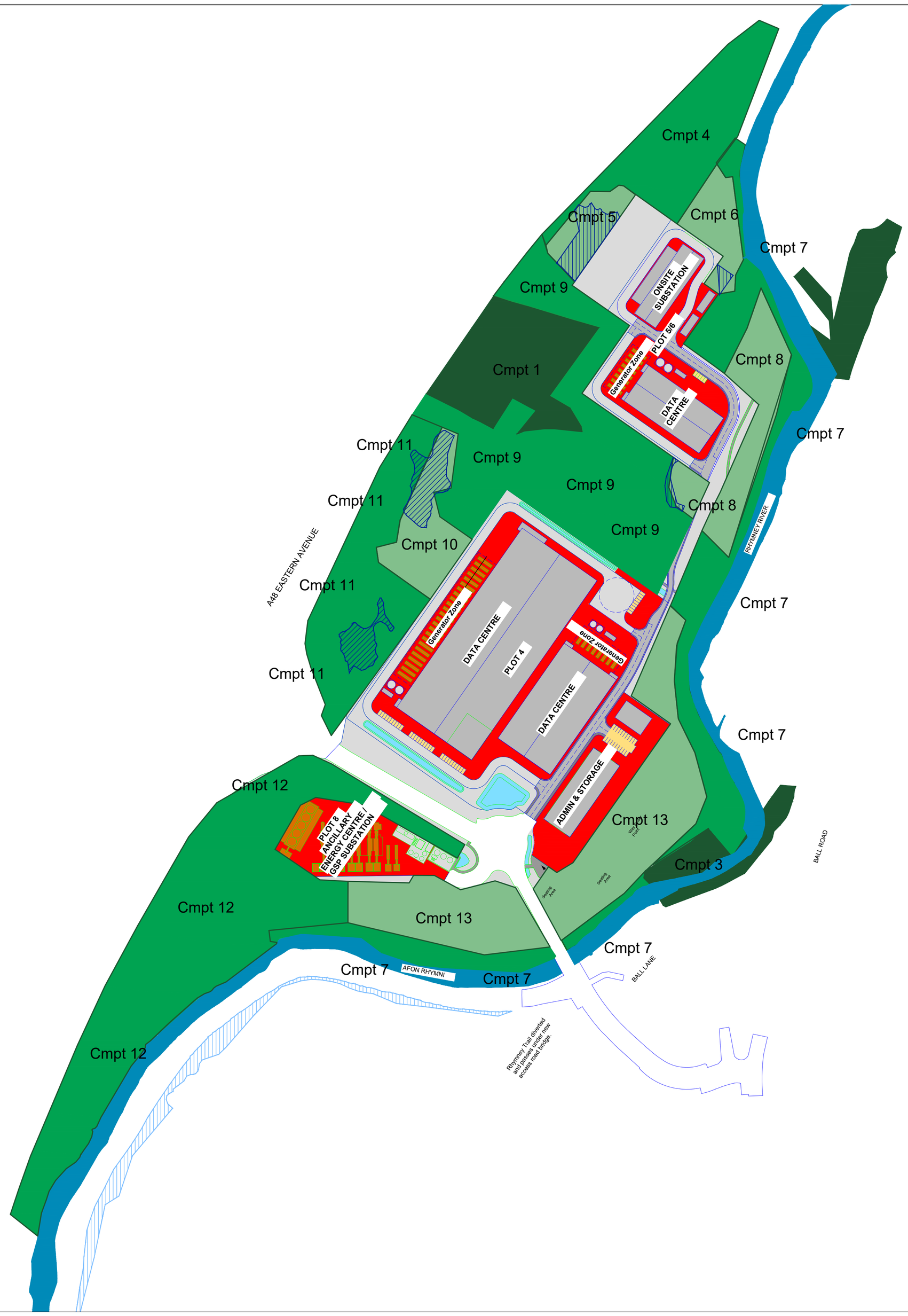

Drawing Title:

Appendix 2 - Woodland Management Plan

Site:

Cardiff Park and Ride East, Cardiff

Client:

Curtis Hall

NORTH

To Scale 1:2000 at A1

KEY

- Ancient Woodland
- Existing Woodland
- Open Space
- Proposed Path
- Proposed Hedging
- River Rhymney
- Proposed Hazel Planting

Drawn By: RG	Date: 20/10/2025

TREE SURVEYS

A. T. Coombes Associates Ltd

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Offsite Dormice Habitat 4.5 ha at 3 m centres 4950 plants

The planting will involve planting 4950 bare rooted transplants (60 to 90 cm) at 3 m spacing. Species will be planted in random mixture. However, large tree species (marked with an asterisk in the list below) will be spaced at 20 m centres with the hazel and other woody shrubs forming a matrix. Large tree species will be omitted in the narrow belt edging the new skateboard centre and a section to the south of the denser riverside woodland belt.

Scientific name	Common Name	Qty
Acer campestre	Field maple	75
*Carpinus betulus**	*Hornbeam*	55
Corylus avellana	Hazel	3700
Crataegus monogyna	Hawthorn	200
Cytisus scoparius	Broom	80
Lonicera periclymenum	Honeysuckle	75
*Quercus petraea**	Sessile oak	25
Prunus spinosa	Black thorn	75
*Quercus robur**	Pedunculate oak	100
Rosa cannina	Dog rose	100
Sambucus nigra	Elder	100
*Tilia cordata**	Small leafed Lime	55
Sorbus aucuparia	Rowan	100
Taxus baccata	Yew	10
Viburnum lantana	Wayfaring tree	100
Viburnum opulus	Guelder rose	100
Total		**4950**

Tree and Shrub Protection

Plants will be protected by Shrub shelters (75 cm) supported by treated softwood stakes (90 cm x 32 mm x 32 mm). Each tree to be fitted with a biodegradable mulch mat (50 cm x 50 cm). The larger tree species shown above with an asterisk to be protected by Tree shelters (1.2 m) supported by a treated softwood stake (1.5 x 32 mm x 32 mm).

Any existing natural regeneration of oak will be retained and preserved and in the event of future browsing selected trees will be protected with Tree Shelters either 75 cm shrub shelters of 1.2 m tree shelters as appropriate.

On-Site Supplementary Dormice Habitat on site 0.76 ha 836 plants

The planting will involve planting 836 bare rooted transplants (60 to 90 cm). Species will be planted in random mixture at 3 m spacing

Scientific name	Common Name	Qty
Corylus avellana	Hazel	600
Crataegus monogyna	Hawthorn	20
Cytisus scoparius	Broom	20
Lonicera periclymenum	Honeysuckle	26
Rosa cannina	Dog rose	25
Sambucus nigra	Elder	25
Sorbus aucuparia	Rowan	25
Taxus baccata	Yew	10
Viburnum lantana	Wayfaring tree	25
Ilex aquifolium	Holly	25
Quercus robur	Pedunculate oak	10
Prunus spinosa	Blackthorn	25
	Total	**836**

Tree and Shrub Protection

Plants will be protected by shrub shelters (75 cm) supported by treated softwood stakes (90 cm x 32 mm x 32 mm). Each tree to be fitted with a biodegradable mulch mat (50 cm x 50 cm)

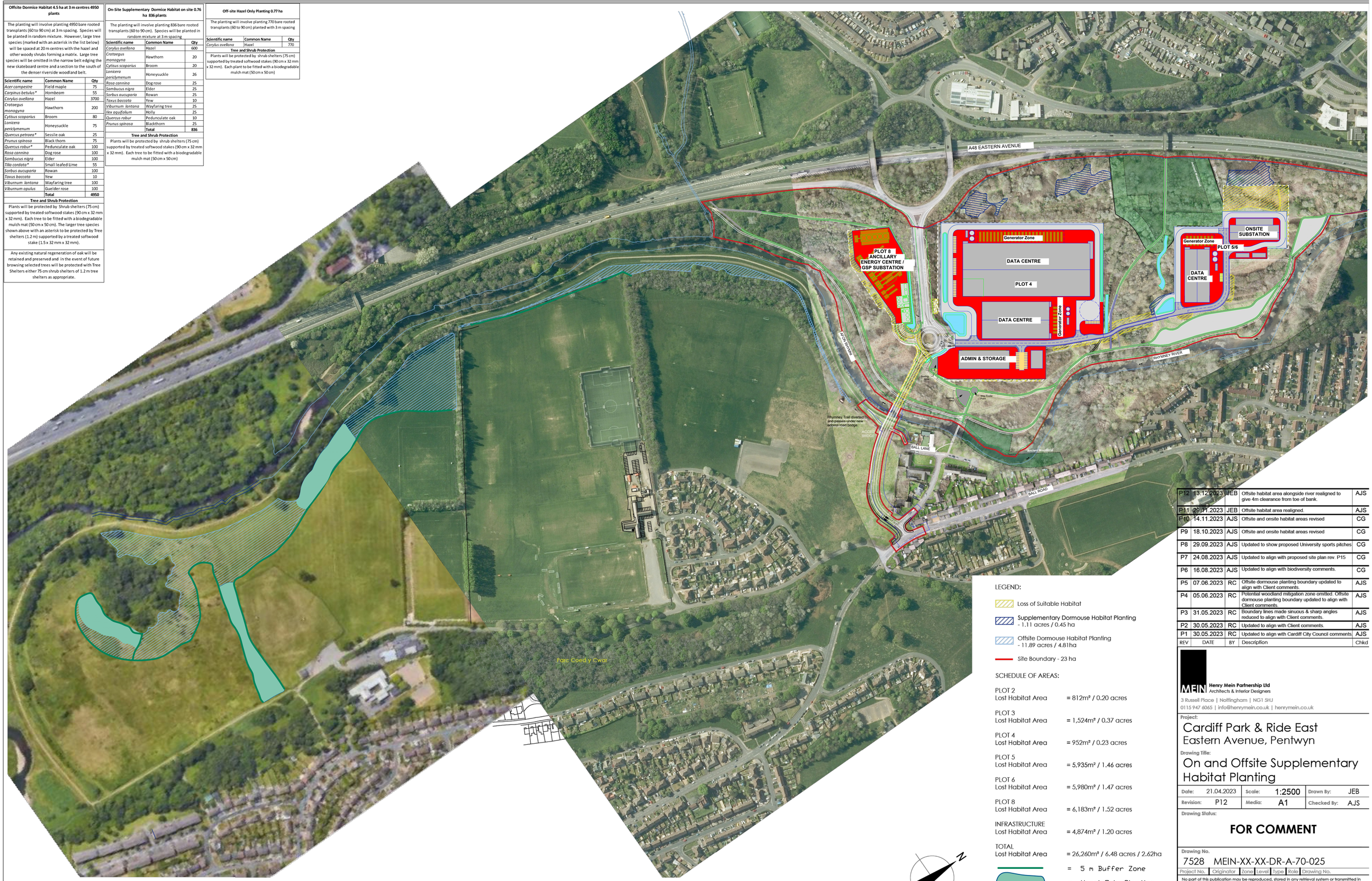
Off-site Hazel Only Planting 0.77 ha

The planting will involve planting 770 bare rooted transplants (60 to 90 cm) planted with 3 m spacing

Scientific name	Common Name	Qty
Corylus avellana	Hazel	770

Tree and Shrub Protection

Plants will be protected by shrub shelters (75 cm) supported by treated softwood stakes (90 cm x 32 mm x 32 mm). Each plant to be fitted with a biodegradable mulch mat (50 cm x 50 cm)



LEGEND:

- Loss of Suitable Habitat
- Supplementary Dormouse Habitat Planting - 1.11 acres / 0.45 ha
- Offsite Dormouse Habitat Planting - 11.89 acres / 4.81ha
- Site Boundary - 23 ha

SCHEDULE OF AREAS:

PLOT 2
Lost Habitat Area = 812m² / 0.20 acres

PLOT 3
Lost Habitat Area = 1,524m² / 0.37 acres

PLOT 4
Lost Habitat Area = 952m² / 0.23 acres

PLOT 5
Lost Habitat Area = 5,935m² / 1.46 acres

PLOT 6
Lost Habitat Area = 5,980m² / 1.47 acres

PLOT 8
Lost Habitat Area = 6,183m² / 1.52 acres

INFRASTRUCTURE
Lost Habitat Area = 4,874m² / 1.20 acres

TOTAL
Lost Habitat Area = 26,260m² / 6.48 acres / 2.62ha

= 5 m Buffer Zone

= Hazel Only Planting

50m SCALE 1:2500

N

Proposed Site Plan

scale 1:2500

REV	DATE	BY	Description	Chkd
P12	13.12.2023	JEB	Offsite habitat area alongside river realigned to give 4m clearance from toe of bank.	AJS
P11	29.11.2023	JEB	Offsite habitat area realigned.	AJS
P10	14.11.2023	AJS	Offsite and onsite habitat areas revised	CG
P9	18.10.2023	AJS	Offsite and onsite habitat areas revised	CG
P8	29.09.2023	AJS	Updated to show proposed University sports pitches	CG
P7	24.08.2023	AJS	Updated to align with proposed site plan rev. P15	CG
P6	16.08.2023	AJS	Updated to align with biodiversity comments.	CG
P5	07.06.2023	RC	Offsite dormouse planting boundary updated to align with Client comments.	AJS
P4	05.06.2023	RC	Potential woodland mitigation zone omitted. Offsite dormouse planting boundary updated to align with Client comments.	AJS
P3	31.05.2023	RC	Boundary lines made sinuous & sharp angles reduced to align with Client comments.	AJS
P2	30.05.2023	RC	Updated to align with Client comments.	AJS
P1	30.05.2023	RC	Updated to align with Cardiff City Council comments.	AJS

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Project:

Cardiff Park & Ride East
Eastern Avenue, Pentwyn

Drawing Title:

On and Offsite Supplementary Habitat Planting

Date:	21.04.2023	Scale:	1:2500	Drawn By:	JEB
Revision:	P12	Media:	A1	Checked By:	AJS

Drawing Status:

FOR COMMENT

Drawing No.

7528 MEIN-XX-XX-DR-A-70-025

Project No.	Originator	Zone	Level	Type	Role	Drawing No.

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item +	Cmpt No	Type	Description of Work	Qty	Unit	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	Yr21	Yr22	Yr23	Yr24	Yr25
1	1	ASNW	Native hedge planting	865	m	X																								
2	1	ASNW	Maintain hedge planting	1	Job		X	X	X	X	X																			
3		ASNW	Annual hedge trimming	865	m							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	1	ASNW	Undertake hazel enrichment planting	117	m	X																								
5	1	ASNW	Maintain enrichment planting	1	Job		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	1	ASNW	Undertake thinning	270	m2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	1	ASNW	Clear enrichment planting regeneration areas	1	Job	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	1	ASNW	Undertake enrichment planting	45	ech	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	1	ASNW	Maintain enrichment planting	1	Job		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	1	ASNW	Coppicing 10% stools	740	m2	X				X					X					X					X					X
11	1	ASNW	Pile brash over stools	1	md	x				X					X					X					X					X
19	3	ASNW	Form new ride/ path for access	1	Job	X																								
20	3	ASNW	Initial Clear deposited rubbish	1	Job	X																								
		ASNW	Annual rubbish clearance (contingency)	1	Job		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	7	Riparian	Informal path clearance	1	Job	x																								
			Undertake thinning	1	Job																									
22	4,9 and 12)	Other Woodland	Undertake thinning	1248	m2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	4,9 and 12)	Other Woodland	Clear enrichment planting/ regeneration areas	1	Job	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24		Other Woodland	Undertake enrichment planting	200	ech	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25		Other Woodland	Maintain enrichment planting	1	Job		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	5, 8, 10 and 13	Open Ground	Biannual mowing late summer (50% 6.2 ha per yr)	3.1	ha	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	5, 8, 10 and 14	Open Ground	Rake off cuttings and pile	3.1	ha	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
28	Remedial Habitat Creation	On site Domice habitat	Plant and guard hazel and woody shrubs	836	ech	X																								
29	Remedial Habitat Creation	On site Domice habitat	Maitain Dormice habitat planting	0.76	ha		X	X	X	X																				
30	Remedial Habitat Creation	Off site Dormice habitat	Plant and guard hazel and woody shrubs	4950	ech																									
31	Remedial Habitat Creation	Off site Dormice habitat	Maitain Dormice habitat planting	4950	ech		X	X	X	X																				
32	Replacement Woodland	Off site Dormice habitat	Plant trees and woody shrubs	1254	ech	X																								
33	Replacement Woodland	Off site Dormice habitat	Maintinance of trees and woody shrubs	1254			X	X	X	X																				
	All	Dormice Habitat	Erect Dormice boxes	50		X																								

item +	Cmpt No	Type	Description of Work	Qty	Unit	Yr1	Yr2	Yr3	Yr4	Yr5	Yr6	Yr7	Yr8	Yr9	Yr10	Yr11	Yr12	Yr13	Yr14	Yr15	Yr16	Yr17	Yr18	Yr19	Yr20	Yr21	Yr22	Yr23	Yr24	Yr25
	All	Dormice Habitat	Erect Dormice bridges	5		X	X																							
	All	Dormice Habitat	Form new earth bank with included timber and brash using spoil from the development	100	m		X																							
34	All		Remove or make safe ash infected with ash dieback (contingence)	1	Job	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
35	All		Undertake professional tree heath and safety survey	1	Job	X		X		X		X		X		X		X		X		X		X		X		X		X
36	All		Undertake basic tree health and safety survey	1	Job		X		X		X		X		X		X		X		X		X		X		X		X	
37	All		Maintain enrichment planting	1	Job		X	X	X	X	X																			
38	All		Path maintenance	1	Job	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
39	All		Eradicate Japanese knotweed and Himalayan balsam	1	Job	X	X	X	X	X																				
40	All		Manage natural regeneration	1	Job	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Invasive Non-Native Species Survey & Management Plan: Cardiff Park & Ride East

Issue 3:
10th October 2025
Ebsford Project: 5187

Ebsford
Environmental

BRIEF INTRODUCTION

Ebsford Environmental Ltd are a consulting and contracting partner specialising in the management of invasive species. We lead the way in delivering efficient, environmentally sustainable and cost-effective projects to a varied client base nationwide, with a unique service offered through a range of bespoke solutions. Our work is accredited by the two leading industry governing bodies: The Invasive Non-Native Specialist Association (INNSA) and the Property Care Association (PCA). We were the first UK company to obtain dual membership of these professional bodies that set standards and ensure projects are in line with current best practice. Our delivery of projects has been recognised in both 2019 and 2023 when we were awarded the Contractor of the Year Award by the Property Care Association and in 2020 receiving double Green Apple Awards for innovation and sustainability within the construction and innovation categories.

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Alex Brook	Head of Technical (Invasive Species)	10/10/2025
Mark Prout	Managing Director (Invasive Species)	23/07/2024

Revision	Purpose	Date
DRAFT Version 1	First Issue	13/02/2024
Version 2	Second Issue – integrating updated Woodland Management Plan	23/07/2024
Version 3	Updated with regards to southern section and bridges, and LA ecology comments.	08/10/2025

Abbreviation	Description
DEFRA	Department of Agriculture, Environment and Rural Affairs
HRA	Habitats Regulations Assessment
IAS (2019)	Invasive Alien Species (Enforcement & Permitting) Order 2019
INNS	Invasive Non-Native Species
ISMP	Invasive Species Management Plan
LNR	Local Nature Reserve
NNR	National Nature Reserve
NRW	Natural Resources Wales
Ramsar	Ramsar Convention on Wetlands of International Importance
SAC	Special Area of Conservation
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SSSI	Area of Special Scientific Interest
WCA (1985)	The Wildlife and Countryside Act 1981 (as amended)

Documents supplied	
7528-MEIN-XX-XX-DR-A-70-003_Proposed Site Plan_P19.pdf	On and offsite Habitat planting plan (Henry Mein Partnership Ltd)
20-0981.07_REP_Cardiff East Park and Ride_EcIA_23-12-15.pdf	Ecological Impact Assessment (Delta-Simons)
A T Coombes AIA at Cardiff Park and Ride East 13 December 2023.pdf	Arboricultural Impact Assessment (A.T. Coombes Associates Ltd)
WMP V20 21 06 2024.pdf	Woodland Management Plan (A.T. Coombes Associates Ltd)
89106.548885_REP_Cardiff-Park-and-Ride_DIA_2023-12-15.pdf	Hazel Dormouse Impact Assessment (Delta-Simons)
7528 70 101 Site Location Plan - Dormouse Bridges.pdf	Dormouse bridges drawing dated 13.11.2024. Supplied after V2 of the original ISMP.
Reptile Mitigation Strategy_Issue_Optimized.pdf	Dated 18.10.2024. Supplied after V2 of the original ISMP.

1. Background & Objectives

The following report follows on from the provisional Invasive Species Management Plan for Japanese knotweed and Himalayan balsam at Cardiff Park and Ride East. It is based on information from previous ecological surveys conducted by Delta-Simons (Dickson et al., 2023), a preliminary invasive non-native species survey conducted on a subsection of the site by Ebsford Environmental Ltd in 2021, and a more recent survey sitewide and beyond (June 2024).

As part of the planning application: *No development, including site clearance, shall commence until such time as an Invasive Non-Native Species Management Plan for the management of invasive non-native plant species that are extensive at the site, including measures to control, remove or provide long-term management of invasive non-native species both during construction and operation, has been submitted to and approved in writing by the local planning authority. The management plan shall follow the order of that below:*

- Provide an introduction to the site, and the proposed works.
- The legislation pertaining to the known invasive species (and others that could occur).
- Appropriate buffer zones to prevent further spread/containment, which includes where roots may occur.
- The methods / duration of control (this could be multiple years), supervision / operative involved, removal / disposal procedures (in line with waste transfer etc) should the species be impacted directly.
- Methods to stabilise the ground (erosion matting), prevent runoff and prevent secondary colonisation by invasive species following eradication.
- Biosecurity procedures for the decontamination of tools / machinery.

- Drawing/s indicating location and extent that will be subject to eradication and / or control.
- A review procedure to update maps of invasive non-native species extent and that of the whole document to relate to drawings and any additional invasive non-native species encountered.
- Monitoring duration.

2. Cardiff Park & Ride East and Proposed Works

2.1 The Site & Proposed Works

The 'site' is known as Cardiff Park & Ride East and is located near Eastern Avenue, Pentwyn, Cardiff CF23 8HH, Ordnance Survey National Grid Reference ST 2130 8099. The site covers a total area of 23 Ha (approx.), of which 5 Ha of hardstanding forms the park and ride in the centre with the surrounding habitats consisting of semi-improved grassland, scrub, broadleaved woodland, ancient woodland, and the Rhymney River with the latter two having the greatest ecological value (Spencer and Sanderson-Lewis, 2023).

The proposal is for the construction of commercial floorspace, associated drive-thru and car parking, and the re-provision of the park and ride, an additional bridge across the Rhymney River and new riverside path along the eastern edge of the site. The first phase will be the vegetation and tree clearance which will facilitate the construction phases.

2.2 Habitats and Protected Species

The Rhymney River is to the south of the site flowing from northeast to the southwest where it continues through Cardiff and flows into the Severn estuary. The Severn Estuary is a Ramsar site, a Special Area of Conservation (SAC) and a Special Protection Area (SPA) and is protected by The Habitats Directive (Council Directive 92/43/EEC, 1992) and a Habitats Regulations Assessment has been produced for the site (Spencer and Sanderson-Lewis, 2023). There are several other designations within the area but outside of the site and these include: Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR) and Site of Importance for Nature Conservation (SINC). The closest of these is the Rhymney River SINC adjacent to the site and both the Howardian LNR and the Rhymney River Section SSSI being within 2 km of the site.

Whilst several areas of woodland including the ancient woodland will be retained and enhanced as part of the development, other areas will need to be felled. This removal presents a risk to hazel dormice which are present, a European Protected Species (e.g. The Conservation of Habitats and Species Regulations., 2017). A Dormouse Impact Assessment has been produced (Spencer and Sanderson-Lewis, 2023) which together with the Woodland Management Plan (WMP) provides details of how this species will be protected and habitat enhanced during the development. In addition, five dormice bridges are to be constructed, one within the red line boundary and four outside and to the south of the site. Prior to any works being undertaken a European Protected Species Licence will be required.

Other protected and notable species present (and potentially present) include bats, otters, badgers, birds, and hedgehogs. Within the woodland there are roosting opportunities for bats and although most trees with bat roosting potential (BRP) will be retained there are several trees that require a pre-felling survey. With regards to birds the site does provide nesting habitat, with the risk period being spring through to late summer (i.e. March to September).

The reptile survey conducted by Delta Simons in 2021 did not cover the entire Site and excluded habitats potentially suitable for reptiles, which are currently proposed for removal. A subsequent survey conducted in 2024 has revealed the presence of reptiles and a mitigation strategy has been developed by WSP (Mott-Dowling et al., 2024).

3. Invasive Non-Native Species Present

The presence of Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*) is known from two previous surveys conducted by Delta-Simons (Dickson et al., 2023) and a preliminary invasive non-native species survey conducted by Ebsford Environmental Ltd in 2021.

A more extensive sitewide survey was conducted in June 2024 with additional offsite areas surveyed where the proposed dormouse bridges are to be installed, south of the site. Individual plants and patches were recorded in the field using QField linked to a GNSS receiver providing an accuracy to within 0.47m. Data recorded included: species and condition and was supplemented with geotagged photographs. During the survey, biosecurity measures followed the principals of check, clean and dry to prevent the spread of INNS.

In total there were 54 patches (or stands) of Japanese knotweed identified on or around the site, 30 onsite / or within 7 m of the site and 24 offsite covering a total area of 9760 m^2 (Table 1). The Himalayan balsam is scattered throughout the vegetated areas of the site, sometimes represented by a few individual plants but also frequently forming large dense patches. The locations of these are shown in Site Map 1, page 17.

Table 1: Summary of Japanese knotweed areas and number of stands / patches within the site, near the site, offsite and near the proposed dormouse bridges.

Location	Area M^2	No. of patches / stands
Onsite	1046.1	11
Onsite / Within 7m of site	2811.2	19
Offsite / Within 7m of dormouse bridge post	2497	5
Offsite (Over 7m from site)	3406.2	19
TOTAL	9760.5	54

There are both small and large, dense and scattered patches of Himalayan balsam within 17.68 Ha of the site. The majority of these are found within the woodland / woodland edges, the river edge and along the edges of shaded paths. The more open drier grass / scrub areas had lower occurrences of Himalayan balsam in the summer of 2024, but it should be noted that this species is highly mobile and can rapidly colonise new areas. It can also respond to seasonal differences in weather whereby it can be dominant in one place during e.g. a wet year and less abundant during dry years, and the dynamics of some riverine habitats may generate shifts in dominance or in other cases Himalayan balsam stands can more permanent (Jernelöv, 2017).

3.1.1 Survey Limitations

Where invasive non-native species have not been part of a previous management plan, and assuming that they have not been treated by a third party or otherwise disturbed then they should be visible during the growing season. However, where treatment of species such as Japanese knotweed has been undertaken, aboveground signs of their presence can be obscured. Although it may appear to be 'dead', deep-rooted dormant rhizome can sometimes be found, which if disturbed during construction and brought to the surface can form new plants.

Where sites are secured behind fencing or the vegetation is unmanaged and in the form of dense scrub, it is not always possible to access and survey these areas.

Himalayan balsam is an annual plant that spreads by seed that is produced every year which can spread onto previously unifested areas. In addition, climatic conditions can influence seed germination and plant growth which influences the emergence of an infestation from one year to the next.

3.1.2 About Japanese knotweed

Japanese knotweed refers to several species including Japanese knotweed (*Fallopia / Reynoutria japonica*); Giant knotweed (*F./R. sachalinensis*); and the hybrid Bohemian knotweed (*F./R* x *bohemica*). They are perennial plants that emerge in the spring from 'woody' structures called crowns that produce stems up to

two-metres tall with large heart-shaped leaves. The plants flower in late summer, dieback in the late autumn / early winter and regrow in the following spring. Although the plants flower, they spread primarily via rhizome (specialised storage roots) and underground shoots which branch out from the crown. These structures have nodes that can either be dormant or active and can form new shoots, stems, and crowns.

The first recorded introduction of Japanese knotweed to the UK was in 1850 via a shipment to the Royal Botanic Gardens, Kew (Bailey and Conolly, 2000). It became a popular garden ornamental plant particularly in large gardens and by the 20th Century it had started to spread into the wild. In their native range (east Asia) these knotweeds have coevolved with other plants (e.g., bamboo species), a range of insect and plant pests (natural enemies) and are some of the first species to recolonise after volcanic eruptions (Bailey et al., 2009). These survival characteristics together with the absence of specific natural enemies and other plant competitors have enabled it to become an invasive species in the UK.

The plant can spread by either being left unmanaged; the uncontrolled movement of soil containing rhizome; or erosion of riverbanks and being washed downstream, etc. Its highly invasive and persistent nature causes ecological harm (Lavoie, 2017) and in certain circumstances it can cause structural damage to the built environment (Fennell et al., 2018).

It is often stated that Japanese knotweed can grow up to 7 m from the parent plant, being referred to as the '7 m rule' which was used in the original Royal Institute of Chartered Surveyors guidance note (RICS, 2012). In recent years scientific research has revealed that the average horizontal underground rhizome extension is 1.4 m for small patches and 2.5 m for large patches, whilst the average depth is 1.64m. The '7 m rule' is derived from earlier guidance and is: '*not considered to be a statistically robust tool for estimating likely rhizome extension*' (Fennell et al., 2018). The new guidance (RICS, 2022) incorporates this and states: '3 m is a more appropriate distance measurement of typical spread of the root/rhizome network in the soil than the 7 m distance adopted for the original risk assessment.'

The final extent and potential volume of knotweed contaminated soils is often dependent on non-visible factors e.g.: 1) water table, which influences the depth; 2) subterranean structures that can divert the direction of rhizome growth e.g., pipes / culverts; and 3) past management / disturbance which can conceal the full extent of the knotweed.

3.1.3 About Himalayan balsam

Himalayan balsam *(Impatiens glandulifera)* is a highly invasive non-native plant which grows in habitats such as watercourses, around ponds, ditches, lakes and in damp woodland. It was introduced from the Himalayas in the 19th Century as a garden ornamental and has since become well-established in the UK and is known for its ability spread rapidly, and is one of the most widespread invasive non-native plants in Europe (Tanner and Gange, 2020)

Himalayan balsam is an annual plant germinating from seed in the spring, flowering in mid-summer (pale pink flowers) and producing 800-1500 seeds per plant after which it dies in the autumn. The seedpods are 'explosive' which scatter the seed up to 7 metres from the parent plant (Jones, 2022) where it remains in the soil until the following spring. Typically the seed inhabits the upper layers of most soils and sediments but in disturbed or cracked soils it can be found down to 0.5m (PCA, 2023).

The viability within the seedbank was previously estimated to be 18 months e.g., (Beerling and Perrins, 1993) but recent research demonstrates survival rates of more than four years at some sites (Saegesser et al., 2016) (Skálová et al., 2019). The seed can also survive being washed downstream during flooding events which enables it to spread from site to site (Čuda *et al.*, 2017).

4. Invasive Non-Native Species and Legislation

The Great Britain Invasive Non-Native Species (INNS) Strategy define INNS as species whose introduction and/or spread threaten biological diversity or have other unforeseen impacts . Although the strategy focuses on prevention and rapid response of species yet to arrive in GB, it recognises the need to manage the impacts of those species already established (GBNNSS, 2023). The state of natural resources report (SoNaRR) published by Natural Resources Wales (2021) highlights the impacts of INNS in Wales on the environment, wellbeing and economy (estimated to be £125 million per annum in 2010).

In the UK there are several statutory instruments regarding INNS with the aim of preventing the spread of these species. The following examples are not an exhaustive list but demonstrate the breadth of legislation with regards to species such as Japanese knotweed and Himalayan balsam.

1. Wildlife & Countryside Act (*WCA*, 1981) aims to prevent the spread of Schedule 9 species into the wild where they pose a threat to biodiversity and ecosystems. Section 14(2) states: if any person plants or otherwise causes to grow in the wild any plant which is included in Part II of Schedule 9, shall be guilty of an offence.

2. The Invasive Alien Species (Enforcement and Permitting) Order (*IAS*, 2019) allows for the enforcement, prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species.

3. Environmental Protection Act (*Environmental Protection Act*, 1990) contains several legal provisions concerning INNS. Any soil or waste containing propagules of a plant species listed in Schedule 9 that is to be removed from a site and are considered to have the potential to cause ecological harm are deemed "Controlled Waste" or "Directive Waste".

For the management of Himalayan balsam the current IAS guidance for 'when you do not need a licence' is: *You do not need a licence to carry out general management to eradicate a species, unless this involves any of the activities covered by this licence. For example, you would not need a licence to remove Himalayan balsam within a river catchment.*

It is not an offence under the act (*WCA*, 1981) to have Japanese knotweed on your land, but it is an offence to cause the spread. These plants and soils containing these species need to be managed accordingly e.g. Environment Agency Regulatory Position Statement (*RPS178*, n.d.). At the same time whilst a plant may stay on someone's land, if unmanaged it can spread onto a neighbour's land which could be seen as 'nuisance': https://www.charleslyndon.com/legal-services/japanese-knotweed/claims-network-rail/Environment.

For further information relating to Wales see the Natural Resources Wales links: Japanese knotweed: what you need to know and Invasive alien species regulations.

5. Japanese knotweed & Himalayan balsam buffers & risk zones

Invasive non-native species are not fixed entities but live organisms that grow and spread beyond their footprint by seed or vegetatively. As such buffer zones have been used to take account of this based on both the scientific literature and current industry best practice. These form the basis of the risk assessment to prioritise patches of INNS which is used in assessing the risks associated with Japanese knotweed and Himalayan balsam. The following outlines the buffer zones to be applied to the two species.

5.1 Japanese knotweed & Himalayan balsam buffers

As part of biosecurity, seven-metre buffer zones are often applied around patches of Japanese knotweed prior to the commencement of any activities within a development. These buffer zones are then cordoned off to stop the uncontrolled movement of machinery or staff within these patches. Although the horizontal rhizome extension is generally 2.5 m the seven-metre buffer provides a sufficient barrier to prevent the movement of

contaminated material within or offsite and is often used in large infrastructure projects such as HS2 (Prŷs-Jones, 2020).

There are dense and scattered patches of Himalayan balsam within 17.68 Ha of the site. There is a risk that if left unmanaged it will spread naturally both within and beyond the site. There is also a high risk that the seed could be spread via uncontrolled movement of machinery and soils during the construction phases of the project. Instead of applying seven-metre buffers to individual patches of Himalayan balsam based on where it was found, it would be better to regard any area other than the existing hardstanding (current park and ride and associated roads) as potentially contaminated. This should be a sufficient barrier to prevent the movement of contaminated material within or offsite if appropriate biosecurity is implemented (see Section 8).

5.2 Japanese knotweed & Himalayan balsam risk zones

An Invasive Species Management Plans (ISMP) should aim to manage the risk to the project, stakeholders, and wider environment. It should identify the species and quantity present and consider their individual modes of spread to identify species specific mitigation and management methods. This baseline information then forms a risk assessment considering the legal responsibilities of the client and how these risks can be controlled.

The management plan should be conducted regarding the protected species present (or potentially present) by liaising with the clients CIEEM ecologists. Only actions approved by the ecologists should be undertaken with the associated licences / supervision where required. The specific management methods will be detailed in the Construction Environmental Management Plan.

The information collected in the most recent survey (June 2024) was imported into a Geographical Information System (GIS). The buffers were then applied to the locations of the Japanese knotweed and overlain onto the maps supplied to identify where INNS occur in relation to the construction activities, woodland management and dormouse bridges. This forms the basis of a risk assessment and assigns a risk level to the INNS patches which are defined below, and aids in prioritising infestations such as the Japanese knotweed patches.

Level 1 Risk: The INNS are outside the red line boundary and more than 7m away from the site.

Level 2 Risk: Onsite or within 7m of the site. Construction (including new / diverted footpaths) and associated tree removal activities are unlikely to spread the INNS beyond their current footprint, and they are away from watercourses that could transport them offsite. Any INNS management is unlikely to impact on dormouse / reptile habitat BUT if left unmanaged the INNS may spread and elevate the risk level.

Level 3 Risk: Onsite or within 7m of the site. Construction (including new / diverted footpaths) and associated tree removal activities are unlikely spread the INNS beyond their current footprint, but they are next to watercourses that could transport them offsite. If the INNS are left unmanaged, they could either spread on/offsite via nearby watercourses or degrade dormouse habitat.

Level 4 Risk: Construction (including new / diverted footpaths) and / or associated tree removal activities are likely to spread the INNS beyond their current footprint either within or offsite. They also risk degrading dormouse / reptile habitat. Management is essential prior to any of the works.

6. Methods and duration of control: Japanese knotweed and Himalayan balsam

6.1 Eradication vs. long-term control

The Great Britain Invasive Non-Native Species (INNS) Strategy outlines the pathways, threats and impacts on both the built and natural environment and to the economy from INNS. It uses the three-stage hierarchical approach adopted by the Convention on Biological Diversity (CBD). The first two stages are preventing new high-risk species entering GB and detecting/rapidly responding to those species that have just entered GB by eradication. The third is those species that are already widely established such as floating pennywort,

Japanese knotweed, giant hogweed and Himalayan balsam where long-term management and control is required (GBNNSS, 2023).

Eradication is the complete and permanent removal of a population (Bomford and O'Brien, 1995) and refers to management measures that are applied to established INNS that remove all individuals from an area where there is no chance of re-introduction (Essl et al., 2020). However, for widely established species total eradication would require significant resources and expertise due to their abundance and ability to spread at a local, regional and national levels. At a local level a species may have been completely removed, 'eradicated', but there may be dormant propagules e.g. seed, rhizome etc. (Klimešová and Klimes, 2007; Panetta, 2015) or continued invasion from neighbouring areas (Robertson et al., 2019), of which common pathways include watercourses e.g. the Rhymney River and associated ditches. Therefore the complete eradication of a widely spread species is only possible / cost-effective in a minority of cases (GBNNSS, 2008) and is dependent on management activities within neighbouring land and at a catchment level, as noted in the current guidance for managing Himalayan balsam (PCA, 2023). As such the GB strategy now prioritise the long-term management of around 20 of the most impactful species where biocontrol is key in reducing their impact (GBNNSS, 2023).

The project offers the opportunity to eradicate certain patches / stands of Japanese knotweed that occur within the construction footprint e.g. by removal in their entirety via offsite disposal or onsite burial. The remaining patches / stands can be managed and controlled during the first five years of the project via e.g. herbicide management. Likewise, Himalayan balsam could be managed and controlled within the first 2-4 years but will require integrating into the 25-year woodland management plan on a long-term basis. Ongoing activities within the WMP would include monitoring for INNS and the subsequent implementation of proactive management if found e.g. pulling Himalayan balsam or reporting newly introduced Japanese knotweed and actioning control. It may also be possible to involve local groups interested in conserving the woodland, which could include TCV, RSPB, Woodland Trust and The Wildlife Trust of South and West Wales.

6.2 Japanese knotweed management

Methods to manage Japanese knotweed will take account of how the plant spreads i.e. via rhizome (a form of storage root) and subterranean lateral shoots which branch out from the crown. These structures have nodes that can either be dormant or active and can form new shoots, stems, and crowns. The methods to manage this species include: 1) complete excavation of contaminated soils with disposal at a licenced landfill; 2) complete excavation of contaminated soils and onsite burial to a required depth / contained within an impermeable root barrier; 3) partial excavation and protection of a newly built structure via an impermeable root barrier; and 4) long-term herbicidal management. Table 2 outlines the methods.

Table 2: Summary of management methods for Japanese knotweed. Guidance is from the Property Care Association Code of Practice for the Management of Japanese knotweed (PCA, 2024)

	Pros	Cons
Offsite removal	Removes the Japanese Knotweed from an undesirable area. No restrictions left onsite. Work can continue immediately after removal. Fast and efficient in comparison to other remediation methodology.	Relatively expensive. Disposal to landfill reduces valuable landfill capacity and needs haulage (which damages the environment and increases the risk of Japanese Knotweed spreading) and in the long term unsustainable. As such, disposal to landfill should only be considered as a last resort when Japanese Knotweed cannot be suitably disposed of on-site.
Onsite Burial	Does not require a set-aside area for control Work can continue immediately after burial Quickly removes the Japanese Knotweed from an undesirable area.	Restrictions remain on the site, e.g. in some areas deep excavation would interfere with buried material. The use of the area above the burial site is limited. Typically requires a large hole to receive material, so it may not be possible if soil is shallow, or water table is high. The appropriate environment agency must be notified. Plant material can accidentally be spread during movement.
Root Barrier	Can be installed to reduce the chance of horizontal and vertical rhizome spread. Can be used to protect structures, hard surfaces and services.	Tears in the membrane or poorly sealed seams between sheets can be exploited by growing rhizome. Can only be installed in favourable weather conditions. Identified on-site contaminants can cause issues to the integrity of the root barrier. Surface drainage and underground water tables can affect installation and ponding can occur, all of which must be taken into consideration.

	Work can continue immediately after installation in areas protected by membranes.	Installation of root barrier is a form of control/prevention to be used in conjunction with other methodology, as it is not in itself a method of eradication.
Screening	Can be cost effective in some scenarios. Less material needs to be disposed of to waste facility. The treated soil can be re-introduced on site as fill or in soft landscaping areas. Where soil needs to be imported, less is required from elsewhere to fill voids created by excavation. Environmentally beneficial as it reduces the amount of waste to landfill and potentially reduces the amount of herbicide required.	All screened soil is still classed as controlled waste Small fragments of Japanese Knotweed could still be present in the soil, leading to re-infestation. The screened soil needs to be accessible as part of the herbicide treatment and monitoring program. Follow up herbicide treatment or manual removal may be required. Plant material can be accidently spread during movement. Soil type and makeup dictate if it can be screened or not. A waste permit is required if using soil screening and/or a picking station.
Stockpiling	Cost effective. Site work can be undertaken while treatment takes place elsewhere on-site. Sustainable remediation. Removes Japanese Knotweed from sensitive or undesirable area. Relocated soils can be formed into a permanent landscaped feature.	Requires an area that can be left undisturbed for several years. Soil from a stockpile must remain on the site. The same cons as herbicide treatment apply in the stockpile area. Must be stored no longer than 12 months before treatment begins. The depth of the stockpiled soil must be appropriate for the future use of the soil. Rhizome buried deeper in a bund is less likely to express itself and may become dormant; as such, bunds should be created as shallow as is practical and should not exceed 0.5 m to allow regrowth. If larger bunds are created, it may be necessary to apply for planning permission.
Herbicide Management	Cost effective. Treatment can be carried out in situ, limiting the capacity for the plant to spread further. Quickly reduces the capacity of the plant to spread on/off site. Quickly reduces the capacity of the plant to impact built structures. Generally considered easier to administer than other methodology.	Can take many years to achieve acceptable results, especially where stands are mature. Management plans that rely solely on herbicide treatment must include at least 2 years of monitoring after all evidence of growth has ceased. Herbicide treatment alone should not be recommended on sites with future development plans that involve the soil being dug and disturbed. Construction works cannot continue in areas still containing the plant and the risks associated with landscaping treated soils, e.g. stimulating regrowth, should be made clear to the client and mitigated for. The use of some herbicides is restricted near waterbodies and desired vegetation. Some herbicides can persist in the soil. Herbicide remediation is considered a "control" method as there is likely to be deep rhizome in the ground that could become active in the soil if it's disturbed later. Effective control requires expert knowledge of herbicide treatment of Japanese Knotweed. If soil containing Japanese Knotweed propagules is to be removed from the site/property it must be classed as controlled waste, even it has been treated with herbicides. Depending on the type/amount of herbicide used, it is possible that the waste could also be classified as hazardous waste. Suboptimal herbicide treatment can induce temporary dormancy.

Management can be either by removing all the plant and the deep-rooted rhizome from a site to a licenced landfill, deep burial onsite or via herbicide. Onsite burial requires all the Japanese knotweed contaminated soils to be excavated and buried at 2m deep within an impermeable membrane or 5m deep without a membrane. This is unlikely to be suitable for the site due to the risk of contaminating groundwater and the nearby watercourse.

Complete removal is often used when Japanese knotweed is within the construction footprint, resulting in the area being free of this invasive species. Herbicide management tends to be used where no construction is planned but management is still required to prevent it from spreading on or offsite. These methods vary in their costs with complete excavation and disposal at a licenced landfill being the most expensive versus herbicide management being generally the least expensive.

The successful application of herbicides needs to take account of the different seasonal aspects of the plant. In the spring the net flow of resources from the rhizome is used for new growth, and by late summer the flow of resources is back into the rhizome prior to leaf fall in the autumn. The late summer growth period is key to successful management of Japanese knotweed whereby a systemic herbicide is transported through the vascular system into the rhizome (Jones et. al., 2018). Continued treatment over three years (plus two monitoring) is necessary due the extensive deep-rooted rhizome network and dormant nodes (PCA, 2024).

The recommended remediation / management for the Japanese knotweed patches are outlined below and shown in

Table 3, for detailed view see Section 16 INNS Risk Levels:

- Table 4: Risk levels assigned to patches of Japanese knotweed on and offsite.
- Table 5: Risk levels assigned to patches of Himalayan balsam on and offsite.

Table 3: Summary table of Japanese knotweed patches, location, risk level and management options. For detailed view see section 16 INNS Risk Levels.

ID	Location	Area M²	Risk Level	Management Option
Jk01, Jk03, Jk05, Jk13.	Onsite / Within 7m of site	436	L2	Biosecurity, 5 Year Herbicide ISMP
Jk06, Jk07, Jk11, Jk12, Jk14, Jk19, Jk24, Jk28, Jk29, Jk32, Jk33, Jk36, Jk37, Jk38, Jk39.	Onsite	2580	L3	Biosecurity, 5 Year Herbicide ISMP
Jk10, Jk15, Jk16, Jk17, Jk18, Jk21, Jk22, Jk34, Jk35.	Onsite	246	L4	Biosecurity, Offsite / Burial Onsite
Jk23, 26, 30.		689		
Jk40, 41, 45, 53, 54.	Offsite / Within 7m of dormouse bridge post	2497	L4	Biosecurity, ECoW during works.

6.2.1 Proposed Management Japanese knotweed – Risk Level 1

The site is vulnerable to the reintroduction of Japanese knotweed from upstream infestations. These infestations are beyond the scope of this management plan but would require management at a catchment level to reduce the risk to the site. Without this catchment level approach, the plant is likely to be reintroduced and thus the goal of total and permanent eradication is uncertain.

An alternative approach is to notify neighbouring landowners, whereby they may instigate management measures. At the same time the 25-year WMP does allow for the monitoring of the site where new introductions could be detected and responded to.

6.2.2 Proposed Management Japanese knotweed – Risk Level 2 and 3

There are four patches of Japanese knotweed within risk level 2. Three of these (Jk01, 03, and 05, 410 m^2) are outside of the site but within seven metres of the current red line boundary. The responsibility for these is with the neighbouring land owner who should be notified of the knotweed and its potential to encroach onto the site. The fourth patch is inside the site (Jk13, 26m^2) but is outside the construction footprint, the new / diverted footpaths area and is away from water. Given that this is unlikely to be disturbed, the patch will be managed using a systemic herbicide over a five-year period.

Within the site there are fifteen level three knotweed patches covering an area 2,580 m^2. These are away from the construction activities but risk being spread offsite via the river. These will be managed using a systemic herbicide over a five-year period.

The current recommendations for herbicidal management of Japanese knotweed using a glyphosate based product is for late season treatment over three years followed by two years of monitoring (e.g. PCA, 2018; Jones et al., 2018). Given the extent of the infestations, it is likely that two to three visits per year will be required to capture all growth. Whilst this will control the knotweed it is possible for dormant live rhizome to remain deep within the soil and disturbance of these areas should be avoided during and after completion of treatment.

Invasive Non-Native Species will be managed in accordance with current best practice as outlined by the Property Care Association (PCA). The application of herbicides will be reviewed by a BASIS qualified person who will consider The Plant Protection Products (Sustainable Use) Regulations, 2012, and all applications will

be undertaken by qualified staff (e.g. NPTC PA1 and PA6AW), a requirement of The Control of Pesticides Regulations, 1986).

6.2.3 Proposed Management Japanese knotweed – Risk Level 4 – construction footprint

There are three patches of Japanese knotweed within the site that are risk level 4 due to the proximity to the new / diverted footpaths and the river (Jk23, Jk26 and Jk30, 689m^2). As there is an exclusion zone for excavation works near the river then these will be managed using a systemic herbicide over a five-year period. Any works upgrading the footpaths will require a watching brief by an invasive species specialist to ensure that the plants are not spread and that biosecurity is maintained.

Jk06 was originally classified as a level 4 risk due to its proximity to the construction footprint, a yard to the rear of Plot 6b. However, this has been reduced to a level 3 as the yard will no longer be constructed, and the knotweed will be over seven metres from the construction footprint. This will be managed using a systemic herbicide over a five-year period

The remaining nine knotweed patches are either within the construction footprint or within the new diverted footpaths. These total an area of 246 m^2 and will require excavation and offsite disposal to a licenced landfill. The estimated volume of these (Jk10, Jk15, Jk16, Jk17, Jk18, Jk21, Jk22, Jk34, Jk35) 500 m^3 or 50 x eight-wheel tippers. Prior to excavation the soils from the INNS patches will be tested for contaminants which is a pre-requisite for acceptance for disposal at a licenced landfill.

Excavations will be conducted by an invasive species specialist adhering to current codes of practice (e.g. PCA / INNSA) and legislation e.g. The Waste Management Licensing Regulations, 1994. The resulting material will then be removed offsite by an approved waste carrier to a licenced landfill.

6.2.4 Dormouse Bridge & Biosecurity Management - Japanese knotweed – Risk Level 4

Apart from the dormouse bridge within the current park and ride, the remaining bridges to be constructed are to south of the site application red line boundary. Four of the bridges are near both Himalayan balsam and Japanese knotweed.

- An invasive species specialist (ECoW) will liaise with the project team to ensure that biosecurity measures are in place prior and during construction of the bridges (see Section 8).
- Biosecurity measures will include track mats to prohibit vehicle contact with the ground when erecting the bridges.
- Any equipment e.g. tools, boots that come into contact with contaminated soils will be cleaned to prevent the spread of INNS.
- After the works the landowner should implement management / control of the remaining INNS.

6.3 Himalayan balsam management

Himalayan balsam is a wide spread species of concern within the site and is listed both within the Wildlife & Countryside Act 1981 (as amended) and the Invasive Aline Species (Enforcement & Permitting) Order 2019. The most recent legislation allows for the enforcement, prevention and management of invasive alien plant and animal species in England and Wales and lists balsam as widely spread. If a listed plant is already growing on your land, including estates open to the public, then in the view of the Defra, the plants are not considered to be intentionally kept or cultivated and is therefore not deemed an offence. However, you cannot intentionally plant listed species on your land, or intentionally cause existing listed plants to spread ("Invasive non-native (alien) plant species," 2022).

There are several methods to manage Himalayan balsam, including pulling, cutting, mowing, grazing, herbicide control, and excavation. If there is insufficient time to allow the seed bank to become exhausted, contaminated soil can be buried or removed by excavation. Arisings should be retained onsite (e.g. bunded or buried) whenever possible and only disposed of offsite as a last resort. This is particularly true given the potential volumes of contaminated soils within the site which would be environmentally unsound and expensive.

To control Himalayan balsam in situ it must be prevented from producing seeds until the seed bank is exhausted (i.e. no viable seeds remain in the soil). The existing plants can be killed relatively quickly by hand pulling, cutting the stem below the first node or by applying herbicide. The timing for management is ideally May to July and prior to seed production (generally late summer onwards) and should be conducted at least twice per year. As the seed bank is short lived (18 months to 4 years), two to four years of control action (taking place before plants set seed) should eradicate the species providing there are no infestations on neighbouring land or upstream (see 6.1).

It is therefore recommended that a management plan is implemented to control the balsam which could be achieved through either physical management such as hand pulling or via a suitable herbicide. These two options are both recognised as effective methods (PCA, 2023; RINSE, 2018). Physical management such as hand pulling has several benefits: 1) no herbicides are used in a public space or the watercourse; 2) the plants are immediately controlled; and 3) there are no non-target effects on the native vegetation from herbicide use; 4) can be achieved via supervised volunteer groups.

Generally, monitoring with follow up treatment, when necessary, should be maintained until at least four years has passed with no Himalayan Balsam growth (PCA, 2023). However, given the sporadic nature of this INNS onsite and both up and down stream, this highly effective method will take several years (PCA, 2023) but could be integrated into the activities within the 25-year WMP, a long-term control and monitoring regime.

6.4 Managing Himalayan balsam.

Managing this species requires targeting the plant in the spring / summer to prevent seed production together with continued management over several years to deplete the seedbank. The viability within the seedbank was previously estimated to be 18 months e.g., (Beerling and Perrins, 1993) but recent research demonstrates survival rates of more than four years at some sites (Saegesser et al., 2016; Skálová et al., 2019).

There is potentially 2 Ha of contaminated soils within the construction footprint, assuming the Himalayan balsam seed is within the top 5 cm of soil then this would potentially be 1000 m^3. Given the large volumes and costs, associated with disposal to a licenced landfill consideration should be given to keeping this material onsite. This will then be incorporated into a sitewide balsam management plan.

6.4.1 Monitoring & Management: Himalayan balsam

The areas within the site where earthworks are not required will be managed throughout the project. The management plan to control the balsam will be achieved through either physical management via hand pulling / cutting or via a suitable herbicide, to be decided by terrain and accessibility. These two options are both recognised as effective methods (see PCA, 2019; RINSE, 2018).

Given the presence of native vegetation and dormouse / reptile habitat plus the scale of the current infestation it is recommend that cutting below the first node is used throughout the construction zone and beyond. This has several benefits: 1) no herbicides are used in a public / work space or the watercourses; 2) the plants are immediately controlled; and 3) non-target effects to native vegetation are limited to cutting and not complete destruction from herbicide use.

Himalayan balsam will require the first management in late spring / early summer, just as the first few plants start to flower (several weeks before primary seed production). Some plants may survive and develop flowers

later in the season but these will be managed on the second visit that coincides with the first Japanese knotweed management visit. This will proceed for four years in total.

	Spring	Summer		Autumn		Winter		Duration
Himalayan balsam	Primary Cut/Pull	Primary Cut/Pull	Monitor Cut/Pull if reqd.	Monitor Cut/Pull if reqd.				Yr 1 – 4
Japanese knotweed			Spray	Spray		Clear dead stems	Clear dead stems	Yr 1 – 5

6.4.2 Post Project Management

On completion of the project, it is recommended that an INNS monitoring, and management plan is initiated particularly for Himalayan balsam. The objective here is to capture any INNS that may have evaded biosecurity measures. This should follow the methods outlined previously i.e., cutting below the first node.

7. Methods to stabilise the ground (erosion matting), prevent runoff and prevent secondary colonisation by invasive species following eradication.

The management of non-native invasive plants such as Japanese Knotweed and Himalayan balsam which usually involve either herbicide treatment or excavation or a combination of both, typically results in exposed ground / bare soil. The areas where Japanese knotweed is to be removed by excavation are within the construction footprint and runoff / erosion will therefore not be an issue.

The most appropriate herbicide used for the control of Japanese knotweed are glyphosate based and are not selective. These areas are likely to generate bare patches of exposed soil for the first three years. Therefore, revegetation will be incorporated into the Invasive Species Management Plan to avoid:

- erosion, especially along streams and rivers
- unsightly areas, particularly in public areas
- undesirable plants moving in, especially other invasive species, and
- a failure to restore biodiversity

Figure 1: Example of revegetation.

Next to all the INNS areas are native plant communities and their associated seedbank. During the initial phases of the management plan, establishment of these potential native plants will be limited due to the application of herbicide particularly in years one and two. By the end of year three it is anticipated that the INNS areas will start to naturally recolonise with native plants.

During the management plan the areas will be monitored for native recolonisation / revegetation. Where areas are identified as not recovering then either erosion matting can be applied to sloped areas with hydroseeding, or just hydroseeding as appropriate.

The erosion mats are often made of biodegradable material (e.g. coir) and can be hydroseeded with native species or left to be colonised by native species from the surrounding areas. They are designed so that seeds

germinate, and the plants grow through the mat and as the fabric ages it decomposes and is replaced by established vegetation. The mats can be expensive but highly effective and sometimes the only choice for steep slopes that need long-term protection (PCA, 2020). An example of this has been carried out by the Canal & Rivers Trust: Eradicating Himalayan balsam in new ways.

8. Biosecurity procedures for the decontamination of tools and machinery

Biosecurity measures will be implemented to control the spread of the INNS on and off site and will be in keeping with the GB invasive non-native species framework strategy (GBNNSS, 2023) adopting the principles of Check, Clean and Dry but tailored to the specific species, e.g. Himalayan balsam and Japanese knotweed.

The existing hardstanding areas forming the park and roads are currently free of INNS. It is the vegetated areas within the red line boundary including areas where woodland management activities are to occur; the potential dormouse bridge areas to the south of the site; and the river banks and associated gravel / mud pathways that contain the INNS.

In terms of construction sites, the Scottish Environmental Protection Agency have published a guide: Biosecurity and management of INNS for construction sites and Controlled Activities (SEPA and NIEA, 2023) Biosecurity measures should be used during any operation that pose a risk of spreading INNS, e.g., vegetation works, construction and engineering works, use of water pumps, or access to the area by any vehicles or staff.

All contractors and staff will be briefed to ensure that everyone is aware of what the species look like, and the issues associated with them. This will be achieved via 'toolbox' talks from site inductions. The following recommendations are based on the current information provided:

8.1 Initial biosecurity actions – pre construction

- Fence off Japanese knotweed areas that are within the site (7m, see Section 5) and erect signs explaining the risks associated with INNS and prohibit unsupervised movement of staff / machinery into INNS areas.
- Existing patches of Japanese knotweed within the construction footprint and new / diverted paths will be excavated and removed offsite to a licenced landfill prior to construction activities. This will reduce the risk from this plant in those areas.
- Soils containing Japanese knotweed rhizome or Himalayan balsam seeds are classified as controlled waste and there is a duty of care for their proper disposal. The soil must be transported by an appropriately licensed carrier and disposed of at an appropriately licensed waste disposal facility.
- The remaining areas will be managed as part of the invasive species management plan i.e. using a systemic herbicide (knotweed) / hand pulling / cutting (balsam) over e five-year period. The management visits will allow for new infestations to be detected and to determine any spread from their original footprint and implement appropriate management.

8.2 Biosecurity actions – during construction

- Provide INNS information sheets on all site Health & Safety notice boards (see links below). The following links from the Natural Resources Wales website provide information that will be used onsite to inform staff or be incorporated into signage. Himalayan balsam, (Jones, 2022) and Japanese knotweed, (Jones, 2020).
- Prohibit unsupervised movement of soils and vegetation containing INNS from within the site to other non-infested areas – both on and off site.

- Neighbouring landowners should be notified if they have INNS adjacent to the site.

- Personnel working on or between sites should ensure their clothing and footwear are cleaned where appropriate to prevent spread.

- Implement biosecurity for vehicles / machinery, tools and boots. A washdown area to prevent the offsite movement of Himalayan balsam seed within soils. Consideration should be given to where the washdown water goes and ensure that it is not released into a waterway. It must be contained, collected and disposed of appropriately. It may be possible to filter the water to reduce the volume of material being disposed of.

- If INNS are in areas where no works are planned or are within a short distance of or are on haul roads, a containment approach will be more effective than attempts to control. The use of fencing suitable for the adjacent works to exclude personnel and machinery (which could increase risk of spread) from areas of INNS in retained areas can be effective in the short-term.

9. Review procedure and monitoring

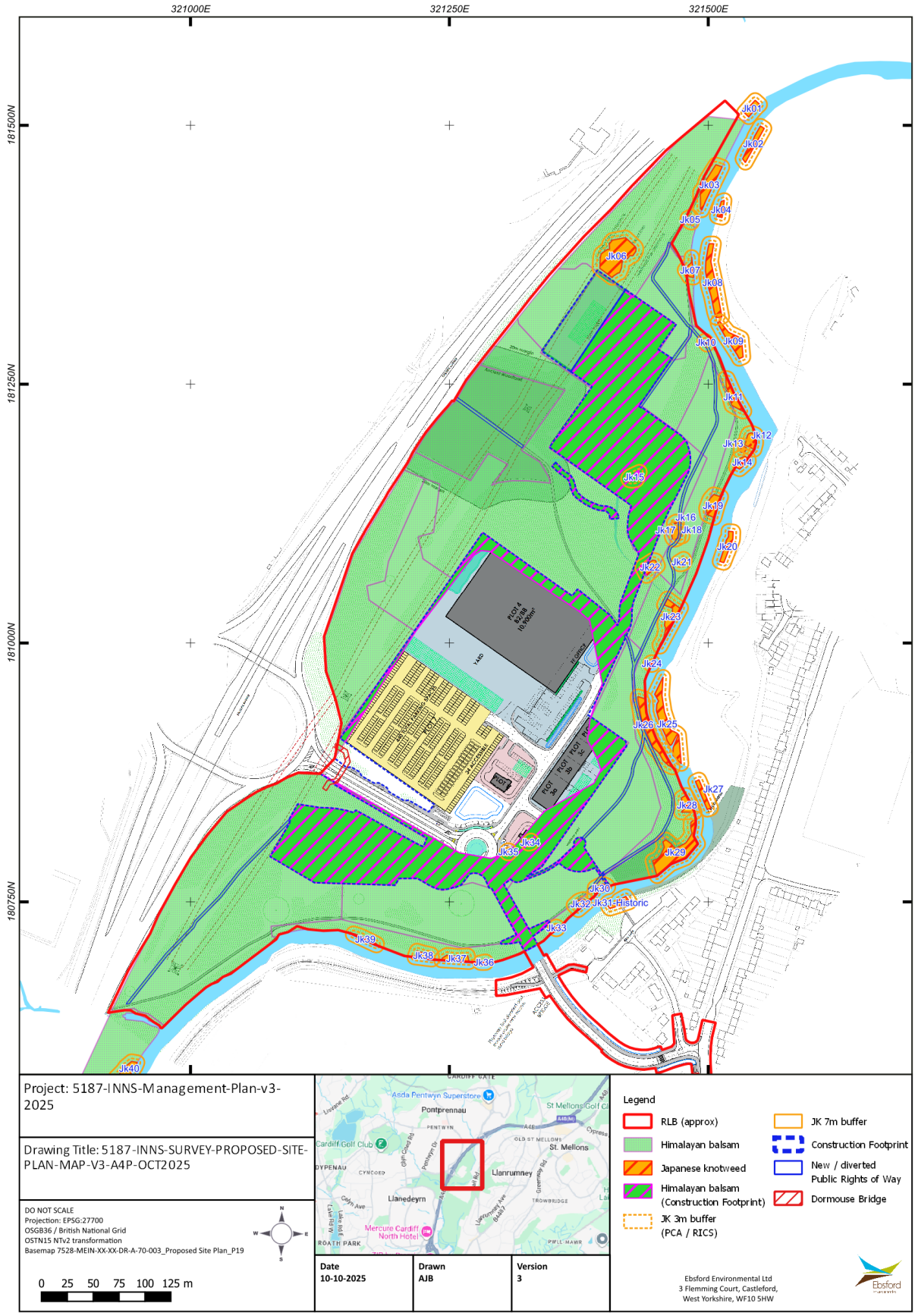
During the construction phases the Invasive Non-Native Species Management Plan (ISMP) will be regularly monitored by the Principal Contractor (PC). This will be advised by a suitably qualified / experienced contractor (i.e. with appropriate accreditation i.e. the Property Care Association or Invasive Non-Native Specialists Association), and the ECoW throughout construction alongside species specific method statements to be developed by the PC. Records will accompany the ISMP and include all management and biosecurity actions taken which will provide an audit trail for the Environmental Management Plan (EMP). Staff within the site including woodland managers, ecologists etc. should report any new sightings of INNS within and near the project for the appropriate management responses to be applied. This will allow for the ISMP to be updated accordingly and follows the principles of the GB NNS strategy: early detection, rapid response and management.

The ISMP should be reviewed regularly to make sure it stays up to date and relevant. It is proposed that this plan will be reviewed every 12 months for five years. The five years includes the construction phase (*circa.* 3 years) plus a further two years, which is the typical length of a Japanese knotweed management plan (five-years). The ISMP can then be handed over to the parties involved in the 25-year WMP where it may be possible to engage with local action groups for ongoing monitoring and management if new infestations occur.

10. Site Map 1a: Locations of Japanese knotweed and Himalayan balsam within and outside the site.

11. Site Map 2b: Locations of Japanese knotweed and Himalayan balsam outside the site and the dormouse bridge locations.

12. Site Map 3: Locations of Japanese knotweed and Himalayan balsam within proposed development. The areas where Himalayan balsam are within the construction footprint are marked with green and purple hatching.



13. Site Map 4: Locations of Japanese knotweed and Himalayan balsam within dormouse habitat.

14. Site Map 5: Locations of Japanese knotweed and Himalayan balsam where trees are to be removed.

15. Site Photos: Japanese knotweed and Himalayan balsam.

Figure 2: Japanese knotweed (Jk06) a long-established stand covering 775 m² consisting of the hybrid / bohemian knotweed (*Reynoutria x bohemica*). The Japanese knotweed is within 7m of the proposed clearance and development: plot 6a and 6b.

Figure 3: Left: Japanese knotweed (Jk22) a large, long-established stand covering 117 m² within an area where trees / vegetation is to be cleared and a proposed access road between plot 4 and 5. Right: Japanese knotweed (Jk34 and 35) two small, long-established stand covering 7.4 m² within an area where trees / vegetation is to be cleared and plot 4 is to be developed.

Figure 4: Himalayan balsam within plot 5.

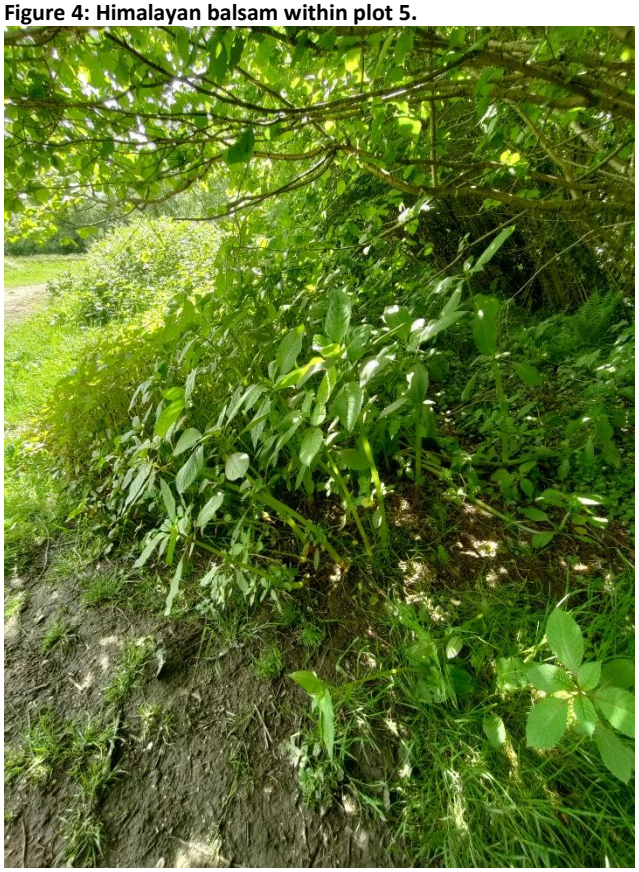


Figure 5: Himalayan balsam north of plot 4.

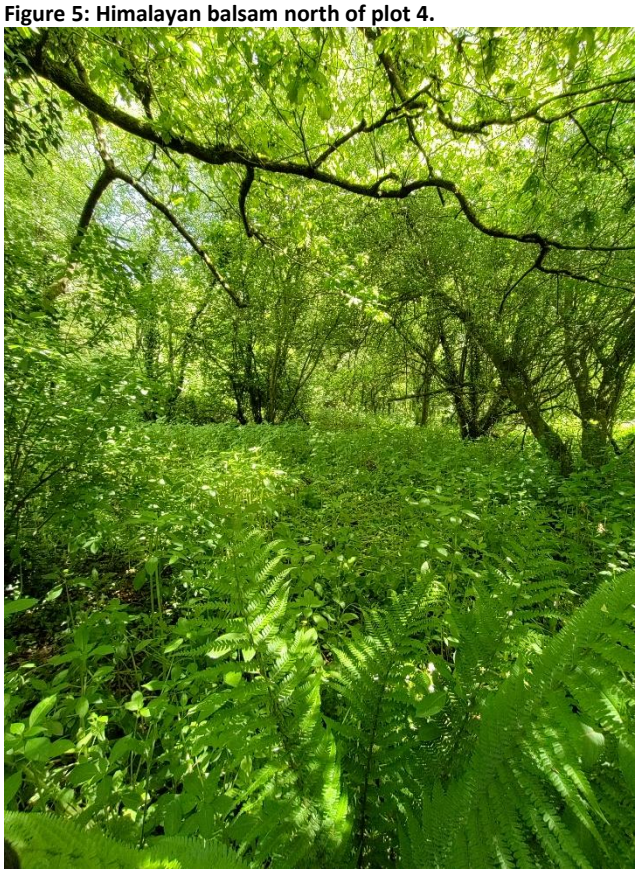
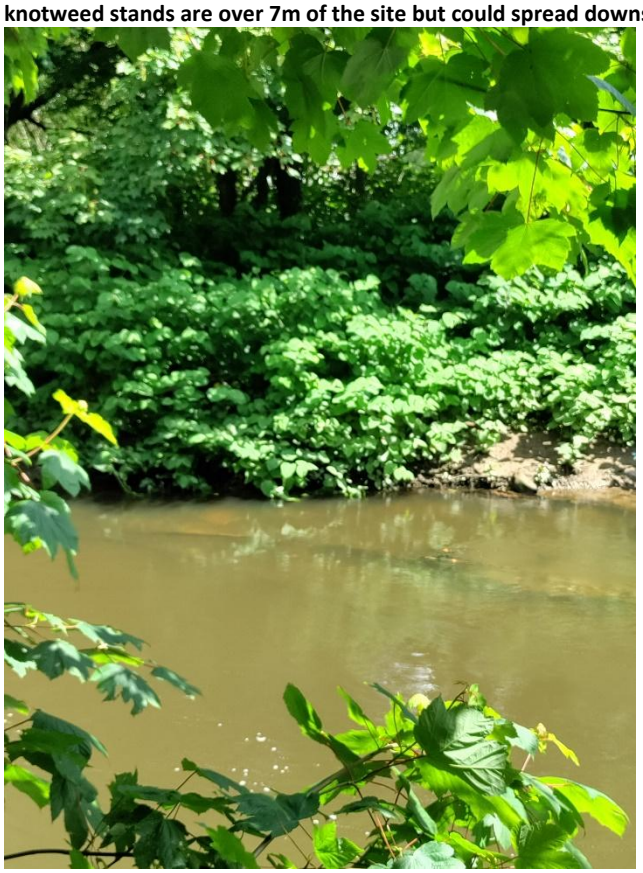


Figure 6: Examples of long-established stands of Japanese knotweed (Jk19 and Jk21) along the proposed new riverside path. These knotweed stands are within 7m of the proposed path works.

Figure 7: Examples of long-established stands of Japanese knotweed (Jk08 and Jk27) along the opposite bank of the river. These knotweed stands are over 7m of the site but could spread downstream.



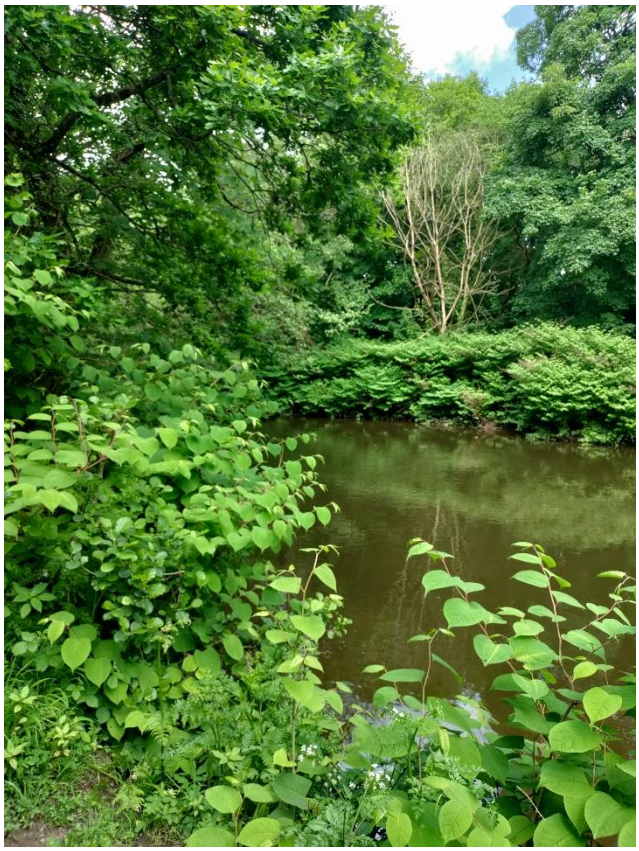


Figure 8: Dormouse bridge 2 Himalayan balsam and Japanese knotweed (Jk40)

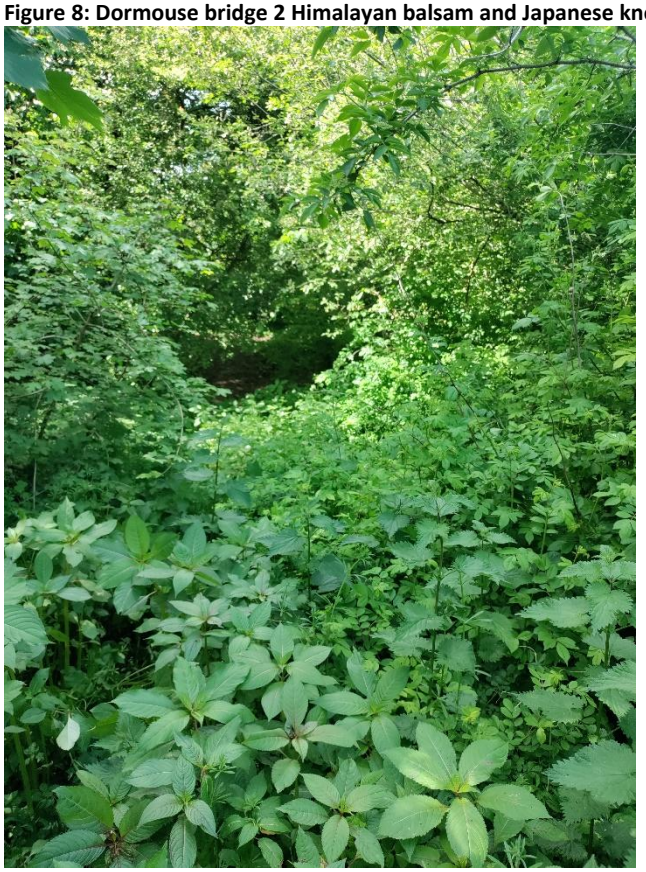


Figure 9: Dormouse bridge 3 Himalayan balsam

16. INNS Risk Levels

Table 4: Risk levels assigned to patches of Japanese knotweed on and offsite.

NAME	SITE	AreaM	WMP-Comp	Construction Zone	Dormouse	TreeRemove	Water	AncntWood	Reptiles	RISK Level	MNGMNT-1	MNGMNT-2	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5
Jk02	Offsite (Over 7m from site)	155.2	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk04	Offsite (Over 7m from site)	61	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk08	Offsite (Over 7m from site)	450.4	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk09	Offsite (Over 7m from site)	274.3	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk20	Offsite (Over 7m from site)	143.1	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk25	Offsite (Over 7m from site)	535.5	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk27	Offsite (Over 7m from site)	110.8	NA	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk31-Historic	Offsite (Over 7m from site)	79.8	Cmpt 03	NO	Not Known	NO	YES	NO	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk42	Offsite (Over 7m from site)	4	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk43	Offsite (Over 7m from site)	132.4	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk44	Offsite (Over 7m from site)	547.6	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk46	Offsite (Over 7m from site)	80.3	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk47	Offsite (Over 7m from site)	79.7	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk48	Offsite (Over 7m from site)	176.1	NA	NO	Not Known	NO	NO	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk49	Offsite (Over 7m from site)	65.8	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk50	Offsite (Over 7m from site)	125	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk51	Offsite (Over 7m from site)	179.4	NA	NO	Not Known	NO	NO	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk52	Offsite (Over 7m from site)	111.3	NA	NO	Not Known	NO	YES	Not Known	Not Known	L1	Notify Landowner.	NA	NA	NA	NA	NA	NA
Jk01	Offsite (Within 7m of site)	94.5	NA	NO	Not Known	NO	YES	NO	Not Known	L2	Notify Landowner.	Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk03	Offsite (Within 7m of site)	301.4	NA	NO	NO	NO	YES	NO	Not Known	L2	Notify Landowner.	Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk05	Offsite (Within 7m of site)	15.1	NA	NO	NO	NO	NO	NO	Not Known	L2	Notify Landowner.	Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk13	Onsite	25.7	Cmpt 07	NO	NO	NO	NO	NO	NO	L2	Notify Landowner.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk06	Onsite	774.7	Cmpt 04	As 2025 Not close to construction zone, 35m Yard not being constructed due to OHPL.	YES	NO	NO	NO	YES	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk07	Onsite / Within 7m of site	76.3	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk11	Onsite	165.4	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter	Late summer / autumn herbicide treatment (2 to 3 visits). Winter	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)

													clearance of dead canes.	clearance of dead canes.		
Jk12	Onsite	119.6	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk14	Onsite	84.9	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk19	Onsite	186.2	Cmpt 07 & 08	NO	NO	NO	YES	NO	YES	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk24	Onsite	4	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk28	Onsite	121.3	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk29	Onsite / Within 7m of site	727.8	Cmpt 03 & 07	NO	NO	NO	YES	YES	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk32	Onsite	68.1	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk33	Onsite	4	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk36	Onsite	3.1	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk37	Onsite	124.1	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk38	Onsite	82.4	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk39	Onsite	38.2	Cmpt 07	NO	NO	NO	YES	NO	NO	L3	Biosecurity.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)

Jk10	Onsite	2.5	Cmpt 07	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk15	Onsite	44.3	NA	INNS within construction zone	YES	YES	NO	NO	NO	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk16	Onsite	2.9	NA	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk17	Onsite	52.6	Cmpt 08	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk18	Onsite	2.3	Cmpt 08	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk21	Onsite	17.3	Cmpt 08	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk22	Onsite	116.4	Cmpt 08 & 09	INNS within construction zone	YES	YES	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA

Jk23	Onsite	213.3	Cmpt 07	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	YES	NO	YES	**L4**	Biosecurity, fence off.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk26	Onsite / Within 7m of site	418.3	Cmpt 07	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	YES	NO	NO	**L4**	Biosecurity, fence off.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk30	Onsite / Within 7m of site	57.7	Cmpt 07	INNS within new / diverted public right of way - upgrading / construction.	NO	NO	YES	NO	YES	**L4**	Biosecurity, fence off.	5 Year Herbicide ISMP.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (2 to 3 visits). Winter clearance of dead canes.	Late summer / autumn herbicide treatment (x2).	Summer monitoring visit (x2)	Summer monitoring visit (x2)
Jk34	Onsite	2.4	NA	INNS within construction zone	YES	NO	NO	NO	YES	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk35	Onsite	5	NA	INNS within construction zone	NO	YES	NO	NO	NO	**L4**	Biosecurity, fence off.	Offsite removal / burial onsite prior to construction activities.	Excavate and stockpile for onsite burial OR offsite disposal to licenced landfill. Conduct monitoring of area removed during knotweed herbicide management visits.	Monitoring	Monitoring	NA	NA
Jk40	Offsite / Within 7m of dormouse bridge post	692.5	Cmpt 12	INNS within construction zone (dormouse bridge)	Not Known	NO	YES	Not Known	Not Known	**L4**	Biosecurity, fence off. Watching brief during installation of bridges.	Notify landowner, Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk41	Offsite / Within 7m of dormouse bridge post	1051.8	NA	INNS within construction zone (dormouse bridge)	Not Known	NO	YES	Not Known	Not Known	**L4**	Biosecurity, fence off. Watching brief during installation of bridges.	Notify landowner, Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk45	Offsite / Within 7m of dormouse bridge post	4	NA	INNS within construction zone (dormouse bridge)	Not Known	NO	YES	Not Known	Not Known	**L4**	Biosecurity, fence off. Watching brief during installation of bridges.	Notify landowner, Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk53	Offsite / Within 7m of dormouse bridge post	64.1	NA	INNS within construction zone (dormouse bridge)	Not Known	NO	YES	Not Known	Not Known	**L4**	Biosecurity, fence off. Watching brief during installation of bridges.	Notify landowner, Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA
Jk54	Offsite / Within 7m of dormouse bridge post	684.6	NA	INNS within construction zone (dormouse bridge)	Not Known	NO	YES	Not Known	Not Known	**L4**	Biosecurity, fence off. Watching brief during installation of bridges.	Notify landowner, Biosecurity, 5 Year Herbicide ISMP.	NA	NA	NA	NA	NA

Table 5: Risk levels assigned to patches of Himalayan balsam on and offsite.

NAME	SITE	AreaM	WMP-Comp	Construct	Dormouse	TreeRemove	Water	AncntWood	RISK Level	Management
Hb01	Onsite	9437.1	Cmpt 01	NO	YES	NO	NO	YES	L2	Biosecurity, Integrate ISMP with WMP
Hb06	Onsite	3198.7	Cmpt 06	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb08	Onsite	5752.6	Cmpt 08	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb08	Onsite	1034.9	Cmpt 08	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb09	Onsite	24693.1	Cmpt 09	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb10	Onsite	5296.7	Cmpt 10	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb11	Onsite	10026.4	Cmpt 11	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb13	Onsite	13176.4	Cmpt 13	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb13	Onsite	8143.2	Cmpt 13	NO	YES	NO	NO	NO	L2	Biosecurity, Integrate ISMP with WMP
Hb03	Onsite	1248.1	Cmpt 03	NO	NO	NO	YES (some elements close)	YES	L3	Biosecurity, Integrate ISMP with WMP
Hb07	Onsite	583	Cmpt 07	NO	NO	NO	YES (some elements close)	NO	L3	Biosecurity, Integrate ISMP with WMP
Hb07	Onsite	4947.3	Cmpt 07	NO	YES	NO	YES (some elements close)	NO	L3	Biosecurity, Integrate ISMP with WMP
Hb07	Onsite	6408.9	Cmpt 07	NO	YES	NO	YES (some elements close)	NO	L3	Biosecurity, Integrate ISMP with WMP
Hb12	Onsite	25874.6	Cmpt 12	NO	YES	NO	YES (some elements close)	NO	L3	Biosecurity, Integrate ISMP with WMP
Hb A	Offsite (Over 7m from site)	56232.6	NA	INNS within construction zone (dormouse bridge)	Not Known	NO	YES (some elements close)	Not Known	L4	Biosecurity, ECoW during works.
Hb B	Onsite	570.1	NA	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb C	Onsite	14070.6	NA	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb D	Onsite	2818.6	NA	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb04	Onsite	10350.9	Cmpt 04	INNS close to construction zone	YES	NO	YES (some elements close)	NO	L4	Biosecurity, Management of Soils
Hb05	Onsite	2836.3	Cmpt 05	INNS close to construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb07	Onsite	658.4	Cmpt 07	INNS close to construction zone	NO	NO	YES (some elements close)	NO	L4	Biosecurity, Management of Soils
Hb07	Onsite	3139.7	Cmpt 07	INNS close to construction zone	NO	NO	YES (some elements close)	NO	L4	Biosecurity, Management of Soils
Hb07	Onsite	123.2	Cmpt 07	INNS within construction zone	NO	NO	YES (some elements close)	NO	L4	Biosecurity, Management of Soils
Hb08	Onsite	362	Cmpt 08	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb09	Onsite	7.7	Cmpt 09	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb09	Onsite	819.8	NA	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb09	Onsite	20620.2	NA	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils
Hb12	Offsite (Over 7m from site)	6057	Cmpt 12	INNS within construction zone (dormouse bridge)	Not Known	NO	YES (some elements close)	Not Known	L4	Biosecurity, ECoW during works.
Hb13	Onsite	657.9	Cmpt 13	INNS within construction zone	YES	NO	NO	NO	L4	Biosecurity, Management of Soils

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Cardiff East Park and Ride - River Rhymney Aquatic Habitat Appraisal

TO	Daniel Frith, Curtis Hall	**FROM**	Dr Matt Harris / Kate Fisher
DATE	01 December 2025	**CONFIDENTIALITY**	Public
SUBJECT	Cardiff East Park and Ride - Aquatic Habitat Appraisal of the River Rhymney		

INTRODUCTION

The Proposed Scheme

This technical note has been prepared in support of the application to install dormouse bridges across the River Rhymney as mitigation for the redevelopment of the Pentwyn Park and Ride Scheme, hereafter known as the Proposed Scheme (Central National Grid Reference ST 21351 80900).

The Proposed Scheme comprises a Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide:

- a data centre and associated buildings and structures;
- associated car parking and access roads;
- a bridge across the Rhymney River; and
- site-wide landscaping and associated works.

In order to offset the loss of dormouse habitat within the boundary of the Proposed Scheme, the installation of three dormouse bridges is proposed to provide connectivity with suitable habitat on the east and west banks of the River Rhymney. The mitigation also includes the planting of vegetation suitable to support dormice on both banks in the immediate vicinity of the proposed bridges to encourage their use.

In addition to the installation of three dormouse bridges (Bridges 2, 3 and 6) a new road bridge will be installed to connect the Proposed Scheme with land to the east of the River Rhymney. The construction of dormouse bridges 2 (Central NGR: ST 20919 80530) and 3 (Central NGR: ST 20866 80332) will require screw piles to be installed into the top of both banks to support the main bridge structure. Following installation of the screw piles the main bridge structure will be carried across the river and attached to the piles to complete the installation. Dormouse bridge 6 will be attached to the underside of the existing pedestrian footbridge (Central NGR: ST 21409 80757) and will require a mobile scaffold to be erected within the river itself in order to allow safe access for engineers during the installation process.

It is envisaged that the construction of the bridge will involve three piers on the Proposed Development side which will have localised foundations created using tracked machinery. The East Pier (last one before the river) is to be set back from the river bank by approximately 10m. The pre-cast concrete beams (~21m) for the three spans on the Proposed Development side will be swung into place via a crane. A temporary works design has facilitated that the crane will then relocate to the first span and swing into place the second span beams and so on with the third span.

The concrete abutment and head wall to the Rhymney side is set back from the back by some 7.5m and will be accessed and constructed through the 'Wates development'. The main precast beams (29.6m) for the river span will be lifted into place from the Rhymney side of the river.

At this stage of the project, we have been informed that there will be no in-channel works for the new road bridge however the concrete abutment and head wall will likely require piling, the methodology of which at this stage is unknown, and will be subject to the results of future ground investigations.

Ecological context

The River Rhymney is functionally linked to the Severn Estuary Special Area of Conservation (SAC) and Severn Estuary Ramsar site which start at the mouth of the River Rhymney 5.5km downstream of the Proposed Scheme. The Severn Estuary SAC is designated for a wide range of qualifying features including sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis* and Twaite shad *Alosa fallax*[1]. The Severn Estuary Ramsar site's qualifying interest features overlap with those of the Severn Estuary SAC and includes an assemblage of migratory fish species. These are Atlantic salmon *Salmo salar*, sea lamprey, river lamprey, allis shad *Alosa alosa* and European eel *Anguilla anguilla*[2].

All of the above species with the exception of European eel, undertake migrations into freshwater habitats to undertake spawning in clean gravels as part of their lifecycle. Juvenile Atlantic salmon[3], brown/sea trout[4] and shad[5] spend the juvenile life stage in freshwater habitats before migrating out to sea as adults. The larval (ammocoete) life stage of both sea and river lamprey also spend time in upstream freshwater habitats, before maturation and migration to the sea. On hatching from gravel nests, ammocoetes burrow into silt deposits where they reside for up to several years before transforming into adults[6]. European eel exhibit the reverse behaviour and enter freshwater habitats as juveniles, where they grow to maturity before heading back to sea to reproduce.

A review of Natural resources Wales (NRW)[7] freshwater fish survey data indicate that the section of the River Rhymney adjacent to the Proposed Scheme is used by the following designated fish species: European eel, brown/sea trout and Atlantic salmon. There are additional records of lamprey species recorded in surveys upstream of the Proposed Scheme, alongside records of salmon, brown/sea trout and European eel.

FISH HABITAT SURVEY METHODOLOGY

A fish habitat survey was undertaken by a suitably qualified and experienced Aquatic Ecologist on the 27th of October 2025. The potential for the watercourse to support protected fish species at the proposed bridge locations was assessed through field observations of various channel and bank characteristics including substrate type, water depth, flow characteristics, presence of large woody debris and bank face material.

[1] https://sac.jncc.gov.uk/site/UK0013030
[2] https://jncc.gov.uk/jncc-assets/RIS/UK11081.pdf
[3] Hendry, K. and Cragg-Hine, D., 2003. Ecology of the Atlantic salmon. Conserving natura 2000 rivers ecology series no. 7. English Nature, Peterborough, p.36.
[4] Jonsson, B., 2000. Biology and Ecology of the Brown Trout and Sea Trout. Freshwater Biology, 45(3), pp.371-372.
[5] Maitland, P.S. and Hatton-Ellis, T.W., 2003. Ecology of the allis and twaite shad: *Alosa alosa* and *Alosa fallax.* Life in UK Rivers.
[6] Maitland, P.S., 2000. Ecology of the river, brook and sea lamprey. Conserving natura, p.52.
[7] https://datamap.gov.wales/maps/new?layergroup=geonode:nrw_freshwater_fish_surveys#/

FISH HABITAT SURVEY RESULTS

Dormouse Bridge 6: Existing Pedestrian Footbridge (APPENDIX A Figure 1) – proposed retrofit

The river at the location of dormouse bridge 6 was approximately 20m wide, with concrete reinforcement on the right-hand bank (RHB) and large stone blocks on the left-hand bank (LHB). The predominant substrate type was cobble and coarse gravel. The main flow type was rippling waves with some downstream riffles, with water depth ranging from ~0.1m at the margins on the RHB to greater than 1m in the centre of the channel. Overhanging trees were present on both the RHB and LHB. No woody debris or silt was observed in the river at this location.

Potential to support Protected species:

Due to the substrate types and flow conditions observed at this site, it is unlikely that protected fish species will be spawning in this location and will instead be using it as a foraging area and migration corridor.

Dormouse Bridge 2 (APPENDIX A Figure 2) – new bridge

The river at the location of dormouse bridge 2 was approximately 10-12m wide, with natural substrate (sandy earth) comprising the RHB and reinforced wooden boards on the LHB. A large fallen willow on the RHB created areas of slower flow with accumulations of sandy silt and leaf litter /organic debris downstream of the tree. The substrate in the main river channel consisted of large gravel and cobbles, with some overlying filamentous algae. The main flow type was predominantly glide, with some backwaters downstream of the fallen willow. Water depth ranged from 5cm at the RHB margin to greater than 80cm in the middle of the channel and across to the LHB.

Potential to support Protected species:

The slower flow and substrate type (sandy silt) present along the RHB has the potential to support lamprey ammocoetes, with the leaf litter also providing suitable habitat for European eel. Salmonid species will likely use this section of river as a foraging area and migration corridor.

Dormouse Bridge 3 (APPENDIX A Figure 3) – new bridge

The river at the location of dormouse bridge 3 was approximately 10m wide, with natural earth substrate at both the RHB and LHB. Trees were observed to extend over the river from both banks and provide some cover to fish. The predominant in-channel substrate was mixed cobble and gravel, with no evidence of silt at either margin. The predominant flow type was glide, with water depth uniform across the river at approximately 1m. The main flow was observed towards the middle of the channel and LHB, with a slower flow along the RHB.

Potential to support Protected species:

Due to the substrate types and flow conditions observed at this site, it is unlikely that protected fish species will be spawning in this location and will instead be using it as a foraging area and migration corridor.

New Main Access Road Bridge (Appendix A Figure 4)

The river at the location of the New main access road bridge was approximately 12m wide, with both the RHB and LHB comprising of natural earth substrate. Trees were observed to extend over the river from both banks and provide some cover to fish. The predominant substrate type was cobble and gravel, with some evidence of filamentous algae and a slight covering of silt. The predominant flow type was glide, with water depth ranging from ~0.4m at the RHB to greater than 1m in the centre of the channel. The main flow was observed towards the middle of the channel and LHB, with a slower flow along the RHB

Potential to support Protected species:

Due to the substrate types and flow conditions observed at this site, it is unlikely that designated fish species will be spawning in this location and will instead be utilising it as a foraging area and migration corridor.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the findings of the fish habitat survey it is likely that the locations surveyed are likely to be used as a migration corridor for fish species that are qualifying features of the Severn estuary SAC and Ramsar site (Atlantic salmon, brown/sea trout, sea lamprey, river lamprey and European eel). In addition, the sandy/silt deposits present at Dormouse bridge 2 have the potential to support lamprey species by providing habitat for ammocoetes, as well as potential habitat for European eel. Based on this, it is recommended that targeted mitigation is implemented at this location. The potential mitigation measures to avoid impacts to protected fish species are included in Table 1 below.

Table 1 Proposed fish mitigation to avoid impacts to protected species

Proposed mitigation	Dormouse bridge 6, Dormouse bridge 3,	Dormouse bridge 2	New main access road bridge
Avoid working in-channel between October and March to reduce impacts to migratory salmonids	✓	✓	
Avoid impact piling works between October and March to reduce impacts to migratory salmonids			✓
Undertake any working in-channel during the day to avoid disturbing nighttime eel and lamprey migration	✓	✓	
Avoid working in-channel /undertake lamprey ammocoete and eel fish rescue prior to installation of dormouse bridge.		✓	

APPENDIX A- SITE PHOTOGRAPHS

Dormouse Bridge 6: Existing Pedestrian Footbridge

Figure 1 View looking downstream from the existing pedestrian bridge, the site for dormouse bridge 1.

DORMOUSE BRIDGE 2

Figure 2 View looking upstream from a short distance below the proposed location of dormouse bridge 2

DORMOUSE BRIDGE 3

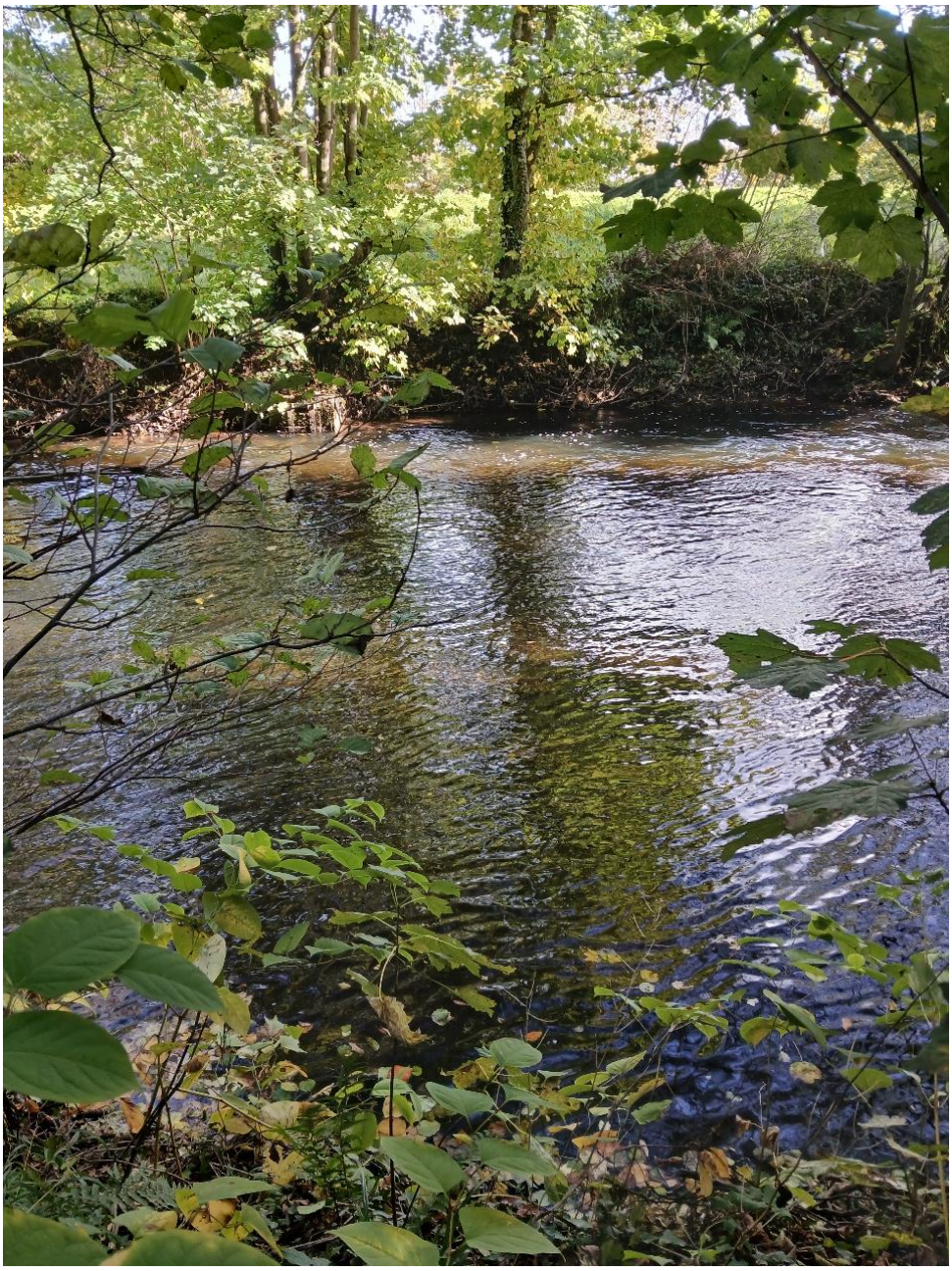
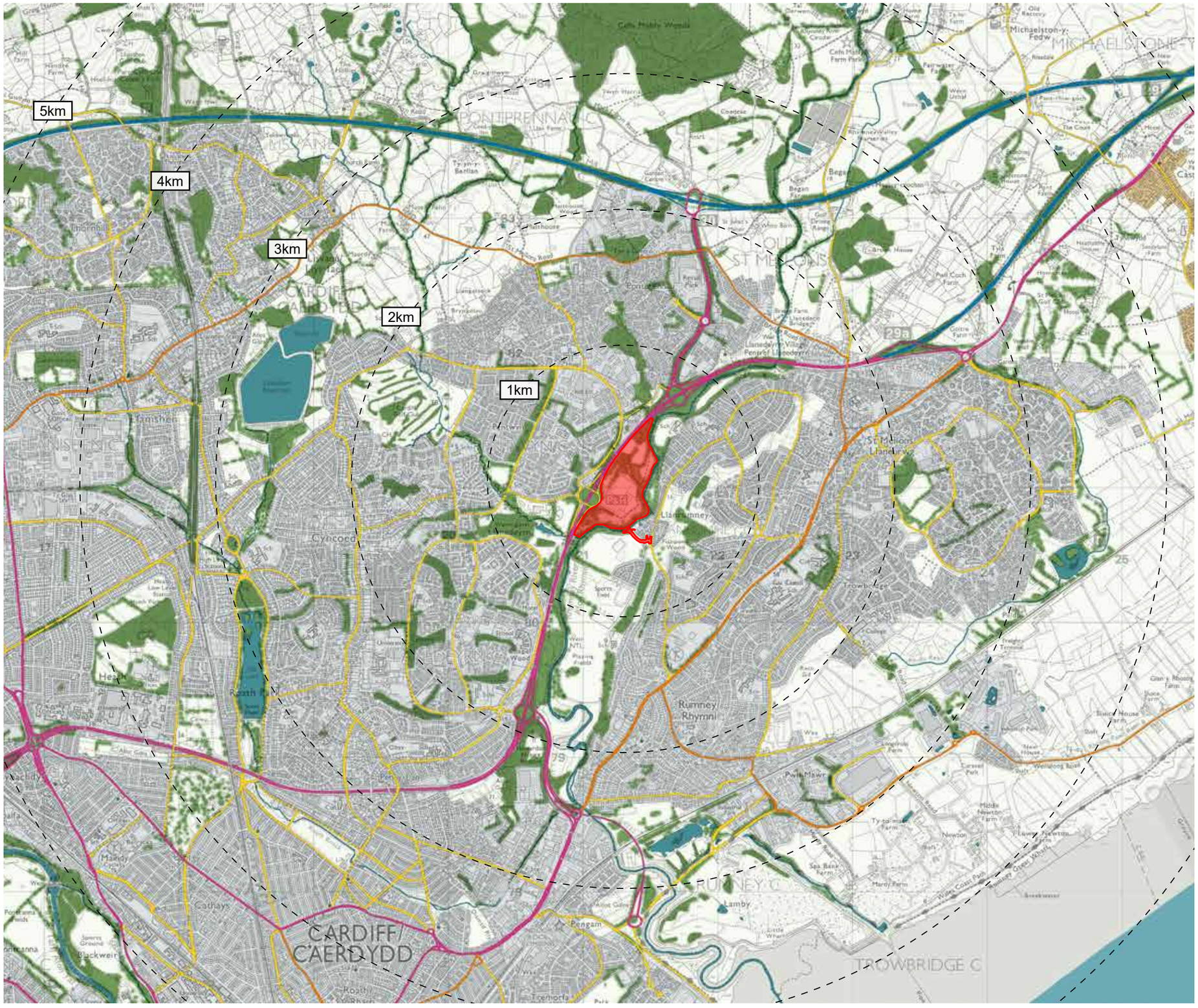


Figure 3 View looking across the River Rhymney at the proposed location of dormouse bridge 3.

Figure 4 View looking across the River Rhymney at the site of the proposed new road bridge.

Dr Matt Harris
Principal Aquatic Ecologist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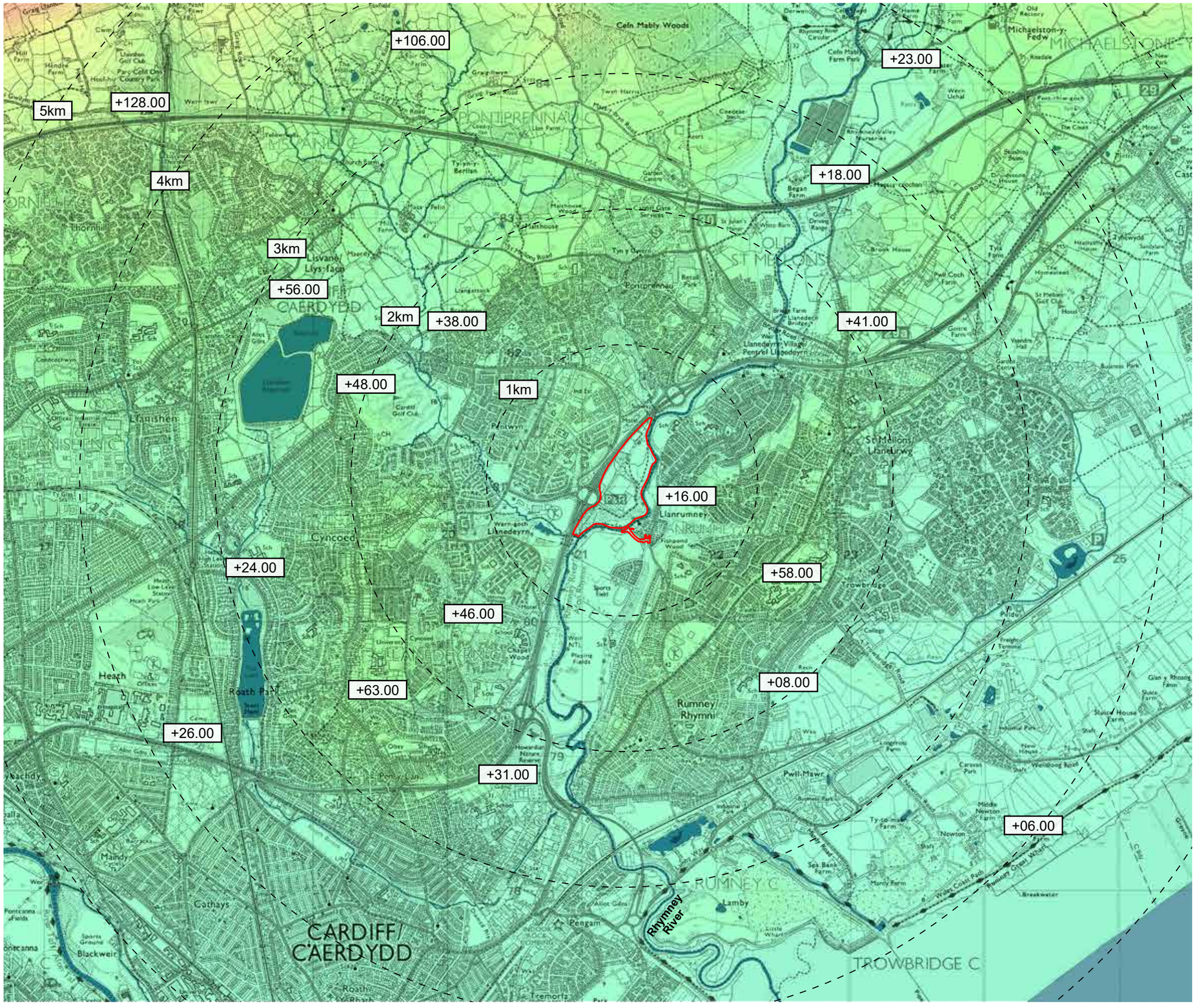
Parcau Wood Wood Wood Wood Wood Wood



KEY

Application Site

Watercourse/Waterbody

250m
240m
230m
220m
210m
200m
190m
180m
170m
160m
150m
140m
130m
120m
110m
100m
90m
80m
70m
60m
50m
40m
30m
20m
10m
0m

+46.00 Spot Height

0km 1km 2km 3km 4km 5km

North

Cardiff Park and Ride East
Appendix **6.2**
Topography

BCA DESIGN
Landscape Architects

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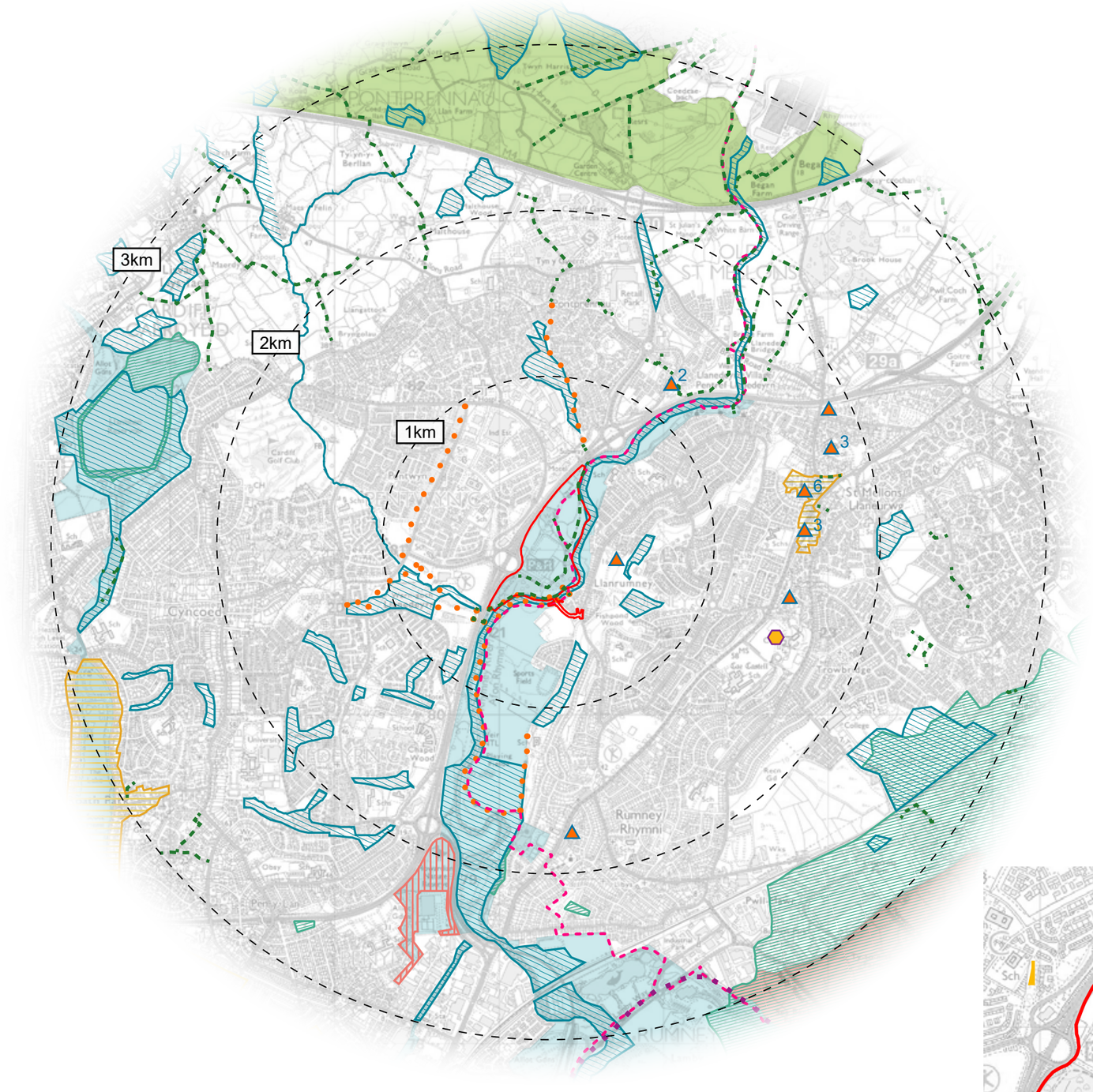

Ancient Woodland

KEY

Application Site

Cardiff Planning Polices

Policy	Reference
Green Wedge	KP3(A)
Special Landscape Area	EN3
River Corridor	EN4

Public Rights of Way/Other Public Access

Footpath

Long Distance Path

Off-road cycle route

Strategic Recreational Route

Historic

Conservation Area

Scheduled Monuments

Listed Buildings (within 1km)

Ecological/Natural Environment

Site of Special Scientific Interest (SSSI)

Site of Importance for Nature Conservation

Local Nature Reserve (LNR)

0km 1km 2km 3km 4km 5km

North

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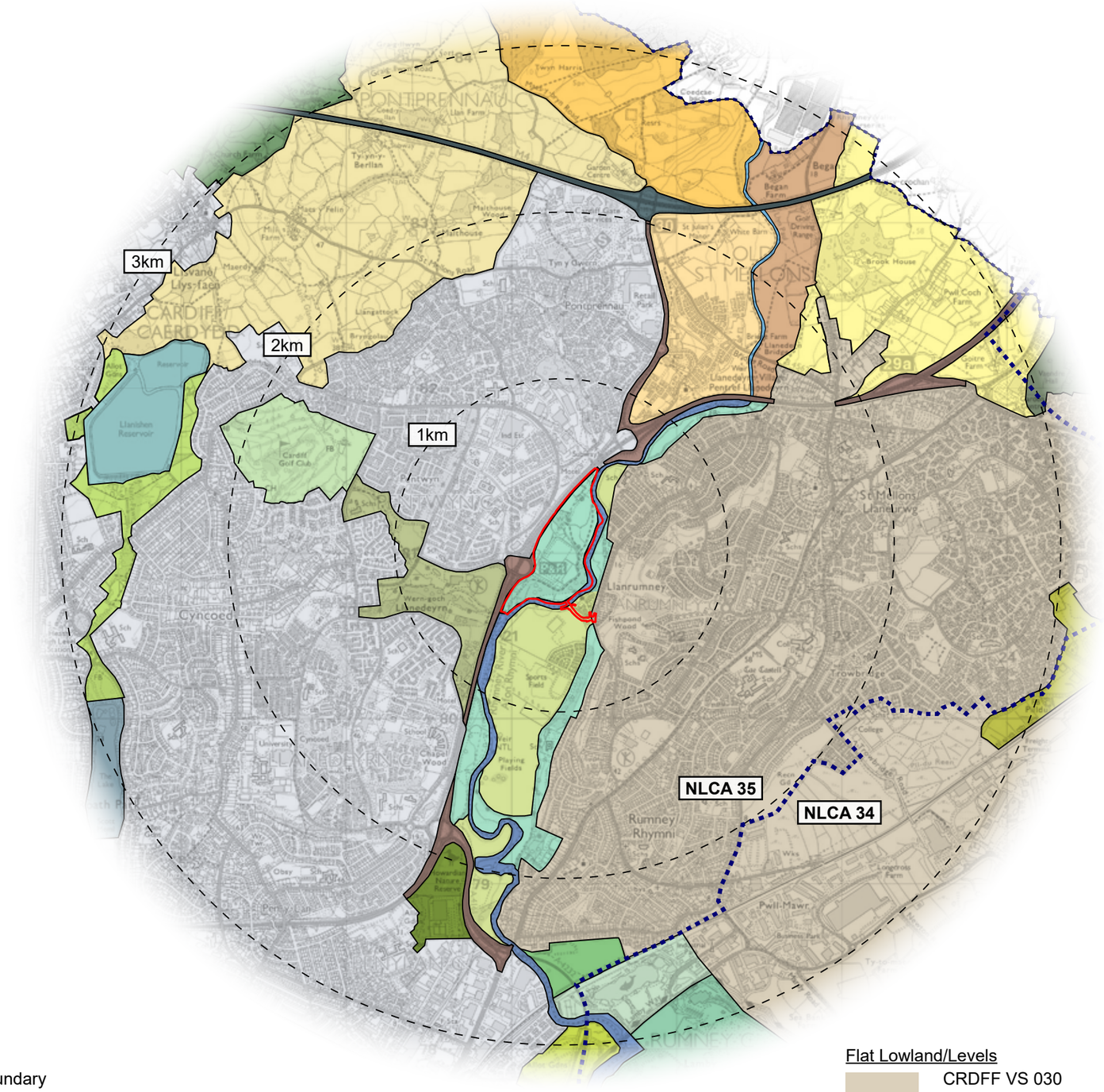
Cardiff Park and Ride East
Appendix **6.3**
Planning Policy/Landscape Designations

BCA DESIGN
Landscape Architects



KEY

Application Site

Visual and Sensory Landscape

Built Land

CRDFF VS 037
Cardiff East

Developed Unbuilt Land

CRDFF VS 051 (includes application site)
Rhymney Valley floor and sides

CRDFF VS 052
Rhymney valley floor playing fields

CRDFF VS 049
Pentwyn Parklands

CRDFF VS 065
Cardiff Gold Club

CRDFF VS 047
Nant Fawr Open Space

CRDFF VS 050
Howardian Nature Reserve

CRDFF VS 054
Rhymney Playing Fields

CRDFF VS 055
Lamby Way Park

CRDFF VS 083
Lamby Way Tip

CRDFF VS 056
Rhymney valley floor urban fringe

CRDFF VS 057
Hendre Lake Park

CRDFF VS 066
St Mellons Golf Course

Inland Water

CRDFF VS 053
River Rhymney

CRDFF VS 072
River Rhymney

CRDFF VS 048
Llanishen Reservoir

CRDFF VS 046
Roath Lake

Road Corridor

CRDFF VS 081
A48 and spur road

CRDFF VS 080
M4 Motoway

Rolling Lowland

CRDFF VS 024
Nant Glandulas

CRDFF VS 025
Cefn Mably Lowlands

CRDFF VS 026
Llanedeyrn Lowlands

CRDFF VS 028
Pwll Coch ridge

Flat Lowland/Levels

CRDFF VS 030
Wentlooge Levels south west

CRDFF VS 027
Rhymney valley floor

Hills, Lower Plateau and Scarp Slopes

CRDFF VS 023
Nant Ty-draw

County Boundary

NLCA Boundary

0km 1km 2km 3km 4km 5km

Source: LANDMAP http://landmap-maps.naturalresources.wales

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Cardiff Park and Ride East
Appendix **6.4**
Landscape Character: LANDMAP

North

BCA DESIGN
Landscape Architects

KEY

Landscape Habitats

- CRDFF LH010 — River Rhymney and surrounds
- CRDFF LH009 — Llanrumney Sports Fields
- CRDFF LH011 — N. of Old St.Mellons
- CRDFF LH061 — Pentwyn and Cyncoed
- CRDFF LH070 — Rhumney and St Mellons

KEY

Cultural Landscape

- CRDFF CL015 — Rhymney Valley Corridor
- CRDFF CL019 — Rural Hinterland
- CRDFF CL018 — Golf Courses

KEY

Historic Landscape

- CRDFF HL008 — River Rhymney Corridor
- CRDFF HL043 — Cyncoed and Penylan

KEY

Geological Landscape

- CRDFF GL003 — Rhymney River Valley
- CRDFF GL001 — Newton
- CRDFF GL010 — Lisvane
- CRDFF GL043 — Cyncoed

0km 1km 2km 3km 4km 5km

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Source: LANDMAP http://landmap-maps.naturalresources.wales

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North

Cardiff Park and Ride East
Appendix **6.5**
Landscape Character: LANDMAP

BCA DESIGN
Landscape Architects

KEY

- Application Site
- Representative Viewpoints
- Illustrative Viewpoints

1	Bridge over A48 (PROW)
2	Bridge over A48 (PROW)
3	Rhymney Trail
4	Pontprennau Woods
5	Ball Lane
6	Rhymney Trail/ Public Footpath Llanedeyrn 7#1
7	Rhymney Trail/ Public Footpath Llanedeyrn 7#1
8	Pedestrian bridge over A48
9	Circle Way East / Parc Coed y Nant
10	Clovelly Cresent (Unverified)
11	Glastonbury Terrace
12	St Mellons 21 (PROW)
13	Ball Road (Unverified)
14	St Edeyrn's Church (Unverified)
15	Llanishen Reservoir (Unverified)
16	Nant y Pandy (Unverified)

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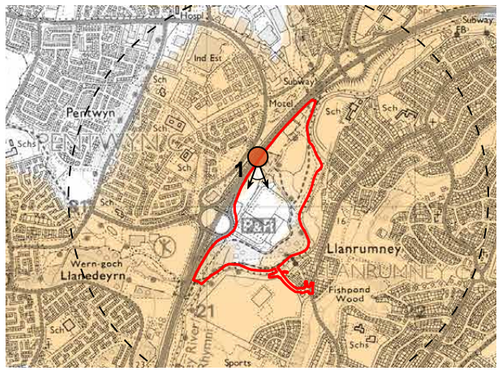
North

2190 Cardiff Park and Ride East
Appendix 6.6
Viewpoint Locations

BCA DESIGN
Landscape Architects

Viewpoint 1: Pedestrian bridge over A48 looking south



Viewpoint Location

Photo taken - 21/01/2022

Height :	**25.049m AOD**
Easting :	**321228.510**
Northing :	**181254.391**

Unverified Image of photo taken 08/10/2025

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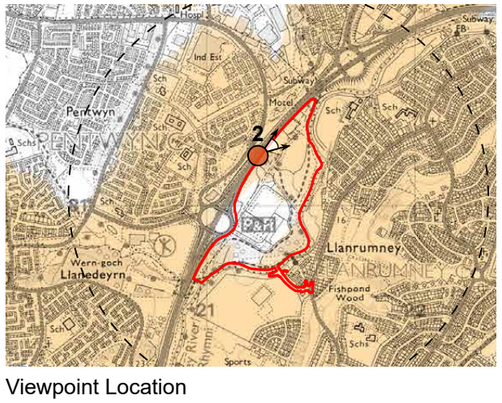
2190 Cardiff Park and Ride East
Appendix 6.7
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 2: Pedestrian bridge over A48 looking north east



Viewpoint Location

Photo taken - 21/01/2022

Height :	**25.002m AOD**
Easting :	**321230.457**
Northing :	**181258.070**

Unverified Image of photo taken 08/10/2025

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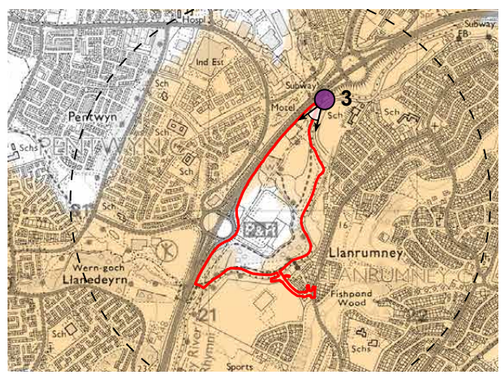
2190 Cardiff Park and Ride East
Appendix 6.8
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 3: Rhymney Trail



Viewpoint Location

Photo taken - 21/01/2022

Height :	**14.852m AOD**
Easting :	**321547.242**
Northing :	**181532.539**

Unverified Image of photo taken 08/10/2025

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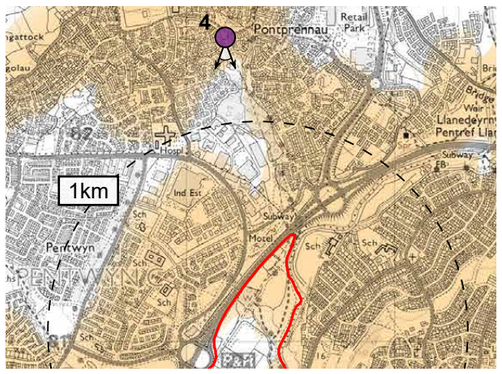
2190 Cardiff Park and Ride East
Appendix 6.9
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 4: Pontprennau Woods



Viewpoint Location

Photo taken - 21/01/2022

Height :	**50.059m AOD**
Easting :	**321197.498**
Northing :	**182477.439**

Unverified Image of photo taken 08/10/2025

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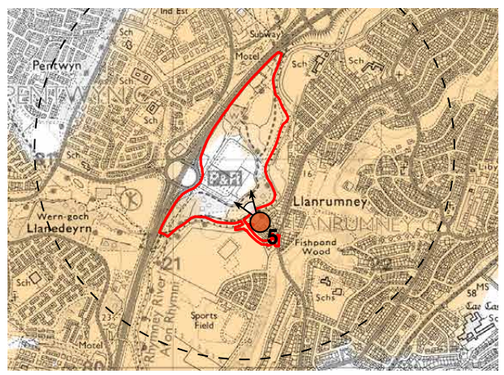
2190 Cardiff Park and Ride East
Appendix 6.10
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 5: Ball Lane



Viewpoint Location

Photo taken - 21/01/2022

Height :	**12.105m AOD**
Easting :	**321438.489**
Northing :	**180705.768**

Unverified Image of photo taken 08/10/2025

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2190 Cardiff Park and Ride East
Appendix 6.11
Viewpoint Photograph - Base Image

BCA DESIGN
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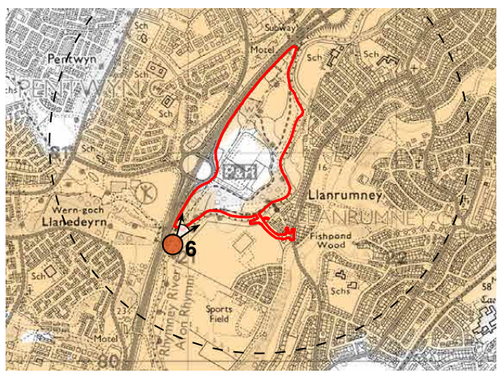
Viewpoint 6: Rhymney Trail/ Public Footpath Llanedeyrn 7#1



Viewpoint Location

Photo taken - 21/01/2022

Height :	**10.998m AOD**
Easting :	**320930.532**
Northing :	**180640.756**

Unverified Image of photo taken 08/10/2025

2190 Cardiff Park and Ride East
Appendix 6.12
Viewpoint Photograph - Base Image

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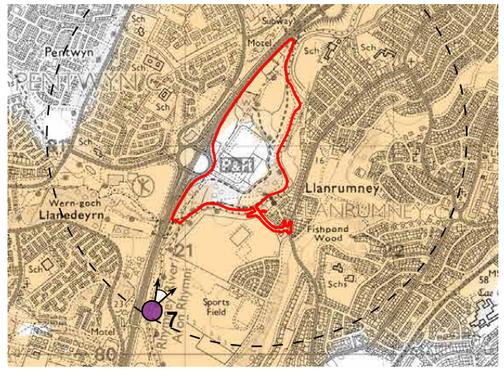
Viewpoint 7: Rhymney Trail/ Public Footpath Llanedeyrn 7#1



Viewpoint Location

Photo taken - 21/01/2022

Height :	**10.111m AOD**
Easting :	**320803.407**
Northing :	**180241.027**

Unverified Image of photo taken 08/10/2025

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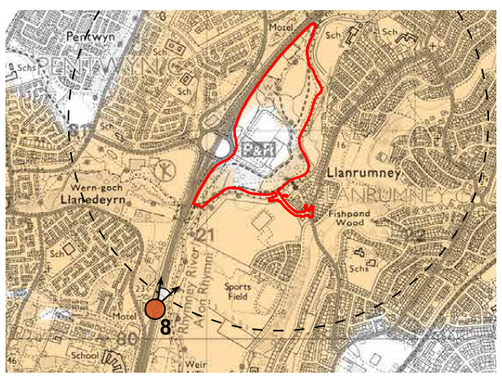
2190 Cardiff Park and Ride East
Appendix 6.13
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 8: Pedestrian bridge over A48



Viewpoint Location

Photo taken - 21/01/2022

Height :	**24.936m AOD**
Easting :	**320771.570**
Northing :	**180175.001**

Unverified Image of photo taken 08/10/2025

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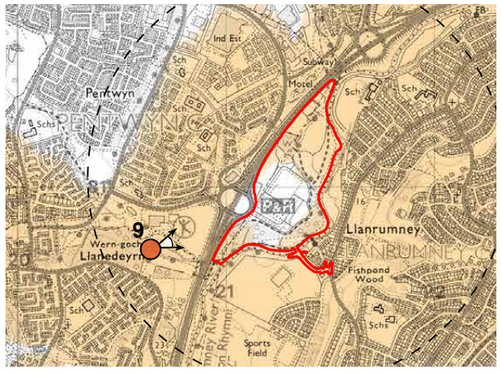
2190 Cardiff Park and Ride East
Appendix 6.14
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 9: Circle Way East / Parc Coed y Nant



Viewpoint Location

Photo taken - 21/01/2022

Height :	**30.923m AOD**
Easting :	**320585.069**
Northing :	**180585.946**

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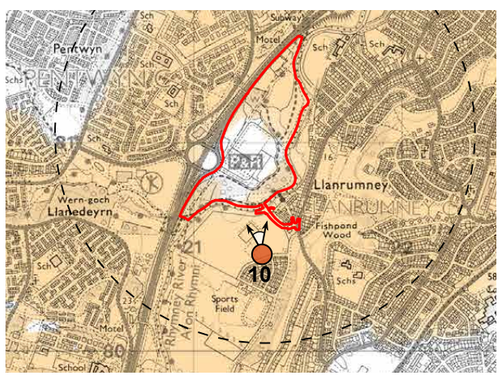
2190 Cardiff Park and Ride East
Appendix 6.15
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 10: Clovelly Cresent



Viewpoint Location

Photo taken - 08/10/2025

Unverified view

2190 Cardiff Park and Ride East
Appendix 6.16
Viewpoint Photograph - Base Image

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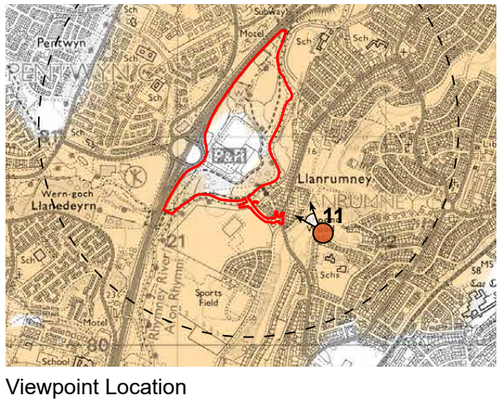
Viewpoint 11: Glastonbury Terrace



Viewpoint Location

Photo taken - 21/01/2022

Height :	**42.362m AOD**
Easting :	**321644.145**
Northing :	**180505.192**

Unverified Image of photo taken 08/10/2025

2190 Cardiff Park and Ride East
Appendix 6.17
Viewpoint Photograph - Base Image

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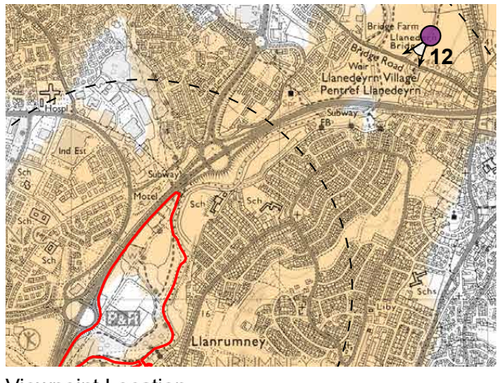
Viewpoint 12: St Mellons 21 (PROW)



Viewpoint Location

Photo taken - 21/01/2022

Height :	**16.910m AOD**
Easting :	**322679.353**
Northing :	**182207.114**

2190 Cardiff Park and Ride East
Appendix 6.18
Viewpoint Photogragh - Base Image

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Landscape Architects

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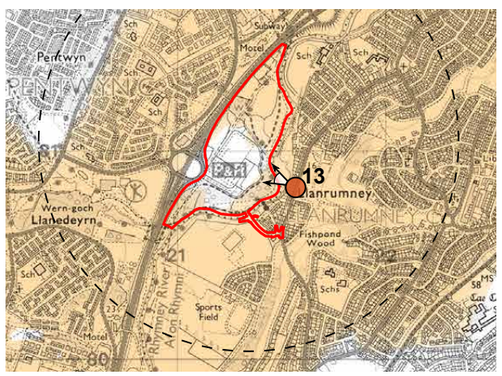
Viewpoint 13: Ball Road



Viewpoint Location

Photo taken - 08/10/2025

Unverified view

2190 Cardiff Park and Ride East
Appendix 6.19
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

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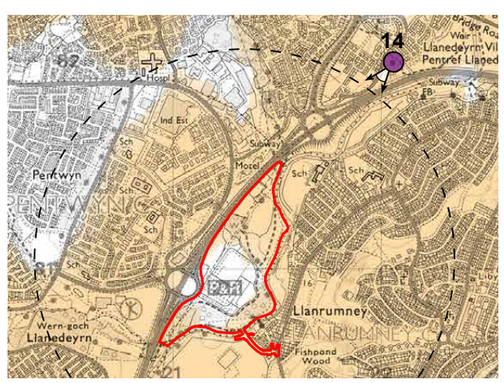
Viewpoint 14 : St Edeyrn’s Church



Viewpoint Location

Photo taken - 08/10/2025

Unverified view

2190 Cardiff Park and Ride East
Appendix 6.20
Viewpoint Photogragh - Base Image

BCA DESIGN
Landscape Architects

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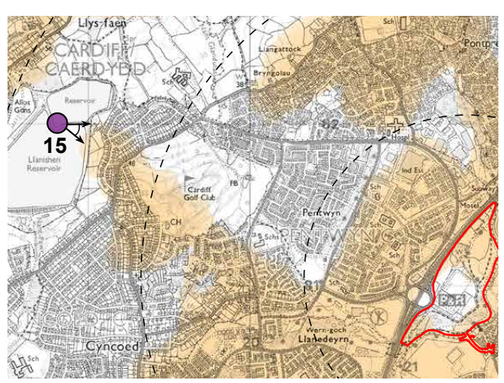
Viewpoint 15 : Llanishen Reservoir



Viewpoint Location

Photo taken - 08/10/2025

Unverified view

2190 Cardiff Park and Ride East
Appendix 6.21
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

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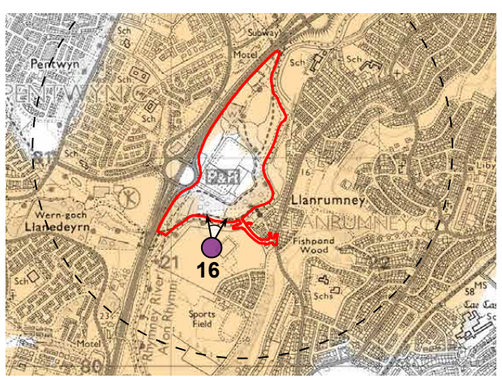
Viewpoint 16 : Nant y Pandy



Viewpoint Location

Photo taken - 08/10/2025

Unverified view

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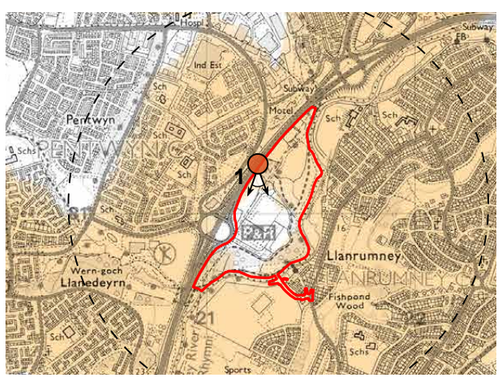
2190 Cardiff Park and Ride East
Appendix 6.22
Viewpoint Photograph - Base Image

BCA DESIGN
Landscape Architects

Viewpoint 1: Pedestrian bridge over A48 looking south



Viewpoint Location

Photo taken - 21/01/2022

Height :	**25.049m AOD**
Easting :	**321228.510**
Northing :	**181254.391**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.23
Visually Verified Representative Viewpoint (Wireframe)

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Landscape Architects

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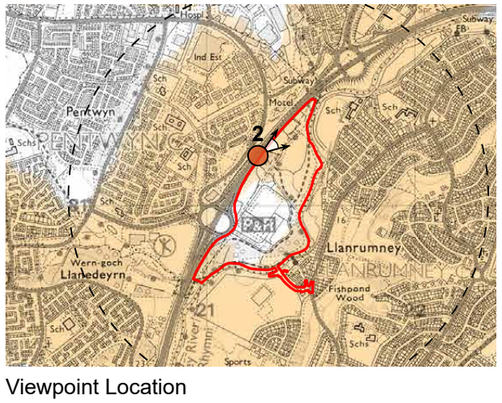
Viewpoint 2: Pedestrian bridge over A48 looking north east



Viewpoint Location

Photo taken - 21/01/2022

Height :	**25.002m AOD**
Easting :	**321230.457**
Northing :	**181258.070**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.24
Visually Verified Representative Viewpoint (Wireframe)

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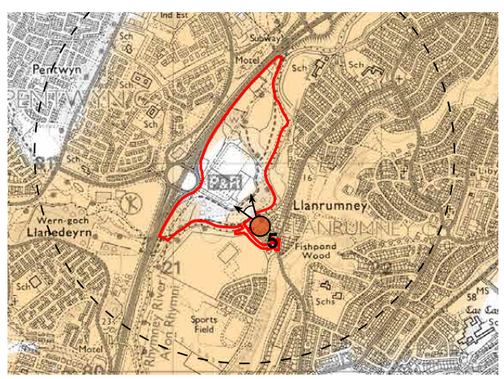
Viewpoint 5: Ball Lane



Viewpoint Location

Photo taken - 21/01/2022

Height :	**12.105m AOD**
Easting :	**321438.489**
Northing :	**180705.768**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.25
Visually Verified Representative Viewpoint (Wireframe)

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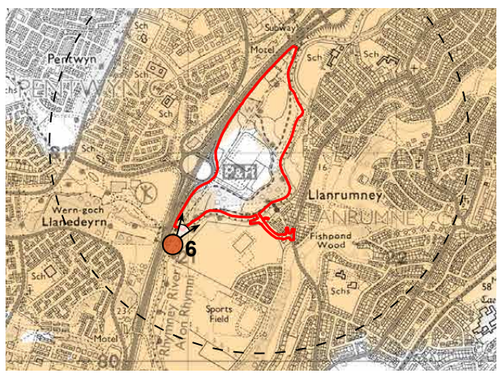
Viewpoint 6: Rhymney Trail/ Public Footpath Llanedeyrn 7#1



Viewpoint Location

Photo taken - 21/01/2022

Height :	**10.998m AOD**
Easting :	**320930.532**
Northing :	**180640.756**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.26
Visually Verified Representative Viewpoint (Wireframe)

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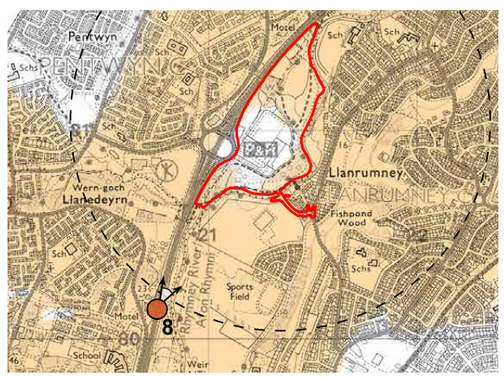
Viewpoint 8: Pedestrian bridge over A48



Viewpoint Location

Photo taken - 21/01/2022

Height :	**24.936m AOD**
Easting :	**320771.570**
Northing :	**180175.001**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.27
Visually Verified Representative Viewpoint (Wireframe)

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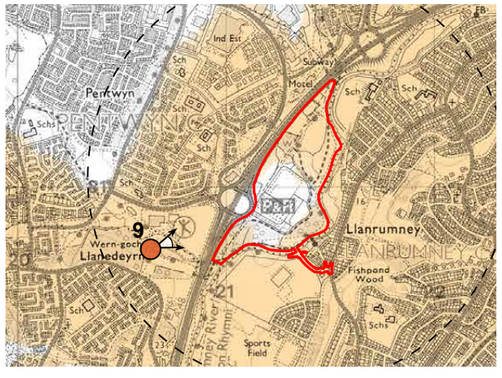
Viewpoint 9: Circle Way East / Parc Coed y Nant



Viewpoint Location

Photo taken - 21/01/2022

Height :	**30.923m AOD**
Easting :	**320585.069**
Northing :	**180585.946**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.28
Visually Verified Representative Viewpoint (Wireframe)

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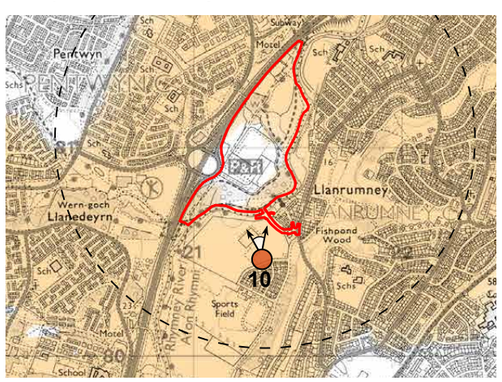
Viewpoint 10: Clovelly Cresent



Viewpoint Location

Photo taken - 21/01/2022

Height :	**10.891m AOD**
Easting :	**321298.296**
Northing :	**180437.020**

Photo taken - 08/10/2025

Unverified view

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.29
Visually Verified Representative Viewpoint (Wireframe)

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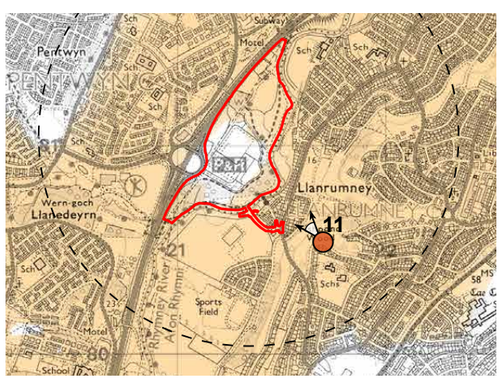
Viewpoint 11: Glastonbury Terrace



Viewpoint Location

Photo taken - 21/01/2022

Height :	**42.362m AOD**
Easting :	**321644.145**
Northing :	**180505.192**

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.30
Visually Verified Representative Viewpoint (Wireframe)

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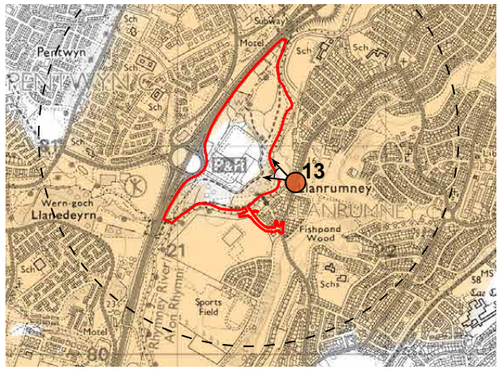
Viewpoint 13: Ball Road



Viewpoint Location

Photo taken - 21/01/2022

Height :	**15.927m AOD**
Easting :	**321503.097**
Northing :	**180575.954**

Photo taken - 08/10/2025

Unverified view

Wireframe KEY

- **Zone A**
- **Zone B**
- **Zone C**
- **Zone D**
- **Zone E**

2190 Cardiff Park and Ride East
Appendix 6.31
Visually Verified Representative Viewpoint (Wireframe)

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NOVEMBER 2025

Cardiff East Park and Ride, Pentwyn

Appendix 7.1 Health Impact Assessment

CONDUCTED BY ICENI PROJECTS LIMITED ON BEHALF OF CURTIS HALL LIMITED (LTD.)

Conducted by Iceni Projects
Limited on behalf of Curtis Hall
Limited (Ltd.)

November 2025

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3 POLICY CONTEXT AND LITERATURE REVIEW 13

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6 SUMMARY AND RECOMMENDATIONS 37

APPENDICES

A1. RELEVANT HEALTH LITERATURE

Document title:	**Cardiff East Park and Ride, Llanrumney: Health Impact Assessment**
Job Number:	I001352
Date:	November 2025
Author / Checked / Approval:	NF / AB / KF

1 INTRODUCTION

1.1 This document has been prepared by Iceni Projects Limited on behalf of Curtis Hall Limited (Ltd) ('the Applicant') in support of a hybrid planning application submitted to Cardiff City Council (the 'Council') for the redevelopment of Cardiff East Park and Ride, Llanrumney (hereafter referred to as 'the Site').

1.2 The hybrid planning application seeks planning permission for the following description of development:

"*Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works."*

1.3 Planning should seek to promote healthy, successful places for people to live and work in. This can be achieved by providing the homes, jobs and services that people need, reducing environmental effects and delivering well-designed buildings and spaces which will create the conditions for healthy, active lifestyles. In addition to access to healthcare services, several other factors are known to influence a person's health status and lifestyle, including economic, environmental and social conditions. These factors are referred to as the wider determinants of health.

1.4 A Health Impact Assessment (HIA) is a practical tool that brings together existing information to demonstrate that health, as a material planning consideration, has been addressed. In Cardiff, the purpose of an HIA is to support the aims of the Local Development Plan (2006–2026) and the Planning for Health and Well-being Supplementary Planning Guidance (SPG), which promote healthier environments through land use planning.

1.5 The HIA process identifies, evaluates, and presents the potential health impacts, both positive and negative, of a proposed development on existing and future populations, taking into account the wider determinants of health such as access to services, active travel, air quality, and social cohesion. It also outlines mitigation strategies to minimise adverse effects and enhance the health-promoting aspects of the scheme, ensuring that development contributes to a more inclusive, resilient, and health-supportive urban environment.

Site Context

1.6 The Site extends to approximately 23.4 hectares (ha) and is located entirely within the administrative area of Cardiff City Council. The Site is situated at Ordnance Survey (OS) National Grid Reference ST212808 while the postcode of the Site is CF23 8HH.

1.7 The existing use of the Site is a Park and Ride facility. In addition to the Park and Ride, the Site features areas of woodland and scrub land with public rights of way and informal footpaths. The existing Park and Ride contains a hard-surfaced area of 4.9 ha with approximately 900 car parking spaces, as well bus drop-off and pick-up points, an office/amenity building and various compounds. The site is accessed from the A48, Eastern Avenue.

1.8 The Site is not shown on the Council's adopted proposals map to be allocated for any specific use. However, in terms of other planning designations, the Site features an area of ancient woodland to the north and a small area to the south, in addition to a number of TPO trees. The north of the Site and a corridor along the river Rhymney lies in an area of high flood risk from rivers and the rest of the Site lies in a low flood risk area. The Site lies within the River Rhymney river corridor.

1.9 Immediately to the north-west of the Site lies the dual carriageway (A48) which extends to the south towards Cardiff City centre. Beyond this lies the residential area of Pentwyn, while to the east lies the residential area of Llanrumney. To the south, on the opposing side of the river, planning permission for a residential scheme of 98 residential units was permitted under application ref:18/02594/MJR. Construction on that site has been largely completed.

Figure 1.1 Site Location

Proposed Development

The Proposed Development

1.10 The Proposed Development is seeking to achieve planning permission for the following:

> *Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works.*

1.12 This HIA should be read in conjunction with the Design and Access Statement which accompanies the planning application, as well as the suite of technical documents submitted with the planning application.

Report Structure

1.13 The assessment is structured as follows:

- **Section 2: Assessment Methodology -** sets out the assessment methodology and the identifies the relevant impact areas.
- **Section 3: Policy Context -** provides an overview of the policy context for considering the health impacts of development.
- **Section 4: Baseline Conditions –** presents the demographic, health and socio-economic profile of the local population and provides an overview of community infrastructure provision.
- **Section 5: Impact Assessment –** provides an assessment of the potential health impacts of the Proposed Development and identifies appropriate mitigation and
- **Section 6: Conclusions** – sets out the conclusions of the assessments and the main recommendations.

2 ASSESSMENT METHODOLOGY

2.1 A HIA is a practical tool that brings together existing information to demonstrate that health, as a material planning consideration, has been addressed. This is considered a best practice approach by the World Health Organisation (WHO).

2.2 The aim of a HIA is to produce a set of evidence-based recommendations to inform decision-making to maximise the positive health impacts and minimise the negative health impacts of proposed policies, plans or projects[1].

2.3 There is no prescribed methodology for assessing the health impacts of development proposals however, the methodology applied within this assessment draws on best practice approaches and examples. The following documents helped devise the assessment methodology which has been agreed with officers:

- **Wales HIA Checklist (A Practical Guide) -** this tool, published by the Wales HIA Support Unit, is designed to assess the likely health impact of development plans and proposals including planning frameworks and masterplans for large areas, regeneration and estate renewal programmes and outline and detailed planning applications; and
- **Health in Environmental Impact Assessment, A Primer for a Proportionate Approach (2017) -** this document, published by the Institute of Sustainability and Environment Professionals (ISEP) provides guidance and recommendations for considering population and human health.

Approach

Baseline

2.4 Firstly, this assessment outlines a baseline health profile of the population (including demographic data, social, economic and community assets, and information on priority groups). The baseline assessment draws on the following:

- Demographic, housing and socio-economic profile (utilising data from Othe Welsh government published ‘Stats Wales’ Population estimates by local authority and age, and Welsh Index of Multiple Deprivation;

[1] World Health Organisation (2022) Health Impact Assessment

- Health profile (utilising public health data from Public Health Wales (PHW), Data Cymru and the Cardiff and Vale Local Public Health Team's Health Needs Assessments.
- Social infrastructure, sustainable transport and environmental profile (utilising data from Data Cymru, Transport for Wales, and Natural Resources Wales and Cardiff City Council etc); and
- Community engagement process undertaken and feedback received – This provides an alternative insight into different ways the proposals could affect health and whether the mitigation measures are tailored to the local context.

2.5 Education provision, dentist capacity and community facilities are scoped out of the baseline assessment as it is not anticipated that these facilities are relevant to the construction or operation of the Proposed Development.

2.6 This analysis is used to identify any priority groups who could be impacted by the Proposed Development. This will be based on the Wales Health Impact Assessment Support Unit's non-exhaustive list[2] which includes:

- Sex/Gender related groups;
- Age related groups: Children and young people, Older people;
- Income related groups: People on low income, Economically inactive, Unemployed/workless, People who are unable to work due to ill health;
- Groups who suffer discrimination or other social disadvantage: People with physical or learning disabilities/difficulties, Refugee groups, People seeking asylum, Travellers, Single parent families, Lesbian and gay and transgender people, Black and minority ethnic groups, Religious groups;
- Income related groups; and
- Geographical groups: People living in areas known to exhibit poor economic and/or health indicators, People living in isolated/over-populated areas, People unable to access services and facilities.

Assessing Effects

2.7 This assessment then identifies and assesses the potential effects of the Proposed Development on health outcomes of the general population, as well as priority groups using an assessment criteria matrix based on the Wales HIA Support Unit Health and Wellbeing Determinants Checklist[3] to consider the connection between determinants and potential health impacts. Determinants are

[2] WHIASU (2020) Population Groups Checklist

[3] WHIASU (2020) Health and Wellbeing Determinants Checklist

factors that can influence health outcomes and are set out in the table below. As well as physical health, potential effects on mental health and wellbeing (influenced by factors including sense of control, participation in community and economic life, feeling safe) will also be considered where relevant.

Table 2.1 Examples of Health and Wellbeing Determinants

Topic	Determinants
Lifestyles	Diet, Physical Activity, Sexual Activity, Use of alcohol, cigarettes, non-prescribed drugs, Other risk-taking activity.
Social and community influences on health	Family organisation and roles, Citizen Power and influence, Social support and social networks, Neighbourliness, Sense of belonging, Local pride, Divisions in community, Social isolation, Peer pressure, Community identity, Cultural and spiritual ethos, Racism and other social exclusion.
Living/environmental conditions affecting health	Built environment, Neighbourhood design, Housing, Indoor environment, Noise, Air and water quality, Attractiveness of area, Green Space, Community Safety, Smell/odour, Waste disposal, Road hazards, Injury hazards, Quality and safety of play area.
Economic conditions affecting health	Unemployment, Income, Economic inactivity, Type of employment, Workplace conditions.
Access and quality of services	Medical services, Public amenities, Other caring services, Careers advice, Shops and commercial services, Transport including parking, Education and training, Information technology.
Macro-economic, environmental and sustainability factors	Government policies, Gross Domestic product, Economic development, Biological diversity, Climate.

2.8 Effects are considered across the demolition and construction works and once the Development is completed and operational. The duration of the effects is highlighted. Where an impact is identified, actions and measures are recommended to mitigate an adverse impact or enhance or secure a beneficial impact. Monitoring is then proposed to ensure this is secured.

2.9 The assessment then explores the health effects of the Proposed Development in combination with other health effects of cumulative schemes.

2.10 This approach has been agreed with Cardiff Council through the pre-application process. The overall methodology is summarised in the flow chart below:

Figure 2.1 Overall Methodology

Impact Areas

2.11 When assessing the health and inequalities effects of the Proposed Development, the geographical scope of the assessment must be clearly defined. It is likely that the most significant health and inequalities effects will predominantly be felt close to the Site, particularly those concerning social infrastructure, spatial characteristics, walking distances, the retail hierarchy, socio economic characteristics and the neighbourhood character all indicate that the strongest functional relationships are most likely to be within the Site's immediate surrounding area. This area forms the Local Impact Area (LIA) for this assessment.

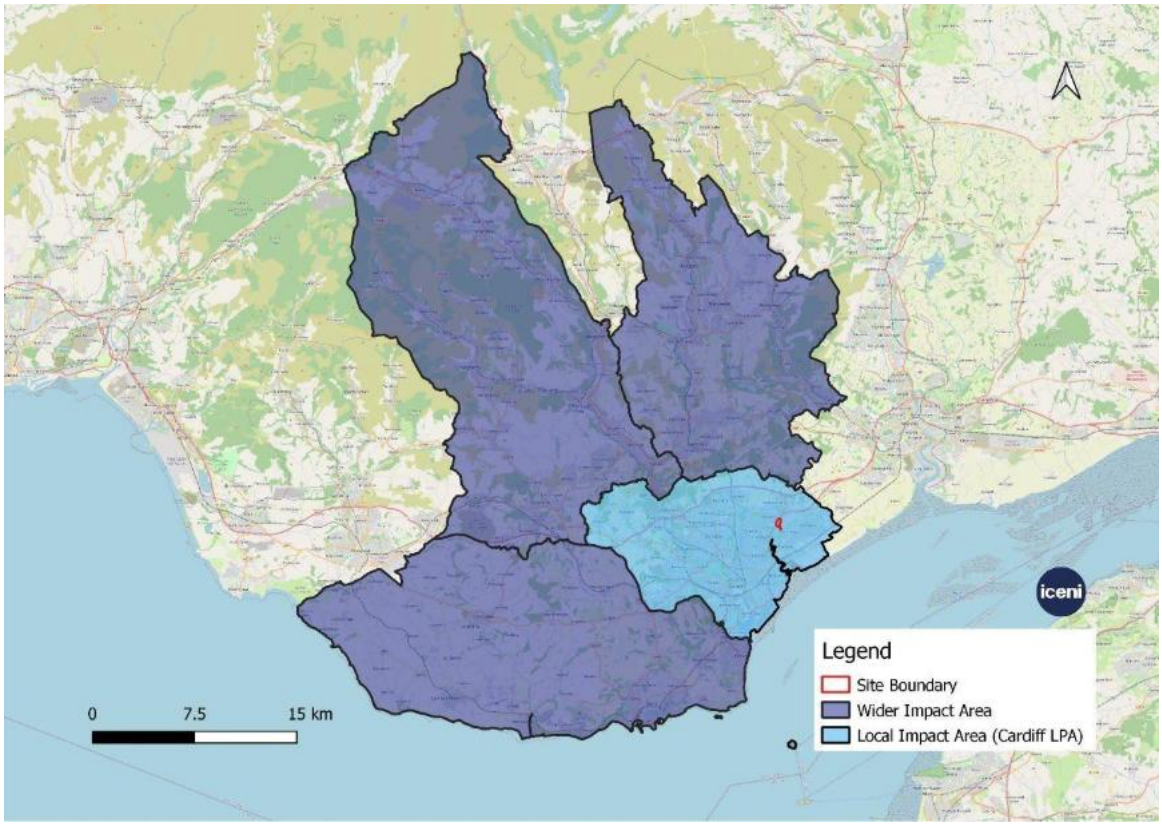
2.12 The Cardiff Local Authority boundary has been used to define the LIA as this area represents the most appropriate statistical fit due to the scale and nature of the Proposed Development. Some effects arising from the Proposed Development will be spread over a broader geographical area. Fo this reason the Wider Impact Area (WIA) includes the local authorities of the Vale of Glamorgan, Rhondda Cynon Taf, and Caerphilly. The Wider Impact Area has been established by analysing commuting pattern data (Census, 2011) of people who work in Cardiff. In total, people that originate their commute in these local authorities combined with Cardiff, represent 84.6% of people that work in Cardiff.

2.13 The site is located within the Lower Super Output Area (LSOA) Pentwyn 3, where data from the Indices of Multiple Deprivation is applied to assess local socio-economic conditions

2.14 The extent of this impact area may be varied for some receptors following best practices or the availability of data. Where this is the case, this will be highlighted within the ES chapter. Indirect or multiplier effects of the Proposed Development, for example concerning the wider economy, will also be considered. A map of the proposed Impact Areas is shown in the figure below. It is likely that the most significant health and inequalities effects will predominantly be felt close to the Site.. As such, in some instances a smaller spatial extent may be considered. Where this is the case, it will be highlighted throughout the HIA and may be dependent upon

- The availability of data e.g. Public Health Wales data;
- To align with other technical assessments within the EIA; or
- Where it would be more appropriate to review alternative boundaries.

Figure 2.2 Study Areas



Source: Iceni Analysis

Significance Criteria

2.15 The assessment of health effects is assessed based on the scale of the increase or decrease compared to the baseline position, as well as the nature and context of the effects, considering the sensitivity of the identified receptor. As per IEMA's 'Determining Significance For Human Health In Environmental Impact Assessment' (2022), the significance of an effect is usually a matter of expert professional judgement informed by reference to an evidence base and to practitioner guidance. Analysis draws on qualitative and quantitative inputs and evidence, including from other technical assessments. The assessment of significance can be highly contextual and requires the assimilation and consideration of a range of information, such as:

- Scientific or academic literature;
- Baseline conditions for the population;
- Health priorities in the jurisdiction;
- Consultation for the project;
- Regulatory standards in the jurisdiction; and

- Health policy context in the jurisdiction.

2.16 The location of the effects and their likely duration are considered where possible. However, in instances where effects cannot be quantified or measured, the assessment is based on qualitative factors and professional judgement.

Receptors and Receptor Sensitivity

2.17 The sensitivity of affected receptors is considered on a scale of high, medium, low, or very low. It is determined through consideration of the baseline position and comparison with wider trends. Consideration is also given to the priority and value attributed to specific receptors in strategy and policy terms. Overall, the assessment is based on professional judgement.

Table 2.1 Receptor Sensitivity Descriptors

Value (Sensitivity)	Descriptor
High	The health or social infrastructure receptors would be operating at full capacity with no surplus capacity for both the existing and future residents.
Medium	The health and social infrastructure receptors would be operating at near capacity levels with surplus capacity for existing and future residents.
Low	The health and social infrastructure receptors would be operating at below capacity with excess surplus capacity for both the existing and future residents.
Very Low	The receptor of limited or no importance.

Magnitude of Impact

2.18 The magnitude of impact is considered as the change experienced from the baseline conditions and the sensitive receptor and was considered on a scale of high, medium, low and very low. Professional judgement is used to determine the magnitude of change for all effects and was considered contextually in terms of the existing baseline and other health factors.

Table 2.2 Magnitude of Impact Descriptors

Impact Magnitude	Descriptor
High	The Development could be expected to have substantial effects (by extent, duration, or magnitude) of more than local significance on the key elements/ features of the baseline conditions, including the population profile, health, levels of deprivation, and facility provision.
Medium	Where the Development could be expected to have notable effects on the key elements/ features of the baseline conditions, including the population profile, health, levels of deprivation, and facility provision.
Low	Where the Development could be expected to have slight, short or localised effects on the key elements/ features of the baseline conditions, including the population profile, health, levels of deprivation, and facility provision.
Very Low	Where the Development could be expected to result in very little/ no distinguishable change from the baseline conditions including the population profile, health, levels of deprivation, and facility provision.

Determining the Duration of Effect

2.19 The duration of the health effects is considered against whether it is temporary or permanent. Due to their nature, all operational effects are permanent unless otherwise stated. In terms of temporary effects, the duration is determined in **Table 2.3** below.

Table 2.3 The timescale for the Temporary Effects

Impact Magnitude	Descriptor
Short Term	Less than 5 years
Medium Term	5 to 25 years
Long Term	25+ years

Assessing Significance

2.20 The significance matrix set out in **Table 2.4** below was used to determine the significance of an effect based on the sensitivity of the receptor and the magnitude of impact.

Table 2.4 Significance of Effect Matrix

Receptor Sensitivity	Magnitude of Impact			
	High	Medium	Low	Very Low
High	Major Beneficial / Adverse	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse
Medium	Major Beneficial / Adverse	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible
Low	Moderate Beneficial / Adverse	Minor Beneficial / Adverse	Negligible	Negligible
Very Low	Minor Beneficial / Adverse	Negligible	Negligible	Negligible

2.21 Effects classified as major or moderate are considered 'significant' (highlighted in grey in the table above), whereas effects classified as minor or negligible are considered 'not significant'. Where the effect is greater than negligible, the effect will then be identified as being either 'beneficial' or 'adverse' and defined as follows:

- Beneficial - a positive and/or advantageous effect; or
- Adverse - a negative and/or disadvantageous/detrimental effect.

Limitations and Assumptions

2.22 Where relevant, assumptions and limitations are highlighted within this assessment. However, the key points of note are identified in this section.

2.23 Data sources are referenced. Where possible, the latest available data has been used; however, it should be noted that many data sources are frequently updated and could be subject to change from the time of drafting or during the planning application process.

2.24 Public health profiles with local authority-level data have been used. This HIA draws on the information set out in other planning application documents and other technical documents available at the time of writing this report.

3 POLICY CONTEXT AND LITERATURE REVIEW

3.1 This section provides an overview of the legislative and policy context for considering the health impacts of development. To ensure that health is considered in a holistic manner, this HIA has been informed by wider policy and literature surrounding healthy places. A list of key articles is presented in **Appendix A1**.

National Policy and Legislation

Future Wales 2040: The National Plan (2021)

3.2 Future Wales 2040: The National Plan ('the National Plan') sets out the land use planning policies and principles for Wales and provides the national policy framework to 2040.

3.3 The National Plan's primary objective is to ensure key national priorities are addressed through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of communities.

3.4 The National Plan constitutes the national tier of the 3-tier planning system, with the preparation of Strategic Development Plans required in all four regions, filtering down to local development plans at the local authority level. Cardiff is located within the South Eastern Region.

3.5 Cardiff is identified within the South East region as a 'National Growth Area' that will be the main focus for growth and investment in the South East region. Strategic and Local Development Plans should recognise the National Growth Area as the focus for strategic economic and housing growth; essential services and facilities; advanced transport and digital infrastructure. Inequalities in the four regions will be addressed by building stronger links between public services, communities and business.

Prosperity for All: The National Strategy (2017)

3.6 The Welsh Government, through its National Strategy, seeks to ensure that Wales is: prosperous sand secure; healthy and active; ambitious and learning; and united and connected. It focuses on those four areas as key themes.

3.7 Through the Prosperous and Secure Theme, the Welsh Government aims to "break down the barriers many faces to getting a job, and create the right environment for businesses to grow and thrive". The Healthy and Active theme highlights the need to "deliver an integrated public transport

network which supports our aim to enable people to travel more actively, by combining different types of transport with walking and cycling".

Local Policy and Strategies

Cardiff Local Development Plan (2016)

3.8 The Cardiff Local Development Plan sets out the spatial strategy and the vision for Cardiff and was formally adopted January 2016. The overall vision for the Plan is that Cardiff will be a *"world-class European capital city with an exceptional quality of life and at the heart of a thriving city-region."* A key outcome for the Plan is for people living in Cardiff to be healthy, with priorities including reducing inequalities in health and addressing the differentials in life expectancy across the city and promoting healthy lifestyles and prevention of ill health.

- **Policy KP14: Healthy Living** – seeks to reduce health inequalities through encouraging healthy lifestyles, addressing the social determinants of health and providing accessible health care facilities. Developments will be supported which provide for active travel, accessible and useable green spaces

- **Policy KP5: Good Quality and Sustainable Design** – aims to provide a healthy and convenient environment for all users that supports the principles of community safety, encourages walking and cycling, and enables employment, essential services and community facilities to be accessible by sustainable transport.

- **Policy C6: Health** – Priority in new developments will be given to reducing health inequalities and encouraging healthy lifestyles by ensuring that they provide a physical and built environment that supports interconnectivity, and active travel choices, and promotes healthy lifestyles.

Planning for Health and Wellbeing SPG (2017)

3.9 The SPG supports policies in the Local Development Plan relating to health and planning. It outlines the key role local planning policies have in ensuring opportunities exist for people to make healthier lifestyle choices and in addressing inequalities in health.

3.10 The SPG emphasises how the built environment can support individuals, families and communities to be active by ensuring interconnectivity within and between developments, prioritising pedestrian over motorised transport, and prioritising active travel structures and layouts. Developers should take into account access to a range of services and public transport.

The Well-being of Future Generations (Wales) Act 2015

3.11 The Well-being of Future Generations Act is underpinned by sustainable development and sets out seven Well-being Goals to guide public bodies in Wales: A prosperous Wales; A resilient Wales; A healthier Wales; A more equal Wales; A Wales of cohesive communities; A Wales of vibrant culture and thriving the Welsh language; and A globally responsible Wales.

3.12 The 'A healthier Wales' goal aims for a society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood. A key priority in achieving this goal is identified as place-making and designing-in community health and well-being: enabling places to support the health and well-being of people and communities. This includes supporting individuals and communities to access active and sustainable transport.

Cardiff Well-being Plan 2023 – 2028

3.13 The Well-being Plan sets out Cardiff's Public Services Board (PSB) priorities over the next five years, focussing on areas such as managing recovery and renewal from the Covid-19 pandemic; ensuring that population growth and economic success benefits all citizens; reducing the inequity gap between the city's most and least deprived; meeting the needs of an ageing population; responding to increasing demands on health and social services; and urgently making the systemic changes needed to mitigate the impacts of climate change and decarbonise the city.

3.14 The Well-being Plan's ambition is to ensure that, for generations to come, Cardiff is an even better place to live and work, and where the benefits of growth are felt by all citizens, the region and nation. The Plan sets out several objectives relevant to health and wellbeing, such as Objective 5: A Capital City that Works for Wales which aims to deliver sustainable, inclusive economic growth, helping to create job opportunities, in particular, 'high value', well-paid jobs.

3.15 The Plan suggests that there are large disparities in levels of unemployment linked with spatial inequality, there is a gap in healthy life expectancy4 which has continued to widen between the most and least deprived areas of the city and there are significant differences in educational attainment levels. The Plan also states that in the more deprived wards of Cardiff, air quality is poorer, there is less access to green space and crime is concentrated in these areas.

Literature Review

3.16 A literature review relating to the wider determinants of health associated with the built environment is set out in **Appendix A1**. Alongside the local health profile, this provides supporting evidence of the health impacts relating to the Proposed Development. The key summary points from this review are included below and focus on the main areas of relevance to the Proposed Development.

Table 3.1 Literature Review Summary Points

Evidence	Proposed Development
Research provides an understanding of the links between environmental noise and the impacts on health including sleep disturbance, annoyance, hypertension and related diseases (A1.3).	A guiding principle of the Proposed Development is to deliver a high-quality data centre development which will not adversely affect nearby residents, during construction and operation, to ensure they can live comfortably and happily. See Living/Environmental Conditions affecting health within the assessment matrix at Table 5.1.
Evidence highlights that walking and cycling are good for our physical and mental health. Switching more journeys to active travel will improve health, quality of life and the environment (A1.4).	The Proposed Development aims to promote active lifestyles through enabling cycling and walking through and beyond the Site. The Proposed Development will provide pedestrian and cycle linkages to Llanrumney and Pentwyn. See Lifestyles within the assessment matrix at Table 5.1.
Healthy developments can reduce health inequalities, reduce obesity and overweight, improve mental health and address social isolation (A1.9).	The Proposed Development promotes active lifestyles through the provision of open space enhancements and pedestrian and cycle linkages to Llanrumney and Pentwyn. See Lifestyles within the assessment matrix at Table 5.1.
Research shows that where someone lives can have an impact on their mental health with the quality of the built environment being a determining factor for mental health, with noise, pollution levels, quality of greenspace, access to services and even 'beauty' all playing a part (A1.12).	The Site falls within the 10% most deprived areas in Wales. The Site performs particularly poorly in the Income, Community Safety and Health domains of the Welsh Index of Multiple Deprivation (WIMD). The Proposed Development will provide employment opportunities during its construction and operation. The Proposed Development will be well-light and will have security measures, where necessary. The Proposed Development will also provide active travel routes which will promote healthy lifestyles to those living and working in proximity to the Proposed Development. See the assessment matrix at Table 5.1.

Summary

3.17 There is a focus at national, regional and local levels to improve health and well-being outcomes. Planning and development play a crucial role in providing the environment for this to be achieved, with Cardiff acknowledging the importance of improving the well-being of the community. It seeks to reduce health inequalities while supporting sustainable economic growth.

3.18 Cardiff's health policies encompass a comprehensive and proactive approach to promoting well-being, ensuring equitable access to healthcare services, and addressing community health needs through strategic planning, collaboration and evidence-based interventions.

4 BASELINE CONDITIONS

4.1 This section sets out the demographic and health profile of the population, as well as considering the economic and labour market profile, and community infrastructure provision. The population of Cardiff Local Authority boundary has been considered as the primary authority where the Site is located and represents the Local Impact Area, as well as the Local Impact Area, while effects on the Wider Impact Area ('WIA' – the local authorities of the Vale of Glamorgan, Rhondda Cynon Taf, and Caerphilly) have also been considered. This baseline assessment enables greater understanding of the potential for health impacts.

Demographic Profile

Age

4.2 Mid-year population estimates for 2022 show that the population of Cardiff is around 274,035 people.

4.3 Based on mid-2022 population estimates, **Figure 4.1** provides a comparison of the population age structure for the LIA, the WIA, and Wales. The age profile of the LIA is generally younger when compared to the other comparator areas, with a much lower proportion of residents of retirement age. Conversely, the WIA, and Wales have a larger proportion of older people in comparison to the LIA.

Figure 4.1 Population age profile

Source: ONS mid-year population estimates, 2023

4.4 The LIA has a larger proportion of residents of working age (16 – 64) compared to the WIA and Wales at 67.5% compared to 61.0% and 60.9% respectively. However, many of these are likely to be students, with the largest age group being those aged 20 – 24. Excluding this group, the proportion of residents aged 25 – 64 in the LIA is similar to that of the WIA and Wales at 50.7% compared with 51.5% and 50.5% respectively, although within the LIA this group skews younger than in the WIA and Wales.

4.5 An outline of the ethnic groups comprising the population of the study areas according to the 2021 Census4 is presented below.

Table 4.1 Ethnic Group

Ethnic group	Local Impact Area	Wider Impact Area	Wales
Asian, Asian British or Asian Welsh	9.7%	1.4%	2.9%
Black, Black British, Black Welsh, Caribbean or African	3.8%	0.3%	0.9%
Mixed or Multiple ethnic groups	4.0%	1.3%	1.6%
White	79.2%	96.5%	93.8%
Other ethnic group	3.3%	0.3%	0.9%

Source: ONS Census, 2021

4.6 Cardiff's population is significantly more ethnically diverse that that of comparator areas. There are lower proportions of White ethnic groups in the LIA (79.2%) compared to the WIA (96.5%) and Wales (93.8%). The largest minority group in Cardiff are Asian, Asian British or Asian Welsh at 9.7%, while this group represents only 1.4% and 2.9% of residents of the WIA and Wales respectively.

4.7 The table below sets out English language proficiency in the study areas according to the 2021 Census[5].

[4] ONS (2021) Census 2021 – TS021 – Ethnic Group

[5] ONS (2021) Census 2021 – TS029 – Proficiency in English

Table 4.2 English language proficiency

English Language Proficiency	Local Impact Area	Wider Impact Area	Wales
Main language is English (English or Welsh in Wales)	91.1%	98.5%	96.7%
Main language is not English (English or Welsh in Wales): Can speak English very well or well	6.9%	1.2%	2.6%
Main language is not English (English or Welsh in Wales): Cannot speak English well	1.6%	0.2%	0.6%
Main language is not English (English or Welsh in Wales): Cannot speak English	0.3%	0.0%	0.1%

Source: ONS Census, 2021

4.8 In terms of English language proficiency, the proportion of people who cannot speak English in the LIA (0.3%) is higher than in the WIA or at the national level at 0% and 0.1% respectively. In addition, the proportion pf people for whom English is not their first language is higher in Cardiff than in comparator areas, albeit overall the proportion whose first language is English remains over 90% in all three geographies.

Deprivation Profile

4.9 The Welsh Indices of Multiple Deprivation (IMD) provides a ranking of neighbourhoods (LSOAs) to compare levels of deprivation across the country. To calculate which rank an area is, seven domains - income, employment, education, health, crime, barriers to housing and living environment- are measured to produce an overall relative measure of deprivation.

4.10 The Site falls into the LSOA Pentwyn 3. **Table 7.5** below breaks down the eight domains that make up the IMD for the Pentwyn 3 LSOA according to the overall rank and decile[vii]. Overall, the area performs poorly for most indicators apart from access to services (4th decile). The Site is located in an area that is extremely deprived in terms of income, employment, health, education, community safety and physical environment.

4.11 **Table 4.3** provides a breakdown of each domain of deprivation score. For health, the LSOA is within the 10% of most deprived LSOAs. This indicator measures morbidity, disability and premature morality as well as poor physical and mental health. The only domain of deprivation for which Pentwyn 3 is not in the 10% of most deprived LSOAs in Wales is crime.

Table 4.3 Index of Multiple Deprivation for LSOA Pentwyn 3

Domain of Deprivation	Rank (Out of 1,909 LSOAs in Wales)	Decile (where 1 is the most deprived and 10 is the least deprived)
Income	31	1st
Employment	168	1st
Education, Skills and Training	97	1st
Health	124	1st
Crime	717	4th
Barriers to Housing and Services	89	1st
Living Environment	129	1st
Overall IMD	**499**	**3rd**

Source: Welsh Index of Multiple Deprivation, 2019

Economic and Labour Market Profile

4.12 Nomis' Labour Market Profile tool draws from a range of data sources including ONS annual population survey (2024), ONS annual survey of hours and earnings (2024), ONS jobs density (2022), and ONS Business Register and Employment Survey (2023).

4.13 A review of the Labour Market Profile tool has been undertaken. MSOA-level data was not available with this tool to understand the economic and labour market profile of the LIA. Data for each local planning authority is available, and so the economic and labour market profile is presented at a Cardiff (WIA) scale. An outline economic and labour market profile is presented below.

4.14 78.5% of those aged 16-64 in Cardiff's population are economically active, which is higher than the national average (75.9%), and the WIA average (73.3%).

4.15 Table 4.4 sets out employment by occupation. 65.8% of workers in Cardiff are in Standard Occupational Classification (SOC) major group 1-3 (1 – managers, directors and senior officials, 2 – professional occupations, 3 – associate professional and technical). This is higher than that of the WIA (60.6%) and Wales (49.2%). Conversely, only 7.4% of workers in Cardiff are in SOC major group 8-9 (8 – process plant and machine operatives, 9 – elementary operations). This is much lower than comparator areas, at 16.7% in the WIA and 14.8% in Wales.

Table 4.4 Employment by Occupation, July 2024 – June 2025

	LIA	WIA	Wales
SOC 2020 Major Group 1-3	**65.8%**	**60.6%**	**49.2%**
1 Managers, Directors and Senior Officials	13.0%	11.2%	10.3%
2 Professional Occupations	37.2%	26.9%	23.7%
3 Associate Professional Occupations	15.7%	22.5%	15.1%
SOC 2020 Major Group 4-5	**15.0%**	**28.5%**	**20.0%**
4 Administrative & Secretarial Occupations	9.6%	16.8%	9.9%
5 Skilled Trades Occupations	5.4%	11.7%	10.0%
SOC 2020 Major Group 6-7	**11.7%**	**18.2%**	**16.0%**
6 Caring, Leisure And Other Service Occupations	4.7%	10.9%	8.9%
7 Sales and Customer Service Occupation4s	7.0%	7.3%	7.0%
Soc 2020 Major Group 8-9	**7.4%**	**16.7%**	**14.8%**
8 Process Plant & Machine Operatives	1.8%	6.4%	5.6%
9 Elementary Occupations	5.6%	10.3%	9.1%

Source: ONS annual population survey, 2024

4.16 Table 4.5 sets out qualification levels. Cardiff has a less well-educated resident population with 54.4% of 16-64 year olds having a qualification of RQF4+, which is higher than the WIA (38.3%) and Wales (44.0%).

Table 4.5 Qualifications, July 2024 – June 2025

	Cardiff	WIA	Wales
RQF4 And Above	54.4%	38.3%	44.0%
RQF3 And Above	70.2%	57.6%	65.5%
RQF2 And Above	85.4%	81.0%	85.6%
RQf1 And Above	86.7%	83.5%	87.8%
Other Qualifications	6.5%	5.7%	3.6%
No Qualifications	6.8%	10.0%	8.6%

Source: ONS annual population survey, 2023

4.17 Gross weekly pay by place of residence is very similar in Cardiff (£584.60) when compared to the WIA (£583.55). However, that of Wales is slightly lower at £574.90. The job density ratio[6] in Cardiff is 0.97 which is much higher than the national average (0.77). Meanwhile the job density of areas that comprise the WIA are lower than Cardiff's at 0.56, 0.61 and 0.62 for Caerphilly, Rhondda Cynon

[6] The density figures represent the ratio of total jobs to population aged 16-64. A job density of 1.0 would mean that there is one job for every resident aged 16-64.

Taf and Vale of Glamorgan respectively. This all suggests that Cardiff has a high proportion of individuals who commute into it from surrounding areas.

4.18 Tabel 4.6 shows which sectors employ the most people in Cardiff, the WIA and Wales. 14.1%% of workers in Cardiff are employed within Human Health and Social Work Activities. While this is the largest industry in the LIA in terms of employment, the proportion of jobs in this industry in the WIA and Wales as a whole is even higher, at 17.6% and 17.1% respectively.

4.19 Overall, the Cardiff economy has a diversified concentration in high value service sectors such as financial and insurance activities (8.0% compared with 1.0% and 2.5% in the WIA and Wales respectively), professional scientific and technical services (8.0% compared with 3.9% and 5.0% in the WIA and Wales respectively), and public administration (11.5% compared with 6.1% and 8.6% in the WIA and Wales respectively), reflecting a broader spread across multiple modern industries.

Table 5.6: Employee Jobs 2023

	Cardiff	WIA	Wales
Total Employee Jobs			
Full-Time	70.50%	66.88%	66.28%
Part-Time	29.50%	33.12%	33.72%
Employee Jobs by Industry			
A: Agriculture, forestry and fishing	0.04%	0.38%	1.08%
B: Mining and quarrying	0.01%	0.12%	0.13%
C: Manufacturing	3.53%	14.84%	10.68%
D: Electricity, gas, steam and air conditioning supply	0.77%	0.27%	0.46%
E: Water supply; sewerage, waste management and remediation activities	0.88%	1.37%	0.92%
F: Construction	3.53%	6.05%	5.07%
G: Wholesale and retail trade; repair of motor vehicles and motorcycles	10.60%	12.09%	12.68%
H: Transportation and storage	1.99%	3.30%	3.23%
I: Accommodation and food service activities	7.95%	7.70%	8.68%
J: Information and communication	4.42%	1.24%	2.30%
K: Financial and insurance activities	7.95%	0.96%	2.46%
L: Real estate activities	1.77%	1.10%	1.38%
M: Professional, scientific and technical activities	7.95%	3.85%	4.99%
N: Administrative and support service activities	8.39%	8.79%	7.30%

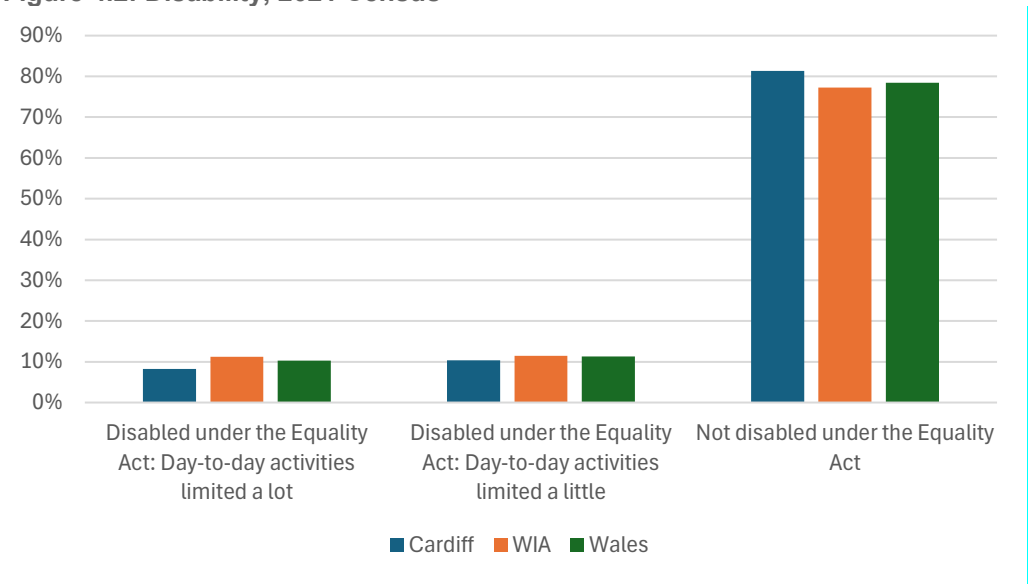
O: Public administration and defence; compulsory social security	11.49%	6.05%	8.60%
P: Education	9.72%	9.89%	8.76%
Q: Human health and social work activities	14.14%	17.59%	17.05%
R: Arts, entertainment and recreation	2.65%	2.47%	2.61%
S: Other service activities	2.21%	1.92%	1.61%
T: Activities of households as employers; undifferentiated goods-and services-producing activities of households for own use	0.00%	0.00%	0.00%
U: Activities of extraterritorial organisations and bodies	0.00%	0.00%	0.00%

Source: ONS Business Register and Employment Survey, 2023

Health Profile

4.20 Census data indicates that 18.6% of the population in the LIA are disabled under the Equality Act with a long-term health problem or disability that limits their day-to-day activities[7]. Within this group, 10.4% of Cardiff's population report that their daily activities are "limited a little", while 8.2% report that their daily activities are "limited a lot". This is slightly lower than the WIA and the national average, as illustrated in **Figure 4.2**.

Figure 4.2: Disability, 2021 Census



Source: ONS Census, 2021

[7] Census 2021 - TS038 Disability

4.21 According to NHS Wales, the proportion of Cardiff residents who have a high of life satisfaction is 83.2% compared with 81.3% at the national average. While in the local authorities which comprise the WIA, the proportions are 79.8%, 77.2% and 81.7% in Caerphilly, Rhondda Cynon Taf and Vale of Glamorgan respectively[8].

4.22 The health profile for Cardiff has been used, while data for the WIA is only available for some indicators, specified below in table 4.7. For some indicators the University Health Board for Cardiff and the Vale has been used, where it has it has been noted.

4.23 The health profile for Cardiff and the WIA is generally in line with national averages for the majority of health indicators, with Cardiff performing slightly better. Both male and female residents in Cardiff live slightly longer than their counterparts across the WIA and on average in Wales.

4.24 The prevalence of children aged 4 and five considered a healthy weight is higher in the Cardiff and Vale University Health Board than at the national level, while the proportion of hospital admissions associated with self-harm is lower at 4.8% than at the national level (6.1%).

4.25 Age standardised death rates for both heart and circulatory diseases and strokes are lower in Cardiff than the average across the WIA and at the national level while the Standardised Mortality Ratio (SMR) for all deaths is also lower. In terms of health, the key performance indicators are as follows:

Table 4.6 Public Health Indicators

	Cardiff	WIA	Wales
Life expectancy (male) [9]	78.1 years[10]	77.7 years[11]	77.9 years
Life expectancy (female)	82.3 years[12]	81.5 years[13]	81.8 years

[8] NHS Wales 2020 https://phw.nhs.wales/services-and-teams/observatory/data-and-analysis/mental-wellbeing-in-wales-2020/

9 Wesh Government, (2020 – 2022) Infobase Cymru https://www.infobasecymru.net/IAS/themes/healthandsocialcare/generalhealth/tabular?viewId=47&geoId=1&subsetId=

10 Cardiff Local Authority

[11] Average between WIA local authorities

12 Cardiff Local Authority

[13] Average between WIA local authorities

Prevalence of children aged four and five considered a healthy weight	77.5%[14]	-[15]	74.3%
Hospital admissions related to self-harm as a proportion of all admissions[16]	4.8%[17]	-	6.1%
SMR[18] for all deaths	98.0[19]	103.7[20]	100.0
Age standardised death rate per 100,000 for heart and circulatory diseases[21]	228.4[22]	266.9[23]	282.0
Age standardised death rate per 100,000 from stroke[24]	51.1[25]	52.9[26]	52.0

Source: NHS Wales, InfobaseCymru, British Heart Foundation

Social Infrastructure

4.26 As acknowledged within the NPPF, access to community infrastructure including education, health provision, community facilities, play space, open-space and sports and recreational facilities can have a significant impact on the health and well-being of the population. Strong, vibrant, sustainable and cohesive communities require good quality, accessible social and community infrastructure. This section looks at GP and hospital facilities in the local area.

[14] Cardiff and Vale University Health Board https://cavuhb.nhs.wales/news/latest-news/cardiff-and-vale-has-among-lowest-levels-of-childhood-obesity-in-wales/
[15] Data unavailable
[16] NHS Wales, External Causes by LHB Provider 2023/24 https://dhcw.nhs.wales/data/statistical-publications-data-products-and-open-data/hospital-admissions/hospital-admissions-publications-tables1/
17 Cardiff and Vale University Health Board

[18] Standardised Mortality Ratio (SMR) is a statistical measure to compare the mortality rates in a specific population to a standard population. Wales has an SMR of 100, indicating that the observed number of deaths is exactly what would be expected based on the standard population. A ratio greater than 100 suggests that the observed rate in the study population is higher than expected, while a ratio less than 100 suggests lower rates than expected.
19 Cardiff Local Authority
[20] Average of LAs comprising the WIA
[21] British Heart Foundation (2023) https://www.bhf.org.uk/-/media/files/for-professionals/research/heart-statistics/bhf-statistics-compendium-2025
22 Cardiff Local Authority
[23] Average of LAs comprising the WIA
[24] British Heart Foundation (2023) https://www.bhf.org.uk/-/media/files/for-professionals/research/heart-statistics/bhf-statistics-compendium-2025
25 Cardiff Local Authority
26 Average of LAs comprising the WIA

Healthcare Provision

GP Facilities

4.27 A review of the NHS Wales shared service partnership tool 'Practices that operate in your area'[27], shows that there is one GP within 15 minutes' walk from the Site (1.2km) while the next closes is approximately 1.8 km from the Site.

Access to Healthy Foods

4.28 The Site is located within Pentwyn, a district within Cardiff. Pentwyn provides access to several shops that provide fresh food, such as Waitrose, Farmfoods and Lidl.

Summary

4.29 The baseline assessment provides an overview of the demographic and health profile of the population. It also establishes the levels of community infrastructure provision in the surrounding area. Key trends are as follows:

- Population: The LIA has a larger proportion of younger people and ethnic minority groups compared to the WIA and Wales. The proportion of people who cannot speak English in the LIA (0.3%) is higher than in the WIA or at national level at 0% and 0.1%, respectively.
- Deprivation: Overall, the Site experiences more deprivation than the national average. This is in line with Cardiff, which is within the 40% most deprived authorities in the country.
- Disability: 18.6% of the population in Cardiff are disabled under the Equality Act. This is slightly lower than comparator areas.
- Health and disease: The health profiles for Cardiff and the WIA are generally in line with national averages for the majority of health indicators.
- Social infrastructure: There are community facilities and open spaces within walking distance of the Site boundary and can also be reached via public transport.

Priority Groups

4.30 The review of the health baseline suggests that there are a number of groups that are currently more sensitive to adverse effects of demolition and construction, as well as potential changes to health

[27] NHS, Find a GP Service, https://www.nhs.uk/service-search/find-a-gp

determinants once the Proposed Development is completed and operational. These key priority groups are identified in **Table 4.12**.

Table 4.7 Identified Priority Groups

Priority Group	Explanation
Children and young people	There are notably higher proportions of children aged 0-19 within the LIA, compared to the WIA and Wales.
Black and Minority Ethnic Groups	Cardiff's population is significantly more ethnically diverse that that of comparator areas.
People living in deprivation	The LSOA where the Site is located is within the 10% most deprived neighbourhoods in the country in terms of overall deprivation. The LSOA falls within the 10% most deprived neighbourhoods in the country in terms of 'Income', 'Employment', 'Education, Skills and Training', 'Health', 'Barriers to Housing and Services', 'and 'Living Environment'.
People on low incomes	Cardiff performs in the lowest income decile for income according to index of multiple deprivation data.
People unable to access services and facilities	The LSOA where the Site is located is also within the 10% most deprived neighbourhoods in the country in terms of 'Barriers to Housing and Services'.

5 ASSESSMENT OF HEALTH IMPACTS

5.1 This section provides an assessment of the health impacts of the Proposed Development, covering both the demolition and construction phase, and the completed development phase. It applies the significance criteria described in Section 2.

5.2 It identifies the link between the determinants (factors that can influence health outcomes) and the health impact. The determinants have been based on HIA Health and Wellbeing Determinants Checklist[28] but will consider potential effects on physical and mental wellbeing for each of the following determinants:

- Lifestyles / behaviours affecting health;
- Social and community influences on health;
- Living and environmental conditions affecting health;
- Economic conditions affecting health;
- Access and quality of services; and
- Macro-economic, environmental and sustainability factors.

[28] WHIASU (2020) Health and Wellbeing Determinants Checklist

Table 5.1 Health Impact Assessment of the Proposed Development

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
Lifestyles	**Construction Phase** The Proposed Development will generate additional employment demand within the construction sector which would positively contribute to construction workers' incomes and lifestyles. The employment opportunities created would include a range of skill levels and could provide parents and guardians access to employment and thereby could help to reduce child poverty. As outlined in **Chapter 7: Socio-economics**, the Proposed Development would directly support 404 – 505 jobs over the construction period. Data centre construction workers receive approximately 10 – 20% higher salaries than the average for commercial construction[29] . This is particularly beneficial as the LSOA within which the Site lies suffers from income deprivation as identified in the baseline. Notwithstanding, construction workers suffer elevated levels of anxiety which can negatively affect lifestyles and are amongst the highest risk of suicide, at 3.7 times higher than the national average[30].	Minor	People on Low Incomes; People from ethnic minorities; Children and Young People; People unable to access services and facilities	Beneficial	Medium-term (temporary)	Mental Health Awareness Toolbox Talk to be provided to all site employees. To ensure that residents benefit from the new jobs created it is advised that the applicants should consider the development of an employment and skills plan with Cardiff Council to ensure local people have access to employment opportunities.	Minor beneficial medium-term (temporary) for the construction phase
	Operational Phase Evidence highlights that walking and cycling are good for our physical and mental health. Switching more journeys to active travel will improve health, quality of life and the environment. The Proposed Development aims to promote active lifestyles by promoting the use of sustainable and active modes amongst staff to travel to the Site. In addition, it also proposes to develop pedestrian and cycle linkages through landscape enhancements to provide recreational uses for the Rhymney Trail. enhancing current provision. Access to play spaces, community or sport facilities such as sport pitches can encourage physical activity. Open space that is of a higher quality is also more likely to be used for physical activity, social interaction or relaxation. The Proposed Development includes areas of new open space through landscaping enhancements to provide recreational uses for the Rhymney Trail for walking and cycling which will provide space for recreation and will encourage social interaction. The Rhymney Trail riverside walk through the site will be retained and enhanced as part of the works, with better surfacing, amenity points,	Minor	People on Low Incomes; People from ethnic minorities; Children and Young People; People unable to access services and facilities	Beneficial	Long-term permanent	Travel Plan to be implemented for the Site to promote the use of public transport, walking and cycling. Implementation and adherence to a Woodland Management Strategy and Landscape Strategy Plan.	Minor beneficial, long-term (permanent) for the operational phase.

29 Atkins Search (2025) https://www.atkinssearch.co.uk/insights/rise-in-data-centre-construction/

30 ONS (2021) Suicide by occupation, England and Wales

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
	lighting and information points. Encouraging physical activity and social interaction can be beneficial for various groups particularly young and older people, people with mental health issues. Site-wide landscaping and ecological/habitat improvements are proposed. Key habitats and foraging corridors are maintained/enhanced within the proposals to encourage growth within the wildlife population. A Woodland Management Plan will enhance the Ancient Woodland and other woodland located on the Site and provide for its sustainable improvement over future years.						
Social and community influences on health	**Construction Phase** The provision of local employment opportunities during the construction phase will help improve social cohesion and mental well-being among construction workers, alongside opportunities for subcontractors and those working in supporting industries. The construction phase will also lead to a new community of workers in the area. Construction activity may cause disturbance and stress to residents on neighbouring roads or land (for example through increased construction traffic) which can have an adverse effect on physical and mental health. These factors indicate that there will be both beneficial and adverse impacts on social cohesion and lifetime neighbourhoods during the construction phase. The emerging proposals have benefitted from a number of pre-application meetings with the Council, with feedback from both planning officers and various technical consultees. The feedback has informed the design evolution of the scheme. Feedback from consultation with stakeholders raised concerns about noise, which could negatively affect the quality of life for nearby residents. However, the Site is distant from residential properties and enveloped by road networks and other noise generating infrastructure. Notwithstanding, a Noise Assessment is appended to the Environmental Statement (Appendix 3.3).	Minor	People on Low Incomes; People living in areas known to exhibit poor economic and/or health indicators; People unable to access services and facilities; Unemployed/ Workless.	Adverse	Medium-term (temporary)	As part of a Construction Environmental Management Plan (CEMP), a Project Manager should be appointed to manage the sub-phases of the Proposed Development during construction. Additionally, the Principal Contractor will agree a process for public consultation. The agreed process will be documented either in a Community Liaison Procedure or within the CEMP. Contractors should be encouraged to use sub-contractors from the local area to reduce journeys to work and the impact of travel on local communities and road network. Employment and Skills Plan to enhance employment and training opportunities for local residents.	Negligible for the construction phase
	Operational Phase The provision of public landscaped amenity space seeks to maximise opportunities for social interaction. Networks in a community can help to reduce depression and levels of chronic illness as well as speed vulnerable groups such as older people living alone. The Proposed Development will also include natural surveillance and make for effective passive and active policing. An External Lighting Assessment Report has been prepared by HasLid Services and accompanies the planning application. It states that the lighting design of the Proposed Development will comply with guidance so that it is safe and well-lit, while ensuring there will be no disruption to bats and other nocturnal local wildlife. Additional mitigation measures have been put in place to further enhance the lighting design such as the installation of backlight shields on lighting fixtures located adjacent to ecological zones.	Minor	People on Low Incomes; Children and Young People; People living in areas known to exhibit poor economic and/or health indicators; People unable to access services and facilities.	Beneficial	Long-term permanent	Implementation of a Landscape and Ecological Management Plan. The provision of amenity spaces to encourage physical activity and social interaction, which is considered beneficial for various groups particularly young and older people, people with mental health issues and health issues The lighting strategy should be adhered to, to ensure the Site is well-lit and safe after dark for pedestrians, to reduce the 'fear of crime' and decrease opportunities for anti-social behaviour or criminal activity, whilst also ensuring no adverse ecological impacts on sensitive areas surrounding the Site.	Minor beneficial, long-term (permanent), for the operation recovery after illness and improve well-being, particularly for al phase

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
Living / environmental conditions affecting health	**Construction Phase** Poor air quality is linked to incidence of chronic lung disease, heart conditions and asthma in children therefore people with respiratory health issues, children and older people are more likely to be vulnerable to a change in air quality. The local health profile indicates that Cardiff performs better than the WIA and Wales as a whole with a lower number of heart and circulatory disease related deaths per 100,000. To prevent dust from being generated at source, measures, such as covering of stockpiles, on-site traffic management, wheel washing and good plant and vehicle maintenance, will be employed to minimise these effects as far as practicable. As discussed in ES Chapter 4: Air Quality, the construction effects of the Proposed Development on air quality are expected to be negligible. The Noise Impact Assessment at Appendix 3.3 of the ES also assesses that noise effects will not be significant. A CEMP will include roles and responsibilities, control measures and activities to be undertaken to minimise environmental effects, as well as monitoring and record-keeping requirements. It will remain a live document to ensure that it is specific to the works and processes that are to be employed during construction site activities.	Minor	Children and Young People; People living in areas known to exhibit poor economic and/or health indicators; People with circulatory diseases.	Adverse	Medium-term (temporary)	The Principal Contractor will need to implement the necessary management and operational controls on-site in order to reduce adverse noise and vibration impacts on nearby sensitive receptors from construction site activities. Measures and control strategies to minimise the impacts of construction activities on workers and neighbouring residents could be set out within a CEMP. This would be developed and formally adopted prior to the commencement of works on-site and secured via an appropriately-worded planning condition.	Negligible for the construction phase
	Operational Phase Research shows that where someone lives can have an impact on their mental health with the quality of the built environment being a determining factor for mental health, with noise, pollution levels, quality of greenspace, access to services and even ‘beauty’ all playing a part. The Proposed Development will deliver a high-quality data centre development. The height and scale of the Proposed Development has been developed with consideration of the surrounding landscape and townscape, and key views to the Site. In the majority of viewpoint locations, the Proposed Development would not give rise to adverse landscape and visual impacts. At reserved matters stage, green walls will be considered on key elevations to increase contributions to biodiversity and reduce any residual visual impacts. There are strong links between environmental noise and the impacts on health including sleep disturbance, stress, hypertension and related diseases. As outlined in ES Chapter 4: Air Quality the operational effects of the Proposed Development on air quality are expected to be negligible. ES Appendix 3.3 Noise Assessment concludes that the Proposed Development will generate noise but will not have an adverse impact on the existing noise sensitive properties. The design of the scheme has been maximised with passive mitigation measures to ensure that impact of noise and vibration is kept to a minimum. The Proposed Development will retain existing vegetation where possible. A Landscape Strategy has been developed including new vegetation and tree planting which will contribute to the overall amenity of the Site.	Minor	Children and Young People; People living in areas known to exhibit poor economic and/or health indicators; People unable to access services and facilities; People living in deprivation; People with existing health issues and disabilities.	Beneficial	Long-term permanent	Implementation and adherence to a Landscape Management Strategy.	Moderate beneficial long-term (permanent) for the operational phase

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
Economic conditions affecting health	**Construction Phase** Employment and income are key determinants of health and wellbeing. Unemployment is significantly linked to deprivation, health inequalities and poorer health outcomes. Given that the LIA currently experiences income deprivation, opportunities for well paid employment will particularly benefit the local community. As outlined in **Chapter 7: Socio-economics**, the Proposed Development would directly support 404 – 505 jobs over the two-year construction period. Jobs in construction include entry level apprenticeships and traineeships, as well as roles that require specialist skills and management experience. For data centre construction, this involves both general skills (such as surveyors, electricians or engineers) and industry specific skills (knowledge of uninterruptible power supplies, heating, ventilations and air cooling, cable management. Data centre construction workers receive approximately 10 – 20% higher salaries than the average for commercial construction[31] . In addition, it is anticipated that 483 - 501 jobs across the Cardiff economy, will be indirectly generated from the Proposed Development. These jobs could include supply chain roles, alongside those working in retail or hospitality. Additionally, the Applicant plans as mitigation to provide early notification of job vacancies and procurement contracts, to promote opportunities to local residents and businesses. This will be done via collaboration with local partners and existing employment support networks such as the into work advise services and Cardiff works as well as non-Cardiff City Council run support hubs such as the Bright Futures Project and Inspire to Achieve. Employment provides opportunities for residents to participate in new social networks, which can in turn increase self-esteem and confidence, alongside an increased ability to afford leisure and recreational activities.	Moderate	People on low incomes; Young people; Economically inactive; Unemployed/ workless.	Beneficial	Medium-term (temporary)	The Proposed Development is expected to provide local employment opportunities during the construction phase where appropriate. Contractors will be encouraged, wherever possible, to use sub-contractors from the local area. This could be secured through a planning condition which ensures an Employment and Skills Plan is provided to facilitate employment opportunities for local people. This would directly support those previously unemployed or on low incomes locally.	Major Beneficial medium-term (temporary) for the construction phase
	Operational Phase The Proposed Development will increase the employment floorspace for the borough, by providing 30,329.5sqm GIA of data centre development across four development plots. These facilities will provide employment opportunities generated (both direct and indirect) in the borough and wider area. It is estimated that	Moderate	People on low incomes; Young people; Economically inactive;	Beneficial	Long-term permanent	Secure an Employment and Skills Plan to ensure local people have access to employment opportunities.	Moderate beneficial long-term (permanent) for the operational phase

31 Atkins Search (2025) https://www.atkinssearch.co.uk/insights/rise-in-data-centre-construction/

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
	the Proposed Development could directly support 100 to 125 jobs on Site, including both part-time and full-time roles. The additional employees at the Proposed Development will also provide increased local spend in the area and in doing so, help local businesses and the economy. Indirectly, this will help to support approximate 195 – 244 further employment opportunities.		Unemployed/ workless.				
Access and quality of services	**Construction Phase** As the Site is currently in use as a Park and Ride for staff, patients and visitors attending the University Hospital, there will be some disruption to existing services. However, an alternative site has been identified to continue this use to mitigate any disruption posed. Increased traffic flows from construction vehicles accessing the Site may result in potential disruption to the strategic road network, which may impact upon the ability of local residents to access healthcare appointments, organised social events, or recreational and community facilities. However, as identified in the Transport Assessment, there is not expected to be significant effects in terms of construction traffic. The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP).	Minor	Children and young people; People with circulatory disease; People unable to access services and facilities.	Neutral	Medium-term (temporary)	A Construction Environmental Management Plan will be agreed prior to construction to detail the traffic plan for deliveries. This will ensure that the effect of construction traffic is mitigated against.	Negligible medium-term (temporary) for the construction phase
	Operational Phase The baseline social infrastructure audit outlined in **Section 2** above has identified that there is currently a range of local services within the surrounding area. As the Proposed Development is not a residential scheme, it is not anticipated that the Proposed Development will generate new residents who could affect current access to services such as schools and GP facilities. The proposals would result in an uplift of 7.48 ha of developed land (data centre) compared to the existing situation. However, due to the security considerations of the data centre plots, this area is not designated as open space or considered to be of significant amenity value. Any loss of undeveloped 'open space' proposed is considered to be negligible due to being of little amenity value, and the impact would be further mitigated through the protection and enhancement measures proposed. Furthermore, access to open space would be significantly improved with the provision of PRoWs across the wider Site and the new bridge link. Increased traffic flows from construction vehicles accessing the Site may result in potential disruption to the strategic road network, which may impact upon the ability of local residents to access healthcare appointments, organised social events, recreational and community facilities. However, as identified in the Transport Assessment, there is not expected to be significant effects in terms of operational traffic.	Minor	Children and Young People; People unable to access services and facilities.	Neutral	Long-term permanent		Negligible long-term (permanent) for the operational phase
Macro-economic, environmental and sustainability factors	**Construction Phase** Embodied energy and carbon in construction materials can lead to an increase in fossil fuel use leading to an increase in greenhouse gas emissions which impacts on climate change. Minimising or reducing	Minor	People living in areas known to exhibit poor economic and/or	Adverse	Medium-term, temporary	A CEMP should set out the strategy, control measures and monitoring procedures that will be implemented to manage and mitigate any	Minor adverse medium-term (temporary) for the construction phase

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
	waste via recycling and appropriate waste disposal can improve human health directly and indirectly. At the reserved matters stage, a Whole Life Carbon Assessment should be undertaken to inform the specification of building materials, considering their embodied carbon and environmental impacts. As mitigation, waste generated during the construction of the Proposed Development will need to be mitigated by the preparation and implementation of a Site Waste Management Plan (SWMP), including measures to ensure that sustainable waste management practices are embedded into the design and construction of the Proposed Development. This mitigation measure would be a live document to be updated throughout the construction process. Through these measures, the proposal will directly respond to the One Planet Cardiff strategy and contribute to the National and Local objectives (including the Cardiff Climate Change Strategy) to reduce carbon emissions.		health indicators; Children and young people; Older people.			adverse environmental effects of the construction process A Site Waste Management Plan will be implemented to ensure use of sustainable waste management practices	
	Operational Phase A Sustainability Statement accompanies the planning application. It outlines the steps that have been taken to minimise the environmental impact of the Proposed Development and achieve a significant on-site reduction in CO2 emissions, following the Energy Hierarchy methodology. The Proposed Development's design will be highly efficient, with the employment of highly efficient air source heat pump (ASHP) systems to serve space heating and cooling demands, and the use of solar thermal systems to pre-heat water. On-Site renewable energy will be generated from photo-voltaic solar panels. As of September 2024, data centres are designated as Critical National Infrastructure (CNI) due to their significance in supporting vital services such as healthcare, finance and communication. Data centres contribute to health benefits as they facilitate the analysis and sharing of large medical datasets to improve diagnosis and treatment outcomes. Data centres can enable advanced healthcare technologies such as telemedicine and electronic health records which aids in sustaining accessible and personalised patient care. This is particularly useful in remote areas and for chronic disease management. Proposed landscaping and species-specific measures will be designed to enhance the biodiversity of the Site such as planting to enhance retained and adjacent vegetation and be of a range of native species, or those of known value to wildlife, and the creation of areas of SuDS such as swales and basins and wildflower grassland which incorporate flowering species. The biodiversity of the site will be enhanced through careful management of the existing woodland, including ancient woodland, and shrub and grass areas. The Proposed Development aims to promote active lifestyles through enabling cycling and walking to work. A Travel Plan has been prepared to accompany the application which indicates that the proposed	Moderate	People living in areas known to exhibit poor economic and/or health indicator; People with existing health issues and disabilities.	Beneficial	Long-term permanent	It should be ensured that a monitoring programme is established during operation to measure the Proposed Development's operational energy consumption. Travel Plan to be implemented for the Site to promote the use of public transport, walking and cycling.	Moderate long-term (permanent) for the operational phase

Determinant	Description of the Potential Impact	Significance of Impact on Priority Groups	Priority Groups Most Affected	Impact (Beneficial / Adverse / Neutral)	Duration	Mitigation	Overall Residual Significance
	development has been designed with active travel linkages from the Site and connecting to Newport Road to the South which runs to the city centre and to Pentwyn Road to the north, connecting to the suburb of Pontprennau. A large portion of Carfiff will be within a short cycle of the Site. Improvements to the PRoWs that already run near the site are also integrated in the design. This will provide good quality routes for users of the site to access the wider area.						

6 SUMMARY AND RECOMMENDATIONS

6.1 This HIA has been prepared by Iceni Projects to identify any potential impacts of the Proposed Development on local health (both physical and mental).

6.2 Where an impact is identified, actions and measures are recommended to enhance the positive impacts. The Proposed Development is expected to result in a range of beneficial health outcomes, notably through the provision of new employment opportunities.

6.3 Of the six wider determinants of health outlined by the Wales HIA Support Unit, the majority of effects during the demolition / construction phase will be negligible after mitigation and all effects will be beneficial once the Proposed Development is complete.

Table 6.1 Summary of Residual Health Effects

Determinant Category	Effects During Demolition / Construction Phase	Effects Once Completed and Operational
Lifestyles / behaviours affecting health	Minor beneficial	Minor beneficial
Social and community influences on health	Negligible	Minor beneficial
Living and environmental conditions affecting health	Negligible	Moderate beneficial
Economic conditions affecting health	Major beneficial	Moderate beneficial
Access and quality of services	Negligible	Negligible
Macro-economic, environmental and sustainability factors	Minor adverse	Moderate beneficial
Overall	**Negligible**	**Moderate beneficial**

6.4 Recommendations have been provided to mitigate adverse effects and enhance the beneficial effects to lead to improved health outcomes. These should be considered at future stages of the project and include:

Demolition / Construction Phase

- Mental Health Awareness Toolbox Talk to be provided to all site employees;
- Construction Environmental Management Plan, Site Waste Management Plan and Community Liaison Procedures are to be secured; and
- Employment and Skills Plan to be secured.

Completed and Operational Phase

- Detailed Travel Plan to be implemented;
- Provision of fresh food to employees on-Site;
- Implementation of a detailed Landscape and Ecological Management Plan and adherence to the Lighting Strategy;
- Employment and Skills Plan to be secured; and
- A detailed Energy and Sustainability Statement should be prepared at reserved matters stage and ensure that a monitoring programme is established.

6.5 In summary, planning should seek to promote healthy, successful places for people to live and work in. This can be achieved by providing the homes, jobs and services that people need, reducing environmental risks and delivering well-designed buildings and spaces which will create the conditions for healthy, active lifestyles. It is considered that the Proposed Development achieves this objective as an overall negligible impact is identified for the construction phase and an overall moderate beneficial impact is identified once completed and operational.

A1. RELEVANT HEALTH LITERATURE

Healthy Places and the Built Environment
NHS (2019) Putting Health into Place
PHE and Partner (2020) Healthy weight environments: using the planning system
PHE and UWE (2020) Spatial Planning and Health: Getting Research into Practice
PHE and partners (2020) Health Impact Assessment in Spatial Planning
PHE (2017) Spatial Planning for Health: An Evidence Resource for Planning and Designing Healthier Places
RTPI (2020) Mental Health and Town Planning
Kellogg College and Global Centre on Healthcare and Urbanisation (2022) What Creates Healthy Cities
Housing and Health
PHE (2017) Improving Health Through the Home
Natural Environment
PHE and Partners (2020) Improving Access to Greenspace, a New Review for 2020
Active Travel and Transport
PHE (2016) Working Together to Promote Active Travel- A Briefing for Local Authorities

Transport Assessment

Cardiff East Park and Ride, Llanrumney

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Prepared by:

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SLR Project No.: 425.067363.00001

1 December 2025

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	1 December 2025	SGT	CP	ID

Basis of Report

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Appendices

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Appendix B **2022 Traffic Flow Diagrams**
Appendix C **2022 Traffic Data**
Appendix D **Collision Data**
Appendix E **Illustrative Site Layout and PRoW Networks**
Appendix F **Internal Site Drawings**
Appendix G **Interim Workplace Travel Plan**
Appendix H **Tremorfa Energy Park and Latos Data Centre TRICS Data**

1.0 Introduction

1.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall (the Applicant). This Transport Assessment (TA) has been prepared in support of the hybrid planning application being submitted by the Applicant to Cardiff Council (the Council) for the redevelopment of Cardiff East Park and Ride, Llanrumney (the site).

1.2 The planning application seeks planning permission for the following description of development:

Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works

Planning History

1.3 The site currently constitutes the Cardiff East Park and Ride, which provides a park and ride service to the University Hospital of Wales, and formerly to the city centre.

1.4 A previous planning application (planning ref: 22/02673/FUL) was prepared and submitted to the Council in November 2022 for the following:

Demolition of existing structures and redevelopment of the site to provide commercial floorspace (Use Classes B1, B2, B8, A3) and/or ancillary Class A1), associated drive-thru and car parking; the re-provision of the park and ride; a bridge across the Rhymney River; site wide landscaping and associated works.

1.5 The application was supported on transport matters by Vectos[1], with a TA, an Interim Workplace Travel Plan and ES Chapter prepared in support of the application. The TA dated August 2023 was updated by a Technical Note on various aspects to the scheme including lighting and the Public Rights of Way Network.

1.6 The planning application was consented in June 2024. Whilst this TA forms part of a new application on the site, all the transport measures that were proposed and consented as part of the TA for the former, consented scheme (Approved TA) are proposed as part of this updated scheme. As such, most of the principles regarding transport have been agreed by the Council when the former scheme gained consent in June 2024. This includes the construction of a new road link between the site and Llanrumney, and the traffic impact of the site within the Approved TA.

1.7 Whilst the full package of measures previously consented are being brought forward, the proposed development will also account for the conditions set out by the Council in the Decision Notice for the consent. This can be found at **Appendix A**.

[1] Now part of SLR Consulting Ltd.

2.0 Existing Situation

2.1 This section of the report will include a detailed description of the site location, the surrounding highway network and the general traffic and transportation of the area including public transport provision, and access to the site via active travel modes such as walking and cycling.

Site Location

2.2 The site is located in east Cardiff, approximately 1.6km northwest of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south.

2.3 **Figure 2.1** indicates the location of the proposed development in a local context.

Figure 2.1 – Site Location

Walking

2.4 There are no footways present on the A48 Eastern Avenue/Bryn Celyn Road junction or on the access road to the P&R. However, a number of leisure walking routes are located within the immediate vicinity of the site, which provide opportunity for travel in all directions on foot.

2.5 These leisure routes primarily take the form of PRoW routes, as illustrated in **Figure 2.2**. Within the immediate proximity of the site, several PRoW routes are present, providing connectivity to the north, east, west and south of the site. To the east of the site, PRoW routes connect with Ball Lane via a footbridge over the Rhymney River. Ball Lane includes footways on either side of the carriageway and connects with the wider walking network along Ball Road.

2.6 To the north of the site, PRoW routes connect with a footbridge over the A48. This provides connectivity to Pentwyn Road which also includes footways, and a number of local facilities. This can be seen in **Photograph 2.1.**

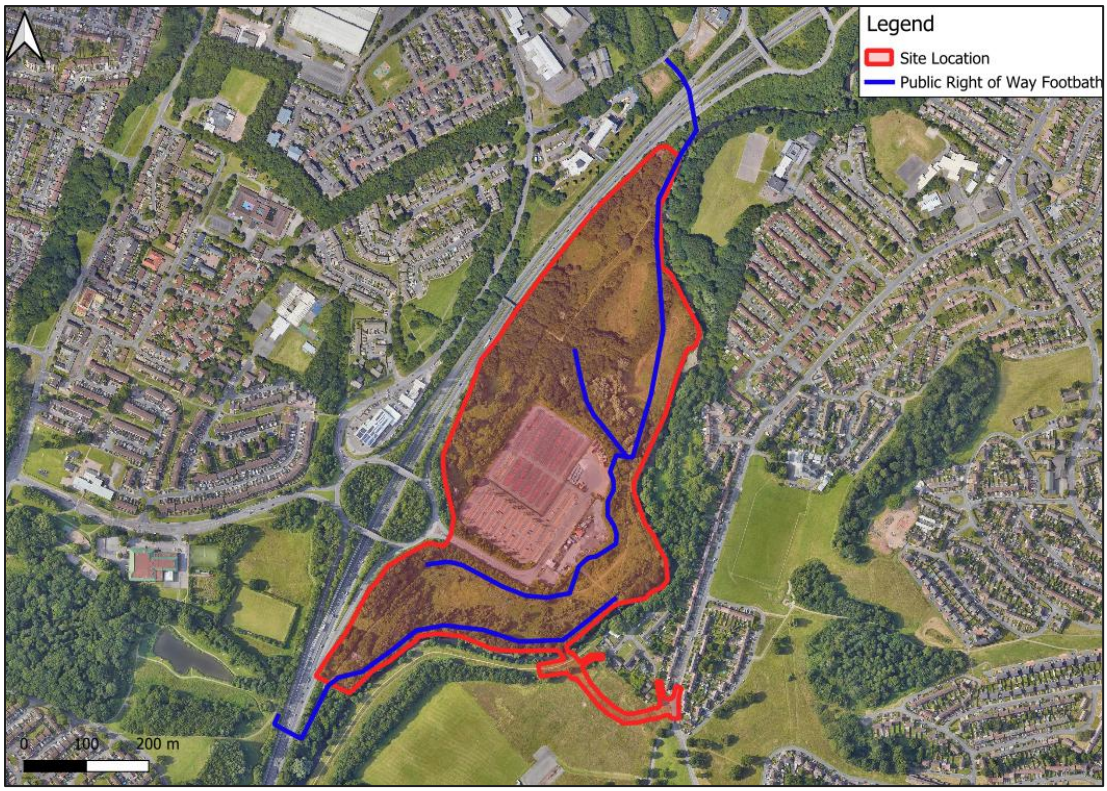
Photograph 2.1 – Public Right of Way across the A48

2.7 A further footbridge across the A48 is also located to the south of the site. This link provides connectivity to Circle Way East where footways and local facilities are also located.

2.8 These PRoW routes also provide a connection to the 'Rhymney Trail', a leisure walking and cycling route around Llanrumney Fields to the south of the site.

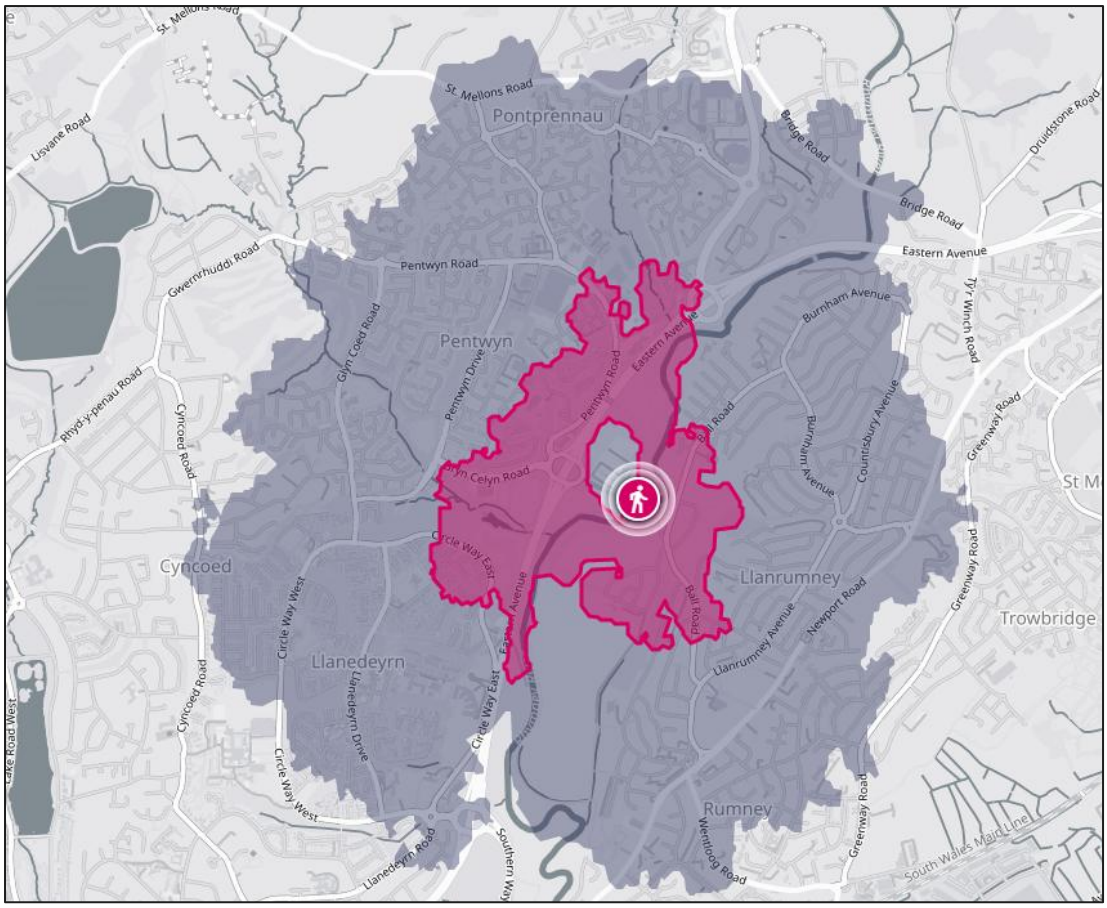
2.9 As described, whilst no footways are provided at the existing site access road and the Eastern Avenue / Bryn Celyn Road junction, the site benefits from a number of leisure active travel routes within the immediate vicinity of the site. These routes provide opportunity to connect with local facilities, services and key areas in all directions.

Figure 2.2 – Existing Public Rights of Way



2.10 **Figure 2.3** shows the current 15- and 30-minute walking isochrones from the site. It shows that (utilising the PRoWs) a large proportion of east Cardiff, including much of Llanrumney and Pentwyn can access the development within a 30-minute walk.

Figure 2.3 – 15 and 30 Minute Walking Isochrones



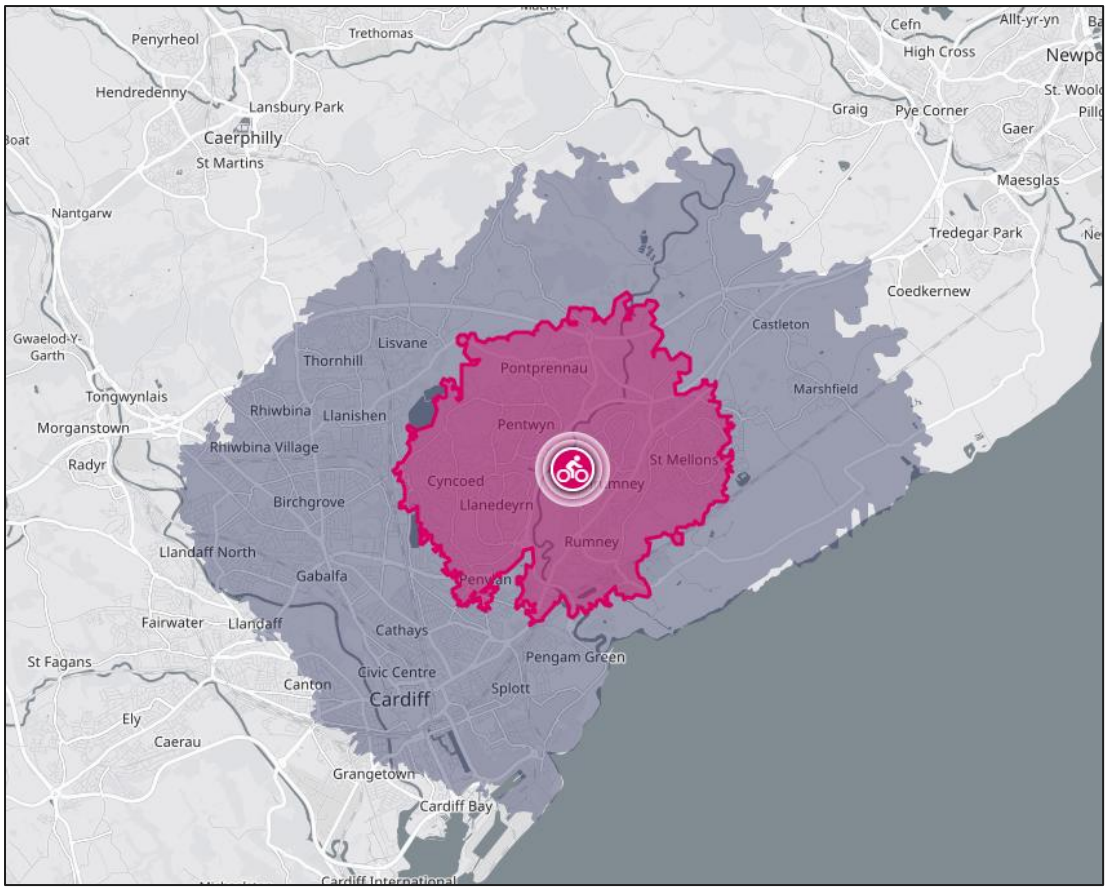
Cycling

2.11 Immediately to the east of the site, the Rhymney Trail runs in a north-south direction, providing a good leisure route accessible from the site than can be used to access the development. The Rhymney Trail runs along the Rhymney River, and to the south connects to Newport Road. Newport Road runs to the city centre and features a shared pedestrian/cycleway for much of its length.

2.12 To the north, the Rhymney Trail runs under the A48 Eastern Avenue to provide a route to Pentwyn Road. It also continues north to the suburb of Pontprennau and St Mellons Road, allowing communities within Pontprennau to access the development.

2.13 **Figure 2.4** shows the current 15- and 30-minute cycling isochrones from the site. It shows that a large proportion of Cardiff are within a short cycle of the site.

Figure 2.4 – 15 and 30 Minute Cycling Isochrones



Bus Services

2.14 A summary of bus services within the vicinity are displayed in **Figure 2.5**. A bus stop is located within the existing site which serves 'Cardiff East Park and Ride'. At present, this bus stop is served by a single bus route, the H59. The H59 provides connectivity with Heath Hospital and runs on a 20-minute frequency.

Figure 2.5 – Existing Bus Services

2.15 There are also bus stops located along Bryn Celyn Road to the west of the site, accessible via existing PRoW routes and footbridges over the A48. These stops are served by bus services 58. The 58 service provides a return service every 20 minutes to the city centre.

2.16 To the east of the site, bus stops are located along Ball Road, which can be accessed via a footbridge over the Rhymney River. These stops are served by bus services 49, 50, 101 and 102.

2.17 A summary of the bus services that are accessible from the site can be seen in **Table 2.1.**

Table 2.1 – Bus Routes accessible from Park and Ride Site

Number	Route	Operating Hours	Frequency (mins)			Operator
			M-F	S	S	
H59	Cardiff East Park and Ride – Heath Hospital	06:30-20:50	3 per hour	N/A	N/A	Cardiff Bus
58	Pontprennau – City Centre	05:14-22:35	3 per hour	2 per hour	2 per hour	Cardiff Bus
49, 50	St Mellons – City Centre	05:25-23:00	4 per hour	1 per hour	1 per hour	Cardiff Bus
101, 102	City Centre – St Mellons/Llanrumney via Pentrebane and Heath Hospital	09:05-17:15	1 per hour	N/A	N/A	Cardiff Bus

Rail Services

2.18 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, which is accessible within an 18-minute cycle from the site, or from using the H59 Bus Service from the Heath Hospital, approximately an 18-minute walk from the station.

2.19 Heath High Level Station is located on the Rhymney Line, and benefits from services to the south towards Cardiff Queen Street, Cardiff Central and Penarth every 15 minutes, and services to the north to Caerphilly, Ystrad Mynach and Bargoed. These provide good travel opportunities to use the station to access the site.

2.20 **Table 2.2** details some of the destinations accessible from the station.

Destination	Frequency (off-peak)	Average Journey Time (mins)
Cardiff Queen Street	6 trains per hour	6
Cardiff Central	6 trains per hour	10
Caerphilly	6 trains per hour	12
Barry	4 trains per hour	37
Penarth	2 trains per hour	24

Local Highway Network

2.21 The existing Cardiff East P&R site is directly accessed from the eastern arm of the A48 Eastern Avenue/Bryn Celyn Road junction and provides good access to local roads via Bryn Celyn Road and the A48. The A48 directly links with the M4 and as such, the site is considered to be well connected to the strategic road network.

A48

2.22 The A48 forms one of Cardiff's arterial routes linking the M4 in the west to the A4232 in the east. The A48 passes north of Cardiff city centre. In the vicinity of the site, the A48 is a dual-carriageway, with a 50mph speed limit travelling to the southwest and to the north east. Further along towards the north-west, the National Speed Limit then applies until reaching the M4. Towards the city centre, the National Speed Limit also applies in part until reaching the city centre.

2.23 The A48 also benefits from bus lanes from the A48 junction to the junction with the A4232 to the southwest, one on each side of the dual carriageway.

Pentwyn Road

2.24 Pentwyn Road is located to the northwest of the A48 junction and is a single-carriageway road subject to a 30mph speed limit. It leads from the site towards Pontprennau and has streetlighting and footways on both sides of the road from a short distance after the junction. There are bus stops present along the road with bus shelters available.

Bryn Celyn Road

2.25 Bryn Celyn Road is located to the west of the A48 junction, and is a dual-carriageway near the junction subject to a 30mph speed limit. It is subject to traffic-calming along its length, with road narrowings creating uncontrolled pedestrian crossings. There are footways present along its length, although not connecting to the A48 junction.

Ball Road

2.26 Ball Road is located to the southeast of the site, across the Rhymney River. It is a single-carriageway road subject to a 30mph speed limit. It runs from Burnham Avenue in the north east, before continuing south towards Llanrumney Avenue. The road is subject to traffic calming in the forms on humps along the carriageway and road narrowings. There are footways present along each side of the carriageway in addition to streetlighting.

Existing Traffic Data

2.27 MCC surveys were undertaken on Tuesday 15th February 2022 at the A48/P&R access junction (Pentwyn Interchange) and at the Ball Road/Hartland Road junction and an ATC survey was undertaken on Ball Road between Thursday 10th to Wednesday 16th February 2022.

2.28 The MCC survey recorded all turning movements at the Pentwyn Interchange junction by vehicle type between the hours of 08:00 – 09:00 and 16:30 – 17:30.

2.29 Flow diagrams showing the observed traffic flows on the highway network in 2022 are shown in **Appendix B** and the existing traffic data is included at **Appendix C**.

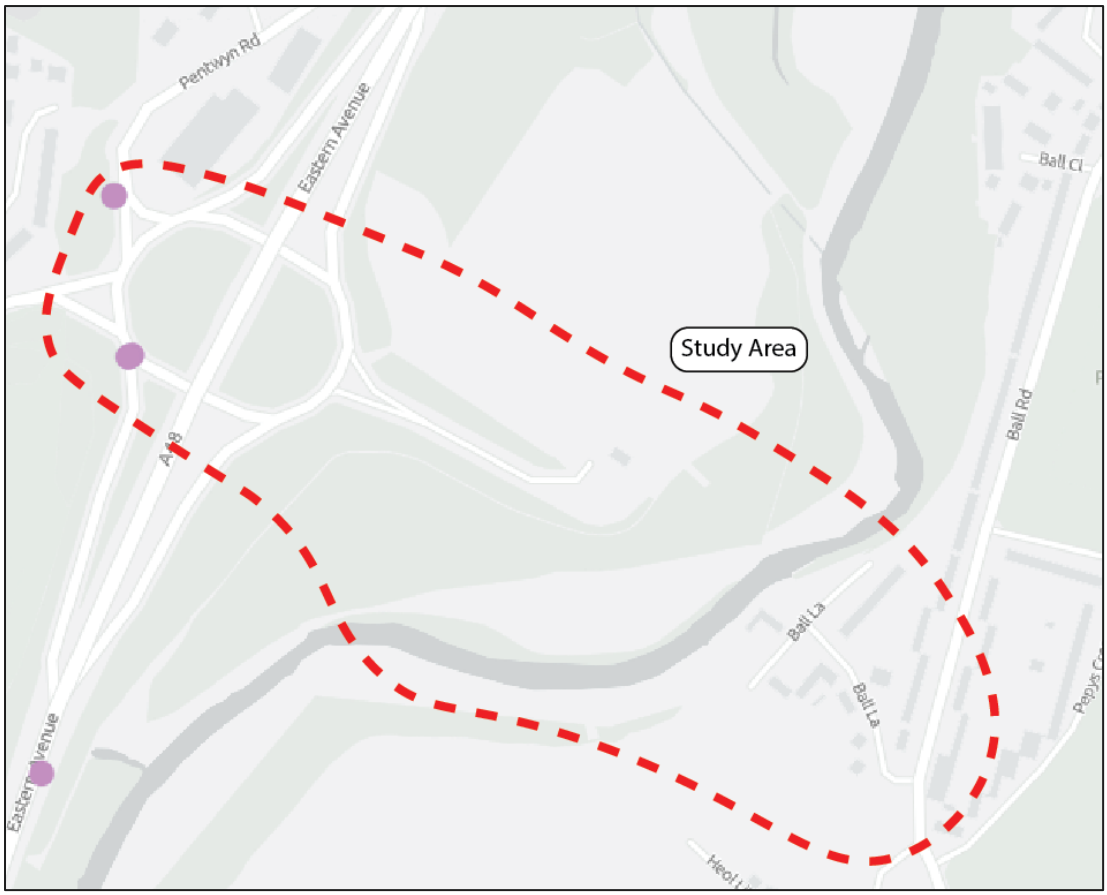
Personal Injury Collision Analysis

2.30 A Personal Injury Collision (PIC) analysis has been undertaken to review whether there may be an existing highway issues or collision clusters in the vicinity of the site which may be exacerbated by the proposed development.

2.31 The review has included any collisions that have happened on the existing Park and Ride Site, the A48 junction and Ball Road near the proposed junction, as these are the only locations where the development would have any significant impact on traffic levels.

2.32 The Department for Transport Mapping Application for Visualising Road Injury Casualties (MAVRIC) was used to review the collision history for the previous 5 years for which data is available (2020 – 2024). **Figure 2.6** shows the study area and the collision locations, and the collision data can be found attached at **Appendix D**.

Figure 2.6 – Collison Study Area and Locations



2.33 There is a total of three collisions shown in the study area of **Figure 2.6**, with one located on Pentwyn Road and two located on the A48 off-slip where it meets the roundabout junction. All collision were of a slight severity.

2.34 Due to there being a limited number of accidents that can be attributed to driver error, it can be presumed that there is no issue with the design of the nearby roads or junctions, or within the site, at present.

Summary

2.35 The site is located in east Cardiff, approximately 1.6km north west of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south, providing good links from the development to the wider area by foot.

2.36 The site benefits from having nearby bus services nearby towards Cardiff City Centre and other parts of Cardiff, including towards Heath Hospital.

2.37 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, and benefits from frequent services, including to Cardiff Central, Cardiff Queen Street, Caerphilly and Penarth.

2.38 A PIC review undertaken shows that there is no major issue with the design of the nearby roads or junctions, or within the site at present, due to there being limited collisions in the area over a period of 5 years.

3.0 Policy Review

3.1 The section details the national and local policy that impacts the development.

National Policy

Planning Policy Wales (Edition 12, February 2024)

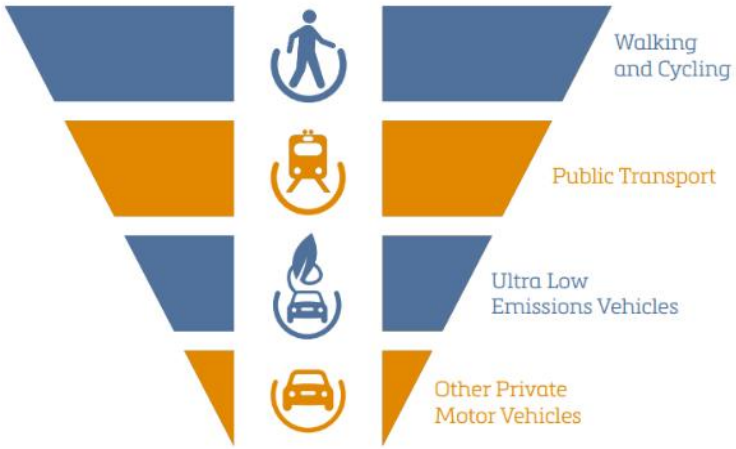
3.2 Planning Policy Wales Edition 12 (PPW) sets out the land use planning policies of the Welsh Government.

3.3 With regards to sustainable transport, PPW advises that, in the context of active and social places, which also relates to employment, all developments should encourage modal shift and be easily accessible by walking, cycling and public transport, by virtue of their location, design and provision of on and off site sustainable transport infrastructure.

3.4 Furthermore, the 'active and social' theme within PPW aims to ensure new development is located and designed in a way which minimises the need to travel, reduces dependency on the private car and enables sustainable access to employment, local services, and community facilities.

3.5 A key theme throughout PPW is the aim of reducing reliance on travel by private car, and the adverse impacts of motorised transport on the environment and people's health, by prioritising and increasing active travel and public transport. Additionally, it states that development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.

3.6 These themes of emphasis on sustainable transport and active travel are supported by the 'Sustainable Transport Hierarchy for Planning' included within PPW.



Technical Advice Note (TAN) 18: Transport

3.7 TAN 18: Transport describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated.

3.8 The document states that sustainable development should be achieved by:

- Integration of transport and land use planning;
- Integration between different types of transport; and
- Integration of transport policy with policies for the environment, education, social justice, health, economic development and wealth creation.

3.9 Integration of land use planning and development of transport infrastructure can help the Welsh Government achieve its wider sustainable development policy objectives by:

- Promoting resource and travel efficient settlement patterns;
- Ensuring new development is located where there is, or will be, good access by public transport, walking and cycling thereby minimising the need for travel and fostering social inclusion;
- Managing parking provision;
- Ensuring that new development and major alterations to existing developments include appropriate provision for pedestrians (including the with special access and mobility requirements), cycling, public transport, and traffic management and parking/servicing;
- Encouraging the location of development near other related uses to encourage multi-purpose trips;
- Promoting cycling and walking;
- Supporting the provision of high quality, inclusive public transport;
- Supporting provision of a reliable and efficient freight network;
- Encouraging good quality design of streets that provide a safe public realm and a distinct sense of place; and
- Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified junctions.

Wales Transport Strategy (Connecting the Nation)

3.10 The wider agenda of this document is to ensure that transport features strongly in the Welsh Assembly Government's policy spectrum:

3.11 'Getting the most out of our existing transport system;

1. Making greater use of more sustainable modes of travel; and
2. Reducing demands on the transport system.'

Active Travel (Wales) Act (2013)

3.12 The Welsh Government seeks to enable more people to walk, cycle and generally travel by more active methods, so that:

1. 'more people can experience the health benefits of active travel;
2. we reduce our greenhouse gas emissions;
3. we help address poverty and disadvantage, and
4. we help our economy to grow by unlocking sustainable economic growth.'

Future Wales: The National Plan 2040 (February 2021)

3.13 This document is a National Development Framework for Wales. It influences all levels of the planning system in Wales and will help to shape Strategic and Local Development Plans prepared by councils and national park authorities.

3.14 The document highlights the importance of reducing emissions to protect well-being and to demonstrate global responsibility. The planning system needs to focus on delivering a decarbonised and resilient Wales through the places that are created, the energy generated and the natural resources and materials that are used and how people live and travel.

3.15 The document recognises that there has been a significant change in the way people live and travel as a result of the COVID-19 pandemic. The pandemic has highlighted the quality and accessibility of people's local areas as being important for people's health and well-being during the pandemic.

3.16 Welsh Government have produced a document called 'COVID-19 Reconstructions: Challenges and Priorities'. This document sets out how people are using places differently, travelling less and spending more time working from home. Welsh Government is encouraging an increase in remote working and has set a long-term ambition for 30% of the Welsh workforce to work away from a traditional office. This is intended to help town centres, reduce congestion and cut carbon emissions. The planning system must therefore respond to these changes and contribute to a sustainable recovery, shaping places around a vision for healthy and resilient places.

3.17 The Welsh Government will work with Transport for Wales, local authorities, operators and partners to deliver the following:

3.18 Active Travel – Prioritising walking and cycling for all local travel;

- Bus – improve the legislative framework for how local bus services are planned and delivered. Invest in the development of integrated regional and local bus networks to increase modal share of bus travel and improve access by bus to a wider range of trip destinations;
- Metro – Develop the South East Metro, South West Metro and North Wales Metro and create new integrated transport systems that provide faster, more frequent and joined up services using trains, buses and light rail; and
- Ultra-low Emission Vehicles – Support the roll-out of suitable fuelling infrastructure to facilitate the adoption of ultra-low emission vehicles, particularly in rural areas.

3.19 In the context of the proposed development, it will be of the utmost importance to promote active travel and public transport for employees wherever possible over travel by private car.

Local Policy

Cardiff Local Development Plan (2006- 2026)

3.20 Cardiff Council's Local Development Plan (LDP) provides the framework for the development and use of land within Cardiff over the LDP period and contains the policies and measures that all new development must adhere to within Cardiff.

3.21 Cardiff Council are currently in the process of developing a new LDP)for Cardiff to replace the existing LDP. The new plan will be called the Cardiff Replacement Local Development Plan (LDP).

3.22 The Replacement LDP will shape Cardiff up to 2036, but until the Replacement LDP is published, the existing LDP will be continuing to act as the framework for the development and use of land within Cardiff.

3.23 Policy T6 makes reference to impact on transport networks and services. It states:

"Development will not be permitted which would cause unacceptable harm to the safe and efficient operation of the highway, public transport and other movement networks including pedestrian and cycle routes, public rights of way and bridle routes."

3.24 Policy T1 of the LDP deals with Transport and specifically Walking and Cycling. The policy states that with a view to enable people to access services, employment, and community facilities by walking and cycling, the council would support developments which incorporates;

- Permeable and legible networks of safe, convenient, and attractive walking and cycling routes;
- Connections to the Cardiff Strategic Cycle Network and routes forming part of the Cardiff Walkable Neighbourhoods Plan;
- Safe, convenient, and attractive walking and cycling connections to existing developments, neighbourhoods, and services;
- Supporting facilities including, signing, secure cycle parking.

3.25 Key to the Local Development Plan is the Transport Strategy which is seeking to achieve a modal split of 50:50 in 2026 for all trips on the network.

Managing Transportation Impacts SPG (July 2018) – Cardiff Council

3.26 This Supplementary Planning Guidance by Cardiff Council details the scope and content of Travel Plans required as part of the overall package of measures to mitigate impacts and support the implementation of LDP transport policies.

3.27 It notes the purpose of a Travel Plan being a long-term management strategy for an occupier to support and detail the sustainable travel options that are available for the site in order to meet the policies and objectives set out by Cardiff Council. For employment uses this is especially relevant due to the consistent arrivals and departures of employees throughout the day.

3.28 In addition, they should set a package of initiatives aimed at improving the availability of travel modes to and from the employment area, prioritising users as per the Travel Plan Pyramid.

Summary

3.29 The national and local transport policy demonstrates the priority for sustainable modes of transport, encouraging active travel and enhancing transport infrastructure for improved connections.

3.30 The principles for the proposed development of this site comply with the transport related planning policy, whilst encouraging choices for achieving sustainable travel modes to and from the site and also beyond the site.

4.0 Development Proposals

4.1 The proposed development is for a Hybrid planning application seeking:

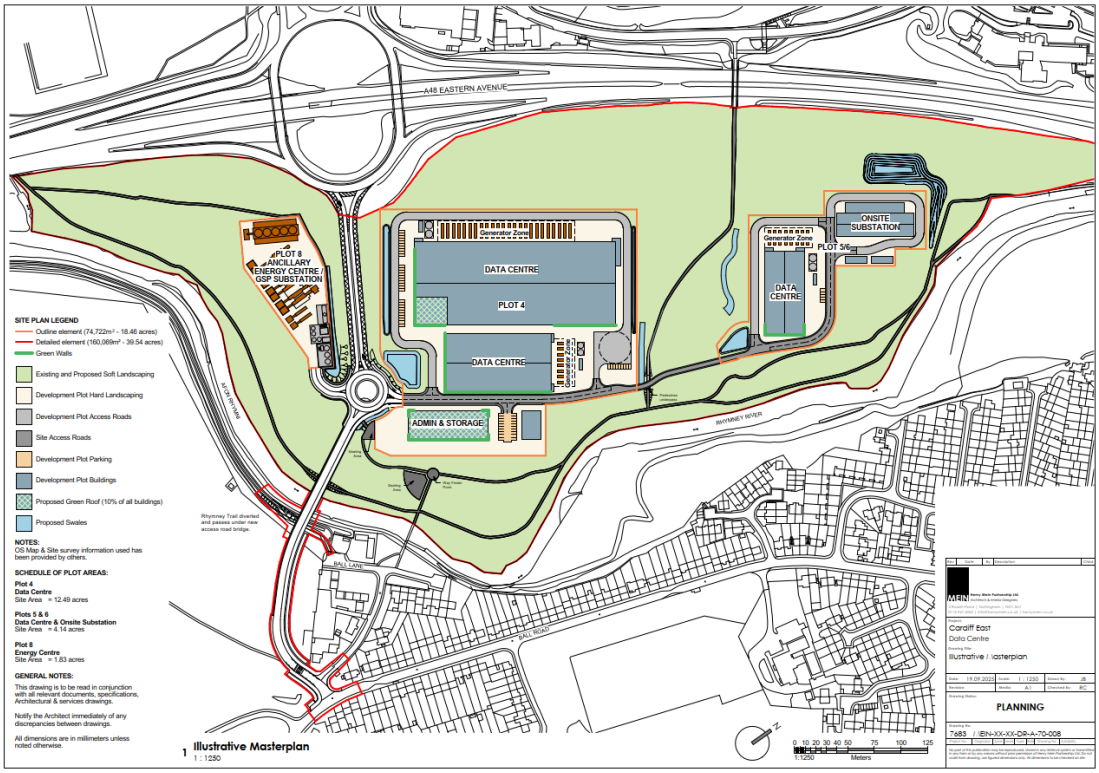
- Outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- Full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

4.2 The development will comprise of the following primary plots

- Data Centre – 50,571m^2
- Data Centre & Onsite Substation – 16,790m^2
- Energy Centre – 7,418m^2

4.3 An Illustrative masterplan for the site can be found at **Appendix E** and can be seen in **Figure 4.1.**

Figure 4.1 – Illustrative Masterplan



Access Arrangements

Vehicular Access

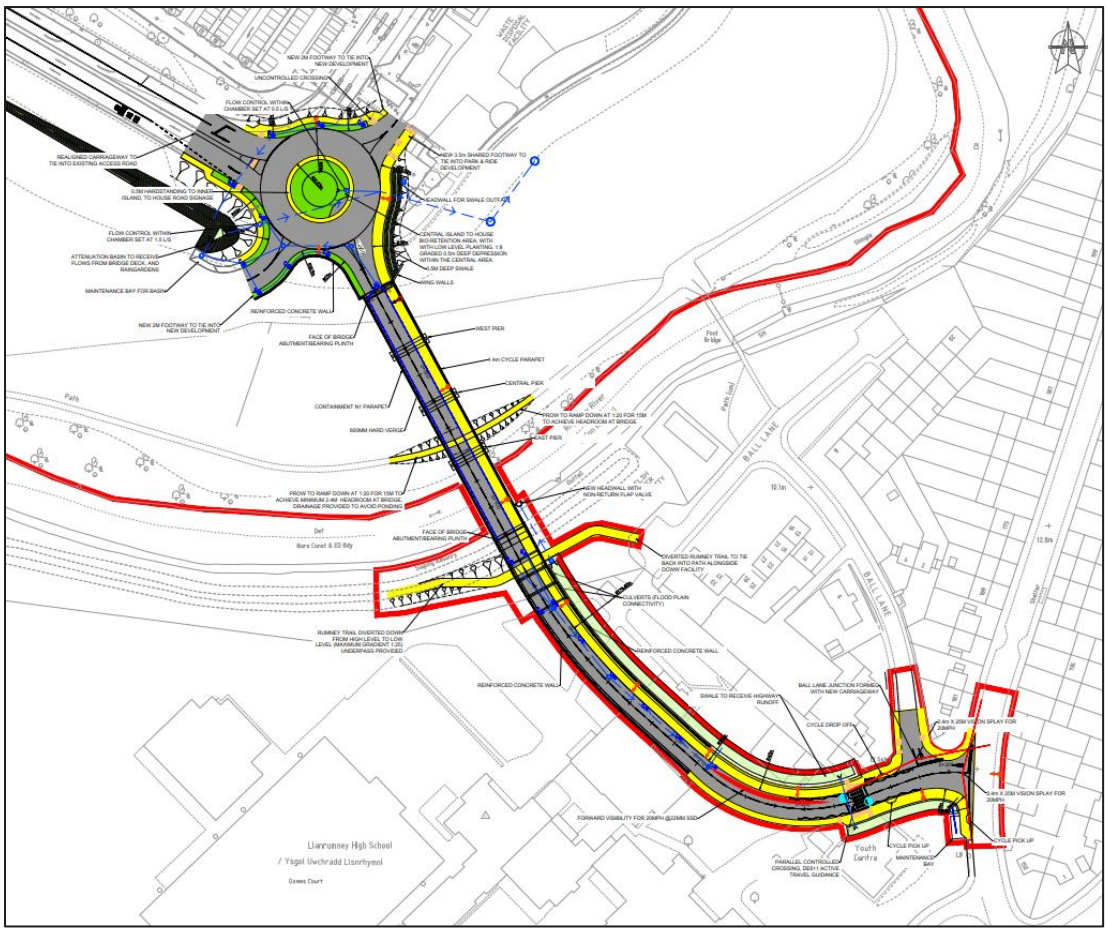
4.4 The site will be accessed via the existing access to the P&R site from the A48 roundabout as shown on the Indicative Site Layout plan at **Figure 4.1**. There are no proposals to alter this junction as part of the development proposals. An internal roundabout junction will provide access to the different land uses at the proposed development.

4.5 Additionally, a new road will be constructed from the internal roundabout across the Rhymney River to connect to Ball Road, providing access from Llanrumney to the site. This road would be lit to appropriate highway design standards so it can be used by pedestrians, cyclists and vehicles. This unchanged from the Approved TA.

4.6 It is proposed that ducting and space is provided for the future implementation of bus gates and ANPR cameras. Within the Council's decision notice on the previous site application, a condition was stipulated that the ANPR system shall at all times ensure that vehicular use of the bridge shall thereafter be restricted to public transport only between the hours of 07:00 and 10:00, and 15:00 and 19:00. This will be maintained for this scheme. Appropriate signage will be located on the link road to inform users of any restrictions

4.7 **Figure 4.2** shows the proposed road from the roundabout within the development to Ball Road. It shows the road has a width of 6.3m, allowing two standard size buses to pass each other without restraint. Additionally, it features a 3.5mm footway/cycleway for pedestrians and cyclists to cross the Rhymney River and access Ball Road from the site.

Figure 4.2 – Proposed New Road to Ball Road



4.8 The Proposed New Road to Ball Road remains unchanged from the previous application. The figure can be found at **Appendix F.**

Active Travel

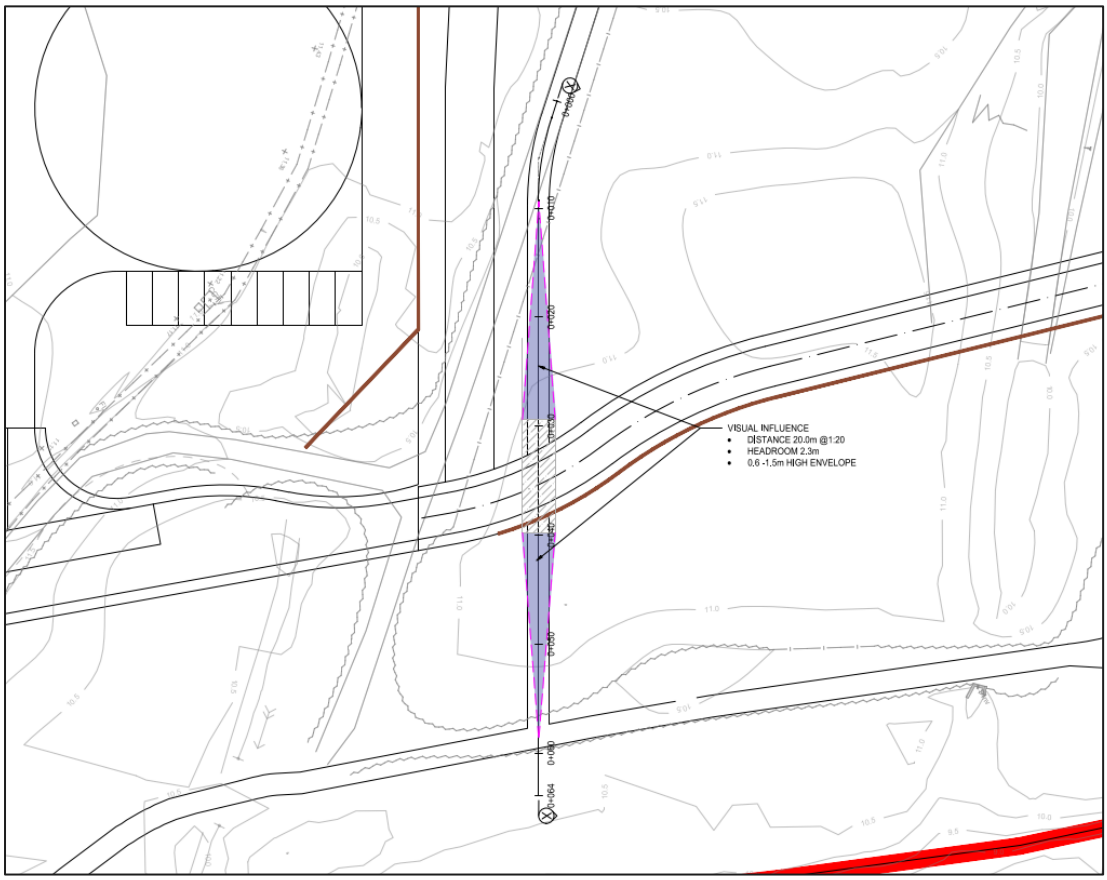
4.9 The new road across the Rhymney River will feature a 3.5m wide footway/cycleway that pedestrians and cyclists will be able use to access Ball Road and Llanrumney.

4.10 Ball Road has been designated an Advisory Cycle Route by Cardiff Council, and as such will be able to continue their journeys through to Llanrumney. The Advisory Cycle Route continues to Newport Road to the southeast, where in future it is hoped that the Cardiff Cycleways scheme will extend, providing users of the site with excellent connectivity to much of east Cardiff, including further north to St Mellons and continue southwest towards Cardiff City Centre.

4.11 In addition to the new active travel link across the River Rhymney, the existing footpath and PRoW network located in the vicinity of the site will be diverted in places to ensure better integration with the development.

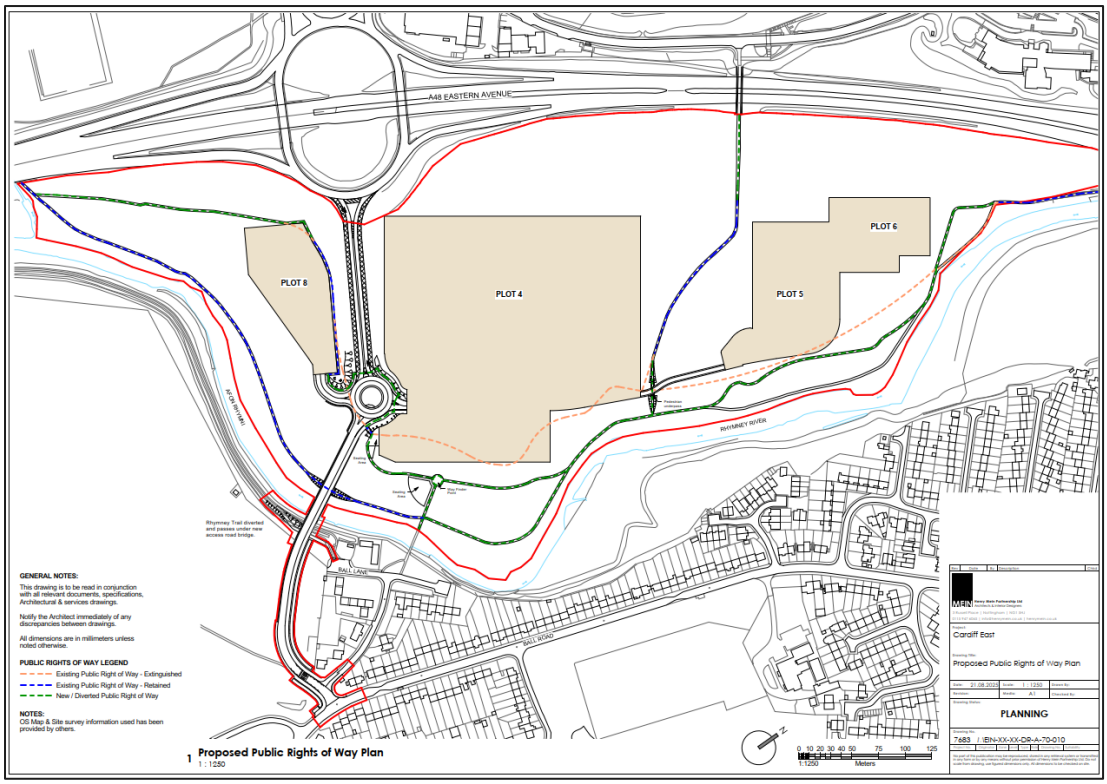
4.12 Given the security need to protect the accesses to the Data Centres, it is proposed that one PRoW should divert into a subway underneath the connecting road between Plot 4 and Plot 5. This will maintain the PRoW connection whilst maintaining the security of the site. This can be seen in **Figure 4.3** and at **Appendix E.**

Figure 4.3 – PRoW Subway



4.13 However, all current through routes will be maintained through the new and diverted routes and will deliver tangible benefits to the active travel infrastructure located near the site. The proposed Public Rights of Way Plan can be seen in **Figure 4.4** and at **Appendix E.**

Figure 4.4 – Proposed Public Rights of Way Network



4.14 The existing link, bridge and new link (to the north and south) and the site internal spine road are to be offered as adopted highway. Not all of the offered adopted highway may choose to be adopted by the Council.

Lighting

4.15 It is proposed to maintain the lighting upgrades proposed as part of the Approved TA. These are listed again here but are as featured within the Approved TA.

4.16 The development proposed a substantial upgrading of the routes to ensure their practical usage in both linking the site and the linking of the communities currently severed by the A48.

4.17 **Photograph 4.1 – 4.3** show the current primary active travel crossings of the A48, in the form of two underpasses located east of Parc Coed y Nant and southwest of Pentwyn Link Road, and a bridge crossing located north of the site.

Photograph 4.1 - Underpass East of Parc Coed y Nant

Photograph 4.2 - Underpass Southwest of Pentwyn Link Road

Photograph 4.3 - Bridge Crossing over A48 to Pentwyn Road

4.18 All three crossing currently suffer from poor lighting, which likely deters significant usage due to concerns over safety and anti-social behaviour.

4.19 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting upgrades to ensure a continuous lighting arrangement, the details of which are to be determined with the Council

4.20 As stated within the Active Travel Act Guidance, July 2021, walking and cycling must be promoted as around-the-clock means of transport, rather than just a daylight activity, if active travel is to play an important role as an alternative to the car for everyday journeys. As such, this will better improve access to the development during daylight hours, but especially during times of low light, such as at night.

Surfacing

4.21 At present, the existing surfacing of the routes near the site is good, with paved paths providing access to the nearest crossings of the A48.

4.22 However, at parts the paved surfacing ends, and instead users must travel across unpaved grass. While suitable for most journeys, it is noted that during adverse weather, the surfacing may become unattractive for users to cross.

4.23 **Photograph 4.4 and 4.5** show the two examples pertinent to the site, mainly the access from the existing footbridge across the Rhymney River to Ball Lane to the southeast of the site, and the existing PRoW continuing north of the site towards Pentwyn.

Photograph 4.4 - Existing Route between the Site and the footbridge to access Ball Lane

Photograph 4.5 - Existing PRoW North of the Site

4.24 The feasibility of surfacing these routes will be explored in detail to determine whether it can be delivered as part of the development.

4.25 Whilst alternative routes would exist from the site to access both sides of the A48, these alternative paved routes could provide additional options for users to access the development.

Improved Crossing Facilities

4.26 To ensure that active travel users can safely traverse Pentwyn Road from the existing bridge crossing of the A48, it is proposed to construct a new Zebra crossing with adjacent cycle crossing across Pentwyn Road, as at present there is no clear continuation of the route, as shown in **Photograph 4.6.**

Photograph 4.6 - Existing Access to Pentwyn Road from A48 Footbridge

4.27 The new Zebra crossing with adjacent cycle crossing would allow users to safely access the pedestrian network leading to Pentwyn.

Signage

4.28 Throughout the site at the junctions of the PROW finger posts can be provided to direct the users of the routes.

4.29 This can be extended to the south of the site from the river to Ball Road and to the north of the site to direct pedestrians and cyclists to the existing network of routes to the north of the A48.

Parking

4.30 Total parking allocation will take into consideration the advice contained within Cardiff Council's Managing Transportation Impacts (Incorporating Parking Standards) SPG (July 2018). It is considered that the proposed development is located within the 'Non Central Area' and therefore the respective standards apply.

4.31 The car parking standards are summarised in **Table 4.1.**

Table 4.1 – Cardiff Council Parking Standards

Type of Development	Parking Standards				
	Maximum Car Parking Spaces	Minimum Staff Cycle Parking	Minimum Visitor Cycle Parking	Maximum Powered Two-Wheeler Parking	Disabled Parking Provision (up to 200 spaces)
B1 Office – Non Central	1 per 50 sqm	2 per 100 sqm	4 plus 1 per 1000 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces
B8 Distribution – Non Central Area	1 per 1,000 sqm	2 per 1000 sqm	1 per 200 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces

4.32 An appropriate level of electric charging points will also be provided in all car parks, in line with national guidance. Future Wales requires a minimum of 10% of all car parking spaces to have a charging facility.

4.33 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards.

Swept Path Analysis

4.34 The link road has been designed from the outset for buses. As such, swept path analysis has been provided to ensure that any future bus movements can be accommodated on the link road.

4.35 The swept path analysis showing bus movements through the site, with access from all directions at Ball Lane.

4.36 Swept path analysis has also been undertaken for an HGV and a Fire Tender to access the site, and visibility splays have been produced for the internal junctions of the proposed development.

4.37 All internal site drawings can be found at **Appendix F.**

Construction Impact

4.38 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

4.39 The CEMP will set out how construction traffic will be managed on the local highway network during the anticipated construction period. The purpose of a CEMP is to ensure that the effect of construction traffic is mitigated against, particularly in relation to local residents and any air quality issues. The CEMP will control the timings, routing and volume of traffic entering/leaving the site during this period.

Travel Plan

4.40 The proposed development will be supported by an Interim Workplace Travel Plan (WTP).

4.41 The WTP sets the overarching strategy to promote sustainable travel to and from the site and limit the number of single occupancy car trips to and from the proposed development.

4.42 The developer will commit to incentives, such as financial contribution towards a travel bond for cycle vouchers and holding various events to encourage walking and cycling as part of everyday commuting.

4.43 The WTP will also encourage car sharing from the proposed development, with preferential spaces for car sharers.

4.44 An interim WTP is included at **Appendix G.**

Summary

4.45 As summarised in this section, the development proposals comprise the development of a data centre campus, including space for an energy centre and substations.

4.46 The proposed development provides the opportunity to provide significant enhancements to the area through the provision of employment opportunity.

4.47 As part of the extensive redevelopment, a new link would be constructed across the Rhymney River, providing new active travel links, public transport links, and a new vehicular route which can form a link between communities either side of the A48. This is unchanged from the previously consented application on the site.

4.48 As part of the extensive upgrading of active travel links in proximity to the site, the existing PRoW network will be diverted to serve the development, linking the site to the already existing active travel network. All through routes will be maintained.

4.49 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting across the primary PRoW through the development and extending to the two primary underpasses and footbridge across the A48, to ensure the good active travel links can always be utilised. A new zebra crossing with adjacent cycle crossing will be created across Pentwyn Road to link with the existing footbridge across the A48.

4.50 The feasibility of surfacing some of the routes within the vicinity of the site will be explored, to provide additional good quality footways.

4.51 An appropriate level of on-site vehicular parking will be provided, reflecting the scale of development and in line with the Council's 2018 SPG.

4.52 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards.

4.53 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

4.54 The proposed development will be supported by an Interim Workplace Travel Plan which will set the overarching strategy to promote sustainable travel to and from the site and limit the number of single occupancy car trips to and from the proposed development.

5.0 Traffic Generation and Distribution

5.1 This section will detail the trip generation for the proposed development and set out how the development trips will distribute on the local highway network.

Trip Generation

Data Centre

5.2 Vehicle trip rates for the Data Centre, which comprises the vast majority of the proposed development, have been derived from the Tremorfa Energy Park and Latos Data Centre at Tremorfa, Cardiff (planning ref: 24/00624/FUL).

5.3 The application was submitted on the 14th of March 2024 and was granted permission by the Council on the 15th of April 2025.

5.4 A Transport Statement was submitted to support the application, which contained trip rates used for Data Centres derived from the TRICS database. These trip rates have therefore been consented by the Council.

5.5 A subsequent review of the TRICS database has shown that the trip rates used for the data centres within the Tremorfa Energy Park application have not changed on the TRICS database. As such, they continue to be the most up-to-date trip rate for data centres.

5.6 The trip rates used within the Tremorfa Energy Park application for Data Centres are summarised in **Table 5.1** with the peak hours shown**,** and the full TRICS output can be seen in **Appendix H.** It is worth noting that the TRICS output resulted in a higher trip generation than a first-principles assessment within the application, thus was used as a robust assessment.

Table 5.1 – Tremorfa Energy Park Data Centre Vehicular Trip Rates

	Arrivals	Departures	Total
06:00 – 07:00	0.10	0.04	0.14
07:00 – 08:00	0.13	0.02	0.15
08:00 – 09:00	0.10	0.03	0.13
16:00 – 17:00	0.01	0.08	0.09
17:00 – 18:00	0.02	0.06	0.08
18:00 – 19:00	0.03	0.06	0.09

5.7 Applying the trip rates shown in **Table 5.1** to the proposed total area of data centres on the proposed development (67,246sqm) results in the proposed trip generation shown in **Table 5.2.**

Table 5.2 – Proposed Vehicle Trip Generation (Data Centre – 67,246sqm)

	Arrivals	Departures	Total
06:00 – 07:00	67	28	95
07:00 – 08:00	87	15	102
08:00 – 09:00	67	20	87
16:00 – 17:00	7	54	61
17:00 – 18:00	11	42	53
18:00 – 19:00	20	40	60

5.8 It is worth noting that the proposed trip generation likely represents a fully staffed data centre with ancillary offices forming part of the development. As the current end user of the site is not currently know, the trip rates above act as a worst-case scenario should the end-occupier use the site as a high-employment site. The site may end up being occupied by an end-user with a far lower staff count and thereby trip generation.

Energy Centre

5.9 TRICS does not have a category for Energy Centre, and as such a first-principles approach needs to be undertaken.

5.10 Given the outline nature of the proposed development, it is not known who the end occupier of the site would be at this stage, and as such the expected number of staff is not final.

5.11 However, given the relative size of the energy centre (7,418m^2), it has been estimated that a total of 10 people per shift would be required to service the site, and assuming a morning, evening and night shift, would result in 30 people per day working at the site.

5.12 Whilst timings would be determined by the occupier, for the purpose of trip generation the following times are assumed:

- Morning Shift – 06:00 – 14:00
- Afternoon Shift – 14:00 – 22:00
- Night Shift – 22:00 – 06:00

5.13 Given the above, the expected impact on peak hours would be minimal. Assuming a worst-case that all members of staff travel to the site via car, **Table 5.3** shows the potential trip generation of the site during the peak hours.

Table 5.3 – Proposed Trip Generation (Energy Centre)

	Arrivals	Departures	Total
06:00 – 07:00	0	10	10
07:00 – 08:00	0	0	0
08:00 – 09:00	0	0	0
16:00 – 17:00	0	0	0
17:00 – 18:00	0	0	0
18:00 – 19:00	0	0	0

5.14 Combining the trip generation of the Data Centre (**Table 5.2)** and the Energy Centre (**Table 5.3)** results in the total trip generation shown in **Table 5.4.**

Table 5.4 – Proposed Trip Generation (Total)

	Arrivals	Departures	Total
06:00 – 07:00	67	38	105
07:00 – 08:00	87	15	102
08:00 – 09:00	67	20	87
16:00 – 17:00	7	54	61
17:00 – 18:00	11	42	53
18:00 – 19:00	20	40	60

5.15 The total consented trip generation of the previous scheme consented as presented within the Approved TA can be seen in **Table 5.5.** Note as the Council does not intend for the Link Road to operate during peak hours, only the sum of the primary trip generation and cross-visitation trips of the previously consented scheme are shown.

Table 5.5 – Summary of Consented Scheme Vehicle Trip Generation

	AM Peak (08:00 – 09:00)			PM Peak (17:00 – 18:00)		
	Arrivals	Departures	Total	Arrivals	Departures	Total
B8 Warehouse	33	17	50	15	30	45
B2 General Industry	37	6	43	3	28	32
Trade Counters	28	21	49	5	10	15
Coffee Shop (Drive Thru)	18	19	36	13	14	27
Fast Food (Drive Thru)	9	9	18	12	14	26
Total	125	73	197	48	95	144

5.16 A comparison of the previously Consented Scheme peak trip generation and the proposed trip generation for the current proposals can be seen in **Table 5.6.** To ensure a robust assessment, the highest generating peak hours for the Proposed Scheme have been selected.

Table 5.6 – Net Trip Generation

	AM Peak Hour			PM Peak Hour		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Previously Consented Scheme	125	73	197	48	95	144
Proposed Scheme	67	38	105	7	54	61
Difference	-58	-35	-92	-41	-41	-83

5.17 As can be seen in **Table 5.6,** the revised scheme with the worst-case scenario trip generation produces far fewer trips on the highway network than when compared to the previously Consented Scheme.

5.18 In addition to the above, the closure of the Link Road to private vehicles during the hours of 07:00 and 10:00 and 15:00 and 19:00 to encourage sustainable transport in accordance with the policies of the Council.

5.19 A shift in mode share may result in the trip generation of the site being reduced further from the already reduced impact shown in **Table 5.6.**

Highway Impact

5.20 Within the TA produced for the Consented Scheme, detailed traffic modelling was undertaken on the surrounding highway network to calculate the traffic impact of the development.

5.21 Within the TA, two scenarios were undertaken, a Baseline Scenario and a Sensitivity Test where throughput on the Link Road was increased by 10%. In all scenarios, all junctions were shown to operate within capacity, with only the Link Road/Ball Road junction nearing its capacity.

5.22 However, the traffic modelling considered the operational impact of a non-time restricted Link Road and therefore had to consider the significant number of diverted trips on the network. Given the Link Road is now expected to only be open to all vehicles during off-peak hours, the junction will likely operate well within its capacity.

5.23 The full traffic modelling work undertaken for the Consented Scheme can be seen within the August 2023 TA associated with the application (ref: 22/02673/FUL).

5.24 Given the acceptability of the traffic impact demonstrated within the 2023 TA, there is no need to undertake an additional traffic impact assessment on the surrounding network, as this site will supersede the previously consented scheme.

6.0 Transport Implementation Strategy

6.1 The objective of the TIS is to promote sustainable modes of transport, including walking, cycling and public transport, and minimise the proportion of single occupancy car driver trips to and from the site.

Existing Journey to Work Data

6.2 The existing travel patterns for journeys to work were investigated for the 'Cardiff 009' MSOAs. **Table 6.1** shows the mode splits from these MSOAs, taken from the 2011 Census data. Whilst not representative of all journey types, it provides an indication of the approximate baseline mode split for all journeys in the area from which to base the aims and targets of the TIS.

6.3 The data summarised in **Table 6.1** illustrates that the existing employees of the 'Cardiff 009' MSOA currently travel to work with a high proportion of car drivers (66%). Despite this, already a significant proportion of people use a bus (11%), travel as a passenger in a car (8%) or walk (11%) to work. This sets a good baseline for the TIS to improve upon. The mode split for all journeys which the TIS seeks to achieve is set out in **Table 6.1**.

Table 6.1 – TIS Current and Target Mode Split (Cardiff 009 MSOA)

Method of Travel	Current Mode Split	Target Mode Split
Work mainly at or from home	0%	0%
Train	0.1%	0.1%
Bus, minibus or coach	10.9%	13.9%
Taxi	0.3%	0.3%
Motorcycle	0.8%	0.8%
Driving a car or van	66.4%	61.4%
Passenger in a car or van	8.4%	8.4%
Bicycle	1.5%	2.5%
On foot	11.4%	12.4%
Other	0.2%	0.2%
Total	100%	100%

6.4 **Table 6.1** demonstrates the sustainable mode split for journeys to and from the site which the TIS is seeking to achieve i.e. 5% reduction in single occupancy car driver trips to the site. The measures aimed at achieving this mode split are set out in a Walking Strategy, Cycling Strategy and Public Transport Strategy, as well as the Mobility Strategy and Interim WTP. In addition, the TIS aims to contribute towards achieving a mode shift towards sustainable travel in the adjoining communities.

6.5 Provided the overall contribution of sustainable travel modes helps deliver the car driver target, variations from the targets for sustainable travel modes are acceptable. Indeed, in some instances it is hoped they are exceeded.

Walking Strategy

6.6 Walking as a mode of transport has significant potential to contribute to an overall sustainable travel strategy.

6.7 The propensity for people to walk or cycle depends on individual preferences and circumstances. These circumstances might include, for instance, the purpose of the journey, the attractiveness of, and activity along, the route, the weather, and the cost of alternatives.

6.8 The thrust of land use and transport policy is to promote and encourage the choice of walking and cycling above all else where travel needs to occur. Therefore, it is both reasonable to assume that walking is a viable and growing means of travel, and that new development, such as this one, should be designed to promote and encourage it.

6.9 In practice, the distance that any individual is likely to choose to walk depends on that individual and the circumstances, but it is fair to assume that over time, given current policies to encourage community, the propensity for individuals to walk, and to walk further, will increase.

6.10 While there will always be some short trips for which a car is the most convenient choice - such as carrying heavy shopping - many journeys can be undertaken on foot, and therefore walking can contribute significantly to a sustainable travel strategy.

6.11 The benefits of walking include:

- It is cheaper in terms of expenditure when compared to the private car or public transport;
- It is convenient, and can provide pleasure and enjoyment;
- It is good exercise, and can form part of a healthy lifestyle (the recommended amount of exercise over a week is activity which should add up to at least 150 minutes (2½ hours) of moderate-intensity activity, in bouts of 10 minutes or more); and
- It is environmentally friendly, with no air or noise pollution and no carbon footprint.

Proposed Development

6.12 The Proposed Development facilitates journeys on foot through:

- The provision of new, improved PRoWs and the altering of other PRoW and informal footways;
- New lighting on existing and proposed PRoWs in the vicinity of the site;
- New zebra crossing of Pentwyn road with adjacent cycle crossing;
- Integration with other transport modes, including connections to bus routes; and
- Proposed new crossing of the Rhymney River, with a new footway connecting the site to Llanrumney.

6.13 Pedestrian routes will be well lit, with good natural surveillance, addressing safety and perceived safety. Pedestrian routes will be largely visible to passing traffic, houses, and areas of activity, ensuring people feel safe and secure when they are walking.

6.14 Pedestrian routes within the site will facilitate the easy integration with other modes, including with footways to the south and east of the site.

6.15 The proposed development of the site will provide improved north-south and east-west connections across the site and beyond.

6.16 To the south of the site the connections for pedestrians to the existing footbridge are good with footway and lighting. Signage in this area would be beneficial.

6.17 The routes across the site will be surfaced and lit where possible and provide connections to the three crossing of the A48 in the centre of the site over the existing bridge and to the north and south of the site via the existing underpasses.

6.18 On the bridge the existing gate on the northern side needs to be replaced to allow cyclists to use this route and a zebra crossing and parallel cycle crossing would be provided. Lighting is proposed in the underpasses.

6.19 An existing PRoW which bisects the site will need to be located

6.20 These improvements, together with good signage, would then provide connections to the existing network of routes to the north of the A48 into Pentwyn.

6.21 This would provide good quality pedestrian links between Rhymney and Pentwyn.

Summary

6.22 A significant proportion of all journeys are undertaken over short distances. Walking as a mode of transport can play a key role in an overall sustainable transport strategy, providing the most efficient method of transporting large numbers of people over short distances.

6.23 The design and layout of the proposed development, supported by this Walking Strategy and will facilitate, and encourage journeys on foot. Increasing the proportion of journeys on foot will create healthier and more socially inclusive environments, assisting the formation of integrated communities.

6.24 The proposed development would provide good quality pedestrian routes both east-west and north-south including good connections between Rhymney and Pentwyn including three options to cross the A48.

Cycling Strategy

6.25 The distance people are prepared to cycle depends on their fitness and physical ability, journey purpose, settlement size and the cycling conditions.

6.26 Cycling isochrones are shown in **Figure 2.4** to demonstrate destinations within a 15 and 30-minute radius.

Proposed Development

6.27 The Proposed Development has been designed on a pedestrian/cyclist level with a hierarchy of roads providing appropriate levels of infrastructure for pedestrians and cyclists.

6.28 **Section 2** details the current cycle infrastructure available in the area. The Rhymney Trail located to the east of the site provides a good, off-road route to Pontprennau to the north, and Newport Road and its shared footway/cycleway to the south of the site.

6.29 The proposed development will provide appropriate cycle parking provision at each development unit in line with the Council's policy, allowing employees to park and store bicycles safely.

6.30 The new bridge over the River Rhymney will include a pedestrian and cycle facility linking the site to Rhymney where there is currently no crossing for cyclists.

6.31 From the south the Cycleway two on Newport Road connections to the advisory cycle route on Balls Road which would connect to the new bridge and into the site. Cyclists would then be able to continue through the site and using the bridge over the A48 to reach Pentwyn and beyond to Pontprennau.

Summary

6.32 The existing cycle network in the vicinity of the site is good in the sense of its wider connectivity and cycling parking will be provided at all locations in line with policy. Connections to the existing Rhymney Trail will be maintained.

6.33 The proposed bridge would be part of a route from cyclists from the cycleway on Newport Road across the River Rhymney to Pentwyn and Pontprennau.

Public Transport Strategy

6.34 The site will be designed to ensure excellent pedestrian links to the bus stops within proximity of the site, including a new proposed link from the proposed development to Ball Road and Llanrumney to the east of the site.

6.35 Existing bus stops located either side of the A48 can be used by members of staff to access the site.

6.36 The new link road may also be used by bus operators to offer new services to the development in future.

Travel Plan

6.37 The proposed development will be supported by a detailed Interim WTP. The WTP will detail the opportunities for movement within, to and from the proposed development. The WTP will also outline the health, social, and economic benefits of travelling by active and sustainable travel modes. The WTP is included as **Appendix G**.

Summary

6.38 The TIS aims to achieve a sustainable mode split for journeys to and from the site, improving on the existing mode split observed for journeys to work in the sites' MSOA, and facilitate a mode shift to further improve the site's sustainable credentials.

6.39 The Mobility Strategy creates the opportunity to provide a step-change in attitudes to travel, to encourage a high proportion of sustainable travel particularly where it is more convenient.

7.0 Summary and Conclusion

Summary

7.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall. This Transport Assessment (TA) has been prepared in support of the hybrid planning application being submitted for the redevelopment of Cardiff East Park and Ride, Llanrumney.

7.2 The planning application seeks planning permission for the following description of development:

Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works

7.3 The site previously gained consent for a B2/B8 development (planning ref: 22/02673/FUL), for which a Transport Assessment was prepared by Vectos[2], which then received consent by Cardiff Council in June 2024.

7.4 This TA has examined the overall accessibility of the proposed development for all modes of travel by reviewing the existing accessibility and relevant local and national policy of the site, outlining the development proposals and its impact on the local highway network, and outlining the Transport Implementation Strategy of the site.

7.5 The traffic generation of the site has been shown to be lower than the traffic generation of the previously approved site. Despite this, the proposed development will provide all of the transport improvements that formed part of the previously approved scheme.

7.6 These improvements include a new bridge connecting the site and the A48 to Ball Road in Llanrumney. The bridge will only permit buses and active travel users at peak times. There is also a raft of improvements proposed to the Public Rights of Way Network that surround the site. This will provide an improved network for users of the site, and current existing users of the PRoW network.

7.7 The new link road may also provide improved bus services to the site in due course through the new link road from the development to Ball Road across the Rhymney River.

7.8 The Travel Plan will detail how the site aims to improve on current mode share for the area, to ensure the proposed development delivers on local and national policy.

Conclusions

7.9 This TA has demonstrated that the site can be delivered without any severe effects on the local highway network, given the impact of the development is less than the previously consented scheme.

7.10 The new bridge and other identified improvements will provide new links to the neighbouring communities as well as the possibility of improved bus services in future.

7.11 As such, the proposed development ought to be encouraged.

[2] Now part of SLR Consulting Ltd.

Appendix A 22/02673/FUL Decision Notice

Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

Reference No: 22/02673/FUL

CARDIFF COUNCIL
CYNGOR CAERDYDD

TOWN AND COUNTRY PLANNING ACT 1990
THE TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE)(WALES) ORDER 2012

APPROVAL OF FULL PLANNING PERMISSION

Name and address of the applicant
Curtis Hall Ltd
Da Vinci House
44 Saffron Hill
London
EC1N 8

Name and address of the agent
Tasha Bullen
Iceni Projects
Da Vinci House
44 Saffron Hill
London
EC1N 8

DATE REGISTERED:	**21 November 2022**
APPLICATION NO:	**22/02673/FUL**
LOCATION:	**Cardiff East Park And Ride, Eastern Avenue, Old St Mellons, Cardiff, CF23 8HH**
PROPOSAL:	**Demolition of existing structures and redevelopment of the site to provide commercial floorspace (Use Classes B1, B2, B8, A3) and/or ancillary Class A1), associated drive-thru and car parking; the re-provision of the park and ride; a bridge across the Rhymney River; site wide landscaping and associated works.**

CARDIFF COUNCIL as the Local Planning Authority in pursuance of its power under the above mentioned Act and Order hereby **GRANTS PLANNING PERMISSION** for the development as described above to be carried out in accordance with the application and the plans submitted therewith, subject to compliance with the following conditions:

Conditions:

Reference No: 22/02673/FUL

Time Limit Conditions

1. The development permitted shall be begun before the expiration of five years from the date of this planning permission.
2.

   Reason: In accordance with the provisions of Section 91 of the Town and Country Planning Act 1990.

List of Approved Plans

2. The development, unless otherwise required by the ensuing conditions, shall be carried out in accordance with the following approved plans and details:

   - Proposed Site Plan Dwg no. 7528 MEIN-XX- XX-DR-A-70-003 Rev P19 (in respect of building and hardscape only).
   - Proposed Public Rights of Way Dwg no. 7528-MEIN-XX-XX-DR-A-70-007 Rev P16
   - Public Rights of Way Dwg no. 7528-MEIN- XX-XX-DR-A-70-021 Rev P12
   - Tree Constraints Plan Dwg no. 7528- MEINXX-XX-DR-A-70-005 Rev P12
   - On and Offsite Supplementary Habitat Planting 7528-MEIN-XX-XX-DR-A-70-025 P12
   - External Lighting Sec 1/3 Dwg no. 10341- EXT-100 Rev P14
   - External Lighting Sec 2/3 Dwg no. 10341- EXT-101 Rev P14
   - External Lighting Sec 3/3 Dwg no. 10341- EXT-104 Rev P1
   - Existing Park and Ride Lux Levels Drawing no, 10341-EXT-103 Rec P01
   - Proposed Block Plan Dwg no. 7528-MEIN- XX-XX-DR-A-70-004 Rev P9
   - Landscape and Boundaries Plan Sheet 01 Dwg no. 7528-MEIN-XX-XX-DR-A-70-008 Rev P9
   - Landscape and Boundaries Plan Sheet 04 Dwg no. 7528-MEIN-XX-XX-DR-A-70-011 Rev P8
   - Landscape and Boundaries Plan Sheet 06 Dwg no. 7528-MEIN-XX-XX-DR-A-70-013 Rev P4
   - Landscape and Boundaries Plan Sheet 07 Dwg no. 7528-MEIN-XX-XX-DR-A-70-014 Rev P5
   - Indicative Landscape Strategy Plan Dwg no. 2190-21-01 S5 Rev P22
   - Off Site Dormice Habitat Landscape Plan 2190- 21-07 S5 P3
   - Proposed Drainage Layout Dwg no. 210204- PIN-XX-XX-DR-C-02302 Rev P14
   - Photogemmetric Layout - 7528-70-003
   - General Arrangement Dwg no. 70071035- WSP-XX-XX-CE-DR-101 Rev P04
   - Proposed Highway Drainage Dwg no. 70071035-WSP-XX-XX-CE-DR-500 Rev P04
   - Landscape and Boundaries Plan Sheet 02 Dwg no. 7528-MEIN-XX-XX-DR-A-70-009- Rev P4
   - Landscape and Boundaries Plan Sheet 03 Dwg no. 7528-MEIN-XX-XX-DR-A-70-010 Rev P3
   - Landscape and Boundaries Plan Sheet 05 Dwg no. 7528-MEIN-XX-XX-DR-A-70-012 Rev P4
   - 3000mm Wide Self Bound Gravel Footpath Dwg no. 2190-21-04 S5
   - Typical Planting Details Dwg no. 2190-21-03 S5
   - External Levels Dwg no. 210204-PIN-XXXX-DR-C-02100 Rev P04

- Swept Paths Dwg no. 70071035-WSP-XX-XX-CE-DR-102 Rev P02
- Highways Contours Dwg no. 70071035- WSP-XX-XX-CE-DR-700 Rev P02
- Highways Chainages Dwg no. 70071035- WSP-XX-XX-CE-DR-701 Rev P01
- Highway Long Section Dwg no. 70071035- WSP-XX-XX-CE-DR-702 Rev P02
- Highways Lighting and Signals Dwg no. 70071035-WSP-XX-XX-CE-DR-1300 Rev P01
- Proposed Viaduct General Arrangement Dwg no. 70071035-STR-001 Rev P05
- GA Plan & Elevations - Plot 01 Dwg no. 7528-MEIN-XX-XX-DR-A-20-010
- GA Plan & Elevations - Plot 02 Dwg no. 7528-MEIN-XX-XX-DR-A-20-020
- GA Plan & Elevations - Plot 03 Dwg no. 7528-MEIN-XX-XX-DR-A-20-030 P3
- Proposed GA Plan L00 - Plot 04 Dwg no. 7528-MEIN-XX-XX-DR-A-20-040 P3
- Proposed GA Plan L01 - Plot 04 Dwg no. 7528-MEIN-XX-XX-DR-A-20-041 P3
- Proposed GA Elevations - Plot 04 Dwg no. 7528-MEIN-XX-XX-DR-A-20-042 P3
- Proposed GA Plans - Plot 05 Dwg no. 7528-MEIN-XX-XX-DR-A-20-050 P3
- Proposed GA Elevations - Plot 05 Dwg no. 7528-MEIN-XX-XX-DR-A-20-051 P3
- Proposed GA Plans - Plot 06 Dwg no. 7528-MEIN-XX-XX-DR-A-20-060 P2
- Proposed GA Elevations - Plot 06 Dwg no. 7528-MEIN-XX-XX-DR-A-20-061 P2
- Proposed GA Plan L00 - Plot 08 Dwg no. 7528-MEIN-XX-XX-DR-A-20-080 P2
- Proposed GA Plan Mez - Plot 08 Dwg no. 7528-MEIN-XX-XX-DR-A-20-081 P2
- Proposed GA Elevations - Plot 08 Dwg no. 7528-MEIN-XX-XX-DR-A-20-082 P2
- Site Location Plan Dwg no. 7528-MEIN-XX-XX-DR-A-70-001 P3
- Existing Site Plan Dwg no. 7528-MEIN-XX-XX-DR-A-70-002 P3
- Existing Constraints Plan Dwg no. 7528-MEIN-XX-XX-DR-A-70-006 P3
- Existing Public Rights of Way Dwg no. 7528-MEIN-XX-XX-DR-A-70-022 P2

Reason: To ensure satisfactory completion of the development and for the avoidance of doubt in line with the aims of Planning Policy Wales to promote an efficient planning system

Pre-commencement Conditions

3. No development shall commence until a phasing schedule and plan, to include the delivery of the bridge, phasing of Green Infrastructure and improvements to the Active Travel infrastructure within the site (see condition 13), has been submitted to and approved in writing by the Local Planning Authority. The development shall thereafter be carried out in accordance with the approved phasing plan.

   Reason: To ensure an orderly form of development in accordance with Local Development Plan Policies KP4 (Masterplanning Approach) and KP5 (Good Quality and Sustainable Design).

4. Construction Environmental Management Plan
   Notwithstanding the submitted details, no development, including site clearance, shall commence until such time as a finalised Construction Environmental Management Plan (CEMP) (updating the Construction Environmental Management Plan Cardiff East Park and Ride Commercial Park, Curtis Hall, Rev 2) has been submitted to and approved in writing by the Local Planning Authority. The CEMP shall, as a minimum, include the following:

   i) details of site hoardings, site access and wheel washing facilities;

ii) a strategy for the delivery of plant and materials;
iii) the parking of vehicles of site operatives and visitors;
iv) loading and unloading of plant and materials;
v) storage of plant and materials used in constructing the development
vi) a plan identifying the location of any site compound;
vii) the erection and maintenance of security hoarding including decorative displays and facilities for public viewing, where appropriate;
viii) Control of Nuisances: details of restrictions to be applied during construction including timing, duration and frequency of works; details of measures to minimise noise and vibration; details of dust control measures and measures to monitor emissions of dust arising from the development; measures to control light spill and the conservation of dark skies.
ix) Traffic Management: access routes, wheel washing facilities, site hoardings, delivery and storage of plant and materials; dedicated vehicle access routes (including any temporary traffic regulation orders required), traffic management proposals and habitat protection measures.
x) a scheme for recycling/disposing of waste resulting from demolition and construction works.
xi) Pollution prevention: Measures to ensure relevant Guidelines for Pollution Prevention and best practice will be implemented, covering GPP1, GPP5, GPP8, and GPP21, including:
    i. Storage of plant and materials (including details and approximate quantities of any chemicals and fuels) - including unloading, containment, bunding and/or appropriate buffer zones, including from any drain.
    ii. How drainage will be controlled at source to prevent release of soil from the site, wastewater and contaminants, including wheel washing facilities, during construction to the storm water system
    iii. Measures to monitor mobilisation of contaminants (water)
    iv. Emergency spill procedures and incident response plan that will be followed in light of any spill at the site.
xii) Soil Management: details of topsoil strip, storage and amelioration for re-use. (The Soil Resource section to be updated in line with the Soil Resources Plan with clear reference to the documents)

xiii) A Biodiversity Section (updating the submitted 'Ecological Construction Method Statement' (EDP, January 2020) to include: -
    a. The appointment and role and responsibilities on site, of a suitably competent Ecological Clerk of Works (EcoW) or similarly competent person, and recording/reporting procedures to cover all key ecological activities undertaken i.e. briefings, post construction surveys, habitat watching briefs and specific species/species group watching briefs and the general outcome (noting requirement to update with a table for inputting lines of communication and emergency contact details and that of the preferred Ecological Consultant. Emergency procedures for environmental incidents and response details shall be added, including that of NRW). ECoW daily logs shall be kept and provided to the Local Planning Authority on a monthly basis for the duration of works.
    b. Identification of "biodiversity protection zones" (including amended ecotone) and the means to prevent impacts i.e. protection, modification etc;
    c. Relevant protection and mitigation that has been determined to be required to be implemented to protect the Rhymney River SINC.

d. Expanded, site specific measures for the protection and initial survey, management of retained ecological and arboricultural assets:
   - Woodlands and Trees.
   - Grasslands.
   - Dormice.
   - Bats.
   - European hedgehog.
   - Badger.
   - Otter (survey of both banks).
   - Birds.
   - Amphibians and Reptiles.

e. Reference to supporting documentation that must be implemented during construction i.e. the SUDS Design, Lighting Design Strategy (for biodiversity), tree protection details in relation to BS5837:2012 (and any other relevant documents), that indicate mitigation/works during construction activities, that run in parallel with construction and are covered separately..

f. The procedure for incidental finds.

xiv) Details of the persons and bodies responsible for activities associated with the CEMP and emergency contact details.

All development shall be undertaken in full accordance with the approved CEMP.

Reason: In the interests of highway safety, and protection of the environment, biodiversity, pollution prevention and public amenity during construction in accordance with Local Development Plan Policies KP16, T5 (Managing Transport Impacts), T6 (Impact on Transport Networks and Services), EN6 (Ecological Networks and Features of Importance for Biodiversity), EN7 (Priority Habitats and Species), EN8 (Trees, Woodlands and Hedgerows), EN10 (Water Sensitive Design), and EN13 (Air, Noise, Light Pollution and Land Contamination).

5. No development, including site clearance, shall commence until such time as an Invasive Non-native Species Management Plan for the management of invasive non-native plant species that are extensive at the site, including measures to control, remove or provide long-term management of invasive non-native species both during construction and operation, has been submitted to and approved in writing by the local planning authority. The management plan shall follow the order of that below:

   - Provide an introduction to the site, and the proposed works.
   - The legislation pertaining to the known invasive species (and others that could occur).
   - Appropriate buffer zones to prevent further spread/containment, which includes where roots may occur.
   - The methods/duration of control (this could be multiple years), supervision/operative involved, removal/disposal procedures (in line with waste transfer etc) should the species be impacted directly.
   - Methods to stabilise the ground (erosion matting), prevent runoff and prevent secondary colonisation by invasive species following eradication.
   - Biosecurity procedures for the decontamination of tools/machinery.

- Drawing/s indicating location and extent that will be subject to eradication and/ or control.
- A review procedure to update maps of invasive non-native species extent and that of the whole document to relate to drawings and any additional invasive non-native species encountered.
- Monitoring duration.

All works within the approved INNS shall be implemented in accordance with the approved details.

Reason: Since INNS are known to be present at the site, control mechanisms are required for the general protection of biodiversity and prevention of the spread of invasive species to ensure accordance with Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

6. No development, including site clearance, shall commence until such time as the following have been submitted to and approved in writing by the Local Planning Authority (LPA) in accordance with the current British Standard 5837:

   - An Arboricultural Method Statement (AMS) detailing the methods to be used to prevent loss of or damage to retained trees within and bounding the site (including use of no dig method, and ensuring no more than 20% of the RPA of retained trees can be covered by a hard surface where a new road or footpath is to be put in place within the Root Protection Areas of retained trees where there is no existing surface), and existing structural planting or areas designated for new structural planting.

   The AMS shall include details of site monitoring of tree protection and tree condition by a qualified arboriculturist, undertaken throughout the development and after its completion, to monitor tree condition. This shall include the preparation of a chronological programme for site monitoring and production of site reports, to be sent to the LPA during the different phases of development and demonstrating how the approved tree protection measures have been complied with.

   - A Tree Protection Plan (TPP) in the form of a scale drawing showing the finalised layout and the tree and landscaping protection methods detailed in the AMS that can be shown graphically.

   The development shall be carried out in full conformity with the approved AMS and TPP.

   Reason: To enable the Local Planning Authority to assess the effects of the proposals on existing trees and landscape; the measures for their protection; to monitor compliance and to make good losses in accordance with Policy KP15, KP16, and EN8 of the Cardiff Local Development Plan 2006-2026.

7. No development shall commence on any part of the site affecting the existing access to Flood Defences (for maintenance purposes) until such time as a new 4m wide flood defence access has been provided (off Clovelly Crescent adjacent to / through the new housing development), in accordance with details that shall first have been submitted to and approved in writing by the Local Planning Authority.

The details shall as a minimum include:

- Drawing(s) identifying the replacement access route
- Materials and construction of the route, ensuing it is appropriate for heavy plant
- Details of the long-term management and maintenance of the route

The new 4m wide access shall thereafter be retained at all times.

Reason: To ensure that Natural Resources Wales (NRW) has unimpeded managed access to their flood defences at all times.

8. Notwithstanding details provided within the submitted Woodland Management Plan, no development shall take place until details of both hard and soft landscape works have been submitted to and approved in writing by the local planning authority. These details shall include:

   i) A statement setting out the design objectives and how these will be delivered;
   ii) earthworks showing existing and proposed finished levels or contours;
   iii) Detailed scheme for amenity areas around the drive-throughs and the amenity terrace and seating areas (having regard also to pedestrian movement, cycling facilities and crossing points to encourage greater active travel)
   iv) means of enclosure and retaining structures;
   v) other vehicle and pedestrian access and circulation areas;
   vi) hard surfacing materials;
   vii) minor artefacts and structures (e.g. furniture, play equipment, refuse or other storage units, signs, etc.),
   viii) water features.
   ix) A soft landscaping implementation programme.
   x) Soft landscape works shall include:
      a. Scaled planting plans prepared by a qualified landscape architect.
      b. Schedules of plant species, sizes, numbers and densities prepared by a qualified landscape architect.
      c. Scaled tree pit sectional and plan drawings prepared by a qualified landscape architect that show the Root Available Soil Volume (RASV) as per the Cardiff Council Green Infrastructure Supplementary Planning Guidance, for each tree (as appropriate) and expressed in cubic metres, where the tree will be growing in a constrained bed such as a car park or narrow verge.
      d. The inclusion of standard trees that will be of wholly native species, their cultivars or non-native species but whose genus is represented in Wales and has the potential to support native invertebrate species. It is also expected that within car parking areas, a large number of trees will be indicated that can reach substantial size (with appropriate root available soil volumes to match).
      e. A methodology to ensure that should any hazel stool translocation take place, that this is in line with arboricultural best practice.
      f. Topsoil and subsoil specification for all planting types, including full details of soil assessment in accordance with the Cardiff Council Soils and Development Technical Guidance Note (Soil Resource Survey and Plan), soil protection, soil stripping, soil storage, soil handling, soil

amelioration, soil remediation and soil placement to ensure it is fit for purpose. The SRS and SRP shall be prepared by a soil scientist in full accordance with the DEFRA Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. The SRS and SRP shall incorporate trial pit and laboratory testing to characterise and quantify the soil resource and its suitability for re-use in-situ and site won, to support proposed landscape types. The SRP shall include full details of auditable site monitoring of soil handling operations by a soil scientist, to include reporting to the LPA to demonstrate compliance accordingly. Where imported planting soils are proposed, full specification details shall be provided including the parameters for all imported planting soils to demonstrate they are suitable for the specific landscape type(s) proposed. Parameters shall include profile depths, textural range, nutrient status, pH on placement, drainage performance and other factors relevant to their functionality in supporting the landscape type. The SRS, SRP and topsoil and subsoil specification shall inform planting plans, tree pit sections, planting methodologies and aftercare specifications.

g. Planting methodology and post-planting aftercare methodology prepared by a qualified landscape architect, including full details of how the landscape architect will oversee landscaping implementation and report to the LPA to confirm compliance with the approved plans and specifications.
h. Evidence to demonstrate that existing and proposed services, lighting, CCTV, drainage and visibility splays will not conflict with proposed planting.
i. an implementation programme (including phasing of work where relevant).

The submitted details shall be consistent with other plans submitted in support of the application and the landscaping shall be carried out in accordance with the approved design and implementation programme.

Reason: To enable the Local Planning Authority to determine that the proposals will maintain and improve the amenity and environmental value of the area, to offset loss of trees, enhancing biodiversity and mitigating the effects of climate change and to monitor compliance in accordance with Local Development Plan Policies KP5, KP15 and KP16 of the Cardiff Local Development Plan 2006-2026.

9. Reptile Mitigation Strategy. Prior to any works commencing in respect of vegetation removal and/or earth works, a Reptile Mitigation Strategy shall have been submitted to and approved in writing by the Local Planning Authority. The Strategy shall include:

- An introduction to the site, baseline data and reasoning for the overarching strategy;
- Discussion of UK reptile species that could be encountered, including reference to relevant legislation and the Environment (Wales) Act 2016.
- The methods for habitat clearance, duration, limits on the clearance area per day, how destructive searching will take place (and limits), and how the site will remain unsuitable for reptiles.
- Time of year.

- An agreed appropriate release site for reptiles.
- The requirements of Ecological Clerk of Works supervision;
- Stop works procedure - If more than 5 reptiles of any species are found and a requirement for immediate consultation with the County Ecologist, to agree an amended strategy and receptor site, prior to any works re-commencing. This is in light of the limited reptile survey extent.
- The logging of actions/species numbers during the works;
- Delivery of a toolbox talk for operatives, this shall include a signing sheet at the end of the strategy, so that this document can also act as a Toolbox Talk.
- Additional requirements to be considered in light of identifying reptiles at the site:
- Potential requirement for a more defined translocation i.e., use of artificial refugia and an agreed trapping duration.
- Identification of an appropriate receptor site, that will be subject to initial management, inclusion of appropriate feature for reptiles I.e., refugia/hibernacula.
- Site management requirements following translocation to the onsite receptor from between 5-25 years;
- Who will undertake management and the funding arrangements;
- Monitoring requirements;
- Appropriate drawings; and
- An overarching table summarising keys work/monitoring/management timings.

Reason: To ensure compliance with The Wildlife and Countryside Act 1981 (as amended), the duty to maintain biodiversity as required as part of the Environment (Wales) Act 2016 as part of Local Planning Authority functions and to comply with EN7 of the City of Cardiff Council Local Development Plan.

10. Prior to any works commencing in respect of vegetation removal and/or earth works, a Badger Walkover Survey (which shall have been undertaken no greater than 3 months prior to vegetation removal or earth works) shall have been conducted, with a report in line with CIEEM Guidelines for Ecological Report Writing, submitted to and approved in writing by the Local Planning Authority. The survey shall follow that of Surveying for Badger (Harris et al., 1989) and Badger Protection: Best Practice Guidance for Developers, Ecologists and Planners (Wales) (Badger Trust, 2023) and take into account all noted previous sett locations and potential sett locations. The County Ecologist must be contacted if an active badger sett is to be impacted by the works.

    Reason: To ensure the protection of badgers in compliance with the Protection of Badgers Act 1992, Schedule 6 of the Wildlife and Countryside Act 1981 (as amended) and Cardiff Council Local Development Plan Policy EN6

Action Conditions

11. Prior to development commencing on the construction of the new bridge crossing across the River Rhymney, amended plans shall be submitted (in conjunction with the Section 278 process) to address the following: -

    - Re-design of the Ball Road junction to include incorporation of traffic signals, waiting restrictions and consideration of existing traffic calming measures; and

- Changes to link road between Ball Road and the bridge to ensure the design can safely accommodate two 12m buses passing each other (without clashing).

- Minor changes to bus lanes on access/egress to ensure these are cut back to finish ahead of both external and internal roundabouts to allow for better general traffic lane access and circulation

- Details of otter passages / ledges

Reason: In the interest of highway safety, and to encourage sustainable transport to limit the impact of the development on use of the adjacent highway in accordance with Local Development Plan Local Development Plan Policies T5 (Managing Transport Impacts) and T6 (Impact on Transport Networks and Services).

12. The new bridge across the River Rhymney shall not be brought into beneficial use until such time as an ANPR system (and any other necessary measures) to prevent and enforce against its use by vehicles (other than public transport) during peak periods have been implemented in full on site in accordance with details that shall first have been submitted to and approved in writing by the Local planning Authority.

    The ANPR system (and any other necessary measures) shall thereafter be retained and shall at all times ensure that vehicular use of the bridge shall thereafter be restricted to public transport only between the hours of 07:00 and 10:00 and 15:00 and 19:00.

    Reason: To encourage sustainable transport to limit the impact of the development on use of the adjacent highway and effect modal shift to non-car modes in accordance with Local Development Plan Local Development Plan Policies T5 (Managing Transport Impacts) and T6 (Impact on Transport Networks and Services).

13. Prior to first beneficial occupation of any unit hereby approved, Active Travel improvements shall be implemented within the site in accordance with a detailed scheme, that shall first have been submitted to and approved in writing by the Local Planning Authority, addressing the following: -

    - Provision of new footpaths and upgrades to width and surfacing of existing/relocated footpaths within the site
    - Replacement of steps on the western side of the existing pedestrian bridge over River Rhymney with a graded ramp integrated with paths on western side of river,
    - Any necessary minor changes required to routes to ensure good visibility for users
    - Provision of directional signage at entrances to and within the site
    - Suitable measures/barriers to control access other to the site than by pedestrians/cyclists

    Reason: Upgraded and new active travel links are necessary in the interests of highway safety by facilitating safe commodious access to and use of the proposed development, in accordance with Policy KP14, T1 and C6 of the adopted Local Development Plan (2016).

14. No part of the development hereby permitted shall be brought into beneficial use until such time as barriers (as applicable), together with associated signage, preventing pedestrian access to/from the A48 gyratory have been provided on site, in accordance with details that shall first have been submitted to and approved in writing by the Local Planning Authority. Thereafter the agreed measures shall be retained in accordance with such approved details.

    Reason: In the interest of highway safety, and to ensure accordance with Local Development Plan Local Development Plan Policies T5 (Managing Transport Impacts) and T6 (Impact on Transport Networks and Services).

15. Prior to their use in the development hereby permitted, samples of the external finishing materials for the development hereby approved shall be submitted to and approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved details.

    Reason: To ensure a satisfactory finished appearance of the development in accordance with Local Development Plan Policy KP5 (Good Quality and Sustainable Design).

16. No unit hereby approved shall be occupied until such time as secure cycle parking has been provided to accord with the standards contained in the 2018 Managing Transport Impacts SPG, and in accordance with details which shall first have been submitted to and approved in writing by the Local Planning Authority. The approved cycle parking shall thereafter be retained for the use of cycle parking.

    Reason: To ensure that adequate provision is made for the sheltered and secure parking of cycles, in accordance with Policy T5 of the adopted City of Cardiff Local Development Plan (2006-2026).

17. No unit hereby approved shall be occupied until such time as boundary treatments / means of enclosure have been provided in accordance with full details which shall first have been submitted to and approved in writing by the Local Planning Authority. Thereafter the site shall not be enclosed other than in accordance with the approved details.

    Reason: To ensure a satisfactory finished appearance of the development in accordance with Local Development Plan Policy KP5 (Good Quality and Sustainable Design).

18. Lighting Design Strategy : Notwithstanding the submitted lighting strategy / scheme (including Hydrock KTA, External Lighting Sec 1/2, drawing number: 10341-EXT-100 rev P14 and Hydrock KTA, External Lighting Sec 2/2, drawing number: 10341-EXT-101 rev P14), no part of the development hereby permitted shall be occupied until such time as a revised/updated site-wide Lighting Scheme / Strategy (for biodiversity), having particular emphasis on the need to implement additional measures to minimise light spill beyond site / plot boundaries and associated illumination of dormouse habitat (<1 lux), and considering bats and other nocturnal species, has been submitted to and approved in writing by the Local Planning Authority.

To ensure ecological receptors are not unacceptably impacted by light spill, the updated Strategy shall seek to: -

- Include an Environmental Lighting Impact Assessment against conservation requirements for protected species
- Provide light modelling images to present the night-time effects of lighting on building elevations and ground surfaces from key viewpoints
- Provide drawings demonstrating light spillage in sensitive areas, showing light spill overlaid on drawings showing retained and created habitats
- Show additional contours of 2 and 5 lux isolines.
- Ensure the P ratings are the lowest in line with BS5489 for all stretches of road - adoptable or otherwise.
- Include internal back louvers to light fitting to reduce light spill to below 1 lux, where they are adjacent to retained, managed or created dormouse habitat (also protecting other nocturnal ecological receptors as a consequence).
- Consider reduced column height in locations associated with the A48 access and south of the roundabout, to reduce light spill.
- Identify measures for timing, dimming, motion sensors to control spillage, and measures to monitor light spillage once development is operational
- Provide hours of lighting operation, where associated with site "units and yards".

Confirm that plans meet that of S38 and S278 agreements of the Highways Act 1980.

Thereafter, no individual unit shall be occupied until such time as the lighting relating to that part of the site has been implemented in accordance with the specifications and locations agreed, which shall be maintained thereafter.

Under no circumstances should any other external lighting be installed without prior consent from the Local Planning Authority.

The strategy will align with the Institute of Lighting Professionals Guidance Note 08/23, BS5489-1:2020 and BSEN13201-2:2015 and fully accord to the requirements of S38/S278 agreements.

Reason: To manage the impact of the development upon protected species, to ensure Favourable Conservation Status of dormouse and bats will be maintained as per the Conservation of Habitats and Species Regulations 2017 (as amended), considerations of maintaining and enhancing biodiversity in line with the Environment (Wales) Act 2016 and to accord with Policies KP16, EN6 and EN7 of the Cardiff Local Development Plan (2006-2026).

19. Green Infrastructure and Landscape Ecological Management Plan (GILEMP) : Notwithstanding details provided within the submitted Woodland Management Plan, a Green Infrastructure and Landscape Ecological Management Plan (GILEMP) (updating the WMP) shall be submitted to the Local Planning Authority within 12 months of the development commencing. This must cover no less than 10 years post development, and be amended to include the following:

    a) Review of vision and objectives in light of the full scheme.
    b) Building upon the principles and commitments for protected species mitigation and compensation for dormice and otter, include:

i. Details of habitats and ecological features present or to be created on and off site, including planting schedules
ii. Phasing proposals for habitat creation which ensure advanced planting of habitat compensation areas
iii. Details of the desired conditions of habitats (present and to be created) on and off site
iv. Details of scheduling and timings of activities
v. Details of short and long-term management, monitoring and maintenance of new and existing landscape and ecological features at the site to deliver and maintain the desired condition
vi. Measures to restrict human access to habitat creation areas
vii. Details of replacement measures should any landscape or environmental features die, be removed or become seriously damaged or diseased within years of completion of development

c) Appropriate management prescriptions for each landscape feature added to the site such as Attenuation basins, Rain gardens, Ponds, Shrub planting, Standard trees, Any additional in accordance with agreed landscaping scheme (Landscape Implementation); and Ecological enhancements.
d) More detail on the follow up management, but especially areas of newly planted scrub and trees - especially related to off-site areas, especially in respect to watering in drought, triggers/frequency, the duration (years), the volume of water required per standard/scrub and by whom.
e) Ecological constraints on site that might influence management or require separate management,
f) Preparation of a work schedule with timings (including an annual work plan capable of being rolled forward over a five-year period, but looking up to 10 years).
g) Details of the body or organisation responsible for implementing the plan, including any updates required.
h) The monitoring requirements to determine the success of landscaping, its management and specific features for wildlife, in years 2, 5 and every 5 years thereafter. This will follow the aims and objectives to determine if they have been achieved. The plan shall also set out (where the results from monitoring show that management aims and objectives of the GILEMP are not being met) how contingencies and/or remedial action will be identified, agreed with the Local Planning Authority and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme.
i) Appropriate drawing(s) indicating habitats, areas of the site for specific species and the enhancements to be managed.
j) The inclusion of a Fire Plan to ensure that replacement planting on site, retained habitat and general landscaping is not damaged by fire. This will include: Water access points, access routes and machine/equipment requirements to reach each broad landscape compartment; Actions to reduce fire risk, direct and indirect interventions, including by site businesses; Alarm procedures; and Remedial measures for landscaping in case of fire.

The submitted details shall be consistent with other plans submitted in support of the application and the landscaping shall be carried out in accordance with the approved design and implementation programme.

Reason: For the overall protection of biodiversity and to ensure the site's landscape and environmental features are adequately managed long term. This aligns the Environment (Wales) Act 2016, with PPW11 Chapter 6 and with policies KP5, KP16, EN6, EN7 and EN8 of the Cardiff Local Development Plan (2006-2026).

20. Data Shelf Life : If site clearance in respect of the development hereby approved does not commence (or, having commenced, is suspended for more than 12 months) within 2 years from the date of the planning consent, all the approved ecological measures and those secured through other planning conditions and ecological reports, shall be reviewed and, where necessary, amended and updated, with careful consideration of "new" ecological receptors. The review shall be informed by update or further ecological surveys commissioned to:

    i. establish if there have been any changes in the presence and/or abundance of habitats and species,
    ii. identify any likely new ecological impacts that might arise from any changes; and
    iii. and identify any changes to legislation, policy or best practice that may alter the conclusions of the assessment.

    Where the survey results/desk study indicate that changes have occurred that will result in ecological impacts, having not been previously addressed in the approved scheme, the original approved ecological measures will be revised. New or amended measures and a timetable for their implementation, shall be submitted to and approved in writing by the Local Planning Authority prior to the commencement of development. Works shall then be carried out in accordance with the new approved ecological measures and timetable.

    If a current ecological report suggests the reassessment of a particular feature before 2 years, that recommendation takes precedence.

    Reason: To ensure the assessment of impacts from the development upon the species concerned, and any measures to mitigate those impacts, are informed by up-to-date information in accordance with legislation, national planning policy and the Cardiff Local Development Plan Policy 2006-2026, KP16, EN4 to EN8.

21. No part of the development hereby approved shall be occupied until an Employment Travel Plan (ETP) (updating the submitted Travel Plan) has been submitted to and approved in writing by the Local Planning Authority in relation to that particular part. The ETP shall set out proposals and targets, measures to encourage use of alternatives to the private car, together with a timetable to limit or reduce the number of single occupancy car journeys to and from that part of the site, and to promote travel by sustainable modes. The ETP shall set out proposals to implement and manage the Travel Plan through a designated Travel Plan Coordinator. The ETP shall be implemented in accordance with the timetable which shall be set out in the plan or in accordance with a revised timetable which shall first be agreed in writing by the Local Planning Authority. Reports demonstrating progress in promoting the sustainable transport measures detailed in the Travel Plan shall be submitted annually to the Local Planning Authority for approval in writing for a period of 5 years beyond final occupation of each particular part of the employment development, commencing from the first anniversary of beneficial occupation.

Reason: To encourage sustainable transport to limit the impact of the development on use of the adjacent highway and effect modal shift to non-car modes in accordance with Local Development Plan Local Development Plan Policies T5 (Managing Transport Impacts) and T6 (Impact on Transport Networks and Services).

22. Prior to first beneficial use of any unit hereby approved, an Operational Noise Management Plan (ONMP) shall have been submitted to and approved in writing by the Local Planning Authority. The ONMP shall detail the necessary controls to ensure there would be no unacceptable impact on nearby residential properties, including (as a minimum): -

- Location of Mechanical Services Equipment, including the results of noise assessment to ensure the noise emitted from additional fixed plant and equipment on the site achieves a rating noise level below background at the nearest noise sensitive premises if operational during the day and night when measured and corrected in accordance with BS 4142: 2014 (or any British Standard amending or superseding that standard);
- A Service Management Plan to ensure noise from deliveries are minimised as far as possible;

and

- the use of 'white noise' reverse signals when operating onsite.

The ONMP shall be subject to periodic review not less than every 24 months (or in response to a request made in writing by the Local Planning Authority in response to receipt of any justified complaints), with the results of such review submitted to the Local Planning Authority for its approval in writing, and any recommended changes to operational activities that may be recommended within such revised ONMP thereafter implemented in accordance with a timetable to be agreed in writing by the Local Planning Authority.
All operations at the site shall be carried out in full accordance with the ONMP (as approved or revised) for the duration of its operation.

Reason: To protect the amenity of nearby residential properties and wider locality and to accord with Policies KP5 and EN13 of the Cardiff Local Development Plan 2006-2026.

23. The construction of each industrial unit hereby approved shall be in accordance with the energy saving measures identified within the submitted Energy report: Energy Efficient & Low Carbon Strategies (Hydrock KTA October 2022). Prior to first beneficial occupation of each unit, a further energy report shall be submitted on behalf of each tenant/operator which demonstrates consideration of the implementation of additional recommendations in the energy report (or additional measures), including: -

- Employment of large-scale, roof-mounted photovoltaic (PV) systems to generate zero-carbon electricity on-site (with the roof structure enhanced to facilitate the fitting of a large-scale roof mounted Photo Voltaic system)
- Installation of CO2 sensors and motorised dampers within large meeting rooms
- Use of external lighting control air lux to allow for each external light fitting to be controlled individually

Reason: In the interest of sustainability and to comply with the requirement within Policy EN12 (Renewable Energy and Low Carbon Technologies) to maximise the potential for renewable energy having regard to the decarbonisation objectives of Planning Policy Wales and Future Wales

24. Prior to first beneficial occupation of any part of the development hereby approved, a scheme of crime prevention measures (with associated implementation timetable), to include perimeter security, means to control vehicular access when unoccupied, CCTV, external lighting (see associated condition *), and building shell security (relating to the first two metres of external walls), shall have been submitted to and approved in writing by the Local Planning Authority. All measures within the agreed scheme shall be implemented in accordance with the approved timetable, and thereafter retained on site as approved.

    Reason: In the interest of managing and 'designing out' crime and creating communities which are safer and feel safer, and to accord with LDP Policy KP13 (Responding to Evidenced Social Needs)

25. No unit hereby approved shall be occupied until appropriate storage areas for separated waste and recycling materials, along with the proposed collection points, have been provided on site in accordance with details that shall first have been submitted to and approved in writing by the Local Planning Authority. Thereafter the waste storage and collection points shall be retained in accordance with such approved details.

    Reason: To ensure appropriate waste management provision to serve all units is provided and retained, in accordance with LDP Policy W2 (Provision for Waste Management Facilities in Development) and the Council's approved SPG 'Waste Collection & Storage Facilities'.

26. The Class A3 / Café Drive Through Units hereby approved shall not be occupied until such time as litter bin(s) - which shall be the responsibility of the occupied unts (or site management company) - have been provided on and in proximity to each of the units, in accordance with a scheme and associated management plan which shall first have been submitted to and approved in writing by the Local Planning Authority. The litter bins shall thereafter be retained and managed in accordance with the approved details.

    Reason: To ensure appropriate waste provision to serve the drive-through units is provided and retained, in accordance with LDP Policy W2 (Provision for Waste Management Facilities in Development) and the Council's approved SPG 'Waste Collection & Storage Facilities'

27. Soft Landscaping Audit. An audit of arboricultural/ landscape /soil compliance against agreed plans/conditions, shall be undertaken on a 6 monthly basis, and provided to the Local Planning Authority commencing from the date of clearance works commencing at the site.

    The audit (s) shall demonstrate that the soft landscaping/arboricultural protection and soil resources are being protected/implemented as per agreed plans/conditions and that there is less than 5% non-compliance, by species, number, area of soft landscape input, handling of soil and protection of trees.

Should a greater than 5% non-compliance be found at any stage of the audit above, prior to submission of the audit, evidence must be provided that the non-compliances have been rectified and/or a timeframe given for soft landscaping, soil remediation or tree protection to be implemented, included the original and final audit provided to the Local Planning Authority in that case.

No later than 12 months following the beneficial occupation of the last phase (or within two years of occupation of the first building, whichever is the sooner), a final audit shall be provided to the LPA demonstrating provision of all necessary soft planting in full compliance with the approved landscaping / GILEMP conditions.

Reason: To ensure the landscaping provides long term benefits to the environment of the site, including vegetated soil and carbon retention, Net Benefits for Biodiversity, improving the amenity and environmental value of the area, and ensure defects are remedied. This aligns with the expectation of PPW Chapter 6 and polices KP15, KP16, EN6, EN7 and EN8 of the Cardiff Local Development Plan (2006-2026).

Regulatory Conditions

28. The retail floorspace hereby permitted shall be used for the purpose specified in the application (coffee shop/cafe) and for no other purposes falling in Class A3 of the Town and Country Planning (Use Classes) Order 1987 (of in any provision equivalent to that class in any statutory instrument amending, revoking or re-enacting that Order).

    Reason: To prevent other retail uses which would need to be fully considered separately by the Local Planning Authority in terms of development plan policies and/or national guidance.

29. No part of the development hereby permitted shall be occupied until such time as Electric Vehicle (EV) charging infrastructure has been provided on, and is operational to serve, each unit / part of the site, with a minimum of 10% of the overall number of spaces for that unit/part provided, and a further 20% of all car parking provided with the necessary ducting for future electric charging points.

    Reason: To ensure the provision of a satisfactory car park layout and that appropriate provision is made for Electric Vehicle charging in accordance with Future Wales Policy 12 (Regional Connectivity).

30. The following ecological enhancements covering green infrastructure to individual ecological receptors, shall be installed at the development to ensure along with relevant avoidance to mitigation, Net Benefits for Biodiversity can be achieved as part of the Step Wise Approach:

    - The enhancements specified in Section 6.3 of "Delta Simons, Ecological Impact Assessment Cardiff East Park and Ride Issue 14, dated 15/12/2023". Further detail will be assessed against future landscape plans for compatibility.
    - Removal of rubbish particularly from the river as per "A.T. Coombes Associates Ltd, Woodland Management Plan at Cardiff East Park and Ride, Eastern Avenue Pentwyn, dated 23rd August 2023"

- Herbicides will only be used on hard surfaced areas, to prevent damage to hard landscaping over time, as a less carbon intensive way of maintaining the hard landscaped environment and ensuring semi-natural habitat remain herbicide free.
- Attenuation basins will contain 100% native species. Rain gardens will contain a minimum of 75% native species by diversity and extent. Planting overall, must look to source local provenance stock.
- 2 of the attenuation basins will contain a pond a minimum of 5m x 5m in size, with shallow sloping margins.
- All retaining walls shall include planting of Hedera helix, Lonicera periclymenum and Clematis vitalba (with appropriate supports), and planting beds at the base of the walls to facilitate this. This can be appropriately factored into detailed designs of retaining walls and yards.
- All disturbed ground not planted with scrub, will be planted with a diverse meadow flower mix suitable for the soil type identified by the Soil Resource Plan.
- Grasslands will be diversified at the site with slot seeding/light harrowing suitable for a floodplain. This will preserve native species diversity and soil carbon. This may include the spreading of material/100mm of topsoil from the species rich bank of plot 8.
- 1 x large bespoke bat box, attached to the south west side of the bridge or a pillar, with access to direct sunlight.
- 4 x bat boxes along the River Rhymney in locations least likely to be disturbed.
- 1 x hibernation bat box in the area of Ancient Woodland.
- 2 x bat boxes suitable for maternity use, on Plot 4 and 5. This should face south or west, but with access to cover adjacent.
- A kestrel box on the edge of the Offsite Supplementary Habitat Planting area.
- 4 x house sparrow terraces and 4 starling boxes.
- 2 x bee banks, south facing, in grassland areas, comprised of nutrient poor substrate from the site.
- 2 x large hibernacula to benefits invertebrates, amphibians and reptiles.
- A continuous gap beneath fences of 100mm or holes of 130mmx130mm under fences, gates, walls etc to allow passage of hedgehog.
- The 40 + apple trees that have been planted in the location of Plot 8, shall be donated to Coed Caerdydd or other charities in Cardiff to be replanted to benefit the community and pollinators.
- To benefit the retention of native provenance trees, young oak trees (or other trees species) (saplings, feathered specimens or potentially as young standards), shall be lifted and used accordingly in site landscaping or at the offsite dormouse habitat creation area.

A drawing indicating the location of enhancements and photographic evidence they have been installed, both close up and at a distance (to indicate their location generally on the site) in line with guidance/best practice, must be provided to Cardiff Council each year (if implementation will take more than 1 year), or no later than one month after the buildings first beneficial use whichever is sooner.

Reason: To comply with the Environment (Wales) Act 2016, to "maintain and enhance biodiversity" and "promote the resilience of ecosystems", the Section 6 duty. Future Wales - The National Plan 2040 - Policy 9, Planning Policy Wales Section 6 and policies KP16, and EN4 to EN8 of the Cardiff Local Development Plan 2006-2026 and those elements discussed in "Cardiff Green Infrastructure SPG Ecology and Biodiversity Technical Guidance Note, 2017".

31. In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported in writing within 2 days to the Local Planning Authority, all associated works must stop, and no further development shall take place unless otherwise agreed in writing until a scheme to deal with the contamination found has been approved. An investigation and risk assessment must be undertaken and where remediation is necessary a remediation scheme and verification plan must be prepared and submitted to and approved in writing by the Local Planning Authority. Following completion of measures identified in the approved remediation scheme a verification report must be submitted to and approved in writing by the Local Planning Authority. The timescale for the above actions shall be agreed with the LPA within 2 weeks of the discovery of any unsuspected contamination.

    Reason: To ensure that any unacceptable risks from land contamination to the future users of the land, neighbouring land, controlled waters, property and ecological systems are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with Policy EN13 of the Cardiff Local Development Plan.

32. All new planting, seeding and turf laying relating to the specific phase shall be completed during the first available planting/seeding season post beneficial occupation of that phase, or the completion of development (whichever is soonest). Any new planting, seeding or turf laying which within a period of 10 years from the beneficial occupation or completion of the development dies, is removed, becomes seriously damaged or diseased, or in the opinion of the Local Planning Authority (LPA) otherwise defective, shall be replaced.

    Replacement planting, seeding or turf laying shall take place during the first available planting/seeding season, to the approved specification, unless the Local Planning Authority gives written consent to any variation.

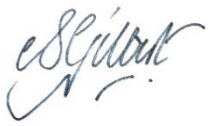
    Reason: In the interests of the visual amenity of the area, enhancing biodiversity and mitigating the effects of climate change in accordance with Policy KP5, KP15 and KP16 of the Cardiff Local Development Plan 2006-2026.

33. All use of site won materials and Imported Soils and Aggregates shall only be undertaken in full accordance with the 'landscape earthworks specification' report by Barry Chinn Associates Limited (which includes a scheme for the contamination assessment and screening of imported and site won material to ensure the suitability of materials used at the development).

    Reason: To ensure that the safety of future occupiers is not prejudiced in accordance with policy EN13 of the Cardiff Local Development Plan.

34. Supervision of Trees - Bats. Prior to the felling of any tree at the site, the Ecological Clerk of Works (ECoW) must ensure a Preliminary Ground Level Roost Assessment (PGLRA) confirms the level of potential of that tree remains as indicated by the Ecological Impact Assessment. If any tree is observed with moderate/high potential, the ECoW will determine what further surveys will be required prior to felling. All PGLRAs and actions will be logged. The log will be supplied to the Local Planning Authority no later than 1 month after felling works are complete.

Reason: To ensure surveys follow best practice and that all trees including those associated with the bridge construction are surveyed. This will ensure that any additional mitigation is addressed with regards to bats and principally the Conservation of Habitats and Species Regulations 2017 (as amended) and Policies EN5, EN6, EN7 and KP16 of the Cardiff Council Local Development Plan.



Simon Gilbert
Head of Planning

Date: 25th June 2024

Informatives:

1. Flood Risk Activity Permit (FRAP) : The proposed works to construct a new bridge/viaduct (reference to FCA, Appendix A: Proposed Viaduct - General Arrangement, Drawing No. 70071035-STR-001/P05) across the River Rhymney and its floodplain (defended and undefended) will require a FRAP. This will also need to include details relating to how NRW can suitably access the existing flood scheme for operational and maintenance activities, including future improvements. Please be aware that NRW may refuse a FRAP application if this aspect is not acceptable. All guidance and details for FRAPs are available on this link Natural Resources Wales / Flood risk activity permits

   Existing Surface Water Outfall: We would like to remind the applicant that where the existing surface water outfall is to be maintained on the eastern boundary, this appears to feed into the combined sewer on our mapping system and therefore, should not flow directly into the Rumney River.

2. In respect of the CEMP (condition*) Natural Resources Wales advise as follows:-

   a) Section 4.86 states all chemicals including fuels will be stored in a way that can be easily moved in the event of a flood. We recommend the CEMP be amended to include that fuel and other chemicals should be stored in a 110% volume equivalent bunded area. Please also note, that the locations of the above activities should be over 10m from surface water drains and watercourses. Furthermore, we recommend any subsequent CEMP ensures that wheel/plant washing is carried out in a bunded area, and the contaminated water is either discharged to foul sewer or tankered away.
   b) Section 4.66 mentions silt fencing being used to filter run-off, however this should not be the only barrier. We recommend that settlement lagoons are also considered and if deemed inappropriate for the site, the reasoning must be clearly stated within the CEMP. The intended maintenance regime and regular inspection of installed silt fencing and other mitigation must also be clearly stated within the CEMP prior to approval and works commencing on the site.

c) We recommend specific reference must be made to NetRegs GPP5 in Section 4.68, the proposed sediment management and water quality monitoring should be included in the CEMP (Section 4.79) and that NRW will be contacted in the event of a pollution incident on our hotline.

3. In respect of the Drainage Strategy (Oil Interceptors), Natural Resources Wales advise as follow: -

   Guidance states that car parks with more than 50 spaces or that are over 800m² should have an oil interceptor. Given the large number of parking spaces and the sensitivity of the receptor site (Severn Estuary European Marine Site), we advise oil interceptors are included within the SUDS management train. Whilst oils and other hydrocarbons can be filtered out through SUDS basins and degrade over time within retention basins, the size of the site with hardstanding throughout means that a large volume of surface water will be entering the retention basins and it is unclear whether the retention basins will retain the surface water long enough for breakdown of hydrocarbons before discharge. We request that oil interceptors are installed to ensure water pollution will not impact on the river Rhymney and the Severn Estuary European Marine Site.

4. To allow tracking of the project, especially with respect to landscaping, a copy of the EPS (Dormouse) License should be sent to the Local Planning Authority as soon as reasonably practicable after it has been issued

5. There will be a requirement to divert the Public Rights of Way Paths. Realignment of recorded Public Footpaths require a Section 257 Town and Country Planning Act Legal Order which is open to public consultation. To formalise the Rhymney Trail, the shared use cycle paths will require a Legal Order under the Cycle Track Conversion Act.

Reference No: 22/02673/FUL

IT IS IMPORTANT THAT YOU SHOULD READ THE NOTES ACCOMPANYING THIS NOTICE

PLANNING DECISION NOTICES: ADDITIONAL INFORMATION
APPLICATIONS FOR PLANNING PERMISSION, APPROVAL OF RESERVED MATTERS AND CERTIFICATE OF LAWFUL USE

(I) **Appeals**

An appeal can be made to the National Assembly for Wales against the City of Cardiffs refusal of planning permission for the proposal or to grant it subject to conditions (see Section 78 of the Town and Country Planning Act 1990). This must be made within 6 months for most applications, and 12 weeks for household applications and A1, A2 and A3 commercial applications.

The Secretary of State may not consider an appeal if it appears that the City could not have granted planning permission for the proposal, or could not have granted it without the conditions it imposed, having regard to the statutory requirements or to the provisions and directions of the development order.

(ii) **Purchase Notices**

The land or property owner may be able to serve a purchase notice on the City if it has refused permission to develop land or has granted it subject to conditions. In order to serve a purchase notice the owner must show that the land can neither be put to a reasonably beneficial use in its existing state and is not capable of reasonably beneficial use by the carrying out of other development which has been or would be permitted. A purchase notice will require the City to buy the owner's interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

(iii) **Compensation**

It may be possible to claim compensation from the City if permission is refused, or granted subject to conditions by the Secretary of State on appeal or on reference of the application to him (see Section 137 and related provisions of the Town and Country Planning Act 1990).

APPLICATIONS FOR CONSENT TO DISPLAY ADVERTISEMENTS

(i) All advertisements (and any site used for the display of advertisements) granted consent must:
   (a) be maintained in a clean, tidy and safe condition;
   (b) not be displayed without the permission of the owner of the site or any person with an interest in the site entitled to grant permission; and
   (c) not be displayed or sited so as to obscure or hinder the ready interpretation of any road traffic sign, railway signal or aid to navigation by water or air, or so as otherwise to make hazardous the use of any highway, railway, waterway or aerodrome.

   Any exiting advertisements which need to be removed shall be removed to the reasonable satisfaction of the City.

(ii) Appeals can be made to the Planning Inspectorate, if consent is refused by the City o is granted subject to conditions, or for less than 5 years. Appeals must be made within 8 weeks from the date of the decision. Appeals must include copies of the application with all relevant submitted plans, correspondence and the decision notice (see Town and Country Planning (Control of Advertisements) Regulations 1992).

Reference No: 22/02673/FUL

APPLICATIONS FOR LISTED BUILDING CONSENT OR CONSERVATION CONSENT

(i) **Appeals**

An appeal can be made to the Planning Inspectorate (normally within 6 months or 12 weeks for household applications and A1, A2 and A3 commercial applications) against the City's decision to refuse consent for the proposal or to grant consent subject to conditions (see regulation 8 of the Planning (Listed Buildings and Conservation Areas) Regulations 1990).

(ii) **Purchase Notice**

The property owner may be able to serve a purchase notice on the City if it has refused consent or granted it subject to conditions. In order to serve a purchase notice the owner must show that the property can neither be put to a reasonably beneficial use in its existing state and is not capable of reasonably beneficial use by the carrying out of other development which has been or would be permitted.

A purchase notice will require the City to buy the owner's interest in the property in accordance with Section 32 of the Planning (Listed Buildings and Conservation Areas) Act 1990.

(iii) **Compensation**

It may be possible to claim compensation from the City if consent is refused, or granted subject to conditions by the Planning Inspectorate on appeal or on reference of the application to him (see Section 27 of the Planning (Listed Building and Conservation Area) Act 1990).

ACCESS TO BUILDINGS FOR DISABLED PERSONS

Please consider adequate provision for access to buildings which disabled persons are likely to use such as shops, offices, factories, railway premises and educational establishments. (See Section 76 of the Town and Country Planning Act 1990). Please contact the BuildingControl Division, PT&E, County Hall, Atlantic Wharf, Cardiff, CF10 4UW for further advice.
(Phone :029 2233 0381/2/3).

PLEASE CONTACT PLANNING AND ENVIRONMENT DECISIONS WALES, CROWN BUILDING, CATHAYS PARK,CARDIFF, CF10 3NQ FOR DETAILS OF APPEAL PROCEDURES AND FORMS:
TEL : 0300 0604400
Email: PEDW.Casework@gov.wales

Appendix B 2022 Traffic Flow Diagrams

Transport Assessment

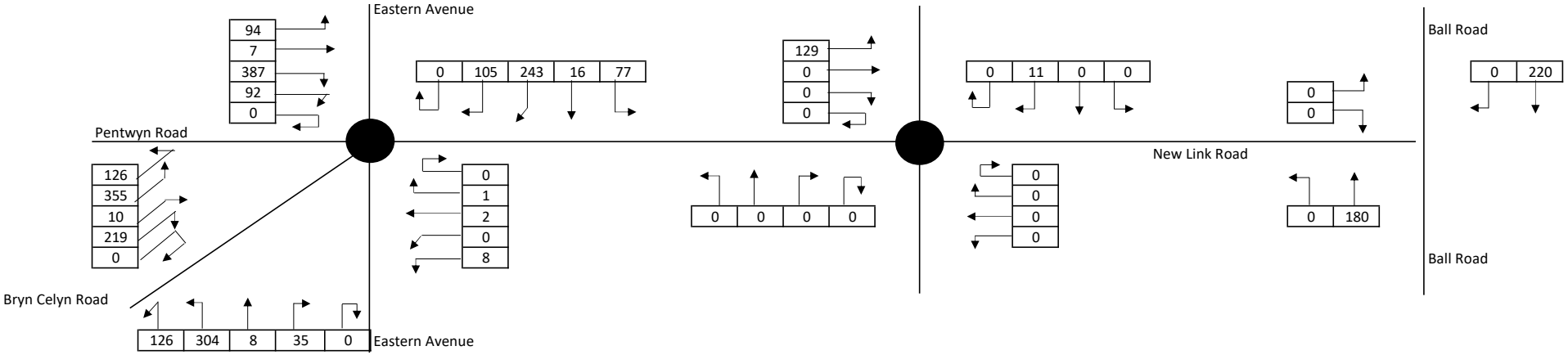
Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

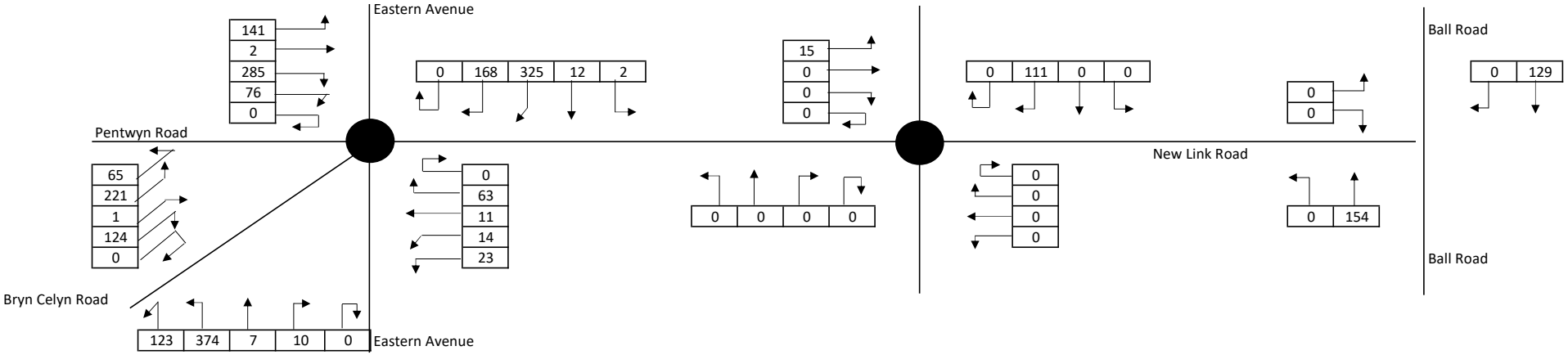
SLR Project No.: 425.067363.00001

1 December 2025

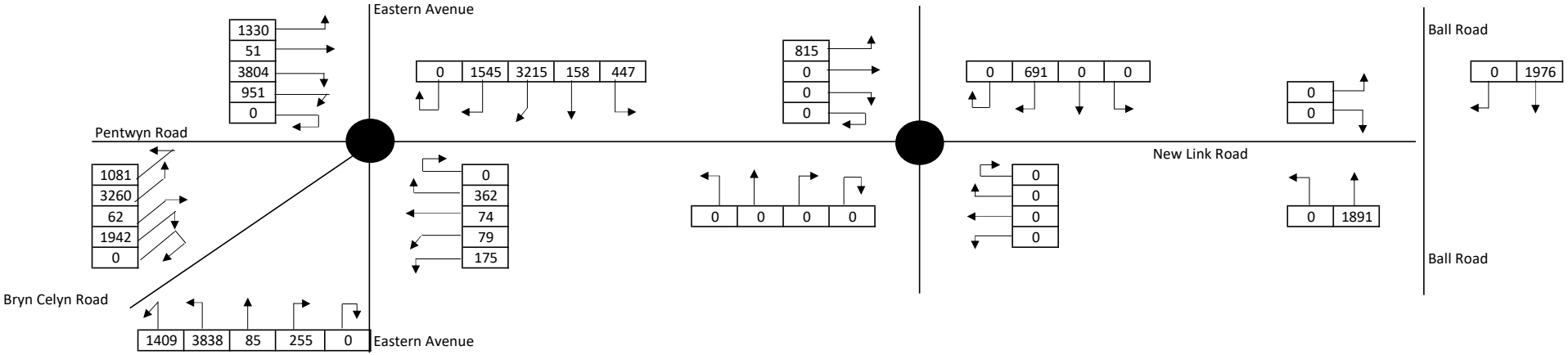
2022 Observed AM (08:00-09:00) - Vehicles



2022 Observed PM (17:00-18:00) - Vehicles



2022 Observed - 24hr AADT - Total Vehicles



Appendix C 2022 Traffic Data

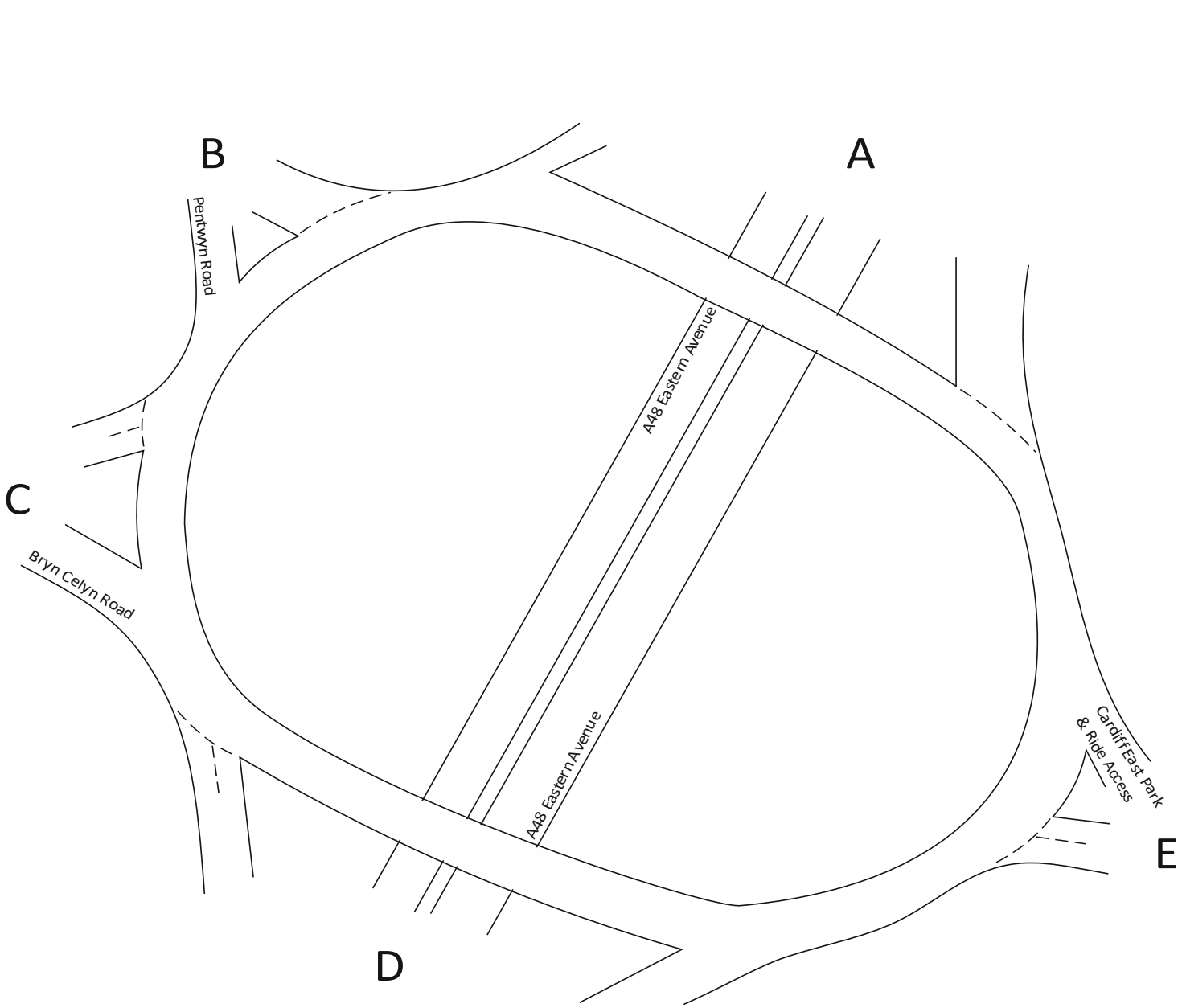
Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

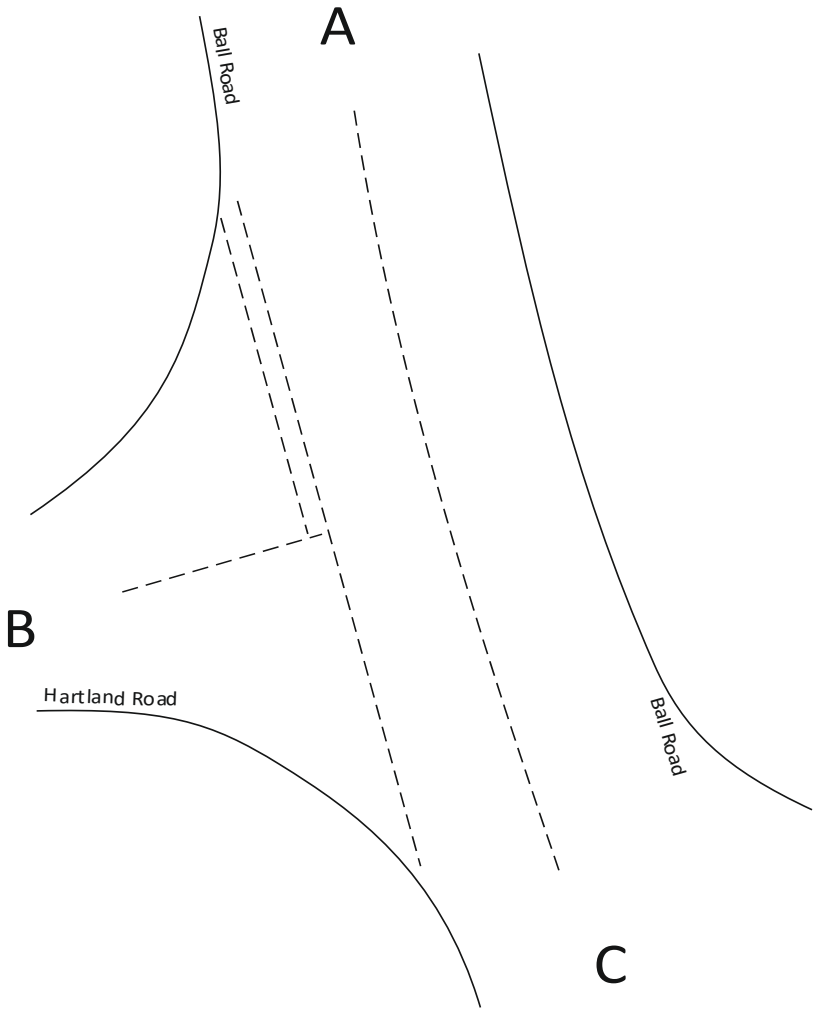
Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 01

Site: 1

Location: A48 Eastern Avenue / Pentwyn Road / Bryn Celyn Road / Cardiff East Park & Ride Access



N

TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 02

Site: 2

Location: Ball Road / Hartland Road

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	0	0	0	0	0	0	9	1	0	0	0	0	0	0	1
07:15	22	0	0	0	0	0	0	22	1	0	0	0	0	0	0	1
07:30	24	3	0	0	0	0	0	27	1	0	0	0	0	0	0	1
07:45	26	0	0	0	0	0	0	26	2	0	0	0	0	0	0	2
H/TOT	81	3	0	0	0	0	0	84	5	0	0	0	0	0	0	5
08:00	20	0	0	0	0	0	0	20	1	1	0	0	0	0	0	2
08:15	22	1	0	0	0	0	0	23	3	1	1	0	0	0	0	5
08:30	29	0	0	0	0	0	0	29	4	0	0	0	0	0	0	4
08:45	5	0	0	0	0	0	0	5	1	2	1	1	0	0	0	5
H/TOT	76	1	0	0	0	0	0	77	9	4	2	1	0	0	0	16
09:00	6	1	1	0	0	0	0	8	2	2	0	1	0	0	0	5
09:15	5	0	0	0	0	0	0	5	1	0	0	0	0	0	0	1
09:30	4	0	0	0	0	0	0	4	0	1	0	0	0	0	0	1
09:45	4	0	0	0	0	0	0	4	2	0	0	0	0	0	0	2
H/TOT	19	1	1	0	0	0	0	21	5	3	0	1	0	0	0	9
P/TOT	176	5	1	0	0	0	0	182	19	7	2	2	0	0	0	30

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:45	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2
H/TOT	1	0	0	0	0	0	0	1	5	1	0	0	0	0	0	6
17:00	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0	3
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
17:30	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	2
17:45	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
H/TOT	1	1	0	0	0	0	0	2	8	4	0	0	0	0	0	12
18:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
18:15	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
18:30	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	0	0	0	2	5	0	0	0	0	0	0	5
P/TOT	4	1	0	0	0	0	0	5	18	5	0	0	0	0	0	23

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	17	0	3	1	0	0	0	21	14	6	0	0	1	0	0	21
07:15	24	6	2	0	0	0	0	32	18	6	0	1	0	1	0	26
07:30	35	9	3	1	0	0	0	48	18	3	1	0	0	0	0	22
07:45	54	12	0	0	0	0	0	66	22	2	5	0	0	0	0	29
H/TOT	130	27	8	2	0	0	0	167	72	17	6	1	1	1	0	98
08:00	34	4	1	0	1	1	0	41	21	3	1	1	1	0	0	27
08:15	71	4	0	1	1	0	0	77	20	0	1	1	1	0	0	23
08:30	67	8	2	1	2	0	0	80	23	3	1	0	1	0	0	28
08:45	33	11	0	1	0	0	0	45	21	3	1	2	0	0	0	27
H/TOT	205	27	3	3	4	1	0	243	85	9	4	4	3	0	0	105
09:00	36	6	2	0	0	0	0	44	25	6	1	0	0	0	0	32
09:15	37	7	0	0	0	0	0	44	28	6	2	0	0	0	0	36
09:30	30	5	3	1	0	0	0	39	13	3	1	0	0	0	0	17
09:45	23	4	0	0	0	0	0	27	20	0	3	1	0	0	0	24
H/TOT	126	22	5	1	0	0	0	154	86	15	7	1	0	0	0	109
P/TOT	461	76	16	6	4	1	0	564	243	41	17	6	4	1	0	312

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	59	3	2	0	0	0	0	64	42	4	1	0	0	0	0	47
16:15	68	12	1	0	0	0	0	81	38	3	0	1	0	0	0	42
16:30	65	6	1	0	0	0	0	72	31	7	0	0	0	0	0	38
16:45	69	6	3	0	0	0	0	78	43	7	0	0	0	0	0	50
H/TOT	261	27	7	0	0	0	0	295	154	21	1	1	0	0	0	177
17:00	70	14	1	0	0	0	0	85	44	5	0	0	0	0	0	49
17:15	76	5	0	0	0	1	0	82	41	1	0	0	0	0	0	42
17:30	75	6	1	0	0	1	0	83	36	5	0	0	0	0	0	41
17:45	71	3	1	0	0	0	0	75	34	2	0	0	0	0	0	36
H/TOT	292	28	3	0	0	2	0	325	155	13	0	0	0	0	0	168
18:00	66	9	0	0	0	0	0	75	28	4	0	0	0	0	0	32
18:15	52	3	0	0	0	0	0	55	24	1	1	0	0	0	0	26
18:30	34	1	1	0	0	0	0	36	23	1	0	0	0	0	0	24
18:45	43	5	0	0	0	0	0	48	21	2	0	1	0	0	0	24
H/TOT	195	18	1	0	0	0	0	214	96	8	1	1	0	0	0	106
P/TOT	748	73	11	0	0	2	0	834	405	42	2	2	0	0	0	451

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	11	3	2	0	0	0	0	16
07:15	0	0	0	0	0	0	0	0	16	7	1	0	0	0	0	24
07:30	0	0	0	0	0	0	0	0	15	1	0	0	0	0	0	16
07:45	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	60	13	4	0	0	0	0	77
08:00	0	0	0	0	0	0	0	0	21	3	1	0	0	0	0	25
08:15	0	0	0	0	0	0	0	0	22	2	1	0	0	0	0	25
08:30	0	0	0	0	0	0	0	0	18	2	2	1	0	0	0	23
08:45	0	0	0	0	0	0	0	0	14	4	3	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	75	11	7	1	0	0	0	94
09:00	0	0	0	0	0	0	0	0	15	0	1	0	0	0	0	16
09:15	0	0	0	0	0	0	0	0	11	2	2	2	0	0	0	17
09:30	0	0	0	0	0	0	0	0	16	5	2	0	0	0	0	23
09:45	0	0	0	0	0	0	0	0	13	8	2	0	0	0	0	23
H/TOT	0	0	0	0	0	0	0	0	55	15	7	2	0	0	0	79
P/TOT	0	0	0	0	0	0	0	0	190	39	18	3	0	0	0	250

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	35	2	0	1	0	0	0	38
16:15	0	0	0	0	0	0	0	0	35	6	2	0	0	2	0	45
16:30	0	0	0	0	0	0	0	0	30	3	0	0	0	0	0	33
16:45	0	0	0	0	0	0	0	0	39	4	0	0	0	0	0	43
H/TOT	0	0	0	0	0	0	0	0	139	15	2	1	0	2	0	159
17:00	0	0	0	0	0	0	0	0	40	3	1	1	0	0	0	45
17:15	0	0	0	0	0	0	0	0	26	7	1	1	0	0	0	35
17:30	0	0	0	0	0	0	0	0	37	2	0	0	0	1	0	40
17:45	0	0	0	0	0	0	0	0	20	1	0	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	123	13	2	2	0	1	0	141
18:00	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	21
18:15	0	0	0	0	0	0	0	0	23	1	0	0	0	0	0	24
18:30	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20
18:45	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	22
H/TOT	0	0	0	0	0	0	0	0	86	1	0	0	0	0	0	87
P/TOT	0	0	0	0	0	0	0	0	348	29	4	3	0	3	0	387

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	2	0	0	0	0	0	0	2	31	8	0	0	1	0	0	40
07:15	3	0	0	0	1	0	0	4	63	15	1	0	0	0	0	79
07:30	4	0	0	0	0	0	0	4	61	5	1	2	0	0	0	69
07:45	2	0	0	0	1	0	0	3	75	5	2	0	1	0	0	83
H/TOT	11	0	0	0	2	0	0	13	230	33	4	2	2	0	0	271
08:00	3	0	0	0	0	0	0	3	97	8	1	0	0	0	0	106
08:15	2	0	0	0	0	0	0	2	92	10	3	0	1	0	0	106
08:30	1	0	0	0	0	0	0	1	91	8	1	0	1	1	0	102
08:45	0	0	0	0	1	0	0	1	66	4	1	2	0	0	0	73
H/TOT	6	0	0	0	1	0	0	7	346	30	6	2	2	1	0	387
09:00	2	0	1	0	0	0	0	3	76	13	2	0	1	0	1	93
09:15	1	0	0	0	1	0	0	2	54	6	0	1	1	0	0	62
09:30	0	0	0	0	1	0	0	1	53	9	6	1	0	0	0	69
09:45	0	0	0	0	0	0	0	0	56	8	2	0	0	0	0	66
H/TOT	3	0	1	0	2	0	0	6	239	36	10	2	2	0	1	290
P/TOT	20	0	1	0	5	0	0	26	815	99	20	6	6	1	1	948

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	1	0	0	1	58	1	2	1	0	0	0	62
16:15	0	0	0	0	0	0	0	0	71	4	1	0	0	0	0	76
16:30	0	0	0	0	0	0	0	0	73	2	1	1	1	0	0	78
16:45	0	0	0	0	1	0	0	1	76	4	1	0	0	0	0	81
H/TOT	0	0	0	0	2	0	0	2	278	11	5	2	1	0	0	297
17:00	0	0	0	0	0	0	0	0	69	1	1	0	0	0	0	71
17:15	0	0	0	0	1	0	0	1	57	3	0	0	0	0	0	60
17:30	0	0	0	0	0	0	0	0	88	2	0	0	1	0	0	91
17:45	0	0	0	0	1	0	0	1	60	3	0	0	0	0	0	63
H/TOT	0	0	0	0	2	0	0	2	274	9	1	0	1	0	0	285
18:00	1	0	0	0	0	0	0	1	67	4	0	0	0	0	0	71
18:15	0	0	0	0	0	0	0	0	67	1	0	0	0	0	0	68
18:30	0	0	0	0	1	0	0	1	70	0	0	0	0	0	0	70
18:45	0	0	0	0	0	0	0	0	71	2	0	0	1	0	0	74
H/TOT	1	0	0	0	1	0	0	2	275	7	0	0	1	0	0	283
P/TOT	1	0	0	0	5	0	0	6	827	27	6	2	3	0	0	865

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0
07:15	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
07:30	4	1	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:45	13	5	2	0	0	0	0	20	0	0	0	0	0	0	0	0
H/TOT	20	7	3	0	2	0	0	32	0	0	0	0	0	0	0	0
08:00	14	0	0	0	1	0	0	15	0	0	0	0	0	0	0	0
08:15	22	3	0	0	2	0	0	27	0	0	0	0	0	0	0	0
08:30	16	4	0	0	0	0	0	20	0	0	0	0	0	0	0	0
08:45	23	4	1	0	2	0	0	30	0	0	0	0	0	0	0	0
H/TOT	75	11	1	0	5	0	0	92	0	0	0	0	0	0	0	0
09:00	29	1	0	0	1	0	0	31	0	0	0	0	0	0	0	0
09:15	24	1	0	0	0	0	0	25	0	0	0	0	0	0	0	0
09:30	8	0	1	0	1	0	0	10	0	0	0	0	0	0	0	0
09:45	7	0	1	0	1	0	0	9	0	0	0	0	0	0	0	0
H/TOT	68	2	2	0	3	0	0	75	0	0	0	0	0	0	0	0
P/TOT	163	20	6	0	10	0	0	199	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	7	1	0	1	0	0	16	0	0	0	0	0	0	0	0
16:15	16	2	0	0	3	0	0	21	0	0	0	0	0	0	0	0
16:30	11	2	0	0	0	0	0	13	0	0	0	0	0	0	0	0
16:45	26	5	0	0	1	0	0	32	0	0	0	0	0	0	0	0
H/TOT	60	16	1	0	5	0	0	82	0	0	0	0	0	0	0	0
17:00	20	1	0	0	0	0	0	21	0	0	0	0	0	0	0	0
17:15	19	2	0	0	2	0	0	23	0	0	0	0	0	0	0	0
17:30	13	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0
17:45	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
H/TOT	70	4	0	0	2	0	0	76	0	0	0	0	0	0	0	0
18:00	22	0	1	0	0	0	0	23	0	0	0	0	0	0	0	0
18:15	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
18:30	25	3	0	0	0	0	0	28	0	0	0	0	0	0	0	0
18:45	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
H/TOT	74	4	1	0	0	0	0	79	0	0	0	0	0	0	0	0
P/TOT	204	24	2	0	7	0	0	237	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	3	0	0	0	0	0	7	36	9	2	0	0	0	0	47
07:15	7	0	1	0	0	0	0	8	47	11	1	0	0	1	0	60
07:30	7	1	0	0	1	0	0	9	66	5	1	0	0	0	0	72
07:45	15	2	0	0	0	0	0	17	65	5	1	0	0	0	0	71
H/TOT	33	6	1	0	1	0	0	41	214	30	5	0	0	1	0	250
08:00	20	3	0	0	1	0	0	24	65	6	1	0	0	0	0	72
08:15	13	1	0	0	0	0	0	14	84	10	1	0	0	0	0	95
08:30	31	1	1	0	0	0	0	33	84	6	0	0	0	0	0	90
08:45	53	1	1	0	0	0	0	55	91	6	1	0	0	0	0	98
H/TOT	117	6	2	0	1	0	0	126	324	28	3	0	0	0	0	355
09:00	26	0	0	0	1	0	0	27	57	6	0	0	0	0	0	63
09:15	21	1	1	0	1	0	0	24	29	7	0	1	0	0	0	37
09:30	4	1	0	0	2	0	0	7	32	4	0	0	0	0	0	36
09:45	8	2	0	0	1	0	0	11	33	10	0	0	0	0	0	43
H/TOT	59	4	1	0	5	0	0	69	151	27	0	1	0	0	0	179
P/TOT	209	16	4	0	7	0	0	236	689	85	8	1	0	1	0	784

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	18	2	0	0	2	0	0	22	48	5	0	0	0	0	0	53
16:15	16	0	0	0	0	0	0	16	63	10	1	0	0	0	0	74
16:30	25	0	1	0	2	0	0	28	71	11	0	0	0	0	0	82
16:45	23	0	0	0	0	0	0	23	56	8	0	0	0	0	0	64
H/TOT	82	2	1	0	4	0	0	89	238	34	1	0	0	0	0	273
17:00	16	1	0	0	2	0	0	19	53	5	1	0	0	0	0	59
17:15	11	0	0	0	0	0	0	11	58	9	0	0	0	0	0	67
17:30	18	0	0	0	1	0	0	19	60	5	0	0	0	0	0	65
17:45	14	1	0	0	1	0	0	16	26	2	0	1	0	1	0	30
H/TOT	59	2	0	0	4	0	0	65	197	21	1	1	0	1	0	221
18:00	15	1	0	0	1	0	0	17	44	4	0	0	0	0	0	48
18:15	19	2	0	0	0	0	0	21	44	4	1	0	0	0	0	49
18:30	19	0	2	0	0	0	0	21	34	0	0	0	0	0	0	34
18:45	14	1	0	0	0	0	0	15	28	5	0	0	0	0	0	33
H/TOT	67	4	2	0	1	0	0	74	150	13	1	0	0	0	0	164
P/TOT	208	8	3	0	9	0	0	228	585	68	3	1	0	1	0	658

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	0	0	0	0	0	0	4	19	6	0	0	0	0	0	25
07:15	4	0	0	0	0	0	0	4	26	4	0	0	0	0	0	30
07:30	2	0	0	0	0	0	0	2	19	10	0	0	0	0	0	29
07:45	2	0	0	0	0	0	0	2	33	3	0	0	0	0	0	36
H/TOT	12	0	0	0	0	0	0	12	97	23	0	0	0	0	0	120
08:00	3	0	0	0	0	0	0	3	52	9	0	0	0	0	0	61
08:15	3	0	0	0	1	0	0	4	39	6	1	0	0	1	0	47
08:30	2	0	0	0	0	0	0	2	49	6	2	0	0	0	0	57
08:45	1	0	0	0	0	0	0	1	46	8	0	0	0	0	0	54
H/TOT	9	0	0	0	1	0	0	10	186	29	3	0	0	1	0	219
09:00	2	0	0	0	0	0	0	2	43	7	0	0	0	0	0	50
09:15	0	0	0	0	0	0	0	0	32	4	1	0	0	0	0	37
09:30	0	0	0	0	0	0	0	0	28	2	1	1	0	0	0	32
09:45	0	0	0	0	0	0	0	0	16	1	2	0	0	0	0	19
H/TOT	2	0	0	0	0	0	0	2	119	14	4	1	0	0	0	138
P/TOT	23	0	0	0	1	0	0	24	402	66	7	1	0	1	0	477

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	0	0	0	1	41	4	0	0	0	0	0	45
16:15	0	0	0	0	0	0	0	0	33	3	0	0	0	0	0	36
16:30	0	0	0	0	0	0	0	0	48	4	0	0	0	0	0	52
16:45	0	0	0	0	0	0	0	0	43	2	0	0	0	0	0	45
H/TOT	1	0	0	0	0	0	0	1	165	13	0	0	0	0	0	178
17:00	0	0	0	0	0	0	0	0	26	3	0	0	0	0	1	30
17:15	1	0	0	0	0	0	0	1	32	1	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	32	2	0	0	0	0	0	34
17:45	0	0	0	0	0	0	0	0	23	4	0	0	0	0	0	27
H/TOT	1	0	0	0	0	0	0	1	113	10	0	0	0	0	1	124
18:00	1	0	0	0	0	0	0	1	22	0	0	0	0	0	0	22
18:15	0	0	0	0	0	0	0	0	29	0	1	0	0	0	0	30
18:30	0	0	0	0	0	0	0	0	25	1	0	0	1	0	0	27
18:45	0	0	0	0	0	0	0	0	37	3	0	0	0	0	0	40
H/TOT	1	0	0	0	0	0	0	1	113	4	1	0	1	0	0	119
P/TOT	3	0	0	0	0	0	0	3	391	27	1	0	1	0	1	421

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	9
07:15	0	0	0	0	0	0	0	0	11	3	0	0	0	0	0	14
07:30	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
07:45	0	0	0	0	0	0	0	0	23	6	0	0	0	0	0	29
H/TOT	0	0	0	0	0	0	0	0	60	12	1	0	0	0	0	73
08:00	0	0	0	0	0	0	0	0	16	3	0	0	0	0	0	19
08:15	0	0	0	0	0	0	0	0	29	5	0	0	0	0	0	34
08:30	0	0	0	0	0	0	0	0	30	3	1	0	0	0	0	34
08:45	0	0	0	0	0	0	0	0	33	6	0	0	0	0	0	39
H/TOT	0	0	0	0	0	0	0	0	108	17	1	0	0	0	0	126
09:00	0	0	0	0	0	0	0	0	27	1	0	1	0	0	0	29
09:15	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
09:30	0	0	0	0	0	0	0	0	9	5	0	0	0	0	0	14
09:45	0	0	0	0	0	0	0	0	10	6	1	0	0	0	0	17
H/TOT	0	0	0	0	0	0	0	0	75	15	1	1	0	0	0	92
P/TOT	0	0	0	0	0	0	0	0	243	44	3	1	0	0	0	291

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	28	5	1	0	0	0	0	34
16:15	0	0	0	0	0	0	0	0	23	5	0	0	0	0	0	28
16:30	0	0	0	0	0	0	0	0	23	3	0	0	0	0	0	26
16:45	0	0	0	0	0	0	0	0	22	6	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	96	19	1	0	0	0	0	116
17:00	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
17:15	0	0	0	0	0	0	0	0	29	4	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	21	4	0	0	0	0	0	25
17:45	0	0	0	0	0	0	0	0	31	2	0	0	0	0	0	33
H/TOT	0	0	0	0	0	0	0	0	110	13	0	0	0	0	0	123
18:00	0	0	0	0	0	0	0	0	33	2	0	0	0	0	0	35
18:15	0	0	0	0	0	0	0	0	36	2	1	0	0	1	0	40
18:30	0	0	0	0	0	0	0	0	31	1	1	0	0	0	0	33
18:45	0	0	0	0	0	0	0	0	26	2	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	126	7	2	0	0	1	0	136
P/TOT	0	0	0	0	0	0	0	0	332	39	3	0	0	1	0	375

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	33	7	3	0	1	0	0	44	0	1	0	0	0	0	0	1
07:15	42	6	0	2	2	0	0	52	0	1	0	0	0	0	0	1
07:30	39	4	1	0	0	0	1	45	0	0	0	0	0	0	0	0
07:45	55	7	1	0	0	0	0	63	3	0	0	0	0	0	0	3
H/TOT	169	24	5	2	3	0	1	204	3	2	0	0	0	0	0	5
08:00	54	10	0	0	0	0	0	64	0	1	0	0	0	0	0	1
08:15	67	3	4	1	0	0	0	75	0	0	0	0	0	0	0	0
08:30	54	10	0	0	3	0	0	67	5	0	0	0	0	0	0	5
08:45	85	5	5	1	1	1	0	98	0	0	2	0	0	0	0	2
H/TOT	260	28	9	2	4	1	0	304	5	1	2	0	0	0	0	8
09:00	72	14	1	0	0	0	0	87	0	0	0	1	0	0	0	1
09:15	57	10	1	0	0	0	0	68	1	0	0	0	0	0	0	1
09:30	49	9	5	0	0	0	0	63	0	1	1	0	0	0	0	2
09:45	48	13	0	0	1	0	0	62	1	1	0	0	0	0	0	2
H/TOT	226	46	7	0	1	0	0	280	2	2	1	1	0	0	0	6
P/TOT	655	98	21	4	8	1	1	788	10	5	3	1	0	0	0	19

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	83	8	1	0	0	1	0	93	0	1	0	0	0	0	0	1
16:15	80	5	0	0	0	0	0	85	4	0	0	0	0	0	0	4
16:30	77	6	1	1	0	0	0	85	2	0	0	0	0	0	0	2
16:45	101	10	1	0	0	0	1	113	0	0	0	0	0	0	0	0
H/TOT	341	29	3	1	0	1	1	376	6	1	0	0	0	0	0	7
17:00	81	7	1	0	0	1	0	90	1	1	0	0	0	0	0	2
17:15	101	12	1	0	0	0	0	114	2	0	0	0	0	0	0	2
17:30	82	5	1	0	0	0	0	88	2	0	0	0	0	0	0	2
17:45	77	5	0	0	0	0	0	82	1	0	0	0	0	0	0	1
H/TOT	341	29	3	0	0	1	0	374	6	1	0	0	0	0	0	7
18:00	81	5	1	0	0	1	0	88	0	1	0	0	0	0	0	1
18:15	76	4	0	0	0	0	0	80	1	0	0	0	0	0	0	1
18:30	59	1	2	0	0	0	0	62	1	0	1	0	0	0	0	2
18:45	63	1	0	0	1	0	0	65	3	1	0	0	0	0	0	4
H/TOT	279	11	3	0	1	1	0	295	5	2	1	0	0	0	0	8
P/TOT	961	69	9	1	1	3	1	1045	17	4	1	0	0	0	0	22

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:15	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
07:30	6	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0
07:45	9	0	0	0	1	0	0	10	0	0	0	0	0	0	0	0
H/TOT	24	0	0	0	4	0	0	28	0	0	0	0	0	0	0	0
08:00	6	0	0	0	2	0	0	8	0	0	0	0	0	0	0	0
08:15	14	0	0	0	2	0	0	16	0	0	0	0	0	0	0	0
08:30	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
08:45	4	0	0	0	2	0	0	6	0	0	0	0	0	0	0	0
H/TOT	28	0	0	0	7	0	0	35	0	0	0	0	0	0	0	0
09:00	2	0	0	0	2	0	0	4	0	0	0	0	0	0	0	0
09:15	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
09:30	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
09:45	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	6	0	0	15	0	0	0	0	0	0	0	0
P/TOT	61	0	0	0	17	0	0	78	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
16:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
16:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	5	0	0	6	0	0	0	0	0	0	0	0
17:00	3	0	0	0	2	0	0	5	0	0	0	0	0	0	0	0
17:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
17:30	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
17:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	4	0	0	0	6	0	0	10	0	0	0	0	0	0	0	0
18:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
18:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
18:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
18:45	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	6	0	0	7	0	0	0	0	0	0	0	0
P/TOT	6	0	0	0	17	0	0	23	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
07:30	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
07:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	4	0	0	6	1	0	0	0	0	0	0	1
08:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
08:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
08:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	6	0	0	8	0	0	0	0	0	0	0	0
09:00	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:45	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
H/TOT	3	0	0	0	4	0	0	7	0	0	0	0	0	0	0	0
P/TOT	7	0	0	0	14	0	0	21	1	0	0	0	0	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
16:15	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
16:30	2	0	0	0	1	0	0	3	2	0	0	0	0	0	0	2
16:45	6	0	0	0	2	0	0	8	1	0	0	0	0	0	0	1
H/TOT	10	0	0	0	5	0	0	15	6	0	0	0	0	0	0	6
17:00	4	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
17:15	3	0	0	0	2	0	0	5	1	0	0	0	0	0	0	1
17:30	8	1	0	0	1	0	0	10	5	0	0	0	0	0	0	5
17:45	2	0	0	0	2	0	0	4	4	0	0	0	0	0	0	4
H/TOT	17	1	0	0	5	0	0	23	14	0	0	0	0	0	0	14
18:00	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0	1
18:15	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
18:30	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
18:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	4	0	0	13	1	0	0	0	0	0	0	1
P/TOT	36	1	0	0	14	0	0	51	21	0	0	0	0	0	0	21

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
07:45	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
08:00	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
09:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
09:15	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1
09:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:45	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
H/TOT	2	0	0	0	2	0	0	4	2	0	1	0	0	0	0	3
P/TOT	4	0	0	0	5	0	0	9	4	0	1	0	0	0	0	5

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	0	0	0	1	0	0	4	7	0	0	0	0	0	0	7
16:15	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	6
16:30	2	0	0	0	1	0	0	3	14	1	0	0	0	0	0	15
16:45	1	0	0	0	0	0	0	1	24	0	0	0	0	0	0	24
H/TOT	6	0	0	0	2	0	0	8	51	1	0	0	0	0	0	52
17:00	6	0	0	0	1	0	0	7	14	0	0	0	0	0	0	14
17:15	0	0	0	0	0	0	0	0	14	1	0	0	0	0	0	15
17:30	3	0	0	0	1	0	0	4	27	0	0	0	0	0	0	27
17:45	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	7
H/TOT	9	0	0	0	2	0	0	11	62	1	0	0	0	0	0	63
18:00	1	0	0	0	0	0	0	1	9	0	0	0	0	0	0	9
18:15	1	0	0	0	1	0	0	2	2	0	0	0	0	0	0	2
18:30	1	0	0	0	1	0	0	2	9	0	0	0	0	0	0	9
18:45	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
H/TOT	3	0	0	0	2	0	0	5	25	0	0	0	0	0	0	25
P/TOT	18	0	0	0	6	0	0	24	138	2	0	0	0	0	0	140

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	1	0	0	1
07:15	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	1
08:00	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	1	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	48	13	4	0	0	0	0	65	41	6	3	1	1	0	0	52
07:15	63	19	2	0	0	1	0	85	65	12	2	1	0	1	0	81
07:30	81	6	1	0	0	0	0	88	78	15	4	1	0	0	0	98
07:45	86	7	2	0	0	0	0	95	104	14	5	0	0	0	0	123
H/TOT	278	45	9	0	0	1	0	333	288	47	14	3	1	1	0	354
08:00	86	10	2	0	0	0	0	98	76	8	2	1	2	1	0	90
08:15	107	12	2	0	0	0	0	121	116	6	2	2	2	0	0	128
08:30	107	8	2	1	0	0	0	118	123	11	3	1	3	0	0	141
08:45	105	10	6	0	0	0	0	121	60	16	2	4	0	0	0	82
H/TOT	405	40	12	1	0	0	0	458	375	41	9	8	7	1	0	441
09:00	73	6	1	1	0	0	0	81	69	15	4	1	0	0	0	89
09:15	42	9	2	3	0	0	0	56	71	13	2	0	0	0	0	86
09:30	48	10	3	0	0	0	0	61	47	9	4	1	0	0	0	61
09:45	47	19	3	0	0	0	0	69	49	4	3	1	0	0	0	57
H/TOT	210	44	9	4	0	0	0	267	236	41	13	3	0	0	0	293
P/TOT	893	129	30	5	0	1	0	1058	899	129	36	14	8	2	0	1088

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	90	8	0	1	0	0	0	99	101	7	3	0	0	0	0	111
16:15	108	16	3	0	0	2	0	129	108	15	1	1	0	0	0	125
16:30	117	15	0	0	0	0	0	132	98	13	1	0	0	0	0	112
16:45	119	12	0	0	0	0	0	131	114	14	3	0	0	0	0	131
H/TOT	434	51	3	1	0	2	0	491	421	49	8	1	0	0	0	479
17:00	108	9	2	1	0	0	0	120	118	19	1	0	0	0	0	138
17:15	100	17	1	1	0	0	0	119	118	6	0	0	0	1	0	125
17:30	126	7	0	0	0	1	0	134	112	13	1	0	0	1	0	127
17:45	54	3	0	1	0	1	0	59	108	8	1	0	0	0	0	117
H/TOT	388	36	3	3	0	2	0	432	456	46	3	0	0	2	0	507
18:00	74	5	0	0	0	0	0	79	95	13	0	0	0	0	0	108
18:15	70	5	1	0	0	0	0	76	79	4	1	0	0	0	0	84
18:30	64	0	1	0	0	0	0	65	60	2	1	0	0	0	0	63
18:45	58	6	0	0	0	0	0	64	64	7	0	1	0	0	0	72
H/TOT	266	16	2	0	0	0	0	284	298	26	2	1	0	0	0	327
P/TOT	1088	103	8	4	0	4	0	1207	1175	121	13	2	0	2	0	1313

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	16	3	0	2	0	0	72	45	12	3	0	1	0	0	61
07:15	67	12	1	3	2	1	0	86	84	22	2	0	2	0	0	110
07:30	65	8	2	0	2	0	1	78	84	7	1	2	1	0	0	95
07:45	93	11	6	0	0	0	0	110	108	12	5	0	2	0	0	127
H/TOT	276	47	12	3	6	1	1	346	321	53	11	2	6	0	0	393
08:00	95	16	1	1	3	0	0	116	135	11	2	0	1	0	0	149
08:15	100	4	5	2	1	0	0	112	138	15	4	0	3	0	0	160
08:30	108	14	2	0	4	0	0	128	126	14	3	1	1	1	0	146
08:45	159	9	7	3	2	1	0	181	103	12	5	2	3	0	0	125
H/TOT	462	43	15	6	10	1	0	537	502	52	14	3	8	1	0	580
09:00	123	20	2	0	1	0	0	146	122	14	4	0	2	0	1	143
09:15	106	17	4	0	2	0	0	129	90	9	2	3	2	0	0	106
09:30	67	13	6	0	3	0	0	89	77	14	9	1	2	0	0	103
09:45	77	15	3	1	2	0	0	98	76	16	5	0	1	0	0	98
H/TOT	373	65	15	1	8	0	0	462	365	53	20	4	7	0	1	450
P/TOT	1111	155	42	10	24	2	1	1345	1188	158	45	9	21	1	1	1423

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	146	14	2	0	3	1	0	166	100	10	3	2	2	0	0	117
16:15	134	8	0	1	0	0	0	143	122	12	3	0	3	2	0	142
16:30	135	13	2	1	3	0	0	154	114	7	1	1	1	0	0	124
16:45	168	17	1	0	0	0	1	187	141	13	1	0	2	0	0	157
H/TOT	583	52	5	2	6	1	1	650	477	42	8	3	8	2	0	540
17:00	147	13	1	0	3	1	0	165	129	5	2	1	0	0	0	137
17:15	153	13	1	0	0	0	0	167	102	12	1	1	3	0	0	119
17:30	139	10	1	0	2	0	0	152	138	4	0	0	1	1	0	144
17:45	125	8	0	0	1	0	0	134	98	5	0	0	1	0	0	104
H/TOT	564	44	3	0	6	1	0	618	467	26	3	2	5	1	0	504
18:00	125	10	1	0	1	1	0	138	111	4	1	0	0	0	0	116
18:15	120	7	1	0	1	0	0	129	108	3	0	0	0	0	0	111
18:30	102	2	4	0	1	0	0	109	115	3	0	0	1	0	0	119
18:45	98	4	0	1	1	0	0	104	102	2	0	0	1	0	0	105
H/TOT	445	23	6	1	4	1	0	480	436	12	1	0	2	0	0	451
P/TOT	1592	119	14	3	16	3	1	1748	1380	80	12	5	15	3	0	1495

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	26	2	4	1	0	0	0	33	63	18	2	0	0	0	0	83
07:15	37	9	2	0	1	0	0	49	84	15	2	0	0	1	0	102
07:30	58	12	4	1	1	0	0	76	94	16	1	0	1	0	0	112
07:45	90	23	2	0	0	0	0	115	115	10	1	0	0	0	0	126
H/TOT	211	46	12	2	2	0	0	273	356	59	6	0	1	1	0	423
08:00	64	7	1	0	2	1	0	75	140	18	1	0	1	0	0	160
08:15	122	12	0	1	3	0	0	138	139	17	2	0	1	1	0	160
08:30	113	15	3	1	2	0	0	134	166	13	3	0	0	0	0	182
08:45	89	21	1	1	2	0	0	114	191	15	2	0	0	0	0	208
H/TOT	388	55	5	3	9	1	0	461	636	63	8	0	2	1	0	710
09:00	92	8	2	1	1	0	0	104	128	13	0	0	1	0	0	142
09:15	90	11	0	0	0	0	0	101	82	12	2	1	1	0	0	98
09:30	47	10	4	1	1	0	0	63	64	7	1	1	2	0	0	75
09:45	40	10	2	0	1	0	0	53	57	13	2	0	1	0	0	73
H/TOT	269	39	8	2	3	0	0	321	331	45	5	2	5	0	0	388
P/TOT	868	140	25	7	14	1	0	1055	1323	167	19	2	8	2	0	1521

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	96	15	4	0	1	0	0	116	108	11	0	0	2	0	0	121
16:15	108	19	1	0	3	0	0	131	112	13	1	0	0	0	0	126
16:30	101	11	1	0	0	0	0	113	144	15	1	0	2	0	0	162
16:45	118	17	3	0	1	0	0	139	122	10	0	0	0	0	0	132
H/TOT	423	62	9	0	5	0	0	499	486	49	2	0	4	0	0	541
17:00	123	18	1	0	0	0	0	142	95	9	1	0	2	0	1	108
17:15	125	11	0	0	2	1	0	139	102	10	0	0	0	0	0	112
17:30	114	10	1	0	0	1	0	126	110	7	0	0	1	0	0	118
17:45	124	6	1	0	0	0	0	131	63	7	0	1	1	1	0	73
H/TOT	486	45	3	0	2	2	0	538	370	33	1	1	4	1	1	411
18:00	122	11	1	0	0	0	0	134	82	5	0	0	1	0	0	88
18:15	106	6	1	0	0	1	0	114	92	6	2	0	0	0	0	100
18:30	90	5	2	0	0	0	0	97	78	1	2	0	1	0	0	82
18:45	78	7	0	0	0	0	0	85	79	9	0	0	0	0	0	88
H/TOT	396	29	4	0	0	1	0	430	331	21	4	0	2	0	0	358
P/TOT	1305	136	16	0	7	3	0	1467	1187	103	7	1	10	1	1	1310

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	14	0	0	1	0	0	66	46	9	3	0	2	0	0	60
07:15	90	19	1	0	2	0	0	112	57	10	0	2	3	0	0	72
07:30	83	15	1	2	1	0	0	102	63	6	2	0	1	0	1	73
07:45	110	8	2	0	2	0	0	122	90	13	1	0	1	0	0	105
H/TOT	334	56	4	2	6	0	0	402	256	38	6	2	7	0	1	310
08:00	150	18	1	0	2	0	0	171	76	14	0	0	2	0	0	92
08:15	134	17	5	0	2	1	0	159	110	8	4	1	2	0	0	125
08:30	145	14	3	0	2	1	0	165	93	13	1	0	4	0	0	111
08:45	114	14	2	3	2	0	0	135	122	11	7	1	3	1	0	145
H/TOT	543	63	11	3	8	2	0	630	401	46	12	2	11	1	0	473
09:00	122	22	2	1	2	0	1	150	101	15	1	2	2	0	0	121
09:15	87	10	1	1	2	0	0	101	90	13	1	0	1	0	0	105
09:30	81	12	7	2	1	0	0	103	59	15	6	0	2	0	0	82
09:45	76	9	4	0	1	0	0	90	62	20	1	0	2	0	0	85
H/TOT	366	53	14	4	6	0	1	444	312	63	9	2	7	0	0	393
P/TOT	1243	172	29	9	20	2	1	1476	969	147	27	6	25	1	1	1176

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	101	5	2	1	0	0	0	109	111	14	2	0	2	1	0	130
16:15	106	7	1	0	2	0	0	116	108	10	0	0	1	0	0	119
16:30	125	6	1	1	2	0	0	135	102	9	1	1	1	0	0	114
16:45	126	7	1	0	2	0	0	136	123	16	1	0	1	0	1	142
H/TOT	458	25	5	2	6	0	0	496	444	49	4	1	5	1	1	505
17:00	102	4	1	0	0	0	1	108	114	11	1	0	2	1	0	129
17:15	93	4	0	0	2	0	0	99	133	16	1	0	1	0	0	151
17:30	129	6	0	0	2	0	0	137	105	9	1	0	2	0	0	117
17:45	88	10	0	0	2	0	0	100	109	7	0	0	1	0	0	117
H/TOT	412	24	1	0	6	0	1	444	461	43	3	0	6	1	0	514
18:00	91	4	0	0	1	0	0	96	114	8	1	0	2	1	0	126
18:15	101	1	1	0	0	0	0	103	113	6	1	0	1	1	0	122
18:30	101	1	0	0	2	0	0	104	92	2	4	0	1	0	0	99
18:45	109	5	0	0	3	0	0	117	92	4	0	0	3	0	0	99
H/TOT	402	11	1	0	6	0	0	420	411	20	6	0	7	2	0	446
P/TOT	1272	60	7	2	18	0	1	1360	1316	112	13	1	18	4	1	1465

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	0	0	0	2	0	0	22	1	0	0	0	1	0	0	2
07:15	33	0	0	0	2	0	0	35	0	0	0	0	2	0	0	2
07:30	36	3	0	0	1	0	0	40	4	0	0	0	2	0	0	6
07:45	39	0	0	0	2	0	0	41	1	0	0	0	1	0	0	2
H/TOT	128	3	0	0	7	0	0	138	6	0	0	0	6	0	0	12
08:00	32	0	0	0	2	0	0	34	0	0	0	0	3	0	0	3
08:15	41	1	0	0	3	0	0	45	1	0	0	0	1	0	0	2
08:30	36	0	0	0	1	0	0	37	1	0	0	0	1	0	0	2
08:45	10	0	0	0	3	0	0	13	1	0	0	0	3	0	0	4
H/TOT	119	1	0	0	9	0	0	129	3	0	0	0	8	0	0	11
09:00	12	1	2	0	2	0	0	17	2	0	0	0	1	0	0	3
09:15	9	0	0	0	2	0	0	11	1	0	0	0	2	0	0	3
09:30	5	0	0	0	3	0	0	8	1	0	0	0	2	0	0	3
09:45	7	0	0	0	1	0	0	8	3	0	1	0	1	0	0	5
H/TOT	33	1	2	0	8	0	0	44	7	0	1	0	6	0	0	14
P/TOT	280	5	2	0	24	0	0	311	16	0	1	0	20	0	0	37

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	3	0	0	4	14	0	0	0	1	0	0	15
16:15	1	0	0	0	1	0	0	2	7	0	0	0	2	0	0	9
16:30	0	0	0	0	1	0	0	1	20	1	0	0	2	0	0	23
16:45	1	0	0	0	2	0	0	3	32	0	0	0	2	0	0	34
H/TOT	3	0	0	0	7	0	0	10	73	1	0	0	7	0	0	81
17:00	4	0	0	0	2	0	0	6	28	0	0	0	1	0	0	29
17:15	2	0	0	0	2	0	0	4	18	1	0	0	2	0	0	21
17:30	0	1	0	0	2	0	0	3	43	1	0	0	2	0	0	46
17:45	0	0	0	0	2	0	0	2	13	0	0	0	2	0	0	15
H/TOT	6	1	0	0	8	0	0	15	102	2	0	0	7	0	0	111
18:00	2	0	0	0	2	0	0	4	12	0	0	0	1	0	0	13
18:15	0	0	0	0	1	0	0	1	5	0	0	0	1	0	0	6
18:30	3	0	0	0	2	0	0	5	15	0	0	0	2	0	0	17
18:45	0	0	0	0	2	0	0	2	6	0	0	0	2	0	0	8
H/TOT	5	0	0	0	7	0	0	12	38	0	0	0	6	0	0	44
P/TOT	14	1	0	0	22	0	0	37	213	3	0	0	20	0	0	236

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	15	8	0	0	0	0	0	23	1	1	0	0	0	0	0	2
07:15	19	4	0	0	2	0	0	25	0	0	0	0	0	0	0	0
07:30	26	7	0	0	0	0	0	33	2	0	0	0	0	0	0	2
07:45	34	7	0	0	0	0	0	41	1	1	0	0	0	0	0	2
H/TOT	94	26	0	0	2	0	0	122	4	2	0	0	0	0	0	6
08:00	31	2	2	0	0	0	0	35	2	0	0	0	0	0	0	2
08:15	30	9	2	0	2	0	0	43	3	0	0	0	0	0	0	3
08:30	44	6	0	0	0	1	0	51	4	1	0	0	0	0	0	5
08:45	40	1	1	0	1	0	0	43	18	0	0	0	0	0	0	18
H/TOT	145	18	5	0	3	1	0	172	27	1	0	0	0	0	0	28
09:00	31	3	1	0	0	0	0	35	3	0	0	0	0	0	0	3
09:15	23	4	1	0	0	0	0	28	0	0	0	0	0	0	0	0
09:30	28	5	0	0	1	0	0	34	1	0	0	0	0	0	0	1
09:45	18	2	0	0	1	0	0	21	0	0	0	0	0	0	0	0
H/TOT	100	14	2	0	2	0	0	118	4	0	0	0	0	0	0	4
P/TOT	339	58	7	0	7	1	0	412	35	3	0	0	0	0	0	38

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	28	6	0	0	1	0	0	35	1	0	0	0	0	0	0	1
16:15	31	5	0	0	0	0	0	36	1	0	0	0	0	0	0	1
16:30	22	2	0	0	1	0	0	25	2	0	1	0	0	0	0	3
16:45	24	3	1	0	0	1	0	29	5	0	0	0	0	0	0	5
H/TOT	105	16	1	0	2	1	0	125	9	0	1	0	0	0	0	10
17:00	30	1	0	0	0	0	0	31	1	0	0	0	0	0	0	1
17:15	35	2	0	0	0	0	0	37	2	1	0	0	0	0	0	3
17:30	37	7	0	0	0	0	0	44	4	0	0	0	0	0	0	4
17:45	28	2	1	0	0	0	0	31	1	0	0	0	0	0	0	1
H/TOT	130	12	1	0	0	0	0	143	8	1	0	0	0	0	0	9
18:00	28	1	0	0	1	0	0	30	2	1	0	0	0	0	0	3
18:15	20	2	0	0	0	0	0	22	0	0	0	0	0	0	0	0
18:30	30	1	1	0	1	0	0	33	5	0	0	0	0	0	0	5
18:45	15	1	0	0	0	0	0	16	2	0	0	0	0	0	0	2
H/TOT	93	5	1	0	2	0	0	101	9	1	0	0	0	0	0	10
P/TOT	328	33	3	0	4	1	0	369	26	2	1	0	0	0	0	29

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	5
07:45	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
H/TOT	2	0	0	0	0	0	0	2	17	7	0	0	0	0	0	24
08:00	0	1	0	0	0	0	0	1	6	2	0	0	0	0	0	8
08:15	5	0	0	0	0	0	0	5	2	5	0	0	0	0	0	7
08:30	3	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3
08:45	7	1	0	0	0	0	0	8	23	1	0	0	0	0	0	24
H/TOT	15	2	0	0	0	0	0	17	34	8	0	0	0	0	0	42
09:00	13	0	0	0	0	0	0	13	33	3	0	0	0	0	0	36
09:15	0	0	0	0	0	0	0	0	6	2	0	0	0	0	0	8
09:30	1	2	0	0	0	0	0	3	2	3	0	0	0	0	0	5
09:45	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
H/TOT	14	2	0	0	0	0	0	16	45	9	0	0	0	0	0	54
P/TOT	31	4	0	0	0	0	0	35	96	24	0	0	0	0	0	120

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	1	0	0	0	0	0	4	5	1	0	0	0	0	0	6
16:15	1	1	0	0	0	0	0	2	6	3	0	0	0	0	0	9
16:30	1	0	0	0	0	0	0	1	3	1	0	0	0	0	0	4
16:45	3	2	0	0	0	0	0	5	3	1	0	0	0	0	0	4
H/TOT	8	4	0	0	0	0	0	12	17	6	0	0	0	0	0	23
17:00	3	0	0	0	0	0	0	3	4	1	1	0	0	0	0	6
17:15	4	0	0	0	0	0	0	4	4	1	0	0	0	0	0	5
17:30	0	1	0	0	0	0	0	1	6	0	0	0	0	0	0	6
17:45	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
H/TOT	7	1	0	0	0	0	0	8	18	2	1	0	0	0	0	21
18:00	7	0	0	0	0	0	0	7	55	1	0	0	0	0	0	56
18:15	1	0	0	0	0	0	0	1	8	1	0	0	0	0	0	9
18:30	1	0	0	0	0	0	0	1	5	0	0	0	0	0	0	5
18:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
H/TOT	9	0	0	0	0	0	0	9	69	2	0	0	0	0	0	71
P/TOT	24	5	0	0	0	0	0	29	104	10	1	0	0	0	0	115

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	2	0	0	0	0	0	10
07:15	0	0	0	0	0	0	0	0	13	2	2	0	0	1	1	19
07:30	3	1	0	0	0	0	0	4	13	1	1	0	0	0	0	15
07:45	3	2	0	0	0	0	0	5	15	3	1	0	4	0	0	23
H/TOT	6	3	0	0	0	0	0	9	49	8	4	0	4	1	1	67
08:00	3	2	0	0	0	0	0	5	13	2	1	0	1	0	0	17
08:15	4	1	0	0	0	0	0	5	27	4	2	0	1	0	0	34
08:30	15	1	0	0	0	0	0	16	21	2	0	0	0	0	0	23
08:45	30	3	0	0	0	0	0	33	39	5	3	0	1	0	0	48
H/TOT	52	7	0	0	0	0	0	59	100	13	6	0	3	0	0	122
09:00	11	3	0	0	0	0	0	14	30	5	2	0	0	0	0	37
09:15	5	2	0	0	0	0	0	7	15	1	0	0	3	0	0	19
09:30	1	0	0	0	0	0	0	1	18	5	0	0	0	0	0	23
09:45	4	2	0	0	0	0	0	6	14	2	2	0	2	0	0	20
H/TOT	21	7	0	0	0	0	0	28	77	13	4	0	5	0	0	99
P/TOT	79	17	0	0	0	0	0	96	226	34	14	0	12	1	1	288

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	3	0	0	0	0	0	10	33	4	0	0	0	0	0	37
16:15	5	2	0	0	0	0	0	7	41	5	0	0	0	0	0	46
16:30	18	2	0	0	0	0	0	20	46	3	2	0	2	1	1	55
16:45	29	0	0	0	0	0	0	29	24	9	1	0	0	0	0	34
H/TOT	59	7	0	0	0	0	0	66	144	21	3	0	2	1	1	172
17:00	25	0	0	0	0	0	0	25	42	10	0	0	0	1	1	54
17:15	6	0	0	0	0	0	0	6	41	4	0	0	0	0	1	46
17:30	14	0	0	0	0	0	0	14	28	3	0	0	1	0	0	32
17:45	12	0	0	0	0	0	0	12	44	3	0	0	0	0	0	47
H/TOT	57	0	0	0	0	0	0	57	155	20	0	0	1	1	2	179
18:00	10	2	0	0	0	0	0	12	40	2	2	0	0	0	0	44
18:15	4	0	0	0	0	0	0	4	45	2	0	0	0	0	1	48
18:30	5	0	0	0	0	0	0	5	27	2	0	0	1	0	1	31
18:45	2	1	0	0	0	0	0	3	28	2	1	0	0	0	0	31
H/TOT	21	3	0	0	0	0	0	24	140	8	3	0	1	0	2	154
P/TOT	137	10	0	0	0	0	0	147	439	49	6	0	4	2	5	505

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	2	0	0	0	0	0	11	16	9	0	0	0	0	0	25
07:15	13	2	2	0	0	1	1	19	19	4	0	0	2	0	0	25
07:30	13	1	1	0	0	0	0	15	28	7	0	0	0	0	0	35
07:45	16	3	1	0	4	0	0	24	35	8	0	0	0	0	0	43
H/TOT	51	8	4	0	4	1	1	69	98	28	0	0	2	0	0	128
08:00	13	3	1	0	1	0	0	18	33	2	2	0	0	0	0	37
08:15	32	4	2	0	1	0	0	39	33	9	2	0	2	0	0	46
08:30	24	2	0	0	0	0	0	26	48	7	0	0	0	1	0	56
08:45	46	6	3	0	1	0	0	56	58	1	1	0	1	0	0	61
H/TOT	115	15	6	0	3	0	0	139	172	19	5	0	3	1	0	200
09:00	43	5	2	0	0	0	0	50	34	3	1	0	0	0	0	38
09:15	15	1	0	0	3	0	0	19	23	4	1	0	0	0	0	28
09:30	19	7	0	0	0	0	0	26	29	5	0	0	1	0	0	35
09:45	14	2	2	0	2	0	0	20	18	2	0	0	1	0	0	21
H/TOT	91	15	4	0	5	0	0	115	104	14	2	0	2	0	0	122
P/TOT	257	38	14	0	12	1	1	323	374	61	7	0	7	1	0	450

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	36	5	0	0	0	0	0	41	29	6	0	0	1	0	0	36
16:15	42	6	0	0	0	0	0	48	32	5	0	0	0	0	0	37
16:30	47	3	2	0	2	1	1	56	24	2	1	0	1	0	0	28
16:45	27	11	1	0	0	0	0	39	29	3	1	0	0	1	0	34
H/TOT	152	25	3	0	2	1	1	184	114	16	2	0	2	1	0	135
17:00	45	10	0	0	0	1	1	57	31	1	0	0	0	0	0	32
17:15	45	4	0	0	0	0	1	50	37	3	0	0	0	0	0	40
17:30	28	4	0	0	1	0	0	33	41	7	0	0	0	0	0	48
17:45	44	3	0	0	0	0	0	47	29	2	1	0	0	0	0	32
H/TOT	162	21	0	0	1	1	2	187	138	13	1	0	0	0	0	152
18:00	47	2	2	0	0	0	0	51	30	2	0	0	1	0	0	33
18:15	46	2	0	0	0	0	1	49	20	2	0	0	0	0	0	22
18:30	28	2	0	0	1	0	1	32	35	1	1	0	1	0	0	38
18:45	28	2	1	0	0	0	0	31	17	1	0	0	0	0	0	18
H/TOT	149	8	3	0	1	0	2	163	102	6	1	0	2	0	0	111
P/TOT	463	54	6	0	4	2	5	534	354	35	4	0	4	1	0	398

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	0	0	0	0	0	2	6	2	0	0	0	0	0	8
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	5	1	0	0	0	0	0	6	3	2	0	0	0	0	0	5
07:45	4	3	0	0	0	0	0	7	6	2	0	0	0	0	0	8
H/TOT	10	5	0	0	0	0	0	15	19	7	0	0	0	0	0	26
08:00	5	2	0	0	0	0	0	7	6	3	0	0	0	0	0	9
08:15	7	1	0	0	0	0	0	8	7	5	0	0	0	0	0	12
08:30	19	2	0	0	0	0	0	21	6	0	0	0	0	0	0	6
08:45	48	3	0	0	0	0	0	51	30	2	0	0	0	0	0	32
H/TOT	79	8	0	0	0	0	0	87	49	10	0	0	0	0	0	59
09:00	14	3	0	0	0	0	0	17	46	3	0	0	0	0	0	49
09:15	5	2	0	0	0	0	0	7	6	2	0	0	0	0	0	8
09:30	2	0	0	0	0	0	0	2	3	5	0	0	0	0	0	8
09:45	4	2	0	0	0	0	0	6	4	1	0	0	0	0	0	5
H/TOT	25	7	0	0	0	0	0	32	59	11	0	0	0	0	0	70
P/TOT	114	20	0	0	0	0	0	134	127	28	0	0	0	0	0	155

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	8	3	0	0	0	0	0	11	8	2	0	0	0	0	0	10
16:15	6	2	0	0	0	0	0	8	7	4	0	0	0	0	0	11
16:30	20	2	1	0	0	0	0	23	4	1	0	0	0	0	0	5
16:45	34	0	0	0	0	0	0	34	6	3	0	0	0	0	0	9
H/TOT	68	7	1	0	0	0	0	76	25	10	0	0	0	0	0	35
17:00	26	0	0	0	0	0	0	26	7	1	1	0	0	0	0	9
17:15	8	1	0	0	0	0	0	9	8	1	0	0	0	0	0	9
17:30	18	0	0	0	0	0	0	18	6	1	0	0	0	0	0	7
17:45	13	0	0	0	0	0	0	13	4	0	0	0	0	0	0	4
H/TOT	65	1	0	0	0	0	0	66	25	3	1	0	0	0	0	29
18:00	12	3	0	0	0	0	0	15	62	1	0	0	0	0	0	63
18:15	4	0	0	0	0	0	0	4	9	1	0	0	0	0	0	10
18:30	10	0	0	0	0	0	0	10	6	0	0	0	0	0	0	6
18:45	4	1	0	0	0	0	0	5	1	0	0	0	0	0	0	1
H/TOT	30	4	0	0	0	0	0	34	78	2	0	0	0	0	0	80
P/TOT	163	12	1	0	0	0	0	176	128	15	1	0	0	0	0	144

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	10	0	0	0	0	0	30	8	2	0	0	0	0	0	10
07:15	23	5	0	0	2	0	0	30	13	2	2	0	0	1	1	19
07:30	29	9	0	0	0	0	0	38	16	2	1	0	0	0	0	19
07:45	39	9	0	0	0	0	0	48	18	5	1	0	4	0	0	28
H/TOT	111	33	0	0	2	0	0	146	55	11	4	0	4	1	1	76
08:00	37	4	2	0	0	0	0	43	16	4	1	0	1	0	0	22
08:15	32	14	2	0	2	0	0	50	31	5	2	0	1	0	0	39
08:30	47	6	0	0	0	1	0	54	36	3	0	0	0	0	0	39
08:45	63	2	1	0	1	0	0	67	69	8	3	0	1	0	0	81
H/TOT	179	26	5	0	3	1	0	214	152	20	6	0	3	0	0	181
09:00	64	6	1	0	0	0	0	71	41	8	2	0	0	0	0	51
09:15	29	6	1	0	0	0	0	36	20	3	0	0	3	0	0	26
09:30	30	8	0	0	1	0	0	39	19	5	0	0	0	0	0	24
09:45	22	3	0	0	1	0	0	26	18	4	2	0	2	0	0	26
H/TOT	145	23	2	0	2	0	0	172	98	20	4	0	5	0	0	127
P/TOT	435	82	7	0	7	1	0	532	305	51	14	0	12	1	1	384

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	33	7	0	0	1	0	0	41	40	7	0	0	0	0	0	47
16:15	37	8	0	0	0	0	0	45	46	7	0	0	0	0	0	53
16:30	25	3	0	0	1	0	0	29	64	5	2	0	2	1	1	75
16:45	27	4	1	0	0	1	0	33	53	9	1	0	0	0	0	63
H/TOT	122	22	1	0	2	1	0	148	203	28	3	0	2	1	1	238
17:00	34	2	1	0	0	0	0	37	67	10	0	0	0	1	1	79
17:15	39	3	0	0	0	0	0	42	47	4	0	0	0	0	1	52
17:30	43	7	0	0	0	0	0	50	42	3	0	0	1	0	0	46
17:45	32	2	1	0	0	0	0	35	56	3	0	0	0	0	0	59
H/TOT	148	14	2	0	0	0	0	164	212	20	0	0	1	1	2	236
18:00	83	2	0	0	1	0	0	86	50	4	2	0	0	0	0	56
18:15	28	3	0	0	0	0	0	31	49	2	0	0	0	0	1	52
18:30	35	1	1	0	1	0	0	38	32	2	0	0	1	0	1	36
18:45	16	1	0	0	0	0	0	17	30	3	1	0	0	0	0	34
H/TOT	162	7	1	0	2	0	0	172	161	11	3	0	1	0	2	178
P/TOT	432	43	4	0	4	1	0	484	576	59	6	0	4	2	5	652

27178		CARDIFF							
		FEBRUARY 2022							
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Total Vehicles**	**5 Day Ave.**	**7 Day Ave.**	**Average 85%ile Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	13738	2101	1963	32.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		12873	1973	1839	32.4

27178		CARDIFF FEBRUARY 2022				
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Average Mean Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	27.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		26.0

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**19**	3	16	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	1	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
04:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
05:00	**13**	0	11	1	1	0	0	0	0	0	0	0	0	0
06:00	**20**	0	16	3	0	0	1	0	0	0	0	0	0	0
07:00	**75**	2	55	12	1	3	2	0	0	0	0	0	0	0
08:00	**180**	2	164	10	1	2	1	0	0	0	0	0	0	0
09:00	**125**	1	104	15	1	2	2	0	0	0	0	0	0	0
10:00	**92**	0	83	6	2	1	0	0	0	0	0	0	0	0
11:00	**127**	0	105	19	3	0	0	0	0	0	0	0	0	0
12:00	**112**	0	102	7	1	2	0	0	0	0	0	0	0	0
13:00	**133**	2	114	14	2	1	0	0	0	0	0	0	0	0
14:00	**143**	0	133	8	2	0	0	0	0	0	0	0	0	0
15:00	**203**	1	183	16	1	2	0	0	0	0	0	0	0	0
16:00	**183**	6	160	13	3	1	0	0	0	0	0	0	0	0
17:00	**154**	1	135	15	1	2	0	0	0	0	0	0	0	0
18:00	**143**	4	128	10	1	0	0	0	0	0	0	0	0	0
19:00	**123**	4	113	5	1	0	0	0	0	0	0	0	0	0
20:00	**96**	2	85	7	2	0	0	0	0	0	0	0	0	0
21:00	**68**	1	59	6	0	1	1	0	0	0	0	0	0	0
22:00	**44**	1	38	5	0	0	0	0	0	0	0	0	0	0
23:00	**31**	1	29	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1670**	**19**	**1466**	**145**	**19**	**16**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1977**	**26**	**1739**	**166**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2052**	**28**	**1806**	**172**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2110**	**32**	**1857**	**174**	**23**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**5**	1	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	1	5	1	0	0	0	0	0	0	0	0	0	0
06:00	**23**	1	21	1	0	0	0	0	0	0	0	0	0	0
07:00	**47**	1	36	7	1	2	0	0	0	0	0	0	0	0
08:00	**159**	0	147	9	1	2	0	0	0	0	0	0	0	0
09:00	**112**	2	97	9	3	1	0	0	0	0	0	0	0	0
10:00	**99**	0	86	10	2	1	0	0	0	0	0	0	0	0
11:00	**119**	1	105	10	2	1	0	0	0	0	0	0	0	0
12:00	**144**	3	124	15	1	1	0	0	0	0	0	0	0	0
13:00	**119**	0	105	13	1	0	0	0	0	0	0	0	0	0
14:00	**160**	2	143	11	2	2	0	0	0	0	0	0	0	0
15:00	**221**	1	203	14	2	1	0	0	0	0	0	0	0	0
16:00	**205**	4	179	18	2	1	1	0	0	0	0	0	0	0
17:00	**164**	3	147	13	1	0	0	0	0	0	0	0	0	0
18:00	**164**	2	154	6	0	2	0	0	0	0	0	0	0	0
19:00	**152**	3	140	6	3	0	0	0	0	0	0	0	0	0
20:00	**85**	0	82	2	0	1	0	0	0	0	0	0	0	0
21:00	**66**	1	59	5	1	0	0	0	0	0	0	0	0	0
22:00	**57**	0	52	4	0	1	0	0	0	0	0	0	0	0
23:00	**46**	2	42	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1713**	**19**	**1526**	**135**	**18**	**14**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**2039**	**24**	**1828**	**149**	**22**	**15**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2142**	**26**	**1922**	**155**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2186**	**28**	**1963**	**156**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**25**	2	22	1	0	0	0	0	0	0	0	0	0	0
01:00	**14**	0	14	0	0	0	0	0	0	0	0	0	0	0
02:00	**20**	1	19	0	0	0	0	0	0	0	0	0	0	0
03:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
04:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**15**	0	13	1	1	0	0	0	0	0	0	0	0	0
06:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
07:00	**25**	0	22	2	1	0	0	0	0	0	0	0	0	0
08:00	**60**	0	54	5	1	0	0	0	0	0	0	0	0	0
09:00	**87**	1	78	6	2	0	0	0	0	0	0	0	0	0
10:00	**101**	0	92	6	3	0	0	0	0	0	0	0	0	0
11:00	**139**	1	131	6	0	1	0	0	0	0	0	0	0	0
12:00	**150**	1	139	7	2	1	0	0	0	0	0	0	0	0
13:00	**157**	2	146	7	2	0	0	0	0	0	0	0	0	0
14:00	**111**	4	94	12	1	0	0	0	0	0	0	0	0	0
15:00	**138**	2	132	3	0	1	0	0	0	0	0	0	0	0
16:00	**112**	1	103	6	2	0	0	0	0	0	0	0	0	0
17:00	**118**	1	111	5	1	0	0	0	0	0	0	0	0	0
18:00	**132**	1	124	5	0	2	0	0	0	0	0	0	0	0
19:00	**121**	0	117	2	0	2	0	0	0	0	0	0	0	0
20:00	**83**	0	79	3	0	1	0	0	0	0	0	0	0	0
21:00	**61**	1	60	0	0	0	0	0	0	0	0	0	0	0
22:00	**53**	0	52	0	1	0	0	0	0	0	0	0	0	0
23:00	**49**	0	44	4	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1330**	**14**	**1226**	**70**	**15**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**15**	**1494**	**75**	**15**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1709**	**15**	**1590**	**79**	**16**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1799**	**18**	**1674**	**81**	**17**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

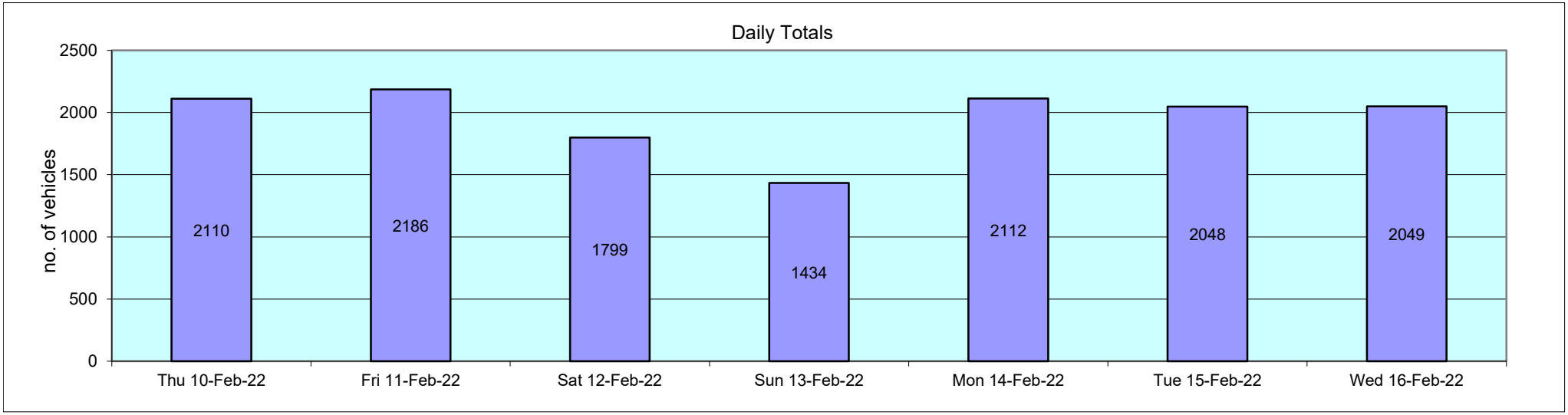
27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**20**	1	18	1	0	0	0	0	0	0	0	0	0	0
01:00	**26**	0	25	1	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
03:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**16**	0	15	0	0	1	0	0	0	0	0	0	0	0
07:00	**21**	0	21	0	0	0	0	0	0	0	0	0	0	0
08:00	**25**	0	24	0	0	1	0	0	0	0	0	0	0	0
09:00	**36**	0	33	2	1	0	0	0	0	0	0	0	0	0
10:00	**63**	0	61	1	0	1	0	0	0	0	0	0	0	0
11:00	**96**	0	88	6	2	0	0	0	0	0	0	0	0	0
12:00	**117**	0	107	8	2	0	0	0	0	0	0	0	0	0
13:00	**124**	3	114	5	1	1	0	0	0	0	0	0	0	0
14:00	**124**	0	111	11	1	1	0	0	0	0	0	0	0	0
15:00	**133**	3	122	7	1	0	0	0	0	0	0	0	0	0
16:00	**115**	0	108	4	2	1	0	0	0	0	0	0	0	0
17:00	**117**	0	112	5	0	0	0	0	0	0	0	0	0	0
18:00	**110**	1	103	4	0	2	0	0	0	0	0	0	0	0
19:00	**78**	1	73	3	0	1	0	0	0	0	0	0	0	0
20:00	**66**	0	63	2	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	45	1	0	1	0	0	0	0	0	0	0	0
22:00	**35**	1	31	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	18	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1081**	**7**	**1004**	**53**	**10**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1288**	**8**	**1200**	**59**	**10**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1344**	**10**	**1249**	**63**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1434**	**11**	**1336**	**65**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**15**	1	14	0	0	0	0	0	0	0	0	0	0	0
01:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	23	1	0	1	0	0	0	0	0	0	0	0
07:00	**67**	0	51	11	1	4	0	0	0	0	0	0	0	0
08:00	**171**	1	149	17	1	2	1	0	0	0	0	0	0	0
09:00	**130**	2	113	13	0	2	0	0	0	0	0	0	0	0
10:00	**93**	1	79	9	2	1	1	0	0	0	0	0	0	0
11:00	**131**	2	116	11	2	0	0	0	0	0	0	0	0	0
12:00	**123**	3	110	8	1	1	0	0	0	0	0	0	0	0
13:00	**105**	1	90	10	1	2	0	0	1	0	0	0	0	0
14:00	**146**	1	134	9	0	2	0	0	0	0	0	0	0	0
15:00	**221**	4	200	14	2	0	1	0	0	0	0	0	0	0
16:00	**202**	2	183	14	1	2	0	0	0	0	0	0	0	0
17:00	**166**	1	147	16	2	0	0	0	0	0	0	0	0	0
18:00	**127**	3	119	4	0	1	0	0	0	0	0	0	0	0
19:00	**125**	3	115	6	0	1	0	0	0	0	0	0	0	0
20:00	**91**	0	86	4	0	1	0	0	0	0	0	0	0	0
21:00	**60**	0	57	2	1	0	0	0	0	0	0	0	0	0
22:00	**51**	0	48	2	1	0	0	0	0	0	0	0	0	0
23:00	**38**	0	38	0	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1682**	**21**	**1491**	**136**	**13**	**17**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**24**	**1772**	**149**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**24**	**1858**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**25**	**1897**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
01:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
02:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	0	0	0	1	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	20	4	1	0	0	0	0	0	0	0	0	0
07:00	**76**	1	54	17	0	3	1	0	0	0	0	0	0	0
08:00	**156**	1	137	14	3	0	1	0	0	0	0	0	0	0
09:00	**107**	0	89	12	1	5	0	0	0	0	0	0	0	0
10:00	**95**	0	81	12	1	1	0	0	0	0	0	0	0	0
11:00	**114**	0	94	17	1	1	1	0	0	0	0	0	0	0
12:00	**124**	1	107	14	0	2	0	0	0	0	0	0	0	0
13:00	**110**	1	93	13	2	1	0	0	0	0	0	0	0	0
14:00	**133**	2	119	9	0	2	0	0	1	0	0	0	0	0
15:00	**207**	0	186	18	1	2	0	0	0	0	0	0	0	0
16:00	**187**	4	171	10	1	1	0	0	0	0	0	0	0	0
17:00	**180**	1	172	6	1	0	0	0	0	0	0	0	0	0
18:00	**158**	0	150	7	0	1	0	0	0	0	0	0	0	0
19:00	**111**	1	100	8	1	1	0	0	0	0	0	0	0	0
20:00	**82**	2	73	6	1	0	0	0	0	0	0	0	0	0
21:00	**56**	0	54	2	0	0	0	0	0	0	0	0	0	0
22:00	**54**	2	50	1	1	0	0	0	0	0	0	0	0	0
23:00	**27**	1	25	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1647**	**11**	**1453**	**149**	**11**	**19**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1921**	**14**	**1700**	**169**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2002**	**17**	**1775**	**171**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2048**	**17**	**1818**	**173**	**15**	**20**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**17**	0	17	0	0	0	0	0	0	0	0	0	0	0
01:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
06:00	**28**	0	22	5	0	1	0	0	0	0	0	0	0	0
07:00	**65**	1	50	11	0	3	0	0	0	0	0	0	0	0
08:00	**174**	0	158	14	2	0	0	0	0	0	0	0	0	0
09:00	**114**	1	92	17	2	2	0	0	0	0	0	0	0	0
10:00	**102**	0	91	8	2	1	0	0	0	0	0	0	0	0
11:00	**118**	4	101	9	0	4	0	0	0	0	0	0	0	0
12:00	**128**	1	111	13	1	2	0	0	0	0	0	0	0	0
13:00	**113**	0	99	11	0	3	0	0	0	0	0	0	0	0
14:00	**128**	0	112	13	2	1	0	0	0	0	0	0	0	0
15:00	**214**	0	191	19	1	2	1	0	0	0	0	0	0	0
16:00	**185**	2	168	12	2	0	1	0	0	0	0	0	0	0
17:00	**145**	0	130	14	1	0	0	0	0	0	0	0	0	0
18:00	**164**	0	149	14	0	1	0	0	0	0	0	0	0	0
19:00	**107**	0	99	6	1	0	1	0	0	0	0	0	0	0
20:00	**73**	0	67	4	0	1	0	0	1	0	0	0	0	0
21:00	**73**	1	71	1	0	0	0	0	0	0	0	0	0	0
22:00	**46**	0	43	2	1	0	0	0	0	0	0	0	0	0
23:00	**32**	0	30	0	0	0	2	0	0	0	0	0	0	0
12H,7-19	**1650**	**9**	**1452**	**155**	**13**	**19**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1931**	**10**	**1711**	**171**	**14**	**21**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2009**	**10**	**1784**	**173**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2049**	**10**	**1822**	**175**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Daily Totals														
Thu 10-Feb-22	**2110**	32	1857	174	23	17	7	0	0	0	0	0	0	0
Fri 11-Feb-22	**2186**	28	1963	156	22	16	1	0	0	0	0	0	0	0
Sat 12-Feb-22	**1799**	18	1674	81	17	9	0	0	0	0	0	0	0	0
Sun 13-Feb-22	**1434**	11	1336	65	10	12	0	0	0	0	0	0	0	0
Mon 14-Feb-22	**2112**	25	1897	151	15	20	3	0	1	0	0	0	0	0
Tue 15-Feb-22	**2048**	17	1818	173	15	20	4	0	1	0	0	0	0	0
Wed 16-Feb-22	**2049**	10	1822	175	15	21	5	0	1	0	0	0	0	0
Total Vehicles														
[--]	**13738**	141	12367	975	117	115	20	0	3	0	0	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22															
00:00	19	31.3	25.9	0	3	12	3	0	0	1	0	0	0	0	0
01:00	9	-	32.9	0	0	2	7	0	0	0	0	0	0	0	0
02:00	6	-	25.8	0	1	4	1	0	0	0	0	0	0	0	0
03:00	6	-	19.7	0	3	3	0	0	0	0	0	0	0	0	0
04:00	5	-	30	0	0	2	3	0	0	0	0	0	0	0	0
05:00	13	30.3	26.2	0	2	9	2	0	0	0	0	0	0	0	0
06:00	20	29.6	26.6	0	1	17	2	0	0	0	0	0	0	0	0
07:00	75	30.9	25.2	2	13	44	15	1	0	0	0	0	0	0	0
08:00	180	29.4	25.5	1	19	142	17	0	0	1	0	0	0	0	0
09:00	125	29.1	25.4	1	14	96	14	0	0	0	0	0	0	0	0
10:00	92	32.3	26.5	0	2	71	19	0	0	0	0	0	0	0	0
11:00	127	33.2	27	0	16	74	34	3	0	0	0	0	0	0	0
12:00	112	34.5	28.3	0	8	64	37	3	0	0	0	0	0	0	0
13:00	133	31.1	26.8	0	12	92	27	1	0	1	0	0	0	0	0
14:00	143	31	26	0	15	97	30	1	0	0	0	0	0	0	0
15:00	203	30.5	26.1	0	16	152	34	0	1	0	0	0	0	0	0
16:00	183	31.4	26.8	1	14	122	43	3	0	0	0	0	0	0	0
17:00	154	33.2	27.8	0	7	104	39	4	0	0	0	0	0	0	0
18:00	143	32.4	28	0	3	92	44	2	2	0	0	0	0	0	0
19:00	123	31.6	27	1	8	88	25	1	0	0	0	0	0	0	0
20:00	96	31.9	26.4	0	7	65	23	0	0	1	0	0	0	0	0
21:00	68	32.8	28.4	0	3	41	22	1	0	1	0	0	0	0	0
22:00	44	33.5	27.5	0	5	27	9	2	1	0	0	0	0	0	0
23:00	31	37.6	28.8	0	3	18	6	3	0	1	0	0	0	0	0
12H,7-19	1670	31.5	26.6	5	139	1150	353	18	3	2	0	0	0	0	0
16H,6-22	1977	31.5	26.7	6	158	1361	425	20	3	4	0	0	0	0	0
18H,6-24	2052	31.5	26.8	6	166	1406	440	25	4	5	0	0	0	0	0
24H,0-24	2110	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**15**	38.4	30.1	0	0	8	6	1	0	0	0	0	0	0	0
01:00	**9**	-	30.4	0	0	5	2	2	0	0	0	0	0	0	0
02:00	**6**	-	34.9	0	0	2	1	3	0	0	0	0	0	0	0
03:00	**2**	-	24.9	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**5**	-	20.6	0	3	1	1	0	0	0	0	0	0	0	0
05:00	**7**	-	23.3	0	2	5	0	0	0	0	0	0	0	0	0
06:00	**23**	35.9	28	0	1	14	8	0	0	0	0	0	0	0	0
07:00	**47**	32	27	0	5	28	13	1	0	0	0	0	0	0	0
08:00	**159**	31.5	27.9	0	3	119	34	3	0	0	0	0	0	0	0
09:00	**112**	30.8	27	0	5	80	26	1	0	0	0	0	0	0	0
10:00	**99**	32.8	28	0	4	70	24	1	0	0	0	0	0	0	0
11:00	**119**	32.5	28.3	0	6	73	34	5	1	0	0	0	0	0	0
12:00	**144**	32.4	27.1	2	9	102	26	4	0	0	0	0	1	0	0
13:00	**119**	31.4	26.1	1	12	80	22	2	1	1	0	0	0	0	0
14:00	**160**	33.2	28	0	6	109	38	6	1	0	0	0	0	0	0
15:00	**221**	31.4	27	0	10	164	44	3	0	0	0	0	0	0	0
16:00	**205**	32.2	27.4	0	11	144	46	3	1	0	0	0	0	0	0
17:00	**164**	31.1	26.5	1	12	115	34	2	0	0	0	0	0	0	0
18:00	**164**	32.7	27.1	0	12	113	37	1	1	0	0	0	0	0	0
19:00	**152**	33.2	28.2	0	4	103	38	4	3	0	0	0	0	0	0
20:00	**85**	32.3	27.6	0	7	52	24	2	0	0	0	0	0	0	0
21:00	**66**	33	28.2	1	2	39	23	1	0	0	0	0	0	0	0
22:00	**57**	34	29.3	0	0	35	19	2	0	0	1	0	0	0	0
23:00	**46**	36.6	27.1	1	6	25	12	1	1	0	0	0	0	0	0
12H,7-19	**1713**	**32**	**27.3**	**4**	**95**	**1197**	**378**	**32**	**5**	**1**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**2039**	**32.2**	**27.4**	**5**	**109**	**1405**	**471**	**39**	**8**	**1**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**2142**	**32.3**	**27.5**	**6**	**115**	**1465**	**502**	**42**	**9**	**1**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**2186**	**32.3**	**27.5**	**6**	**120**	**1488**	**512**	**48**	**9**	**1**	**1**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22															
00:00	**25**	30.5	25.1	0	3	18	4	0	0	0	0	0	0	0	0
01:00	**14**	38.5	29	0	1	9	3	1	0	0	0	0	0	0	0
02:00	**20**	34	28.2	0	1	13	5	0	1	0	0	0	0	0	0
03:00	**12**	38.2	30	0	0	8	4	0	0	0	0	0	0	0	0
04:00	**4**	-	30.1	0	0	2	2	0	0	0	0	0	0	0	0
05:00	**15**	38.2	28.6	0	2	9	3	0	1	0	0	0	0	0	0
06:00	**12**	34.7	29.5	0	0	7	4	1	0	0	0	0	0	0	0
07:00	**25**	32.7	27.5	0	1	16	7	1	0	0	0	0	0	0	0
08:00	**60**	33.1	26.1	0	10	35	15	0	0	0	0	0	0	0	0
09:00	**87**	31.8	26.8	0	6	56	24	0	1	0	0	0	0	0	0
10:00	**101**	31.8	27	0	7	73	19	2	0	0	0	0	0	0	0
11:00	**139**	32.2	26.8	0	14	87	36	2	0	0	0	0	0	0	0
12:00	**150**	31.7	27.1	0	5	109	33	1	2	0	0	0	0	0	0
13:00	**157**	32	27.4	0	9	111	35	2	0	0	0	0	0	0	0
14:00	**111**	33.4	28.1	1	6	72	28	3	1	0	0	0	0	0	0
15:00	**138**	33.7	28.1	1	6	82	45	1	3	0	0	0	0	0	0
16:00	**112**	33.1	28	0	7	73	29	1	2	0	0	0	0	0	0
17:00	**118**	33.3	27.5	1	5	79	33	0	0	0	0	0	0	0	0
18:00	**132**	29.9	26.8	1	6	107	13	3	1	0	1	0	0	0	0
19:00	**121**	31.1	25.8	0	20	79	20	1	1	0	0	0	0	0	0
20:00	**83**	34.6	27.8	0	10	50	16	3	2	0	1	0	0	0	1
21:00	**61**	33.8	27.8	0	3	43	12	2	1	0	0	0	0	0	0
22:00	**53**	32.1	27.1	0	6	28	18	1	0	0	0	0	0	0	0
23:00	**49**	33.3	28.1	0	5	28	14	0	2	0	0	0	0	0	0
12H,7-19	**1330**	**32.3**	**27.3**	**4**	**82**	**900**	**317**	**16**	**10**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**32.3**	**27.3**	**4**	**115**	**1079**	**369**	**23**	**14**	**0**	**2**	**0**	**0**	**0**	**1**
18H,6-24	**1709**	**32.3**	**27.3**	**4**	**126**	**1135**	**401**	**24**	**16**	**0**	**2**	**0**	**0**	**0**	**1**
24H,0-24	**1799**	**32.4**	**27.3**	**4**	**133**	**1194**	**422**	**25**	**18**	**0**	**2**	**0**	**0**	**0**	**1**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**20**	36	28.2	0	2	12	5	1	0	0	0	0	0	0	0
01:00	**26**	41.4	31.1	0	1	11	9	4	1	0	0	0	0	0	0
02:00	**8**	-	27.5	0	0	5	3	0	0	0	0	0	0	0	0
03:00	**15**	30.3	24.6	0	2	11	2	0	0	0	0	0	0	0	0
04:00	**12**	32.4	26.9	0	1	9	1	0	1	0	0	0	0	0	0
05:00	**9**	-	34	0	0	4	3	0	1	1	0	0	0	0	0
06:00	**16**	36.8	28.6	0	0	11	3	2	0	0	0	0	0	0	0
07:00	**21**	33.9	27.1	0	2	12	7	0	0	0	0	0	0	0	0
08:00	**25**	32.2	27.5	0	1	18	5	1	0	0	0	0	0	0	0
09:00	**36**	33.7	26.7	0	5	21	10	0	0	0	0	0	0	0	0
10:00	**63**	34.6	27.7	0	11	35	12	4	0	1	0	0	0	0	0
11:00	**96**	31.6	27.4	0	6	68	21	1	0	0	0	0	0	0	0
12:00	**117**	34	28.1	0	12	63	37	3	1	1	0	0	0	0	0
13:00	**124**	33.9	28	1	11	71	39	1	0	1	0	0	0	0	0
14:00	**124**	32.6	27.8	0	5	84	33	1	1	0	0	0	0	0	0
15:00	**133**	33.6	28.6	1	6	84	36	4	1	0	0	0	1	0	0
16:00	**115**	33.6	27.9	0	12	66	34	2	1	0	0	0	0	0	0
17:00	**117**	31.5	27.2	1	7	81	27	1	0	0	0	0	0	0	0
18:00	**110**	31.2	26.6	0	9	78	22	1	0	0	0	0	0	0	0
19:00	**78**	33.5	28.2	0	4	50	19	2	2	1	0	0	0	0	0
20:00	**66**	33.8	28.3	0	4	37	25	0	0	0	0	0	0	0	0
21:00	**47**	35	28.7	0	2	27	17	1	0	0	0	0	0	0	0
22:00	**35**	34.1	29	0	2	19	12	0	0	1	1	0	0	0	0
23:00	**21**	34.1	29.2	1	0	10	9	0	0	1	0	0	0	0	0
12H,7-19	**1081**	**32.9**	**27.7**	**3**	**87**	**681**	**283**	**19**	**4**	**3**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**1288**	**33.1**	**27.8**	**3**	**97**	**806**	**347**	**24**	**6**	**4**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**1344**	**33.2**	**27.8**	**4**	**99**	**835**	**368**	**24**	**6**	**6**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**1434**	**33.3**	**27.9**	**4**	**105**	**887**	**391**	**29**	**9**	**7**	**1**	**0**	**1**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**15**	46.1	31.4	0	1	8	2	2	1	1	0	0	0	0	0
01:00	**8**	-	27.1	0	0	7	1	0	0	0	0	0	0	0	0
02:00	**6**	-	30.3	0	0	4	2	0	0	0	0	0	0	0	0
03:00	**2**	-	28.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**2**	-	27.7	0	0	2	0	0	0	0	0	0	0	0	0
05:00	**7**	-	27	0	0	7	0	0	0	0	0	0	0	0	0
06:00	**25**	37.4	28.5	0	2	15	5	2	0	1	0	0	0	0	0
07:00	**67**	31.8	27.1	0	7	44	16	0	0	0	0	0	0	0	0
08:00	**171**	31.4	26.2	0	23	112	34	0	2	0	0	0	0	0	0
09:00	**130**	31.8	27.6	0	10	88	28	3	0	1	0	0	0	0	0
10:00	**93**	33.9	27	0	10	60	20	3	0	0	0	0	0	0	0
11:00	**131**	30.8	26.7	0	5	103	21	2	0	0	0	0	0	0	0
12:00	**123**	34.9	28	1	6	73	39	2	2	0	0	0	0	0	0
13:00	**105**	31.2	26.9	0	8	70	25	2	0	0	0	0	0	0	0
14:00	**146**	31.5	26.8	1	13	97	34	0	1	0	0	0	0	0	0
15:00	**221**	32	26.3	1	22	152	44	2	0	0	0	0	0	0	0
16:00	**202**	31.4	27.2	0	8	153	37	2	1	1	0	0	0	0	0
17:00	**166**	32.4	27.6	0	7	113	45	1	0	0	0	0	0	0	0
18:00	**127**	31.1	26	0	21	83	20	3	0	0	0	0	0	0	0
19:00	**125**	32.7	27.4	0	10	81	32	1	1	0	0	0	0	0	0
20:00	**91**	31.6	27.1	0	1	73	16	1	0	0	0	0	0	0	0
21:00	**60**	35.4	29.2	0	1	36	20	2	1	0	0	0	0	0	0
22:00	**51**	31.4	27.4	0	3	37	8	2	0	1	0	0	0	0	0
23:00	**38**	31.5	26.9	0	2	29	5	1	0	1	0	0	0	0	0
12H,7-19	**1682**	**31.8**	**26.9**	**3**	**140**	**1148**	**363**	**20**	**6**	**2**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**31.9**	**27**	**3**	**154**	**1353**	**436**	**26**	**8**	**3**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**31.9**	**27**	**3**	**159**	**1419**	**449**	**29**	**8**	**5**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**31.9**	**27.1**	**3**	**160**	**1449**	**454**	**31**	**9**	**6**	**0**	**0**	**0**	**0**	**0**

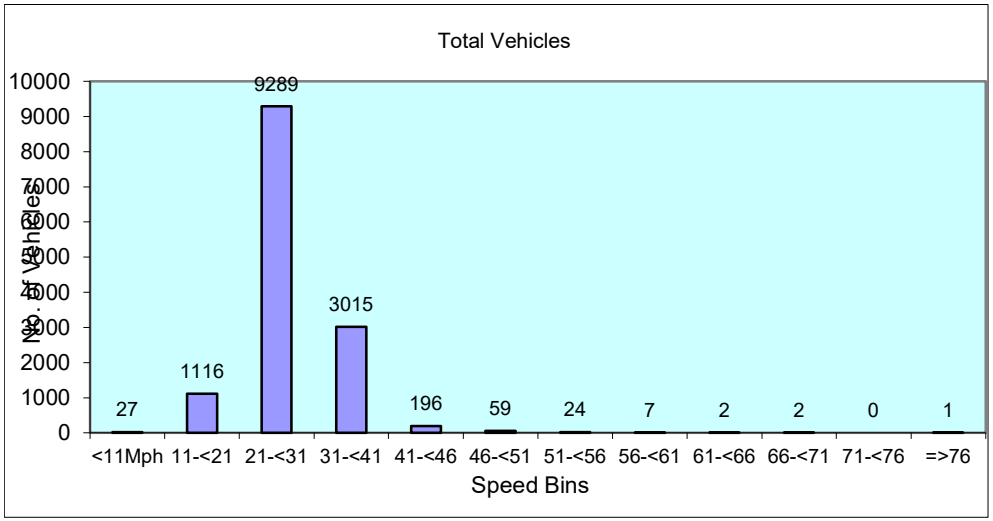
Data produced by
Transport Surveys Ltd

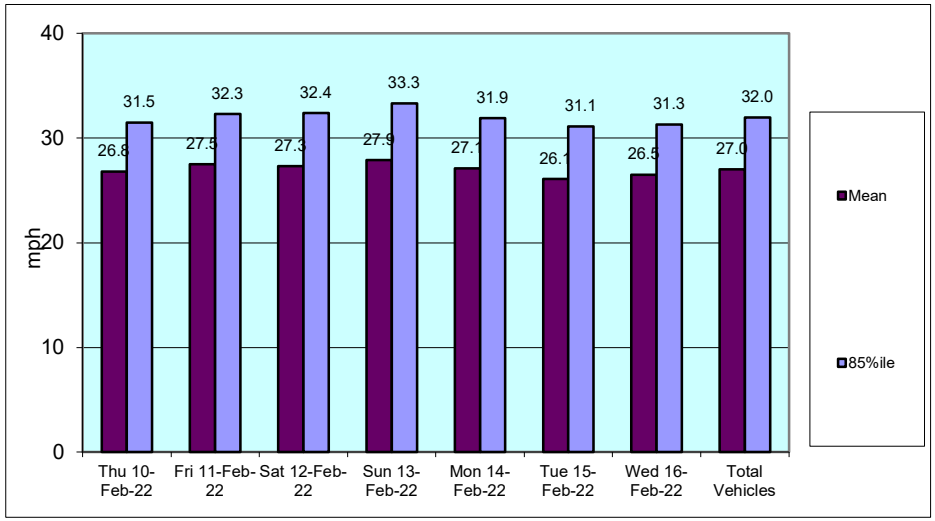
27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	12	40.4	28.3	0	0	9	1	1	1	0	0	0	0	0	0
01:00	10	-	26.8	0	0	10	0	0	0	0	0	0	0	0	0
02:00	10	-	31.7	0	0	3	7	0	0	0	0	0	0	0	0
03:00	3	-	30.8	0	0	1	2	0	0	0	0	0	0	0	0
04:00	2	-	28.2	0	0	1	1	0	0	0	0	0	0	0	0
05:00	9	-	30.7	0	0	4	5	0	0	0	0	0	0	0	0
06:00	25	32	26.7	0	2	18	5	0	0	0	0	0	0	0	0
07:00	76	32.9	26.5	0	8	49	18	1	0	0	0	0	0	0	0
08:00	156	28.4	24.2	0	28	114	14	0	0	0	0	0	0	0	0
09:00	107	28.8	23.5	0	25	71	11	0	0	0	0	0	0	0	0
10:00	95	29.3	25.5	0	12	71	11	0	0	0	1	0	0	0	0
11:00	114	29.3	25	0	18	84	11	0	0	1	0	0	0	0	0
12:00	124	30.9	25.9	0	13	86	24	1	0	0	0	0	0	0	0
13:00	110	30.5	26.6	0	4	81	25	0	0	0	0	0	0	0	0
14:00	133	31.3	25.9	0	18	85	28	2	0	0	0	0	0	0	0
15:00	207	31.1	26.4	0	16	150	39	1	1	0	0	0	0	0	0
16:00	187	31.5	27.1	0	11	134	39	1	2	0	0	0	0	0	0
17:00	180	30.5	26.3	0	12	137	31	0	0	0	0	0	0	0	0
18:00	158	30.7	26.3	0	10	117	30	1	0	0	0	0	0	0	0
19:00	111	32.5	27.3	0	11	68	29	2	1	0	0	0	0	0	0
20:00	82	34.4	26.5	0	12	49	19	1	0	1	0	0	0	0	0
21:00	56	32.8	26.5	0	10	31	12	2	1	0	0	0	0	0	0
22:00	54	32.3	27.6	0	3	32	18	1	0	0	0	0	0	0	0
23:00	27	34.6	25.5	0	4	18	5	0	0	0	0	0	0	0	0
12H,7-19	1647	30.5	25.9	0	175	1179	281	7	3	1	1	0	0	0	0
16H,6-22	1921	30.9	26	0	210	1345	346	12	5	2	1	0	0	0	0
18H,6-24	2002	30.9	26	0	217	1395	369	13	5	2	1	0	0	0	0
24H,0-24	2048	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**17**	33.8	27.5	0	2	10	5	0	0	0	0	0	0	0	0
01:00	**5**	-	24.8	0	0	5	0	0	0	0	0	0	0	0	0
02:00	**8**	-	23	0	3	5	0	0	0	0	0	0	0	0	0
03:00	**2**	-	26.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**0**	-	-	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	-	26.8	0	0	7	1	0	0	0	0	0	0	0	0
06:00	**28**	33.9	27.6	0	3	18	5	1	0	1	0	0	0	0	0
07:00	**65**	32.8	26	0	15	39	8	2	1	0	0	0	0	0	0
08:00	**174**	29.8	26.5	0	7	143	22	1	0	1	0	0	0	0	0
09:00	**114**	31.1	26.2	1	15	77	20	1	0	0	0	0	0	0	0
10:00	**102**	31.7	27	0	7	70	25	0	0	0	0	0	0	0	0
11:00	**118**	32.6	25.6	0	19	71	27	0	1	0	0	0	0	0	0
12:00	**128**	30.8	25.8	0	21	84	18	4	1	0	0	0	0	0	0
13:00	**113**	32.4	26.9	0	15	69	26	3	0	0	0	0	0	0	0
14:00	**128**	31.9	27.5	0	8	84	33	3	0	0	0	0	0	0	0
15:00	**214**	30.1	25.7	0	14	167	33	0	0	0	0	0	0	0	0
16:00	**185**	30.5	26	1	22	126	35	1	0	0	0	0	0	0	0
17:00	**145**	32.1	26.7	0	13	95	35	1	1	0	0	0	0	0	0
18:00	**164**	31.9	26.4	2	16	110	32	2	0	0	1	1	0	0	0
19:00	**107**	31.7	26.3	0	14	70	20	2	0	0	0	1	0	0	0
20:00	**73**	31.1	27.1	0	3	54	14	1	0	0	1	0	0	0	0
21:00	**73**	33.2	28	0	8	43	21	1	0	0	0	0	0	0	0
22:00	**46**	31.8	26.8	0	0	38	8	0	0	0	0	0	0	0	0
23:00	**32**	35.2	28.1	0	1	23	7	1	0	0	0	0	0	0	0
12H,7-19	**1650**	**31.2**	**26.3**	**4**	**172**	**1135**	**314**	**18**	**4**	**1**	**1**	**1**	**0**	**0**	**0**
16H,6-22	**1931**	**31.3**	**26.4**	**4**	**200**	**1320**	**374**	**23**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
18H,6-24	**2009**	**31.3**	**26.5**	**4**	**201**	**1381**	**389**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
24H,0-24	**2049**	**31.3**	**26.5**	**4**	**206**	**1410**	**395**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Daily Totals															
Thu 10-Feb-22	**2110**	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0
Fri 11-Feb-22	**2186**	32.3	27.5	6	120	1488	512	48	9	1	1	0	1	0	0
Sat 12-Feb-22	**1799**	32.4	27.3	4	133	1194	422	25	18	0	2	0	0	0	1
Sun 13-Feb-22	**1434**	33.3	27.9	4	105	887	391	29	9	7	1	0	1	0	0
Mon 14-Feb-22	**2112**	31.9	27.1	3	160	1449	454	31	9	6	0	0	0	0	0
Tue 15-Feb-22	**2048**	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0
Wed 16-Feb-22	**2049**	31.3	26.5	4	206	1410	395	24	4	2	2	2	0	0	0
Total Vehicles															
[--]	**13738**	32.0	27.0	27	1116	9289	3015	196	59	24	7	2	2	0	1





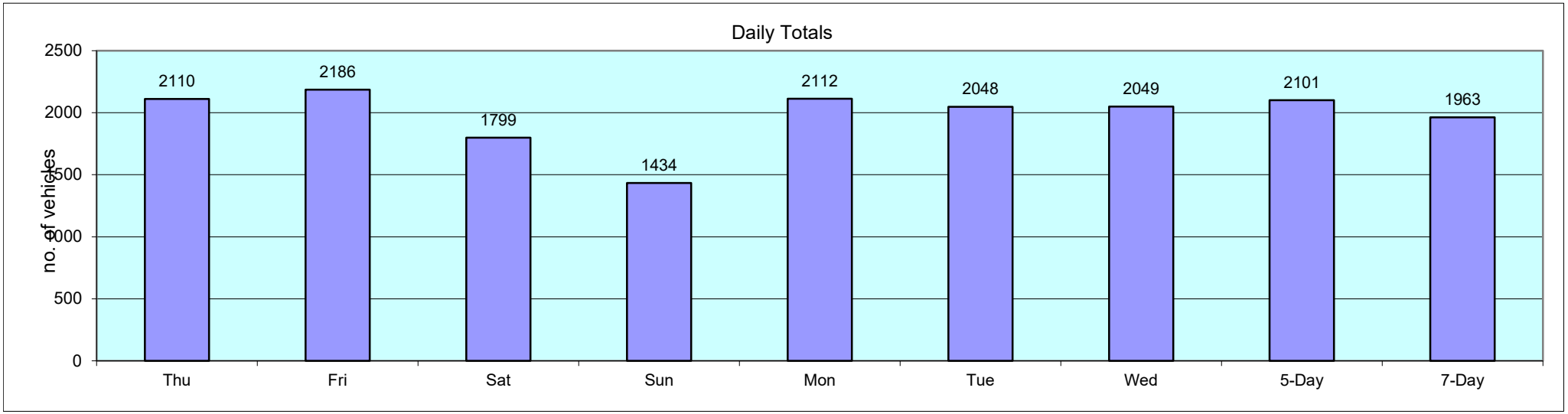
Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)		
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**19**	15	25	20	15	12	17	16	18
01:00	**9**	9	14	26	8	10	5	8	12
02:00	**6**	6	20	8	6	10	8	7	9
03:00	**6**	2	12	15	2	3	2	3	6
04:00	**5**	5	4	12	2	2	0	3	4
05:00	**13**	7	15	9	7	9	8	9	10
06:00	**20**	23	12	16	25	25	28	24	21
07:00	**75**	47	25	21	67	76	65	66	54
08:00	**180**	159	60	25	171	156	174	168	132
09:00	**125**	112	87	36	130	107	114	118	102
10:00	**92**	99	101	63	93	95	102	96	92
11:00	**127**	119	139	96	131	114	118	122	121
12:00	**112**	144	150	117	123	124	128	126	128
13:00	**133**	119	157	124	105	110	113	116	123
14:00	**143**	160	111	124	146	133	128	142	135
15:00	**203**	221	138	133	221	207	214	213	191
16:00	**183**	205	112	115	202	187	185	192	170
17:00	**154**	164	118	117	166	180	145	162	149
18:00	**143**	164	132	110	127	158	164	151	143
19:00	**123**	152	121	78	125	111	107	124	117
20:00	**96**	85	83	66	91	82	73	85	82
21:00	**68**	66	61	47	60	56	73	65	62
22:00	**44**	57	53	35	51	54	46	50	49
23:00	**31**	46	49	21	38	27	32	35	35
12H,7-19	**1670**	**1713**	**1330**	**1081**	**1682**	**1647**	**1650**	**1672**	**1539**
16H,6-22	**1977**	**2039**	**1607**	**1288**	**1983**	**1921**	**1931**	**1970**	**1821**
18H,6-24	**2052**	**2142**	**1709**	**1344**	**2072**	**2002**	**2009**	**2055**	**1904**
24H,0-24	**2110**	**2186**	**1799**	**1434**	**2112**	**2048**	**2049**	**2101**	**1963**
Am	**08:00**	**08:00**	**11:00**	**11:00**	**08:00**	**08:00**	**08:00**		
Peak	**180**	**159**	**139**	**96**	**171**	**156**	**174**		
Pm	**15:00**	**15:00**	**13:00**	**15:00**	**15:00**	**15:00**	**15:00**		
Peak	**203**	**221**	**157**	**133**	**221**	**207**	**214**		

27178	CARDIFF	Site No: 27178001	Location	Site 1 - Ball Road (att to T/P)
		Channel: Northbound		

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**9**	2	7	0	0	0	0	0	0	0	0	0	0	0
01:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**40**	2	35	2	0	1	0	0	0	0	0	0	0	0
06:00	**63**	1	51	10	0	0	1	0	0	0	0	0	0	0
07:00	**123**	3	102	15	0	2	1	0	0	0	0	0	0	0
08:00	**220**	3	196	14	0	4	3	0	0	0	0	0	0	0
09:00	**120**	1	105	9	0	3	2	0	0	0	0	0	0	0
10:00	**106**	2	92	9	0	3	0	0	0	0	0	0	0	0
11:00	**127**	2	115	6	0	2	1	0	1	0	0	0	0	0
12:00	**117**	0	110	4	0	3	0	0	0	0	0	0	0	0
13:00	**102**	4	85	9	1	2	1	0	0	0	0	0	0	0
14:00	**149**	1	135	10	0	2	1	0	0	0	0	0	0	0
15:00	**172**	1	157	8	0	4	2	0	0	0	0	0	0	0
16:00	**149**	2	132	9	0	3	3	0	0	0	0	0	0	0
17:00	**129**	3	114	8	0	3	1	0	0	0	0	0	0	0
18:00	**109**	3	100	4	0	1	1	0	0	0	0	0	0	0
19:00	**94**	1	88	3	0	1	1	0	0	0	0	0	0	0
20:00	**76**	2	69	4	0	1	0	0	0	0	0	0	0	0
21:00	**40**	2	34	3	0	1	0	0	0	0	0	0	0	0
22:00	**26**	0	23	2	0	1	0	0	0	0	0	0	0	0
23:00	**20**	1	18	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**25**	**1443**	**105**	**1**	**32**	**16**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31**	**1685**	**125**	**1**	**35**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**32**	**1726**	**127**	**1**	**37**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**36**	**1796**	**131**	**1**	**38**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**6**	1	5	0	0	0	0	0	0	0	0	0	0	0
01:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**23**	0	21	1	0	1	0	0	0	0	0	0	0	0
06:00	**48**	1	41	6	0	0	0	0	0	0	0	0	0	0
07:00	**123**	3	105	13	0	2	0	0	0	0	0	0	0	0
08:00	**198**	2	180	12	0	3	0	0	1	0	0	0	0	0
09:00	**133**	2	118	10	0	2	1	0	0	0	0	0	0	0
10:00	**98**	0	88	7	0	2	1	0	0	0	0	0	0	0
11:00	**101**	1	93	4	0	3	0	0	0	0	0	0	0	0
12:00	**123**	1	110	9	0	2	1	0	0	0	0	0	0	0
13:00	**100**	3	85	9	0	3	0	0	0	0	0	0	0	0
14:00	**143**	1	131	8	0	2	1	0	0	0	0	0	0	0
15:00	**196**	0	182	7	1	4	1	1	0	0	0	0	0	0
16:00	**159**	2	143	11	0	2	1	0	0	0	0	0	0	0
17:00	**152**	6	136	6	0	3	1	0	0	0	0	0	0	0
18:00	**128**	3	122	1	0	2	0	0	0	0	0	0	0	0
19:00	**92**	1	88	2	0	1	0	0	0	0	0	0	0	0
20:00	**70**	0	66	3	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	42	4	0	1	0	0	0	0	0	0	0	0
22:00	**37**	1	32	2	0	1	1	0	0	0	0	0	0	0
23:00	**30**	1	27	1	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1654**	**24**	**1493**	**97**	**1**	**30**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**26**	**1730**	**112**	**1**	**33**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**28**	**1789**	**115**	**1**	**35**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2036**	**29**	**1841**	**119**	**1**	**36**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**16**	0	15	1	0	0	0	0	0	0	0	0	0	0
01:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
02:00	**3**	0	3	0	0	0	0	0	0	0	0	0	0	0
03:00	**5**	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
05:00	**16**	0	13	2	0	1	0	0	0	0	0	0	0	0
06:00	**26**	0	24	1	0	0	1	0	0	0	0	0	0	0
07:00	**40**	1	35	3	0	1	0	0	0	0	0	0	0	0
08:00	**91**	2	78	9	0	2	0	0	0	0	0	0	0	0
09:00	**109**	1	100	5	0	3	0	0	0	0	0	0	0	0
10:00	**130**	0	117	10	0	2	1	0	0	0	0	0	0	0
11:00	**121**	0	109	8	0	3	1	0	0	0	0	0	0	0
12:00	**144**	0	132	7	0	2	3	0	0	0	0	0	0	0
13:00	**142**	1	133	4	0	1	2	0	1	0	0	0	0	0
14:00	**117**	2	103	10	0	1	1	0	0	0	0	0	0	0
15:00	**82**	2	75	2	0	2	1	0	0	0	0	0	0	0
16:00	**94**	1	86	6	0	1	0	0	0	0	0	0	0	0
17:00	**115**	1	106	5	0	3	0	0	0	0	0	0	0	0
18:00	**94**	0	89	4	0	1	0	0	0	0	0	0	0	0
19:00	**103**	0	97	4	0	1	1	0	0	0	0	0	0	0
20:00	**71**	0	68	3	0	0	0	0	0	0	0	0	0	0
21:00	**47**	1	45	0	0	1	0	0	0	0	0	0	0	0
22:00	**45**	0	42	3	0	0	0	0	0	0	0	0	0	0
23:00	**33**	0	29	3	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1279**	**11**	**1163**	**73**	**0**	**22**	**9**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**12**	**1397**	**81**	**0**	**24**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**12**	**1468**	**87**	**0**	**25**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**12**	**1525**	**91**	**0**	**26**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

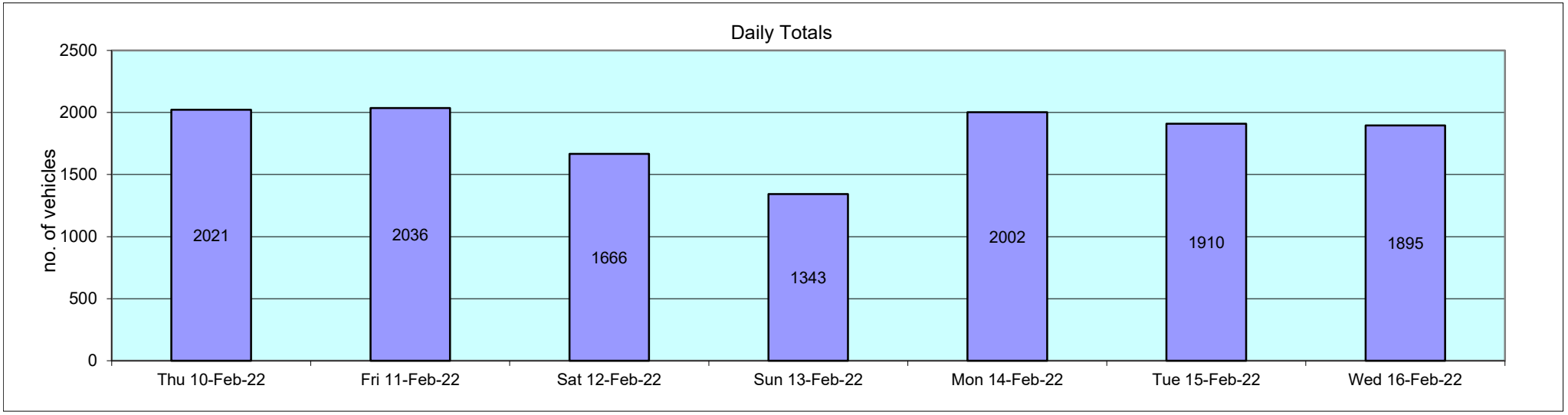
27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**13**	0	12	1	0	0	0	0	0	0	0	0	0	0
01:00	**13**	1	11	1	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	8	1	0	0	0	0	0	0	0	0	0	0
06:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
07:00	**29**	0	27	1	0	1	0	0	0	0	0	0	0	0
08:00	**37**	0	33	3	0	1	0	0	0	0	0	0	0	0
09:00	**66**	0	64	1	1	0	0	0	0	0	0	0	0	0
10:00	**98**	1	92	2	0	2	1	0	0	0	0	0	0	0
11:00	**91**	1	82	5	0	2	1	0	0	0	0	0	0	0
12:00	**133**	1	126	2	0	2	2	0	0	0	0	0	0	0
13:00	**104**	0	97	4	0	2	1	0	0	0	0	0	0	0
14:00	**118**	1	110	5	0	2	0	0	0	0	0	0	0	0
15:00	**96**	1	88	5	0	2	0	0	0	0	0	0	0	0
16:00	**99**	1	94	2	0	2	0	0	0	0	0	0	0	0
17:00	**102**	0	94	6	0	2	0	0	0	0	0	0	0	0
18:00	**90**	1	84	4	0	1	0	0	0	0	0	0	0	0
19:00	**78**	1	74	1	0	1	1	0	0	0	0	0	0	0
20:00	**55**	0	51	3	0	1	0	0	0	0	0	0	0	0
21:00	**36**	0	35	0	0	1	0	0	0	0	0	0	0	0
22:00	**24**	0	21	1	0	1	1	0	0	0	0	0	0	0
23:00	**11**	0	10	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1063**	**7**	**991**	**40**	**1**	**19**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**8**	**1166**	**44**	**1**	**22**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**8**	**1197**	**45**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1343**	**9**	**1254**	**48**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
01:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	3	1	0	0	0	0	0	0	0	0	0	0
04:00	**16**	0	14	2	0	0	0	0	0	0	0	0	0	0
05:00	**31**	0	29	1	0	1	0	0	0	0	0	0	0	0
06:00	**55**	1	41	8	0	3	1	0	0	0	1	0	0	0
07:00	**116**	2	92	16	0	4	2	0	0	0	0	0	0	0
08:00	**205**	0	189	13	0	2	1	0	0	0	0	0	0	0
09:00	**118**	0	99	14	0	3	2	0	0	0	0	0	0	0
10:00	**109**	4	90	12	0	3	0	0	0	0	0	0	0	0
11:00	**143**	1	127	12	0	2	1	0	0	0	0	0	0	0
12:00	**118**	0	108	6	0	3	1	0	0	0	0	0	0	0
13:00	**93**	3	77	11	0	2	0	0	0	0	0	0	0	0
14:00	**137**	1	127	6	0	3	0	0	0	0	0	0	0	0
15:00	**179**	0	167	8	0	4	0	0	0	0	0	0	0	0
16:00	**160**	4	144	10	0	0	2	0	0	0	0	0	0	0
17:00	**135**	1	122	8	0	2	2	0	0	0	0	0	0	0
18:00	**110**	3	103	3	0	1	0	0	0	0	0	0	0	0
19:00	**101**	2	95	2	0	1	1	0	0	0	0	0	0	0
20:00	**67**	2	65	0	0	0	0	0	0	0	0	0	0	0
21:00	**39**	1	35	1	0	1	1	0	0	0	0	0	0	0
22:00	**33**	1	29	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**19**	**1445**	**119**	**0**	**29**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**25**	**1681**	**130**	**0**	**34**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1939**	**27**	**1729**	**132**	**0**	**36**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**2002**	**27**	**1787**	**136**	**0**	**37**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	3	0	2	1	0	0	0	0	0	0	0	0	0	0
01:00	8	0	7	1	0	0	0	0	0	0	0	0	0	0
02:00	4	0	3	1	0	0	0	0	0	0	0	0	0	0
03:00	5	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	10	0	9	1	0	0	0	0	0	0	0	0	0	0
05:00	35	1	31	2	0	1	0	0	0	0	0	0	0	0
06:00	55	0	45	7	0	3	0	0	0	0	0	0	0	0
07:00	114	1	96	15	0	2	0	0	0	0	0	0	0	0
08:00	192	1	179	5	0	4	3	0	0	0	0	0	0	0
09:00	111	1	101	8	0	1	0	0	0	0	0	0	0	0
10:00	84	0	68	13	0	3	0	0	0	0	0	0	0	0
11:00	127	0	111	14	0	1	1	0	0	0	0	0	0	0
12:00	118	1	102	12	0	3	0	0	0	0	0	0	0	0
13:00	91	0	79	5	0	3	4	0	0	0	0	0	0	0
14:00	149	3	134	10	0	2	0	0	0	0	0	0	0	0
15:00	199	1	179	13	0	4	2	0	0	0	0	0	0	0
16:00	137	4	121	9	0	2	1	0	0	0	0	0	0	0
17:00	148	0	138	9	0	0	1	0	0	0	0	0	0	0
18:00	103	0	97	3	0	2	1	0	0	0	0	0	0	0
19:00	79	1	74	4	0	0	0	0	0	0	0	0	0	0
20:00	56	0	51	4	0	0	1	0	0	0	0	0	0	0
21:00	28	0	27	0	0	1	0	0	0	0	0	0	0	0
22:00	34	1	29	4	0	0	0	0	0	0	0	0	0	0
23:00	20	0	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	1573	12	1405	116	0	27	13	0	0	0	0	0	0	0
16H,6-22	1791	13	1602	131	0	31	14	0	0	0	0	0	0	0
18H,6-24	1845	14	1650	135	0	32	14	0	0	0	0	0	0	0
24H,0-24	1910	15	1706	142	0	33	14	0	0	0	0	0	0	0

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
01:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	1	1	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	11	1	0	0	0	0	0	0	0	0	0	0
05:00	**35**	0	33	1	0	1	0	0	0	0	0	0	0	0
06:00	**63**	2	54	3	0	3	1	0	0	0	0	0	0	0
07:00	**117**	1	104	10	0	2	0	0	0	0	0	0	0	0
08:00	**192**	0	170	18	1	2	1	0	0	0	0	0	0	0
09:00	**126**	1	113	8	0	2	2	0	0	0	0	0	0	0
10:00	**103**	0	91	9	1	2	0	0	0	0	0	0	0	0
11:00	**107**	4	99	3	0	1	0	0	0	0	0	0	0	0
12:00	**111**	4	95	9	1	2	0	0	0	0	0	0	0	0
13:00	**95**	1	87	6	0	1	0	0	0	0	0	0	0	0
14:00	**133**	1	122	5	1	1	3	0	0	0	0	0	0	0
15:00	**190**	0	168	18	1	1	2	0	0	0	0	0	0	0
16:00	**127**	1	121	4	0	1	0	0	0	0	0	0	0	0
17:00	**138**	1	126	9	1	1	0	0	0	0	0	0	0	0
18:00	**118**	1	100	14	0	0	3	0	0	0	0	0	0	0
19:00	**86**	0	85	1	0	0	0	0	0	0	0	0	0	0
20:00	**51**	0	51	0	0	0	0	0	0	0	0	0	0	0
21:00	**43**	1	40	1	0	1	0	0	0	0	0	0	0	0
22:00	**22**	0	20	0	0	1	1	0	0	0	0	0	0	0
23:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**15**	**1396**	**113**	**6**	**16**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1800**	**18**	**1626**	**118**	**6**	**20**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1832**	**18**	**1655**	**119**	**6**	**21**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1895**	**18**	**1714**	**122**	**6**	**22**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	**TOTAL VEHICLES**	**MOTOR-CYCLES**	**CARS OR CAR-BASED LGV**	**LIGHT GOODS VEHICLES**	**BUSES**	**TWO AXLE, SIX TYRE, RIGID/BUSES**	**THREE AXLE RIGID**	**FOUR OR MORE AXLE RIGID**	**FOUR OR LESS AXLE ARTIC**	**FIVE AXLE ARTIC**	**SIX OR MORE AXLE ARTIC**	**FIVE OR LESS AXLE MULTI-TRAILER ARTIC**	**SIX AXLE MULTI-TRAILER ARTIC**	**SEVEN OR MORE AXLE ARTIC**
Daily Totals														
Thu 10-Feb-22	**2021**	36	1796	131	1	38	18	0	1	0	0	0	0	0
Fri 11-Feb-22	**2036**	29	1841	119	1	36	8	1	1	0	0	0	0	0
Sat 12-Feb-22	**1666**	12	1525	91	0	26	11	0	1	0	0	0	0	0
Sun 13-Feb-22	**1343**	9	1254	48	1	24	7	0	0	0	0	0	0	0
Mon 14-Feb-22	**2002**	27	1787	136	0	37	14	0	0	0	1	0	0	0
Tue 15-Feb-22	**1910**	15	1706	142	0	33	14	0	0	0	0	0	0	0
Wed 16-Feb-22	**1895**	18	1714	122	6	22	13	0	0	0	0	0	0	0
Total Vehicles														
[--]	**12873**	146	11623	789	9	216	85	1	3	0	1	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22																
00:00	**9**	-	25.2	0	2	5	2	0	0	0	0	0	0	0	0
01:00	**3**	-	30.9	0	0	2	1	0	0	0	0	0	0	0	0
02:00	**5**	-	30.8	0	0	2	3	0	0	0	0	0	0	0	0
03:00	**7**	-	30	0	0	3	4	0	0	0	0	0	0	0	0
04:00	**15**	37.8	31.9	0	0	6	8	0	1	0	0	0	0	0	0
05:00	**40**	34.5	29.6	0	2	19	18	1	0	0	0	0	0	0	0
06:00	**63**	35.5	29	0	3	35	23	0	0	1	1	0	0	0	0
07:00	**123**	32	25.9	1	21	73	26	1	0	1	0	0	0	0	0
08:00	**220**	29.4	23.5	0	62	131	27	0	0	0	0	0	0	0	0
09:00	**120**	31.4	24.9	1	23	72	22	2	0	0	0	0	0	0	0
10:00	**106**	30.6	25.2	1	19	68	18	0	0	0	0	0	0	0	0
11:00	**127**	32.2	26.5	0	16	75	34	2	0	0	0	0	0	0	0
12:00	**117**	32.5	26.9	0	17	58	39	2	0	1	0	0	0	0	0
13:00	**102**	31.8	25.3	0	27	55	14	5	0	0	1	0	0	0	0
14:00	**149**	30.8	24.7	0	38	83	27	1	0	0	0	0	0	0	0
15:00	**172**	29.1	22.9	0	59	91	20	2	0	0	0	0	0	0	0
16:00	**149**	31.6	24.5	0	48	69	30	2	0	0	0	0	0	0	0
17:00	**129**	31.9	26.2	0	19	77	30	2	1	0	0	0	0	0	0
18:00	**109**	32.8	26.2	0	20	58	28	2	0	1	0	0	0	0	0
19:00	**94**	32.4	26.4	0	12	61	18	2	1	0	0	0	0	0	0
20:00	**76**	33.4	26.5	0	13	39	22	1	1	0	0	0	0	0	0
21:00	**40**	35.4	26.3	0	8	22	9	0	0	1	0	0	0	0	0
22:00	**26**	36.8	29	0	3	14	7	2	0	0	0	0	0	0	0
23:00	**20**	35.8	28.4	0	0	13	6	0	1	0	0	0	0	0	0
12H,7-19	**1623**	**31.4**	**25**	**3**	**369**	**910**	**315**	**21**	**1**	**3**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31.7**	**25.3**	**3**	**405**	**1067**	**387**	**24**	**3**	**5**	**2**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**31.8**	**25.4**	**3**	**408**	**1094**	**400**	**26**	**4**	**5**	**2**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**32**	**25.6**	**3**	**412**	**1131**	**436**	**27**	**5**	**5**	**2**	**0**	**0**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**6**	-	25.9	0	1	4	1	0	0	0	0	0	0	0	0
01:00	**6**	-	29	0	1	4	0	0	0	1	0	0	0	0	0
02:00	**5**	-	30.4	0	0	3	2	0	0	0	0	0	0	0	0
03:00	**3**	-	30.5	0	0	1	2	0	0	0	0	0	0	0	0
04:00	**15**	35.1	29.1	0	0	10	4	1	0	0	0	0	0	0	0
05:00	**23**	34	29.7	0	1	10	11	0	0	1	0	0	0	0	0
06:00	**48**	33.3	27.4	0	5	29	12	1	0	1	0	0	0	0	0
07:00	**123**	33.8	27.8	0	13	65	41	3	0	1	0	0	0	0	0
08:00	**198**	32.1	26.2	0	39	108	46	3	1	1	0	0	0	0	0
09:00	**133**	31.5	25.7	0	27	75	31	0	0	0	0	0	0	0	0
10:00	**98**	32.6	26.8	0	15	54	26	3	0	0	0	0	0	0	0
11:00	**101**	33.3	26.8	1	18	52	24	5	1	0	0	0	0	0	0
12:00	**123**	31.1	24.8	0	30	71	21	1	0	0	0	0	0	0	0
13:00	**100**	29.8	24.3	0	23	65	11	1	0	0	0	0	0	0	0
14:00	**143**	31.9	25.3	0	32	79	31	1	0	0	0	0	0	0	0
15:00	**196**	30.1	23.7	0	72	94	25	4	1	0	0	0	0	0	0
16:00	**159**	31.2	24.2	0	50	78	30	0	0	1	0	0	0	0	0
17:00	**152**	31.3	25.5	0	37	85	26	2	1	1	0	0	0	0	0
18:00	**128**	31.7	26.2	0	24	77	23	1	2	1	0	0	0	0	0
19:00	**92**	33.5	26.5	0	17	47	23	5	0	0	0	0	0	0	0
20:00	**70**	34.1	28.1	0	9	34	23	2	1	1	0	0	0	0	0
21:00	**47**	35.9	29.6	0	3	25	16	2	0	0	1	0	0	0	0
22:00	**37**	34.5	27.4	1	6	17	12	0	0	0	1	0	0	0	0
23:00	**30**	32.9	27.2	0	8	14	6	1	0	0	0	0	1	0	0
12H,7-19	**1654**	**31.7**	**25.5**	**1**	**380**	**903**	**335**	**24**	**6**	**5**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**31.9**	**25.8**	**1**	**414**	**1038**	**409**	**34**	**7**	**7**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**32**	**25.8**	**2**	**428**	**1069**	**427**	**35**	**7**	**7**	**2**	**0**	**1**	**0**	**0**
24H,0-24	**2036**	**32**	**25.9**	**2**	**431**	**1101**	**447**	**36**	**7**	**9**	**2**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22																
00:00	**16**	37.3	28.6	0	2	8	5	1	0	0	0	0	0	0	0
01:00	**11**	40.6	28.6	0	1	6	3	0	1	0	0	0	0	0	0
02:00	**3**	-	25.3	0	0	2	1	0	0	0	0	0	0	0	0
03:00	**5**	-	24.9	0	0	5	0	0	0	0	0	0	0	0	0
04:00	**11**	40.6	32.7	0	0	5	5	0	0	1	0	0	0	0	0
05:00	**16**	37	27.7	0	3	9	3	1	0	0	0	0	0	0	0
06:00	**26**	39.5	30.4	0	0	16	7	1	2	0	0	0	0	0	0
07:00	**40**	34	27.1	0	6	22	10	2	0	0	0	0	0	0	0
08:00	**91**	31.5	25.4	1	20	50	17	2	1	0	0	0	0	0	0
09:00	**109**	32.9	27.6	0	13	57	36	3	0	0	0	0	0	0	0
10:00	**130**	31.8	26	0	25	76	28	1	0	0	0	0	0	0	0
11:00	**121**	31.1	25.6	0	23	74	23	0	1	0	0	0	0	0	0
12:00	**144**	31.2	25.5	0	29	84	28	3	0	0	0	0	0	0	0
13:00	**142**	32.8	25.3	1	36	70	32	2	1	0	0	0	0	0	0
14:00	**117**	33.4	26.9	0	16	69	28	2	1	0	1	0	0	0	0
15:00	**82**	31.7	26.6	0	14	45	22	1	0	0	0	0	0	0	0
16:00	**94**	33.4	26.7	1	17	48	23	4	1	0	0	0	0	0	0
17:00	**115**	32.9	26.8	0	15	62	37	1	0	0	0	0	0	0	0
18:00	**94**	33	26.1	0	18	54	20	2	0	0	0	0	0	0	0
19:00	**103**	32.9	26.4	0	16	57	29	0	1	0	0	0	0	0	0
20:00	**71**	33.5	26.7	0	11	39	18	3	0	0	0	0	0	0	0
21:00	**47**	34.5	26.8	0	8	23	16	0	0	0	0	0	0	0	0
22:00	**45**	31.7	26.8	0	4	30	10	1	0	0	0	0	0	0	0
23:00	**33**	33.4	29.6	0	1	17	14	0	0	1	0	0	0	0	0
12H,7-19	**1279**	**32.5**	**26.2**	**3**	**232**	**711**	**304**	**23**	**5**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**32.8**	**26.3**	**3**	**267**	**846**	**374**	**27**	**8**	**0**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**32.8**	**26.4**	**3**	**272**	**893**	**398**	**28**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**32.8**	**26.5**	**3**	**278**	**928**	**415**	**30**	**9**	**2**	**1**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**13**	37.4	28.8	0	2	6	4	0	0	0	1	0	0	0	0
01:00	**13**	37.2	29.1	0	2	5	5	1	0	0	0	0	0	0	0
02:00	**6**	-	33.7	0	0	2	3	1	0	0	0	0	0	0	0
03:00	**8**	-	26.6	0	0	7	1	0	0	0	0	0	0	0	0
04:00	**12**	34.8	28	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**9**	-	33.9	0	0	3	4	1	1	0	0	0	0	0	0
06:00	**15**	35.7	28	0	0	12	2	1	0	0	0	0	0	0	0
07:00	**29**	33.3	27.9	0	2	17	10	0	0	0	0	0	0	0	0
08:00	**37**	33.8	27.9	0	4	20	13	0	0	0	0	0	0	0	0
09:00	**66**	32.9	27.1	0	7	42	16	1	0	0	0	0	0	0	0
10:00	**98**	34.4	29.1	0	1	63	28	4	2	0	0	0	0	0	0
11:00	**91**	33.3	26.1	0	15	53	21	2	0	0	0	0	0	0	0
12:00	**133**	32.5	25.9	0	24	75	31	3	0	0	0	0	0	0	0
13:00	**104**	33.1	26.2	0	27	47	24	3	2	1	0	0	0	0	0
14:00	**118**	34.1	27	0	18	66	32	1	0	0	1	0	0	0	0
15:00	**96**	35.3	27.3	1	15	46	30	4	0	0	0	0	0	0	0
16:00	**99**	34.3	27.7	0	14	50	33	2	0	0	0	0	0	0	0
17:00	**102**	32.3	26.6	1	15	57	26	2	1	0	0	0	0	0	0
18:00	**90**	35.5	27.3	0	12	51	22	4	1	0	0	0	0	0	0
19:00	**78**	33.8	28.8	0	5	40	30	3	0	0	0	0	0	0	0
20:00	**55**	34.8	28.4	0	3	27	24	0	1	0	0	0	0	0	0
21:00	**36**	33.8	28	0	5	17	13	0	1	0	0	0	0	0	0
22:00	**24**	33.2	28.8	0	1	16	6	0	0	0	1	0	0	0	0
23:00	**11**	45.3	29.6	0	2	5	2	1	0	0	0	1	0	0	0
12H,7-19	**1063**	**33.4**	**27**	**2**	**154**	**587**	**286**	**26**	**6**	**1**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**33.6**	**27.3**	**2**	**167**	**683**	**355**	**30**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**33.6**	**27.3**	**2**	**170**	**704**	**363**	**31**	**8**	**1**	**2**	**1**	**0**	**0**	**0**
24H,0-24	**1343**	**33.8**	**27.4**	**2**	**175**	**733**	**385**	**34**	**9**	**1**	**3**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**6**	-	34.2	0	1	2	1	0	1	0	1	0	0	0	0
01:00	**4**	-	25.5	0	1	1	2	0	0	0	0	0	0	0	0
02:00	**2**	-	30.3	0	0	1	1	0	0	0	0	0	0	0	0
03:00	**4**	-	30.9	0	0	1	3	0	0	0	0	0	0	0	0
04:00	**16**	38.1	30.5	0	0	10	5	0	1	0	0	0	0	0	0
05:00	**31**	35.1	30.1	0	2	14	14	0	0	0	1	0	0	0	0
06:00	**55**	33.8	27	1	10	24	19	1	0	0	0	0	0	0	0
07:00	**116**	32.8	27	0	17	64	32	3	0	0	0	0	0	0	0
08:00	**205**	32.7	25.1	0	61	92	51	0	0	1	0	0	0	0	0
09:00	**118**	31.5	25.5	0	27	58	32	0	1	0	0	0	0	0	0
10:00	**109**	32.1	26.1	1	21	61	23	1	1	1	0	0	0	0	0
11:00	**143**	31.1	25.7	1	26	82	33	1	0	0	0	0	0	0	0
12:00	**118**	31.8	26.3	0	21	61	36	0	0	0	0	0	0	0	0
13:00	**93**	32.4	26.8	0	7	57	29	0	0	0	0	0	0	0	0
14:00	**137**	32.5	26.1	0	24	80	29	2	2	0	0	0	0	0	0
15:00	**179**	31.9	24.1	0	58	86	33	2	0	0	0	0	0	0	0
16:00	**160**	30.8	24.3	0	47	83	26	3	1	0	0	0	0	0	0
17:00	**135**	32.4	24.8	0	40	69	23	2	0	1	0	0	0	0	0
18:00	**110**	32.2	25.6	0	25	57	24	2	1	1	0	0	0	0	0
19:00	**101**	31.3	24.4	0	27	51	22	1	0	0	0	0	0	0	0
20:00	**67**	33.2	27.4	0	8	40	14	4	0	1	0	0	0	0	0
21:00	**39**	45.4	32.3	0	5	13	15	0	2	1	1	2	0	0	0
22:00	**33**	39.7	28.4	0	4	18	7	3	0	1	0	0	0	0	0
23:00	**21**	32.1	26.7	0	4	13	4	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**32**	**25.5**	**2**	**374**	**850**	**371**	**16**	**6**	**4**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**32.1**	**25.7**	**3**	**424**	**978**	**441**	**22**	**8**	**6**	**1**	**2**	**0**	**0**	**0**
18H,6-24	**1939**	**32.2**	**25.7**	**3**	**432**	**1009**	**452**	**25**	**8**	**7**	**1**	**2**	**0**	**0**	**0**
24H,0-24	**2002**	**32.3**	**25.9**	**3**	**436**	**1038**	**478**	**25**	**10**	**7**	**3**	**2**	**0**	**0**	**0**

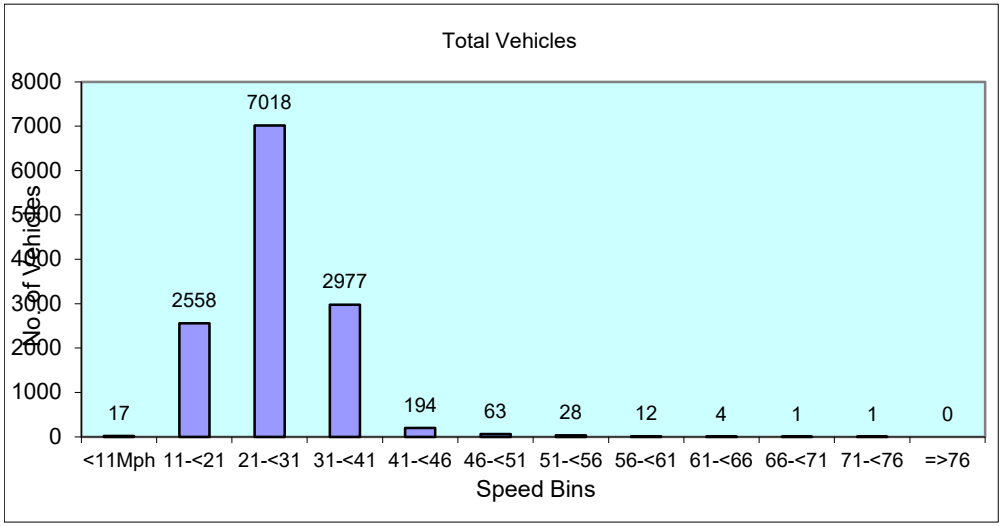
Data produced by
Transport Surveys Ltd

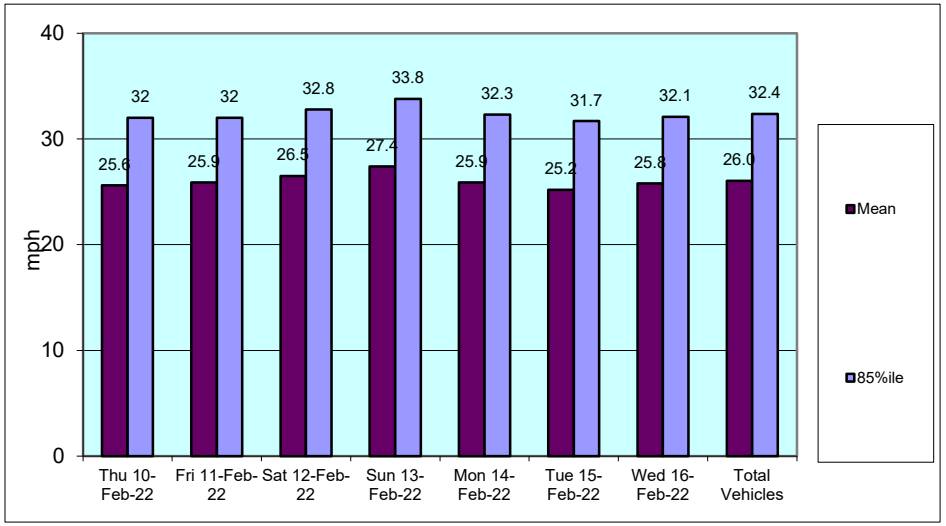
27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	**3**	-	32.4	0	0	1	2	0	0	0	0	0	0	0	0
01:00	**8**	-	26.2	0	2	4	1	1	0	0	0	0	0	0	0
02:00	**4**	-	30.7	0	0	2	1	1	0	0	0	0	0	0	0
03:00	**5**	-	30.2	0	0	3	2	0	0	0	0	0	0	0	0
04:00	**10**	-	28.5	0	0	6	4	0	0	0	0	0	0	0	0
05:00	**35**	36.3	30.7	0	0	18	15	0	1	1	0	0	0	0	0
06:00	**55**	33.4	27.6	0	5	29	21	0	0	0	0	0	0	0	0
07:00	**114**	30.8	25.9	0	18	72	23	1	0	0	0	0	0	0	0
08:00	**192**	30.3	23.5	0	70	90	30	2	0	0	0	0	0	0	0
09:00	**111**	28.2	23.6	0	26	70	15	0	0	0	0	0	0	0	0
10:00	**84**	29.6	24.2	0	25	48	10	1	0	0	0	0	0	0	0
11:00	**127**	31.2	25.7	0	30	66	27	2	2	0	0	0	0	0	0
12:00	**118**	31.9	25	0	28	66	22	1	1	0	0	0	0	0	0
13:00	**91**	32.7	26.1	0	18	51	19	2	0	0	1	0	0	0	0
14:00	**149**	31.5	25.3	0	34	88	24	2	1	0	0	0	0	0	0
15:00	**199**	30	24.3	0	61	109	26	1	1	0	0	0	0	1	0
16:00	**137**	30.9	24	0	44	67	23	1	2	0	0	0	0	0	0
17:00	**148**	32.9	25.6	0	37	68	41	2	0	0	0	0	0	0	0
18:00	**103**	30.8	24.4	0	24	61	17	1	0	0	0	0	0	0	0
19:00	**79**	34.6	27	0	14	40	21	3	1	0	0	0	0	0	0
20:00	**56**	36.3	27.5	0	10	29	13	1	2	1	0	0	0	0	0
21:00	**28**	36.7	28.3	0	2	16	9	0	1	0	0	0	0	0	0
22:00	**34**	30.5	24.9	0	6	22	6	0	0	0	0	0	0	0	0
23:00	**20**	27.4	23.8	0	4	14	2	0	0	0	0	0	0	0	0
12H,7-19	**1573**	**30.9**	**24.7**	**0**	**415**	**856**	**277**	**16**	**7**	**0**	**1**	**0**	**0**	**1**	**0**
16H,6-22	**1791**	**31.5**	**25.1**	**0**	**446**	**970**	**341**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
18H,6-24	**1845**	**31.4**	**25**	**0**	**456**	**1006**	**349**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
24H,0-24	**1910**	**31.7**	**25.2**	**0**	**458**	**1040**	**374**	**22**	**12**	**2**	**1**	**0**	**0**	**1**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**8**	-	29.9	0	0	5	3	0	0	0	0	0	0	0	0
01:00	**2**	-	27.4	0	0	1	1	0	0	0	0	0	0	0	0
02:00	**2**	-	17.1	0	2	0	0	0	0	0	0	0	0	0	0
03:00	**4**	-	28.9	0	0	3	1	0	0	0	0	0	0	0	0
04:00	**12**	35.6	29.3	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**35**	34.3	29.6	0	1	17	15	2	0	0	0	0	0	0	0
06:00	**63**	34.2	28.5	0	4	36	22	1	0	0	0	0	0	0	0
07:00	**117**	33	26.8	1	20	62	32	1	0	1	0	0	0	0	0
08:00	**192**	30.8	24.6	0	44	113	34	1	0	0	0	0	0	0	0
09:00	**126**	31.4	26.3	0	15	81	29	0	1	0	0	0	0	0	0
10:00	**103**	31.8	25.9	0	17	65	20	1	0	0	0	0	0	0	0
11:00	**107**	32.5	26.3	1	16	60	27	3	0	0	0	0	0	0	0
12:00	**111**	30.9	24.3	1	30	61	17	1	1	0	0	0	0	0	0
13:00	**95**	32.4	25.5	0	18	49	28	0	0	0	0	0	0	0	0
14:00	**133**	32.7	26.3	0	27	69	33	3	0	0	0	1	0	0	0
15:00	**190**	30.2	23.9	0	61	95	33	0	1	0	0	0	0	0	0
16:00	**127**	31.1	24.4	0	38	65	21	2	1	0	0	0	0	0	0
17:00	**138**	32.5	26.1	0	23	73	39	2	1	0	0	0	0	0	0
18:00	**118**	31.1	24.6	1	27	65	23	0	2	0	0	0	0	0	0
19:00	**86**	32.3	26.7	0	14	48	20	2	2	0	0	0	0	0	0
20:00	**51**	32.8	27	0	4	36	8	1	1	1	0	0	0	0	0
21:00	**43**	35.2	28.7	0	4	22	17	0	0	0	0	0	0	0	0
22:00	**22**	34.9	29.8	0	0	11	10	0	1	0	0	0	0	0	0
23:00	**10**	-	26.1	0	2	4	4	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**31.5**	**25.3**	**4**	**336**	**858**	**336**	**14**	**7**	**1**	**0**	**1**	**0**	**0**	**0**
16H,6-22	**1800**	**31.8**	**25.6**	**4**	**362**	**1000**	**403**	**18**	**10**	**2**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1832**	**31.9**	**25.7**	**4**	**364**	**1015**	**417**	**18**	**11**	**2**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**1895**	**32.1**	**25.8**	**4**	**368**	**1047**	**442**	**20**	**11**	**2**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	**Total Vehicles**	**85%ile Speed**	**Mean Speed**	**<11Mph**	**11-<21**	**21-<31**	**31-<41**	**41-<46**	**46-<51**	**51-<56**	**56-<61**	**61-<66**	**66-<71**	**71-<76**	**=>76**
Daily Totals															
Thu 10-Feb-22	**2021**	32	25.6	3	412	1131	436	27	5	5	2	0	0	0	0
Fri 11-Feb-22	**2036**	32	25.9	2	431	1101	447	36	7	9	2	0	1	0	0
Sat 12-Feb-22	**1666**	32.8	26.5	3	278	928	415	30	9	2	1	0	0	0	0
Sun 13-Feb-22	**1343**	33.8	27.4	2	175	733	385	34	9	1	3	1	0	0	0
Mon 14-Feb-22	**2002**	32.3	25.9	3	436	1038	478	25	10	7	3	2	0	0	0
Tue 15-Feb-22	**1910**	31.7	25.2	0	458	1040	374	22	12	2	1	0	0	1	0
Wed 16-Feb-22	**1895**	32.1	25.8	4	368	1047	442	20	11	2	0	1	0	0	0
Total Vehicles															
[--]	**12873**	32.4	26.0	17	2558	7018	2977	194	63	28	12	4	1	1	0



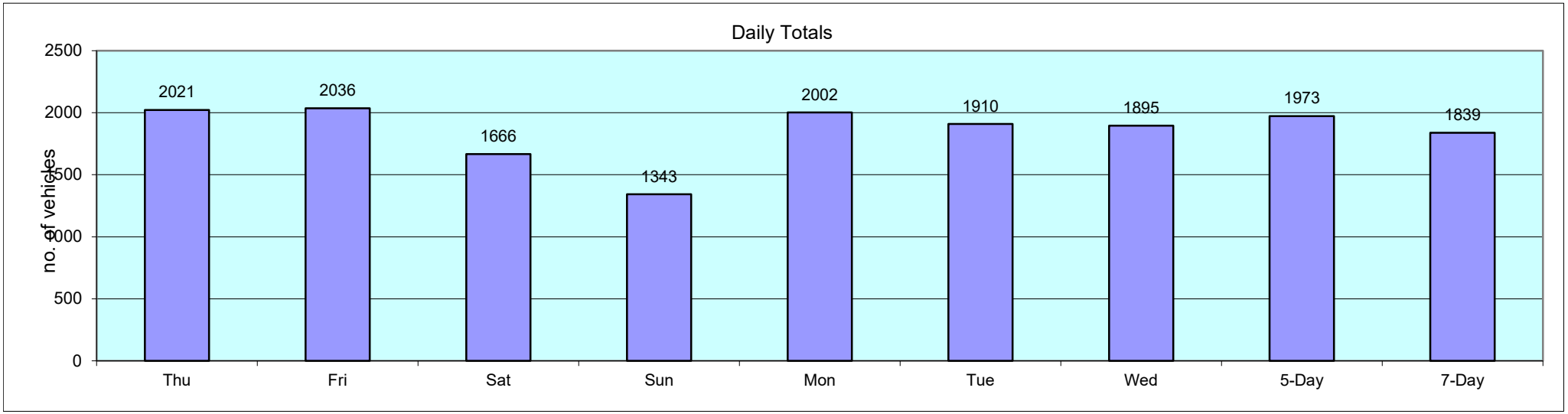


27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Southbound		Location		Site 1 - Ball Road (att to T/P)	
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**9**	6	16	13	6	3	8	6	9
01:00	**3**	6	11	13	4	8	2	5	7
02:00	**5**	5	3	6	2	4	2	4	4
03:00	**7**	3	5	8	4	5	4	5	5
04:00	**15**	15	11	12	16	10	12	14	13
05:00	**40**	23	16	9	31	35	35	33	27
06:00	**63**	48	26	15	55	55	63	57	46
07:00	**123**	123	40	29	116	114	117	119	95
08:00	**220**	198	91	37	205	192	192	201	162
09:00	**120**	133	109	66	118	111	126	122	112
10:00	**106**	98	130	98	109	84	103	100	104
11:00	**127**	101	121	91	143	127	107	121	117
12:00	**117**	123	144	133	118	118	111	117	123
13:00	**102**	100	142	104	93	91	95	96	104
14:00	**149**	143	117	118	137	149	133	142	135
15:00	**172**	196	82	96	179	199	190	187	159
16:00	**149**	159	94	99	160	137	127	146	132
17:00	**129**	152	115	102	135	148	138	140	131
18:00	**109**	128	94	90	110	103	118	114	107
19:00	**94**	92	103	78	101	79	86	90	90
20:00	**76**	70	71	55	67	56	51	64	64
21:00	**40**	47	47	36	39	28	43	39	40
22:00	**26**	37	45	24	33	34	22	30	32
23:00	**20**	30	33	11	21	20	10	20	21
12H,7-19	**1623**	**1654**	**1279**	**1063**	**1623**	**1573**	**1557**	**1606**	**1482**
16H,6-22	**1896**	**1911**	**1526**	**1247**	**1885**	**1791**	**1800**	**1857**	**1722**
18H,6-24	**1942**	**1978**	**1604**	**1282**	**1939**	**1845**	**1832**	**1907**	**1775**
24H,0-24	**2021**	**2036**	**1666**	**1343**	**2002**	**1910**	**1895**	**1973**	**1839**
Am	**08:00**	**08:00**	**10:00**	**10:00**	**08:00**	**08:00**	**08:00**		
Peak	**220**	**198**	**130**	**98**	**205**	**192**	**192**		
Pm	**15:00**	**15:00**	**12:00**	**12:00**	**15:00**	**15:00**	**15:00**		
Peak	**172**	**196**	**144**	**133**	**179**	**199**	**190**		

27178	CARDIFF	Site No: 27178001 Channel: Southbound	Location	Site 1 - Ball Road (att to T/P)

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



Classification Schemes

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	<6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	<10.0	10.0 - 18.0			
	car + 2 axle trailer	4	<10.0		<3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 -15.0		<3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			<3.5	
4	Traditional bus/coach	2	>20.0				
	Traditional bus/coach	3	>19.0				
5	single unit truck/bus - dual rear axle	2	14.9 - 20.0			<3.5	
6	3 axle truck	3		<18.0			
7	4 axle truck	4					
8	2S1	3		>18.0			
	2S2	4		>5.0	>3.5		
	3S1	4		<5.0	>10.0		
9	3S2	5		<6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		>6.0			
12	3S1-2	6					>10.0
13	truck	7 or more					

Appendix D Collision Data

Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

MG NSRF/A

ACCIDENT STATISTICS

*FATAL / SERIOUS / SLIGHT

Incident URN

Other ref.

1.3 ACCIDENT REFERENCE

1.9 TIME H H M M

DAY* Su M T W Th F S

1.7 DATE D D M M 2 0 Y Y

1st Road Class & No. or (Unclassified - UC) (Not Known - NK)

1st Road Name

Outside House No. or Name or Marker Post No.

at junction with / or metres N S E W * of

2nd Road Class & No. or (Unclassified - UC) (Not Known - NK)

2nd Road Name

Town

Sector /Beat No.

County or Borough

Parish No. or Name

1.10 Local Auth No. (if known)

1.11 Grid Reference E — N

REPORTING OFFICER Name

Number

BCU/Stn

1.2 Force

Tel Number

1.5 Number of vehicles

1.6 Number of casualties

1.14 ROAD TYPE

		✗
Roundabout	1	
One way street	2	
Dual carriageway	3	
Single carriageway	6	
Slip road	7	
Unknown	9	

1.15 Speed Limit (Permanent)

1.16 JUNCTION DETAIL

		✗
Not at or within 20 metres of junction	00	
Roundabout	01	
Mini roundabout	02	
T or staggered junction	03	
Slip road	05	
Crossroads	06	
Junction more than four arms (not RAB)	07	
Using private drive or entrance	08	
Other junction	09	

JUNCTION ACCIDENTS ONLY

1.17 JUNCTION CONTROL

		✗
Authorised person	1	
Automatic traffic signal	2	
Stop sign	3	
Give way or uncontrolled	4	

1.20a PEDESTRIAN CROSSING - HUMAN CONTROL

		✗
None within 50 metres	0	
Control by school crossing patrol	1	
Control by other authorised person	2	

1.20b PEDESTRIAN CROSSING - PHYSICAL FACILITIES

		✗
No physical crossing facility within 50m	0	
Zebra crossing	1	
Pelican, puffin, toucan or similar non-junction pedestrian light crossing	4	
Pedestrian phase at traffic signal junction	5	
Footbridge or subway	7	
Central refuge — no other controls	8	

1.22 WEATHER

		✗
Fine without high winds	1	
Raining without high winds	2	
Snowing without high winds	3	
Fine with high winds	4	
Raining with high winds	5	
Snowing with high winds	6	
Fog or mist — if hazard	7	
Other	8	
Unknown	9	

1.23 ROAD SURFACE CONDITION

		✗
Dry	1	
Wet / Damp	2	
Snow	3	
Frost / Ice	4	
Flood (surface water over 3cm deep)	5	

1.21 LIGHT CONDITIONS

		✗
Daylight:	1	
Darkness: street lights present and lit	4	
Darkness: street lights present but unlit	5	
Darkness: no street lighting	6	
Darkness: street lighting unknown	7	

1.24 SPECIAL CONDITIONS AT SITE

		✗
None	0	
Auto traffic signal out	1	
Auto traffic signal partially defective	2	
Permanent road signing or marking defective or obscured	3	
Roadworks	4	
Road surface defective	5	
Oil or diesel	6	
Mud	7	

1.25 CARRIAGEWAY HAZARDS

		✗
None	0	
Dislodged vehicle load in carriageway	1	
Other object in carriageway	2	
Involvement with previous accident	3	
Pedestrian in carriageway - not injured	6	
Any animal in carriageway (except ridden horse)	7	

1.26 Did a police officer attend the scene and obtain the details for this report?

		✗
Yes	1	
No	2	

Subject to local directions, boxes with a grey background need not be completed if already recorded

** Circle as appropriate*

VEHICLE RECORD

2.26 VEHICLE REGISTRATION MARK

Vehicle 001	
Vehicle 002	
Vehicle 003	
Vehicle 004	

2.35 WAS THE VEHICLE LEFT HAND DRIVE ✗

		VEHICLE 1	2	3	4
No	1				
Yes	2				

2.5 / 2.5a TYPE OF VEHICLE ✗

Car	09				
Taxi / Private hire car	08				
Van - Goods vehicle 3.5 tonnes mgw and under	19				
Goods vehicle over 3.5 tonnes mgw and under 7.5 tonnes mgw	20				
Goods vehicle 7.5 tonnes mgw & over	21				
Goods vehicle - unknown weight	98				
M/cycle 50cc and under	02				
M/cycle over 50cc and up to 125cc	03				
M/cycle over 125cc and up to 500cc	04				
Motorcycle over 500cc	05				
Motorcycle - cc unknown	97				
Electric Motorcycle	23				
Pedal cycle	01				
Bus or coach (17 or more passenger seats)	11				
Minibus (8-16 passenger seats)	10				
Agricultural vehicle (include diggers etc)	17				
Ridden horse	16				
Mobility scooter	22				
Tram / Light rail	18				
Other vehicle 1	90				
Other vehicle 2	90				
Other vehicle 3	90				
Other vehicle 4	90				

2.6 TOWING AND ARTICULATION ✗

No tow or articulation	0				
Articulated vehicle	1				
Double or multiple trailer	2				
Caravan	3				
Single trailer	4				
Other tow	5				

2.22 AGE OF DRIVER (Estimate if necessary)

Vehicle 001		Vehicle 002	
Vehicle 003		Vehicle 004	

2.27 DRIVER HOME POSTCODE

or Code: 1- Unknown 2- Non UK Resident 3 - Parked & unattended

Vehicle 001		
Vehicle 002		
Vehicle 003		
Vehicle 004		

2.23 BREATH TEST ✗

		VEHICLE 1	2	3	4
Not applicable	0				
Positive	1				
Negative	2				
Not requested	3				
Refused to provide	4				
Driver not contacted at time of col'	5				
Not provided (medical reasons)	6				

2.24 HIT AND RUN ✗

Not hit and run	0				
Hit and run	1				
Non-stop vehicle, not hit	2				

2.21 SEX OF DRIVER ✗

Male	1				
Female	2				
Not known	3				

2.9 VEHICLE LOCATION AT TIME OF ACCIDENT RESTRICTED LANE/AWAY FROM MAIN C'WAY ✗

On main carriageway not in restricted lane	00				
Tram / Light rail track	01				
Bus lane	02				
Busway (inc. guided busway)	03				
Cycle lane (on main carriageway)	04				
Cycleway or shared use footway (not part of main carriageway)	05				
On lay-by / hard shoulder	06				
Entering lay-by/ hard shoulder	07				
Leaving lay-by / hard shoulder	08				
Footway (pavement)	09				

2.10 JUNCTION LOCATION OF VEHICLE ✗

Not at or within 20m of junction	0				
Approaching junction or waiting /parked at junction approach	1				
Cleared junction or waiting/ parked at junction exit	2				
Leaving roundabout	3				
Entering roundabout	4				
Leaving main road	5				
Entering main road	6				
Entering from slip road	7				
Mid junction– on roundabout or on main road	8				

2.7 MANOEUVRES ✗

Reversing	01				
Parked	02				
Waiting to go ahead but held up	03				
Slowing or stopping	04				
Moving off	05				
U turn	06				
Turning left	07				
Waiting to turn left	08				
Turning right	09				
Waiting to turn right	10				
Changing lane to left	11				
Changing lane to right	12				
O'taking moving veh on its offside	13				
O'taking stationary veh on its offside	14				
Overtaking on nearside	15				
Going ahead left hand bend	16				
Going ahead right hand bend	17				
Going ahead other	18				

2.11 SKIDDING AND OVERTURNING ✗

		VEHICLE 1	2	3	4
No skidding, jack-knifing or overturning	0				
Skidded	1				
Skidded and overturned	2				
Jack - knifed	3				
Jack - knifed and overturned	4				
Overturned	5				

2.12 HIT OBJECT IN CARRIAGEWAY ✗

None	00				
Previous accident	01				
Roadworks	02				
Parked vehicle	04				
Bridge - roof	05				
Bridge - side	06				
Bollard / Refuge	07				
Open door of vehicle	08				
Central island of roundabout	09				
Kerb	10				
Any animal (except ridden horse)	12				
Other object	11				

2.13 VEHICLE LEAVING CARRIAGEWAY ✗

Did not leave carriageway	0				
Left carriageway nearside	1				
Left carriageway nearside and rebounded	2				
Left carriageway straight ahead at junction	3				
Left carriageway offside onto central reservation	4				
Left carriageway offside onto central reserve and rebounded	5				
Left carriageway offside and crossed central reservation	6				
Left carriageway offside	7				
Left carriageway offside and rebounded	8				

2.14 FIRST OBJECT HIT OFF CARRIAGEWAY ✗

None	00				
Road sign / Traffic signal	01				
Lamp post	02				
Telegraph pole / Electricity pole	03				
Tree	04				
Bus stop / Bus shelter	05				
Central crash barrier	06				
Nearside or offside crash barrier	07				
Submerged in water (completely)	08				
Entered ditch	09				
Wall or fence	11				
Other permanent object	10				

2.16 FIRST POINT OF IMPACT ✗

Did not impact	0				
Front	1				
Back	2				
Offside	3				
Nearside	4				

2.29 JOURNEY PURPOSE OF DRIVER/RIDER ✗

Journey as part of work	1				
Commuting to / from work	2				
Taking school pupil to/from school	3				
Pupil riding to / from school	4				
Other	5				
Not known	6				

Subject to local directions, boxes with a grey background need not be completed if already recorded

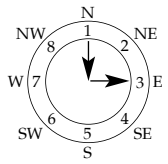
2.8 DIRECTION OF VEHICLE TRAVEL

1. Using the Example shown complete the FROM and TO boxes for the vehicles concerned, indicating direction of travel FROM and TO
2. If PARKED enter '00'

Vehicle 001		*Vehicle 002*	
FROM	TO	FROM	TO
Vehicle 003		*Vehicle 004*	
FROM	TO	FROM	TO

EXAMPLE

FROM	TO
1	3



CASUALTY RECORD

3.4 VEHICLE REFERENCE NUMBER
Enter VEH No. which CASUALTY occupied (for pedestrians, code vehicle that struck them first) e.g. 001,002 etc.

Casualty 001	0	Casualty 002	0
Casualty 003	0	Casualty 004	0
Casualty 005	0	Casualty 006	0

3.18 CASUALTY HOME POSTCODE
or Code: 1- Unknown
2- Non UK Resident

Casualty 001	
Casualty 002	
Casualty 003	
Casualty 004	
Casualty 005	
Casualty 006	

3.7 SEX OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Male	1						
Female	2						

3.8 AGE OF CASUALTY (Estimate if necessary)
For children less than a year enter 00

Casualty 001		Casualty 002	
Casualty 003		Casualty 004	
Casualty 005		Casualty 006	

3.6 CASUALTY CLASS ✗

		CASUALTY 1	2	3	4	5	6
Driver/Rider	1						
Veh./pillion Passenger	2						
Pedestrian	3						

3.9 SEVERITY OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Fatal	1						
Serious	2						
Slight	3						

3.20 CYCLE HELMET WORN ✗

		CASUALTY 1	2	3	4	5	6
Not a cyclist	0						
Yes	1						
No	2						
Not known	3						

3.15 CAR PASSENGER (not driver) ✗

Not a car passenger	0						
Front seat passenger	1						
Rear seat passenger	2						

3.16 BUS OR COACH PASSENGER ✗
(17 passenger seats or more)

Not a bus or coach passenger	0						
Boarding	1						
Alighting	2						
Standing passenger	3						
Seated passenger	4						

3.14 SEAT BELT IN USE ✗

Not applicable	0						
Worn and independently confirmed	1						
Worn but not independently confirmed	2						
Not worn	3						
Unknown	4						

LOCAL STATISTICS

PEDESTRIAN CASUALTIES ONLY

3.10 PEDESTRIAN LOCATION ✗

		CASUALTY 1	2	3	4	5	6
In carriageway, crossing on pedestrian crossing facility	01						
In carriageway, crossing within zig-zag lines at crossing approach	02						
In carriageway, crossing within zig-zag lines at crossing exit	03						
In carriageway, crossing elsewhere within 50m of pedestrian crossing	04						
In carriageway, crossing elsewhere	05						
On footway or verge	06						
On refuge, central island or central reservation	07						
In centre of carriageway, not on refuge, island or central reservation	08						
In carriageway, not crossing	09						
Unknown or other	10						

3.12 PEDESTRIAN DIRECTION ✗

		CASUALTY 1	2	3	4	5	6
Standing still	0						
Northbound	1						
Northeast bound	2						
Eastbound	3						
Southeast bound	4						
Southbound	5						
Southwest bound	6						
Westbound	7						
Northwest bound	8						
Unknown	9						

3.19 PEDESTRIAN ROAD MAINTENANCE WORKER ✗

No / not applicable	0						
Yes	1						
Not known	2						

3.11 PEDESTRIAN MOVEMENT ✗

		CASUALTY 1	2	3	4	5	6
Crossing from driver's nearside	1						
Crossing from driver's nearside-masked by parked or stationary veh'	2						
Crossing from driver's offside	3						
Crossing from driver's offside-masked by parked or stationary veh'	4						
In carriageway, stationary - not crossing (standing or playing)	5						
In carriageway, stationary -not crossing (standing or playing), masked by parked or stationary veh'	6						
Walking along in carriageway-facing traffic	7						
Walking along in carriageway-back to traffic	8						
Unknown or other	9						

CONTRIBUTORY FACTORS

1. Select up to six factors from the grid, relevant to the accident.
2. Factors may be shown in any order, but an indication must be given of whether each factor is ***very likely (A)*** or ***possible (B).***
3. Only include factors that you consider contributed to the accident. (i.e. do NOT include "Poor road surface" unless relevant).
4. More than one factor may, if appropriate, be related to the same road user.
5. The same factor may be related to more than one road user.
6. The participant should be identified by the relevant vehicle or casualty ref no. (e.g. 001, 002 etc.), preceded by "V" if the factor applies to a vehicle, driver/rider or the road environment (e.g. V002), or "C" if the factor relates to a pedestrian or passenger casualty (e.g. C001).
7. Enter U000 if the factor relates to an uninjured pedestrian.

Road Environment Contributed	***103*** Slippery road (due to weather)	***102*** Deposit on road (e.g. oil, mud, chippings)	***101*** Poor or defective road surface	***110*** Sunken, raised or slippery inspection cover	***108*** Road layout (e.g. bend, hill, narrow carriageway)	***107*** Temporary road layout (e.g. contraflow)	***109*** Animal or object in carriageway	***104*** Inadequate or masked signs or road markings	***105*** Defective traffic signals	***106*** Traffic calming (e.g. speed cushions, road humps, chicanes)
Vehicle Defects	***201*** Tyres illegal, defective or under-inflated	***202*** Defective lights or indicators	***203*** Defective brakes	***204*** Defective steering or suspension	***205*** Defective or missing mirrors	***206*** Overloaded or poorly loaded vehicle or trailer				
Driver/Rider Only (Includes Pedal Cycles and Horse Riders) Injudicious Action	***308*** Following too close	***306*** Exceeding speed limit	***302*** Disobeyed Give Way or Stop sign or markings	***301*** Disobeyed automatic traffic signal	***307*** Travelling too fast for conditions	***310*** Cyclist entering road from pavement	***305*** Illegal turn or direction of travel	***304*** Disobeyed pedestrian crossing facility	***309*** Vehicle travelling along pavement	***303*** Disobeyed double white lines
Driver/ Rider Error or Reaction	***405*** Failed to look properly	***406*** Failed to judge other person's path or speed	***403*** Poor turn or manoeuvre	***408*** Sudden braking	***409*** Swerved	***401*** Junction overshoot	***402*** Junction restart (moving off at junction)	***404*** Failed to signal or misleading signal	***407*** Too close to cyclist, horse or pedestrian	***410*** Loss of control
Impairment or Distraction	***501*** Impaired by alcohol	***502*** Impaired by drugs (illicit or medicinal)	***508*** Driver using mobile phone	***503*** Fatigue	***509*** Distraction in vehicle	***510*** Distraction outside vehicle	***505*** Illness or disability, mental or physical	***504*** Uncorrected, defective eyesight	***507*** Rider wearing dark clothing	***506*** Not displaying lights at night or in poor visibility
Behaviour or Inexperience	***602*** Careless, reckless or in a hurry	***605*** Learner or inexperienced driver/rider	***601*** Aggressive driving	***603*** Nervous, uncertain or panic	***607*** Unfamiliar with model of vehicle	***606*** Inexperience of driving on the left	***604*** Driving too slow for conditions or slow vehicle (e.g. tractor)			
Vision Affected by	***701*** Stationary or parked vehicle(s)	***703*** Road layout (e.g. bend, winding road, hill crest)	***706*** Dazzling sun	***707*** Rain, sleet, snow or fog	***708*** Spray from other vehicles	***705*** Dazzling headlights	***710*** Vehicle blind spot	***702*** Vegetation	***704*** Buildings, road signs, street furniture	***709*** Visor or windscreen dirty, scratched or frosted etc.
Pedestrian Only (Casualty or Uninjured)	***802*** Failed to look properly	***808*** Careless, reckless or in a hurry	***803*** Failed to judge vehicle's path or speed	***801*** Crossing road masked by stationary or parked vehicle	***806*** Impaired by alcohol	***807*** Impaired by drugs (illicit or medicinal)	***805*** Dangerous action in carriageway (e.g. playing)	***804*** Wrong use of pedestrian crossing facility	***809*** Pedestrian wearing dark clothing at night	***810*** Disability or illness, mental or physical
Special Codes	***901*** Stolen vehicle	***902*** Vehicle in course of crime	***903*** Emergency vehicle on a call	***904*** Vehicle door opened or closed negligently						****999*** Other – Please specify below

	1st	***2nd***	***3rd***	***4th***	***5th***	***6th***
Factor in the accident						
Which participant? (e.g. V001, C001, U000)						
Very likely (A) or Possible (B)						

*If 999 Other, give brief details

(Note: Only use if another factor contributed to the accident ***and include it in the text description of how the accident occurred***)

These factors reflect the reporting officer's opinion at the time of reporting and may not be the result of extensive investigation

accident_index	accident_year	accident_reference	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to	vehicle_location_restricted_lane
2.02362E+12	2023	622300193	1	19	0	18	5	1	0
2.02362E+12	2023	622300193	2	9	0	3	5	1	0
2.02162E+12	2021	622200017	1	9	0	5	4	8	0
2.02162E+12	2021	622200017	2	9	0	3	4	8	0

collision_index	collision_year	collision_ref_no	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre_historic	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to
2.02462E+12	2024	622400220	1	9	0	7	7	6	8

junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway	first_point_of_impact	vehicle_left_hand_drive
4	0	0	0	0	1	1
1	0	0	3	6	2	1
4	0	0	0	0	1	1
4	0	0	0	0	2	1

vehicle_location_restricted_lane_historic	vehicle_location_restricted_lane	junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway
0	0	3	1	0	1	0

journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code	age_of_vehicle	generic_make_model	driver_imd_decile
6	1	58	9	2402	2	16	FORD TRANSIT	1
6	1	33	6	1339	1	16	HONDA JAZZ	3
6	1	18	4	1229	1	13	VAUXHALL CORSA	6
6	2	49	8	1333	1	0	RENAULT CAPTUR	10

first_point_of_impact	vehicle_left_hand_drive	journey_purpose_of_driver_historic	journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code
1	1	6	6	1	35	6	2401	2

driver_home_area_type	lsoa_of_driver	escooter_flag	dir_from_e	dir_from_n	dir_to_e	dir_to_n	driver_distance_banding	
1	W01001884	0	NULL	NULL	NULL	NULL	1	
1	W01001875	0	NULL	NULL	NULL	NULL	1	
1	W01001814	0	NULL	NULL	NULL	NULL	1	
1	W01001841	0	NULL	NULL	NULL	NULL	1	
age_of_vehicle	generic_make_model	driver_imd_decile	lsoa_of_driver	escooter_flag	driver_distance_banding			
22	VOLVO S60	3	W01001805	0	1			

Appendix E Illustrative Site Layout and PRoW Networks

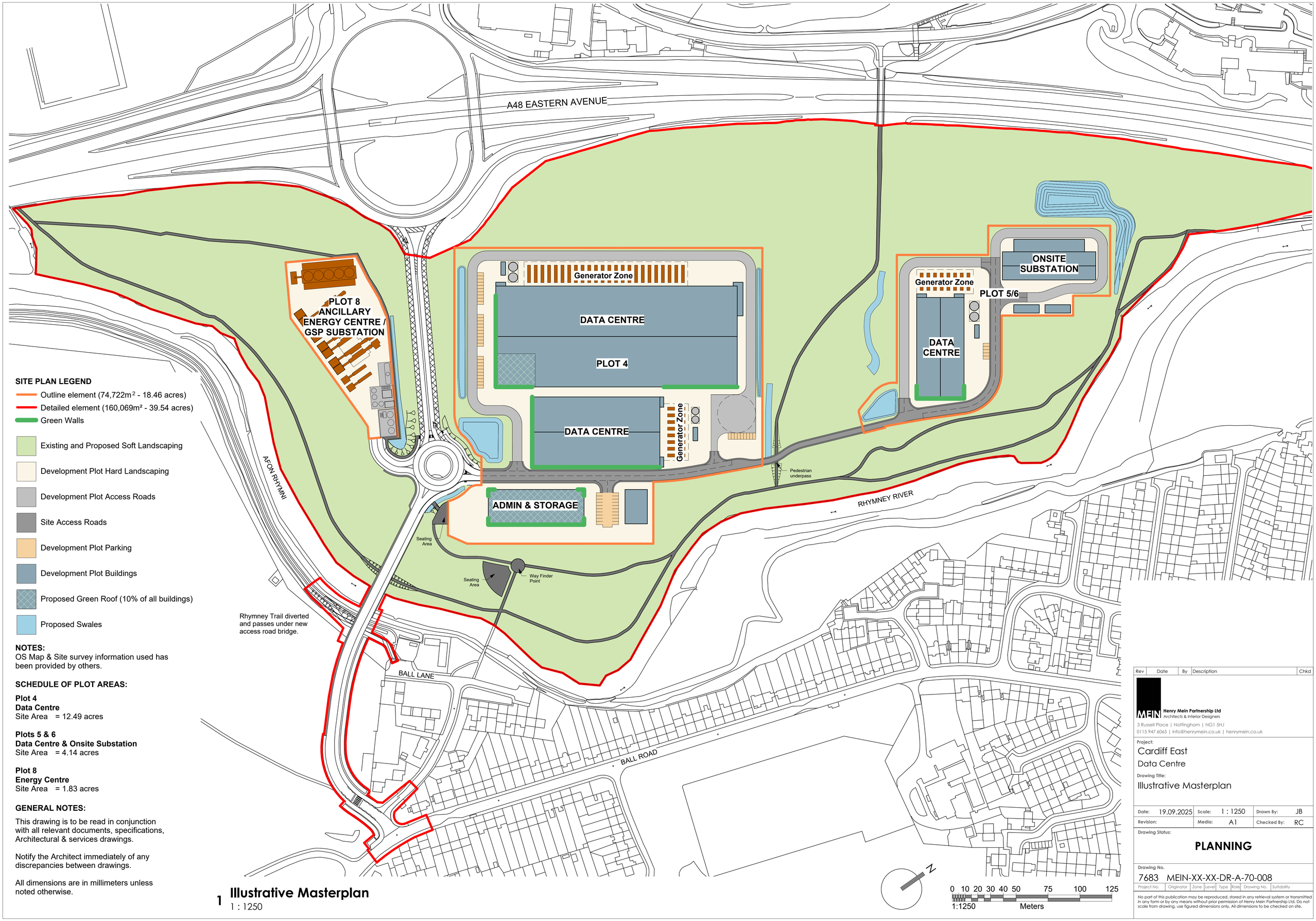
Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



SITE PLAN LEGEND

- Outline element (74,722m² - 18.46 acres)
- Detailed element (160,069m² - 39.54 acres)
- Green Walls
- Existing and Proposed Soft Landscaping
- Development Plot Hard Landscaping
- Development Plot Access Roads
- Site Access Roads
- Development Plot Parking
- Development Plot Buildings
- Proposed Green Roof (10% of all buildings)
- Proposed Swales

NOTES:
OS Map & Site survey information used has been provided by others.

SCHEDULE OF PLOT AREAS:

Plot 4
Data Centre
Site Area = 12.49 acres

Plots 5 & 6
Data Centre & Onsite Substation
Site Area = 4.14 acres

Plot 8
Energy Centre
Site Area = 1.83 acres

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Illustrative Masterplan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Illustrative Masterplan

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-008

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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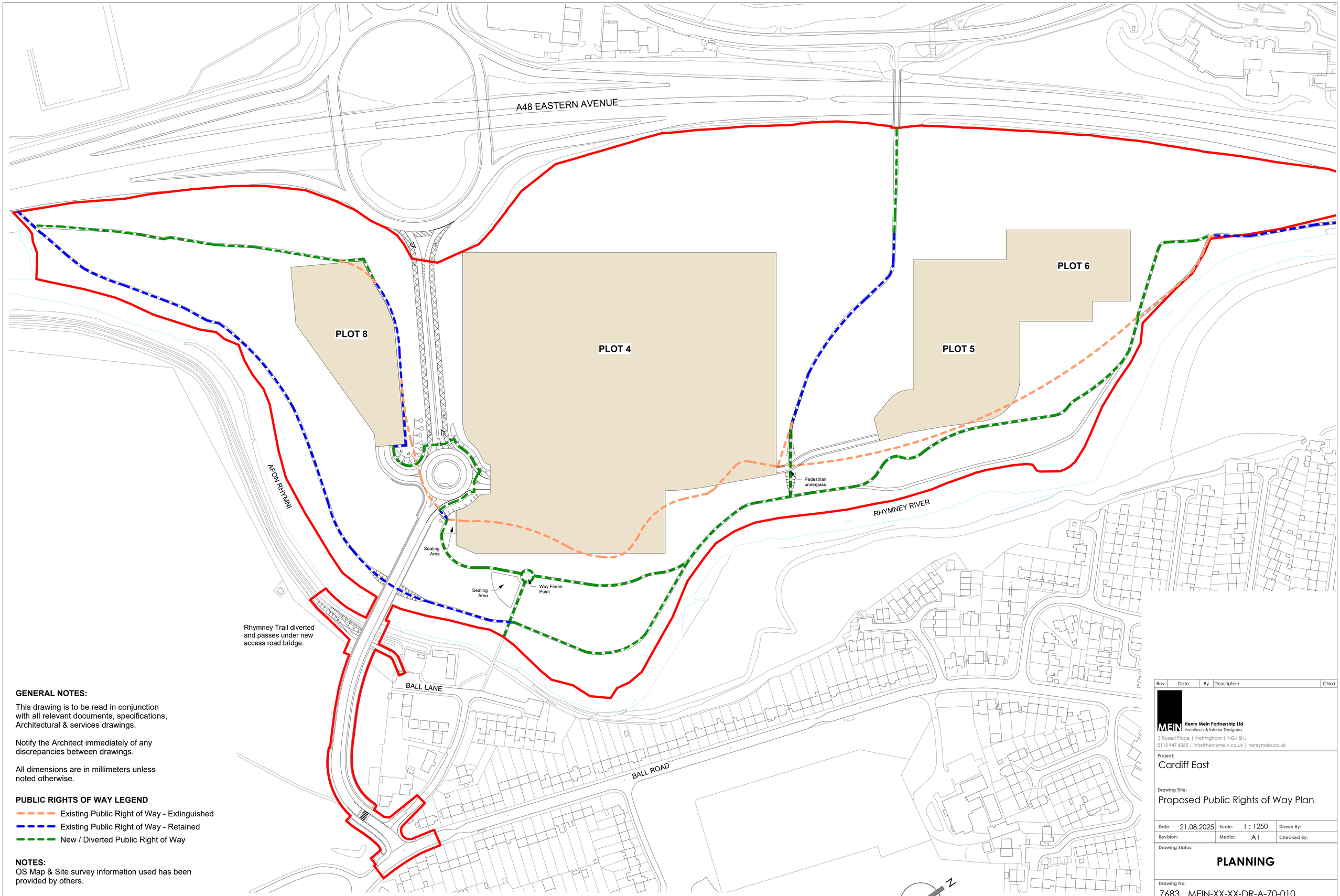

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

PUBLIC RIGHTS OF WAY LEGEND

- Existing Public Right of Way - Extinguished
- Existing Public Right of Way - Retained
- New / Diverted Public Right of Way

NOTES:
OS Map & Site survey information used has been provided by others.

1 Proposed Public Rights of Way Plan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East

Drawing Title:
Proposed Public Rights of Way Plan

Date:	21.08.2025	Scale:	1 : 1250	Drawn By:
Revision:		Media:	A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-010

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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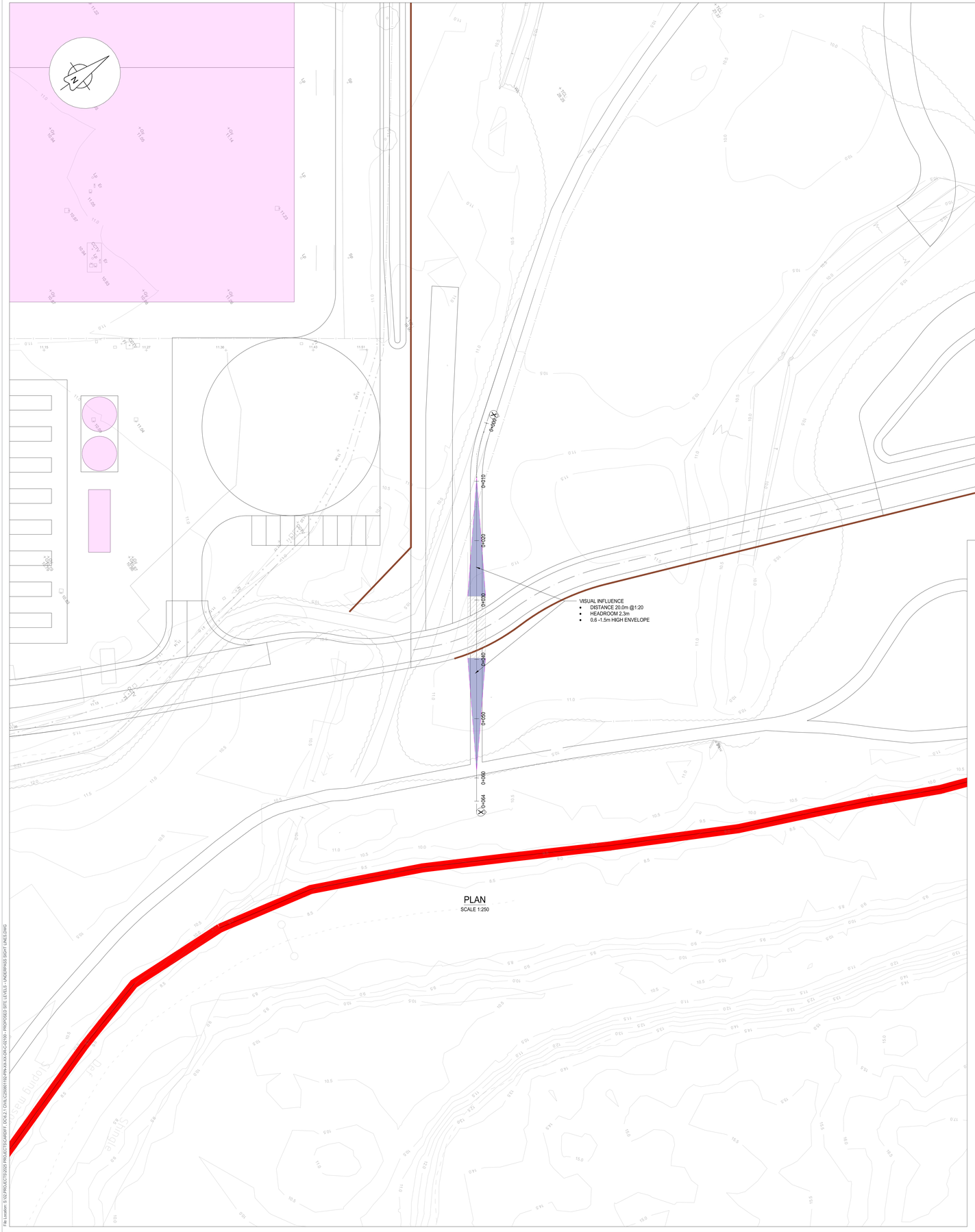
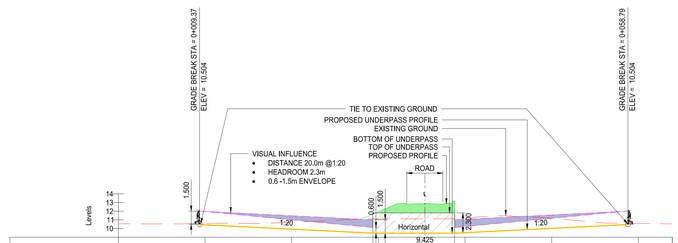


PLAN
SCALE 1:250



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	63.911
EXISTING LEVELS	10.540	10.567	10.720	11.115	11.211	11.162	10.579	10.531
PROPOSED LEVELS		10.473	9.973	9.504	9.564	10.064		
DIFFERENCE BETWEEN EXISTING & PROPOSED		-0.094	-0.747	-1.611	-1.647	-1.118		
VERTICAL GEOMETRY		G:-5.00% L:20.00		G:0.00% L:9.42		G:5.00% L:20.00		
HORIZONTAL GEOMETRY	L =1.576	R: 25.000 L: 7.738	L =1.683	L =52.914				

SECTION X-X (VISUAL PROFILE)
SCALE: H 1:250,V 1:250. DATUM: 9.000

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.
5. THIS DRAWING IS TO BE PRINTED IN COLOUR.
6. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY STATED. / IS TO BE USED FOR CONSTRUCTION PURPOSES.
7. EXISTING SITE AND LEVEL INFORMATION TAKEN FROM EXISTING LEVELS AND TOPOGRAPHICAL SURVEY DRAWINGFROM WSP.
8. THIS DRAWING USES THE GREAT BRITAIN COORDINATE SYSTEM "OSGB1936,NationalGrid".
9. THIS DRAWING HAS BEEN PREPARED USING THE PROPOSED SITE LAYOUT FROM MEIN 19.09.25
10. EMBANKMENTS TIE TO EXISTING LEVELS - THIS MAY VARY DUE TO TOP SOIL STRIPS ETC.

SCALE 1:250
0 2.5 5 7.5 10 12.5m
DIMENSIONS IN METRES

DRAFT -
FOR INFORMATION

REV	DESCRIPTION	BY	CHK / APP	DATE
0	PLANNING (WIP)	AMB	SOR	18/11/25

CLIENT
Curtis Hall Ltd

PROJECT
CARDIFF EAST
DATA CENTRE

DRAWING TITLE
UNDERPASS SIGHT LINES

PINNACLE CONSULTING ENGINEERS
PINNACLE HOUSE,
MAPLE WAY,
BROADLAND GATE,
NORWICH.
NR13 5HB. TELEPHONE: 01603 327 170
WELWYN GARDEN CITY ■ LONDON ■ DUBLIN ■ THE HAGUE ■ FRANKFURT

DRAWING STATUS				
INFORMATION (WIP)				
SCALE @ A0	DATE	DRAWN BY	CHECKED	APPROVED
As shown	NOV '25	AMB	SOR	JM
DRG NO.				REV.
C250801192-PIN-XX-XX-DR-C-02110				0

COPYRIGHT PINNACLE

File Location: S:\02.PROJECTS\2025 PROJECTS\CARDIFF_DCK\2.3 CIVIL\C250801192-PIN-XX-XX-DR-C-02100 - PROPOSED SITE LEVELS - UNDERPASS SIGHT LINES.DWG

Appendix F Internal Site Drawings

Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

UNCONTROLLED CROSSING

FLOW CONTROL WITHIN CHAMBER SET AT 0.5 L/S

REALIGNED CARRIAGEWAY TO TIE INTO EXISTING ACCESS ROAD

NEW 3.5m SHARED FOOTWAY TO TIE INTO PARK & RIDE DEVELOPMENT

0.5M HARDSTANDING TO INNER ISLAND, TO HOUSE ROAD SIGNAGE

HEADWALL FOR SWALE OUTFALL

FLOW CONTROL WITHIN CHAMBER SET AT 1.5 L/S

CENTRAL ISLAND TO HOUSE BIO-RETENTION AREA, WITH WITH LOW LEVEL PLANTING. 1:8 GRADED 0.5m DEEP DEPRESSION WITHIN THE CENTRAL AREA.

ATTENUATION BASIN TO RECEIVE FLOWS FROM BRIDGE DECK, AND RAINGARDENS

0.5M DEEP SWALE

WING WALLS

MAINTENANCE BAY FOR BASIN

REINFORCED CONCRETE WALL

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

WEST PIER

1.4m CYCLE PARAPET

CENTRAL PIER

CONTAINMENT N1 PARAPET

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE HEADROOM AT BRIDGE

600MM HARD VERGE

EAST PIER

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE MINIMUM 2.4M HEADROOM AT BRIDGE, DRAINAGE PROVIDED TO AVOID PONDING

NEW HEADWALL WITH NON-RETURN FLAP VALVE

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

DIVERTED RUMNEY TRAIL TO TIE BACK INTO PATH ALONGSIDE DCWW FACILITY

CULVERTS (FLOOD PLAIN CONNECTIVITY)

RUMNEY TRAIL DIVERTED DOWN FROM HIGH LEVEL TO LOW LEVEL (MAXIMUM GRADIENT 1:25) UNDERPASS PROVIDED

REINFORCED CONCRETE WALL

REINFORCED CONCRETE WALL

SWALE TO RECEIVE HIGHWAY RUNOFF

BALL LANE JUNCTION FORMED WITH NEW CARRIAGEWAY

CYCLE DROP OFF

2.4m X 25M VISION SPLAY FOR 20MPH

2.4m X 25M VISION SPLAY FOR 20MPH

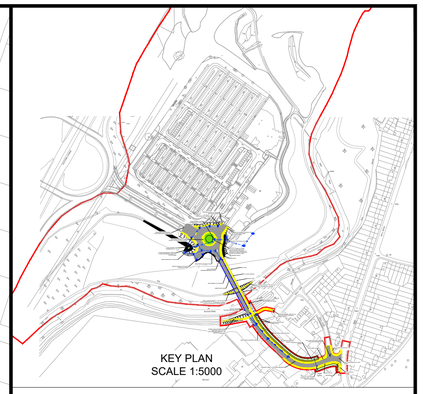
FORWARD VISIBILITY FOR 20MPH @22MM SSD

CYCLE PICK UP

CYCLE PICK UP

MAINTENANCE BAY

PARALLEL CONTROLLED CROSSING, DE611 ACTIVE TRAVEL GUIDANCE



KEY PLAN
SCALE 1:5000

NOTES
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4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES

KEY

- DEVELOPMENT PLANNING BOUNDARY
- BITUMINOUS CARRIAGEWAY
- BITUMINOUS FOOTWAY/ CYCLEWAY
- HIGHWAY VERGE/ EMBANKMENT / CUTTING
- BRIDGE PARAPET/ RETAINING WALL
- PROPOSED STREET LIGHTING
- EXISTING STREET LIGHTING

LADDER PAVING GREY COLOUR (4 FLAT RIBS PER SLAB) TO MARK THE BOUNDARY BETWEEN FOOTWAY AND SHARED FOOTWAY CYCLE WAY.

TACTILE PAVING AT CONTROLLED CROSSING TO BE RED BLISTER
TACTILE PAVING AT UNCONTROLLED CROSSING TO BE BUFF BLISTER

Rev.	Date	Description	By	Eng° Ch'k	Disc° Ch'k	App'd
P05	14/12/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P04	14/12/23	ATTENUATION BASIN/SWALE AMENDED	GW	GW	GW	GW
P03	10/03/23	BATTER REMOVED, R/W ADDED	SID	SID	SID	GW
P02	DEC-22	AMENDMENTS FOLLOWING SAB CONSULTATION	SID	SID	SID	GW

Suitability: FOR PLANNING

Status: -

wsp
1 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
GENERAL ARRANGEMENT

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-101

Design Stage: -

Revision: P05

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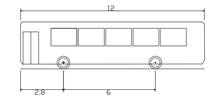
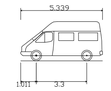
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES



'Standard' Rigid Bus

Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	3.069m
Min Body Ground Clearance	0.309m
Track Width	2.350m
Lock to lock time	4.00s
Wall to Wall Turning Radius	10.771m



3.5t Panel Van

Overall Length	5.339m
Overall Width	1.986m
Overall Body Height	2.565m
Min Body Ground Clearance	0.338m
Track Width	1.986m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.400m

Rev.	Date	Description	By	Eng' Ch'k	Discr' Ch'k	App'd
P03	28.11.25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P01	28/10/22	FIRST ISSUE FOR APPROVAL-	SID	SID	GW	GW

Suitability: FOR PLANNING

Status: -

1 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
SWEPT PATHS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number	Design Stage	Revision
70071035-WSP-XX-XX-CE-DR-102	-	P03

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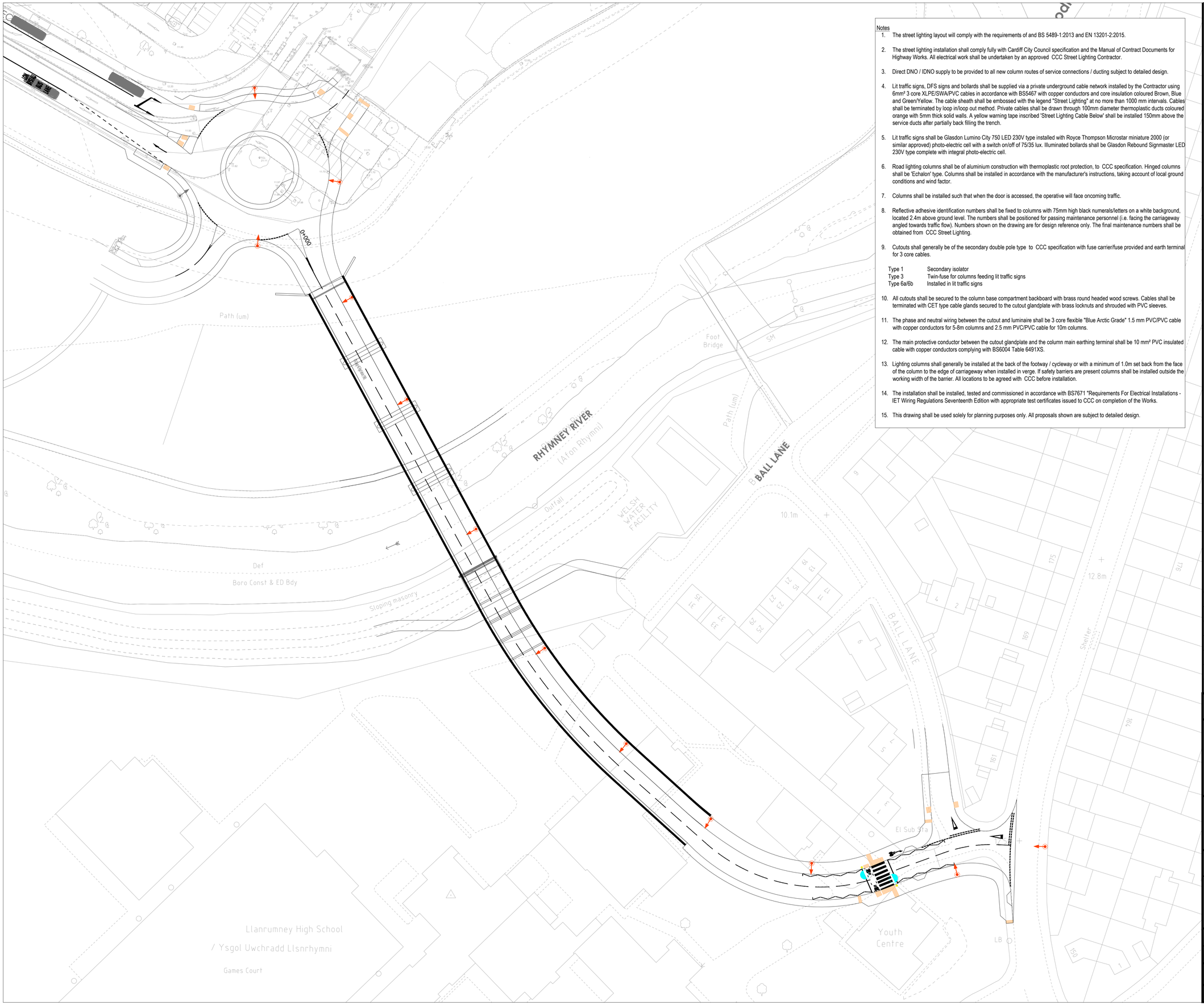
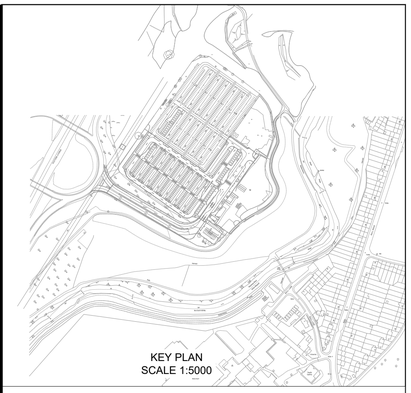


Notes

1. The street lighting layout will comply with the requirements of and BS 5489-1:2013 and EN 13201-2:2015.
2. The street lighting installation shall comply fully with Cardiff City Council specification and the Manual of Contract Documents for Highway Works. All electrical work shall be undertaken by an approved CCC Street Lighting Contractor.
3. Direct DNO / IDNO supply to be provided to all new column routes of service connections / ducting subject to detailed design.
4. Lit traffic signs, DFS signs and bollards shall be supplied via a private underground cable network installed by the Contractor using 6mm² 3 core XLPE/SWA/PVC cables in accordance with BS5467 with copper conductors and core insulation coloured Brown, Blue and Green/Yellow. The cable sheath shall be embossed with the legend "Street Lighting" at no more than 1000 mm intervals. Cables shall be terminated by loop in/loop out method. Private cables shall be drawn through 100mm diameter thermoplastic ducts coloured orange with 5mm thick solid walls. A yellow warning tape inscribed 'Street Lighting Cable Below' shall be installed 150mm above the service ducts after partially back filling the trench.
5. Lit traffic signs shall be Glasdon Lumino City 750 LED 230V type installed with Royce Thompson Microstar miniature 2000 (or similar approved) photo-electric cell with a switch on/off of 75/35 lux. Illuminated bollards shall be Glasdon Rebound Signmaster LED 230V type complete with integral photo-electric cell.
6. Road lighting columns shall be of aluminium construction with thermoplastic root protection, to CCC specification. Hinged columns shall be 'Echalon' type. Columns shall be installed in accordance with the manufacturer's instructions, taking account of local ground conditions and wind factor.
7. Columns shall be installed such that when the door is accessed, the operative will face oncoming traffic.
8. Reflective adhesive identification numbers shall be fixed to columns with 75mm high black numerals/letters on a white background, located 2.4m above ground level. The numbers shall be positioned for passing maintenance personnel (i.e. facing the carriageway angled towards traffic flow). Numbers shown on the drawing are for design reference only. The final maintenance numbers shall be obtained from CCC Street Lighting.
9. Cutouts shall generally be of the secondary double pole type to CCC specification with fuse carrier/fuse provided and earth terminal for 3 core cables.

Type 1	Secondary isolator
Type 3	Twin-fuse for columns feeding lit traffic signs
Type 6a/6b	Installed in lit traffic signs

10. All cutouts shall be secured to the column base compartment backboard with brass round headed wood screws. Cables shall be terminated with CET type cable glands secured to the cutout glandplate with brass locknuts and shrouded with PVC sleeves.
11. The phase and neutral wiring between the cutout and luminaire shall be 3 core flexible "Blue Arctic Grade" 1.5 mm PVC/PVC cable with copper conductors for 5-8m columns and 2.5 mm PVC/PVC cable for 10m columns.
12. The main protective conductor between the cutout glandplate and the column main earthing terminal shall be 10 mm² PVC insulated cable with copper conductors complying with BS6004 Table 6491XS.
13. Lighting columns shall generally be installed at the back of the footway / cycleway or with a minimum of 1.0m set back from the face of the column to the edge of carriageway when installed in verge. If safety barriers are present columns shall be installed outside the working width of the barrier. All locations to be agreed with CCC before installation.
14. The installation shall be installed, tested and commissioned in accordance with BS7671 "Requirements For Electrical Installations - IET Wiring Regulations Seventeenth Edition with appropriate test certificates issued to CCC on completion of the Works.
15. This drawing shall be used solely for planning purposes only. All proposals shown are subject to detailed design.



KEY PLAN
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KEY

8M TAPERED ALUMINUM LIGHTING COLUMN COUPLED WITH DIMMABLE LED LUMINAIRE TO VOG / CCC APPROVED SPECIFICATION

PROPOSED SIMMONSIGNS MIDUBEL COMBINED BELISHA BEACON AND ROAD LIGHTING POST OF 6M NOMINAL HEIGHT WITH A POST TOP MOUNTED (AT 0° TILT) SIGNIFY LUMA GEN2 MINI BGP703 DPL1 NW LED LUMINAIRE WITH A 8.0KLM (DIMMED TO 60%) OUTPUT COMPLETE WITH ELECTRONIC DRIVER AND SIGNIFY CITY TOUCH CMS NODE. FULL COWELS TO BE FITTED.

Rev.	Date	Description	By	Eng' Ch'k	Darc' Ch'k	App'd
P02	28/11/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	VL	GW	GW

Suitability: FOR PLANNING
Status: -

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Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
HIGHWAY LIGHTING & SIGNALS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-1300
Design Stage: -
Revision: P02

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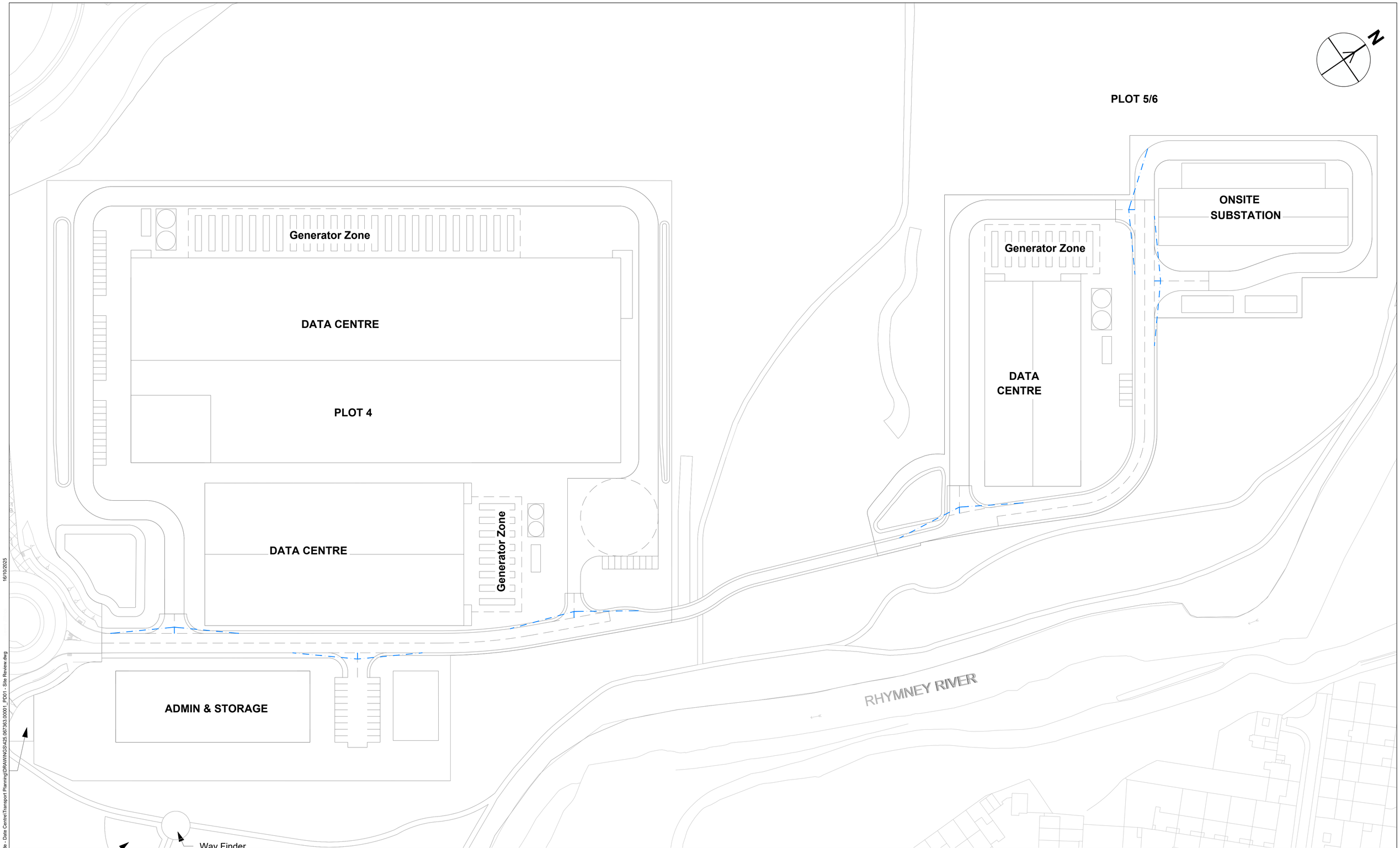

16/10/2025

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Date: 15.10.25	Date: 15.10.25	Date: 15.10.25	Date: 15.10.25

Drawing Title: Proposed Plots 4, 5 & 6 Visibility Assessment

Drawing Number: PD01 | Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

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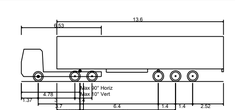
2.4 x 25m Visibility Splay (20 mph MFS)



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

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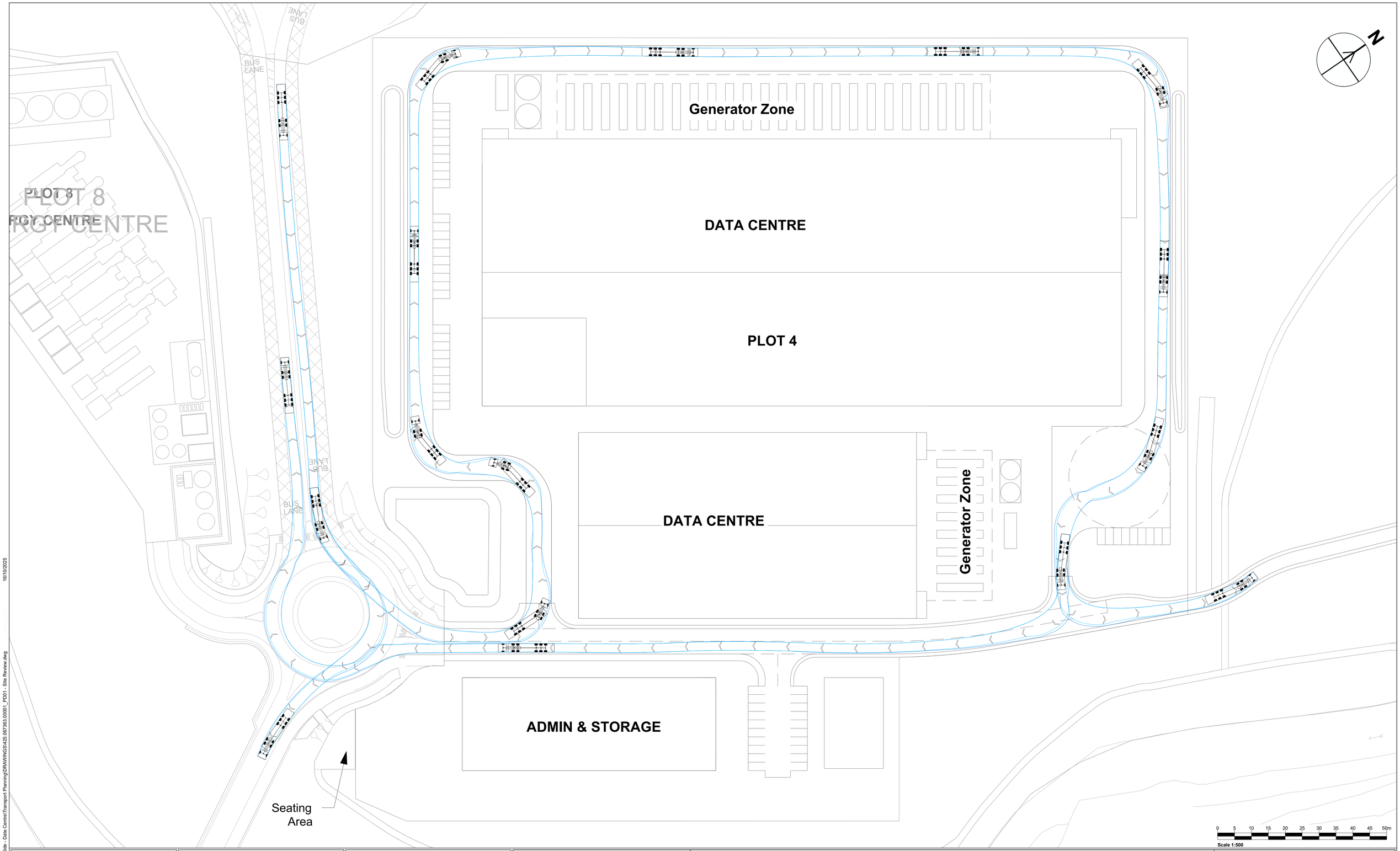

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Drawing Status & Suitability Code			
Designed: LJ / Date: 15.10.25	Drawn: LJ / Date: 15.10.25	Checked: ST / Date: 15.10.25	Authorised: ST / Date: 15.10.25
Drawing Title: Swept Path Analysis - 16.5m HGV Plot 4 Access			
Drawing Number: PD01_AT01	Rev.	Scale: 1:500 @ A1	SLR Project No.: 425.067363.00001

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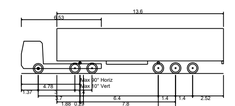

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Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

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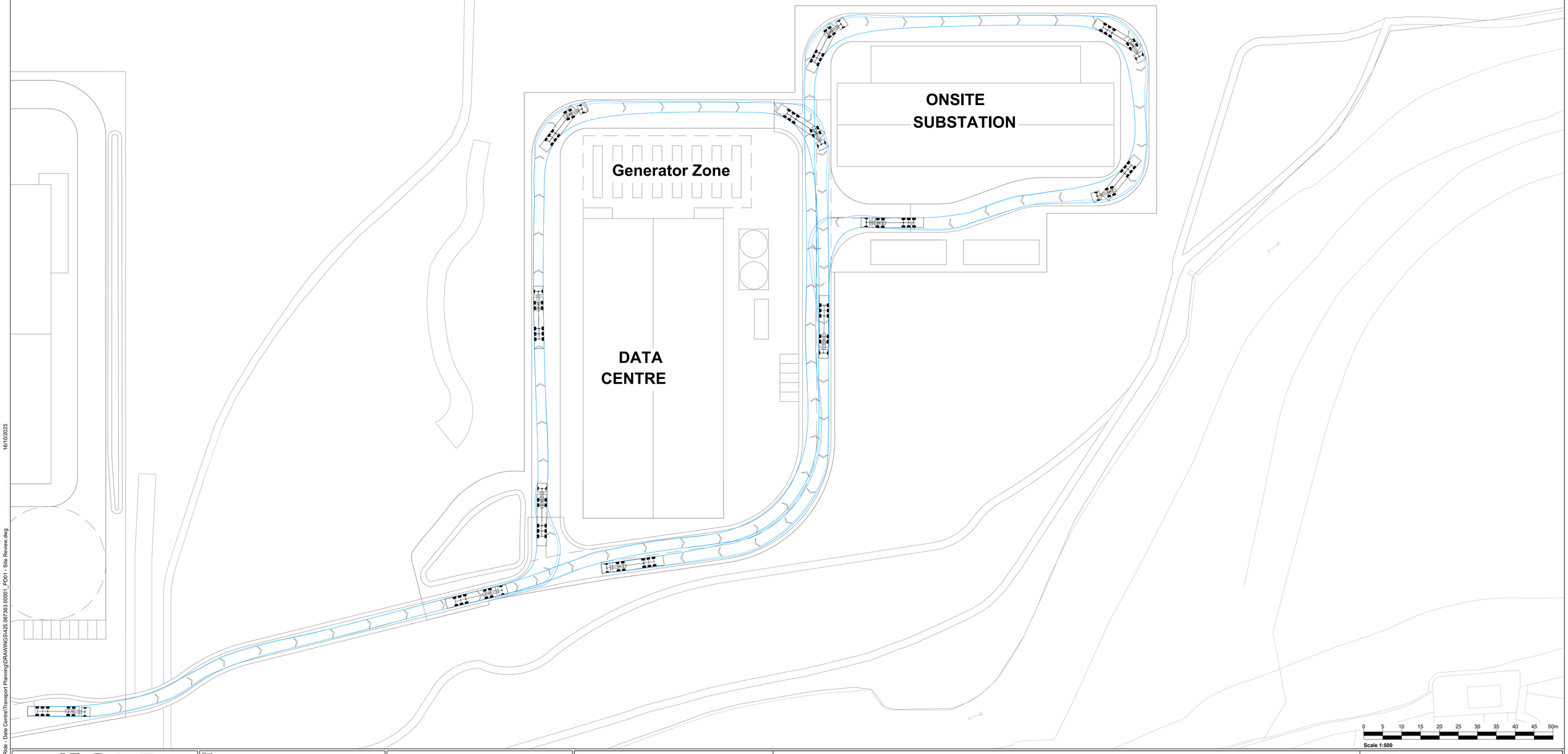
PLOT 5/6



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Scale 1:500

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www.slrconsulting.com	Project: Pentwyn Park & Ride	Legend:	
Drawing Status & Suitability Code			
Designed: LJ / Drawn: LJ / Checked: ST / Authorised: ST	Drawing Title: Swept Path Analysis - 16.5m HGV Plot 5/6 Access		
Date: 15.10.25 / 15.10.25 / 15.10.25 / 15.10.25			
Drawing Number: PD01_AT02 / Rev.	Scale: 1:500 @ A1 / SLR Project No.: 425.067363.00001		

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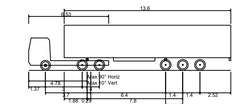

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Overall Length	16.500m
Overall Width	2.550m
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Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

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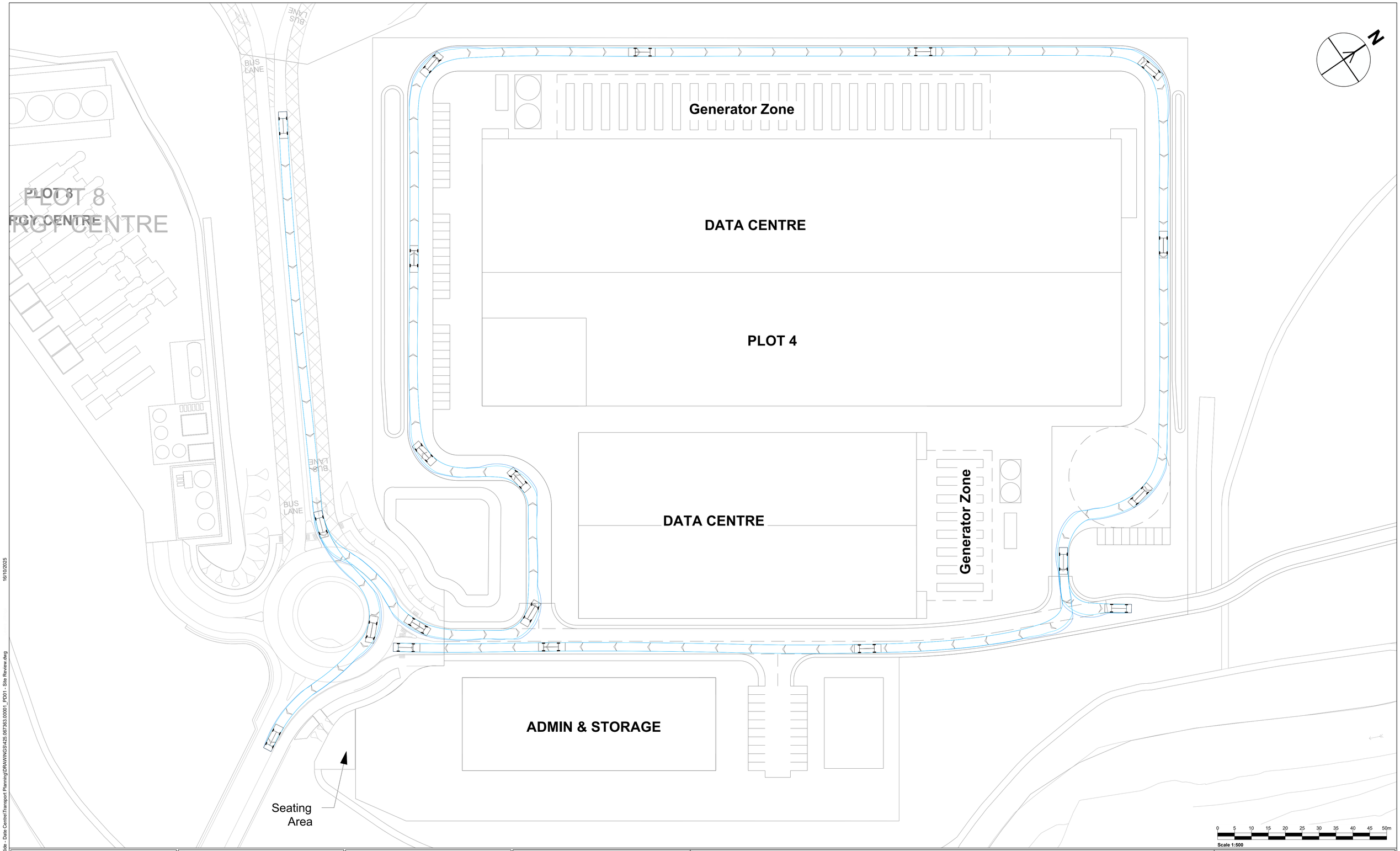

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Drawing Title: Swept Path Analysis - Fire Tender
Plot 4 Access

Drawing Number: PD01_AT03

Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

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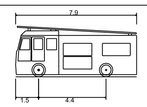

Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

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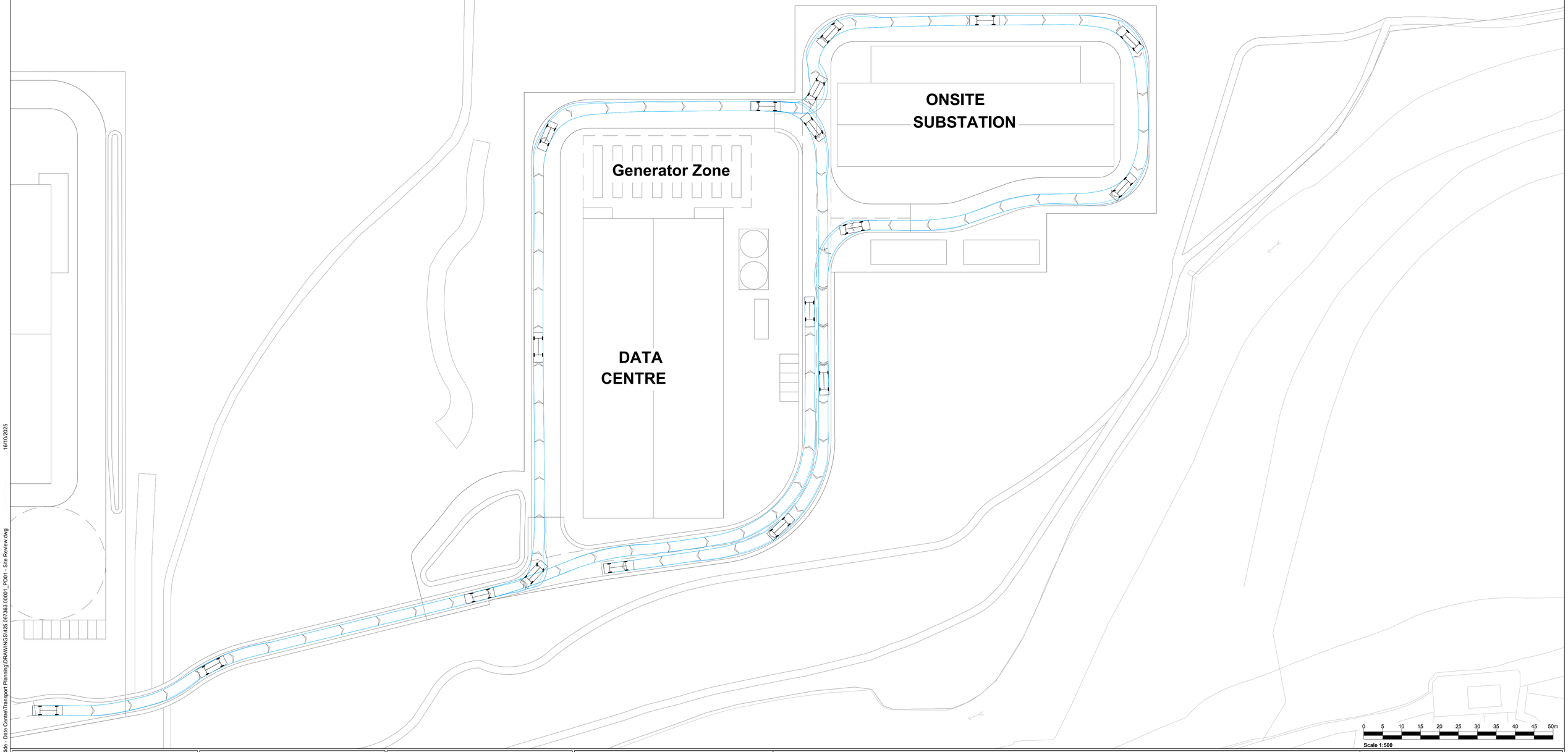
PLOT 5/6



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Scale 1:500

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Drawing Number: **PD01_AT04** Rev.

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Title: Swept Path Analysis - Fire Tender
Plot 5/6 Access

Scale: 1:500 @ A1

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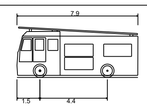
Vehicle Detail:



Pumping Appliance

Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

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Appendix G Interim Workplace Travel Plan

Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

Prepared by:

SLR Consulting Limited

Tudor House, 16 Cathedral Road, Cardiff, CF11 9LJ

SLR Project No.: 425.067363.00001

1 December 2025

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	1 December 2025	CS	SGT	ID

Basis of Report

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Appendix B **2022 Traffic Data**
Appendix C **Collision Data**
Appendix D **Illustrative Site Layout and PRoW Network**
Appendix E **Internal Site Drawings**
Appendix F **Sample Workplace Travel Survey**

1.0 Introduction

1.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall (the Applicant). This Transport Assessment (TA) has been prepared in support of the planning application being submitted by the Applicant to Cardiff Council (the Council) for the redevelopment of Cardiff East Park and Ride, Llanrumney (the site).

1.2 The hybrid planning application seeks planning permission for the following description of development:

1.3 *Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works*

1.4 The proposed development provides the opportunity for a data centre campus and associated employment floorspace. The proposed development would also facilitate a new bridge connecting the site with Llanrumney.

1.5 The scope of this Interim Workplace Travel Plan has been prepared in accordance with both local and national planning policy guidance, a summary of which is provided below:

- Planning Policy Wales (Edition 12)
- Technical Advice Note 18 (Transport)
- Future Wales – The National Plan 2040
- Llwybr Newydd – The Wales Transport Strategy 2021
- Active Travel (Wales) Act 2013
- Active Travel Act Guidance 2021
- Cardiff Local Development Plan 2006 – 2026
- Managing Transportation Impacts SPG (July 2018)

1.6 These documents provide the requirements and best practice guidelines for the production of Travel Plans within Cardiff and Wales and seek to create Travel Plans that provide a long-term management strategy for an occupier of a site that seeks to deliver sustainable transport objectives through positive action.

2.0 Existing Conditions

2.1 This section of the report will include a detailed description of the site location, the surrounding highway network and the general traffic and transportation of the area including public transport provision, and access to the site via active travel modes such as walking and cycling.

Site Location

2.2 The site is located in east Cardiff, approximately 1.6km northwest of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south.

2.3 **Figure 2.1** indicates the location of the proposed development in a local context.

Figure 2.1 - Site Location

Walking

2.4 There are no footways present on the A48 Eastern Avenue/Bryn Celyn Road junction or on the access road to the P&R. However, a number of leisure walking routes are located within the immediate vicinity of the site, which provide opportunity for travel in all directions on foot.

2.5 These leisure routes primarily take the form of PRoW routes, as illustrated in **Figure 2.2**. Within the immediate proximity of the site, several PRoW routes are present, providing connectivity to the north, east, west and south of the site. To the east of the site, PRoW routes connect with Ball Lane via a footbridge over the Rhymney River. Ball Lane includes footways on either side of the carriageway and connects with the wider walking network along Ball Road.

Figure 2.2 – Existing Public Rights of Way

2.6 To the north of the site, PRoW routes connect with a footbridge over the A48. This provides connectivity to Pentwyn Road which also includes footways, and a number of local facilities. This can be seen in **Photograph 2.1.**

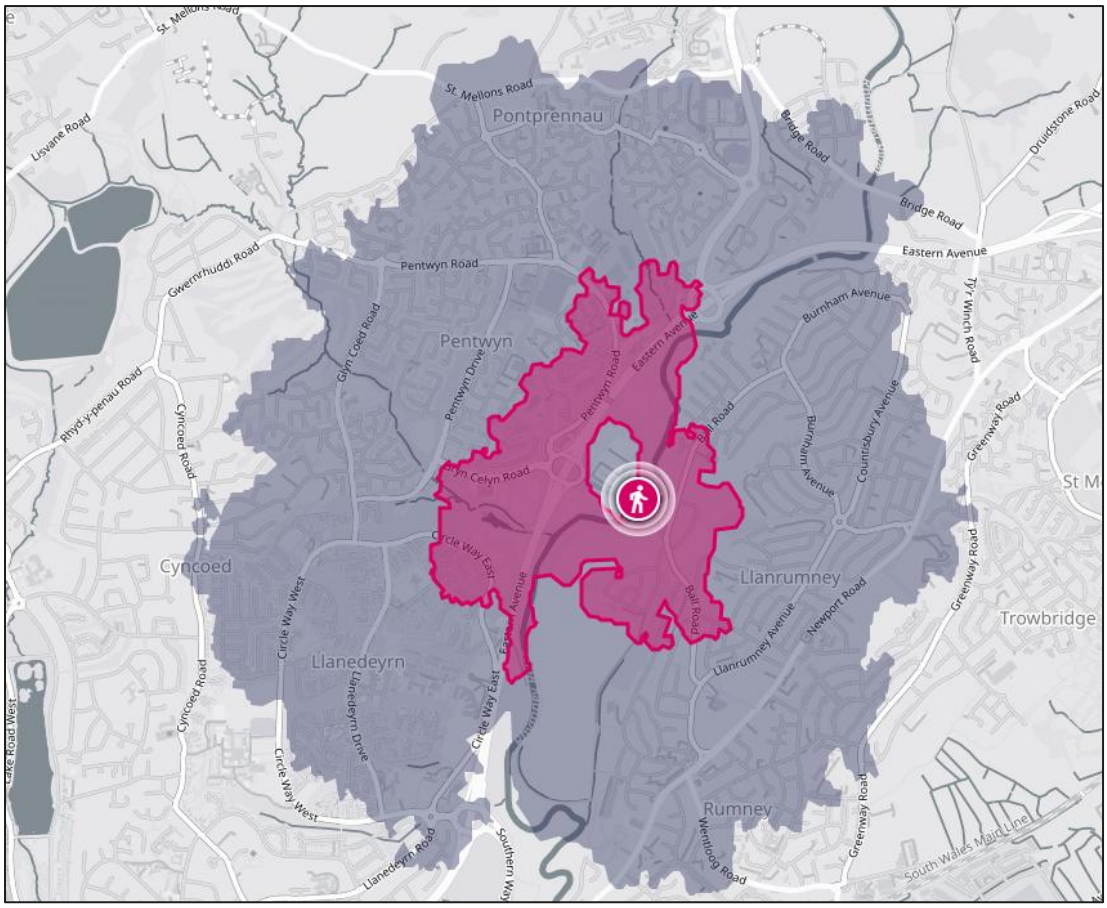
Photograph 2.1 – Public Right of Way across the A48

2.7 A further footbridge across the A48 is also located to the south of the site. This link provides connectivity to Circle Way East where footways and local facilities are also located.

2.8 These PRoW routes also provide a connection to the 'Rhymney Trail', a leisure walking and cycling route around Llanrumney Fields to the south of the site.

2.9 As described, whilst no footways are provided at the existing site access road and the Eastern Avenue / Bryn Celyn Road junction, the site benefits from a number of leisure active travel routes within the immediate vicinity of the site. These routes provide opportunity to connect with local facilities, services and key areas in all directions.

Figure 2.3 – 15 and 30 Minute Walking Isochrones



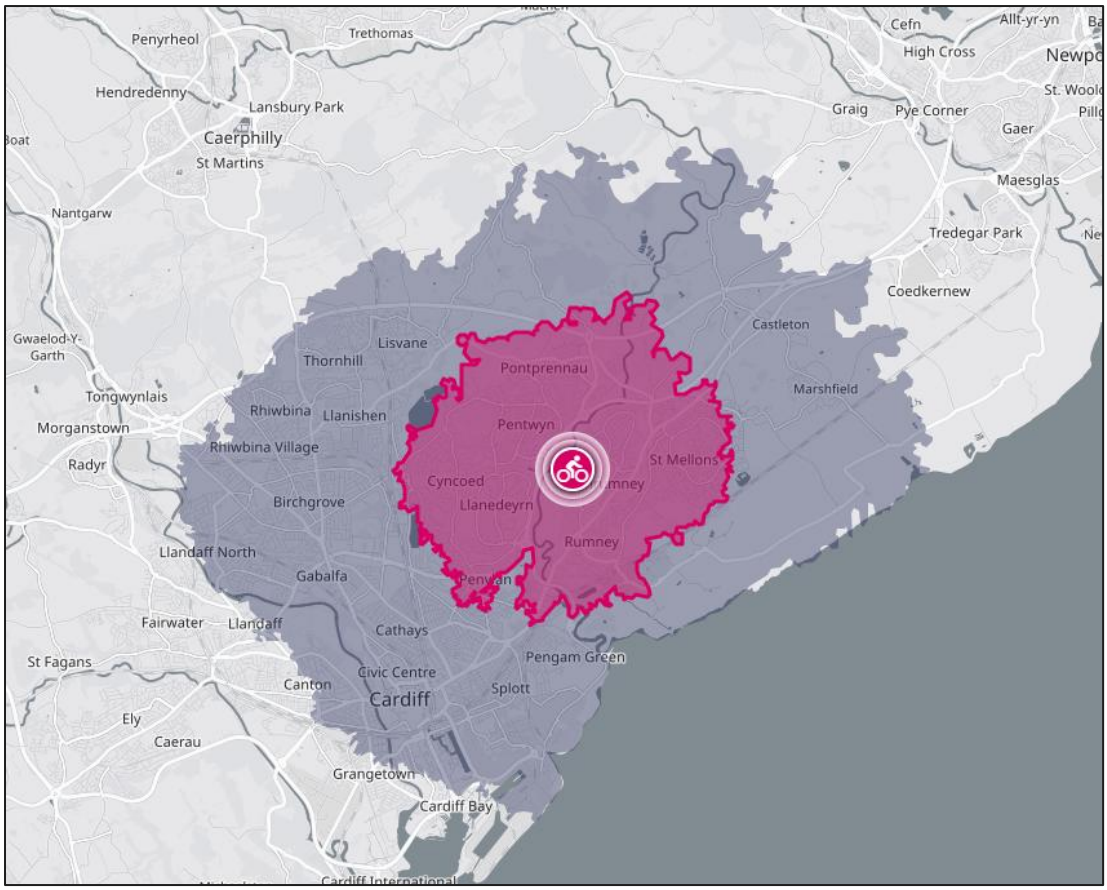
Cycling

2.10 Immediately to the east of the site, the Rhymney Trail runs in a north-south direction, providing a good leisure route accessible from the site than can be used to access the development. The Rhymney Trail runs along the Rhymney River, and to the south connects to Newport Road. Newport Road runs to the city centre and features a shared pedestrian/cycleway for much of its length.

2.11 To the north, the Rhymney Trail runs under the A48 Eastern Avenue to provide a route to Pentwyn Road. It also continues north to the suburb of Pontprennau and St Mellons Road, allowing communities within Pontprennau to access the development.

2.12 Figure 2.4 shows the current 15- and 30-minute cycling isochrones from the site. It shows that a large proportion of Cardiff are within a short cycle of the site.

Figure 2.4 – 15 and 30 Minute Cycling Isochrones



Bus Services

2.13 A summary of bus services within the vicinity are displayed in **Figure 2.5**. A bus stop is located within the existing site which serves 'Cardiff East Park and Ride'. At present, this bus stop is served by a single bus route, the H59. The H59 provides connectivity with Heath Hospital and runs on a 20-minute frequency.

Figure 2.5 - Existing Bus Services

2.14 There are also bus stops located along Bryn Celyn Road to the west of the site, accessible via existing PRoW routes and footbridges over the A48. These stops are served by bus services 58. The 58 service provides a return service every 20 minutes to the city centre.

2.15 To the east of the site, bus stops are located along Ball Road, which can be accessed via a footbridge over the Rhymney River. These stops are served by bus services 49, 50, 101 and 102.

2.16 A summary of the bus services that are accessible from the site can be seen in **Table 2.1.**

Table 2.1 – Bus Routes accessible within vicinity of the site

Number	Route	Operating Hours	Frequency			Operator
			M-F	S	S	
H59	Cardiff East Park and Ride – Heath Hospital	06:30-20:50	3 per hour	N/A	N/A	Cardiff Bus
58	Pontprennau – City Centre	05:14-22:35	3 per hour	2 per hour	2 per hour	Cardiff Bus
49, 50	St Mellons – City Centre	05:25-23:00	4 per hour	1 per hour	1 per hour	Cardiff Bus
101, 102	City Centre – St Mellons/Llanrumney via Pentrebane and Heath Hospital	09:05-17:15	1 per hour	N/A	N/A	Cardiff Bus

Rail Services

2.17 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, which is accessible within an 18-minute cycle from the site, or from using the H59 Bus Service from the Heath Hospital, approximately an 18-minute walk from the station.

2.18 Heath High Level Station is located on the Rhymney Line, and benefits from services to the south towards Cardiff Queen Street, Cardiff Central and Penarth every 15 minutes, and services to the north to Caerphilly, Ystrad Mynach and Bargoed. These provide good travel opportunities to use the station to access the site.

2.19 **Table 2.2** details some of the destinations accessible from the station.

Table 2.2 - Local Rail Services and Frequencies

Destination	Frequency (off-peak)	Average Journey Time (mins)
Cardiff Queen Street	6 trains per hour	6
Cardiff Central	6 trains per hour	10
Caerphilly	6 trains per hour	12
Barry	4 trains per hour	37
Penarth	2 trains per hour	24

Local Highway Network

2.20 The existing Cardiff East P&R site is directly accessed from the eastern arm of the A48 Eastern Avenue/Bryn Celyn Road junction and provides good access to local roads via Bryn Celyn Road and the A48. The A48 directly links with the M4 and as such, the site is considered to be well connected to the strategic road network.

A48

2.21 The A48 forms one of Cardiff's arterial routes linking the M4 in the west to the A4232 in the east. The A48 passes north of Cardiff city centre. In the vicinity of the site, the A48 is a dual-carriageway, with a 50mph speed limit travelling to the southwest and to the north east. Further along towards the north-west, the National Speed Limit then applies until reaching the M4. Towards the city centre, the National Speed Limit also applies in part until reaching the city centre.

2.22 The A48 also benefits from bus lanes from the A48 junction to the junction with the A4232 to the southwest, one on each side of the dual carriageway.

Pentwyn Road

2.23 Pentwyn Road is located to the northwest of the A48 junction and is a single-carriageway road subject to a 30mph speed limit. It leads from the site towards Pontprennau and has streetlighting and footways on both sides of the road from a short distance after the junction. There are bus stops present along the road with bus shelters available.

Bryn Celyn Road

2.24 Bryn Celyn Road is located to the west of the A48 junction, and is a dual-carriageway near the junction subject to a 30mph speed limit. It is subject to traffic-calming along its length, with road narrowings creating uncontrolled pedestrian crossings. There are footways present along its length, although not connecting to the A48 junction.

Ball Road

2.25 Ball Road is located to the southeast of the site, across the Rhymney River. It is a single-carriageway road subject to a 30mph speed limit. It runs from Burnham Avenue in the north east, before continuing south towards Llanrumney Avenue. The road is subject to traffic calming in the forms on humps along the carriageway and road narrowings. There are footways present along each side of the carriageway in addition to streetlighting.

Existing Traffic Data

2.26 MCC surveys were undertaken on Tuesday 15th February 2022 at the A48/P&R access junction (Pentwyn Interchange) and at the Ball Road/Hartland Road junction and an ATC survey was undertaken on Ball Road between Thursday 10th to Wednesday 16th February 2022.

2.27 The MCC survey recorded all turning movements at the Pentwyn Interchange junction by vehicle type between the hours of 08:00 – 09:00 and 16:30 – 17:30.

2.28 Flow diagrams showing the observed traffic flows on the highway network in 2022 are shown in **Appendix A** and the existing traffic data is included at **Appendix B**.

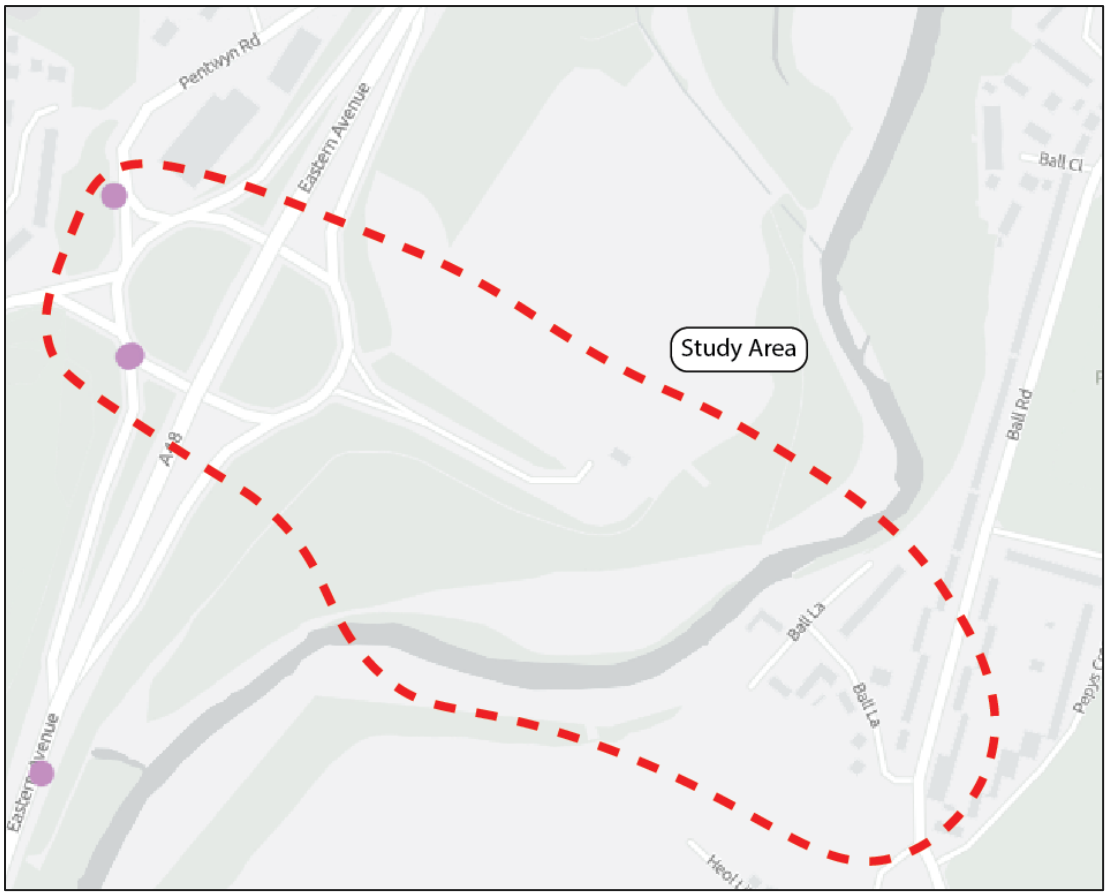
Personal Injury Collision Analysis

2.29 A Personal Injury Collision (PIC) analysis has been undertaken to review whether there may be an existing highway issues or collision clusters in the vicinity of the site which may be exacerbated by the proposed development.

2.30 The review has included any collisions that have happened on the existing Park and Ride Site, the A48 junction and Ball Road near the proposed junction, as these are the only locations where the development would have any significant impact on traffic levels.

2.31 The Department for Transport Mapping Application for Visualising Road Injury Casualties (MAVRIC) was used to review the collision history for the previous 5 years for which data is available (2020 – 2024). **Figure 2.6** shows the study area and the collision locations, and the collision data can be found attached at **Appendix C**.

Figure 2.6 – Collison Study Area and Locations



2.32 There is a total of three collisions shown in the study area of **Figure 2.6**, with one located on Pentwyn Road and two located on the A48 off-slip where it meets the roundabout junction. All collision were of a slight severity.

2.33 Due to there being a limited number of accidents that can be attributed to driver error, it can be presumed that there is no issue with the design of the nearby roads or junctions, or within the site, at present.

Summary

2.34 The site is located in east Cardiff, approximately 1.6km north west of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south, providing good links from the development to the wider area by foot.

2.35 The site benefits from having nearby bus services nearby towards Cardiff City Centre and other parts of Cardiff, including towards Heath Hospital.

2.36 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, and benefits from frequent services, including to Cardiff Central, Cardiff Queen Street, Caerphilly and Penarth.

2.37 A PIC review undertaken shows that there is no major issue with the design of the nearby roads or junctions, or within the site at present, due to there being limited collisions in the area over a period of 5 years

3.0 Policy Review

3.1 The section details the national and local policy that impacts the development.

National Policy

Planning Policy Wales (Edition 12, February 2024)

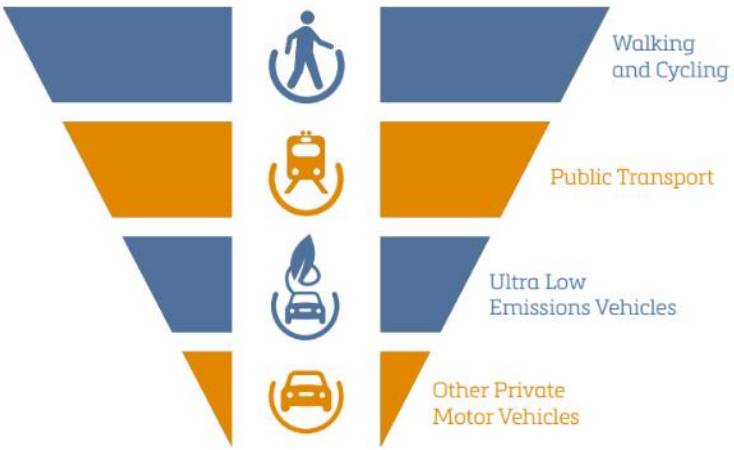
3.2 Planning Policy Wales Edition 12 (PPW) sets out the land use planning policies of the Welsh Government.

3.3 With regards to sustainable transport, PPW advises that, in the context of active and social places, which also relates to employment, all developments should encourage modal shift and be easily accessible by walking, cycling and public transport, by virtue of their location, design and provision of on and off site sustainable transport infrastructure.

3.4 Furthermore, the 'active and social' theme within PPW aims to ensure new development is located and designed in a way which minimises the need to travel, reduces dependency on the private car and enables sustainable access to employment, local services, and community facilities.

3.5 A key theme throughout PPW is the aim of reducing reliance on travel by private car, and the adverse impacts of motorised transport on the environment and people's health, by prioritising and increasing active travel and public transport. Additionally, it states that development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.

3.6 These themes of emphasis on sustainable transport and active travel are supported by the 'Sustainable Transport Hierarchy for Planning' included within PPW.



Technical Advice Note (TAN) 18: Transport

3.7 TAN 18: Transport describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated.

3.8 The document states that sustainable development should be achieved by:

- Integration of transport and land use planning;
- Integration between different types of transport; and
- Integration of transport policy with policies for the environment, education, social justice, health, economic development and wealth creation.

3.9 Integration of land use planning and development of transport infrastructure can help the Welsh Government achieve its wider sustainable development policy objectives by:

- Promoting resource and travel efficient settlement patterns;
- Ensuring new development is located where there is, or will be, good access by public transport, walking and cycling thereby minimising the need for travel and fostering social inclusion;
- Managing parking provision;
- Ensuring that new development and major alterations to existing developments include appropriate provision for pedestrians (including the with special access and mobility requirements), cycling, public transport, and traffic management and parking/servicing;
- Encouraging the location of development near other related uses to encourage multi-purpose trips;
- Promoting cycling and walking;
- Supporting the provision of high quality, inclusive public transport;
- Supporting provision of a reliable and efficient freight network;
- Encouraging good quality design of streets that provide a safe public realm and a distinct sense of place; and
- Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified junctions.

Wales Transport Strategy (Connecting the Nation)

3.10 The wider agenda of this document is to ensure that transport features strongly in the Welsh Assembly Government's policy spectrum:

3.11 'Getting the most out of our existing transport system;

1. Making greater use of more sustainable modes of travel; and
2. Reducing demands on the transport system.'

Active Travel (Wales) Act (2013)

3.12 The Welsh Government seeks to enable more people to walk, cycle and generally travel by more active methods, so that:

1. 'more people can experience the health benefits of active travel;
2. we reduce our greenhouse gas emissions;
3. we help address poverty and disadvantage, and
4. we help our economy to grow by unlocking sustainable economic growth.'

3.13 By connecting key sites such as workplaces, hospitals, schools and shopping areas with active travel routes, the Act will encourage people to rely less on their cars when making short journeys and make implementing successful Travel Plans easier.

Future Wales: The National Plan 2040 (February 2021)

3.14 This document is a National Development Framework for Wales. It influences all levels of the planning system in Wales and will help to shape Strategic and Local Development Plans prepared by councils and national park authorities.

3.15 The document highlights the importance of reducing emissions to protect well-being and to demonstrate global responsibility. The planning system needs to focus on delivering a decarbonised and resilient Wales through the places that are created, the energy generated and the natural resources and materials that are used and how people live and travel.

3.16 The document recognises that there has been a significant change in the way people live and travel as a result of the COVID-19 pandemic. The pandemic has highlighted the quality and accessibility of people's local areas as being important for people's health and well-being during the pandemic.

3.17 Welsh Government have produced a document called 'COVID-19 Reconstructions: Challenges and Priorities'. This document sets out how people are using places differently, travelling less and spending more time working from home. Welsh Government is encouraging an increase in remote working and has set a long-term ambition for 30% of the Welsh workforce to work away from a traditional office. This is intended to help town centres, reduce congestion and cut carbon emissions. The planning system must therefore respond to these changes and contribute to a sustainable recovery, shaping places around a vision for healthy and resilient places.

3.18 The Welsh Government will work with Transport for Wales, local authorities, operators and partners to deliver the following:

3.19 Active Travel – Prioritising walking and cycling for all local travel;

- Bus – improve the legislative framework for how local bus services are planned and delivered. Invest in the development of integrated regional and local bus networks to increase modal share of bus travel and improve access by bus to a wider range of trip destinations;
- Metro – Develop the South East Metro, South West Metro and North Wales Metro and create new integrated transport systems that provide faster, more frequent and joined up services using trains, buses and light rail; and
- Ultra-low Emission Vehicles – Support the roll-out of suitable fuelling infrastructure to facilitate the adoption of ultra-low emission vehicles, particularly in rural areas.

3.20 In the context of the proposed development, it will be of the utmost importance to promote active travel and public transport for employees wherever possible over travel by private car.

Local Policy

Cardiff Local Development Plan (2006- 2026)

3.21 Cardiff Council's Local Development Plan (LDP) provides the framework for the development and use of land within Cardiff over the LDP period and contains the policies and measures that all new development must adhere to within Cardiff. Cardiff are currently a new LDP which will cover the period of 2021-2036.

3.22 Policy T6 makes reference to impact on transport networks and services. It states:

"Development will not be permitted which would cause unacceptable harm to the safe and efficient operation of the highway, public transport and other movement networks including pedestrian and cycle routes, public rights of way and bridle routes."

3.23 Policy T1 of the LDP deals with Transport and specifically Walking and Cycling. The policy states that with a view to enable people to access services, employment, and community facilities by walking and cycling, the council would support developments which incorporates;

- Permeable and legible networks of safe, convenient, and attractive walking and cycling routes;
- Connections to the Cardiff Strategic Cycle Network and routes forming part of the Cardiff Walkable Neighbourhoods Plan;
- Safe, convenient, and attractive walking and cycling connections to existing developments, neighbourhoods, and services;
- Supporting facilities including, signing, secure cycle parking.

3.24 Key to the Local Development Plan is the Transport Strategy which is seeking to achieve a modal split of 50:50 in 2026 for all trips on the network.

Managing Transportation Impacts SPG (July 2018) – Cardiff Council

3.25 This Supplementary Planning Guidance by Cardiff Council details the scope and content of Travel Plans required as part of the overall package of measures to mitigate impacts and support the implementation of LDP transport policies.

3.26 It notes the purpose of a Travel Plan being a long-term management strategy for an occupier to support and detail the sustainable travel options that are available for the site in order to meet the policies and objectives set out by Cardiff Council. For employment uses this is especially relevant due to the consistent arrivals and departures of employees throughout the day.

3.27 In addition, they should set a package of initiatives aimed at improving the availability of travel modes to and from the employment area, prioritising users as per the Travel Plan Pyramid.

Summary

3.28 The national and local transport policy demonstrates the priority for sustainable modes of transport, encouraging active travel and enhancing transport infrastructure for improved connections.

3.29 The principles for the proposed development of this site comply with the transport related planning policy, whilst encouraging choices for achieving sustainable travel modes to and from the site and also beyond the site.

4.0 Development Proposals

4.1 The proposed development is for a Hybrid planning application seeking:

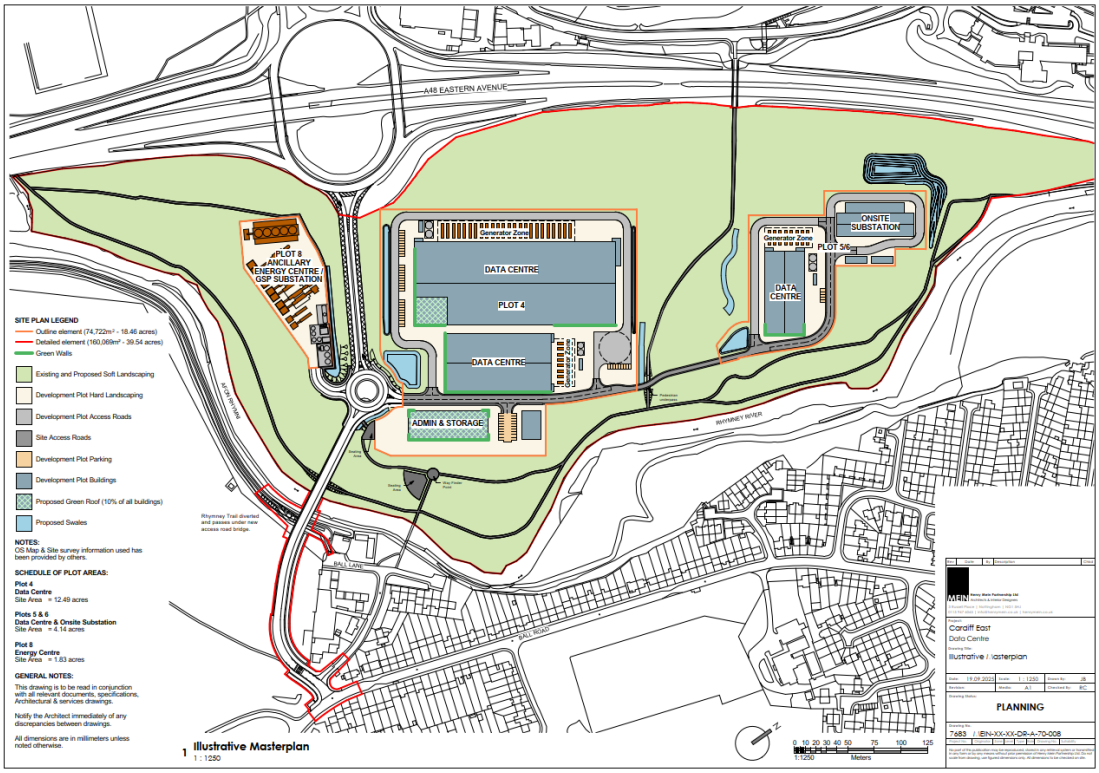
- Outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- Full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

4.2 The development will comprise of the following primary plots

- Data Centre – 50,571m2
- Data Centre & Onsite Substation – 16,790m2
- Energy Centre – 7,418m2

4.3 An Illustrative masterplan for the site can be found at **Appendix D** and can be seen in **Figure 4.1.**

Figure 4.1 – Illustrative Masterplan



Access Arrangements

Vehicular Access

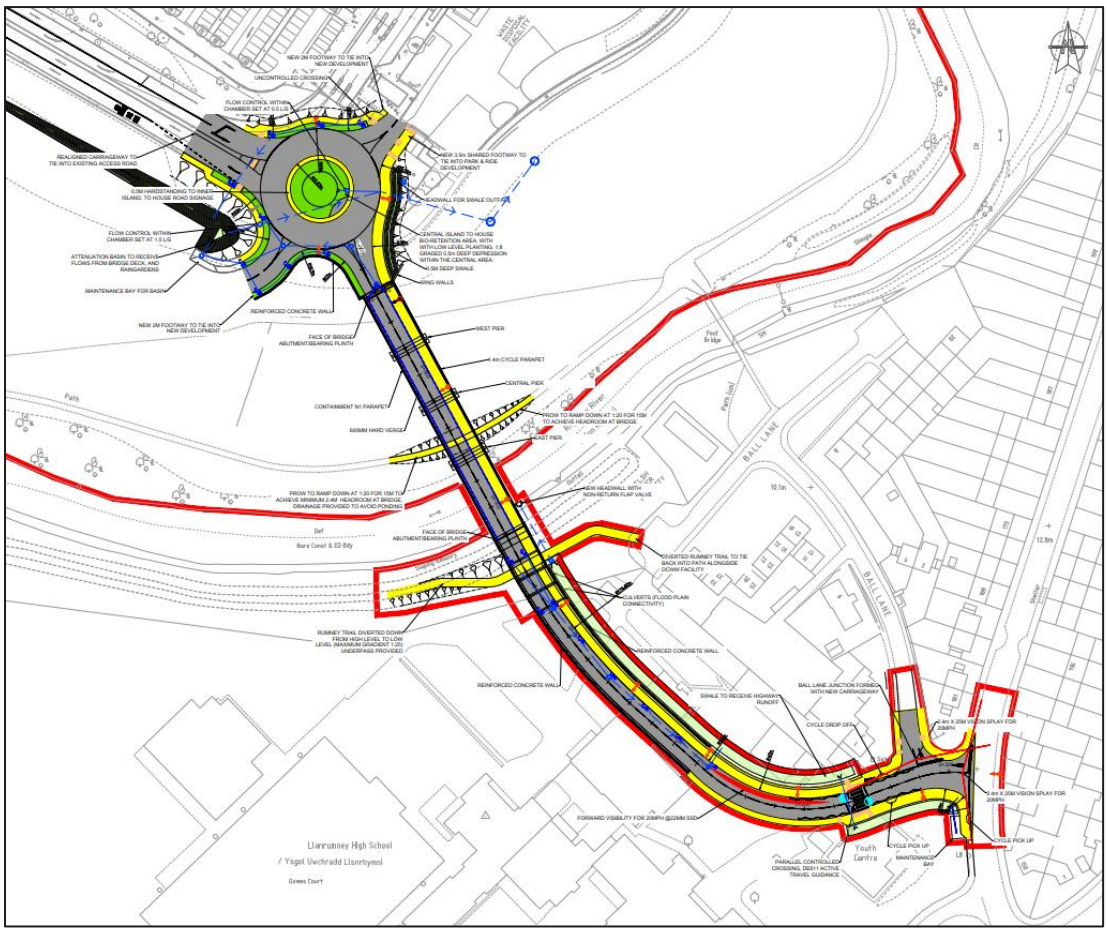
4.4 The site will be accessed via the existing access to the P&R site from the A48 roundabout as shown on the Indicative Site Layout plan at Figure 4.1. There are no proposals to alter this junction as part of the development proposals. An internal roundabout junction will provide access to the different land uses at the proposed development.

4.5 Additionally, a new road will be constructed from the internal roundabout across the Rhymney River to connect to Ball Road, providing access from Llanrumney to the site. This road would be lit to appropriate highway design standards so it can be used by pedestrians, cyclists and vehicles. This unchanged from the Approved TA.

4.6 It is proposed that ducting and space is provided for the future implementation of bus gates and ANPR cameras. Within the Councils decision notice on the previous on-site application, a condition was stipulated that the ANPR system shall at all times ensure that vehicular use of the bridge shall thereafter be restricted to public transport only between the hours of 07:00 and 10:00 and 15:00 and 19:00. This will be maintained for this scheme. Appropriate signage will be located on the link road to inform users of any restrictions

4.7 **Figure 4.2** shows the proposed road from the roundabout within the development to Ball Road. It shows the road has a width of 6.3m, allowing two standard size buses to pass each other without restraint. Additionally, it features a 3.5mm footway/cycleway for pedestrians and cyclists to cross the Rhymney River and access Ball Road from the site.

Figure 4.2 – Proposed New Road to Ball Road



4.8 The Proposed New Road to Ball Road remains unchanged from the previous application. The figure can be found at **Appendix E.**

Active Travel

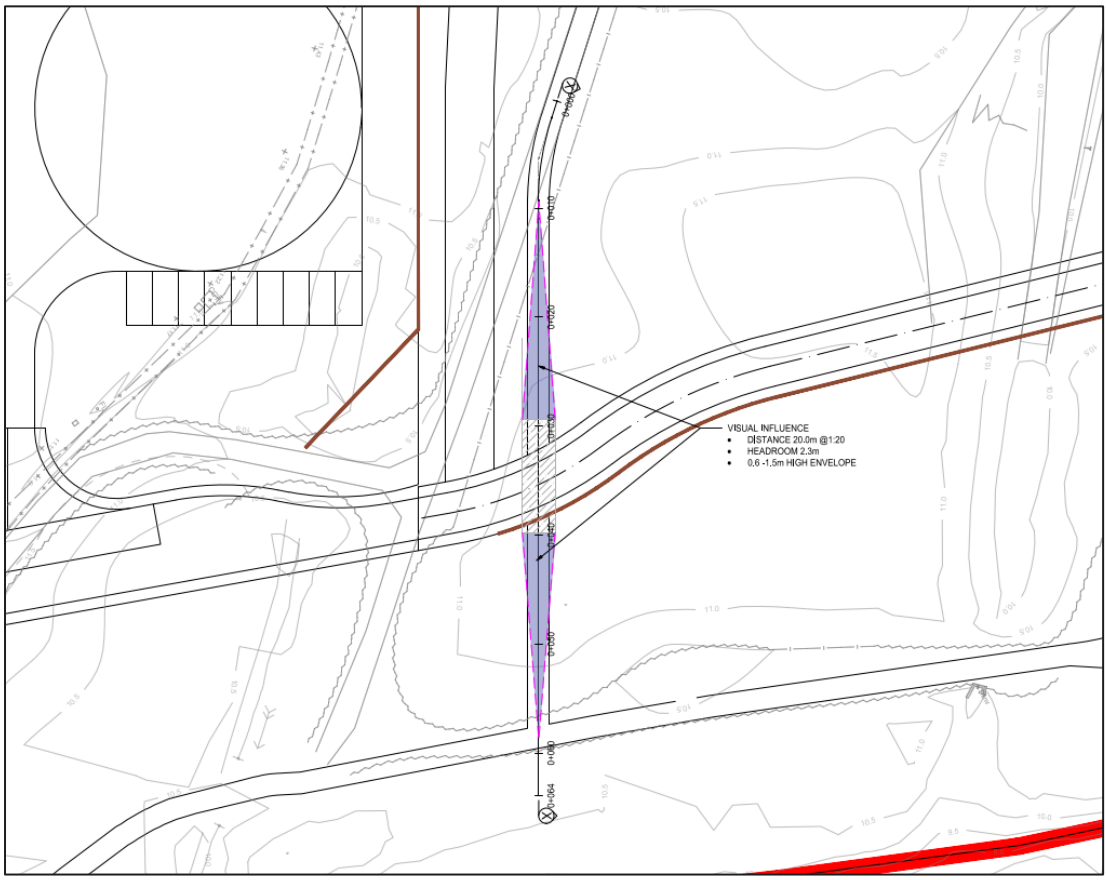
4.9 The new road across the Rhymney River will feature a 3.5m wide footway/cycleway that pedestrians and cyclists will be able use to access Ball Road and Llanrumney.

4.10 Ball Road has been designated an Advisory Cycle Route by Cardiff Council, and as such will be able to continue their journeys through to Llanrumney. The Advisory Cycle Route continues to Newport Road to the southeast, where in future it is hoped that the Cardiff Cycleways scheme will extend, providing users of the site with excellent connectivity to much of east Cardiff, including further north to St Mellons and continue southwest towards Cardiff City Centre.

4.11 In addition to the new active travel link across the River Rhymney, the existing footpath and PRoW network located in the vicinity of the site will be diverted in places to ensure better integration with the development.

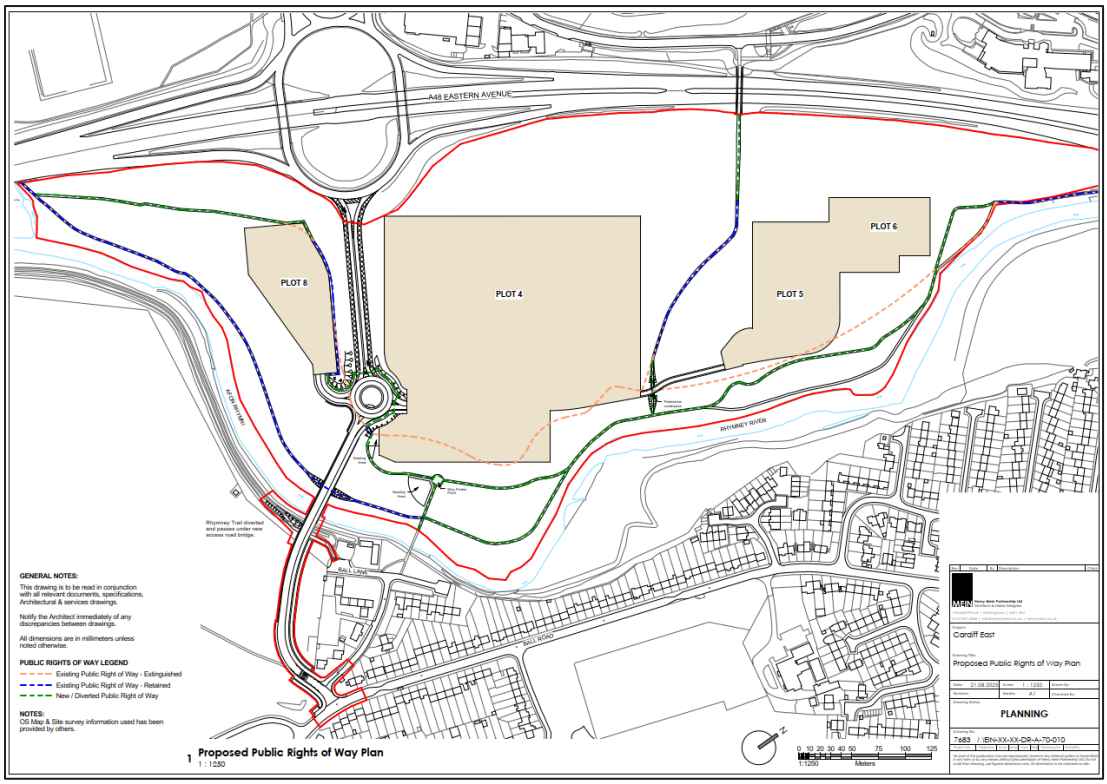
4.12 Given the security need to protect the accesses to the Data Centres, it is proposed that one PRoW should divert into a subway underneath the connecting road between Plot 4 and Plot 5. This will maintain the PRoW connection whilst maintaining the security of the site. This can be seen in **Figure 4.3** and at **Appendix D.**

Figure 4.3 – PRoW Subway



4.13 However, all current through routes will be maintained through the new and diverted routes and will deliver tangible benefits to the active travel infrastructure located near the site. The proposed Public Rights of Way Plan can be seen in **Figure 4.4** and at **Appendix D.**

Figure 4.4 – Proposed Public Rights of Way Network



4.14 The existing link, bridge and new link (to the north and south) and the site internal spine road are to be offered as adopted highway. Not all of the offered adopted highway may choose to be adopted by the Council.

Lighting

4.15 It is proposed to maintain the lighting upgrades proposed as part of the Approved TA. These are listed again here but are as featured within the Approved TA.

4.16 The development proposed a substantial upgrading of the routes to ensure their practical usage in both linking the site and the linking of the communities currently severed by the A48.

4.17 **Photograph 4.1 – 4.3** show the current primary active travel crossings of the A48, in the form of two underpasses located east of Parc Coed y Nant and southwest of Pentwyn Link Road, and a bridge crossing located north of the site.

Photograph 4.1 - Underpass East of Parc Coed y Nant

Photograph 4.2 - Underpass Southwest of Pentwyn Link Road

Photograph 4.3 - Bridge Crossing over A48 to Pentwyn Road

4.18 All three crossing currently suffer from poor lighting, which likely deters significant usage due to concerns over safety and anti-social behaviour.

4.19 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting upgrades to ensure a continuous lighting arrangement, the details of which are to be determined with the Council

4.20 As stated within the Active Travel Act Guidance, July 2021, walking and cycling must be promoted as around-the-clock means of transport, rather than just a daylight activity, if active travel is to play an important role as an alternative to the car for everyday journeys. As such, this will better improve access to the development during daylight hours, but especially during times of low light, such as at night.

Surfacing

4.21 At present, the existing surfacing of the routes near the site is good, with paved paths providing access to the nearest crossings of the A48.

4.22 However, at parts the paved surfacing ends, and instead users must travel across unpaved grass. While suitable for most journeys, it is noted that during adverse weather, the surfacing may become unattractive for users to cross.

4.23 **Photograph 4.4 and 4.5** show the two examples pertinent to the site, mainly the access from the existing footbridge across the Rhymney River to Ball Lane to the southeast of the site, and the existing PRoW continuing north of the site towards Pentwyn.

Photograph 4.4 - Existing Route between the Site and the footbridge to access Ball Lane

Photograph 4.5 - Existing PRoW North of the Site

4.24 The feasibility of surfacing these routes will be explored in detail to determine whether it can be delivered as part of the development.

4.25 Whilst alternative routes would exist from the site to access both sides of the A48, these alternative paved routes could provide additional options for users to access the development.

Improved Crossing Facilities

4.26 To ensure that active travel users can safely traverse Pentwyn Road from the existing bridge crossing of the A48, it is proposed to construct a new Zebra crossing with adjacent cycle crossing across Pentwyn Road, as at present there is no clear continuation of the route, as shown in **Photograph 4.6.**

Photograph 4.6 - Existing Access to Pentwyn Road from A48 Footbridge

4.27 The new Zebra crossing with adjacent cycle crossing would allow users to safely access the pedestrian network leading to Pentwyn.

Signage

4.28 Throughout the site at the junctions of the PROW finger posts can be provided to direct the users of the routes.

4.29 This can be extended to the south of the site from the river to Ball Road and to the north of the site to direct pedestrians and cyclists to the existing network of routes to the north of the A48.

Parking

4.30 Total parking allocation will take into consideration the advice contained within Cardiff Council's Managing Transportation Impacts (Incorporating Parking Standards) SPG (July 2018). It is considered that the proposed development is located within the 'Non Central Area' and therefore the respective standards apply.

4.31 The car parking standards are summarised in **Table 4.1.**

Table 4.1 – Cardiff Council Parking Standards

Type of Development	Parking Standards				
	Maximum Car Parking Spaces	Minimum Staff Cycle Parking	Minimum Visitor Cycle Parking	Maximum Powered Two-Wheeler Parking	Disabled Parking Provision (up to 200 spaces)
B1 Office – Non Central	1 per 50 sqm	2 per 100 sqm	4 plus 1 per 1000 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces
B8 Distribution – Non Central Area	1 per 1,000 sqm	2 per 1000 sqm	1 per 200 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces

4.32 An appropriate level of electric charging points will also be provided in all car parks, in line with national guidance. Future Wales requires a minimum of 10% of all car parking spaces to have a charging facility.

4.33 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards. This will be both within the Park and Ride area and associated with each of the proposed units.

Swept Path Analysis

4.34 The link road has been designed from the outset for buses. As such, swept path analysis has been provided to ensure that any future bus movements can be accommodated on the link road.

4.35 The swept path analysis showing bus movements through the site, with access from all directions at Ball Lane.

4.36 Swept path analysis has also been undertaken for an HGV and a Fire Tender to access the site, and visibility splays have been produced for the internal junctions of the proposed development.

4.37 All internal site drawings can be found at **Appendix E.**

Construction Impact

4.38 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

4.39 The CEMP will set out how construction traffic will be managed on the local highway network during the anticipated construction period. The purpose of a CEMP is to ensure that the effect of construction traffic is mitigated against, particularly in relation to local residents and any air quality issues. The CEMP will control the timings, routing and volume of traffic entering/leaving the site during this period.

Summary

4.40 As summarised in this section, the development proposals comprise the development of a data centre campus, including space for an energy centre and substations.

4.41 The proposed development provides the opportunity to provide significant enhancements to the area through the provision of employment opportunity.

4.42 As part of the extensive redevelopment, a new link would be constructed across the Rhymney River, providing new active travel links, public transport links, and a new vehicular route which can form a link between communities either side of the A48. This is unchanged from the previously consented application on the site.

4.43 As part of the extensive upgrading of active travel links in proximity to the site, the existing PRoW network will be diverted to serve the development, linking the site to the already existing active travel network. All through routes will be maintained.

4.44 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting across the primary PRoW through the development and extending to the two primary underpasses and footbridge across the A48, to ensure the good active travel links can always be utilised. A new zebra crossing with adjacent cycle crossing will be created across Pentwyn Road to link with the existing footbridge across the A48.

4.45 The feasibility of surfacing some of the routes within the vicinity of the site will be explored, to provide additional good quality footways.

4.46 An appropriate level of on-site vehicular parking will be provided, reflecting the scale of development and in line with the Council's 2018 SPG.

4.47 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards.

4.48 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

5.0 Baseline Travel Patterns

5.1 The section sets out the baseline modal split for the development, using the 2011 Census Method of Travel to Work data for the Mid-Layer Super Output Area (MSOA) 'Cardiff 009'. Whilst not representative of all journey types, it provides an indication of the approximate baseline mode split for all journeys in the area from which to base the aims and targets of the Interim Travel Plan.

5.2 The data summarised in **Table 5.1** illustrates that the existing employees of the 'Cardiff 009' MSOA currently travel to work with a high proportion of car drivers (66%). Despite this, already a significant proportion of people use a bus (11%), travel as a passenger in a car (8%) or walk (11%) to work. This sets a good baseline for the Travel Plan to improve upon. The mode split for all journeys which the Travel Plan seeks to achieve is set out in **Table 5.1.**

Table 5.1 - Current Mode Split (Cardiff 009 MSOA)

Method of travel to work	MSOA (009 Cardiff)
Train	0.1%
Underground, Light Rail or Tram	0%
Bus, minibus or coach	10.9%
Taxi	0.3%
Motorcycle, scooter or moped	0.8%
Driving a car or van	66.4%
Passenger in a car or van	8.4%
Bicycle	1.5%
On foot	11.4%
Work Mainly from Home	0%
Other method	0.2%
Total	100%

5.3 **Table 5.1** demonstrates the sustainable mode split for journeys to and from the site which the Travel Plan is seeking to achieve i.e. 5% reduction in single occupancy car driver trips to the site. To achieve these targets, a series of objectives and targets will be set, and a strategy created detailing how these will be met.

6.0 Objectives and Targets

Objectives

6.1 This Travel Plan is primarily aimed at reducing the dependence of staff travelling via single occupancy car. Therefore, the primary objectives of this Travel Plan are to achieve and promote the following:

- Encouragement to use alternative modes of transport to the private car;
- Increased awareness of the environmental and social benefits of using alternative modes of transport;
- Actively promote sustainable transport options for travel to and from the proposed development, to enable informed decisions about how to travel is to be made;
- Reduced level of car use, particularly single occupancy car use;
- Increase awareness of the advantages and availability of sustainable modes, but particularly active modes;
- Increase the use of active and sustainable travel modes (particularly for shorter trips), and to encourage people to build active travel into their everyday routines to support and contribute to wider health benefits; and
- Raise awareness of the impacts of travel choices on health, safety and the local environment etc.

Targets

6.2 To assess whether this Travel Plan is successful in achieving its objectives, a set of targets have been set.

6.3 All targets need to be SMART; that is Specific, Measurable, Achievable, Realistic and Time related.

6.4 Targets, or outcomes can be reviewed and once achieved will be maintained at not less than that level, subject to review as part of the annual monitoring programme. In addition, targets may be modified once travel surveys have been undertaken following discussion with Cardiff Council Highways Department.

6.5 There are two types of targets, namely: ‘Action’ and ‘Aim’ targets. Action targets set out specific commitments to implement measures to ensure delivery. Aim targets provide numerical goals for mode shift.

Action Targets

6.6 The following targets have been derived using the assumed modal split for the development as set out in **Section 5**.

6.7 **Table 6.1** below shows the target modal split for the development once the Travel Plan has been implemented.

Table 6.1 - Current and Target Mode Split (Cardiff 009 MSOA)

Method of Travel	Year 0	Year 5
Underground, metro, light rail, tram	0%	0%
Train	0.1%	0.1%
Bus, minibus, or coach	10.9%	13.9%
Taxi	0.3%	0.3%
Motorcycle, scooter or moped	0.8%	0.8%
Driving a car or van	66.4%	61.4%
Passenger in a car or van	8.4%	8.4%
Bicycle	1.5%	2.5%
On foot	11.4%	12.4%
Work Mainly at or from home	0%	0%
Other method of travel to work	0.2%	0.2%
Total	100%	100%

6.8 The primary purpose of the Travel Plan is to limit unnecessary or unsustainable car journeys (particularly those with single occupants) to and from the development.

6.9 If the subsequent baseline travel survey shows that the assumed modal split is not accurate, the targets will be amended to account for the actual modal split. Targets will be finalised and written into the full Travel Plan once the travel surveys have been completed.

6.10 The Travel Plan should aim to build on the current target level and good level of accessibility provided to the site through nearby active travel routes. The Travel Plan will assist Cardiff Council in achieving their 50:50 modal split target.

6.11 The Travel Plan aims to take advantage of the site's location and boost bus, walking and cycling mode shares the most, while maintaining or gradually increasing other sustainable modes. It is hoped that these actions will result in fewer journeys to work being undertaken by car or van over the travel plan period.

7.0 Travel Plan Strategy

Travel Plan Coordinator

7.1 The landowner/developer will be responsible for ensuring the transport at the site (e.g. pedestrian and cycle access points, cycle storage, etc) is in good condition for regular use. The landowner / developer will also be responsible for nominating an individual who will lead the delivery of the travel plan. The landowner / developer will be responsible for funding the travel plan measures and monitoring activity.

7.2 A Travel Plan Coordinator (TPC) will be nominated by the landowner / developer to oversee the development of the travel plan and to ensure its effective implementation. The TPC is most likely to be the office manager.

7.3 The TPC's role will commence prior to first occupation of the site to ensure the promotion of the travel plan at the earliest opportunity and to develop travel information packs for when the building is occupied.

7.4 The main roles and responsibilities of the TPC are to:

- Manage, review and lead the delivery of the travel plan;
- Liaise with Cardiff Council as necessary;
- Promote the travel plan and its measures;
- Promote the site's sustainable characteristics through the marketing process;
- Maintain updated information on noticeboards; and
- Monitor the effectiveness of travel plan initiatives.

7.5 The time spent by the TPC on the Travel Plan will vary according to the stage of the travel planning process. It is expected that travel planning responsibilities will intensify on first occupation and during monitoring periods. Outside of these times, travel planning activities will lessen. The TPC will undertake their travel planning responsibilities alongside their day-to-day work role.

7.6 The contact details of the nominated TPC will be forwarded to Cardiff Council at the earliest opportunity.

Marketing and Awareness Raising

7.7 Employees will be made aware of the Travel Plan and the site's sustainable measures through communication and promotional tools.

- A welcome travel pack will be distributed to each employee upon adoption of the travel plan and when a new employee starts. The Welcome Pack will contain information on travel options, links to websites, information about cycle training and other travel planning measures
- The TPC will encourage employees to get involved with national and local sustainable travel campaigns.
- Information on travel options will be located physically where possible, for example within notice boards in communal areas.

Travel Packs

7.8 The TPC will prepare and issue Travel Packs to future employees which will describe the Travel Plan whilst including details concerning walking and cycling routes, bus routes, bus and rail services, car sharing schemes, car clubs and eco-driving.

Reporting

7.9 The TPC will prepare a full monitoring report on the progress of the Travel Plan. The report will include the following:

- Progress on the implementation of measures and initiatives to progress sustainable transport use;
- Latest survey results (if a survey year); and
- Any revisions to targets and measures.

8.0 Measures and Initiatives

8.1 This section of the Travel Plan outlines the specific measures to be implemented and help achieve the objectives. The listed measures, which include awareness and promotion initiatives, will be validated following undertaking the baseline staff travel surveys and then modified accordingly.

8.2 The implementation of the listed measures, which include awareness initiatives and infrastructure provision, is the core of the Travel Plan.

Measures

Survey of Staff Travel

8.3 The TPC will be responsible for preparing and distributing a survey of staff travel surveys to be undertaken within 3 months of occupation of the unit and thereafter on an annual basis. The TPC shall then compile a full monitoring report following the first 3 months following the occupation of the development and thereafter on an annual basis. A sample Workplace Travel Survey form is included in **Appendix F.**

8.4 The findings of the results of the survey will be made available to the local authority and posted on the Travel Plan notice board.

Travel Pack

8.5 A travel pack will be distributed to all new employees upon occupation of the office, and will include the following information:

- The name and contact details of the TPC and the availability of the TPC to speak with staff;
- An introduction to the Travel Plan, its purpose etc, and a summary document;
- Maps of walking and cycling routes to key destinations;
- Timetables, route maps and ticketing information for public transport;
- Car sharing and car club information;
- Contact details for local taxi companies; and
- Location and contact details of nearby services.

Travel Notice Board

8.6 In a suitable location accessible by all staff at their respective buildings, there will be a Travel Plan Notice Board. This will contain the name and contact details of the TPC, plans showing the nearest bus routes and bus stops, location of pedestrian routes, travel initiatives, offers of lifts and car-sharing, details of local cycle shops able to service cycles during the day, a copy of the local cycle network leaflet, and results of the travel survey. This information will be updated by the TPC when revised.

8.7 A copy of the full Travel Plan would also be available for any member of staff if they wish to look at it.

Personalised Travel Planning

8.8 The TPC will offer a personalised Travel Planning service for all new staff. It is expected that this will be offered during induction sessions.

8.9 The TPC will be able to draw on advice from journey planning websites such as Traveline Cymru.

8.10 The TPC will report the results of the travel survey to the relevant Cardiff Council officers and establish a way forward. The TPC will also seek to ensure that pedestrian routes are appropriately maintained.

8.11 The TPC will promote the Health benefits of walking and explore the possibility of using such schemes as '10,000 steps a day campaign.'

8.12 The Travel Plan noticeboard will contain a map showing location of all pedestrian routes to the site and the recommended crossing points over the adjoining roads.

Cycling

8.13 The TPC will also seek to ensure that cycle routes are appropriately maintained. This will be achieved through regular dialogue with the Council.

8.14 Employees will be provided with information and advice concerning safe cycle routes to the site and the TPC will promote the health and economic benefits of cycling through the use of campaigns, such as National Bike Week.

8.15 The TPC will explore with local bicycle retailers the possibility of providing discounts on cycling equipment to employees of the development. The take up of this discount, if agreed, will be monitored.

8.16 External funding to purchase cycles or cycle clothing is available through the government assisted Cycle-to-Work scheme whereby the cost of purchasing a new cycle or cycle equipment by staff is reduced through a salary sacrifice scheme. The TPC will include details on the TP Noticeboard and assist any member of staff wising to purchase a cycle or equipment this way.

Public Transport

8.17 Up-to-date details of bus, train and taxi services, including route information and service frequencies, will be permanently on display the on the Travel Plan notice board. Details of National Rail, Traveline and car sharing websites and enquiry phone numbers will also be displayed.

8.18 Taxis can have an important role in providing for employee trips, in particular when other modes of transport may not be available. The TPC will ensure that the contact details for a local taxi operator are available on site.

9.0 Summary

9.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall (the Applicant). This Travel Plan (TA) has been prepared in support of the planning application being submitted by the Applicant to Cardiff Council (the Council) for the redevelopment of Cardiff East Park and Ride, Llanrumney (the site).

9.2 The site comprises the existing Cardiff East Park and Ride in Llanrumney, Cardiff and is located approximately 8km to the north east of Cardiff city centre, with Llanrumney to the east and Llanedeyrn to the west. The site is adjacent to the A48 Pentwyn Interchange junction on the A48 Eastern Avenue which provides vehicular access to the existing Park and Ride site.

9.3 This Interim Travel Plan has been designed in line with both local and national policy to provide a comprehensive strategy to ensure the site is as sustainable as possible.

9.4 The scheme has been designed with active travel linkages to the wider network, and to improve the PRoWs that already run near the site. This will provide good quality routes for users of the site to access the wider area.

9.5 The development will also lead to a substantial upgrade of the surrounding active travel network, with a new route across the River Rhymney, new lighting across the primary PRoW network and a new zebra crossing on Pentwyn Road.

9.6 The new road link across to Ball Road also has the opportunity to improve bus connectivity to the site. Bull Road benefits from frequent bus connection to Cardiff City Centre from nearby bus stops that utilises bus priority measures to ensure good travel time to and from the city centre.

9.7 The Travel Plan has set out detailed objectives and targets for the site, and has outlined a comprehensive Travel Plan Strategy in order to achieve these aims. These include several of measures and initiatives for the site to utilise.

9.8 This Travel Plan will ensure the site utilises the excellent sustainability links the area has to provide, and encourage a tangible mode shift for users of the site.

Appendix A 2022 Traffic Flow Diagrams

Travel Plan

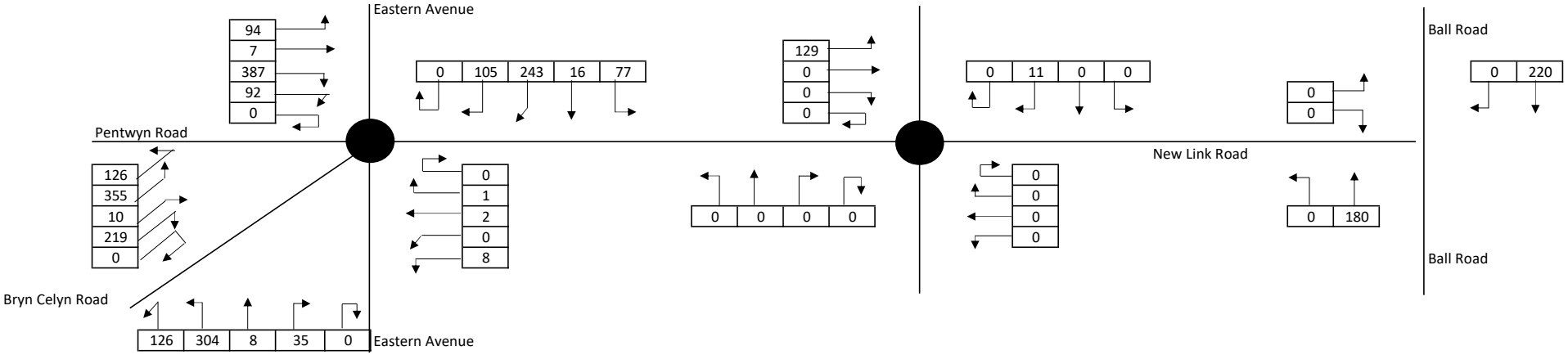
Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

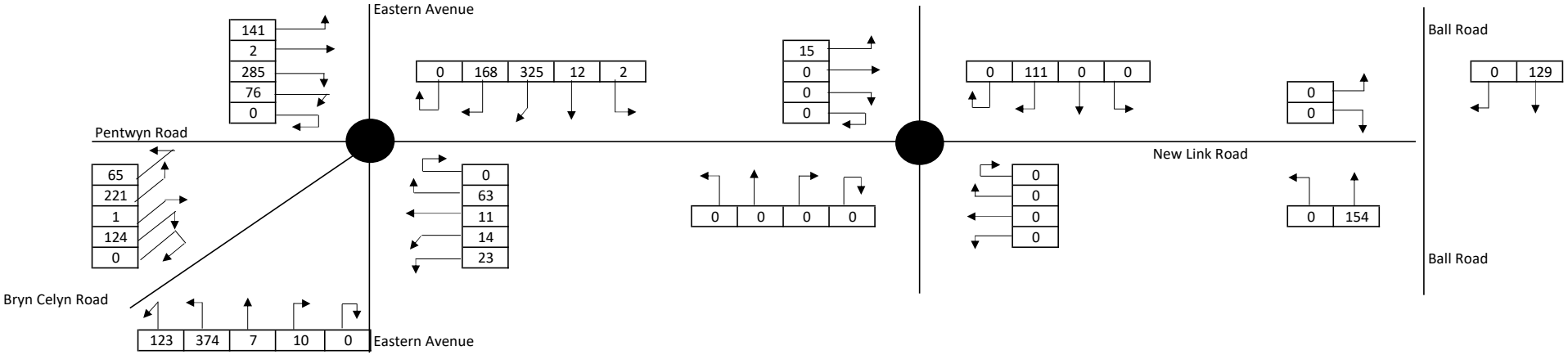
SLR Project No.: 425.067363.00001

1 December 2025

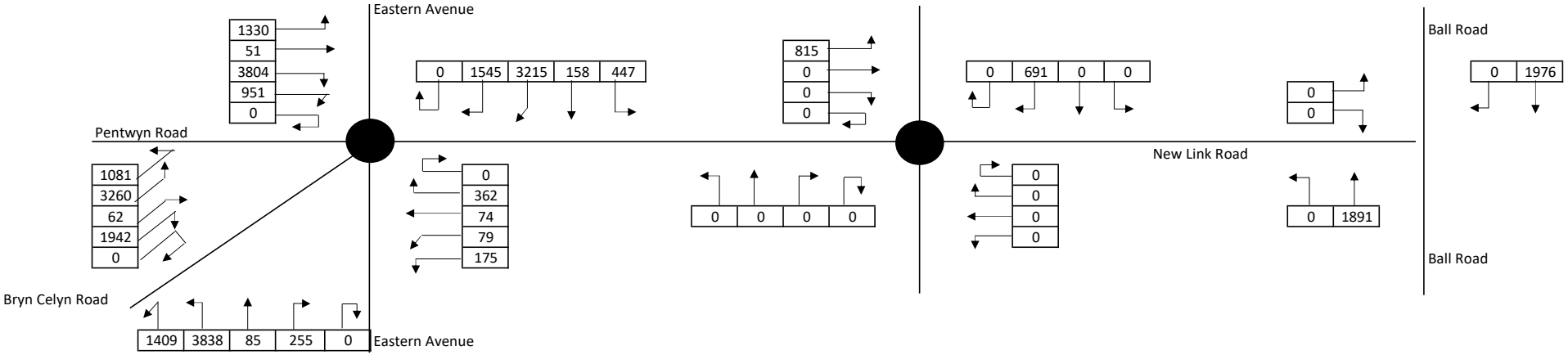
2022 Observed AM (08:00-09:00) - Vehicles



2022 Observed PM (17:00-18:00) - Vehicles



2022 Observed - 24hr AADT - Total Vehicles



Appendix B 2022 Traffic Data

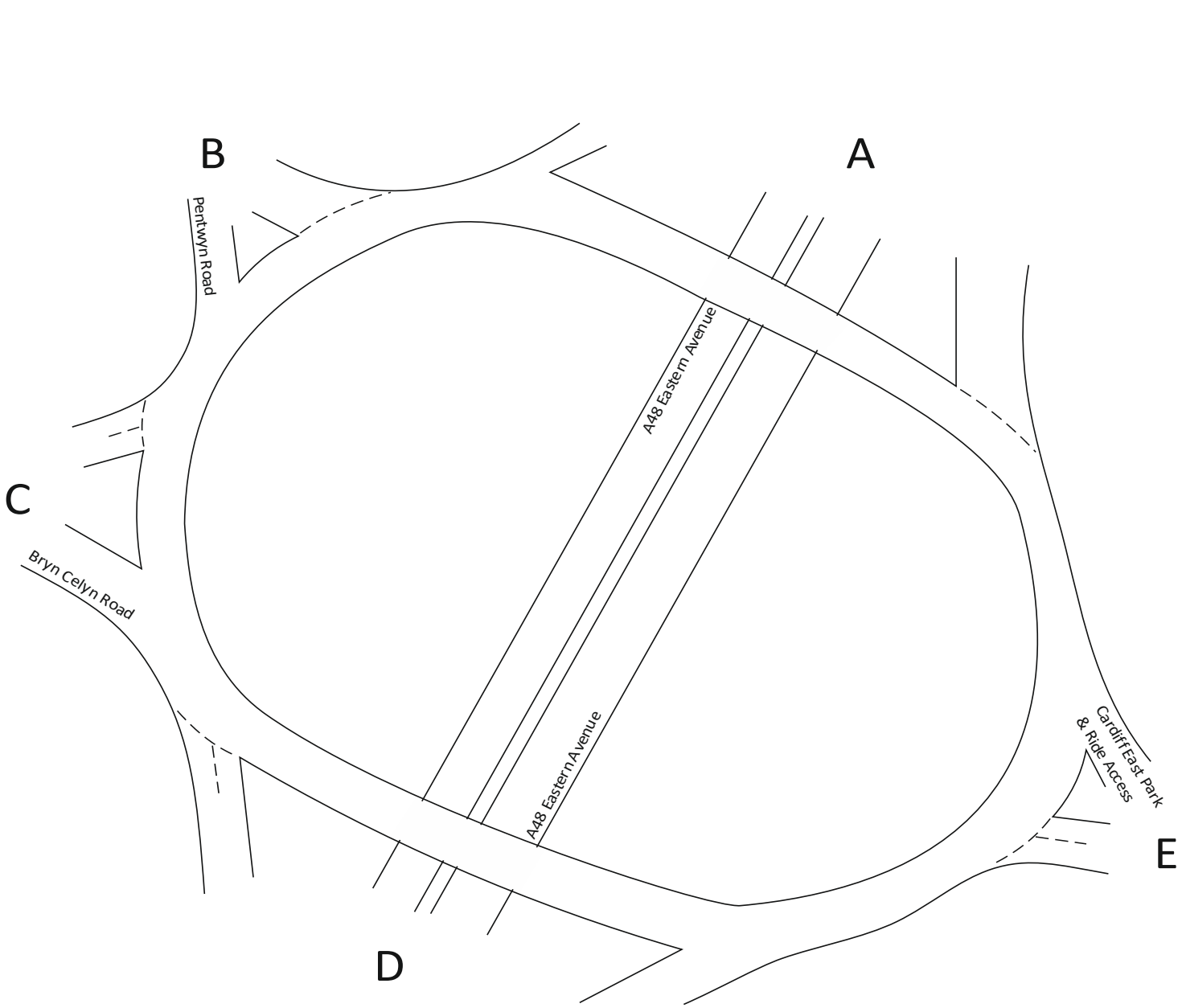
Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

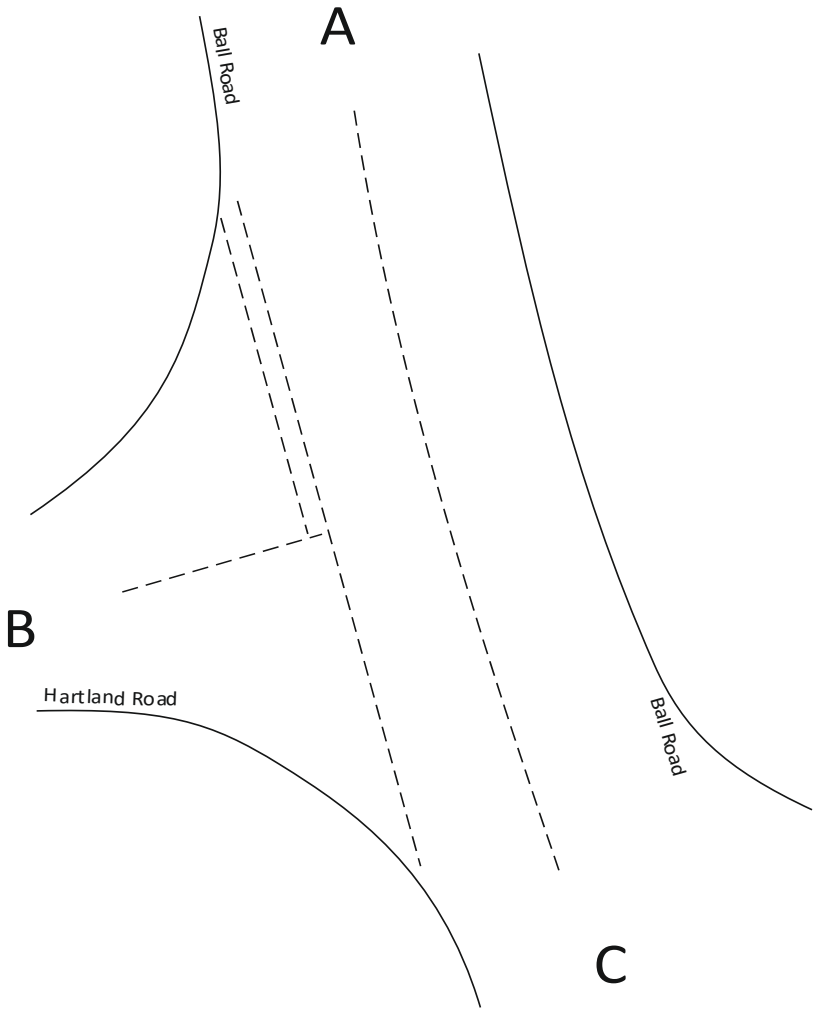
Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 01

Site: 1

Location: A48 Eastern Avenue / Pentwyn Road / Bryn Celyn Road / Cardiff East Park & Ride Access



N

TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 02

Site: 2

Location: Ball Road / Hartland Road

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	0	0	0	0	0	0	9	1	0	0	0	0	0	0	1
07:15	22	0	0	0	0	0	0	22	1	0	0	0	0	0	0	1
07:30	24	3	0	0	0	0	0	27	1	0	0	0	0	0	0	1
07:45	26	0	0	0	0	0	0	26	2	0	0	0	0	0	0	2
H/TOT	81	3	0	0	0	0	0	84	5	0	0	0	0	0	0	5
08:00	20	0	0	0	0	0	0	20	1	1	0	0	0	0	0	2
08:15	22	1	0	0	0	0	0	23	3	1	1	0	0	0	0	5
08:30	29	0	0	0	0	0	0	29	4	0	0	0	0	0	0	4
08:45	5	0	0	0	0	0	0	5	1	2	1	1	0	0	0	5
H/TOT	76	1	0	0	0	0	0	77	9	4	2	1	0	0	0	16
09:00	6	1	1	0	0	0	0	8	2	2	0	1	0	0	0	5
09:15	5	0	0	0	0	0	0	5	1	0	0	0	0	0	0	1
09:30	4	0	0	0	0	0	0	4	0	1	0	0	0	0	0	1
09:45	4	0	0	0	0	0	0	4	2	0	0	0	0	0	0	2
H/TOT	19	1	1	0	0	0	0	21	5	3	0	1	0	0	0	9
P/TOT	176	5	1	0	0	0	0	182	19	7	2	2	0	0	0	30

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:45	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2
H/TOT	1	0	0	0	0	0	0	1	5	1	0	0	0	0	0	6
17:00	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0	3
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
17:30	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	2
17:45	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
H/TOT	1	1	0	0	0	0	0	2	8	4	0	0	0	0	0	12
18:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
18:15	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
18:30	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	0	0	0	2	5	0	0	0	0	0	0	5
P/TOT	4	1	0	0	0	0	0	5	18	5	0	0	0	0	0	23

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	17	0	3	1	0	0	0	21	14	6	0	0	1	0	0	21
07:15	24	6	2	0	0	0	0	32	18	6	0	1	0	1	0	26
07:30	35	9	3	1	0	0	0	48	18	3	1	0	0	0	0	22
07:45	54	12	0	0	0	0	0	66	22	2	5	0	0	0	0	29
H/TOT	130	27	8	2	0	0	0	167	72	17	6	1	1	1	0	98
08:00	34	4	1	0	1	1	0	41	21	3	1	1	1	0	0	27
08:15	71	4	0	1	1	0	0	77	20	0	1	1	1	0	0	23
08:30	67	8	2	1	2	0	0	80	23	3	1	0	1	0	0	28
08:45	33	11	0	1	0	0	0	45	21	3	1	2	0	0	0	27
H/TOT	205	27	3	3	4	1	0	243	85	9	4	4	3	0	0	105
09:00	36	6	2	0	0	0	0	44	25	6	1	0	0	0	0	32
09:15	37	7	0	0	0	0	0	44	28	6	2	0	0	0	0	36
09:30	30	5	3	1	0	0	0	39	13	3	1	0	0	0	0	17
09:45	23	4	0	0	0	0	0	27	20	0	3	1	0	0	0	24
H/TOT	126	22	5	1	0	0	0	154	86	15	7	1	0	0	0	109
P/TOT	461	76	16	6	4	1	0	564	243	41	17	6	4	1	0	312

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	59	3	2	0	0	0	0	64	42	4	1	0	0	0	0	47
16:15	68	12	1	0	0	0	0	81	38	3	0	1	0	0	0	42
16:30	65	6	1	0	0	0	0	72	31	7	0	0	0	0	0	38
16:45	69	6	3	0	0	0	0	78	43	7	0	0	0	0	0	50
H/TOT	261	27	7	0	0	0	0	295	154	21	1	1	0	0	0	177
17:00	70	14	1	0	0	0	0	85	44	5	0	0	0	0	0	49
17:15	76	5	0	0	0	1	0	82	41	1	0	0	0	0	0	42
17:30	75	6	1	0	0	1	0	83	36	5	0	0	0	0	0	41
17:45	71	3	1	0	0	0	0	75	34	2	0	0	0	0	0	36
H/TOT	292	28	3	0	0	2	0	325	155	13	0	0	0	0	0	168
18:00	66	9	0	0	0	0	0	75	28	4	0	0	0	0	0	32
18:15	52	3	0	0	0	0	0	55	24	1	1	0	0	0	0	26
18:30	34	1	1	0	0	0	0	36	23	1	0	0	0	0	0	24
18:45	43	5	0	0	0	0	0	48	21	2	0	1	0	0	0	24
H/TOT	195	18	1	0	0	0	0	214	96	8	1	1	0	0	0	106
P/TOT	748	73	11	0	0	2	0	834	405	42	2	2	0	0	0	451

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	11	3	2	0	0	0	0	16
07:15	0	0	0	0	0	0	0	0	16	7	1	0	0	0	0	24
07:30	0	0	0	0	0	0	0	0	15	1	0	0	0	0	0	16
07:45	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	60	13	4	0	0	0	0	77
08:00	0	0	0	0	0	0	0	0	21	3	1	0	0	0	0	25
08:15	0	0	0	0	0	0	0	0	22	2	1	0	0	0	0	25
08:30	0	0	0	0	0	0	0	0	18	2	2	1	0	0	0	23
08:45	0	0	0	0	0	0	0	0	14	4	3	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	75	11	7	1	0	0	0	94
09:00	0	0	0	0	0	0	0	0	15	0	1	0	0	0	0	16
09:15	0	0	0	0	0	0	0	0	11	2	2	2	0	0	0	17
09:30	0	0	0	0	0	0	0	0	16	5	2	0	0	0	0	23
09:45	0	0	0	0	0	0	0	0	13	8	2	0	0	0	0	23
H/TOT	0	0	0	0	0	0	0	0	55	15	7	2	0	0	0	79
P/TOT	0	0	0	0	0	0	0	0	190	39	18	3	0	0	0	250

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	35	2	0	1	0	0	0	38
16:15	0	0	0	0	0	0	0	0	35	6	2	0	0	2	0	45
16:30	0	0	0	0	0	0	0	0	30	3	0	0	0	0	0	33
16:45	0	0	0	0	0	0	0	0	39	4	0	0	0	0	0	43
H/TOT	0	0	0	0	0	0	0	0	139	15	2	1	0	2	0	159
17:00	0	0	0	0	0	0	0	0	40	3	1	1	0	0	0	45
17:15	0	0	0	0	0	0	0	0	26	7	1	1	0	0	0	35
17:30	0	0	0	0	0	0	0	0	37	2	0	0	0	1	0	40
17:45	0	0	0	0	0	0	0	0	20	1	0	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	123	13	2	2	0	1	0	141
18:00	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	21
18:15	0	0	0	0	0	0	0	0	23	1	0	0	0	0	0	24
18:30	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20
18:45	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	22
H/TOT	0	0	0	0	0	0	0	0	86	1	0	0	0	0	0	87
P/TOT	0	0	0	0	0	0	0	0	348	29	4	3	0	3	0	387

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	2	0	0	0	0	0	0	2	31	8	0	0	1	0	0	40
07:15	3	0	0	0	1	0	0	4	63	15	1	0	0	0	0	79
07:30	4	0	0	0	0	0	0	4	61	5	1	2	0	0	0	69
07:45	2	0	0	0	1	0	0	3	75	5	2	0	1	0	0	83
H/TOT	11	0	0	0	2	0	0	13	230	33	4	2	2	0	0	271
08:00	3	0	0	0	0	0	0	3	97	8	1	0	0	0	0	106
08:15	2	0	0	0	0	0	0	2	92	10	3	0	1	0	0	106
08:30	1	0	0	0	0	0	0	1	91	8	1	0	1	1	0	102
08:45	0	0	0	0	1	0	0	1	66	4	1	2	0	0	0	73
H/TOT	6	0	0	0	1	0	0	7	346	30	6	2	2	1	0	387
09:00	2	0	1	0	0	0	0	3	76	13	2	0	1	0	1	93
09:15	1	0	0	0	1	0	0	2	54	6	0	1	1	0	0	62
09:30	0	0	0	0	1	0	0	1	53	9	6	1	0	0	0	69
09:45	0	0	0	0	0	0	0	0	56	8	2	0	0	0	0	66
H/TOT	3	0	1	0	2	0	0	6	239	36	10	2	2	0	1	290
P/TOT	20	0	1	0	5	0	0	26	815	99	20	6	6	1	1	948

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	1	0	0	1	58	1	2	1	0	0	0	62
16:15	0	0	0	0	0	0	0	0	71	4	1	0	0	0	0	76
16:30	0	0	0	0	0	0	0	0	73	2	1	1	1	0	0	78
16:45	0	0	0	0	1	0	0	1	76	4	1	0	0	0	0	81
H/TOT	0	0	0	0	2	0	0	2	278	11	5	2	1	0	0	297
17:00	0	0	0	0	0	0	0	0	69	1	1	0	0	0	0	71
17:15	0	0	0	0	1	0	0	1	57	3	0	0	0	0	0	60
17:30	0	0	0	0	0	0	0	0	88	2	0	0	1	0	0	91
17:45	0	0	0	0	1	0	0	1	60	3	0	0	0	0	0	63
H/TOT	0	0	0	0	2	0	0	2	274	9	1	0	1	0	0	285
18:00	1	0	0	0	0	0	0	1	67	4	0	0	0	0	0	71
18:15	0	0	0	0	0	0	0	0	67	1	0	0	0	0	0	68
18:30	0	0	0	0	1	0	0	1	70	0	0	0	0	0	0	70
18:45	0	0	0	0	0	0	0	0	71	2	0	0	1	0	0	74
H/TOT	1	0	0	0	1	0	0	2	275	7	0	0	1	0	0	283
P/TOT	1	0	0	0	5	0	0	6	827	27	6	2	3	0	0	865

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0
07:15	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
07:30	4	1	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:45	13	5	2	0	0	0	0	20	0	0	0	0	0	0	0	0
H/TOT	20	7	3	0	2	0	0	32	0	0	0	0	0	0	0	0
08:00	14	0	0	0	1	0	0	15	0	0	0	0	0	0	0	0
08:15	22	3	0	0	2	0	0	27	0	0	0	0	0	0	0	0
08:30	16	4	0	0	0	0	0	20	0	0	0	0	0	0	0	0
08:45	23	4	1	0	2	0	0	30	0	0	0	0	0	0	0	0
H/TOT	75	11	1	0	5	0	0	92	0	0	0	0	0	0	0	0
09:00	29	1	0	0	1	0	0	31	0	0	0	0	0	0	0	0
09:15	24	1	0	0	0	0	0	25	0	0	0	0	0	0	0	0
09:30	8	0	1	0	1	0	0	10	0	0	0	0	0	0	0	0
09:45	7	0	1	0	1	0	0	9	0	0	0	0	0	0	0	0
H/TOT	68	2	2	0	3	0	0	75	0	0	0	0	0	0	0	0
P/TOT	163	20	6	0	10	0	0	199	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	7	1	0	1	0	0	16	0	0	0	0	0	0	0	0
16:15	16	2	0	0	3	0	0	21	0	0	0	0	0	0	0	0
16:30	11	2	0	0	0	0	0	13	0	0	0	0	0	0	0	0
16:45	26	5	0	0	1	0	0	32	0	0	0	0	0	0	0	0
H/TOT	60	16	1	0	5	0	0	82	0	0	0	0	0	0	0	0
17:00	20	1	0	0	0	0	0	21	0	0	0	0	0	0	0	0
17:15	19	2	0	0	2	0	0	23	0	0	0	0	0	0	0	0
17:30	13	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0
17:45	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
H/TOT	70	4	0	0	2	0	0	76	0	0	0	0	0	0	0	0
18:00	22	0	1	0	0	0	0	23	0	0	0	0	0	0	0	0
18:15	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
18:30	25	3	0	0	0	0	0	28	0	0	0	0	0	0	0	0
18:45	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
H/TOT	74	4	1	0	0	0	0	79	0	0	0	0	0	0	0	0
P/TOT	204	24	2	0	7	0	0	237	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	3	0	0	0	0	0	7	36	9	2	0	0	0	0	47
07:15	7	0	1	0	0	0	0	8	47	11	1	0	0	1	0	60
07:30	7	1	0	0	1	0	0	9	66	5	1	0	0	0	0	72
07:45	15	2	0	0	0	0	0	17	65	5	1	0	0	0	0	71
H/TOT	33	6	1	0	1	0	0	41	214	30	5	0	0	1	0	250
08:00	20	3	0	0	1	0	0	24	65	6	1	0	0	0	0	72
08:15	13	1	0	0	0	0	0	14	84	10	1	0	0	0	0	95
08:30	31	1	1	0	0	0	0	33	84	6	0	0	0	0	0	90
08:45	53	1	1	0	0	0	0	55	91	6	1	0	0	0	0	98
H/TOT	117	6	2	0	1	0	0	126	324	28	3	0	0	0	0	355
09:00	26	0	0	0	1	0	0	27	57	6	0	0	0	0	0	63
09:15	21	1	1	0	1	0	0	24	29	7	0	1	0	0	0	37
09:30	4	1	0	0	2	0	0	7	32	4	0	0	0	0	0	36
09:45	8	2	0	0	1	0	0	11	33	10	0	0	0	0	0	43
H/TOT	59	4	1	0	5	0	0	69	151	27	0	1	0	0	0	179
P/TOT	209	16	4	0	7	0	0	236	689	85	8	1	0	1	0	784

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	18	2	0	0	2	0	0	22	48	5	0	0	0	0	0	53
16:15	16	0	0	0	0	0	0	16	63	10	1	0	0	0	0	74
16:30	25	0	1	0	2	0	0	28	71	11	0	0	0	0	0	82
16:45	23	0	0	0	0	0	0	23	56	8	0	0	0	0	0	64
H/TOT	82	2	1	0	4	0	0	89	238	34	1	0	0	0	0	273
17:00	16	1	0	0	2	0	0	19	53	5	1	0	0	0	0	59
17:15	11	0	0	0	0	0	0	11	58	9	0	0	0	0	0	67
17:30	18	0	0	0	1	0	0	19	60	5	0	0	0	0	0	65
17:45	14	1	0	0	1	0	0	16	26	2	0	1	0	1	0	30
H/TOT	59	2	0	0	4	0	0	65	197	21	1	1	0	1	0	221
18:00	15	1	0	0	1	0	0	17	44	4	0	0	0	0	0	48
18:15	19	2	0	0	0	0	0	21	44	4	1	0	0	0	0	49
18:30	19	0	2	0	0	0	0	21	34	0	0	0	0	0	0	34
18:45	14	1	0	0	0	0	0	15	28	5	0	0	0	0	0	33
H/TOT	67	4	2	0	1	0	0	74	150	13	1	0	0	0	0	164
P/TOT	208	8	3	0	9	0	0	228	585	68	3	1	0	1	0	658

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	0	0	0	0	0	0	4	19	6	0	0	0	0	0	25
07:15	4	0	0	0	0	0	0	4	26	4	0	0	0	0	0	30
07:30	2	0	0	0	0	0	0	2	19	10	0	0	0	0	0	29
07:45	2	0	0	0	0	0	0	2	33	3	0	0	0	0	0	36
H/TOT	12	0	0	0	0	0	0	12	97	23	0	0	0	0	0	120
08:00	3	0	0	0	0	0	0	3	52	9	0	0	0	0	0	61
08:15	3	0	0	0	1	0	0	4	39	6	1	0	0	1	0	47
08:30	2	0	0	0	0	0	0	2	49	6	2	0	0	0	0	57
08:45	1	0	0	0	0	0	0	1	46	8	0	0	0	0	0	54
H/TOT	9	0	0	0	1	0	0	10	186	29	3	0	0	1	0	219
09:00	2	0	0	0	0	0	0	2	43	7	0	0	0	0	0	50
09:15	0	0	0	0	0	0	0	0	32	4	1	0	0	0	0	37
09:30	0	0	0	0	0	0	0	0	28	2	1	1	0	0	0	32
09:45	0	0	0	0	0	0	0	0	16	1	2	0	0	0	0	19
H/TOT	2	0	0	0	0	0	0	2	119	14	4	1	0	0	0	138
P/TOT	23	0	0	0	1	0	0	24	402	66	7	1	0	1	0	477

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	0	0	0	1	41	4	0	0	0	0	0	45
16:15	0	0	0	0	0	0	0	0	33	3	0	0	0	0	0	36
16:30	0	0	0	0	0	0	0	0	48	4	0	0	0	0	0	52
16:45	0	0	0	0	0	0	0	0	43	2	0	0	0	0	0	45
H/TOT	1	0	0	0	0	0	0	1	165	13	0	0	0	0	0	178
17:00	0	0	0	0	0	0	0	0	26	3	0	0	0	0	1	30
17:15	1	0	0	0	0	0	0	1	32	1	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	32	2	0	0	0	0	0	34
17:45	0	0	0	0	0	0	0	0	23	4	0	0	0	0	0	27
H/TOT	1	0	0	0	0	0	0	1	113	10	0	0	0	0	1	124
18:00	1	0	0	0	0	0	0	1	22	0	0	0	0	0	0	22
18:15	0	0	0	0	0	0	0	0	29	0	1	0	0	0	0	30
18:30	0	0	0	0	0	0	0	0	25	1	0	0	1	0	0	27
18:45	0	0	0	0	0	0	0	0	37	3	0	0	0	0	0	40
H/TOT	1	0	0	0	0	0	0	1	113	4	1	0	1	0	0	119
P/TOT	3	0	0	0	0	0	0	3	391	27	1	0	1	0	1	421

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	9
07:15	0	0	0	0	0	0	0	0	11	3	0	0	0	0	0	14
07:30	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
07:45	0	0	0	0	0	0	0	0	23	6	0	0	0	0	0	29
H/TOT	0	0	0	0	0	0	0	0	60	12	1	0	0	0	0	73
08:00	0	0	0	0	0	0	0	0	16	3	0	0	0	0	0	19
08:15	0	0	0	0	0	0	0	0	29	5	0	0	0	0	0	34
08:30	0	0	0	0	0	0	0	0	30	3	1	0	0	0	0	34
08:45	0	0	0	0	0	0	0	0	33	6	0	0	0	0	0	39
H/TOT	0	0	0	0	0	0	0	0	108	17	1	0	0	0	0	126
09:00	0	0	0	0	0	0	0	0	27	1	0	1	0	0	0	29
09:15	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
09:30	0	0	0	0	0	0	0	0	9	5	0	0	0	0	0	14
09:45	0	0	0	0	0	0	0	0	10	6	1	0	0	0	0	17
H/TOT	0	0	0	0	0	0	0	0	75	15	1	1	0	0	0	92
P/TOT	0	0	0	0	0	0	0	0	243	44	3	1	0	0	0	291

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	28	5	1	0	0	0	0	34
16:15	0	0	0	0	0	0	0	0	23	5	0	0	0	0	0	28
16:30	0	0	0	0	0	0	0	0	23	3	0	0	0	0	0	26
16:45	0	0	0	0	0	0	0	0	22	6	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	96	19	1	0	0	0	0	116
17:00	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
17:15	0	0	0	0	0	0	0	0	29	4	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	21	4	0	0	0	0	0	25
17:45	0	0	0	0	0	0	0	0	31	2	0	0	0	0	0	33
H/TOT	0	0	0	0	0	0	0	0	110	13	0	0	0	0	0	123
18:00	0	0	0	0	0	0	0	0	33	2	0	0	0	0	0	35
18:15	0	0	0	0	0	0	0	0	36	2	1	0	0	1	0	40
18:30	0	0	0	0	0	0	0	0	31	1	1	0	0	0	0	33
18:45	0	0	0	0	0	0	0	0	26	2	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	126	7	2	0	0	1	0	136
P/TOT	0	0	0	0	0	0	0	0	332	39	3	0	0	1	0	375

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	33	7	3	0	1	0	0	44	0	1	0	0	0	0	0	1
07:15	42	6	0	2	2	0	0	52	0	1	0	0	0	0	0	1
07:30	39	4	1	0	0	0	1	45	0	0	0	0	0	0	0	0
07:45	55	7	1	0	0	0	0	63	3	0	0	0	0	0	0	3
H/TOT	169	24	5	2	3	0	1	204	3	2	0	0	0	0	0	5
08:00	54	10	0	0	0	0	0	64	0	1	0	0	0	0	0	1
08:15	67	3	4	1	0	0	0	75	0	0	0	0	0	0	0	0
08:30	54	10	0	0	3	0	0	67	5	0	0	0	0	0	0	5
08:45	85	5	5	1	1	1	0	98	0	0	2	0	0	0	0	2
H/TOT	260	28	9	2	4	1	0	304	5	1	2	0	0	0	0	8
09:00	72	14	1	0	0	0	0	87	0	0	0	1	0	0	0	1
09:15	57	10	1	0	0	0	0	68	1	0	0	0	0	0	0	1
09:30	49	9	5	0	0	0	0	63	0	1	1	0	0	0	0	2
09:45	48	13	0	0	1	0	0	62	1	1	0	0	0	0	0	2
H/TOT	226	46	7	0	1	0	0	280	2	2	1	1	0	0	0	6
P/TOT	655	98	21	4	8	1	1	788	10	5	3	1	0	0	0	19

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	83	8	1	0	0	1	0	93	0	1	0	0	0	0	0	1
16:15	80	5	0	0	0	0	0	85	4	0	0	0	0	0	0	4
16:30	77	6	1	1	0	0	0	85	2	0	0	0	0	0	0	2
16:45	101	10	1	0	0	0	1	113	0	0	0	0	0	0	0	0
H/TOT	341	29	3	1	0	1	1	376	6	1	0	0	0	0	0	7
17:00	81	7	1	0	0	1	0	90	1	1	0	0	0	0	0	2
17:15	101	12	1	0	0	0	0	114	2	0	0	0	0	0	0	2
17:30	82	5	1	0	0	0	0	88	2	0	0	0	0	0	0	2
17:45	77	5	0	0	0	0	0	82	1	0	0	0	0	0	0	1
H/TOT	341	29	3	0	0	1	0	374	6	1	0	0	0	0	0	7
18:00	81	5	1	0	0	1	0	88	0	1	0	0	0	0	0	1
18:15	76	4	0	0	0	0	0	80	1	0	0	0	0	0	0	1
18:30	59	1	2	0	0	0	0	62	1	0	1	0	0	0	0	2
18:45	63	1	0	0	1	0	0	65	3	1	0	0	0	0	0	4
H/TOT	279	11	3	0	1	1	0	295	5	2	1	0	0	0	0	8
P/TOT	961	69	9	1	1	3	1	1045	17	4	1	0	0	0	0	22

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:15	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
07:30	6	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0
07:45	9	0	0	0	1	0	0	10	0	0	0	0	0	0	0	0
H/TOT	24	0	0	0	4	0	0	28	0	0	0	0	0	0	0	0
08:00	6	0	0	0	2	0	0	8	0	0	0	0	0	0	0	0
08:15	14	0	0	0	2	0	0	16	0	0	0	0	0	0	0	0
08:30	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
08:45	4	0	0	0	2	0	0	6	0	0	0	0	0	0	0	0
H/TOT	28	0	0	0	7	0	0	35	0	0	0	0	0	0	0	0
09:00	2	0	0	0	2	0	0	4	0	0	0	0	0	0	0	0
09:15	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
09:30	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
09:45	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	6	0	0	15	0	0	0	0	0	0	0	0
P/TOT	61	0	0	0	17	0	0	78	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
16:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
16:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	5	0	0	6	0	0	0	0	0	0	0	0
17:00	3	0	0	0	2	0	0	5	0	0	0	0	0	0	0	0
17:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
17:30	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
17:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	4	0	0	0	6	0	0	10	0	0	0	0	0	0	0	0
18:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
18:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
18:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
18:45	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	6	0	0	7	0	0	0	0	0	0	0	0
P/TOT	6	0	0	0	17	0	0	23	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
07:30	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
07:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	4	0	0	6	1	0	0	0	0	0	0	1
08:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
08:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
08:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	6	0	0	8	0	0	0	0	0	0	0	0
09:00	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:45	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
H/TOT	3	0	0	0	4	0	0	7	0	0	0	0	0	0	0	0
P/TOT	7	0	0	0	14	0	0	21	1	0	0	0	0	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
16:15	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
16:30	2	0	0	0	1	0	0	3	2	0	0	0	0	0	0	2
16:45	6	0	0	0	2	0	0	8	1	0	0	0	0	0	0	1
H/TOT	10	0	0	0	5	0	0	15	6	0	0	0	0	0	0	6
17:00	4	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
17:15	3	0	0	0	2	0	0	5	1	0	0	0	0	0	0	1
17:30	8	1	0	0	1	0	0	10	5	0	0	0	0	0	0	5
17:45	2	0	0	0	2	0	0	4	4	0	0	0	0	0	0	4
H/TOT	17	1	0	0	5	0	0	23	14	0	0	0	0	0	0	14
18:00	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0	1
18:15	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
18:30	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
18:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	4	0	0	13	1	0	0	0	0	0	0	1
P/TOT	36	1	0	0	14	0	0	51	21	0	0	0	0	0	0	21

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
07:45	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
08:00	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
09:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
09:15	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1
09:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:45	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
H/TOT	2	0	0	0	2	0	0	4	2	0	1	0	0	0	0	3
P/TOT	4	0	0	0	5	0	0	9	4	0	1	0	0	0	0	5

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	0	0	0	1	0	0	4	7	0	0	0	0	0	0	7
16:15	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	6
16:30	2	0	0	0	1	0	0	3	14	1	0	0	0	0	0	15
16:45	1	0	0	0	0	0	0	1	24	0	0	0	0	0	0	24
H/TOT	6	0	0	0	2	0	0	8	51	1	0	0	0	0	0	52
17:00	6	0	0	0	1	0	0	7	14	0	0	0	0	0	0	14
17:15	0	0	0	0	0	0	0	0	14	1	0	0	0	0	0	15
17:30	3	0	0	0	1	0	0	4	27	0	0	0	0	0	0	27
17:45	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	7
H/TOT	9	0	0	0	2	0	0	11	62	1	0	0	0	0	0	63
18:00	1	0	0	0	0	0	0	1	9	0	0	0	0	0	0	9
18:15	1	0	0	0	1	0	0	2	2	0	0	0	0	0	0	2
18:30	1	0	0	0	1	0	0	2	9	0	0	0	0	0	0	9
18:45	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
H/TOT	3	0	0	0	2	0	0	5	25	0	0	0	0	0	0	25
P/TOT	18	0	0	0	6	0	0	24	138	2	0	0	0	0	0	140

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	1	0	0	1
07:15	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	1
08:00	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	1	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	48	13	4	0	0	0	0	65	41	6	3	1	1	0	0	52
07:15	63	19	2	0	0	1	0	85	65	12	2	1	0	1	0	81
07:30	81	6	1	0	0	0	0	88	78	15	4	1	0	0	0	98
07:45	86	7	2	0	0	0	0	95	104	14	5	0	0	0	0	123
H/TOT	278	45	9	0	0	1	0	333	288	47	14	3	1	1	0	354
08:00	86	10	2	0	0	0	0	98	76	8	2	1	2	1	0	90
08:15	107	12	2	0	0	0	0	121	116	6	2	2	2	0	0	128
08:30	107	8	2	1	0	0	0	118	123	11	3	1	3	0	0	141
08:45	105	10	6	0	0	0	0	121	60	16	2	4	0	0	0	82
H/TOT	405	40	12	1	0	0	0	458	375	41	9	8	7	1	0	441
09:00	73	6	1	1	0	0	0	81	69	15	4	1	0	0	0	89
09:15	42	9	2	3	0	0	0	56	71	13	2	0	0	0	0	86
09:30	48	10	3	0	0	0	0	61	47	9	4	1	0	0	0	61
09:45	47	19	3	0	0	0	0	69	49	4	3	1	0	0	0	57
H/TOT	210	44	9	4	0	0	0	267	236	41	13	3	0	0	0	293
P/TOT	893	129	30	5	0	1	0	1058	899	129	36	14	8	2	0	1088

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	90	8	0	1	0	0	0	99	101	7	3	0	0	0	0	111
16:15	108	16	3	0	0	2	0	129	108	15	1	1	0	0	0	125
16:30	117	15	0	0	0	0	0	132	98	13	1	0	0	0	0	112
16:45	119	12	0	0	0	0	0	131	114	14	3	0	0	0	0	131
H/TOT	434	51	3	1	0	2	0	491	421	49	8	1	0	0	0	479
17:00	108	9	2	1	0	0	0	120	118	19	1	0	0	0	0	138
17:15	100	17	1	1	0	0	0	119	118	6	0	0	0	1	0	125
17:30	126	7	0	0	0	1	0	134	112	13	1	0	0	1	0	127
17:45	54	3	0	1	0	1	0	59	108	8	1	0	0	0	0	117
H/TOT	388	36	3	3	0	2	0	432	456	46	3	0	0	2	0	507
18:00	74	5	0	0	0	0	0	79	95	13	0	0	0	0	0	108
18:15	70	5	1	0	0	0	0	76	79	4	1	0	0	0	0	84
18:30	64	0	1	0	0	0	0	65	60	2	1	0	0	0	0	63
18:45	58	6	0	0	0	0	0	64	64	7	0	1	0	0	0	72
H/TOT	266	16	2	0	0	0	0	284	298	26	2	1	0	0	0	327
P/TOT	1088	103	8	4	0	4	0	1207	1175	121	13	2	0	2	0	1313

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	16	3	0	2	0	0	72	45	12	3	0	1	0	0	61
07:15	67	12	1	3	2	1	0	86	84	22	2	0	2	0	0	110
07:30	65	8	2	0	2	0	1	78	84	7	1	2	1	0	0	95
07:45	93	11	6	0	0	0	0	110	108	12	5	0	2	0	0	127
H/TOT	276	47	12	3	6	1	1	346	321	53	11	2	6	0	0	393
08:00	95	16	1	1	3	0	0	116	135	11	2	0	1	0	0	149
08:15	100	4	5	2	1	0	0	112	138	15	4	0	3	0	0	160
08:30	108	14	2	0	4	0	0	128	126	14	3	1	1	1	0	146
08:45	159	9	7	3	2	1	0	181	103	12	5	2	3	0	0	125
H/TOT	462	43	15	6	10	1	0	537	502	52	14	3	8	1	0	580
09:00	123	20	2	0	1	0	0	146	122	14	4	0	2	0	1	143
09:15	106	17	4	0	2	0	0	129	90	9	2	3	2	0	0	106
09:30	67	13	6	0	3	0	0	89	77	14	9	1	2	0	0	103
09:45	77	15	3	1	2	0	0	98	76	16	5	0	1	0	0	98
H/TOT	373	65	15	1	8	0	0	462	365	53	20	4	7	0	1	450
P/TOT	1111	155	42	10	24	2	1	1345	1188	158	45	9	21	1	1	1423

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	146	14	2	0	3	1	0	166	100	10	3	2	2	0	0	117
16:15	134	8	0	1	0	0	0	143	122	12	3	0	3	2	0	142
16:30	135	13	2	1	3	0	0	154	114	7	1	1	1	0	0	124
16:45	168	17	1	0	0	0	1	187	141	13	1	0	2	0	0	157
H/TOT	583	52	5	2	6	1	1	650	477	42	8	3	8	2	0	540
17:00	147	13	1	0	3	1	0	165	129	5	2	1	0	0	0	137
17:15	153	13	1	0	0	0	0	167	102	12	1	1	3	0	0	119
17:30	139	10	1	0	2	0	0	152	138	4	0	0	1	1	0	144
17:45	125	8	0	0	1	0	0	134	98	5	0	0	1	0	0	104
H/TOT	564	44	3	0	6	1	0	618	467	26	3	2	5	1	0	504
18:00	125	10	1	0	1	1	0	138	111	4	1	0	0	0	0	116
18:15	120	7	1	0	1	0	0	129	108	3	0	0	0	0	0	111
18:30	102	2	4	0	1	0	0	109	115	3	0	0	1	0	0	119
18:45	98	4	0	1	1	0	0	104	102	2	0	0	1	0	0	105
H/TOT	445	23	6	1	4	1	0	480	436	12	1	0	2	0	0	451
P/TOT	1592	119	14	3	16	3	1	1748	1380	80	12	5	15	3	0	1495

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	26	2	4	1	0	0	0	33	63	18	2	0	0	0	0	83
07:15	37	9	2	0	1	0	0	49	84	15	2	0	0	1	0	102
07:30	58	12	4	1	1	0	0	76	94	16	1	0	1	0	0	112
07:45	90	23	2	0	0	0	0	115	115	10	1	0	0	0	0	126
H/TOT	211	46	12	2	2	0	0	273	356	59	6	0	1	1	0	423
08:00	64	7	1	0	2	1	0	75	140	18	1	0	1	0	0	160
08:15	122	12	0	1	3	0	0	138	139	17	2	0	1	1	0	160
08:30	113	15	3	1	2	0	0	134	166	13	3	0	0	0	0	182
08:45	89	21	1	1	2	0	0	114	191	15	2	0	0	0	0	208
H/TOT	388	55	5	3	9	1	0	461	636	63	8	0	2	1	0	710
09:00	92	8	2	1	1	0	0	104	128	13	0	0	1	0	0	142
09:15	90	11	0	0	0	0	0	101	82	12	2	1	1	0	0	98
09:30	47	10	4	1	1	0	0	63	64	7	1	1	2	0	0	75
09:45	40	10	2	0	1	0	0	53	57	13	2	0	1	0	0	73
H/TOT	269	39	8	2	3	0	0	321	331	45	5	2	5	0	0	388
P/TOT	868	140	25	7	14	1	0	1055	1323	167	19	2	8	2	0	1521

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	96	15	4	0	1	0	0	116	108	11	0	0	2	0	0	121
16:15	108	19	1	0	3	0	0	131	112	13	1	0	0	0	0	126
16:30	101	11	1	0	0	0	0	113	144	15	1	0	2	0	0	162
16:45	118	17	3	0	1	0	0	139	122	10	0	0	0	0	0	132
H/TOT	423	62	9	0	5	0	0	499	486	49	2	0	4	0	0	541
17:00	123	18	1	0	0	0	0	142	95	9	1	0	2	0	1	108
17:15	125	11	0	0	2	1	0	139	102	10	0	0	0	0	0	112
17:30	114	10	1	0	0	1	0	126	110	7	0	0	1	0	0	118
17:45	124	6	1	0	0	0	0	131	63	7	0	1	1	1	0	73
H/TOT	486	45	3	0	2	2	0	538	370	33	1	1	4	1	1	411
18:00	122	11	1	0	0	0	0	134	82	5	0	0	1	0	0	88
18:15	106	6	1	0	0	1	0	114	92	6	2	0	0	0	0	100
18:30	90	5	2	0	0	0	0	97	78	1	2	0	1	0	0	82
18:45	78	7	0	0	0	0	0	85	79	9	0	0	0	0	0	88
H/TOT	396	29	4	0	0	1	0	430	331	21	4	0	2	0	0	358
P/TOT	1305	136	16	0	7	3	0	1467	1187	103	7	1	10	1	1	1310

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	14	0	0	1	0	0	66	46	9	3	0	2	0	0	60
07:15	90	19	1	0	2	0	0	112	57	10	0	2	3	0	0	72
07:30	83	15	1	2	1	0	0	102	63	6	2	0	1	0	1	73
07:45	110	8	2	0	2	0	0	122	90	13	1	0	1	0	0	105
H/TOT	334	56	4	2	6	0	0	402	256	38	6	2	7	0	1	310
08:00	150	18	1	0	2	0	0	171	76	14	0	0	2	0	0	92
08:15	134	17	5	0	2	1	0	159	110	8	4	1	2	0	0	125
08:30	145	14	3	0	2	1	0	165	93	13	1	0	4	0	0	111
08:45	114	14	2	3	2	0	0	135	122	11	7	1	3	1	0	145
H/TOT	543	63	11	3	8	2	0	630	401	46	12	2	11	1	0	473
09:00	122	22	2	1	2	0	1	150	101	15	1	2	2	0	0	121
09:15	87	10	1	1	2	0	0	101	90	13	1	0	1	0	0	105
09:30	81	12	7	2	1	0	0	103	59	15	6	0	2	0	0	82
09:45	76	9	4	0	1	0	0	90	62	20	1	0	2	0	0	85
H/TOT	366	53	14	4	6	0	1	444	312	63	9	2	7	0	0	393
P/TOT	1243	172	29	9	20	2	1	1476	969	147	27	6	25	1	1	1176

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	101	5	2	1	0	0	0	109	111	14	2	0	2	1	0	130
16:15	106	7	1	0	2	0	0	116	108	10	0	0	1	0	0	119
16:30	125	6	1	1	2	0	0	135	102	9	1	1	1	0	0	114
16:45	126	7	1	0	2	0	0	136	123	16	1	0	1	0	1	142
H/TOT	458	25	5	2	6	0	0	496	444	49	4	1	5	1	1	505
17:00	102	4	1	0	0	0	1	108	114	11	1	0	2	1	0	129
17:15	93	4	0	0	2	0	0	99	133	16	1	0	1	0	0	151
17:30	129	6	0	0	2	0	0	137	105	9	1	0	2	0	0	117
17:45	88	10	0	0	2	0	0	100	109	7	0	0	1	0	0	117
H/TOT	412	24	1	0	6	0	1	444	461	43	3	0	6	1	0	514
18:00	91	4	0	0	1	0	0	96	114	8	1	0	2	1	0	126
18:15	101	1	1	0	0	0	0	103	113	6	1	0	1	1	0	122
18:30	101	1	0	0	2	0	0	104	92	2	4	0	1	0	0	99
18:45	109	5	0	0	3	0	0	117	92	4	0	0	3	0	0	99
H/TOT	402	11	1	0	6	0	0	420	411	20	6	0	7	2	0	446
P/TOT	1272	60	7	2	18	0	1	1360	1316	112	13	1	18	4	1	1465

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	0	0	0	2	0	0	22	1	0	0	0	1	0	0	2
07:15	33	0	0	0	2	0	0	35	0	0	0	0	2	0	0	2
07:30	36	3	0	0	1	0	0	40	4	0	0	0	2	0	0	6
07:45	39	0	0	0	2	0	0	41	1	0	0	0	1	0	0	2
H/TOT	128	3	0	0	7	0	0	138	6	0	0	0	6	0	0	12
08:00	32	0	0	0	2	0	0	34	0	0	0	0	3	0	0	3
08:15	41	1	0	0	3	0	0	45	1	0	0	0	1	0	0	2
08:30	36	0	0	0	1	0	0	37	1	0	0	0	1	0	0	2
08:45	10	0	0	0	3	0	0	13	1	0	0	0	3	0	0	4
H/TOT	119	1	0	0	9	0	0	129	3	0	0	0	8	0	0	11
09:00	12	1	2	0	2	0	0	17	2	0	0	0	1	0	0	3
09:15	9	0	0	0	2	0	0	11	1	0	0	0	2	0	0	3
09:30	5	0	0	0	3	0	0	8	1	0	0	0	2	0	0	3
09:45	7	0	0	0	1	0	0	8	3	0	1	0	1	0	0	5
H/TOT	33	1	2	0	8	0	0	44	7	0	1	0	6	0	0	14
P/TOT	280	5	2	0	24	0	0	311	16	0	1	0	20	0	0	37

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	3	0	0	4	14	0	0	0	1	0	0	15
16:15	1	0	0	0	1	0	0	2	7	0	0	0	2	0	0	9
16:30	0	0	0	0	1	0	0	1	20	1	0	0	2	0	0	23
16:45	1	0	0	0	2	0	0	3	32	0	0	0	2	0	0	34
H/TOT	3	0	0	0	7	0	0	10	73	1	0	0	7	0	0	81
17:00	4	0	0	0	2	0	0	6	28	0	0	0	1	0	0	29
17:15	2	0	0	0	2	0	0	4	18	1	0	0	2	0	0	21
17:30	0	1	0	0	2	0	0	3	43	1	0	0	2	0	0	46
17:45	0	0	0	0	2	0	0	2	13	0	0	0	2	0	0	15
H/TOT	6	1	0	0	8	0	0	15	102	2	0	0	7	0	0	111
18:00	2	0	0	0	2	0	0	4	12	0	0	0	1	0	0	13
18:15	0	0	0	0	1	0	0	1	5	0	0	0	1	0	0	6
18:30	3	0	0	0	2	0	0	5	15	0	0	0	2	0	0	17
18:45	0	0	0	0	2	0	0	2	6	0	0	0	2	0	0	8
H/TOT	5	0	0	0	7	0	0	12	38	0	0	0	6	0	0	44
P/TOT	14	1	0	0	22	0	0	37	213	3	0	0	20	0	0	236

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	15	8	0	0	0	0	0	23	1	1	0	0	0	0	0	2
07:15	19	4	0	0	2	0	0	25	0	0	0	0	0	0	0	0
07:30	26	7	0	0	0	0	0	33	2	0	0	0	0	0	0	2
07:45	34	7	0	0	0	0	0	41	1	1	0	0	0	0	0	2
H/TOT	94	26	0	0	2	0	0	122	4	2	0	0	0	0	0	6
08:00	31	2	2	0	0	0	0	35	2	0	0	0	0	0	0	2
08:15	30	9	2	0	2	0	0	43	3	0	0	0	0	0	0	3
08:30	44	6	0	0	0	1	0	51	4	1	0	0	0	0	0	5
08:45	40	1	1	0	1	0	0	43	18	0	0	0	0	0	0	18
H/TOT	145	18	5	0	3	1	0	172	27	1	0	0	0	0	0	28
09:00	31	3	1	0	0	0	0	35	3	0	0	0	0	0	0	3
09:15	23	4	1	0	0	0	0	28	0	0	0	0	0	0	0	0
09:30	28	5	0	0	1	0	0	34	1	0	0	0	0	0	0	1
09:45	18	2	0	0	1	0	0	21	0	0	0	0	0	0	0	0
H/TOT	100	14	2	0	2	0	0	118	4	0	0	0	0	0	0	4
P/TOT	339	58	7	0	7	1	0	412	35	3	0	0	0	0	0	38

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	28	6	0	0	1	0	0	35	1	0	0	0	0	0	0	1
16:15	31	5	0	0	0	0	0	36	1	0	0	0	0	0	0	1
16:30	22	2	0	0	1	0	0	25	2	0	1	0	0	0	0	3
16:45	24	3	1	0	0	1	0	29	5	0	0	0	0	0	0	5
H/TOT	105	16	1	0	2	1	0	125	9	0	1	0	0	0	0	10
17:00	30	1	0	0	0	0	0	31	1	0	0	0	0	0	0	1
17:15	35	2	0	0	0	0	0	37	2	1	0	0	0	0	0	3
17:30	37	7	0	0	0	0	0	44	4	0	0	0	0	0	0	4
17:45	28	2	1	0	0	0	0	31	1	0	0	0	0	0	0	1
H/TOT	130	12	1	0	0	0	0	143	8	1	0	0	0	0	0	9
18:00	28	1	0	0	1	0	0	30	2	1	0	0	0	0	0	3
18:15	20	2	0	0	0	0	0	22	0	0	0	0	0	0	0	0
18:30	30	1	1	0	1	0	0	33	5	0	0	0	0	0	0	5
18:45	15	1	0	0	0	0	0	16	2	0	0	0	0	0	0	2
H/TOT	93	5	1	0	2	0	0	101	9	1	0	0	0	0	0	10
P/TOT	328	33	3	0	4	1	0	369	26	2	1	0	0	0	0	29

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	5
07:45	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
H/TOT	2	0	0	0	0	0	0	2	17	7	0	0	0	0	0	24
08:00	0	1	0	0	0	0	0	1	6	2	0	0	0	0	0	8
08:15	5	0	0	0	0	0	0	5	2	5	0	0	0	0	0	7
08:30	3	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3
08:45	7	1	0	0	0	0	0	8	23	1	0	0	0	0	0	24
H/TOT	15	2	0	0	0	0	0	17	34	8	0	0	0	0	0	42
09:00	13	0	0	0	0	0	0	13	33	3	0	0	0	0	0	36
09:15	0	0	0	0	0	0	0	0	6	2	0	0	0	0	0	8
09:30	1	2	0	0	0	0	0	3	2	3	0	0	0	0	0	5
09:45	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
H/TOT	14	2	0	0	0	0	0	16	45	9	0	0	0	0	0	54
P/TOT	31	4	0	0	0	0	0	35	96	24	0	0	0	0	0	120

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	1	0	0	0	0	0	4	5	1	0	0	0	0	0	6
16:15	1	1	0	0	0	0	0	2	6	3	0	0	0	0	0	9
16:30	1	0	0	0	0	0	0	1	3	1	0	0	0	0	0	4
16:45	3	2	0	0	0	0	0	5	3	1	0	0	0	0	0	4
H/TOT	8	4	0	0	0	0	0	12	17	6	0	0	0	0	0	23
17:00	3	0	0	0	0	0	0	3	4	1	1	0	0	0	0	6
17:15	4	0	0	0	0	0	0	4	4	1	0	0	0	0	0	5
17:30	0	1	0	0	0	0	0	1	6	0	0	0	0	0	0	6
17:45	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
H/TOT	7	1	0	0	0	0	0	8	18	2	1	0	0	0	0	21
18:00	7	0	0	0	0	0	0	7	55	1	0	0	0	0	0	56
18:15	1	0	0	0	0	0	0	1	8	1	0	0	0	0	0	9
18:30	1	0	0	0	0	0	0	1	5	0	0	0	0	0	0	5
18:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
H/TOT	9	0	0	0	0	0	0	9	69	2	0	0	0	0	0	71
P/TOT	24	5	0	0	0	0	0	29	104	10	1	0	0	0	0	115

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	2	0	0	0	0	0	10
07:15	0	0	0	0	0	0	0	0	13	2	2	0	0	1	1	19
07:30	3	1	0	0	0	0	0	4	13	1	1	0	0	0	0	15
07:45	3	2	0	0	0	0	0	5	15	3	1	0	4	0	0	23
H/TOT	6	3	0	0	0	0	0	9	49	8	4	0	4	1	1	67
08:00	3	2	0	0	0	0	0	5	13	2	1	0	1	0	0	17
08:15	4	1	0	0	0	0	0	5	27	4	2	0	1	0	0	34
08:30	15	1	0	0	0	0	0	16	21	2	0	0	0	0	0	23
08:45	30	3	0	0	0	0	0	33	39	5	3	0	1	0	0	48
H/TOT	52	7	0	0	0	0	0	59	100	13	6	0	3	0	0	122
09:00	11	3	0	0	0	0	0	14	30	5	2	0	0	0	0	37
09:15	5	2	0	0	0	0	0	7	15	1	0	0	3	0	0	19
09:30	1	0	0	0	0	0	0	1	18	5	0	0	0	0	0	23
09:45	4	2	0	0	0	0	0	6	14	2	2	0	2	0	0	20
H/TOT	21	7	0	0	0	0	0	28	77	13	4	0	5	0	0	99
P/TOT	79	17	0	0	0	0	0	96	226	34	14	0	12	1	1	288

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	3	0	0	0	0	0	10	33	4	0	0	0	0	0	37
16:15	5	2	0	0	0	0	0	7	41	5	0	0	0	0	0	46
16:30	18	2	0	0	0	0	0	20	46	3	2	0	2	1	1	55
16:45	29	0	0	0	0	0	0	29	24	9	1	0	0	0	0	34
H/TOT	59	7	0	0	0	0	0	66	144	21	3	0	2	1	1	172
17:00	25	0	0	0	0	0	0	25	42	10	0	0	0	1	1	54
17:15	6	0	0	0	0	0	0	6	41	4	0	0	0	0	1	46
17:30	14	0	0	0	0	0	0	14	28	3	0	0	1	0	0	32
17:45	12	0	0	0	0	0	0	12	44	3	0	0	0	0	0	47
H/TOT	57	0	0	0	0	0	0	57	155	20	0	0	1	1	2	179
18:00	10	2	0	0	0	0	0	12	40	2	2	0	0	0	0	44
18:15	4	0	0	0	0	0	0	4	45	2	0	0	0	0	1	48
18:30	5	0	0	0	0	0	0	5	27	2	0	0	1	0	1	31
18:45	2	1	0	0	0	0	0	3	28	2	1	0	0	0	0	31
H/TOT	21	3	0	0	0	0	0	24	140	8	3	0	1	0	2	154
P/TOT	137	10	0	0	0	0	0	147	439	49	6	0	4	2	5	505

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	2	0	0	0	0	0	11	16	9	0	0	0	0	0	25
07:15	13	2	2	0	0	1	1	19	19	4	0	0	2	0	0	25
07:30	13	1	1	0	0	0	0	15	28	7	0	0	0	0	0	35
07:45	16	3	1	0	4	0	0	24	35	8	0	0	0	0	0	43
H/TOT	51	8	4	0	4	1	1	69	98	28	0	0	2	0	0	128
08:00	13	3	1	0	1	0	0	18	33	2	2	0	0	0	0	37
08:15	32	4	2	0	1	0	0	39	33	9	2	0	2	0	0	46
08:30	24	2	0	0	0	0	0	26	48	7	0	0	0	1	0	56
08:45	46	6	3	0	1	0	0	56	58	1	1	0	1	0	0	61
H/TOT	115	15	6	0	3	0	0	139	172	19	5	0	3	1	0	200
09:00	43	5	2	0	0	0	0	50	34	3	1	0	0	0	0	38
09:15	15	1	0	0	3	0	0	19	23	4	1	0	0	0	0	28
09:30	19	7	0	0	0	0	0	26	29	5	0	0	1	0	0	35
09:45	14	2	2	0	2	0	0	20	18	2	0	0	1	0	0	21
H/TOT	91	15	4	0	5	0	0	115	104	14	2	0	2	0	0	122
P/TOT	257	38	14	0	12	1	1	323	374	61	7	0	7	1	0	450

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	36	5	0	0	0	0	0	41	29	6	0	0	1	0	0	36
16:15	42	6	0	0	0	0	0	48	32	5	0	0	0	0	0	37
16:30	47	3	2	0	2	1	1	56	24	2	1	0	1	0	0	28
16:45	27	11	1	0	0	0	0	39	29	3	1	0	0	1	0	34
H/TOT	152	25	3	0	2	1	1	184	114	16	2	0	2	1	0	135
17:00	45	10	0	0	0	1	1	57	31	1	0	0	0	0	0	32
17:15	45	4	0	0	0	0	1	50	37	3	0	0	0	0	0	40
17:30	28	4	0	0	1	0	0	33	41	7	0	0	0	0	0	48
17:45	44	3	0	0	0	0	0	47	29	2	1	0	0	0	0	32
H/TOT	162	21	0	0	1	1	2	187	138	13	1	0	0	0	0	152
18:00	47	2	2	0	0	0	0	51	30	2	0	0	1	0	0	33
18:15	46	2	0	0	0	0	1	49	20	2	0	0	0	0	0	22
18:30	28	2	0	0	1	0	1	32	35	1	1	0	1	0	0	38
18:45	28	2	1	0	0	0	0	31	17	1	0	0	0	0	0	18
H/TOT	149	8	3	0	1	0	2	163	102	6	1	0	2	0	0	111
P/TOT	463	54	6	0	4	2	5	534	354	35	4	0	4	1	0	398

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	0	0	0	0	0	2	6	2	0	0	0	0	0	8
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	5	1	0	0	0	0	0	6	3	2	0	0	0	0	0	5
07:45	4	3	0	0	0	0	0	7	6	2	0	0	0	0	0	8
H/TOT	10	5	0	0	0	0	0	15	19	7	0	0	0	0	0	26
08:00	5	2	0	0	0	0	0	7	6	3	0	0	0	0	0	9
08:15	7	1	0	0	0	0	0	8	7	5	0	0	0	0	0	12
08:30	19	2	0	0	0	0	0	21	6	0	0	0	0	0	0	6
08:45	48	3	0	0	0	0	0	51	30	2	0	0	0	0	0	32
H/TOT	79	8	0	0	0	0	0	87	49	10	0	0	0	0	0	59
09:00	14	3	0	0	0	0	0	17	46	3	0	0	0	0	0	49
09:15	5	2	0	0	0	0	0	7	6	2	0	0	0	0	0	8
09:30	2	0	0	0	0	0	0	2	3	5	0	0	0	0	0	8
09:45	4	2	0	0	0	0	0	6	4	1	0	0	0	0	0	5
H/TOT	25	7	0	0	0	0	0	32	59	11	0	0	0	0	0	70
P/TOT	114	20	0	0	0	0	0	134	127	28	0	0	0	0	0	155

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	8	3	0	0	0	0	0	11	8	2	0	0	0	0	0	10
16:15	6	2	0	0	0	0	0	8	7	4	0	0	0	0	0	11
16:30	20	2	1	0	0	0	0	23	4	1	0	0	0	0	0	5
16:45	34	0	0	0	0	0	0	34	6	3	0	0	0	0	0	9
H/TOT	68	7	1	0	0	0	0	76	25	10	0	0	0	0	0	35
17:00	26	0	0	0	0	0	0	26	7	1	1	0	0	0	0	9
17:15	8	1	0	0	0	0	0	9	8	1	0	0	0	0	0	9
17:30	18	0	0	0	0	0	0	18	6	1	0	0	0	0	0	7
17:45	13	0	0	0	0	0	0	13	4	0	0	0	0	0	0	4
H/TOT	65	1	0	0	0	0	0	66	25	3	1	0	0	0	0	29
18:00	12	3	0	0	0	0	0	15	62	1	0	0	0	0	0	63
18:15	4	0	0	0	0	0	0	4	9	1	0	0	0	0	0	10
18:30	10	0	0	0	0	0	0	10	6	0	0	0	0	0	0	6
18:45	4	1	0	0	0	0	0	5	1	0	0	0	0	0	0	1
H/TOT	30	4	0	0	0	0	0	34	78	2	0	0	0	0	0	80
P/TOT	163	12	1	0	0	0	0	176	128	15	1	0	0	0	0	144

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	10	0	0	0	0	0	30	8	2	0	0	0	0	0	10
07:15	23	5	0	0	2	0	0	30	13	2	2	0	0	1	1	19
07:30	29	9	0	0	0	0	0	38	16	2	1	0	0	0	0	19
07:45	39	9	0	0	0	0	0	48	18	5	1	0	4	0	0	28
H/TOT	111	33	0	0	2	0	0	146	55	11	4	0	4	1	1	76
08:00	37	4	2	0	0	0	0	43	16	4	1	0	1	0	0	22
08:15	32	14	2	0	2	0	0	50	31	5	2	0	1	0	0	39
08:30	47	6	0	0	0	1	0	54	36	3	0	0	0	0	0	39
08:45	63	2	1	0	1	0	0	67	69	8	3	0	1	0	0	81
H/TOT	179	26	5	0	3	1	0	214	152	20	6	0	3	0	0	181
09:00	64	6	1	0	0	0	0	71	41	8	2	0	0	0	0	51
09:15	29	6	1	0	0	0	0	36	20	3	0	0	3	0	0	26
09:30	30	8	0	0	1	0	0	39	19	5	0	0	0	0	0	24
09:45	22	3	0	0	1	0	0	26	18	4	2	0	2	0	0	26
H/TOT	145	23	2	0	2	0	0	172	98	20	4	0	5	0	0	127
P/TOT	435	82	7	0	7	1	0	532	305	51	14	0	12	1	1	384

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	33	7	0	0	1	0	0	41	40	7	0	0	0	0	0	47
16:15	37	8	0	0	0	0	0	45	46	7	0	0	0	0	0	53
16:30	25	3	0	0	1	0	0	29	64	5	2	0	2	1	1	75
16:45	27	4	1	0	0	1	0	33	53	9	1	0	0	0	0	63
H/TOT	122	22	1	0	2	1	0	148	203	28	3	0	2	1	1	238
17:00	34	2	1	0	0	0	0	37	67	10	0	0	0	1	1	79
17:15	39	3	0	0	0	0	0	42	47	4	0	0	0	0	1	52
17:30	43	7	0	0	0	0	0	50	42	3	0	0	1	0	0	46
17:45	32	2	1	0	0	0	0	35	56	3	0	0	0	0	0	59
H/TOT	148	14	2	0	0	0	0	164	212	20	0	0	1	1	2	236
18:00	83	2	0	0	1	0	0	86	50	4	2	0	0	0	0	56
18:15	28	3	0	0	0	0	0	31	49	2	0	0	0	0	1	52
18:30	35	1	1	0	1	0	0	38	32	2	0	0	1	0	1	36
18:45	16	1	0	0	0	0	0	17	30	3	1	0	0	0	0	34
H/TOT	162	7	1	0	2	0	0	172	161	11	3	0	1	0	2	178
P/TOT	432	43	4	0	4	1	0	484	576	59	6	0	4	2	5	652

27178		CARDIFF							
		FEBRUARY 2022							
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Total Vehicles**	**5 Day Ave.**	**7 Day Ave.**	**Average 85%ile Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	13738	2101	1963	32.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		12873	1973	1839	32.4

27178		CARDIFF FEBRUARY 2022				
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Average Mean Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	27.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		26.0

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**19**	3	16	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	1	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
04:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
05:00	**13**	0	11	1	1	0	0	0	0	0	0	0	0	0
06:00	**20**	0	16	3	0	0	1	0	0	0	0	0	0	0
07:00	**75**	2	55	12	1	3	2	0	0	0	0	0	0	0
08:00	**180**	2	164	10	1	2	1	0	0	0	0	0	0	0
09:00	**125**	1	104	15	1	2	2	0	0	0	0	0	0	0
10:00	**92**	0	83	6	2	1	0	0	0	0	0	0	0	0
11:00	**127**	0	105	19	3	0	0	0	0	0	0	0	0	0
12:00	**112**	0	102	7	1	2	0	0	0	0	0	0	0	0
13:00	**133**	2	114	14	2	1	0	0	0	0	0	0	0	0
14:00	**143**	0	133	8	2	0	0	0	0	0	0	0	0	0
15:00	**203**	1	183	16	1	2	0	0	0	0	0	0	0	0
16:00	**183**	6	160	13	3	1	0	0	0	0	0	0	0	0
17:00	**154**	1	135	15	1	2	0	0	0	0	0	0	0	0
18:00	**143**	4	128	10	1	0	0	0	0	0	0	0	0	0
19:00	**123**	4	113	5	1	0	0	0	0	0	0	0	0	0
20:00	**96**	2	85	7	2	0	0	0	0	0	0	0	0	0
21:00	**68**	1	59	6	0	1	1	0	0	0	0	0	0	0
22:00	**44**	1	38	5	0	0	0	0	0	0	0	0	0	0
23:00	**31**	1	29	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1670**	**19**	**1466**	**145**	**19**	**16**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1977**	**26**	**1739**	**166**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2052**	**28**	**1806**	**172**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2110**	**32**	**1857**	**174**	**23**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**5**	1	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	1	5	1	0	0	0	0	0	0	0	0	0	0
06:00	**23**	1	21	1	0	0	0	0	0	0	0	0	0	0
07:00	**47**	1	36	7	1	2	0	0	0	0	0	0	0	0
08:00	**159**	0	147	9	1	2	0	0	0	0	0	0	0	0
09:00	**112**	2	97	9	3	1	0	0	0	0	0	0	0	0
10:00	**99**	0	86	10	2	1	0	0	0	0	0	0	0	0
11:00	**119**	1	105	10	2	1	0	0	0	0	0	0	0	0
12:00	**144**	3	124	15	1	1	0	0	0	0	0	0	0	0
13:00	**119**	0	105	13	1	0	0	0	0	0	0	0	0	0
14:00	**160**	2	143	11	2	2	0	0	0	0	0	0	0	0
15:00	**221**	1	203	14	2	1	0	0	0	0	0	0	0	0
16:00	**205**	4	179	18	2	1	1	0	0	0	0	0	0	0
17:00	**164**	3	147	13	1	0	0	0	0	0	0	0	0	0
18:00	**164**	2	154	6	0	2	0	0	0	0	0	0	0	0
19:00	**152**	3	140	6	3	0	0	0	0	0	0	0	0	0
20:00	**85**	0	82	2	0	1	0	0	0	0	0	0	0	0
21:00	**66**	1	59	5	1	0	0	0	0	0	0	0	0	0
22:00	**57**	0	52	4	0	1	0	0	0	0	0	0	0	0
23:00	**46**	2	42	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1713**	**19**	**1526**	**135**	**18**	**14**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**2039**	**24**	**1828**	**149**	**22**	**15**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2142**	**26**	**1922**	**155**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2186**	**28**	**1963**	**156**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**25**	2	22	1	0	0	0	0	0	0	0	0	0	0
01:00	**14**	0	14	0	0	0	0	0	0	0	0	0	0	0
02:00	**20**	1	19	0	0	0	0	0	0	0	0	0	0	0
03:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
04:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**15**	0	13	1	1	0	0	0	0	0	0	0	0	0
06:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
07:00	**25**	0	22	2	1	0	0	0	0	0	0	0	0	0
08:00	**60**	0	54	5	1	0	0	0	0	0	0	0	0	0
09:00	**87**	1	78	6	2	0	0	0	0	0	0	0	0	0
10:00	**101**	0	92	6	3	0	0	0	0	0	0	0	0	0
11:00	**139**	1	131	6	0	1	0	0	0	0	0	0	0	0
12:00	**150**	1	139	7	2	1	0	0	0	0	0	0	0	0
13:00	**157**	2	146	7	2	0	0	0	0	0	0	0	0	0
14:00	**111**	4	94	12	1	0	0	0	0	0	0	0	0	0
15:00	**138**	2	132	3	0	1	0	0	0	0	0	0	0	0
16:00	**112**	1	103	6	2	0	0	0	0	0	0	0	0	0
17:00	**118**	1	111	5	1	0	0	0	0	0	0	0	0	0
18:00	**132**	1	124	5	0	2	0	0	0	0	0	0	0	0
19:00	**121**	0	117	2	0	2	0	0	0	0	0	0	0	0
20:00	**83**	0	79	3	0	1	0	0	0	0	0	0	0	0
21:00	**61**	1	60	0	0	0	0	0	0	0	0	0	0	0
22:00	**53**	0	52	0	1	0	0	0	0	0	0	0	0	0
23:00	**49**	0	44	4	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1330**	**14**	**1226**	**70**	**15**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**15**	**1494**	**75**	**15**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1709**	**15**	**1590**	**79**	**16**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1799**	**18**	**1674**	**81**	**17**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

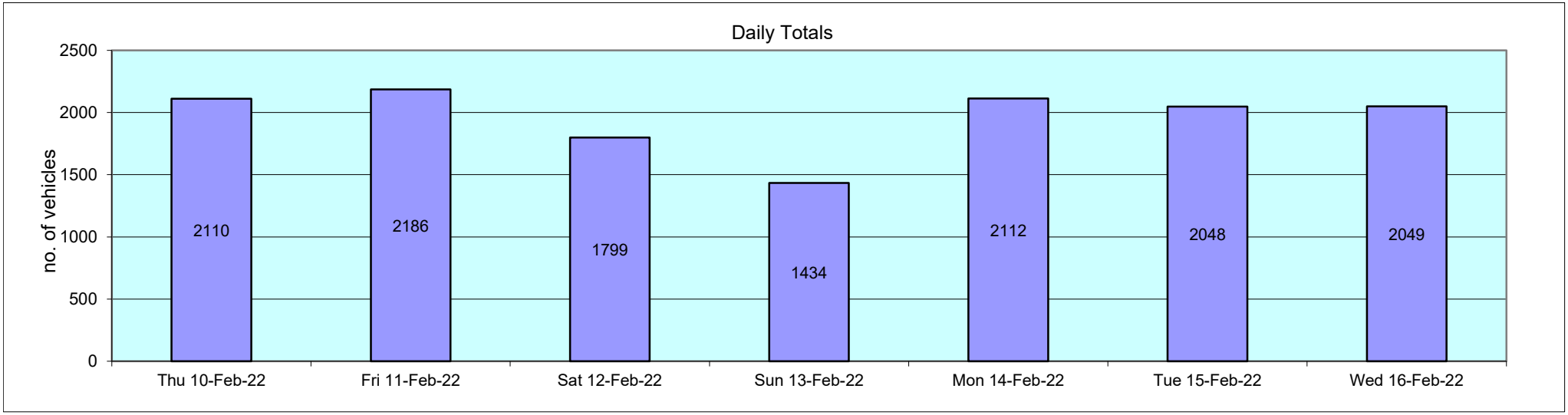
27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**20**	1	18	1	0	0	0	0	0	0	0	0	0	0
01:00	**26**	0	25	1	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
03:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**16**	0	15	0	0	1	0	0	0	0	0	0	0	0
07:00	**21**	0	21	0	0	0	0	0	0	0	0	0	0	0
08:00	**25**	0	24	0	0	1	0	0	0	0	0	0	0	0
09:00	**36**	0	33	2	1	0	0	0	0	0	0	0	0	0
10:00	**63**	0	61	1	0	1	0	0	0	0	0	0	0	0
11:00	**96**	0	88	6	2	0	0	0	0	0	0	0	0	0
12:00	**117**	0	107	8	2	0	0	0	0	0	0	0	0	0
13:00	**124**	3	114	5	1	1	0	0	0	0	0	0	0	0
14:00	**124**	0	111	11	1	1	0	0	0	0	0	0	0	0
15:00	**133**	3	122	7	1	0	0	0	0	0	0	0	0	0
16:00	**115**	0	108	4	2	1	0	0	0	0	0	0	0	0
17:00	**117**	0	112	5	0	0	0	0	0	0	0	0	0	0
18:00	**110**	1	103	4	0	2	0	0	0	0	0	0	0	0
19:00	**78**	1	73	3	0	1	0	0	0	0	0	0	0	0
20:00	**66**	0	63	2	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	45	1	0	1	0	0	0	0	0	0	0	0
22:00	**35**	1	31	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	18	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1081**	**7**	**1004**	**53**	**10**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1288**	**8**	**1200**	**59**	**10**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1344**	**10**	**1249**	**63**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1434**	**11**	**1336**	**65**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**15**	1	14	0	0	0	0	0	0	0	0	0	0	0
01:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	23	1	0	1	0	0	0	0	0	0	0	0
07:00	**67**	0	51	11	1	4	0	0	0	0	0	0	0	0
08:00	**171**	1	149	17	1	2	1	0	0	0	0	0	0	0
09:00	**130**	2	113	13	0	2	0	0	0	0	0	0	0	0
10:00	**93**	1	79	9	2	1	1	0	0	0	0	0	0	0
11:00	**131**	2	116	11	2	0	0	0	0	0	0	0	0	0
12:00	**123**	3	110	8	1	1	0	0	0	0	0	0	0	0
13:00	**105**	1	90	10	1	2	0	0	1	0	0	0	0	0
14:00	**146**	1	134	9	0	2	0	0	0	0	0	0	0	0
15:00	**221**	4	200	14	2	0	1	0	0	0	0	0	0	0
16:00	**202**	2	183	14	1	2	0	0	0	0	0	0	0	0
17:00	**166**	1	147	16	2	0	0	0	0	0	0	0	0	0
18:00	**127**	3	119	4	0	1	0	0	0	0	0	0	0	0
19:00	**125**	3	115	6	0	1	0	0	0	0	0	0	0	0
20:00	**91**	0	86	4	0	1	0	0	0	0	0	0	0	0
21:00	**60**	0	57	2	1	0	0	0	0	0	0	0	0	0
22:00	**51**	0	48	2	1	0	0	0	0	0	0	0	0	0
23:00	**38**	0	38	0	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1682**	**21**	**1491**	**136**	**13**	**17**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**24**	**1772**	**149**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**24**	**1858**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**25**	**1897**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
01:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
02:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	0	0	0	1	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	20	4	1	0	0	0	0	0	0	0	0	0
07:00	**76**	1	54	17	0	3	1	0	0	0	0	0	0	0
08:00	**156**	1	137	14	3	0	1	0	0	0	0	0	0	0
09:00	**107**	0	89	12	1	5	0	0	0	0	0	0	0	0
10:00	**95**	0	81	12	1	1	0	0	0	0	0	0	0	0
11:00	**114**	0	94	17	1	1	1	0	0	0	0	0	0	0
12:00	**124**	1	107	14	0	2	0	0	0	0	0	0	0	0
13:00	**110**	1	93	13	2	1	0	0	0	0	0	0	0	0
14:00	**133**	2	119	9	0	2	0	0	1	0	0	0	0	0
15:00	**207**	0	186	18	1	2	0	0	0	0	0	0	0	0
16:00	**187**	4	171	10	1	1	0	0	0	0	0	0	0	0
17:00	**180**	1	172	6	1	0	0	0	0	0	0	0	0	0
18:00	**158**	0	150	7	0	1	0	0	0	0	0	0	0	0
19:00	**111**	1	100	8	1	1	0	0	0	0	0	0	0	0
20:00	**82**	2	73	6	1	0	0	0	0	0	0	0	0	0
21:00	**56**	0	54	2	0	0	0	0	0	0	0	0	0	0
22:00	**54**	2	50	1	1	0	0	0	0	0	0	0	0	0
23:00	**27**	1	25	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1647**	**11**	**1453**	**149**	**11**	**19**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1921**	**14**	**1700**	**169**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2002**	**17**	**1775**	**171**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2048**	**17**	**1818**	**173**	**15**	**20**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**17**	0	17	0	0	0	0	0	0	0	0	0	0	0
01:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
06:00	**28**	0	22	5	0	1	0	0	0	0	0	0	0	0
07:00	**65**	1	50	11	0	3	0	0	0	0	0	0	0	0
08:00	**174**	0	158	14	2	0	0	0	0	0	0	0	0	0
09:00	**114**	1	92	17	2	2	0	0	0	0	0	0	0	0
10:00	**102**	0	91	8	2	1	0	0	0	0	0	0	0	0
11:00	**118**	4	101	9	0	4	0	0	0	0	0	0	0	0
12:00	**128**	1	111	13	1	2	0	0	0	0	0	0	0	0
13:00	**113**	0	99	11	0	3	0	0	0	0	0	0	0	0
14:00	**128**	0	112	13	2	1	0	0	0	0	0	0	0	0
15:00	**214**	0	191	19	1	2	1	0	0	0	0	0	0	0
16:00	**185**	2	168	12	2	0	1	0	0	0	0	0	0	0
17:00	**145**	0	130	14	1	0	0	0	0	0	0	0	0	0
18:00	**164**	0	149	14	0	1	0	0	0	0	0	0	0	0
19:00	**107**	0	99	6	1	0	1	0	0	0	0	0	0	0
20:00	**73**	0	67	4	0	1	0	0	1	0	0	0	0	0
21:00	**73**	1	71	1	0	0	0	0	0	0	0	0	0	0
22:00	**46**	0	43	2	1	0	0	0	0	0	0	0	0	0
23:00	**32**	0	30	0	0	0	2	0	0	0	0	0	0	0
12H,7-19	**1650**	**9**	**1452**	**155**	**13**	**19**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1931**	**10**	**1711**	**171**	**14**	**21**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2009**	**10**	**1784**	**173**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2049**	**10**	**1822**	**175**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Daily Totals														
Thu 10-Feb-22	**2110**	32	1857	174	23	17	7	0	0	0	0	0	0	0
Fri 11-Feb-22	**2186**	28	1963	156	22	16	1	0	0	0	0	0	0	0
Sat 12-Feb-22	**1799**	18	1674	81	17	9	0	0	0	0	0	0	0	0
Sun 13-Feb-22	**1434**	11	1336	65	10	12	0	0	0	0	0	0	0	0
Mon 14-Feb-22	**2112**	25	1897	151	15	20	3	0	1	0	0	0	0	0
Tue 15-Feb-22	**2048**	17	1818	173	15	20	4	0	1	0	0	0	0	0
Wed 16-Feb-22	**2049**	10	1822	175	15	21	5	0	1	0	0	0	0	0
Total Vehicles														
[--]	**13738**	141	12367	975	117	115	20	0	3	0	0	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22															
00:00	19	31.3	25.9	0	3	12	3	0	0	1	0	0	0	0	0
01:00	9	-	32.9	0	0	2	7	0	0	0	0	0	0	0	0
02:00	6	-	25.8	0	1	4	1	0	0	0	0	0	0	0	0
03:00	6	-	19.7	0	3	3	0	0	0	0	0	0	0	0	0
04:00	5	-	30	0	0	2	3	0	0	0	0	0	0	0	0
05:00	13	30.3	26.2	0	2	9	2	0	0	0	0	0	0	0	0
06:00	20	29.6	26.6	0	1	17	2	0	0	0	0	0	0	0	0
07:00	75	30.9	25.2	2	13	44	15	1	0	0	0	0	0	0	0
08:00	180	29.4	25.5	1	19	142	17	0	0	1	0	0	0	0	0
09:00	125	29.1	25.4	1	14	96	14	0	0	0	0	0	0	0	0
10:00	92	32.3	26.5	0	2	71	19	0	0	0	0	0	0	0	0
11:00	127	33.2	27	0	16	74	34	3	0	0	0	0	0	0	0
12:00	112	34.5	28.3	0	8	64	37	3	0	0	0	0	0	0	0
13:00	133	31.1	26.8	0	12	92	27	1	0	1	0	0	0	0	0
14:00	143	31	26	0	15	97	30	1	0	0	0	0	0	0	0
15:00	203	30.5	26.1	0	16	152	34	0	1	0	0	0	0	0	0
16:00	183	31.4	26.8	1	14	122	43	3	0	0	0	0	0	0	0
17:00	154	33.2	27.8	0	7	104	39	4	0	0	0	0	0	0	0
18:00	143	32.4	28	0	3	92	44	2	2	0	0	0	0	0	0
19:00	123	31.6	27	1	8	88	25	1	0	0	0	0	0	0	0
20:00	96	31.9	26.4	0	7	65	23	0	0	1	0	0	0	0	0
21:00	68	32.8	28.4	0	3	41	22	1	0	1	0	0	0	0	0
22:00	44	33.5	27.5	0	5	27	9	2	1	0	0	0	0	0	0
23:00	31	37.6	28.8	0	3	18	6	3	0	1	0	0	0	0	0
12H,7-19	1670	31.5	26.6	5	139	1150	353	18	3	2	0	0	0	0	0
16H,6-22	1977	31.5	26.7	6	158	1361	425	20	3	4	0	0	0	0	0
18H,6-24	2052	31.5	26.8	6	166	1406	440	25	4	5	0	0	0	0	0
24H,0-24	2110	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**15**	38.4	30.1	0	0	8	6	1	0	0	0	0	0	0	0
01:00	**9**	-	30.4	0	0	5	2	2	0	0	0	0	0	0	0
02:00	**6**	-	34.9	0	0	2	1	3	0	0	0	0	0	0	0
03:00	**2**	-	24.9	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**5**	-	20.6	0	3	1	1	0	0	0	0	0	0	0	0
05:00	**7**	-	23.3	0	2	5	0	0	0	0	0	0	0	0	0
06:00	**23**	35.9	28	0	1	14	8	0	0	0	0	0	0	0	0
07:00	**47**	32	27	0	5	28	13	1	0	0	0	0	0	0	0
08:00	**159**	31.5	27.9	0	3	119	34	3	0	0	0	0	0	0	0
09:00	**112**	30.8	27	0	5	80	26	1	0	0	0	0	0	0	0
10:00	**99**	32.8	28	0	4	70	24	1	0	0	0	0	0	0	0
11:00	**119**	32.5	28.3	0	6	73	34	5	1	0	0	0	0	0	0
12:00	**144**	32.4	27.1	2	9	102	26	4	0	0	0	0	1	0	0
13:00	**119**	31.4	26.1	1	12	80	22	2	1	1	0	0	0	0	0
14:00	**160**	33.2	28	0	6	109	38	6	1	0	0	0	0	0	0
15:00	**221**	31.4	27	0	10	164	44	3	0	0	0	0	0	0	0
16:00	**205**	32.2	27.4	0	11	144	46	3	1	0	0	0	0	0	0
17:00	**164**	31.1	26.5	1	12	115	34	2	0	0	0	0	0	0	0
18:00	**164**	32.7	27.1	0	12	113	37	1	1	0	0	0	0	0	0
19:00	**152**	33.2	28.2	0	4	103	38	4	3	0	0	0	0	0	0
20:00	**85**	32.3	27.6	0	7	52	24	2	0	0	0	0	0	0	0
21:00	**66**	33	28.2	1	2	39	23	1	0	0	0	0	0	0	0
22:00	**57**	34	29.3	0	0	35	19	2	0	0	1	0	0	0	0
23:00	**46**	36.6	27.1	1	6	25	12	1	1	0	0	0	0	0	0
12H,7-19	**1713**	**32**	**27.3**	**4**	**95**	**1197**	**378**	**32**	**5**	**1**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**2039**	**32.2**	**27.4**	**5**	**109**	**1405**	**471**	**39**	**8**	**1**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**2142**	**32.3**	**27.5**	**6**	**115**	**1465**	**502**	**42**	**9**	**1**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**2186**	**32.3**	**27.5**	**6**	**120**	**1488**	**512**	**48**	**9**	**1**	**1**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22															
00:00	**25**	30.5	25.1	0	3	18	4	0	0	0	0	0	0	0	0
01:00	**14**	38.5	29	0	1	9	3	1	0	0	0	0	0	0	0
02:00	**20**	34	28.2	0	1	13	5	0	1	0	0	0	0	0	0
03:00	**12**	38.2	30	0	0	8	4	0	0	0	0	0	0	0	0
04:00	**4**	-	30.1	0	0	2	2	0	0	0	0	0	0	0	0
05:00	**15**	38.2	28.6	0	2	9	3	0	1	0	0	0	0	0	0
06:00	**12**	34.7	29.5	0	0	7	4	1	0	0	0	0	0	0	0
07:00	**25**	32.7	27.5	0	1	16	7	1	0	0	0	0	0	0	0
08:00	**60**	33.1	26.1	0	10	35	15	0	0	0	0	0	0	0	0
09:00	**87**	31.8	26.8	0	6	56	24	0	1	0	0	0	0	0	0
10:00	**101**	31.8	27	0	7	73	19	2	0	0	0	0	0	0	0
11:00	**139**	32.2	26.8	0	14	87	36	2	0	0	0	0	0	0	0
12:00	**150**	31.7	27.1	0	5	109	33	1	2	0	0	0	0	0	0
13:00	**157**	32	27.4	0	9	111	35	2	0	0	0	0	0	0	0
14:00	**111**	33.4	28.1	1	6	72	28	3	1	0	0	0	0	0	0
15:00	**138**	33.7	28.1	1	6	82	45	1	3	0	0	0	0	0	0
16:00	**112**	33.1	28	0	7	73	29	1	2	0	0	0	0	0	0
17:00	**118**	33.3	27.5	1	5	79	33	0	0	0	0	0	0	0	0
18:00	**132**	29.9	26.8	1	6	107	13	3	1	0	1	0	0	0	0
19:00	**121**	31.1	25.8	0	20	79	20	1	1	0	0	0	0	0	0
20:00	**83**	34.6	27.8	0	10	50	16	3	2	0	1	0	0	0	1
21:00	**61**	33.8	27.8	0	3	43	12	2	1	0	0	0	0	0	0
22:00	**53**	32.1	27.1	0	6	28	18	1	0	0	0	0	0	0	0
23:00	**49**	33.3	28.1	0	5	28	14	0	2	0	0	0	0	0	0
12H,7-19	**1330**	**32.3**	**27.3**	**4**	**82**	**900**	**317**	**16**	**10**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**32.3**	**27.3**	**4**	**115**	**1079**	**369**	**23**	**14**	**0**	**2**	**0**	**0**	**0**	**1**
18H,6-24	**1709**	**32.3**	**27.3**	**4**	**126**	**1135**	**401**	**24**	**16**	**0**	**2**	**0**	**0**	**0**	**1**
24H,0-24	**1799**	**32.4**	**27.3**	**4**	**133**	**1194**	**422**	**25**	**18**	**0**	**2**	**0**	**0**	**0**	**1**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**20**	36	28.2	0	2	12	5	1	0	0	0	0	0	0	0
01:00	**26**	41.4	31.1	0	1	11	9	4	1	0	0	0	0	0	0
02:00	**8**	-	27.5	0	0	5	3	0	0	0	0	0	0	0	0
03:00	**15**	30.3	24.6	0	2	11	2	0	0	0	0	0	0	0	0
04:00	**12**	32.4	26.9	0	1	9	1	0	1	0	0	0	0	0	0
05:00	**9**	-	34	0	0	4	3	0	1	1	0	0	0	0	0
06:00	**16**	36.8	28.6	0	0	11	3	2	0	0	0	0	0	0	0
07:00	**21**	33.9	27.1	0	2	12	7	0	0	0	0	0	0	0	0
08:00	**25**	32.2	27.5	0	1	18	5	1	0	0	0	0	0	0	0
09:00	**36**	33.7	26.7	0	5	21	10	0	0	0	0	0	0	0	0
10:00	**63**	34.6	27.7	0	11	35	12	4	0	1	0	0	0	0	0
11:00	**96**	31.6	27.4	0	6	68	21	1	0	0	0	0	0	0	0
12:00	**117**	34	28.1	0	12	63	37	3	1	1	0	0	0	0	0
13:00	**124**	33.9	28	1	11	71	39	1	0	1	0	0	0	0	0
14:00	**124**	32.6	27.8	0	5	84	33	1	1	0	0	0	0	0	0
15:00	**133**	33.6	28.6	1	6	84	36	4	1	0	0	0	1	0	0
16:00	**115**	33.6	27.9	0	12	66	34	2	1	0	0	0	0	0	0
17:00	**117**	31.5	27.2	1	7	81	27	1	0	0	0	0	0	0	0
18:00	**110**	31.2	26.6	0	9	78	22	1	0	0	0	0	0	0	0
19:00	**78**	33.5	28.2	0	4	50	19	2	2	1	0	0	0	0	0
20:00	**66**	33.8	28.3	0	4	37	25	0	0	0	0	0	0	0	0
21:00	**47**	35	28.7	0	2	27	17	1	0	0	0	0	0	0	0
22:00	**35**	34.1	29	0	2	19	12	0	0	1	1	0	0	0	0
23:00	**21**	34.1	29.2	1	0	10	9	0	0	1	0	0	0	0	0
12H,7-19	**1081**	**32.9**	**27.7**	**3**	**87**	**681**	**283**	**19**	**4**	**3**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**1288**	**33.1**	**27.8**	**3**	**97**	**806**	**347**	**24**	**6**	**4**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**1344**	**33.2**	**27.8**	**4**	**99**	**835**	**368**	**24**	**6**	**6**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**1434**	**33.3**	**27.9**	**4**	**105**	**887**	**391**	**29**	**9**	**7**	**1**	**0**	**1**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**15**	46.1	31.4	0	1	8	2	2	1	1	0	0	0	0	0
01:00	**8**	-	27.1	0	0	7	1	0	0	0	0	0	0	0	0
02:00	**6**	-	30.3	0	0	4	2	0	0	0	0	0	0	0	0
03:00	**2**	-	28.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**2**	-	27.7	0	0	2	0	0	0	0	0	0	0	0	0
05:00	**7**	-	27	0	0	7	0	0	0	0	0	0	0	0	0
06:00	**25**	37.4	28.5	0	2	15	5	2	0	1	0	0	0	0	0
07:00	**67**	31.8	27.1	0	7	44	16	0	0	0	0	0	0	0	0
08:00	**171**	31.4	26.2	0	23	112	34	0	2	0	0	0	0	0	0
09:00	**130**	31.8	27.6	0	10	88	28	3	0	1	0	0	0	0	0
10:00	**93**	33.9	27	0	10	60	20	3	0	0	0	0	0	0	0
11:00	**131**	30.8	26.7	0	5	103	21	2	0	0	0	0	0	0	0
12:00	**123**	34.9	28	1	6	73	39	2	2	0	0	0	0	0	0
13:00	**105**	31.2	26.9	0	8	70	25	2	0	0	0	0	0	0	0
14:00	**146**	31.5	26.8	1	13	97	34	0	1	0	0	0	0	0	0
15:00	**221**	32	26.3	1	22	152	44	2	0	0	0	0	0	0	0
16:00	**202**	31.4	27.2	0	8	153	37	2	1	1	0	0	0	0	0
17:00	**166**	32.4	27.6	0	7	113	45	1	0	0	0	0	0	0	0
18:00	**127**	31.1	26	0	21	83	20	3	0	0	0	0	0	0	0
19:00	**125**	32.7	27.4	0	10	81	32	1	1	0	0	0	0	0	0
20:00	**91**	31.6	27.1	0	1	73	16	1	0	0	0	0	0	0	0
21:00	**60**	35.4	29.2	0	1	36	20	2	1	0	0	0	0	0	0
22:00	**51**	31.4	27.4	0	3	37	8	2	0	1	0	0	0	0	0
23:00	**38**	31.5	26.9	0	2	29	5	1	0	1	0	0	0	0	0
12H,7-19	**1682**	**31.8**	**26.9**	**3**	**140**	**1148**	**363**	**20**	**6**	**2**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**31.9**	**27**	**3**	**154**	**1353**	**436**	**26**	**8**	**3**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**31.9**	**27**	**3**	**159**	**1419**	**449**	**29**	**8**	**5**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**31.9**	**27.1**	**3**	**160**	**1449**	**454**	**31**	**9**	**6**	**0**	**0**	**0**	**0**	**0**

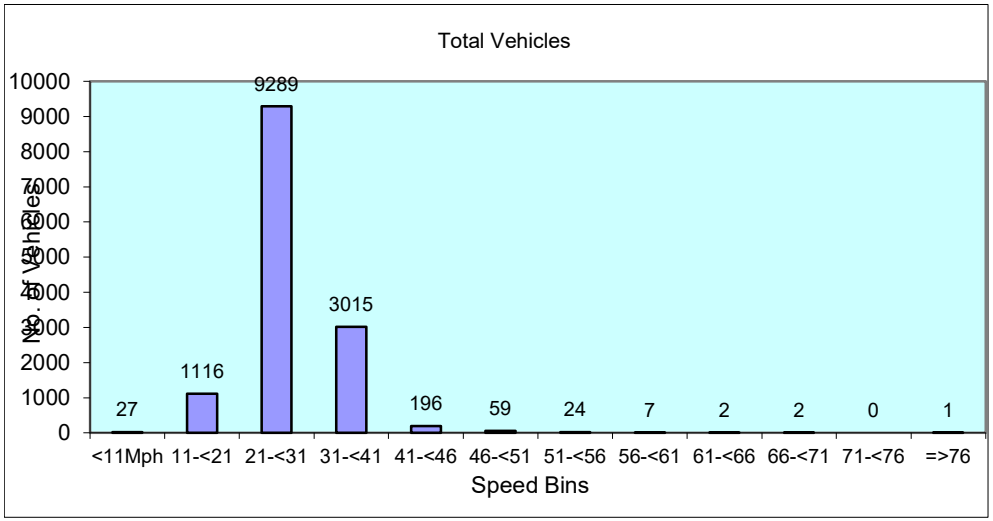
Data produced by
Transport Surveys Ltd

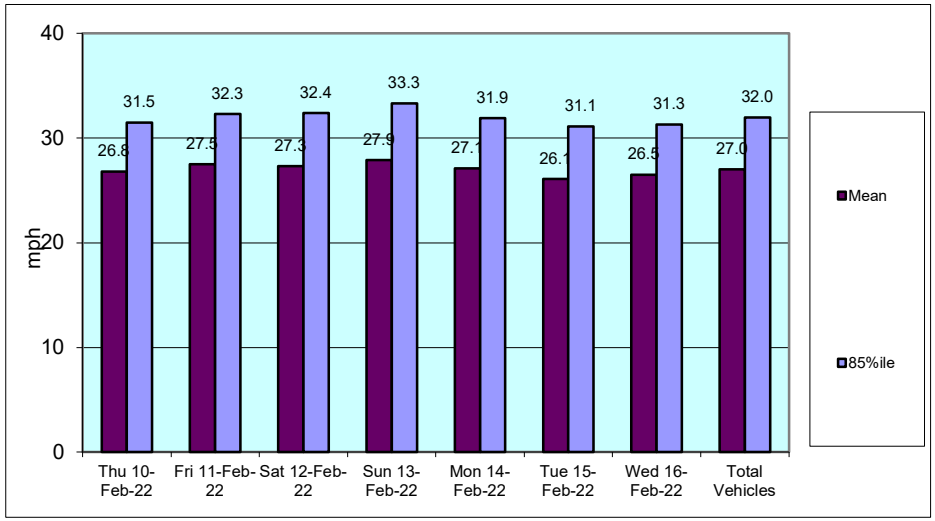
27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	12	40.4	28.3	0	0	9	1	1	1	0	0	0	0	0	0
01:00	10	-	26.8	0	0	10	0	0	0	0	0	0	0	0	0
02:00	10	-	31.7	0	0	3	7	0	0	0	0	0	0	0	0
03:00	3	-	30.8	0	0	1	2	0	0	0	0	0	0	0	0
04:00	2	-	28.2	0	0	1	1	0	0	0	0	0	0	0	0
05:00	9	-	30.7	0	0	4	5	0	0	0	0	0	0	0	0
06:00	25	32	26.7	0	2	18	5	0	0	0	0	0	0	0	0
07:00	76	32.9	26.5	0	8	49	18	1	0	0	0	0	0	0	0
08:00	156	28.4	24.2	0	28	114	14	0	0	0	0	0	0	0	0
09:00	107	28.8	23.5	0	25	71	11	0	0	0	0	0	0	0	0
10:00	95	29.3	25.5	0	12	71	11	0	0	0	1	0	0	0	0
11:00	114	29.3	25	0	18	84	11	0	0	1	0	0	0	0	0
12:00	124	30.9	25.9	0	13	86	24	1	0	0	0	0	0	0	0
13:00	110	30.5	26.6	0	4	81	25	0	0	0	0	0	0	0	0
14:00	133	31.3	25.9	0	18	85	28	2	0	0	0	0	0	0	0
15:00	207	31.1	26.4	0	16	150	39	1	1	0	0	0	0	0	0
16:00	187	31.5	27.1	0	11	134	39	1	2	0	0	0	0	0	0
17:00	180	30.5	26.3	0	12	137	31	0	0	0	0	0	0	0	0
18:00	158	30.7	26.3	0	10	117	30	1	0	0	0	0	0	0	0
19:00	111	32.5	27.3	0	11	68	29	2	1	0	0	0	0	0	0
20:00	82	34.4	26.5	0	12	49	19	1	0	1	0	0	0	0	0
21:00	56	32.8	26.5	0	10	31	12	2	1	0	0	0	0	0	0
22:00	54	32.3	27.6	0	3	32	18	1	0	0	0	0	0	0	0
23:00	27	34.6	25.5	0	4	18	5	0	0	0	0	0	0	0	0
12H,7-19	1647	30.5	25.9	0	175	1179	281	7	3	1	1	0	0	0	0
16H,6-22	1921	30.9	26	0	210	1345	346	12	5	2	1	0	0	0	0
18H,6-24	2002	30.9	26	0	217	1395	369	13	5	2	1	0	0	0	0
24H,0-24	2048	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**17**	33.8	27.5	0	2	10	5	0	0	0	0	0	0	0	0
01:00	**5**	-	24.8	0	0	5	0	0	0	0	0	0	0	0	0
02:00	**8**	-	23	0	3	5	0	0	0	0	0	0	0	0	0
03:00	**2**	-	26.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**0**	-	-	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	-	26.8	0	0	7	1	0	0	0	0	0	0	0	0
06:00	**28**	33.9	27.6	0	3	18	5	1	0	1	0	0	0	0	0
07:00	**65**	32.8	26	0	15	39	8	2	1	0	0	0	0	0	0
08:00	**174**	29.8	26.5	0	7	143	22	1	0	1	0	0	0	0	0
09:00	**114**	31.1	26.2	1	15	77	20	1	0	0	0	0	0	0	0
10:00	**102**	31.7	27	0	7	70	25	0	0	0	0	0	0	0	0
11:00	**118**	32.6	25.6	0	19	71	27	0	1	0	0	0	0	0	0
12:00	**128**	30.8	25.8	0	21	84	18	4	1	0	0	0	0	0	0
13:00	**113**	32.4	26.9	0	15	69	26	3	0	0	0	0	0	0	0
14:00	**128**	31.9	27.5	0	8	84	33	3	0	0	0	0	0	0	0
15:00	**214**	30.1	25.7	0	14	167	33	0	0	0	0	0	0	0	0
16:00	**185**	30.5	26	1	22	126	35	1	0	0	0	0	0	0	0
17:00	**145**	32.1	26.7	0	13	95	35	1	1	0	0	0	0	0	0
18:00	**164**	31.9	26.4	2	16	110	32	2	0	0	1	1	0	0	0
19:00	**107**	31.7	26.3	0	14	70	20	2	0	0	0	1	0	0	0
20:00	**73**	31.1	27.1	0	3	54	14	1	0	0	1	0	0	0	0
21:00	**73**	33.2	28	0	8	43	21	1	0	0	0	0	0	0	0
22:00	**46**	31.8	26.8	0	0	38	8	0	0	0	0	0	0	0	0
23:00	**32**	35.2	28.1	0	1	23	7	1	0	0	0	0	0	0	0
12H,7-19	**1650**	**31.2**	**26.3**	**4**	**172**	**1135**	**314**	**18**	**4**	**1**	**1**	**1**	**0**	**0**	**0**
16H,6-22	**1931**	**31.3**	**26.4**	**4**	**200**	**1320**	**374**	**23**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
18H,6-24	**2009**	**31.3**	**26.5**	**4**	**201**	**1381**	**389**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
24H,0-24	**2049**	**31.3**	**26.5**	**4**	**206**	**1410**	**395**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Daily Totals															
Thu 10-Feb-22	**2110**	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0
Fri 11-Feb-22	**2186**	32.3	27.5	6	120	1488	512	48	9	1	1	0	1	0	0
Sat 12-Feb-22	**1799**	32.4	27.3	4	133	1194	422	25	18	0	2	0	0	0	1
Sun 13-Feb-22	**1434**	33.3	27.9	4	105	887	391	29	9	7	1	0	1	0	0
Mon 14-Feb-22	**2112**	31.9	27.1	3	160	1449	454	31	9	6	0	0	0	0	0
Tue 15-Feb-22	**2048**	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0
Wed 16-Feb-22	**2049**	31.3	26.5	4	206	1410	395	24	4	2	2	2	0	0	0
Total Vehicles															
[--]	**13738**	32.0	27.0	27	1116	9289	3015	196	59	24	7	2	2	0	1





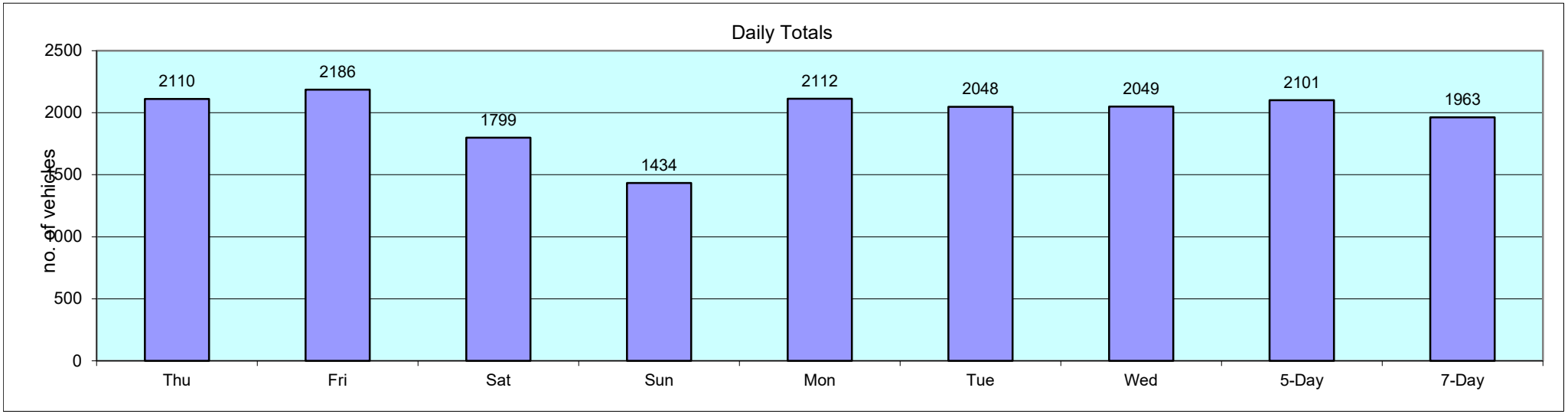
Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)		
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**19**	15	25	20	15	12	17	16	18
01:00	**9**	9	14	26	8	10	5	8	12
02:00	**6**	6	20	8	6	10	8	7	9
03:00	**6**	2	12	15	2	3	2	3	6
04:00	**5**	5	4	12	2	2	0	3	4
05:00	**13**	7	15	9	7	9	8	9	10
06:00	**20**	23	12	16	25	25	28	24	21
07:00	**75**	47	25	21	67	76	65	66	54
08:00	**180**	159	60	25	171	156	174	168	132
09:00	**125**	112	87	36	130	107	114	118	102
10:00	**92**	99	101	63	93	95	102	96	92
11:00	**127**	119	139	96	131	114	118	122	121
12:00	**112**	144	150	117	123	124	128	126	128
13:00	**133**	119	157	124	105	110	113	116	123
14:00	**143**	160	111	124	146	133	128	142	135
15:00	**203**	221	138	133	221	207	214	213	191
16:00	**183**	205	112	115	202	187	185	192	170
17:00	**154**	164	118	117	166	180	145	162	149
18:00	**143**	164	132	110	127	158	164	151	143
19:00	**123**	152	121	78	125	111	107	124	117
20:00	**96**	85	83	66	91	82	73	85	82
21:00	**68**	66	61	47	60	56	73	65	62
22:00	**44**	57	53	35	51	54	46	50	49
23:00	**31**	46	49	21	38	27	32	35	35
12H,7-19	**1670**	**1713**	**1330**	**1081**	**1682**	**1647**	**1650**	**1672**	**1539**
16H,6-22	**1977**	**2039**	**1607**	**1288**	**1983**	**1921**	**1931**	**1970**	**1821**
18H,6-24	**2052**	**2142**	**1709**	**1344**	**2072**	**2002**	**2009**	**2055**	**1904**
24H,0-24	**2110**	**2186**	**1799**	**1434**	**2112**	**2048**	**2049**	**2101**	**1963**
Am	**08:00**	**08:00**	**11:00**	**11:00**	**08:00**	**08:00**	**08:00**		
Peak	**180**	**159**	**139**	**96**	**171**	**156**	**174**		
Pm	**15:00**	**15:00**	**13:00**	**15:00**	**15:00**	**15:00**	**15:00**		
Peak	**203**	**221**	**157**	**133**	**221**	**207**	**214**		

27178	CARDIFF	Site No: 27178001	Location	Site 1 - Ball Road (att to T/P)
		Channel: Northbound		

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**9**	2	7	0	0	0	0	0	0	0	0	0	0	0
01:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**40**	2	35	2	0	1	0	0	0	0	0	0	0	0
06:00	**63**	1	51	10	0	0	1	0	0	0	0	0	0	0
07:00	**123**	3	102	15	0	2	1	0	0	0	0	0	0	0
08:00	**220**	3	196	14	0	4	3	0	0	0	0	0	0	0
09:00	**120**	1	105	9	0	3	2	0	0	0	0	0	0	0
10:00	**106**	2	92	9	0	3	0	0	0	0	0	0	0	0
11:00	**127**	2	115	6	0	2	1	0	1	0	0	0	0	0
12:00	**117**	0	110	4	0	3	0	0	0	0	0	0	0	0
13:00	**102**	4	85	9	1	2	1	0	0	0	0	0	0	0
14:00	**149**	1	135	10	0	2	1	0	0	0	0	0	0	0
15:00	**172**	1	157	8	0	4	2	0	0	0	0	0	0	0
16:00	**149**	2	132	9	0	3	3	0	0	0	0	0	0	0
17:00	**129**	3	114	8	0	3	1	0	0	0	0	0	0	0
18:00	**109**	3	100	4	0	1	1	0	0	0	0	0	0	0
19:00	**94**	1	88	3	0	1	1	0	0	0	0	0	0	0
20:00	**76**	2	69	4	0	1	0	0	0	0	0	0	0	0
21:00	**40**	2	34	3	0	1	0	0	0	0	0	0	0	0
22:00	**26**	0	23	2	0	1	0	0	0	0	0	0	0	0
23:00	**20**	1	18	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**25**	**1443**	**105**	**1**	**32**	**16**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31**	**1685**	**125**	**1**	**35**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**32**	**1726**	**127**	**1**	**37**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**36**	**1796**	**131**	**1**	**38**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**6**	1	5	0	0	0	0	0	0	0	0	0	0	0
01:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**23**	0	21	1	0	1	0	0	0	0	0	0	0	0
06:00	**48**	1	41	6	0	0	0	0	0	0	0	0	0	0
07:00	**123**	3	105	13	0	2	0	0	0	0	0	0	0	0
08:00	**198**	2	180	12	0	3	0	0	1	0	0	0	0	0
09:00	**133**	2	118	10	0	2	1	0	0	0	0	0	0	0
10:00	**98**	0	88	7	0	2	1	0	0	0	0	0	0	0
11:00	**101**	1	93	4	0	3	0	0	0	0	0	0	0	0
12:00	**123**	1	110	9	0	2	1	0	0	0	0	0	0	0
13:00	**100**	3	85	9	0	3	0	0	0	0	0	0	0	0
14:00	**143**	1	131	8	0	2	1	0	0	0	0	0	0	0
15:00	**196**	0	182	7	1	4	1	1	0	0	0	0	0	0
16:00	**159**	2	143	11	0	2	1	0	0	0	0	0	0	0
17:00	**152**	6	136	6	0	3	1	0	0	0	0	0	0	0
18:00	**128**	3	122	1	0	2	0	0	0	0	0	0	0	0
19:00	**92**	1	88	2	0	1	0	0	0	0	0	0	0	0
20:00	**70**	0	66	3	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	42	4	0	1	0	0	0	0	0	0	0	0
22:00	**37**	1	32	2	0	1	1	0	0	0	0	0	0	0
23:00	**30**	1	27	1	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1654**	**24**	**1493**	**97**	**1**	**30**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**26**	**1730**	**112**	**1**	**33**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**28**	**1789**	**115**	**1**	**35**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2036**	**29**	**1841**	**119**	**1**	**36**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**16**	0	15	1	0	0	0	0	0	0	0	0	0	0
01:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
02:00	**3**	0	3	0	0	0	0	0	0	0	0	0	0	0
03:00	**5**	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
05:00	**16**	0	13	2	0	1	0	0	0	0	0	0	0	0
06:00	**26**	0	24	1	0	0	1	0	0	0	0	0	0	0
07:00	**40**	1	35	3	0	1	0	0	0	0	0	0	0	0
08:00	**91**	2	78	9	0	2	0	0	0	0	0	0	0	0
09:00	**109**	1	100	5	0	3	0	0	0	0	0	0	0	0
10:00	**130**	0	117	10	0	2	1	0	0	0	0	0	0	0
11:00	**121**	0	109	8	0	3	1	0	0	0	0	0	0	0
12:00	**144**	0	132	7	0	2	3	0	0	0	0	0	0	0
13:00	**142**	1	133	4	0	1	2	0	1	0	0	0	0	0
14:00	**117**	2	103	10	0	1	1	0	0	0	0	0	0	0
15:00	**82**	2	75	2	0	2	1	0	0	0	0	0	0	0
16:00	**94**	1	86	6	0	1	0	0	0	0	0	0	0	0
17:00	**115**	1	106	5	0	3	0	0	0	0	0	0	0	0
18:00	**94**	0	89	4	0	1	0	0	0	0	0	0	0	0
19:00	**103**	0	97	4	0	1	1	0	0	0	0	0	0	0
20:00	**71**	0	68	3	0	0	0	0	0	0	0	0	0	0
21:00	**47**	1	45	0	0	1	0	0	0	0	0	0	0	0
22:00	**45**	0	42	3	0	0	0	0	0	0	0	0	0	0
23:00	**33**	0	29	3	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1279**	**11**	**1163**	**73**	**0**	**22**	**9**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**12**	**1397**	**81**	**0**	**24**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**12**	**1468**	**87**	**0**	**25**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**12**	**1525**	**91**	**0**	**26**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

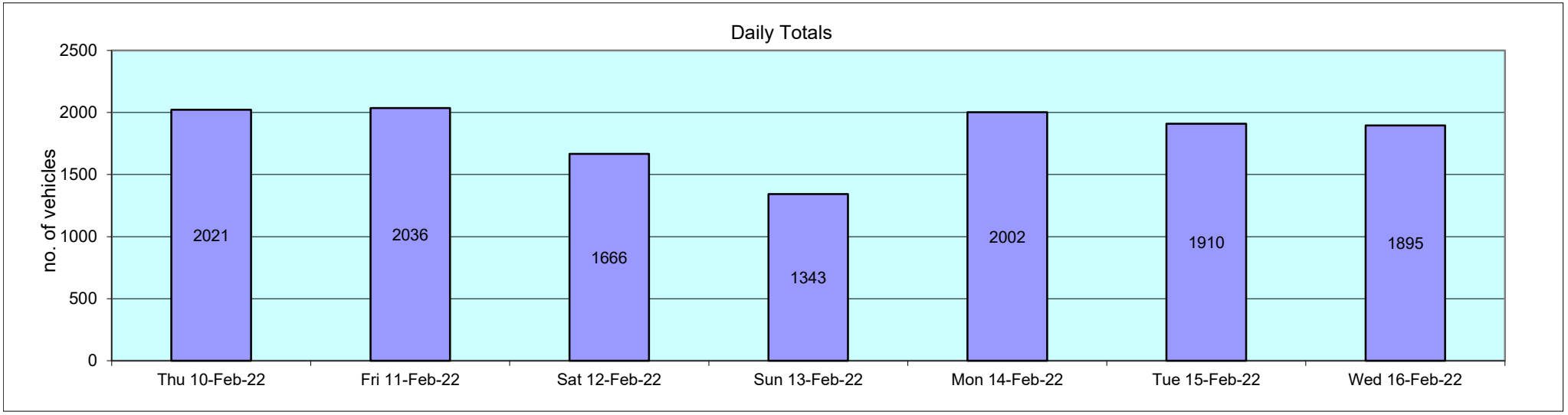
27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**13**	0	12	1	0	0	0	0	0	0	0	0	0	0
01:00	**13**	1	11	1	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	8	1	0	0	0	0	0	0	0	0	0	0
06:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
07:00	**29**	0	27	1	0	1	0	0	0	0	0	0	0	0
08:00	**37**	0	33	3	0	1	0	0	0	0	0	0	0	0
09:00	**66**	0	64	1	1	0	0	0	0	0	0	0	0	0
10:00	**98**	1	92	2	0	2	1	0	0	0	0	0	0	0
11:00	**91**	1	82	5	0	2	1	0	0	0	0	0	0	0
12:00	**133**	1	126	2	0	2	2	0	0	0	0	0	0	0
13:00	**104**	0	97	4	0	2	1	0	0	0	0	0	0	0
14:00	**118**	1	110	5	0	2	0	0	0	0	0	0	0	0
15:00	**96**	1	88	5	0	2	0	0	0	0	0	0	0	0
16:00	**99**	1	94	2	0	2	0	0	0	0	0	0	0	0
17:00	**102**	0	94	6	0	2	0	0	0	0	0	0	0	0
18:00	**90**	1	84	4	0	1	0	0	0	0	0	0	0	0
19:00	**78**	1	74	1	0	1	1	0	0	0	0	0	0	0
20:00	**55**	0	51	3	0	1	0	0	0	0	0	0	0	0
21:00	**36**	0	35	0	0	1	0	0	0	0	0	0	0	0
22:00	**24**	0	21	1	0	1	1	0	0	0	0	0	0	0
23:00	**11**	0	10	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1063**	**7**	**991**	**40**	**1**	**19**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**8**	**1166**	**44**	**1**	**22**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**8**	**1197**	**45**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1343**	**9**	**1254**	**48**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
01:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	3	1	0	0	0	0	0	0	0	0	0	0
04:00	**16**	0	14	2	0	0	0	0	0	0	0	0	0	0
05:00	**31**	0	29	1	0	1	0	0	0	0	0	0	0	0
06:00	**55**	1	41	8	0	3	1	0	0	0	1	0	0	0
07:00	**116**	2	92	16	0	4	2	0	0	0	0	0	0	0
08:00	**205**	0	189	13	0	2	1	0	0	0	0	0	0	0
09:00	**118**	0	99	14	0	3	2	0	0	0	0	0	0	0
10:00	**109**	4	90	12	0	3	0	0	0	0	0	0	0	0
11:00	**143**	1	127	12	0	2	1	0	0	0	0	0	0	0
12:00	**118**	0	108	6	0	3	1	0	0	0	0	0	0	0
13:00	**93**	3	77	11	0	2	0	0	0	0	0	0	0	0
14:00	**137**	1	127	6	0	3	0	0	0	0	0	0	0	0
15:00	**179**	0	167	8	0	4	0	0	0	0	0	0	0	0
16:00	**160**	4	144	10	0	0	2	0	0	0	0	0	0	0
17:00	**135**	1	122	8	0	2	2	0	0	0	0	0	0	0
18:00	**110**	3	103	3	0	1	0	0	0	0	0	0	0	0
19:00	**101**	2	95	2	0	1	1	0	0	0	0	0	0	0
20:00	**67**	2	65	0	0	0	0	0	0	0	0	0	0	0
21:00	**39**	1	35	1	0	1	1	0	0	0	0	0	0	0
22:00	**33**	1	29	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**19**	**1445**	**119**	**0**	**29**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**25**	**1681**	**130**	**0**	**34**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1939**	**27**	**1729**	**132**	**0**	**36**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**2002**	**27**	**1787**	**136**	**0**	**37**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	3	0	2	1	0	0	0	0	0	0	0	0	0	0
01:00	8	0	7	1	0	0	0	0	0	0	0	0	0	0
02:00	4	0	3	1	0	0	0	0	0	0	0	0	0	0
03:00	5	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	10	0	9	1	0	0	0	0	0	0	0	0	0	0
05:00	35	1	31	2	0	1	0	0	0	0	0	0	0	0
06:00	55	0	45	7	0	3	0	0	0	0	0	0	0	0
07:00	114	1	96	15	0	2	0	0	0	0	0	0	0	0
08:00	192	1	179	5	0	4	3	0	0	0	0	0	0	0
09:00	111	1	101	8	0	1	0	0	0	0	0	0	0	0
10:00	84	0	68	13	0	3	0	0	0	0	0	0	0	0
11:00	127	0	111	14	0	1	1	0	0	0	0	0	0	0
12:00	118	1	102	12	0	3	0	0	0	0	0	0	0	0
13:00	91	0	79	5	0	3	4	0	0	0	0	0	0	0
14:00	149	3	134	10	0	2	0	0	0	0	0	0	0	0
15:00	199	1	179	13	0	4	2	0	0	0	0	0	0	0
16:00	137	4	121	9	0	2	1	0	0	0	0	0	0	0
17:00	148	0	138	9	0	0	1	0	0	0	0	0	0	0
18:00	103	0	97	3	0	2	1	0	0	0	0	0	0	0
19:00	79	1	74	4	0	0	0	0	0	0	0	0	0	0
20:00	56	0	51	4	0	0	1	0	0	0	0	0	0	0
21:00	28	0	27	0	0	1	0	0	0	0	0	0	0	0
22:00	34	1	29	4	0	0	0	0	0	0	0	0	0	0
23:00	20	0	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	1573	12	1405	116	0	27	13	0	0	0	0	0	0	0
16H,6-22	1791	13	1602	131	0	31	14	0	0	0	0	0	0	0
18H,6-24	1845	14	1650	135	0	32	14	0	0	0	0	0	0	0
24H,0-24	1910	15	1706	142	0	33	14	0	0	0	0	0	0	0

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
01:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	1	1	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	11	1	0	0	0	0	0	0	0	0	0	0
05:00	**35**	0	33	1	0	1	0	0	0	0	0	0	0	0
06:00	**63**	2	54	3	0	3	1	0	0	0	0	0	0	0
07:00	**117**	1	104	10	0	2	0	0	0	0	0	0	0	0
08:00	**192**	0	170	18	1	2	1	0	0	0	0	0	0	0
09:00	**126**	1	113	8	0	2	2	0	0	0	0	0	0	0
10:00	**103**	0	91	9	1	2	0	0	0	0	0	0	0	0
11:00	**107**	4	99	3	0	1	0	0	0	0	0	0	0	0
12:00	**111**	4	95	9	1	2	0	0	0	0	0	0	0	0
13:00	**95**	1	87	6	0	1	0	0	0	0	0	0	0	0
14:00	**133**	1	122	5	1	1	3	0	0	0	0	0	0	0
15:00	**190**	0	168	18	1	1	2	0	0	0	0	0	0	0
16:00	**127**	1	121	4	0	1	0	0	0	0	0	0	0	0
17:00	**138**	1	126	9	1	1	0	0	0	0	0	0	0	0
18:00	**118**	1	100	14	0	0	3	0	0	0	0	0	0	0
19:00	**86**	0	85	1	0	0	0	0	0	0	0	0	0	0
20:00	**51**	0	51	0	0	0	0	0	0	0	0	0	0	0
21:00	**43**	1	40	1	0	1	0	0	0	0	0	0	0	0
22:00	**22**	0	20	0	0	1	1	0	0	0	0	0	0	0
23:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**15**	**1396**	**113**	**6**	**16**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1800**	**18**	**1626**	**118**	**6**	**20**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1832**	**18**	**1655**	**119**	**6**	**21**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1895**	**18**	**1714**	**122**	**6**	**22**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	**TOTAL VEHICLES**	**MOTOR-CYCLES**	**CARS OR CAR-BASED LGV**	**LIGHT GOODS VEHICLES**	**BUSES**	**TWO AXLE, SIX TYRE, RIGID/BUSES**	**THREE AXLE RIGID**	**FOUR OR MORE AXLE RIGID**	**FOUR OR LESS AXLE ARTIC**	**FIVE AXLE ARTIC**	**SIX OR MORE AXLE ARTIC**	**FIVE OR LESS AXLE MULTI-TRAILER ARTIC**	**SIX AXLE MULTI-TRAILER ARTIC**	**SEVEN OR MORE AXLE ARTIC**
Daily Totals														
Thu 10-Feb-22	**2021**	36	1796	131	1	38	18	0	1	0	0	0	0	0
Fri 11-Feb-22	**2036**	29	1841	119	1	36	8	1	1	0	0	0	0	0
Sat 12-Feb-22	**1666**	12	1525	91	0	26	11	0	1	0	0	0	0	0
Sun 13-Feb-22	**1343**	9	1254	48	1	24	7	0	0	0	0	0	0	0
Mon 14-Feb-22	**2002**	27	1787	136	0	37	14	0	0	0	1	0	0	0
Tue 15-Feb-22	**1910**	15	1706	142	0	33	14	0	0	0	0	0	0	0
Wed 16-Feb-22	**1895**	18	1714	122	6	22	13	0	0	0	0	0	0	0
Total Vehicles														
[--]	**12873**	146	11623	789	9	216	85	1	3	0	1	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22																
00:00	**9**	-	25.2	0	2	5	2	0	0	0	0	0	0	0	0
01:00	**3**	-	30.9	0	0	2	1	0	0	0	0	0	0	0	0
02:00	**5**	-	30.8	0	0	2	3	0	0	0	0	0	0	0	0
03:00	**7**	-	30	0	0	3	4	0	0	0	0	0	0	0	0
04:00	**15**	37.8	31.9	0	0	6	8	0	1	0	0	0	0	0	0
05:00	**40**	34.5	29.6	0	2	19	18	1	0	0	0	0	0	0	0
06:00	**63**	35.5	29	0	3	35	23	0	0	1	1	0	0	0	0
07:00	**123**	32	25.9	1	21	73	26	1	0	1	0	0	0	0	0
08:00	**220**	29.4	23.5	0	62	131	27	0	0	0	0	0	0	0	0
09:00	**120**	31.4	24.9	1	23	72	22	2	0	0	0	0	0	0	0
10:00	**106**	30.6	25.2	1	19	68	18	0	0	0	0	0	0	0	0
11:00	**127**	32.2	26.5	0	16	75	34	2	0	0	0	0	0	0	0
12:00	**117**	32.5	26.9	0	17	58	39	2	0	1	0	0	0	0	0
13:00	**102**	31.8	25.3	0	27	55	14	5	0	0	1	0	0	0	0
14:00	**149**	30.8	24.7	0	38	83	27	1	0	0	0	0	0	0	0
15:00	**172**	29.1	22.9	0	59	91	20	2	0	0	0	0	0	0	0
16:00	**149**	31.6	24.5	0	48	69	30	2	0	0	0	0	0	0	0
17:00	**129**	31.9	26.2	0	19	77	30	2	1	0	0	0	0	0	0
18:00	**109**	32.8	26.2	0	20	58	28	2	0	1	0	0	0	0	0
19:00	**94**	32.4	26.4	0	12	61	18	2	1	0	0	0	0	0	0
20:00	**76**	33.4	26.5	0	13	39	22	1	1	0	0	0	0	0	0
21:00	**40**	35.4	26.3	0	8	22	9	0	0	1	0	0	0	0	0
22:00	**26**	36.8	29	0	3	14	7	2	0	0	0	0	0	0	0
23:00	**20**	35.8	28.4	0	0	13	6	0	1	0	0	0	0	0	0
12H,7-19	**1623**	**31.4**	**25**	**3**	**369**	**910**	**315**	**21**	**1**	**3**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31.7**	**25.3**	**3**	**405**	**1067**	**387**	**24**	**3**	**5**	**2**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**31.8**	**25.4**	**3**	**408**	**1094**	**400**	**26**	**4**	**5**	**2**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**32**	**25.6**	**3**	**412**	**1131**	**436**	**27**	**5**	**5**	**2**	**0**	**0**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**6**	-	25.9	0	1	4	1	0	0	0	0	0	0	0	0
01:00	**6**	-	29	0	1	4	0	0	0	1	0	0	0	0	0
02:00	**5**	-	30.4	0	0	3	2	0	0	0	0	0	0	0	0
03:00	**3**	-	30.5	0	0	1	2	0	0	0	0	0	0	0	0
04:00	**15**	35.1	29.1	0	0	10	4	1	0	0	0	0	0	0	0
05:00	**23**	34	29.7	0	1	10	11	0	0	1	0	0	0	0	0
06:00	**48**	33.3	27.4	0	5	29	12	1	0	1	0	0	0	0	0
07:00	**123**	33.8	27.8	0	13	65	41	3	0	1	0	0	0	0	0
08:00	**198**	32.1	26.2	0	39	108	46	3	1	1	0	0	0	0	0
09:00	**133**	31.5	25.7	0	27	75	31	0	0	0	0	0	0	0	0
10:00	**98**	32.6	26.8	0	15	54	26	3	0	0	0	0	0	0	0
11:00	**101**	33.3	26.8	1	18	52	24	5	1	0	0	0	0	0	0
12:00	**123**	31.1	24.8	0	30	71	21	1	0	0	0	0	0	0	0
13:00	**100**	29.8	24.3	0	23	65	11	1	0	0	0	0	0	0	0
14:00	**143**	31.9	25.3	0	32	79	31	1	0	0	0	0	0	0	0
15:00	**196**	30.1	23.7	0	72	94	25	4	1	0	0	0	0	0	0
16:00	**159**	31.2	24.2	0	50	78	30	0	0	1	0	0	0	0	0
17:00	**152**	31.3	25.5	0	37	85	26	2	1	1	0	0	0	0	0
18:00	**128**	31.7	26.2	0	24	77	23	1	2	1	0	0	0	0	0
19:00	**92**	33.5	26.5	0	17	47	23	5	0	0	0	0	0	0	0
20:00	**70**	34.1	28.1	0	9	34	23	2	1	1	0	0	0	0	0
21:00	**47**	35.9	29.6	0	3	25	16	2	0	0	1	0	0	0	0
22:00	**37**	34.5	27.4	1	6	17	12	0	0	0	1	0	0	0	0
23:00	**30**	32.9	27.2	0	8	14	6	1	0	0	0	0	1	0	0
12H,7-19	**1654**	**31.7**	**25.5**	**1**	**380**	**903**	**335**	**24**	**6**	**5**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**31.9**	**25.8**	**1**	**414**	**1038**	**409**	**34**	**7**	**7**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**32**	**25.8**	**2**	**428**	**1069**	**427**	**35**	**7**	**7**	**2**	**0**	**1**	**0**	**0**
24H,0-24	**2036**	**32**	**25.9**	**2**	**431**	**1101**	**447**	**36**	**7**	**9**	**2**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22																
00:00	**16**	37.3	28.6	0	2	8	5	1	0	0	0	0	0	0	0
01:00	**11**	40.6	28.6	0	1	6	3	0	1	0	0	0	0	0	0
02:00	**3**	-	25.3	0	0	2	1	0	0	0	0	0	0	0	0
03:00	**5**	-	24.9	0	0	5	0	0	0	0	0	0	0	0	0
04:00	**11**	40.6	32.7	0	0	5	5	0	0	1	0	0	0	0	0
05:00	**16**	37	27.7	0	3	9	3	1	0	0	0	0	0	0	0
06:00	**26**	39.5	30.4	0	0	16	7	1	2	0	0	0	0	0	0
07:00	**40**	34	27.1	0	6	22	10	2	0	0	0	0	0	0	0
08:00	**91**	31.5	25.4	1	20	50	17	2	1	0	0	0	0	0	0
09:00	**109**	32.9	27.6	0	13	57	36	3	0	0	0	0	0	0	0
10:00	**130**	31.8	26	0	25	76	28	1	0	0	0	0	0	0	0
11:00	**121**	31.1	25.6	0	23	74	23	0	1	0	0	0	0	0	0
12:00	**144**	31.2	25.5	0	29	84	28	3	0	0	0	0	0	0	0
13:00	**142**	32.8	25.3	1	36	70	32	2	1	0	0	0	0	0	0
14:00	**117**	33.4	26.9	0	16	69	28	2	1	0	1	0	0	0	0
15:00	**82**	31.7	26.6	0	14	45	22	1	0	0	0	0	0	0	0
16:00	**94**	33.4	26.7	1	17	48	23	4	1	0	0	0	0	0	0
17:00	**115**	32.9	26.8	0	15	62	37	1	0	0	0	0	0	0	0
18:00	**94**	33	26.1	0	18	54	20	2	0	0	0	0	0	0	0
19:00	**103**	32.9	26.4	0	16	57	29	0	1	0	0	0	0	0	0
20:00	**71**	33.5	26.7	0	11	39	18	3	0	0	0	0	0	0	0
21:00	**47**	34.5	26.8	0	8	23	16	0	0	0	0	0	0	0	0
22:00	**45**	31.7	26.8	0	4	30	10	1	0	0	0	0	0	0	0
23:00	**33**	33.4	29.6	0	1	17	14	0	0	1	0	0	0	0	0
12H,7-19	**1279**	**32.5**	**26.2**	**3**	**232**	**711**	**304**	**23**	**5**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**32.8**	**26.3**	**3**	**267**	**846**	**374**	**27**	**8**	**0**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**32.8**	**26.4**	**3**	**272**	**893**	**398**	**28**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**32.8**	**26.5**	**3**	**278**	**928**	**415**	**30**	**9**	**2**	**1**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**13**	37.4	28.8	0	2	6	4	0	0	0	1	0	0	0	0
01:00	**13**	37.2	29.1	0	2	5	5	1	0	0	0	0	0	0	0
02:00	**6**	-	33.7	0	0	2	3	1	0	0	0	0	0	0	0
03:00	**8**	-	26.6	0	0	7	1	0	0	0	0	0	0	0	0
04:00	**12**	34.8	28	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**9**	-	33.9	0	0	3	4	1	1	0	0	0	0	0	0
06:00	**15**	35.7	28	0	0	12	2	1	0	0	0	0	0	0	0
07:00	**29**	33.3	27.9	0	2	17	10	0	0	0	0	0	0	0	0
08:00	**37**	33.8	27.9	0	4	20	13	0	0	0	0	0	0	0	0
09:00	**66**	32.9	27.1	0	7	42	16	1	0	0	0	0	0	0	0
10:00	**98**	34.4	29.1	0	1	63	28	4	2	0	0	0	0	0	0
11:00	**91**	33.3	26.1	0	15	53	21	2	0	0	0	0	0	0	0
12:00	**133**	32.5	25.9	0	24	75	31	3	0	0	0	0	0	0	0
13:00	**104**	33.1	26.2	0	27	47	24	3	2	1	0	0	0	0	0
14:00	**118**	34.1	27	0	18	66	32	1	0	0	1	0	0	0	0
15:00	**96**	35.3	27.3	1	15	46	30	4	0	0	0	0	0	0	0
16:00	**99**	34.3	27.7	0	14	50	33	2	0	0	0	0	0	0	0
17:00	**102**	32.3	26.6	1	15	57	26	2	1	0	0	0	0	0	0
18:00	**90**	35.5	27.3	0	12	51	22	4	1	0	0	0	0	0	0
19:00	**78**	33.8	28.8	0	5	40	30	3	0	0	0	0	0	0	0
20:00	**55**	34.8	28.4	0	3	27	24	0	1	0	0	0	0	0	0
21:00	**36**	33.8	28	0	5	17	13	0	1	0	0	0	0	0	0
22:00	**24**	33.2	28.8	0	1	16	6	0	0	0	1	0	0	0	0
23:00	**11**	45.3	29.6	0	2	5	2	1	0	0	0	1	0	0	0
12H,7-19	**1063**	**33.4**	**27**	**2**	**154**	**587**	**286**	**26**	**6**	**1**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**33.6**	**27.3**	**2**	**167**	**683**	**355**	**30**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**33.6**	**27.3**	**2**	**170**	**704**	**363**	**31**	**8**	**1**	**2**	**1**	**0**	**0**	**0**
24H,0-24	**1343**	**33.8**	**27.4**	**2**	**175**	**733**	**385**	**34**	**9**	**1**	**3**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**6**	-	34.2	0	1	2	1	0	1	0	1	0	0	0	0
01:00	**4**	-	25.5	0	1	1	2	0	0	0	0	0	0	0	0
02:00	**2**	-	30.3	0	0	1	1	0	0	0	0	0	0	0	0
03:00	**4**	-	30.9	0	0	1	3	0	0	0	0	0	0	0	0
04:00	**16**	38.1	30.5	0	0	10	5	0	1	0	0	0	0	0	0
05:00	**31**	35.1	30.1	0	2	14	14	0	0	0	1	0	0	0	0
06:00	**55**	33.8	27	1	10	24	19	1	0	0	0	0	0	0	0
07:00	**116**	32.8	27	0	17	64	32	3	0	0	0	0	0	0	0
08:00	**205**	32.7	25.1	0	61	92	51	0	0	1	0	0	0	0	0
09:00	**118**	31.5	25.5	0	27	58	32	0	1	0	0	0	0	0	0
10:00	**109**	32.1	26.1	1	21	61	23	1	1	1	0	0	0	0	0
11:00	**143**	31.1	25.7	1	26	82	33	1	0	0	0	0	0	0	0
12:00	**118**	31.8	26.3	0	21	61	36	0	0	0	0	0	0	0	0
13:00	**93**	32.4	26.8	0	7	57	29	0	0	0	0	0	0	0	0
14:00	**137**	32.5	26.1	0	24	80	29	2	2	0	0	0	0	0	0
15:00	**179**	31.9	24.1	0	58	86	33	2	0	0	0	0	0	0	0
16:00	**160**	30.8	24.3	0	47	83	26	3	1	0	0	0	0	0	0
17:00	**135**	32.4	24.8	0	40	69	23	2	0	1	0	0	0	0	0
18:00	**110**	32.2	25.6	0	25	57	24	2	1	1	0	0	0	0	0
19:00	**101**	31.3	24.4	0	27	51	22	1	0	0	0	0	0	0	0
20:00	**67**	33.2	27.4	0	8	40	14	4	0	1	0	0	0	0	0
21:00	**39**	45.4	32.3	0	5	13	15	0	2	1	1	2	0	0	0
22:00	**33**	39.7	28.4	0	4	18	7	3	0	1	0	0	0	0	0
23:00	**21**	32.1	26.7	0	4	13	4	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**32**	**25.5**	**2**	**374**	**850**	**371**	**16**	**6**	**4**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**32.1**	**25.7**	**3**	**424**	**978**	**441**	**22**	**8**	**6**	**1**	**2**	**0**	**0**	**0**
18H,6-24	**1939**	**32.2**	**25.7**	**3**	**432**	**1009**	**452**	**25**	**8**	**7**	**1**	**2**	**0**	**0**	**0**
24H,0-24	**2002**	**32.3**	**25.9**	**3**	**436**	**1038**	**478**	**25**	**10**	**7**	**3**	**2**	**0**	**0**	**0**

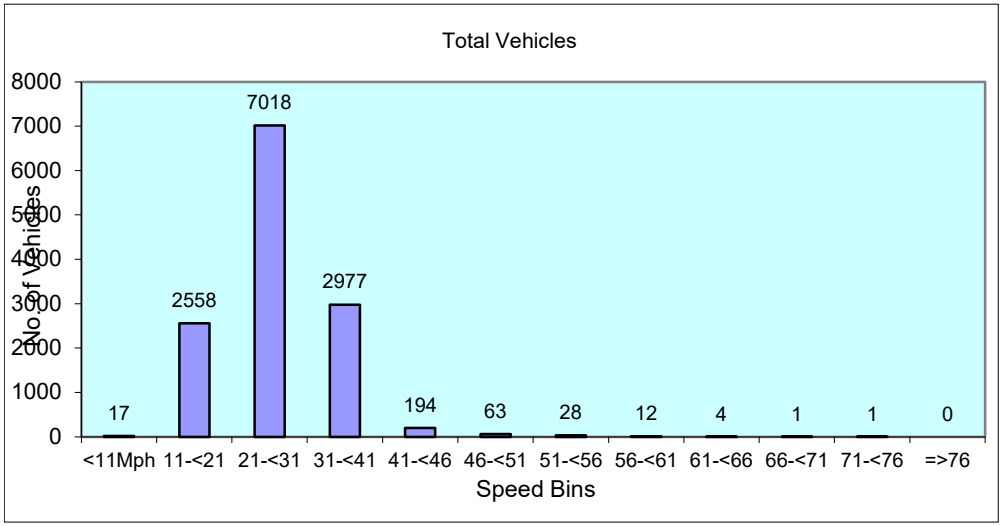
Data produced by
Transport Surveys Ltd

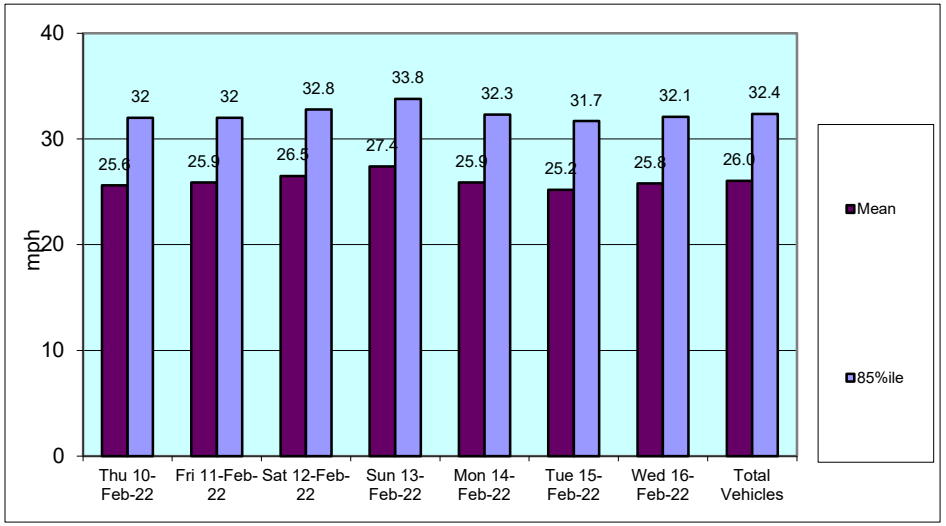
27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	**3**	-	32.4	0	0	1	2	0	0	0	0	0	0	0	0
01:00	**8**	-	26.2	0	2	4	1	1	0	0	0	0	0	0	0
02:00	**4**	-	30.7	0	0	2	1	1	0	0	0	0	0	0	0
03:00	**5**	-	30.2	0	0	3	2	0	0	0	0	0	0	0	0
04:00	**10**	-	28.5	0	0	6	4	0	0	0	0	0	0	0	0
05:00	**35**	36.3	30.7	0	0	18	15	0	1	1	0	0	0	0	0
06:00	**55**	33.4	27.6	0	5	29	21	0	0	0	0	0	0	0	0
07:00	**114**	30.8	25.9	0	18	72	23	1	0	0	0	0	0	0	0
08:00	**192**	30.3	23.5	0	70	90	30	2	0	0	0	0	0	0	0
09:00	**111**	28.2	23.6	0	26	70	15	0	0	0	0	0	0	0	0
10:00	**84**	29.6	24.2	0	25	48	10	1	0	0	0	0	0	0	0
11:00	**127**	31.2	25.7	0	30	66	27	2	2	0	0	0	0	0	0
12:00	**118**	31.9	25	0	28	66	22	1	1	0	0	0	0	0	0
13:00	**91**	32.7	26.1	0	18	51	19	2	0	0	1	0	0	0	0
14:00	**149**	31.5	25.3	0	34	88	24	2	1	0	0	0	0	0	0
15:00	**199**	30	24.3	0	61	109	26	1	1	0	0	0	0	1	0
16:00	**137**	30.9	24	0	44	67	23	1	2	0	0	0	0	0	0
17:00	**148**	32.9	25.6	0	37	68	41	2	0	0	0	0	0	0	0
18:00	**103**	30.8	24.4	0	24	61	17	1	0	0	0	0	0	0	0
19:00	**79**	34.6	27	0	14	40	21	3	1	0	0	0	0	0	0
20:00	**56**	36.3	27.5	0	10	29	13	1	2	1	0	0	0	0	0
21:00	**28**	36.7	28.3	0	2	16	9	0	1	0	0	0	0	0	0
22:00	**34**	30.5	24.9	0	6	22	6	0	0	0	0	0	0	0	0
23:00	**20**	27.4	23.8	0	4	14	2	0	0	0	0	0	0	0	0
12H,7-19	**1573**	**30.9**	**24.7**	**0**	**415**	**856**	**277**	**16**	**7**	**0**	**1**	**0**	**0**	**1**	**0**
16H,6-22	**1791**	**31.5**	**25.1**	**0**	**446**	**970**	**341**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
18H,6-24	**1845**	**31.4**	**25**	**0**	**456**	**1006**	**349**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
24H,0-24	**1910**	**31.7**	**25.2**	**0**	**458**	**1040**	**374**	**22**	**12**	**2**	**1**	**0**	**0**	**1**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**8**	-	29.9	0	0	5	3	0	0	0	0	0	0	0	0
01:00	**2**	-	27.4	0	0	1	1	0	0	0	0	0	0	0	0
02:00	**2**	-	17.1	0	2	0	0	0	0	0	0	0	0	0	0
03:00	**4**	-	28.9	0	0	3	1	0	0	0	0	0	0	0	0
04:00	**12**	35.6	29.3	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**35**	34.3	29.6	0	1	17	15	2	0	0	0	0	0	0	0
06:00	**63**	34.2	28.5	0	4	36	22	1	0	0	0	0	0	0	0
07:00	**117**	33	26.8	1	20	62	32	1	0	1	0	0	0	0	0
08:00	**192**	30.8	24.6	0	44	113	34	1	0	0	0	0	0	0	0
09:00	**126**	31.4	26.3	0	15	81	29	0	1	0	0	0	0	0	0
10:00	**103**	31.8	25.9	0	17	65	20	1	0	0	0	0	0	0	0
11:00	**107**	32.5	26.3	1	16	60	27	3	0	0	0	0	0	0	0
12:00	**111**	30.9	24.3	1	30	61	17	1	1	0	0	0	0	0	0
13:00	**95**	32.4	25.5	0	18	49	28	0	0	0	0	0	0	0	0
14:00	**133**	32.7	26.3	0	27	69	33	3	0	0	0	1	0	0	0
15:00	**190**	30.2	23.9	0	61	95	33	0	1	0	0	0	0	0	0
16:00	**127**	31.1	24.4	0	38	65	21	2	1	0	0	0	0	0	0
17:00	**138**	32.5	26.1	0	23	73	39	2	1	0	0	0	0	0	0
18:00	**118**	31.1	24.6	1	27	65	23	0	2	0	0	0	0	0	0
19:00	**86**	32.3	26.7	0	14	48	20	2	2	0	0	0	0	0	0
20:00	**51**	32.8	27	0	4	36	8	1	1	1	0	0	0	0	0
21:00	**43**	35.2	28.7	0	4	22	17	0	0	0	0	0	0	0	0
22:00	**22**	34.9	29.8	0	0	11	10	0	1	0	0	0	0	0	0
23:00	**10**	-	26.1	0	2	4	4	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**31.5**	**25.3**	**4**	**336**	**858**	**336**	**14**	**7**	**1**	**0**	**1**	**0**	**0**	**0**
16H,6-22	**1800**	**31.8**	**25.6**	**4**	**362**	**1000**	**403**	**18**	**10**	**2**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1832**	**31.9**	**25.7**	**4**	**364**	**1015**	**417**	**18**	**11**	**2**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**1895**	**32.1**	**25.8**	**4**	**368**	**1047**	**442**	**20**	**11**	**2**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	**Total Vehicles**	**85%ile Speed**	**Mean Speed**	**<11Mph**	**11-<21**	**21-<31**	**31-<41**	**41-<46**	**46-<51**	**51-<56**	**56-<61**	**61-<66**	**66-<71**	**71-<76**	**=>76**
Daily Totals															
Thu 10-Feb-22	**2021**	32	25.6	3	412	1131	436	27	5	5	2	0	0	0	0
Fri 11-Feb-22	**2036**	32	25.9	2	431	1101	447	36	7	9	2	0	1	0	0
Sat 12-Feb-22	**1666**	32.8	26.5	3	278	928	415	30	9	2	1	0	0	0	0
Sun 13-Feb-22	**1343**	33.8	27.4	2	175	733	385	34	9	1	3	1	0	0	0
Mon 14-Feb-22	**2002**	32.3	25.9	3	436	1038	478	25	10	7	3	2	0	0	0
Tue 15-Feb-22	**1910**	31.7	25.2	0	458	1040	374	22	12	2	1	0	0	1	0
Wed 16-Feb-22	**1895**	32.1	25.8	4	368	1047	442	20	11	2	0	1	0	0	0
Total Vehicles															
[--]	**12873**	32.4	26.0	17	2558	7018	2977	194	63	28	12	4	1	1	0



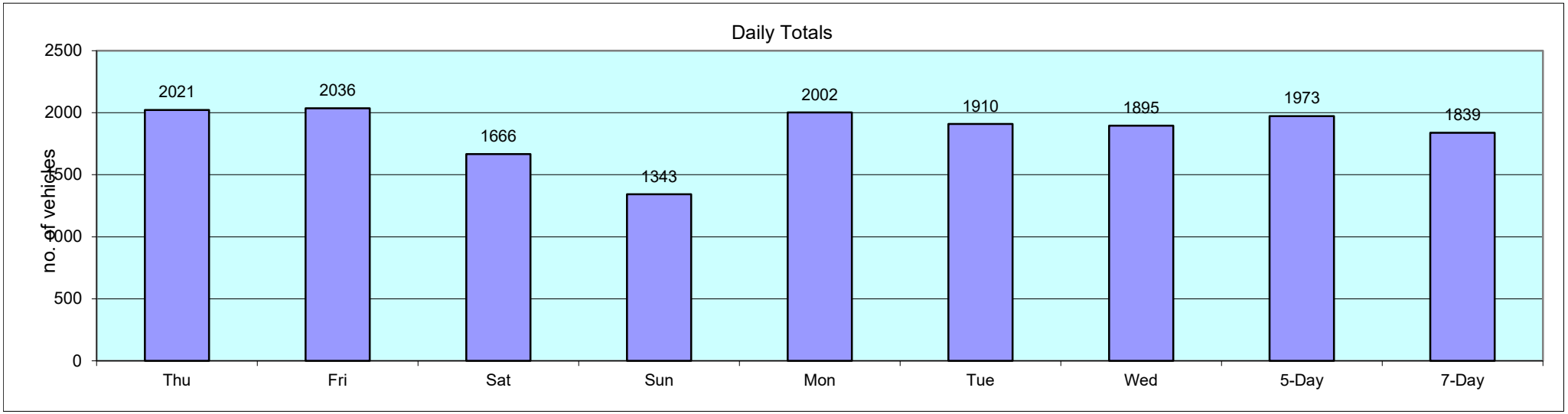


27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Southbound		Location		Site 1 - Ball Road (att to T/P)	
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**9**	6	16	13	6	3	8	6	9
01:00	**3**	6	11	13	4	8	2	5	7
02:00	**5**	5	3	6	2	4	2	4	4
03:00	**7**	3	5	8	4	5	4	5	5
04:00	**15**	15	11	12	16	10	12	14	13
05:00	**40**	23	16	9	31	35	35	33	27
06:00	**63**	48	26	15	55	55	63	57	46
07:00	**123**	123	40	29	116	114	117	119	95
08:00	**220**	198	91	37	205	192	192	201	162
09:00	**120**	133	109	66	118	111	126	122	112
10:00	**106**	98	130	98	109	84	103	100	104
11:00	**127**	101	121	91	143	127	107	121	117
12:00	**117**	123	144	133	118	118	111	117	123
13:00	**102**	100	142	104	93	91	95	96	104
14:00	**149**	143	117	118	137	149	133	142	135
15:00	**172**	196	82	96	179	199	190	187	159
16:00	**149**	159	94	99	160	137	127	146	132
17:00	**129**	152	115	102	135	148	138	140	131
18:00	**109**	128	94	90	110	103	118	114	107
19:00	**94**	92	103	78	101	79	86	90	90
20:00	**76**	70	71	55	67	56	51	64	64
21:00	**40**	47	47	36	39	28	43	39	40
22:00	**26**	37	45	24	33	34	22	30	32
23:00	**20**	30	33	11	21	20	10	20	21
12H,7-19	**1623**	**1654**	**1279**	**1063**	**1623**	**1573**	**1557**	**1606**	**1482**
16H,6-22	**1896**	**1911**	**1526**	**1247**	**1885**	**1791**	**1800**	**1857**	**1722**
18H,6-24	**1942**	**1978**	**1604**	**1282**	**1939**	**1845**	**1832**	**1907**	**1775**
24H,0-24	**2021**	**2036**	**1666**	**1343**	**2002**	**1910**	**1895**	**1973**	**1839**
Am	**08:00**	**08:00**	**10:00**	**10:00**	**08:00**	**08:00**	**08:00**		
Peak	**220**	**198**	**130**	**98**	**205**	**192**	**192**		
Pm	**15:00**	**15:00**	**12:00**	**12:00**	**15:00**	**15:00**	**15:00**		
Peak	**172**	**196**	**144**	**133**	**179**	**199**	**190**		

27178	CARDIFF	Site No: 27178001 Channel: Southbound	Location	Site 1 - Ball Road (att to T/P)

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



Classification Schemes

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	<6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	<10.0	10.0 - 18.0			
	car + 2 axle trailer	4	<10.0		<3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 -15.0		<3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			<3.5	
4	Traditional bus/coach	2	>20.0				
	Traditional bus/coach	3	>19.0				
5	single unit truck/bus - dual rear axle	2	14.9 - 20.0			<3.5	
6	3 axle truck	3		<18.0			
7	4 axle truck	4					
8	2S1	3		>18.0			
	2S2	4		>5.0	>3.5		
	3S1	4		<5.0	>10.0		
9	3S2	5		<6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		>6.0			
12	3S1-2	6					>10.0
13	truck	7 or more					

Appendix C Collision Data

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

MG NSRF/A

ACCIDENT STATISTICS

*FATAL / SERIOUS / SLIGHT

Incident URN

Other ref.

1.3 ACCIDENT REFERENCE

1.9 TIME H H M M

DAY* Su M T W Th F S

1.7 DATE D D M M 2 0 Y Y

1st Road Class & No. or (Unclassified - UC) (Not Known - NK)

1st Road Name

Outside House No. or Name or Marker Post No.

at junction with / or metres N S E W * of

2nd Road Class & No. or (Unclassified - UC) (Not Known - NK)

2nd Road Name

Town

Sector /Beat No.

County or Borough

Parish No. or Name

1.10 Local Auth No. (if known)

1.11 Grid Reference E — N

REPORTING OFFICER Name

Number

BCU/Stn

1.2 Force

Tel Number

1.5 Number of vehicles

1.6 Number of casualties

1.14 ROAD TYPE

		✗
Roundabout	1	
One way street	2	
Dual carriageway	3	
Single carriageway	6	
Slip road	7	
Unknown	9	

1.15 Speed Limit (Permanent)

1.16 JUNCTION DETAIL

		✗
Not at or within 20 metres of junction	00	
Roundabout	01	
Mini roundabout	02	
T or staggered junction	03	
Slip road	05	
Crossroads	06	
Junction more than four arms (not RAB)	07	
Using private drive or entrance	08	
Other junction	09	

JUNCTION ACCIDENTS ONLY

1.17 JUNCTION CONTROL

		✗
Authorised person	1	
Automatic traffic signal	2	
Stop sign	3	
Give way or uncontrolled	4	

1.20a PEDESTRIAN CROSSING - HUMAN CONTROL

		✗
None within 50 metres	0	
Control by school crossing patrol	1	
Control by other authorised person	2	

1.20b PEDESTRIAN CROSSING - PHYSICAL FACILITIES

		✗
No physical crossing facility within 50m	0	
Zebra crossing	1	
Pelican, puffin, toucan or similar non-junction pedestrian light crossing	4	
Pedestrian phase at traffic signal junction	5	
Footbridge or subway	7	
Central refuge — no other controls	8	

1.22 WEATHER

		✗
Fine without high winds	1	
Raining without high winds	2	
Snowing without high winds	3	
Fine with high winds	4	
Raining with high winds	5	
Snowing with high winds	6	
Fog or mist — if hazard	7	
Other	8	
Unknown	9	

1.23 ROAD SURFACE CONDITION

		✗
Dry	1	
Wet / Damp	2	
Snow	3	
Frost / Ice	4	
Flood (surface water over 3cm deep)	5	

1.21 LIGHT CONDITIONS

		✗
Daylight:	1	
Darkness: street lights present and lit	4	
Darkness: street lights present but unlit	5	
Darkness: no street lighting	6	
Darkness: street lighting unknown	7	

1.24 SPECIAL CONDITIONS AT SITE

		✗
None	0	
Auto traffic signal out	1	
Auto traffic signal partially defective	2	
Permanent road signing or marking defective or obscured	3	
Roadworks	4	
Road surface defective	5	
Oil or diesel	6	
Mud	7	

1.25 CARRIAGEWAY HAZARDS

		✗
None	0	
Dislodged vehicle load in carriageway	1	
Other object in carriageway	2	
Involvement with previous accident	3	
Pedestrian in carriageway - not injured	6	
Any animal in carriageway (except ridden horse)	7	

1.26 Did a police officer attend the scene and obtain the details for this report?

		✗
Yes	1	
No	2	

Subject to local directions, boxes with a grey background need not be completed if already recorded

** Circle as appropriate*

VEHICLE RECORD

2.26 VEHICLE REGISTRATION MARK

Vehicle 001	
Vehicle 002	
Vehicle 003	
Vehicle 004	

2.35 WAS THE VEHICLE LEFT HAND DRIVE ✗

		VEHICLE 1	2	3	4
No	1				
Yes	2				

2.5 / 2.5a TYPE OF VEHICLE ✗

Car	09				
Taxi / Private hire car	08				
Van - Goods vehicle 3.5 tonnes mgw and under	19				
Goods vehicle over 3.5 tonnes mgw and under 7.5 tonnes mgw	20				
Goods vehicle 7.5 tonnes mgw & over	21				
Goods vehicle - unknown weight	98				
M/cycle 50cc and under	02				
M/cycle over 50cc and up to 125cc	03				
M/cycle over 125cc and up to 500cc	04				
Motorcycle over 500cc	05				
Motorcycle - cc unknown	97				
Electric Motorcycle	23				
Pedal cycle	01				
Bus or coach (17 or more passenger seats)	11				
Minibus (8-16 passenger seats)	10				
Agricultural vehicle (include diggers etc)	17				
Ridden horse	16				
Mobility scooter	22				
Tram / Light rail	18				
Other vehicle 1	90				
Other vehicle 2	90				
Other vehicle 3	90				
Other vehicle 4	90				

2.6 TOWING AND ARTICULATION ✗

No tow or articulation	0				
Articulated vehicle	1				
Double or multiple trailer	2				
Caravan	3				
Single trailer	4				
Other tow	5				

2.22 AGE OF DRIVER (Estimate if necessary)

Vehicle 001		Vehicle 002	
Vehicle 003		Vehicle 004	

2.27 DRIVER HOME POSTCODE

or Code: 1- Unknown 2- Non UK Resident 3 - Parked & unattended

Vehicle 001		
Vehicle 002		
Vehicle 003		
Vehicle 004		

2.23 BREATH TEST ✗

		VEHICLE 1	2	3	4
Not applicable	0				
Positive	1				
Negative	2				
Not requested	3				
Refused to provide	4				
Driver not contacted at time of col'	5				
Not provided (medical reasons)	6				

2.24 HIT AND RUN ✗

Not hit and run	0				
Hit and run	1				
Non-stop vehicle, not hit	2				

2.21 SEX OF DRIVER ✗

Male	1				
Female	2				
Not known	3				

2.9 VEHICLE LOCATION AT TIME OF ACCIDENT RESTRICTED LANE/AWAY FROM MAIN C'WAY ✗

On main carriageway not in restricted lane	00				
Tram / Light rail track	01				
Bus lane	02				
Busway (inc. guided busway)	03				
Cycle lane (on main carriageway)	04				
Cycleway or shared use footway (not part of main carriageway)	05				
On lay-by / hard shoulder	06				
Entering lay-by/ hard shoulder	07				
Leaving lay-by / hard shoulder	08				
Footway (pavement)	09				

2.10 JUNCTION LOCATION OF VEHICLE ✗

Not at or within 20m of junction	0				
Approaching junction or waiting /parked at junction approach	1				
Cleared junction or waiting/ parked at junction exit	2				
Leaving roundabout	3				
Entering roundabout	4				
Leaving main road	5				
Entering main road	6				
Entering from slip road	7				
Mid junction– on roundabout or on main road	8				

2.7 MANOEUVRES ✗

Reversing	01				
Parked	02				
Waiting to go ahead but held up	03				
Slowing or stopping	04				
Moving off	05				
U turn	06				
Turning left	07				
Waiting to turn left	08				
Turning right	09				
Waiting to turn right	10				
Changing lane to left	11				
Changing lane to right	12				
O'taking moving veh on its offside	13				
O'taking stationary veh on its offside	14				
Overtaking on nearside	15				
Going ahead left hand bend	16				
Going ahead right hand bend	17				
Going ahead other	18				

2.11 SKIDDING AND OVERTURNING ✗

		VEHICLE 1	2	3	4
No skidding, jack-knifing or overturning	0				
Skidded	1				
Skidded and overturned	2				
Jack - knifed	3				
Jack - knifed and overturned	4				
Overturned	5				

2.12 HIT OBJECT IN CARRIAGEWAY ✗

None	00				
Previous accident	01				
Roadworks	02				
Parked vehicle	04				
Bridge - roof	05				
Bridge - side	06				
Bollard / Refuge	07				
Open door of vehicle	08				
Central island of roundabout	09				
Kerb	10				
Any animal (except ridden horse)	12				
Other object	11				

2.13 VEHICLE LEAVING CARRIAGEWAY ✗

Did not leave carriageway	0				
Left carriageway nearside	1				
Left carriageway nearside and rebounded	2				
Left carriageway straight ahead at junction	3				
Left carriageway offside onto central reservation	4				
Left carriageway offside onto central reserve and rebounded	5				
Left carriageway offside and crossed central reservation	6				
Left carriageway offside	7				
Left carriageway offside and rebounded	8				

2.14 FIRST OBJECT HIT OFF CARRIAGEWAY ✗

None	00				
Road sign / Traffic signal	01				
Lamp post	02				
Telegraph pole / Electricity pole	03				
Tree	04				
Bus stop / Bus shelter	05				
Central crash barrier	06				
Nearside or offside crash barrier	07				
Submerged in water (completely)	08				
Entered ditch	09				
Wall or fence	11				
Other permanent object	10				

2.16 FIRST POINT OF IMPACT ✗

Did not impact	0				
Front	1				
Back	2				
Offside	3				
Nearside	4				

2.29 JOURNEY PURPOSE OF DRIVER/RIDER ✗

Journey as part of work	1				
Commuting to / from work	2				
Taking school pupil to/from school	3				
Pupil riding to / from school	4				
Other	5				
Not known	6				

Subject to local directions, boxes with a grey background need not be completed if already recorded

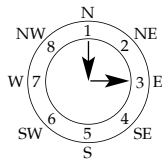
2.8 DIRECTION OF VEHICLE TRAVEL

1. Using the Example shown complete the FROM and TO boxes for the vehicles concerned, indicating direction of travel FROM and TO
2. If PARKED enter '00'

Vehicle 001		*Vehicle 002*	
FROM	TO	FROM	TO
Vehicle 003		*Vehicle 004*	
FROM	TO	FROM	TO

EXAMPLE

FROM	TO
1	3



CASUALTY RECORD

3.4 VEHICLE REFERENCE NUMBER
Enter VEH No. which CASUALTY occupied (for pedestrians, code vehicle that struck them first) e.g. 001,002 etc.

Casualty 001	0	Casualty 002	0
Casualty 003	0	Casualty 004	0
Casualty 005	0	Casualty 006	0

3.18 CASUALTY HOME POSTCODE
or Code: 1- Unknown
2- Non UK Resident

Casualty 001	
Casualty 002	
Casualty 003	
Casualty 004	
Casualty 005	
Casualty 006	

3.7 SEX OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Male	1						
Female	2						

3.8 AGE OF CASUALTY (Estimate if necessary)
For children less than a year enter 00

Casualty 001		Casualty 002	
Casualty 003		Casualty 004	
Casualty 005		Casualty 006	

3.6 CASUALTY CLASS ✗

		CASUALTY 1	2	3	4	5	6
Driver/Rider	1						
Veh./pillion Passenger	2						
Pedestrian	3						

3.9 SEVERITY OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Fatal	1						
Serious	2						
Slight	3						

3.20 CYCLE HELMET WORN ✗

		CASUALTY 1	2	3	4	5	6
Not a cyclist	0						
Yes	1						
No	2						
Not known	3						

3.15 CAR PASSENGER (not driver) ✗

Not a car passenger	0						
Front seat passenger	1						
Rear seat passenger	2						

3.16 BUS OR COACH PASSENGER ✗
(17 passenger seats or more)

Not a bus or coach passenger	0						
Boarding	1						
Alighting	2						
Standing passenger	3						
Seated passenger	4						

3.14 SEAT BELT IN USE ✗

Not applicable	0						
Worn and independently confirmed	1						
Worn but not independently confirmed	2						
Not worn	3						
Unknown	4						

LOCAL STATISTICS

PEDESTRIAN CASUALTIES ONLY

3.10 PEDESTRIAN LOCATION ✗

		CASUALTY 1	2	3	4	5	6
In carriageway, crossing on pedestrian crossing facility	01						
In carriageway, crossing within zig-zag lines at crossing approach	02						
In carriageway, crossing within zig-zag lines at crossing exit	03						
In carriageway, crossing elsewhere within 50m of pedestrian crossing	04						
In carriageway, crossing elsewhere	05						
On footway or verge	06						
On refuge, central island or central reservation	07						
In centre of carriageway, not on refuge, island or central reservation	08						
In carriageway, not crossing	09						
Unknown or other	10						

3.12 PEDESTRIAN DIRECTION ✗

		CASUALTY 1	2	3	4	5	6
Standing still	0						
Northbound	1						
Northeast bound	2						
Eastbound	3						
Southeast bound	4						
Southbound	5						
Southwest bound	6						
Westbound	7						
Northwest bound	8						
Unknown	9						

3.19 PEDESTRIAN ROAD MAINTENANCE WORKER ✗

No / not applicable	0						
Yes	1						
Not known	2						

3.11 PEDESTRIAN MOVEMENT ✗

		CASUALTY 1	2	3	4	5	6
Crossing from driver's nearside	1						
Crossing from driver's nearside-masked by parked or stationary veh'	2						
Crossing from driver's offside	3						
Crossing from driver's offside-masked by parked or stationary veh'	4						
In carriageway, stationary - not crossing (standing or playing)	5						
In carriageway, stationary -not crossing (standing or playing), masked by parked or stationary veh'	6						
Walking along in carriageway-facing traffic	7						
Walking along in carriageway-back to traffic	8						
Unknown or other	9						

CONTRIBUTORY FACTORS

1. Select up to six factors from the grid, relevant to the accident.
2. Factors may be shown in any order, but an indication must be given of whether each factor is ***very likely (A)*** or ***possible (B).***
3. Only include factors that you consider contributed to the accident. (i.e. do NOT include "Poor road surface" unless relevant).
4. More than one factor may, if appropriate, be related to the same road user.
5. The same factor may be related to more than one road user.
6. The participant should be identified by the relevant vehicle or casualty ref no. (e.g. 001, 002 etc.), preceded by "V" if the factor applies to a vehicle, driver/rider or the road environment (e.g. V002), or "C" if the factor relates to a pedestrian or passenger casualty (e.g. C001).
7. Enter U000 if the factor relates to an uninjured pedestrian.

Road Environment Contributed	***103*** Slippery road (due to weather)	***102*** Deposit on road (e.g. oil, mud, chippings)	***101*** Poor or defective road surface	***110*** Sunken, raised or slippery inspection cover	***108*** Road layout (e.g. bend, hill, narrow carriageway)	***107*** Temporary road layout (e.g. contraflow)	***109*** Animal or object in carriageway	***104*** Inadequate or masked signs or road markings	***105*** Defective traffic signals	***106*** Traffic calming (e.g. speed cushions, road humps, chicanes)
Vehicle Defects	***201*** Tyres illegal, defective or under-inflated	***202*** Defective lights or indicators	***203*** Defective brakes	***204*** Defective steering or suspension	***205*** Defective or missing mirrors	***206*** Overloaded or poorly loaded vehicle or trailer				
Driver/Rider Only (Includes Pedal Cycles and Horse Riders) Injudicious Action	***308*** Following too close	***306*** Exceeding speed limit	***302*** Disobeyed Give Way or Stop sign or markings	***301*** Disobeyed automatic traffic signal	***307*** Travelling too fast for conditions	***310*** Cyclist entering road from pavement	***305*** Illegal turn or direction of travel	***304*** Disobeyed pedestrian crossing facility	***309*** Vehicle travelling along pavement	***303*** Disobeyed double white lines
Driver/ Rider Error or Reaction	***405*** Failed to look properly	***406*** Failed to judge other person's path or speed	***403*** Poor turn or manoeuvre	***408*** Sudden braking	***409*** Swerved	***401*** Junction overshoot	***402*** Junction restart (moving off at junction)	***404*** Failed to signal or misleading signal	***407*** Too close to cyclist, horse or pedestrian	***410*** Loss of control
Impairment or Distraction	***501*** Impaired by alcohol	***502*** Impaired by drugs (illicit or medicinal)	***508*** Driver using mobile phone	***503*** Fatigue	***509*** Distraction in vehicle	***510*** Distraction outside vehicle	***505*** Illness or disability, mental or physical	***504*** Uncorrected, defective eyesight	***507*** Rider wearing dark clothing	***506*** Not displaying lights at night or in poor visibility
Behaviour or Inexperience	***602*** Careless, reckless or in a hurry	***605*** Learner or inexperienced driver/rider	***601*** Aggressive driving	***603*** Nervous, uncertain or panic	***607*** Unfamiliar with model of vehicle	***606*** Inexperience of driving on the left	***604*** Driving too slow for conditions or slow vehicle (e.g. tractor)			
Vision Affected by	***701*** Stationary or parked vehicle(s)	***703*** Road layout (e.g. bend, winding road, hill crest)	***706*** Dazzling sun	***707*** Rain, sleet, snow or fog	***708*** Spray from other vehicles	***705*** Dazzling headlights	***710*** Vehicle blind spot	***702*** Vegetation	***704*** Buildings, road signs, street furniture	***709*** Visor or windscreen dirty, scratched or frosted etc.
Pedestrian Only (Casualty or Uninjured)	***802*** Failed to look properly	***808*** Careless, reckless or in a hurry	***803*** Failed to judge vehicle's path or speed	***801*** Crossing road masked by stationary or parked vehicle	***806*** Impaired by alcohol	***807*** Impaired by drugs (illicit or medicinal)	***805*** Dangerous action in carriageway (e.g. playing)	***804*** Wrong use of pedestrian crossing facility	***809*** Pedestrian wearing dark clothing at night	***810*** Disability or illness, mental or physical
Special Codes	***901*** Stolen vehicle	***902*** Vehicle in course of crime	***903*** Emergency vehicle on a call	***904*** Vehicle door opened or closed negligently						****999*** Other – Please specify below

	1st	***2nd***	***3rd***	***4th***	***5th***	***6th***
Factor in the accident						
Which participant? (e.g. V001, C001, U000)						
Very likely (A) or Possible (B)						

*If 999 Other, give brief details

(Note: Only use if another factor contributed to the accident ***and include it in the text description of how the accident occurred***)

These factors reflect the reporting officer's opinion at the time of reporting and may not be the result of extensive investigation

accident_index	accident_year	accident_reference	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to	vehicle_location_restricted_lane
2.02362E+12	2023	622300193	1	19	0	18	5	1	0
2.02362E+12	2023	622300193	2	9	0	3	5	1	0
2.02162E+12	2021	622200017	1	9	0	5	4	8	0
2.02162E+12	2021	622200017	2	9	0	3	4	8	0

collision_index	collision_year	collision_ref_no	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre_historic	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to
2.02462E+12	2024	622400220	1	9	0	7	7	6	8

junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway	first_point_of_impact	vehicle_left_hand_drive
4	0	0	0	0	1	1
1	0	0	3	6	2	1
4	0	0	0	0	1	1
4	0	0	0	0	2	1

vehicle_location_restricted_lane_historic	vehicle_location_restricted_lane	junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway
0	0	3	1	0	1	0

journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code	age_of_vehicle	generic_make_model	driver_imd_decile
6	1	58	9	2402	2	16	FORD TRANSIT	1
6	1	33	6	1339	1	16	HONDA JAZZ	3
6	1	18	4	1229	1	13	VAUXHALL CORSA	6
6	2	49	8	1333	1	0	RENAULT CAPTUR	10

first_point_of_impact	vehicle_left_hand_drive	journey_purpose_of_driver_historic	journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code
1	1	6	6	1	35	6	2401	2

driver_home_area_type	lsoa_of_driver	escooter_flag	dir_from_e	dir_from_n	dir_to_e	dir_to_n	driver_distance_banding	
1	W01001884	0	NULL	NULL	NULL	NULL	1	
1	W01001875	0	NULL	NULL	NULL	NULL	1	
1	W01001814	0	NULL	NULL	NULL	NULL	1	
1	W01001841	0	NULL	NULL	NULL	NULL	1	
age_of_vehicle	generic_make_model	driver_imd_decile	lsoa_of_driver	escooter_flag	driver_distance_banding			
22	VOLVO S60	3	W01001805	0	1			

Appendix D Illustrative Site Layout and PRoW Network

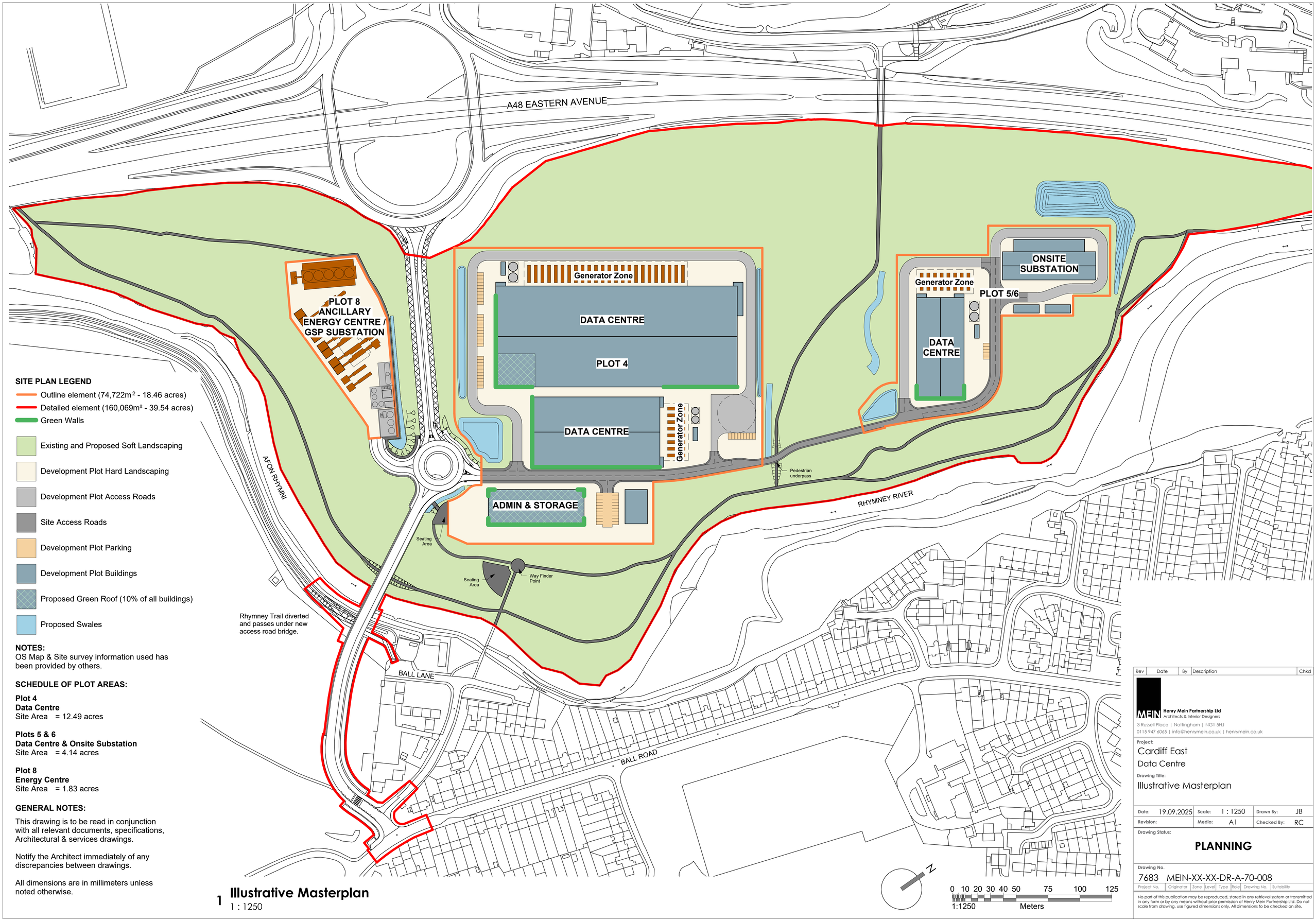
Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



SITE PLAN LEGEND

- Outline element (74,722m² - 18.46 acres)
- Detailed element (160,069m² - 39.54 acres)
- Green Walls
- Existing and Proposed Soft Landscaping
- Development Plot Hard Landscaping
- Development Plot Access Roads
- Site Access Roads
- Development Plot Parking
- Development Plot Buildings
- Proposed Green Roof (10% of all buildings)
- Proposed Swales

NOTES:
OS Map & Site survey information used has been provided by others.

SCHEDULE OF PLOT AREAS:

Plot 4
Data Centre
Site Area = 12.49 acres

Plots 5 & 6
Data Centre & Onsite Substation
Site Area = 4.14 acres

Plot 8
Energy Centre
Site Area = 1.83 acres

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Illustrative Masterplan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Illustrative Masterplan

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-008

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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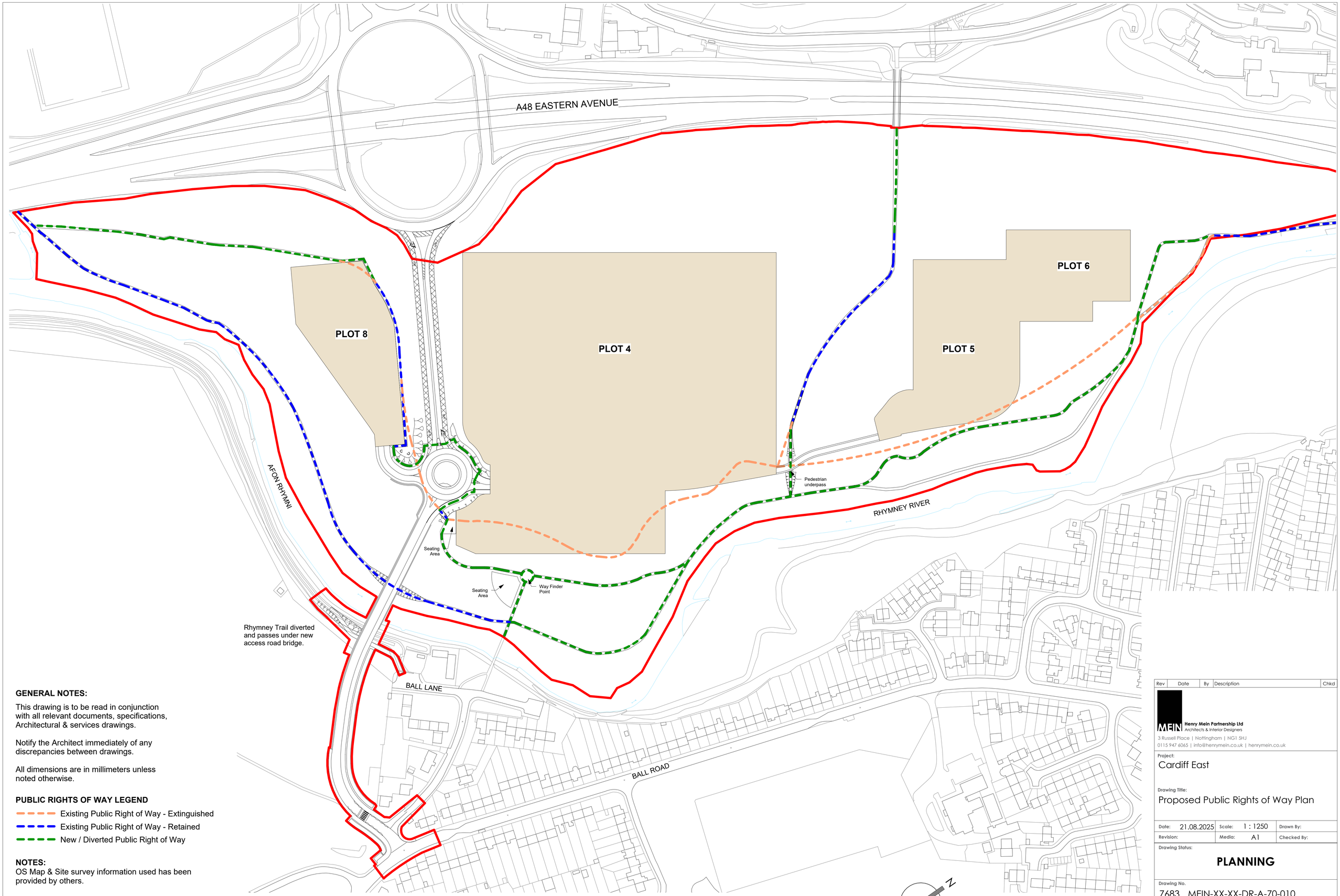

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

PUBLIC RIGHTS OF WAY LEGEND

- Existing Public Right of Way - Extinguished
- Existing Public Right of Way - Retained
- New / Diverted Public Right of Way

NOTES:
OS Map & Site survey information used has been provided by others.

1 Proposed Public Rights of Way Plan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East

Drawing Title:
Proposed Public Rights of Way Plan

Date:	21.08.2025	Scale:	1 : 1250	Drawn By:
Revision:		Media:	A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-010

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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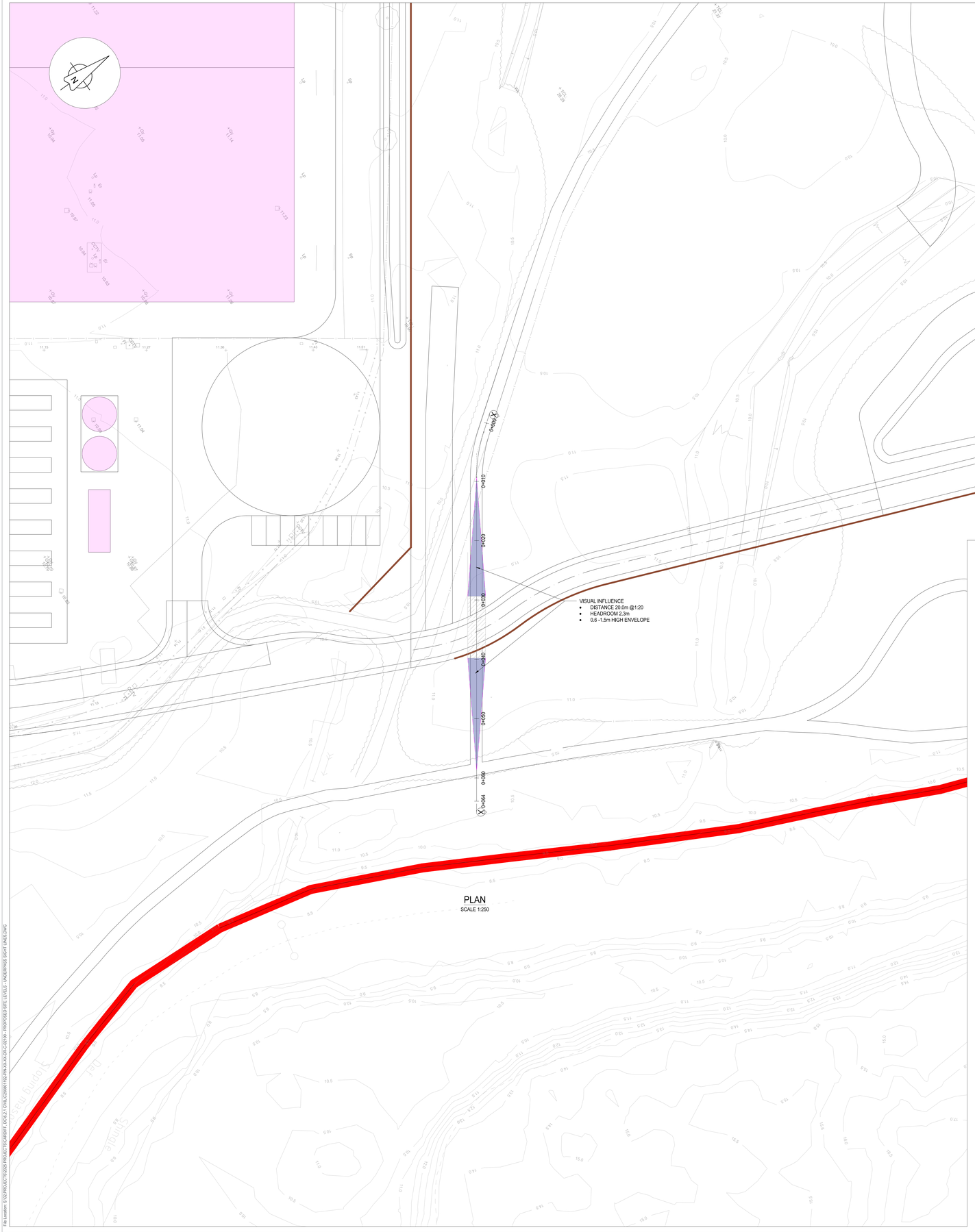
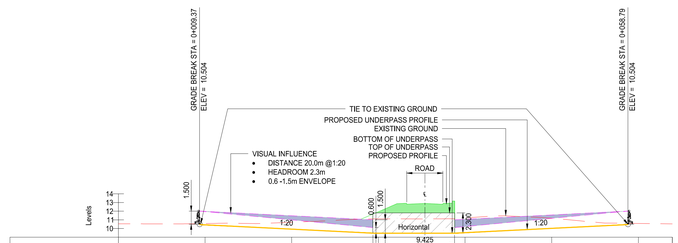


PLAN
SCALE 1:250



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	63.911
EXISTING LEVELS	10.540	10.567	10.720	11.115	11.211	11.162	10.579	10.531
PROPOSED LEVELS		10.473	9.973	9.504	9.564	10.064		
DIFFERENCE BETWEEN EXISTING & PROPOSED		-0.094	-0.747	-1.611	-1.647	-1.118		
VERTICAL GEOMETRY		G:-5.00% L:20.00		G:0.00% L:9.42		G:5.00% L:20.00		
HORIZONTAL GEOMETRY	L =1.576	R: 25.000 L: 7.738	L =1.683	L =52.914				

SECTION X-X (VISUAL PROFILE)
SCALE: H 1:250,V 1:250. DATUM: 9.000

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.
5. THIS DRAWING IS TO BE PRINTED IN COLOUR.
6. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY STATED. / IS TO BE USED FOR CONSTRUCTION PURPOSES.
7. EXISTING SITE AND LEVEL INFORMATION TAKEN FROM EXISTING LEVELS AND TOPOGRAPHICAL SURVEY DRAWINGFROM WSP.
8. THIS DRAWING USES THE GREAT BRITAIN COORDINATE SYSTEM "OSGB1936,NationalGrid".
9. THIS DRAWING HAS BEEN PREPARED USING THE PROPOSED SITE LAYOUT FROM MEIN 19.09.25
10. EMBANKMENTS TIE TO EXISTING LEVELS - THIS MAY VARY DUE TO TOP SOIL STRIPS ETC.

SCALE 1:250
0 2.5 5 7.5 10 12.5m
DIMENSIONS IN METRES

DRAFT -
FOR INFORMATION

REV	DESCRIPTION	BY	CHK / APP	DATE
0	PLANNING (WIP)	AMB	SOR	18/11/25

CLIENT
Curtis Hall Ltd

PROJECT
CARDIFF EAST
DATA CENTRE

DRAWING TITLE
UNDERPASS SIGHT LINES

PINNACLE CONSULTING ENGINEERS
PINNACLE HOUSE,
MAPLE WAY,
BROADLAND GATE,
NORWICH.
NR13 5HB. TELEPHONE: 01603 327 170
WELWYN GARDEN CITY ■ LONDON ■ DUBLIN ■ THE HAGUE ■ FRANKFURT

DRAWING STATUS				
INFORMATION (WIP)				
SCALE @ A0	DATE	DRAWN BY	CHECKED	APPROVED
As shown	NOV '25	AMB	SOR	JM
DRG NO.				REV.
C250801192-PIN-XX-XX-DR-C-02110				0

COPYRIGHT PINNACLE

File Location: S:\02.PROJECTS\2025 PROJECTS\CARDIFF_DCK\2.3 CIVIL\C250801192-PIN-XX-XX-DR-C-02100 - PROPOSED SITE LEVELS - UNDERPASS SIGHT LINES.DWG

Appendix E Internal Site Drawings

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

UNCONTROLLED CROSSING

FLOW CONTROL WITHIN CHAMBER SET AT 0.5 L/S

REALIGNED CARRIAGEWAY TO TIE INTO EXISTING ACCESS ROAD

NEW 3.5m SHARED FOOTWAY TO TIE INTO PARK & RIDE DEVELOPMENT

0.5M HARDSTANDING TO INNER ISLAND, TO HOUSE ROAD SIGNAGE

HEADWALL FOR SWALE OUTFALL

FLOW CONTROL WITHIN CHAMBER SET AT 1.5 L/S

CENTRAL ISLAND TO HOUSE BIO-RETENTION AREA, WITH WITH LOW LEVEL PLANTING. 1:8 GRADED 0.5m DEEP DEPRESSION WITHIN THE CENTRAL AREA.

ATTENUATION BASIN TO RECEIVE FLOWS FROM BRIDGE DECK, AND RAINGARDENS

0.5M DEEP SWALE

WING WALLS

MAINTENANCE BAY FOR BASIN

REINFORCED CONCRETE WALL

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

WEST PIER

1.4m CYCLE PARAPET

CENTRAL PIER

CONTAINMENT N1 PARAPET

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE HEADROOM AT BRIDGE

600MM HARD VERGE

EAST PIER

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE MINIMUM 2.4M HEADROOM AT BRIDGE, DRAINAGE PROVIDED TO AVOID PONDING

NEW HEADWALL WITH NON-RETURN FLAP VALVE

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

DIVERTED RUMNEY TRAIL TO TIE BACK INTO PATH ALONGSIDE DCWW FACILITY

CULVERTS (FLOOD PLAIN CONNECTIVITY)

RUMNEY TRAIL DIVERTED DOWN FROM HIGH LEVEL TO LOW LEVEL (MAXIMUM GRADIENT 1:25) UNDERPASS PROVIDED

REINFORCED CONCRETE WALL

REINFORCED CONCRETE WALL

SWALE TO RECEIVE HIGHWAY RUNOFF

BALL LANE JUNCTION FORMED WITH NEW CARRIAGEWAY

CYCLE DROP OFF

2.4m X 25M VISION SPLAY FOR 20MPH

2.4m X 25M VISION SPLAY FOR 20MPH

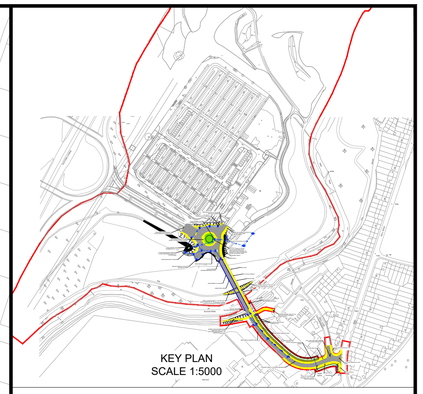
FORWARD VISIBILITY FOR 20MPH @22MM SSD

CYCLE PICK UP

CYCLE PICK UP

MAINTENANCE BAY

PARALLEL CONTROLLED CROSSING, DE611 ACTIVE TRAVEL GUIDANCE



KEY PLAN
SCALE 1:5000

NOTES
1. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (AOD)
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES

KEY

- DEVELOPMENT PLANNING BOUNDARY
- BITUMINOUS CARRIAGEWAY
- BITUMINOUS FOOTWAY/ CYCLEWAY
- HIGHWAY VERGE/ EMBANKMENT / CUTTING
- BRIDGE PARAPET/ RETAINING WALL
- PROPOSED STREET LIGHTING
- EXISTING STREET LIGHTING

LADDER PAVING GREY COLOUR (4 FLAT RIBS PER SLAB) TO MARK THE BOUNDARY BETWEEN FOOTWAY AND SHARED FOOTWAY CYCLE WAY.

TACTILE PAVING AT CONTROLLED CROSSING TO BE RED BLISTER
TACTILE PAVING AT UNCONTROLLED CROSSING TO BE BUFF BLISTER

Rev.	Date	Description	By	Eng° Ch'k	Disc° Ch'k	App'd
P05	14/12/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P04	14/12/23	ATTENUATION BASIN/SWALE AMENDED	GW	GW	GW	GW
P03	10/03/23	BATTER REMOVED, R/W ADDED	SID	SID	SID	GW
P02	DEC-22	AMENDMENTS FOLLOWING SAB CONSULTATION	SID	SID	SID	GW

Suitability: FOR PLANNING

Status: -

wsp
1 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
GENERAL ARRANGEMENT

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-101

Design Stage: -

Revision: P05

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NOTES
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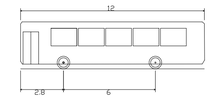
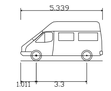
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES



'Standard' Rigid Bus

Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	3.069m
Min Body Ground Clearance	0.309m
Track Width	2.350m
Lock to lock time	4.00s
Wall to Wall Turning Radius	10.771m



3.5t Panel Van

Overall Length	5.339m
Overall Width	1.986m
Overall Body Height	2.565m
Min Body Ground Clearance	0.338m
Track Width	1.986m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.400m

Rev.	Date	Description	By	Eng' Ch'k	Discr' Ch'k	App'd
P03	28.11.25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P01	28/10/22	FIRST ISSUE FOR APPROVAL-	SID	SID	GW	GW

Suitability: FOR PLANNING

Status: -

1 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
SWEPT PATHS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number	Design Stage	Revision
70071035-WSP-XX-XX-CE-DR-102	-	P03

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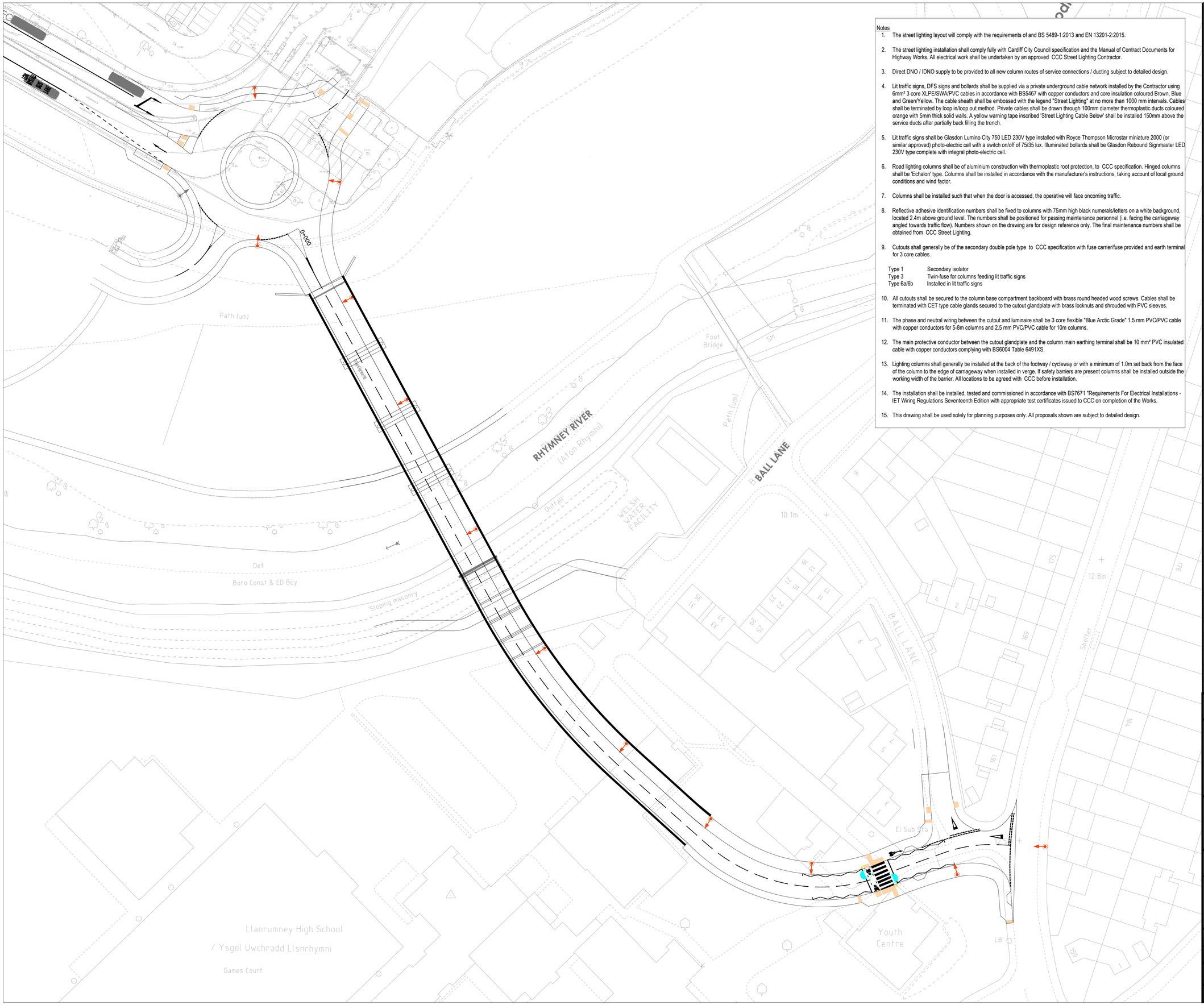
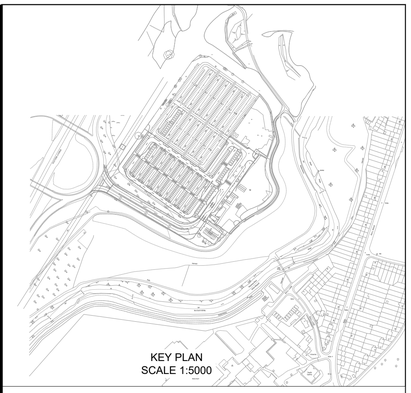


Notes

1. The street lighting layout will comply with the requirements of and BS 5489-1:2013 and EN 13201-2:2015.
2. The street lighting installation shall comply fully with Cardiff City Council specification and the Manual of Contract Documents for Highway Works. All electrical work shall be undertaken by an approved CCC Street Lighting Contractor.
3. Direct DNO / IDNO supply to be provided to all new column routes of service connections / ducting subject to detailed design.
4. Lit traffic signs, DFS signs and bollards shall be supplied via a private underground cable network installed by the Contractor using 6mm² 3 core XLPE/SWA/PVC cables in accordance with BS5467 with copper conductors and core insulation coloured Brown, Blue and Green/Yellow. The cable sheath shall be embossed with the legend "Street Lighting" at no more than 1000 mm intervals. Cables shall be terminated by loop in/loop out method. Private cables shall be drawn through 100mm diameter thermoplastic ducts coloured orange with 5mm thick solid walls. A yellow warning tape inscribed 'Street Lighting Cable Below' shall be installed 150mm above the service ducts after partially back filling the trench.
5. Lit traffic signs shall be Glasdon Lumino City 750 LED 230V type installed with Royce Thompson Microstar miniature 2000 (or similar approved) photo-electric cell with a switch on/off of 75/35 lux. Illuminated bollards shall be Glasdon Rebound Signmaster LED 230V type complete with integral photo-electric cell.
6. Road lighting columns shall be of aluminium construction with thermoplastic root protection, to CCC specification. Hinged columns shall be 'Echalon' type. Columns shall be installed in accordance with the manufacturer's instructions, taking account of local ground conditions and wind factor.
7. Columns shall be installed such that when the door is accessed, the operative will face oncoming traffic.
8. Reflective adhesive identification numbers shall be fixed to columns with 75mm high black numerals/letters on a white background, located 2.4m above ground level. The numbers shall be positioned for passing maintenance personnel (i.e. facing the carriageway angled towards traffic flow). Numbers shown on the drawing are for design reference only. The final maintenance numbers shall be obtained from CCC Street Lighting.
9. Cutouts shall generally be of the secondary double pole type to CCC specification with fuse carrier/fuse provided and earth terminal for 3 core cables.

Type 1	Secondary isolator
Type 3	Twin-fuse for columns feeding lit traffic signs
Type 6a/6b	Installed in lit traffic signs

10. All cutouts shall be secured to the column base compartment backboard with brass round headed wood screws. Cables shall be terminated with CET type cable glands secured to the cutout glandplate with brass locknuts and shrouded with PVC sleeves.
11. The phase and neutral wiring between the cutout and luminaire shall be 3 core flexible "Blue Arctic Grade" 1.5 mm PVC/PVC cable with copper conductors for 5-8m columns and 2.5 mm PVC/PVC cable for 10m columns.
12. The main protective conductor between the cutout glandplate and the column main earthing terminal shall be 10 mm² PVC insulated cable with copper conductors complying with BS6004 Table 6491XS.
13. Lighting columns shall generally be installed at the back of the footway / cycleway or with a minimum of 1.0m set back from the face of the column to the edge of carriageway when installed in verge. If safety barriers are present columns shall be installed outside the working width of the barrier. All locations to be agreed with CCC before installation.
14. The installation shall be installed, tested and commissioned in accordance with BS7671 "Requirements For Electrical Installations - IET Wiring Regulations Seventeenth Edition with appropriate test certificates issued to CCC on completion of the Works.
15. This drawing shall be used solely for planning purposes only. All proposals shown are subject to detailed design.



KEY PLAN
SCALE 1:5000

KEY

8M TAPERED ALUMINUM LIGHTING COLUMN COUPLED WITH DIMMABLE LED LUMINAIRE TO VOG / CCC APPROVED SPECIFICATION

PROPOSED SIMMONSIGNS MIDUBEL COMBINED BELISHA BEACON AND ROAD LIGHTING POST OF 6M NOMINAL HEIGHT WITH A POST TOP MOUNTED (AT 0° TILT) SIGNIFY LUMA GEN2 MINI BGP703 DPL1 NW LED LUMINAIRE WITH A 8.0KLM (DIMMED TO 60%) OUTPUT COMPLETE WITH ELECTRONIC DRIVER AND SIGNIFY CITY TOUCH CMS NODE. FULL COWELS TO BE FITTED.

Rev.	Date	Description	By	Eng' Ch'k	Darc' Ch'k	App'd
P02	28/11/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	VL	GW	GW

Suitability: FOR PLANNING
Status: -

wsp
1 Capital Quarter
Tyndall St
Cardiff
CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
HIGHWAY LIGHTING & SIGNALS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-1300
Design Stage: -
Revision: P02

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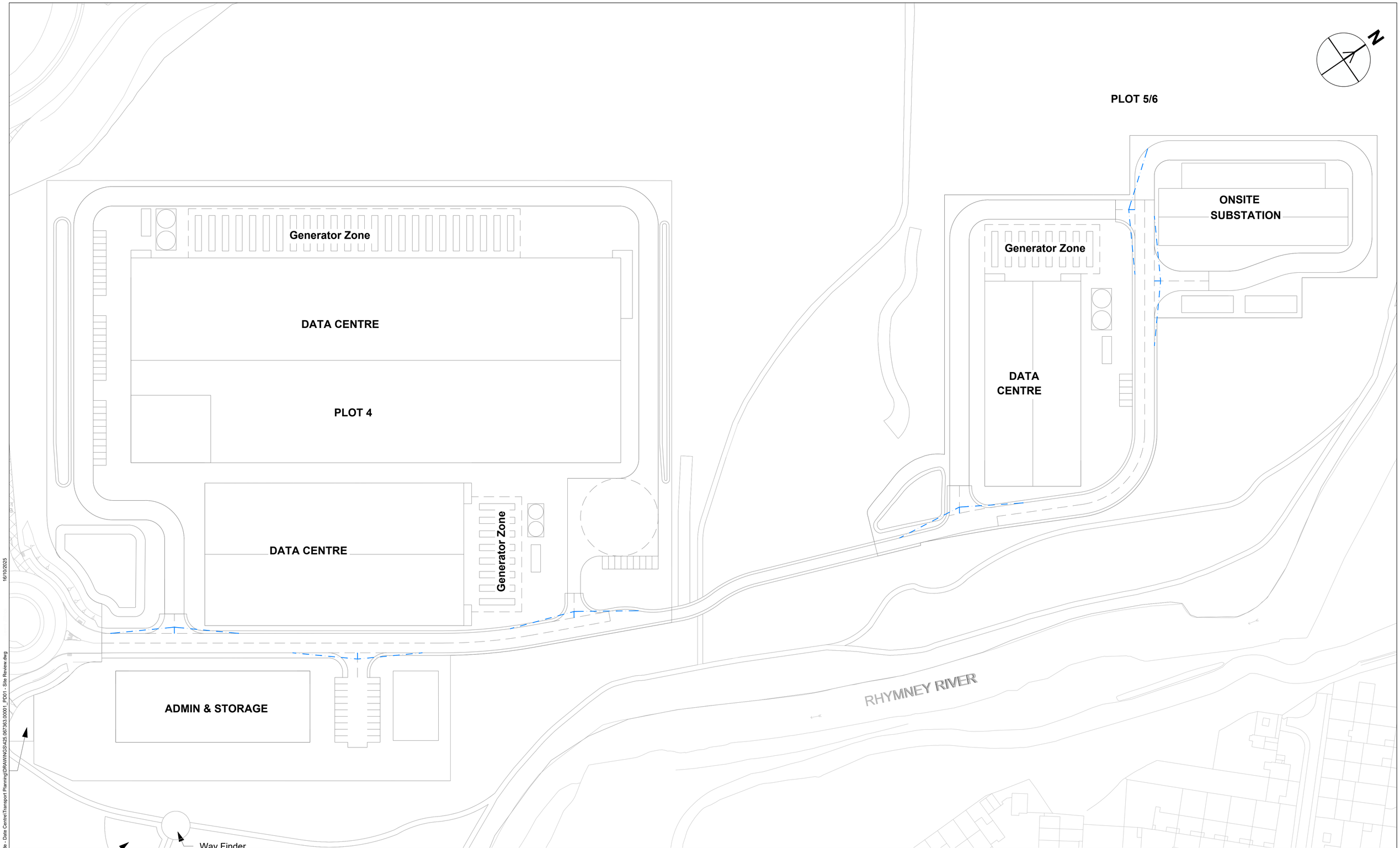


16/10/2025

X:\Projects\250000\425.067363.00001 - Pentwyn Park & Ride - Date Centre\Transport Planning\DRAWINGS\425.067363.00001 - PD01 - Site Review.dwg

SLR

www.slrconsulting.com

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Status & Suitability Code:

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date: 15.10.25	Date: 15.10.25	Date: 15.10.25	Date: 15.10.25

Drawing Title: Proposed Plots 4, 5 & 6 Visibility Assessment

Drawing Number: PD01 | Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

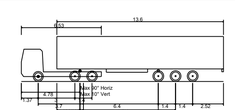
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

2.4 x 25m Visibility Splay (20 mph MFS)



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

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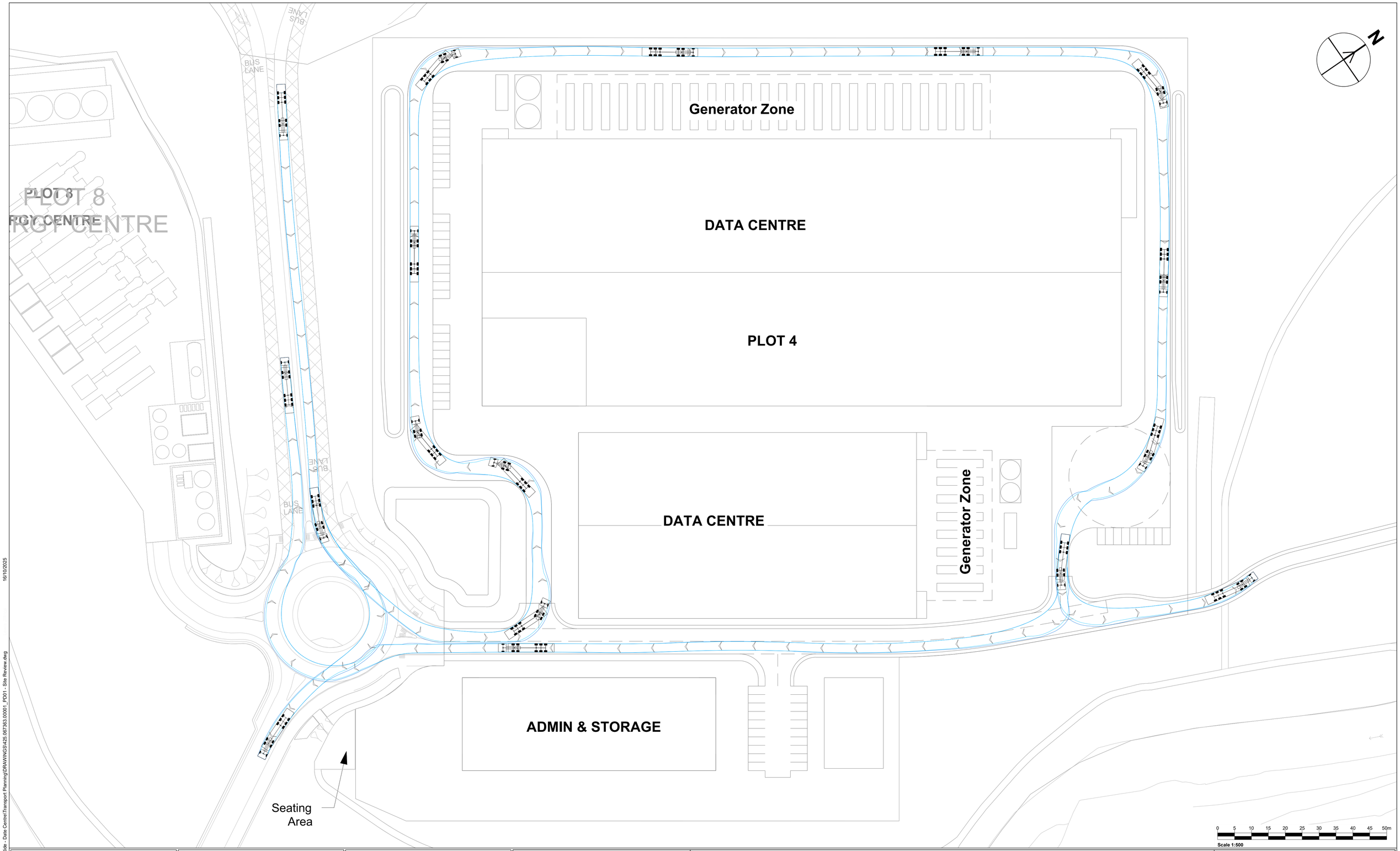

SLR	Client: Curtis Hall Ltd		
www.slrconsulting.com	Project: Pentwyn Park & Ride		
Drawing Status & Suitability Code			
Designed: LJ / Date: 15.10.25	Drawn: LJ / Date: 15.10.25	Checked: ST / Date: 15.10.25	Authorised: ST / Date: 15.10.25
Drawing Title: Swept Path Analysis - 16.5m HGV Plot 4 Access			
Drawing Number: PD01_AT01	Rev.	Scale: 1:500 @ A1	SLR Project No.: 425.067363.00001

Rev	Amendments	Date	By	Chk	Auth

Notes:

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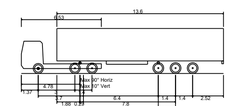
2. White lining is indicative only.

Legend:

Vehicle Detail:



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

16/10/2025

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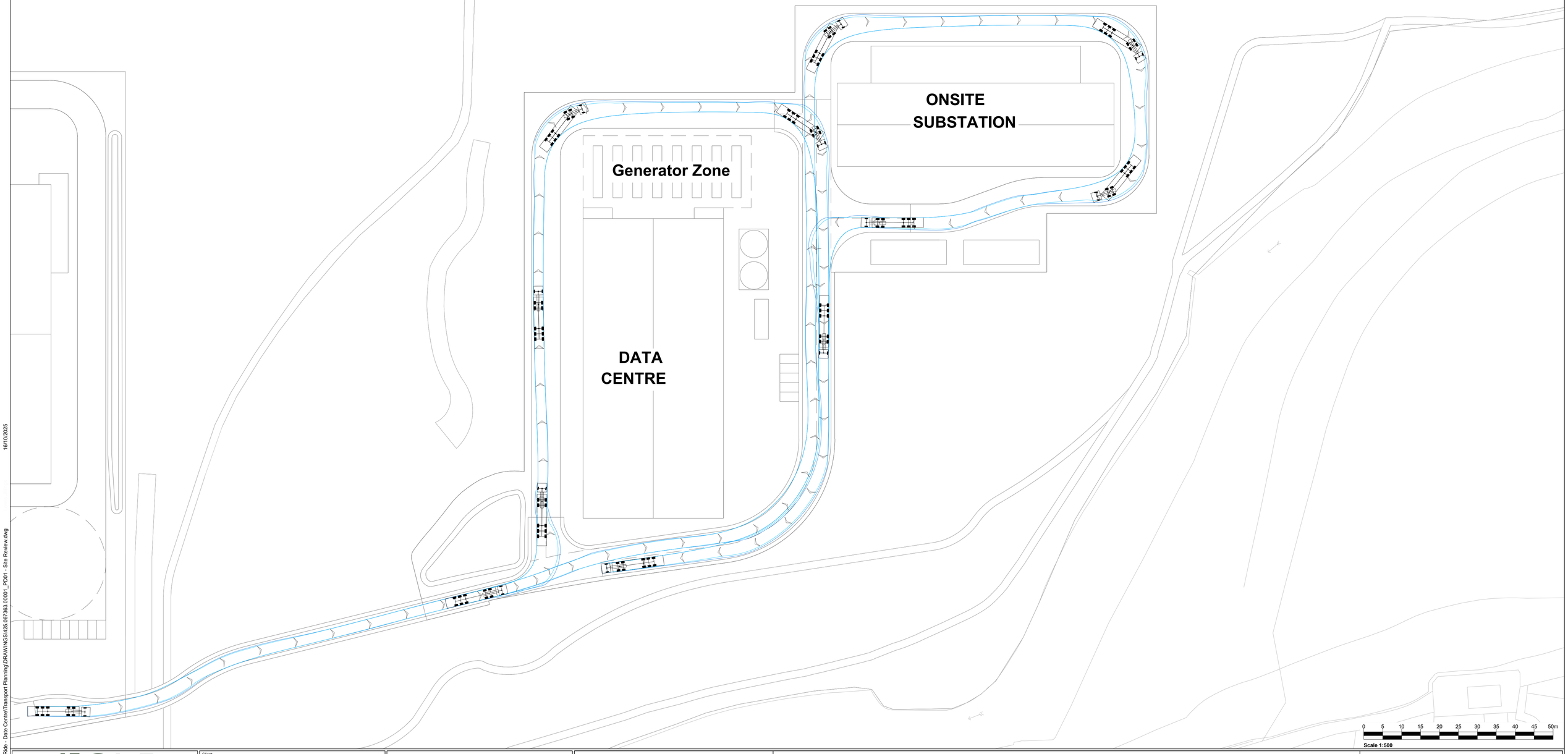
N

PLOT 5/6



0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

SLR	Client: Curtis Hall Ltd	Notes:	Vehicle Detail:
www.slrconsulting.com	Project: Pentwyn Park & Ride	Legend:	
Drawing Status & Suitability Code			
Designed: LJ / Drawn: LJ / Checked: ST / Authorised: ST	Drawing Title: Swept Path Analysis - 16.5m HGV Plot 5/6 Access		
Date: 15.10.25 / 15.10.25 / 15.10.25 / 15.10.25			
Drawing Number: PD01_AT02 / Rev.	Scale: 1:500 @ A1 / SLR Project No.: 425.067363.00001		

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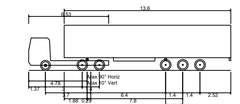

Max Legal Length (UK) Articulated Vehicle (16.5m)

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Overall Body Height	3.681m
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Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

Rev	Amendments	Date	By	Chk	Auth

16/10/2025

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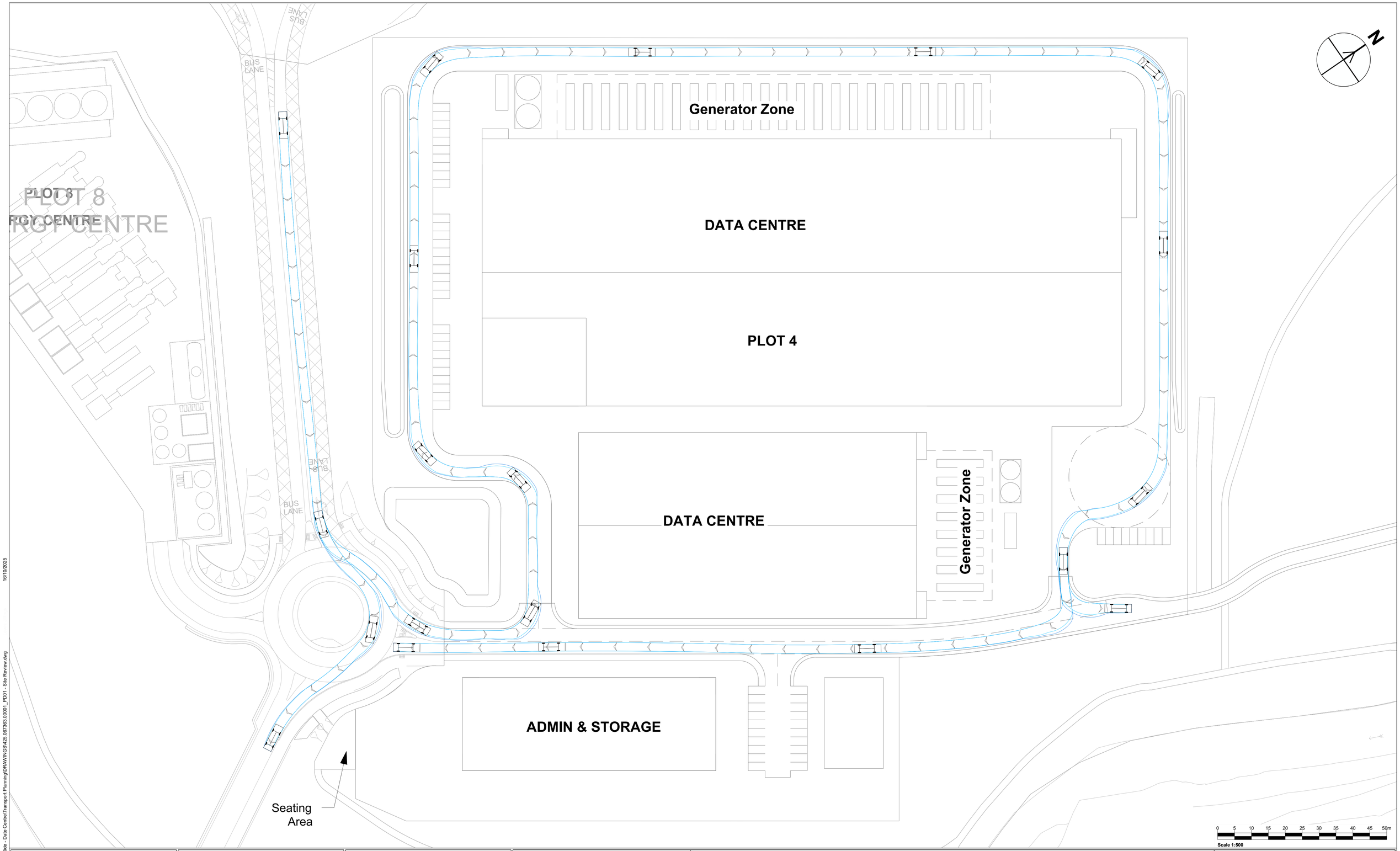

SLR

www.slrconsulting.com

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Status & Suitability Code:

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date: 15.10.25	Date: 15.10.25	Date: 15.10.25	Date: 15.10.25

Drawing Title: Swept Path Analysis - Fire Tender
Plot 4 Access

Drawing Number: PD01_AT03

Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

Rev	Amendments	Date	By	Chk	Auth

Notes:

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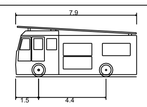
Legend:

Vehicle Detail:



Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

16/10/2025

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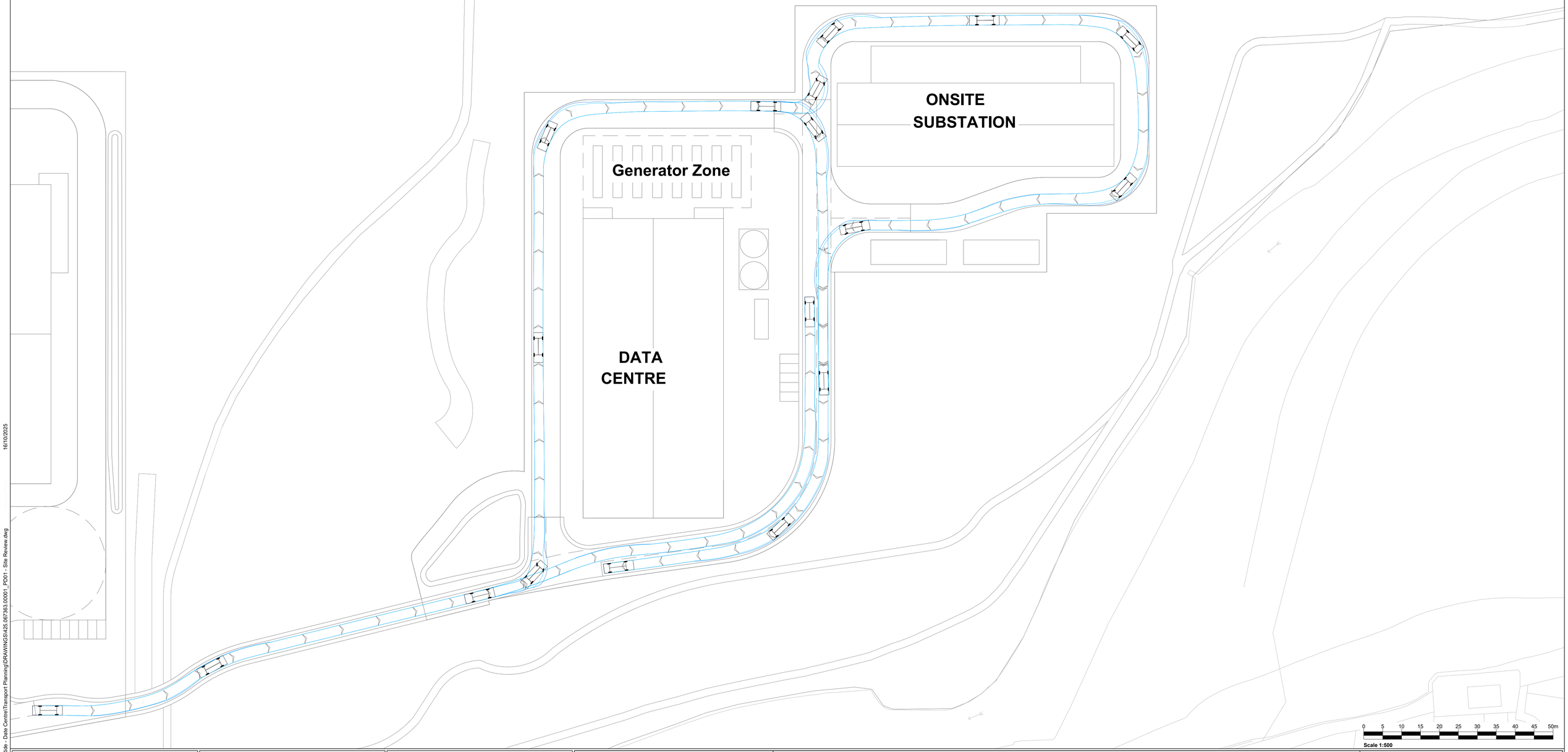
N

PLOT 5/6



0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

16/10/2025

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SLR

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Drawing Status & Suitability Code

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date 15.10.25	Date 15.10.25	Date 15.10.25	Date 15.10.25

Drawing Number: **PD01_AT04** Rev.

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Title: Swept Path Analysis - Fire Tender
Plot 5/6 Access

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

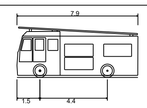
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

Vehicle Detail:



Pumping Appliance

Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

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Appendix F Sample Workplace Travel Survey

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

Employee Travel Survey

All information provided is anonymous. Thank you for you cooperation.

Q1 Full home postcode: ……

Q2 Gender:

- Male ☐
- Female ☐

Q3 Are you:

- Full Time ☐
- Part Time ☐

Q4 Age:

- Under 25 ☐
- 25 -34 ☐
- 35 – 44 ☐
- 45 – 54 ☐
- 55 or over ☐

Q5 Do you have any disability which affects your travel arrangements?

- Yes ☐
- No ☐

Q6 How do you usually travel to work?

- Bus ☐
- Bicycle ☐
- Car driver (on your own) ☐
- Car driver (with a passenger) ☐
- Car passenger ☐
- Walk ☐
- Motorcycle / Moped / Scooter ☐
- Train ☐
- Other …….

Q7 If you drive to work where do you normally park?

- Staff Car Park ☐
- Nearby Street ☐
- Other ……. ☐

Q8 How often do you travel to and from work by the mode of transport specified in Question 6?

- 5 or more times a week ☐
- 2-4 times a week ☐
- Once a week ☐
- Less than once a week ☐

Q9 Which of the following do you occasionally use instead of your usual form of transport?

- Bus ☐
- Bicycle ☐
- Car driver (on your own) ☐
- Car driver (with a passenger) ☐
- Car passenger ☐
- Walk ☐
- Motorcycle / Moped / Scooter ☐
- Train ☐
- Other …….
- No alternative used ☐

Q10 How far away is your residence from work approximately?

- 0-1 mile ☐
- 1-2 miles ☐
- 2-5 miles ☐
- 5-10 miles ☐
- 10+ miles ☐

Q11 How long does it usually take for you to travel to and from work?

	To work	From work
0 – 15 min	☐	☐
16 – 30 min	☐	☐
31 – 60 min	☐	☐
61 – 90 min	☐	☐
Over 90 min	☐	☐

Q12 If you regularly come to work by car what is you main reason?

- Get a lift ☐
- Health reasons ☐
- Lack of an alternative ☐
- Convenience ☐
- Car essential to perform job ☐
- Dropping off / collecting children ☐
- Personal safety ☐
- Car cheaper than public transport ☐

Q13 Are you prepared to car share?

Yes – Individually (or already do)	☐
Yes – should an in-house scheme exist	☐
No	☐

Q15 Which of the following changes would encourage you to cycle to work? (If you already do cycle which would you most like to see?)

Safer, better lit cycle routes	☐
Improved cycle parking near site	☐
Improved/ provision of showers on site	☐
Discount or loan to buy a bike	☐
Cycle training to improve skills	☐
Other …….	
Nothing	☐

Q16 Which of the following would encourage you to use the bus to travel to work? (If you already use the bus which would you most like to see?)

More frequent services	☐
More reliable services	☐
Improved public transport information	☐
Improved pedestrian conditions around bus stops	☐
Bus stops within closer proximity to home / work	☐
Cleaner and more comfortable buses	☐
Improved facilities at bus stops	☐
Cheaper / subsidised fares	☐
Other ……	
None	☐

Q17 Which of the following would encourage you to use the train to travel to work? (If you already use the train which would you most like to see?)

More frequent services	☐
More reliable services	☐
Improved public transport information	☐
Improved pedestrian conditions around train station	☐
Train stations within closer proximity to home	☐
Cleaner and more comfortable trains	☐
Improved facilities at train stations	☐
Cheaper / subsidised fares	☐
Other ……	
None	☐

Q18 Do you have any comments about your travel to work?

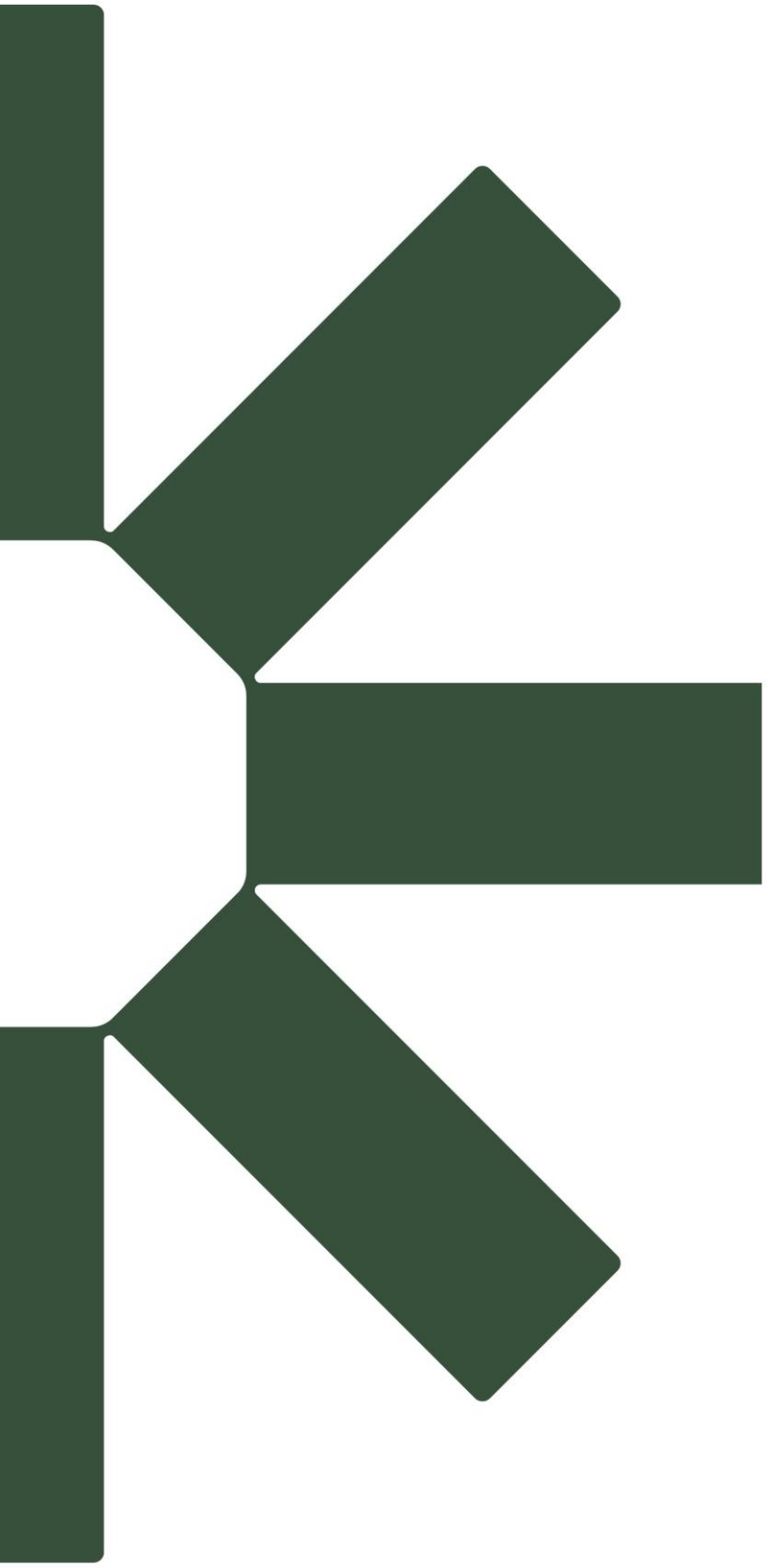
……..

……..

……..

……..

……..



Making Sustainability Happen

Appendix H Tremorfa Energy Park and Latos Data Centre TRICS Data

Transport Assessment

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

. . . Licence No: 152302

Calculation Reference: AUDIT-152302-231122-1141

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : A - OFFICE
TOTAL VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	SO	SLOUGH	4 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter:	Gross floor area
Actual Range:	5677 to 16000 (units: sqm)
Range Selected by User:	186 to 135750 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/15 to 24/05/23

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	1 days
Wednesday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	4 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	4

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Industrial Zone	4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	5 days - Selected
Servicing vehicles Excluded	X days - Selected

Secondary Filtering selection:

Use Class:

Not Known	4 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Filter by Site Operations Breakdown:
All Surveys Included

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:
25,001 to 50,000 4 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:
250,001 to 500,000 4 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:
0.6 to 1.0 4 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:
No 4 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:
No PTAL Present 4 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 SO-02-A-03 DATA CENTRE SLOUGH
LIVERPOOL ROAD
SLOUGH

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 16000 sqm
Survey date: WEDNESDAY *26/04/23* *Survey Type: MANUAL*

2 SO-02-A-04 DATA CENTRE SLOUGH
LIVERPOOL ROAD
SLOUGH

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 5677 sqm
Survey date: WEDNESDAY *24/05/23* *Survey Type: MANUAL*

3 SO-02-A-05 DATA CENTRE SLOUGH
LIVERPOOL ROAD
SLOUGH

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 11700 sqm
Survey date: WEDNESDAY *24/05/23* *Survey Type: MANUAL*

4 SO-02-A-06 DATA CENTRE SLOUGH
AJAX AVENUE
SLOUGH

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 11402 sqm
Survey date: MONDAY *22/05/23* *Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
TOTAL VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.007	3	9593	0.000	3	9593	0.007
05:00 - 06:00	3	9593	0.024	3	9593	0.007	3	9593	0.031
06:00 - 07:00	4	11195	0.100	4	11195	0.042	4	11195	0.142
07:00 - 08:00	4	11195	0.130	4	11195	0.022	4	11195	0.152
08:00 - 09:00	4	11195	0.100	4	11195	0.029	4	11195	0.129
09:00 - 10:00	4	11195	0.067	4	11195	0.040	4	11195	0.107
10:00 - 11:00	4	11195	0.054	4	11195	0.025	4	11195	0.079
11:00 - 12:00	4	11195	0.031	4	11195	0.047	4	11195	0.078
12:00 - 13:00	4	11195	0.029	4	11195	0.040	4	11195	0.069
13:00 - 14:00	4	11195	0.040	4	11195	0.045	4	11195	0.085
14:00 - 15:00	4	11195	0.042	4	11195	0.047	4	11195	0.089
15:00 - 16:00	4	11195	0.013	4	11195	0.089	4	11195	0.102
16:00 - 17:00	4	11195	0.011	4	11195	0.080	4	11195	0.091
17:00 - 18:00	4	11195	0.016	4	11195	0.063	4	11195	0.079
18:00 - 19:00	4	11195	0.029	4	11195	0.060	4	11195	0.089
19:00 - 20:00	4	11195	0.009	4	11195	0.025	4	11195	0.034
20:00 - 21:00	3	9593	0.003	3	9593	0.021	3	9593	0.024
21:00 - 22:00	3	9593	0.003	3	9593	0.014	3	9593	0.017
22:00 - 23:00	3	9593	0.010	3	9593	0.017	3	9593	0.027
23:00 - 24:00	3	9593	0.007	3	9593	0.003	3	9593	0.010
Total Rates:			0.725			0.716			1.441

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

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Parameter summary

Trip rate parameter range selected:	5677 - 16000 (units: sqm)
Survey date date range:	01/01/15 - 24/05/23
Number of weekdays (Monday-Friday):	5
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
TAXIS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.003	3	9593	0.003	3	9593	0.006
06:00 - 07:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
07:00 - 08:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
08:00 - 09:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
09:00 - 10:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
10:00 - 11:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
11:00 - 12:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
12:00 - 13:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
13:00 - 14:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
14:00 - 15:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
15:00 - 16:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
16:00 - 17:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
17:00 - 18:00	4	11195	0.004	4	11195	0.004	4	11195	0.008
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.013			0.013			0.026

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
06:00 - 07:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
07:00 - 08:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
08:00 - 09:00	4	11195	0.004	4	11195	0.004	4	11195	0.008
09:00 - 10:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
10:00 - 11:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
11:00 - 12:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
12:00 - 13:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
13:00 - 14:00	4	11195	0.004	4	11195	0.004	4	11195	0.008
14:00 - 15:00	4	11195	0.007	4	11195	0.004	4	11195	0.011
15:00 - 16:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
16:00 - 17:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
17:00 - 18:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.019			0.018			0.037

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
CYCLISTS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
06:00 - 07:00	4	11195	0.016	4	11195	0.000	4	11195	0.016
07:00 - 08:00	4	11195	0.004	4	11195	0.000	4	11195	0.004
08:00 - 09:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
09:00 - 10:00	4	11195	0.004	4	11195	0.000	4	11195	0.004
10:00 - 11:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
11:00 - 12:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
12:00 - 13:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
13:00 - 14:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
14:00 - 15:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
15:00 - 16:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
16:00 - 17:00	4	11195	0.000	4	11195	0.004	4	11195	0.004
17:00 - 18:00	4	11195	0.000	4	11195	0.011	4	11195	0.011
18:00 - 19:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
19:00 - 20:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
20:00 - 21:00	3	9593	0.000	3	9593	0.003	3	9593	0.003
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.028			0.028			0.056

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
CARS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.007	3	9593	0.000	3	9593	0.007
05:00 - 06:00	3	9593	0.021	3	9593	0.003	3	9593	0.024
06:00 - 07:00	4	11195	0.096	4	11195	0.038	4	11195	0.134
07:00 - 08:00	4	11195	0.098	4	11195	0.013	4	11195	0.111
08:00 - 09:00	4	11195	0.067	4	11195	0.009	4	11195	0.076
09:00 - 10:00	4	11195	0.045	4	11195	0.022	4	11195	0.067
10:00 - 11:00	4	11195	0.038	4	11195	0.011	4	11195	0.049
11:00 - 12:00	4	11195	0.022	4	11195	0.029	4	11195	0.051
12:00 - 13:00	4	11195	0.016	4	11195	0.027	4	11195	0.043
13:00 - 14:00	4	11195	0.016	4	11195	0.027	4	11195	0.043
14:00 - 15:00	4	11195	0.022	4	11195	0.031	4	11195	0.053
15:00 - 16:00	4	11195	0.007	4	11195	0.045	4	11195	0.052
16:00 - 17:00	4	11195	0.007	4	11195	0.065	4	11195	0.072
17:00 - 18:00	4	11195	0.009	4	11195	0.056	4	11195	0.065
18:00 - 19:00	4	11195	0.029	4	11195	0.060	4	11195	0.089
19:00 - 20:00	4	11195	0.007	4	11195	0.020	4	11195	0.027
20:00 - 21:00	3	9593	0.003	3	9593	0.021	3	9593	0.024
21:00 - 22:00	3	9593	0.003	3	9593	0.014	3	9593	0.017
22:00 - 23:00	3	9593	0.010	3	9593	0.017	3	9593	0.027
23:00 - 24:00	3	9593	0.007	3	9593	0.003	3	9593	0.010
Total Rates:			0.530			0.511			1.041

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
LGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
06:00 - 07:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
07:00 - 08:00	4	11195	0.025	4	11195	0.004	4	11195	0.029
08:00 - 09:00	4	11195	0.029	4	11195	0.016	4	11195	0.045
09:00 - 10:00	4	11195	0.018	4	11195	0.016	4	11195	0.034
10:00 - 11:00	4	11195	0.011	4	11195	0.013	4	11195	0.024
11:00 - 12:00	4	11195	0.007	4	11195	0.011	4	11195	0.018
12:00 - 13:00	4	11195	0.013	4	11195	0.013	4	11195	0.026
13:00 - 14:00	4	11195	0.020	4	11195	0.013	4	11195	0.033
14:00 - 15:00	4	11195	0.011	4	11195	0.009	4	11195	0.020
15:00 - 16:00	4	11195	0.007	4	11195	0.042	4	11195	0.049
16:00 - 17:00	4	11195	0.004	4	11195	0.013	4	11195	0.017
17:00 - 18:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.149			0.154			0.303

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
MOTOR CYCLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
06:00 - 07:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
07:00 - 08:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
08:00 - 09:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
09:00 - 10:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
10:00 - 11:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
11:00 - 12:00	4	11195	0.002	4	11195	0.004	4	11195	0.006
12:00 - 13:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
13:00 - 14:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
14:00 - 15:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
15:00 - 16:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
16:00 - 17:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
17:00 - 18:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.002	4	11195	0.004	4	11195	0.006
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.012			0.012			0.024

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
Servicing Vehicles
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
06:00 - 07:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
07:00 - 08:00	4	11195	0.004	4	11195	0.002	4	11195	0.006
08:00 - 09:00	4	11195	0.018	4	11195	0.018	4	11195	0.036
09:00 - 10:00	4	11195	0.013	4	11195	0.016	4	11195	0.029
10:00 - 11:00	4	11195	0.013	4	11195	0.009	4	11195	0.022
11:00 - 12:00	4	11195	0.009	4	11195	0.011	4	11195	0.020
12:00 - 13:00	4	11195	0.004	4	11195	0.004	4	11195	0.008
13:00 - 14:00	4	11195	0.009	4	11195	0.011	4	11195	0.020
14:00 - 15:00	4	11195	0.013	4	11195	0.011	4	11195	0.024
15:00 - 16:00	4	11195	0.002	4	11195	0.004	4	11195	0.006
16:00 - 17:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
17:00 - 18:00	4	11195	0.004	4	11195	0.004	4	11195	0.008
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.095			0.096			0.191

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

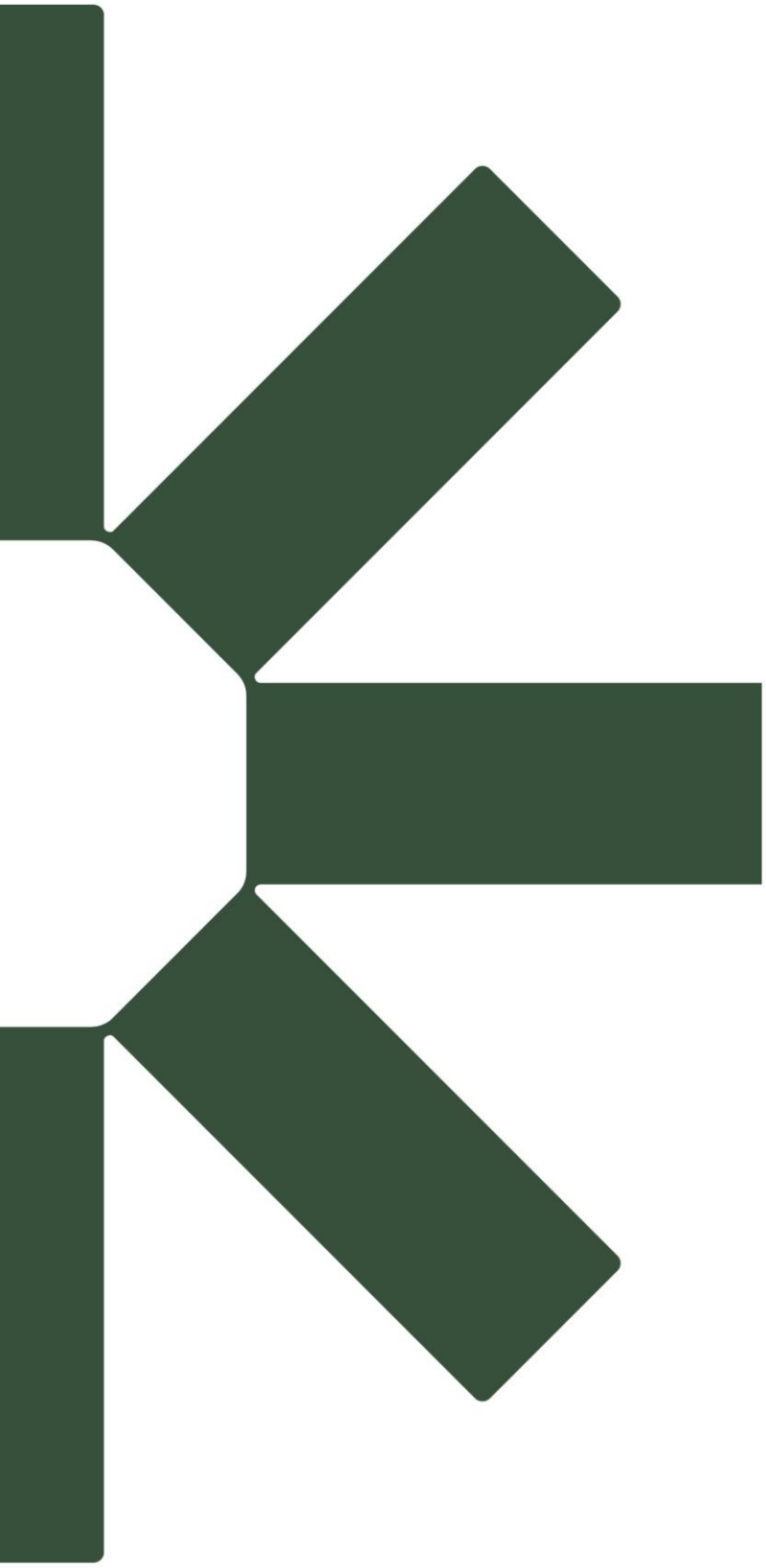
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

TRIP RATE for Land Use 02 - EMPLOYMENT/A - OFFICE
Scooters
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
01:00 - 02:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
02:00 - 03:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
03:00 - 04:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
04:00 - 05:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
05:00 - 06:00	3	9593	0.003	3	9593	0.000	3	9593	0.003
06:00 - 07:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
07:00 - 08:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
08:00 - 09:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
09:00 - 10:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
10:00 - 11:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
11:00 - 12:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
12:00 - 13:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
13:00 - 14:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
14:00 - 15:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
15:00 - 16:00	4	11195	0.002	4	11195	0.002	4	11195	0.004
16:00 - 17:00	4	11195	0.002	4	11195	0.000	4	11195	0.002
17:00 - 18:00	4	11195	0.000	4	11195	0.002	4	11195	0.002
18:00 - 19:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
19:00 - 20:00	4	11195	0.000	4	11195	0.000	4	11195	0.000
20:00 - 21:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
21:00 - 22:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
22:00 - 23:00	3	9593	0.000	3	9593	0.003	3	9593	0.003
23:00 - 24:00	3	9593	0.000	3	9593	0.000	3	9593	0.000
Total Rates:			0.013			0.013			0.026

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*



Making Sustainability Happen

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

Prepared by:

SLR Consulting Limited

Tudor House, 16 Cathedral Road, Cardiff, CF11 9LJ

SLR Project No.: 425.067363.00001

1 December 2025

Revision: 01

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	1 December 2025	CS	SGT	ID

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Appendix A **2022 Traffic Flow Diagrams**
Appendix B **2022 Traffic Data**
Appendix C **Collision Data**
Appendix D **Illustrative Site Layout and PRoW Network**
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1.0 Introduction

1.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall (the Applicant). This Transport Assessment (TA) has been prepared in support of the planning application being submitted by the Applicant to Cardiff Council (the Council) for the redevelopment of Cardiff East Park and Ride, Llanrumney (the site).

1.2 The hybrid planning application seeks planning permission for the following description of development:

1.3 *Hybrid Planning Application (part full/part outline) for the demolition of existing structures and redevelopment of the site to provide a data centre and associated buildings and structures, associated car parking and access roads, a bridge across the Rhymney River, site wide landscaping and associated works*

1.4 The proposed development provides the opportunity for a data centre campus and associated employment floorspace. The proposed development would also facilitate a new bridge connecting the site with Llanrumney.

1.5 The scope of this Interim Workplace Travel Plan has been prepared in accordance with both local and national planning policy guidance, a summary of which is provided below:

- Planning Policy Wales (Edition 12)
- Technical Advice Note 18 (Transport)
- Future Wales – The National Plan 2040
- Llwybr Newydd – The Wales Transport Strategy 2021
- Active Travel (Wales) Act 2013
- Active Travel Act Guidance 2021
- Cardiff Local Development Plan 2006 – 2026
- Managing Transportation Impacts SPG (July 2018)

1.6 These documents provide the requirements and best practice guidelines for the production of Travel Plans within Cardiff and Wales and seek to create Travel Plans that provide a long-term management strategy for an occupier of a site that seeks to deliver sustainable transport objectives through positive action.

2.0 Existing Conditions

2.1 This section of the report will include a detailed description of the site location, the surrounding highway network and the general traffic and transportation of the area including public transport provision, and access to the site via active travel modes such as walking and cycling.

Site Location

2.2 The site is located in east Cardiff, approximately 1.6km northwest of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south.

2.3 **Figure 2.1** indicates the location of the proposed development in a local context.

Figure 2.1 - Site Location

Walking

2.4 There are no footways present on the A48 Eastern Avenue/Bryn Celyn Road junction or on the access road to the P&R. However, a number of leisure walking routes are located within the immediate vicinity of the site, which provide opportunity for travel in all directions on foot.

2.5 These leisure routes primarily take the form of PRoW routes, as illustrated in **Figure 2.2**. Within the immediate proximity of the site, several PRoW routes are present, providing connectivity to the north, east, west and south of the site. To the east of the site, PRoW routes connect with Ball Lane via a footbridge over the Rhymney River. Ball Lane includes footways on either side of the carriageway and connects with the wider walking network along Ball Road.

Figure 2.2 – Existing Public Rights of Way

2.6 To the north of the site, PRoW routes connect with a footbridge over the A48. This provides connectivity to Pentwyn Road which also includes footways, and a number of local facilities. This can be seen in **Photograph 2.1.**

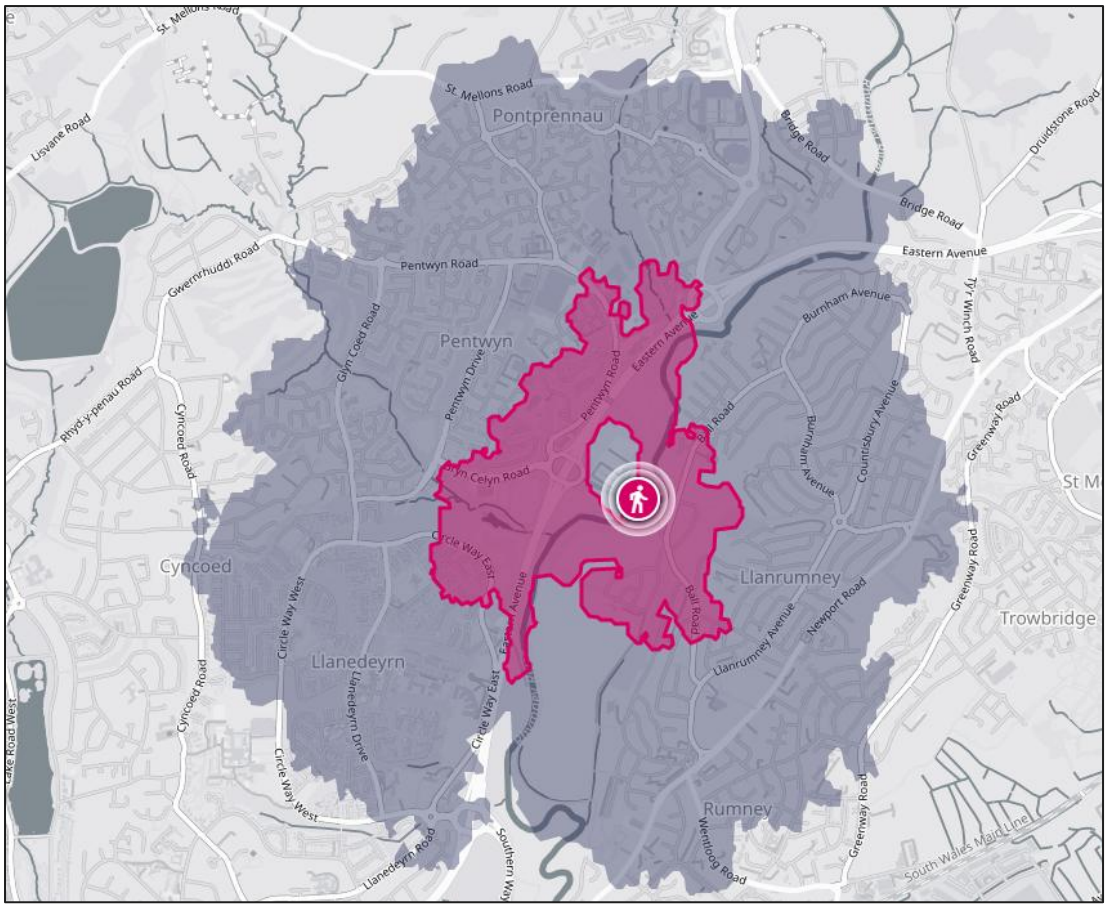
Photograph 2.1 – Public Right of Way across the A48

2.7 A further footbridge across the A48 is also located to the south of the site. This link provides connectivity to Circle Way East where footways and local facilities are also located.

2.8 These PRoW routes also provide a connection to the 'Rhymney Trail', a leisure walking and cycling route around Llanrumney Fields to the south of the site.

2.9 As described, whilst no footways are provided at the existing site access road and the Eastern Avenue / Bryn Celyn Road junction, the site benefits from a number of leisure active travel routes within the immediate vicinity of the site. These routes provide opportunity to connect with local facilities, services and key areas in all directions.

Figure 2.3 – 15 and 30 Minute Walking Isochrones



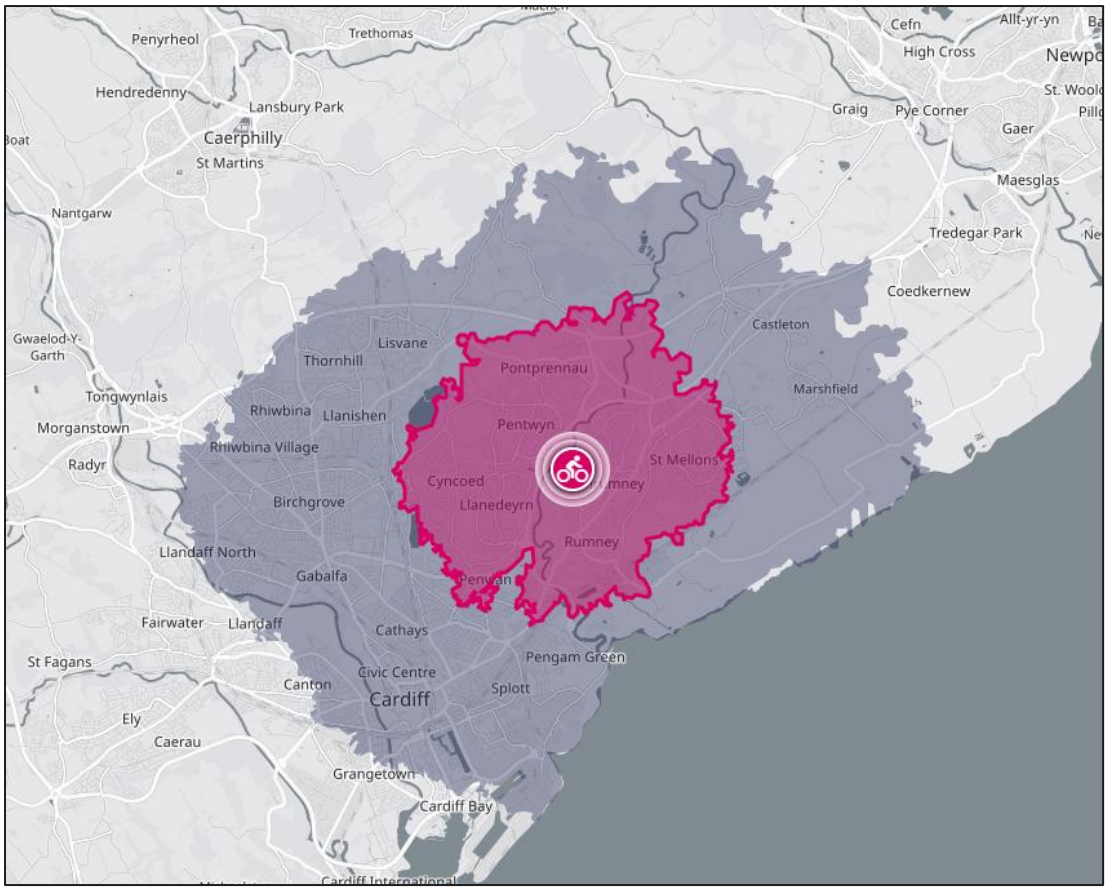
Cycling

2.10 Immediately to the east of the site, the Rhymney Trail runs in a north-south direction, providing a good leisure route accessible from the site than can be used to access the development. The Rhymney Trail runs along the Rhymney River, and to the south connects to Newport Road. Newport Road runs to the city centre and features a shared pedestrian/cycleway for much of its length.

2.11 To the north, the Rhymney Trail runs under the A48 Eastern Avenue to provide a route to Pentwyn Road. It also continues north to the suburb of Pontprennau and St Mellons Road, allowing communities within Pontprennau to access the development.

2.12 Figure 2.4 shows the current 15- and 30-minute cycling isochrones from the site. It shows that a large proportion of Cardiff are within a short cycle of the site.

Figure 2.4 – 15 and 30 Minute Cycling Isochrones



Bus Services

2.13 A summary of bus services within the vicinity are displayed in **Figure 2.5**. A bus stop is located within the existing site which serves 'Cardiff East Park and Ride'. At present, this bus stop is served by a single bus route, the H59. The H59 provides connectivity with Heath Hospital and runs on a 20-minute frequency.

Figure 2.5 - Existing Bus Services

2.14 There are also bus stops located along Bryn Celyn Road to the west of the site, accessible via existing PRoW routes and footbridges over the A48. These stops are served by bus services 58. The 58 service provides a return service every 20 minutes to the city centre.

2.15 To the east of the site, bus stops are located along Ball Road, which can be accessed via a footbridge over the Rhymney River. These stops are served by bus services 49, 50, 101 and 102.

2.16 A summary of the bus services that are accessible from the site can be seen in **Table 2.1.**

Table 2.1 – Bus Routes accessible within vicinity of the site

Number	Route	Operating Hours	Frequency			Operator
			M-F	S	S	
H59	Cardiff East Park and Ride – Heath Hospital	06:30-20:50	3 per hour	N/A	N/A	Cardiff Bus
58	Pontprennau – City Centre	05:14-22:35	3 per hour	2 per hour	2 per hour	Cardiff Bus
49, 50	St Mellons – City Centre	05:25-23:00	4 per hour	1 per hour	1 per hour	Cardiff Bus
101, 102	City Centre – St Mellons/Llanrumney via Pentrebane and Heath Hospital	09:05-17:15	1 per hour	N/A	N/A	Cardiff Bus

Rail Services

2.17 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, which is accessible within an 18-minute cycle from the site, or from using the H59 Bus Service from the Heath Hospital, approximately an 18-minute walk from the station.

2.18 Heath High Level Station is located on the Rhymney Line, and benefits from services to the south towards Cardiff Queen Street, Cardiff Central and Penarth every 15 minutes, and services to the north to Caerphilly, Ystrad Mynach and Bargoed. These provide good travel opportunities to use the station to access the site.

2.19 **Table 2.2** details some of the destinations accessible from the station.

Table 2.2 - Local Rail Services and Frequencies

Destination	Frequency (off-peak)	Average Journey Time (mins)
Cardiff Queen Street	6 trains per hour	6
Cardiff Central	6 trains per hour	10
Caerphilly	6 trains per hour	12
Barry	4 trains per hour	37
Penarth	2 trains per hour	24

Local Highway Network

2.20 The existing Cardiff East P&R site is directly accessed from the eastern arm of the A48 Eastern Avenue/Bryn Celyn Road junction and provides good access to local roads via Bryn Celyn Road and the A48. The A48 directly links with the M4 and as such, the site is considered to be well connected to the strategic road network.

A48

2.21 The A48 forms one of Cardiff's arterial routes linking the M4 in the west to the A4232 in the east. The A48 passes north of Cardiff city centre. In the vicinity of the site, the A48 is a dual-carriageway, with a 50mph speed limit travelling to the southwest and to the north east. Further along towards the north-west, the National Speed Limit then applies until reaching the M4. Towards the city centre, the National Speed Limit also applies in part until reaching the city centre.

2.22 The A48 also benefits from bus lanes from the A48 junction to the junction with the A4232 to the southwest, one on each side of the dual carriageway.

Pentwyn Road

2.23 Pentwyn Road is located to the northwest of the A48 junction and is a single-carriageway road subject to a 30mph speed limit. It leads from the site towards Pontprennau and has streetlighting and footways on both sides of the road from a short distance after the junction. There are bus stops present along the road with bus shelters available.

Bryn Celyn Road

2.24 Bryn Celyn Road is located to the west of the A48 junction, and is a dual-carriageway near the junction subject to a 30mph speed limit. It is subject to traffic-calming along its length, with road narrowings creating uncontrolled pedestrian crossings. There are footways present along its length, although not connecting to the A48 junction.

Ball Road

2.25 Ball Road is located to the southeast of the site, across the Rhymney River. It is a single-carriageway road subject to a 30mph speed limit. It runs from Burnham Avenue in the north east, before continuing south towards Llanrumney Avenue. The road is subject to traffic calming in the forms on humps along the carriageway and road narrowings. There are footways present along each side of the carriageway in addition to streetlighting.

Existing Traffic Data

2.26 MCC surveys were undertaken on Tuesday 15th February 2022 at the A48/P&R access junction (Pentwyn Interchange) and at the Ball Road/Hartland Road junction and an ATC survey was undertaken on Ball Road between Thursday 10th to Wednesday 16th February 2022.

2.27 The MCC survey recorded all turning movements at the Pentwyn Interchange junction by vehicle type between the hours of 08:00 – 09:00 and 16:30 – 17:30.

2.28 Flow diagrams showing the observed traffic flows on the highway network in 2022 are shown in **Appendix A** and the existing traffic data is included at **Appendix B**.

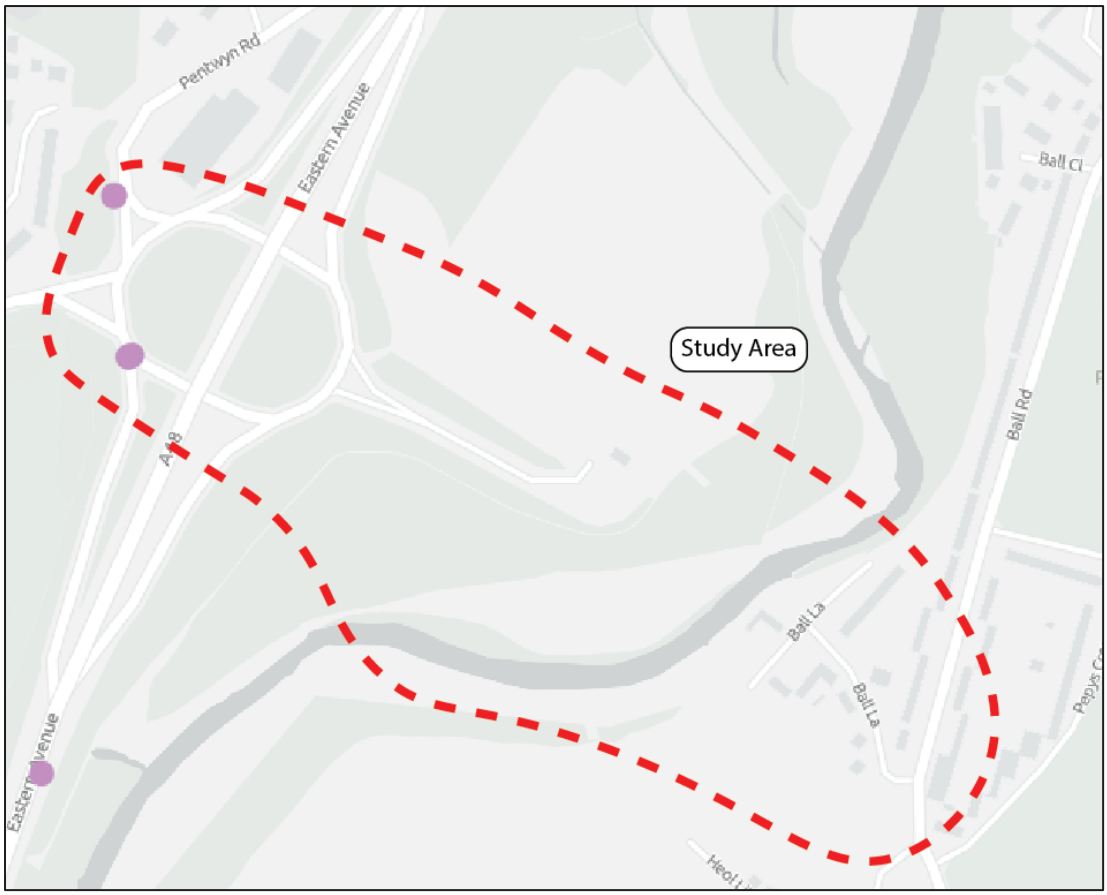
Personal Injury Collision Analysis

2.29 A Personal Injury Collision (PIC) analysis has been undertaken to review whether there may be an existing highway issues or collision clusters in the vicinity of the site which may be exacerbated by the proposed development.

2.30 The review has included any collisions that have happened on the existing Park and Ride Site, the A48 junction and Ball Road near the proposed junction, as these are the only locations where the development would have any significant impact on traffic levels.

2.31 The Department for Transport Mapping Application for Visualising Road Injury Casualties (MAVRIC) was used to review the collision history for the previous 5 years for which data is available (2020 – 2024). **Figure 2.6** shows the study area and the collision locations, and the collision data can be found attached at **Appendix C**.

Figure 2.6 – Collison Study Area and Locations



2.32 There is a total of three collisions shown in the study area of **Figure 2.6**, with one located on Pentwyn Road and two located on the A48 off-slip where it meets the roundabout junction. All collision were of a slight severity.

2.33 Due to there being a limited number of accidents that can be attributed to driver error, it can be presumed that there is no issue with the design of the nearby roads or junctions, or within the site, at present.

Summary

2.34 The site is located in east Cardiff, approximately 1.6km north west of the suburb of Llanrumney. It is bound to the west by the A48, to the east by the Rhymney River and residential properties at Ball Road, and Public Rights of Way (PRoW) routes and open fields to the south, providing good links from the development to the wider area by foot.

2.35 The site benefits from having nearby bus services nearby towards Cardiff City Centre and other parts of Cardiff, including towards Heath Hospital.

2.36 The nearest rail station to the site is Heath High Level Station, which is located approximately 4km from the site, and benefits from frequent services, including to Cardiff Central, Cardiff Queen Street, Caerphilly and Penarth.

2.37 A PIC review undertaken shows that there is no major issue with the design of the nearby roads or junctions, or within the site at present, due to there being limited collisions in the area over a period of 5 years

3.0 Policy Review

3.1 The section details the national and local policy that impacts the development.

National Policy

Planning Policy Wales (Edition 12, February 2024)

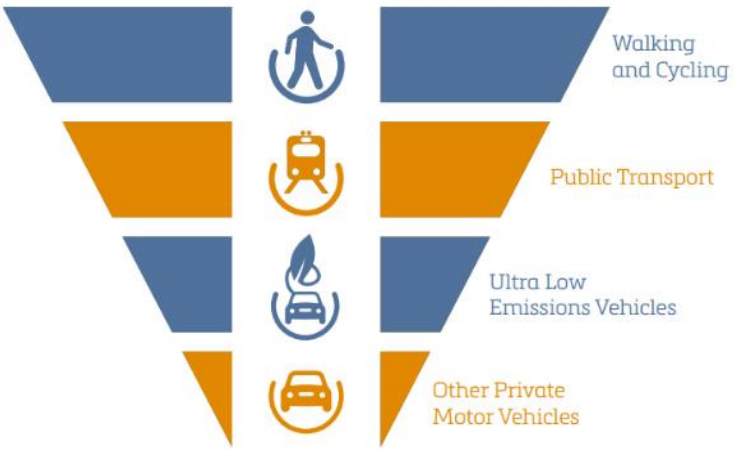
3.2 Planning Policy Wales Edition 12 (PPW) sets out the land use planning policies of the Welsh Government.

3.3 With regards to sustainable transport, PPW advises that, in the context of active and social places, which also relates to employment, all developments should encourage modal shift and be easily accessible by walking, cycling and public transport, by virtue of their location, design and provision of on and off site sustainable transport infrastructure.

3.4 Furthermore, the 'active and social' theme within PPW aims to ensure new development is located and designed in a way which minimises the need to travel, reduces dependency on the private car and enables sustainable access to employment, local services, and community facilities.

3.5 A key theme throughout PPW is the aim of reducing reliance on travel by private car, and the adverse impacts of motorised transport on the environment and people's health, by prioritising and increasing active travel and public transport. Additionally, it states that development proposals must seek to maximise accessibility by walking, cycling and public transport, by prioritising the provision of appropriate on-site infrastructure and, where necessary, mitigating transport impacts through the provision of off-site measures, such as the development of active travel routes, bus priority infrastructure and financial support for public transport services.

3.6 These themes of emphasis on sustainable transport and active travel are supported by the 'Sustainable Transport Hierarchy for Planning' included within PPW.



Technical Advice Note (TAN) 18: Transport

3.7 TAN 18: Transport describes how to integrate land use and transport planning and explains how transport impacts should be assessed and mitigated.

3.8 The document states that sustainable development should be achieved by:

- Integration of transport and land use planning;
- Integration between different types of transport; and
- Integration of transport policy with policies for the environment, education, social justice, health, economic development and wealth creation.

3.9 Integration of land use planning and development of transport infrastructure can help the Welsh Government achieve its wider sustainable development policy objectives by:

- Promoting resource and travel efficient settlement patterns;
- Ensuring new development is located where there is, or will be, good access by public transport, walking and cycling thereby minimising the need for travel and fostering social inclusion;
- Managing parking provision;
- Ensuring that new development and major alterations to existing developments include appropriate provision for pedestrians (including the with special access and mobility requirements), cycling, public transport, and traffic management and parking/servicing;
- Encouraging the location of development near other related uses to encourage multi-purpose trips;
- Promoting cycling and walking;
- Supporting the provision of high quality, inclusive public transport;
- Supporting provision of a reliable and efficient freight network;
- Encouraging good quality design of streets that provide a safe public realm and a distinct sense of place; and
- Ensuring that transport infrastructure or service improvements necessary to serve new development allow existing transport networks to continue to perform their identified junctions.

Wales Transport Strategy (Connecting the Nation)

3.10 The wider agenda of this document is to ensure that transport features strongly in the Welsh Assembly Government's policy spectrum:

3.11 'Getting the most out of our existing transport system;

1. Making greater use of more sustainable modes of travel; and
2. Reducing demands on the transport system.'

Active Travel (Wales) Act (2013)

3.12 The Welsh Government seeks to enable more people to walk, cycle and generally travel by more active methods, so that:

1. 'more people can experience the health benefits of active travel;
2. we reduce our greenhouse gas emissions;
3. we help address poverty and disadvantage, and
4. we help our economy to grow by unlocking sustainable economic growth.'

3.13 By connecting key sites such as workplaces, hospitals, schools and shopping areas with active travel routes, the Act will encourage people to rely less on their cars when making short journeys and make implementing successful Travel Plans easier.

Future Wales: The National Plan 2040 (February 2021)

3.14 This document is a National Development Framework for Wales. It influences all levels of the planning system in Wales and will help to shape Strategic and Local Development Plans prepared by councils and national park authorities.

3.15 The document highlights the importance of reducing emissions to protect well-being and to demonstrate global responsibility. The planning system needs to focus on delivering a decarbonised and resilient Wales through the places that are created, the energy generated and the natural resources and materials that are used and how people live and travel.

3.16 The document recognises that there has been a significant change in the way people live and travel as a result of the COVID-19 pandemic. The pandemic has highlighted the quality and accessibility of people's local areas as being important for people's health and well-being during the pandemic.

3.17 Welsh Government have produced a document called 'COVID-19 Reconstructions: Challenges and Priorities'. This document sets out how people are using places differently, travelling less and spending more time working from home. Welsh Government is encouraging an increase in remote working and has set a long-term ambition for 30% of the Welsh workforce to work away from a traditional office. This is intended to help town centres, reduce congestion and cut carbon emissions. The planning system must therefore respond to these changes and contribute to a sustainable recovery, shaping places around a vision for healthy and resilient places.

3.18 The Welsh Government will work with Transport for Wales, local authorities, operators and partners to deliver the following:

3.19 Active Travel – Prioritising walking and cycling for all local travel;

- Bus – improve the legislative framework for how local bus services are planned and delivered. Invest in the development of integrated regional and local bus networks to increase modal share of bus travel and improve access by bus to a wider range of trip destinations;
- Metro – Develop the South East Metro, South West Metro and North Wales Metro and create new integrated transport systems that provide faster, more frequent and joined up services using trains, buses and light rail; and
- Ultra-low Emission Vehicles – Support the roll-out of suitable fuelling infrastructure to facilitate the adoption of ultra-low emission vehicles, particularly in rural areas.

3.20 In the context of the proposed development, it will be of the utmost importance to promote active travel and public transport for employees wherever possible over travel by private car.

Local Policy

Cardiff Local Development Plan (2006- 2026)

3.21 Cardiff Council's Local Development Plan (LDP) provides the framework for the development and use of land within Cardiff over the LDP period and contains the policies and measures that all new development must adhere to within Cardiff. Cardiff are currently a new LDP which will cover the period of 2021-2036.

3.22 Policy T6 makes reference to impact on transport networks and services. It states:

"Development will not be permitted which would cause unacceptable harm to the safe and efficient operation of the highway, public transport and other movement networks including pedestrian and cycle routes, public rights of way and bridle routes."

3.23 Policy T1 of the LDP deals with Transport and specifically Walking and Cycling. The policy states that with a view to enable people to access services, employment, and community facilities by walking and cycling, the council would support developments which incorporates;

- Permeable and legible networks of safe, convenient, and attractive walking and cycling routes;
- Connections to the Cardiff Strategic Cycle Network and routes forming part of the Cardiff Walkable Neighbourhoods Plan;
- Safe, convenient, and attractive walking and cycling connections to existing developments, neighbourhoods, and services;
- Supporting facilities including, signing, secure cycle parking.

3.24 Key to the Local Development Plan is the Transport Strategy which is seeking to achieve a modal split of 50:50 in 2026 for all trips on the network.

Managing Transportation Impacts SPG (July 2018) – Cardiff Council

3.25 This Supplementary Planning Guidance by Cardiff Council details the scope and content of Travel Plans required as part of the overall package of measures to mitigate impacts and support the implementation of LDP transport policies.

3.26 It notes the purpose of a Travel Plan being a long-term management strategy for an occupier to support and detail the sustainable travel options that are available for the site in order to meet the policies and objectives set out by Cardiff Council. For employment uses this is especially relevant due to the consistent arrivals and departures of employees throughout the day.

3.27 In addition, they should set a package of initiatives aimed at improving the availability of travel modes to and from the employment area, prioritising users as per the Travel Plan Pyramid.

Summary

3.28 The national and local transport policy demonstrates the priority for sustainable modes of transport, encouraging active travel and enhancing transport infrastructure for improved connections.

3.29 The principles for the proposed development of this site comply with the transport related planning policy, whilst encouraging choices for achieving sustainable travel modes to and from the site and also beyond the site.

4.0 Development Proposals

4.1 The proposed development is for a Hybrid planning application seeking:

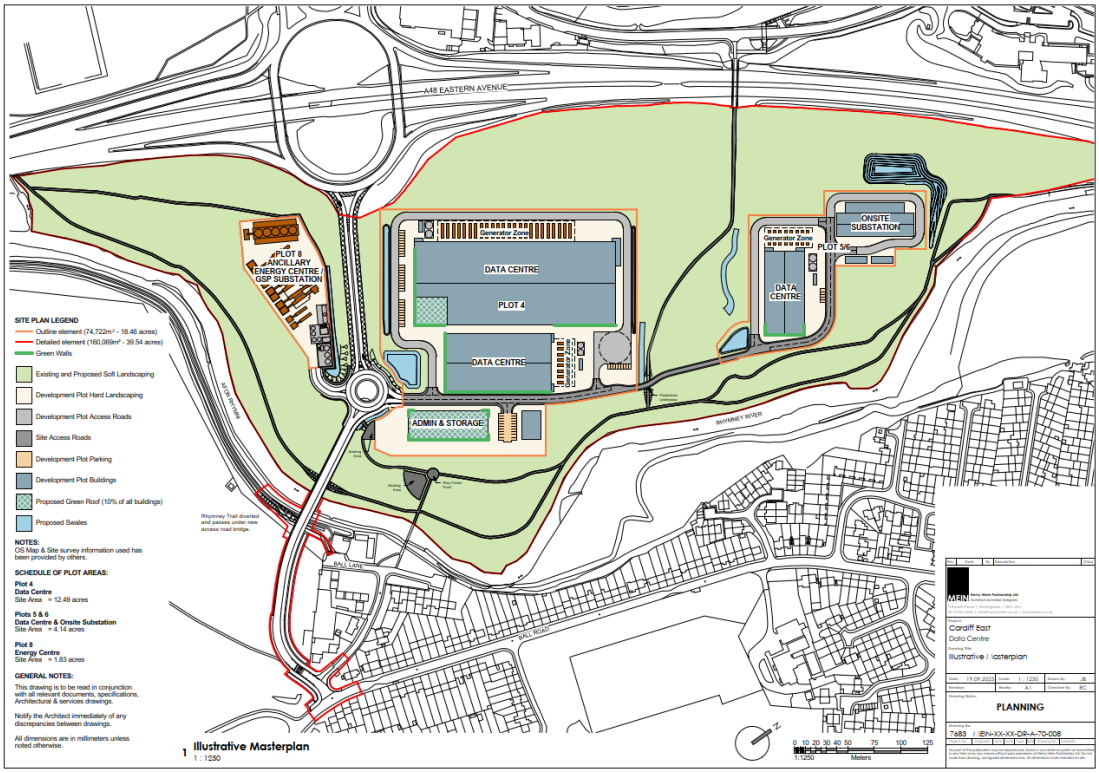
- Outline planning permission with all matters reserved except for access for the development of a data centre campus (Use Class B8) including site preparation, new buildings, an energy centre, substations and internal accesses, infrastructure, spaces, facilities, landscaping, surface water drainage features and other works that will be needed to construct and serve the campus; and
- Full planning permission for amendments to the existing access road, including the provision of a roundabout, the provision of a bridge across the Rhymney River, site wide landscaping and associated works.

4.2 The development will comprise of the following primary plots

- Data Centre – 50,571m2
- Data Centre & Onsite Substation – 16,790m2
- Energy Centre – 7,418m2

4.3 An Illustrative masterplan for the site can be found at **Appendix D** and can be seen in **Figure 4.1.**

Figure 4.1 – Illustrative Masterplan



Access Arrangements

Vehicular Access

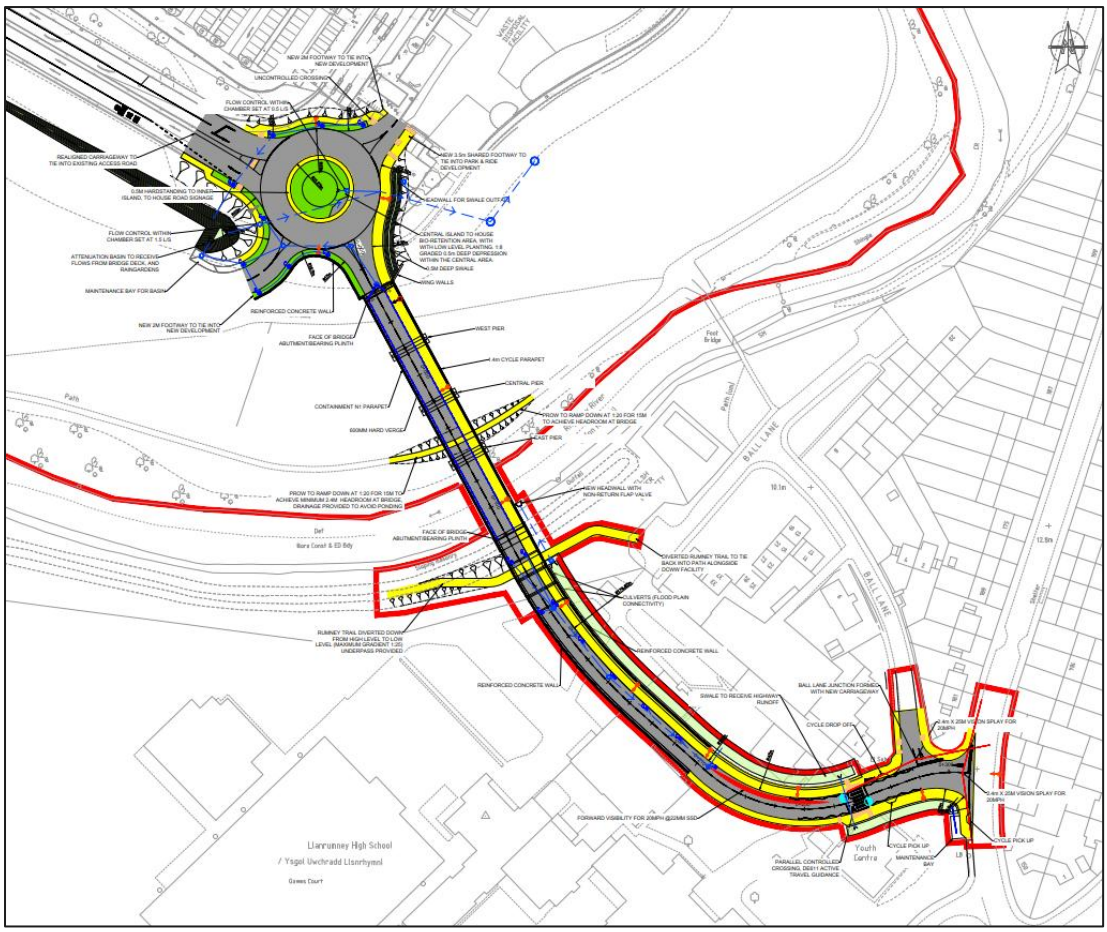
4.4 The site will be accessed via the existing access to the P&R site from the A48 roundabout as shown on the Indicative Site Layout plan at Figure 4.1. There are no proposals to alter this junction as part of the development proposals. An internal roundabout junction will provide access to the different land uses at the proposed development.

4.5 Additionally, a new road will be constructed from the internal roundabout across the Rhymney River to connect to Ball Road, providing access from Llanrumney to the site. This road would be lit to appropriate highway design standards so it can be used by pedestrians, cyclists and vehicles. This unchanged from the Approved TA.

4.6 It is proposed that ducting and space is provided for the future implementation of bus gates and ANPR cameras. Within the Councils decision notice on the previous on-site application, a condition was stipulated that the ANPR system shall at all times ensure that vehicular use of the bridge shall thereafter be restricted to public transport only between the hours of 07:00 and 10:00 and 15:00 and 19:00. This will be maintained for this scheme. Appropriate signage will be located on the link road to inform users of any restrictions

4.7 **Figure 4.2** shows the proposed road from the roundabout within the development to Ball Road. It shows the road has a width of 6.3m, allowing two standard size buses to pass each other without restraint. Additionally, it features a 3.5mm footway/cycleway for pedestrians and cyclists to cross the Rhymney River and access Ball Road from the site.

Figure 4.2 – Proposed New Road to Ball Road



4.8 The Proposed New Road to Ball Road remains unchanged from the previous application. The figure can be found at **Appendix E.**

Active Travel

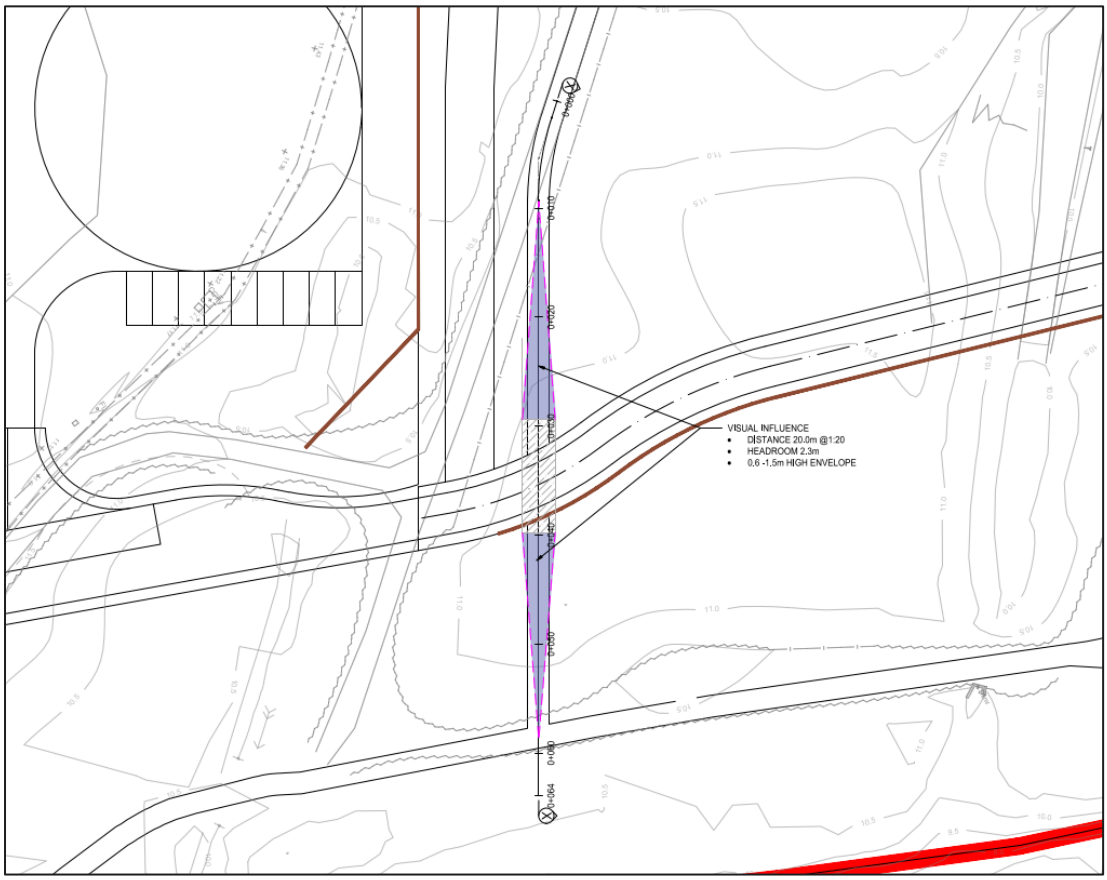
4.9 The new road across the Rhymney River will feature a 3.5m wide footway/cycleway that pedestrians and cyclists will be able use to access Ball Road and Llanrumney.

4.10 Ball Road has been designated an Advisory Cycle Route by Cardiff Council, and as such will be able to continue their journeys through to Llanrumney. The Advisory Cycle Route continues to Newport Road to the southeast, where in future it is hoped that the Cardiff Cycleways scheme will extend, providing users of the site with excellent connectivity to much of east Cardiff, including further north to St Mellons and continue southwest towards Cardiff City Centre.

4.11 In addition to the new active travel link across the River Rhymney, the existing footpath and PRoW network located in the vicinity of the site will be diverted in places to ensure better integration with the development.

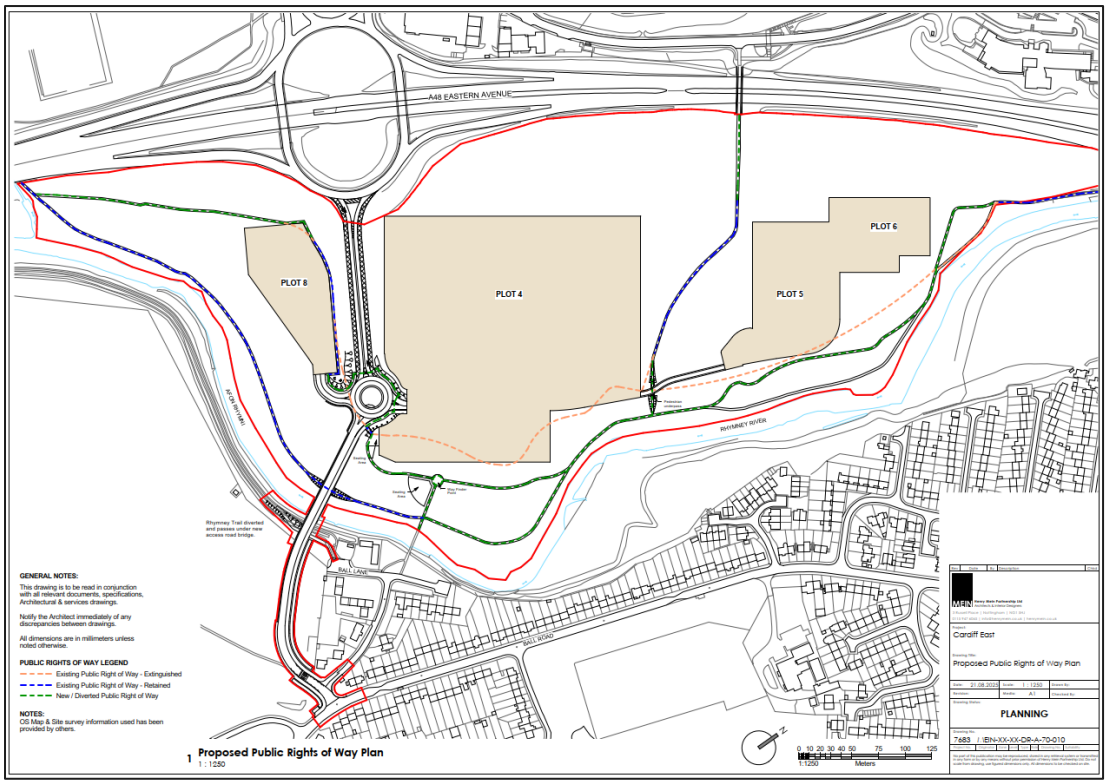
4.12 Given the security need to protect the accesses to the Data Centres, it is proposed that one PRoW should divert into a subway underneath the connecting road between Plot 4 and Plot 5. This will maintain the PRoW connection whilst maintaining the security of the site. This can be seen in **Figure 4.3** and at **Appendix D.**

Figure 4.3 – PRoW Subway



4.13 However, all current through routes will be maintained through the new and diverted routes and will deliver tangible benefits to the active travel infrastructure located near the site. The proposed Public Rights of Way Plan can be seen in **Figure 4.4** and at **Appendix D.**

Figure 4.4 – Proposed Public Rights of Way Network



4.14 The existing link, bridge and new link (to the north and south) and the site internal spine road are to be offered as adopted highway. Not all of the offered adopted highway may choose to be adopted by the Council.

Lighting

4.15 It is proposed to maintain the lighting upgrades proposed as part of the Approved TA. These are listed again here but are as featured within the Approved TA.

4.16 The development proposed a substantial upgrading of the routes to ensure their practical usage in both linking the site and the linking of the communities currently severed by the A48.

4.17 **Photograph 4.1 – 4.3** show the current primary active travel crossings of the A48, in the form of two underpasses located east of Parc Coed y Nant and southwest of Pentwyn Link Road, and a bridge crossing located north of the site.

Photograph 4.1 - Underpass East of Parc Coed y Nant

Photograph 4.2 - Underpass Southwest of Pentwyn Link Road

Photograph 4.3 - Bridge Crossing over A48 to Pentwyn Road

4.18 All three crossing currently suffer from poor lighting, which likely deters significant usage due to concerns over safety and anti-social behaviour.

4.19 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting upgrades to ensure a continuous lighting arrangement, the details of which are to be determined with the Council

4.20 As stated within the Active Travel Act Guidance, July 2021, walking and cycling must be promoted as around-the-clock means of transport, rather than just a daylight activity, if active travel is to play an important role as an alternative to the car for everyday journeys. As such, this will better improve access to the development during daylight hours, but especially during times of low light, such as at night.

Surfacing

4.21 At present, the existing surfacing of the routes near the site is good, with paved paths providing access to the nearest crossings of the A48.

4.22 However, at parts the paved surfacing ends, and instead users must travel across unpaved grass. While suitable for most journeys, it is noted that during adverse weather, the surfacing may become unattractive for users to cross.

4.23 **Photograph 4.4 and 4.5** show the two examples pertinent to the site, mainly the access from the existing footbridge across the Rhymney River to Ball Lane to the southeast of the site, and the existing PRoW continuing north of the site towards Pentwyn.

Photograph 4.4 - Existing Route between the Site and the footbridge to access Ball Lane

Photograph 4.5 - Existing PRoW North of the Site

4.24 The feasibility of surfacing these routes will be explored in detail to determine whether it can be delivered as part of the development.

4.25 Whilst alternative routes would exist from the site to access both sides of the A48, these alternative paved routes could provide additional options for users to access the development.

Improved Crossing Facilities

4.26 To ensure that active travel users can safely traverse Pentwyn Road from the existing bridge crossing of the A48, it is proposed to construct a new Zebra crossing with adjacent cycle crossing across Pentwyn Road, as at present there is no clear continuation of the route, as shown in **Photograph 4.6.**

Photograph 4.6 - Existing Access to Pentwyn Road from A48 Footbridge

4.27 The new Zebra crossing with adjacent cycle crossing would allow users to safely access the pedestrian network leading to Pentwyn.

Signage

4.28 Throughout the site at the junctions of the PROW finger posts can be provided to direct the users of the routes.

4.29 This can be extended to the south of the site from the river to Ball Road and to the north of the site to direct pedestrians and cyclists to the existing network of routes to the north of the A48.

Parking

4.30 Total parking allocation will take into consideration the advice contained within Cardiff Council's Managing Transportation Impacts (Incorporating Parking Standards) SPG (July 2018). It is considered that the proposed development is located within the 'Non Central Area' and therefore the respective standards apply.

4.31 The car parking standards are summarised in **Table 4.1.**

Table 4.1 – Cardiff Council Parking Standards

Type of Development	Parking Standards				
	Maximum Car Parking Spaces	Minimum Staff Cycle Parking	Minimum Visitor Cycle Parking	Maximum Powered Two-Wheeler Parking	Disabled Parking Provision (up to 200 spaces)
B1 Office – Non Central	1 per 50 sqm	2 per 100 sqm	4 plus 1 per 1000 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces
B8 Distribution – Non Central Area	1 per 1,000 sqm	2 per 1000 sqm	1 per 200 sqm	1%-5% of total parking spaces	5% of total parking spaces, and a further 5% of spaces should be enlarged standard spaces

4.32 An appropriate level of electric charging points will also be provided in all car parks, in line with national guidance. Future Wales requires a minimum of 10% of all car parking spaces to have a charging facility.

4.33 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards. This will be both within the Park and Ride area and associated with each of the proposed units.

Swept Path Analysis

4.34 The link road has been designed from the outset for buses. As such, swept path analysis has been provided to ensure that any future bus movements can be accommodated on the link road.

4.35 The swept path analysis showing bus movements through the site, with access from all directions at Ball Lane.

4.36 Swept path analysis has also been undertaken for an HGV and a Fire Tender to access the site, and visibility splays have been produced for the internal junctions of the proposed development.

4.37 All internal site drawings can be found at **Appendix E.**

Construction Impact

4.38 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

4.39 The CEMP will set out how construction traffic will be managed on the local highway network during the anticipated construction period. The purpose of a CEMP is to ensure that the effect of construction traffic is mitigated against, particularly in relation to local residents and any air quality issues. The CEMP will control the timings, routing and volume of traffic entering/leaving the site during this period.

Summary

4.40 As summarised in this section, the development proposals comprise the development of a data centre campus, including space for an energy centre and substations.

4.41 The proposed development provides the opportunity to provide significant enhancements to the area through the provision of employment opportunity.

4.42 As part of the extensive redevelopment, a new link would be constructed across the Rhymney River, providing new active travel links, public transport links, and a new vehicular route which can form a link between communities either side of the A48. This is unchanged from the previously consented application on the site.

4.43 As part of the extensive upgrading of active travel links in proximity to the site, the existing PRoW network will be diverted to serve the development, linking the site to the already existing active travel network. All through routes will be maintained.

4.44 To ensure the site can integrate and link with communities both sides of the A48, the development proposes to provide lighting across the primary PRoW through the development and extending to the two primary underpasses and footbridge across the A48, to ensure the good active travel links can always be utilised. A new zebra crossing with adjacent cycle crossing will be created across Pentwyn Road to link with the existing footbridge across the A48.

4.45 The feasibility of surfacing some of the routes within the vicinity of the site will be explored, to provide additional good quality footways.

4.46 An appropriate level of on-site vehicular parking will be provided, reflecting the scale of development and in line with the Council's 2018 SPG.

4.47 Cycle and motorcycle parking will be provided in accordance with the Council's adopted standards.

4.48 The impact of construction vehicles will be controlled via an agreed Construction Environmental Management Plan (CEMP) which will form part of the suite of application documents.

5.0 Baseline Travel Patterns

5.1 The section sets out the baseline modal split for the development, using the 2011 Census Method of Travel to Work data for the Mid-Layer Super Output Area (MSOA) 'Cardiff 009'. Whilst not representative of all journey types, it provides an indication of the approximate baseline mode split for all journeys in the area from which to base the aims and targets of the Interim Travel Plan.

5.2 The data summarised in **Table 5.1** illustrates that the existing employees of the 'Cardiff 009' MSOA currently travel to work with a high proportion of car drivers (66%). Despite this, already a significant proportion of people use a bus (11%), travel as a passenger in a car (8%) or walk (11%) to work. This sets a good baseline for the Travel Plan to improve upon. The mode split for all journeys which the Travel Plan seeks to achieve is set out in **Table 5.1.**

Table 5.1 - Current Mode Split (Cardiff 009 MSOA)

Method of travel to work	MSOA (009 Cardiff)
Train	0.1%
Underground, Light Rail or Tram	0%
Bus, minibus or coach	10.9%
Taxi	0.3%
Motorcycle, scooter or moped	0.8%
Driving a car or van	66.4%
Passenger in a car or van	8.4%
Bicycle	1.5%
On foot	11.4%
Work Mainly from Home	0%
Other method	0.2%
Total	100%

5.3 **Table 5.1** demonstrates the sustainable mode split for journeys to and from the site which the Travel Plan is seeking to achieve i.e. 5% reduction in single occupancy car driver trips to the site. To achieve these targets, a series of objectives and targets will be set, and a strategy created detailing how these will be met.

6.0 Objectives and Targets

Objectives

6.1 This Travel Plan is primarily aimed at reducing the dependence of staff travelling via single occupancy car. Therefore, the primary objectives of this Travel Plan are to achieve and promote the following:

- Encouragement to use alternative modes of transport to the private car;
- Increased awareness of the environmental and social benefits of using alternative modes of transport;
- Actively promote sustainable transport options for travel to and from the proposed development, to enable informed decisions about how to travel is to be made;
- Reduced level of car use, particularly single occupancy car use;
- Increase awareness of the advantages and availability of sustainable modes, but particularly active modes;
- Increase the use of active and sustainable travel modes (particularly for shorter trips), and to encourage people to build active travel into their everyday routines to support and contribute to wider health benefits; and
- Raise awareness of the impacts of travel choices on health, safety and the local environment etc.

Targets

6.2 To assess whether this Travel Plan is successful in achieving its objectives, a set of targets have been set.

6.3 All targets need to be SMART; that is Specific, Measurable, Achievable, Realistic and Time related.

6.4 Targets, or outcomes can be reviewed and once achieved will be maintained at not less than that level, subject to review as part of the annual monitoring programme. In addition, targets may be modified once travel surveys have been undertaken following discussion with Cardiff Council Highways Department.

6.5 There are two types of targets, namely: ‘Action’ and ‘Aim’ targets. Action targets set out specific commitments to implement measures to ensure delivery. Aim targets provide numerical goals for mode shift.

Action Targets

6.6 The following targets have been derived using the assumed modal split for the development as set out in **Section 5**.

6.7 **Table 6.1** below shows the target modal split for the development once the Travel Plan has been implemented.

Table 6.1 - Current and Target Mode Split (Cardiff 009 MSOA)

Method of Travel	Year 0	Year 5
Underground, metro, light rail, tram	0%	0%
Train	0.1%	0.1%
Bus, minibus, or coach	10.9%	13.9%
Taxi	0.3%	0.3%
Motorcycle, scooter or moped	0.8%	0.8%
Driving a car or van	66.4%	61.4%
Passenger in a car or van	8.4%	8.4%
Bicycle	1.5%	2.5%
On foot	11.4%	12.4%
Work Mainly at or from home	0%	0%
Other method of travel to work	0.2%	0.2%
Total	100%	100%

6.8 The primary purpose of the Travel Plan is to limit unnecessary or unsustainable car journeys (particularly those with single occupants) to and from the development.

6.9 If the subsequent baseline travel survey shows that the assumed modal split is not accurate, the targets will be amended to account for the actual modal split. Targets will be finalised and written into the full Travel Plan once the travel surveys have been completed.

6.10 The Travel Plan should aim to build on the current target level and good level of accessibility provided to the site through nearby active travel routes. The Travel Plan will assist Cardiff Council in achieving their 50:50 modal split target.

6.11 The Travel Plan aims to take advantage of the site's location and boost bus, walking and cycling mode shares the most, while maintaining or gradually increasing other sustainable modes. It is hoped that these actions will result in fewer journeys to work being undertaken by car or van over the travel plan period.

7.0 Travel Plan Strategy

Travel Plan Coordinator

7.1 The landowner/developer will be responsible for ensuring the transport at the site (e.g. pedestrian and cycle access points, cycle storage, etc) is in good condition for regular use. The landowner / developer will also be responsible for nominating an individual who will lead the delivery of the travel plan. The landowner / developer will be responsible for funding the travel plan measures and monitoring activity.

7.2 A Travel Plan Coordinator (TPC) will be nominated by the landowner / developer to oversee the development of the travel plan and to ensure its effective implementation. The TPC is most likely to be the office manager.

7.3 The TPC's role will commence prior to first occupation of the site to ensure the promotion of the travel plan at the earliest opportunity and to develop travel information packs for when the building is occupied.

7.4 The main roles and responsibilities of the TPC are to:

- Manage, review and lead the delivery of the travel plan;
- Liaise with Cardiff Council as necessary;
- Promote the travel plan and its measures;
- Promote the site's sustainable characteristics through the marketing process;
- Maintain updated information on noticeboards; and
- Monitor the effectiveness of travel plan initiatives.

7.5 The time spent by the TPC on the Travel Plan will vary according to the stage of the travel planning process. It is expected that travel planning responsibilities will intensify on first occupation and during monitoring periods. Outside of these times, travel planning activities will lessen. The TPC will undertake their travel planning responsibilities alongside their day-to-day work role.

7.6 The contact details of the nominated TPC will be forwarded to Cardiff Council at the earliest opportunity.

Marketing and Awareness Raising

7.7 Employees will be made aware of the Travel Plan and the site's sustainable measures through communication and promotional tools.

- A welcome travel pack will be distributed to each employee upon adoption of the travel plan and when a new employee starts. The Welcome Pack will contain information on travel options, links to websites, information about cycle training and other travel planning measures
- The TPC will encourage employees to get involved with national and local sustainable travel campaigns.
- Information on travel options will be located physically where possible, for example within notice boards in communal areas.

Travel Packs

7.8 The TPC will prepare and issue Travel Packs to future employees which will describe the Travel Plan whilst including details concerning walking and cycling routes, bus routes, bus and rail services, car sharing schemes, car clubs and eco-driving.

Reporting

7.9 The TPC will prepare a full monitoring report on the progress of the Travel Plan. The report will include the following:

- Progress on the implementation of measures and initiatives to progress sustainable transport use;
- Latest survey results (if a survey year); and
- Any revisions to targets and measures.

8.0 Measures and Initiatives

8.1 This section of the Travel Plan outlines the specific measures to be implemented and help achieve the objectives. The listed measures, which include awareness and promotion initiatives, will be validated following undertaking the baseline staff travel surveys and then modified accordingly.

8.2 The implementation of the listed measures, which include awareness initiatives and infrastructure provision, is the core of the Travel Plan.

Measures

Survey of Staff Travel

8.3 The TPC will be responsible for preparing and distributing a survey of staff travel surveys to be undertaken within 3 months of occupation of the unit and thereafter on an annual basis. The TPC shall then compile a full monitoring report following the first 3 months following the occupation of the development and thereafter on an annual basis. A sample Workplace Travel Survey form is included in **Appendix F.**

8.4 The findings of the results of the survey will be made available to the local authority and posted on the Travel Plan notice board.

Travel Pack

8.5 A travel pack will be distributed to all new employees upon occupation of the office, and will include the following information:

- The name and contact details of the TPC and the availability of the TPC to speak with staff;
- An introduction to the Travel Plan, its purpose etc, and a summary document;
- Maps of walking and cycling routes to key destinations;
- Timetables, route maps and ticketing information for public transport;
- Car sharing and car club information;
- Contact details for local taxi companies; and
- Location and contact details of nearby services.

Travel Notice Board

8.6 In a suitable location accessible by all staff at their respective buildings, there will be a Travel Plan Notice Board. This will contain the name and contact details of the TPC, plans showing the nearest bus routes and bus stops, location of pedestrian routes, travel initiatives, offers of lifts and car-sharing, details of local cycle shops able to service cycles during the day, a copy of the local cycle network leaflet, and results of the travel survey. This information will be updated by the TPC when revised.

8.7 A copy of the full Travel Plan would also be available for any member of staff if they wish to look at it.

Personalised Travel Planning

8.8 The TPC will offer a personalised Travel Planning service for all new staff. It is expected that this will be offered during induction sessions.

8.9 The TPC will be able to draw on advice from journey planning websites such as Traveline Cymru.

8.10 The TPC will report the results of the travel survey to the relevant Cardiff Council officers and establish a way forward. The TPC will also seek to ensure that pedestrian routes are appropriately maintained.

8.11 The TPC will promote the Health benefits of walking and explore the possibility of using such schemes as '10,000 steps a day campaign.'

8.12 The Travel Plan noticeboard will contain a map showing location of all pedestrian routes to the site and the recommended crossing points over the adjoining roads.

Cycling

8.13 The TPC will also seek to ensure that cycle routes are appropriately maintained. This will be achieved through regular dialogue with the Council.

8.14 Employees will be provided with information and advice concerning safe cycle routes to the site and the TPC will promote the health and economic benefits of cycling through the use of campaigns, such as National Bike Week.

8.15 The TPC will explore with local bicycle retailers the possibility of providing discounts on cycling equipment to employees of the development. The take up of this discount, if agreed, will be monitored.

8.16 External funding to purchase cycles or cycle clothing is available through the government assisted Cycle-to-Work scheme whereby the cost of purchasing a new cycle or cycle equipment by staff is reduced through a salary sacrifice scheme. The TPC will include details on the TP Noticeboard and assist any member of staff wising to purchase a cycle or equipment this way.

Public Transport

8.17 Up-to-date details of bus, train and taxi services, including route information and service frequencies, will be permanently on display the on the Travel Plan notice board. Details of National Rail, Traveline and car sharing websites and enquiry phone numbers will also be displayed.

8.18 Taxis can have an important role in providing for employee trips, in particular when other modes of transport may not be available. The TPC will ensure that the contact details for a local taxi operator are available on site.

9.0 Summary

9.1 SLR Consulting Ltd. has been retained to provide highways and transport advice to Curtis Hall (the Applicant). This Travel Plan (TA) has been prepared in support of the planning application being submitted by the Applicant to Cardiff Council (the Council) for the redevelopment of Cardiff East Park and Ride, Llanrumney (the site).

9.2 The site comprises the existing Cardiff East Park and Ride in Llanrumney, Cardiff and is located approximately 8km to the north east of Cardiff city centre, with Llanrumney to the east and Llanedeyrn to the west. The site is adjacent to the A48 Pentwyn Interchange junction on the A48 Eastern Avenue which provides vehicular access to the existing Park and Ride site.

9.3 This Interim Travel Plan has been designed in line with both local and national policy to provide a comprehensive strategy to ensure the site is as sustainable as possible.

9.4 The scheme has been designed with active travel linkages to the wider network, and to improve the PRoWs that already run near the site. This will provide good quality routes for users of the site to access the wider area.

9.5 The development will also lead to a substantial upgrade of the surrounding active travel network, with a new route across the River Rhymney, new lighting across the primary PRoW network and a new zebra crossing on Pentwyn Road.

9.6 The new road link across to Ball Road also has the opportunity to improve bus connectivity to the site. Bull Road benefits from frequent bus connection to Cardiff City Centre from nearby bus stops that utilises bus priority measures to ensure good travel time to and from the city centre.

9.7 The Travel Plan has set out detailed objectives and targets for the site, and has outlined a comprehensive Travel Plan Strategy in order to achieve these aims. These include several of measures and initiatives for the site to utilise.

9.8 This Travel Plan will ensure the site utilises the excellent sustainability links the area has to provide, and encourage a tangible mode shift for users of the site.

Appendix A 2022 Traffic Flow Diagrams

Travel Plan

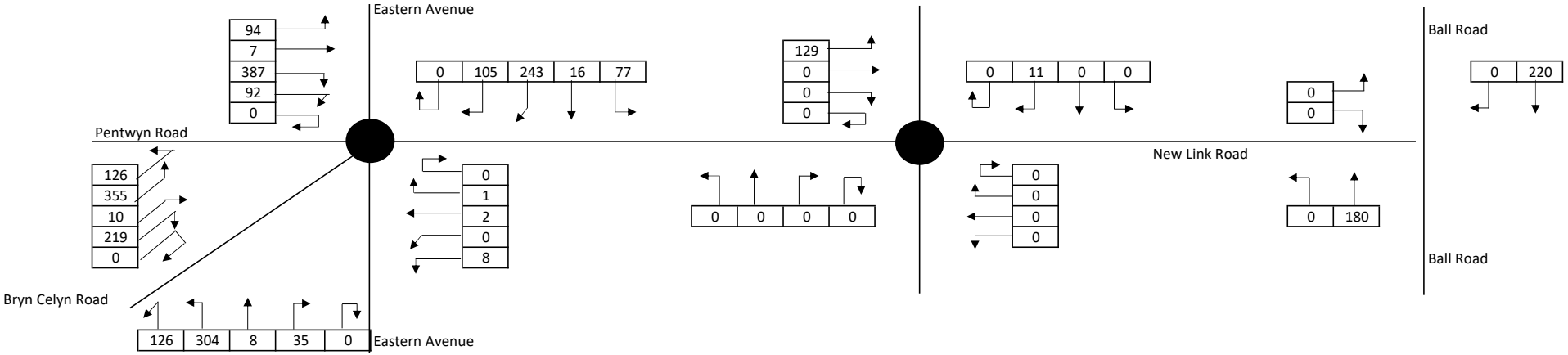
Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

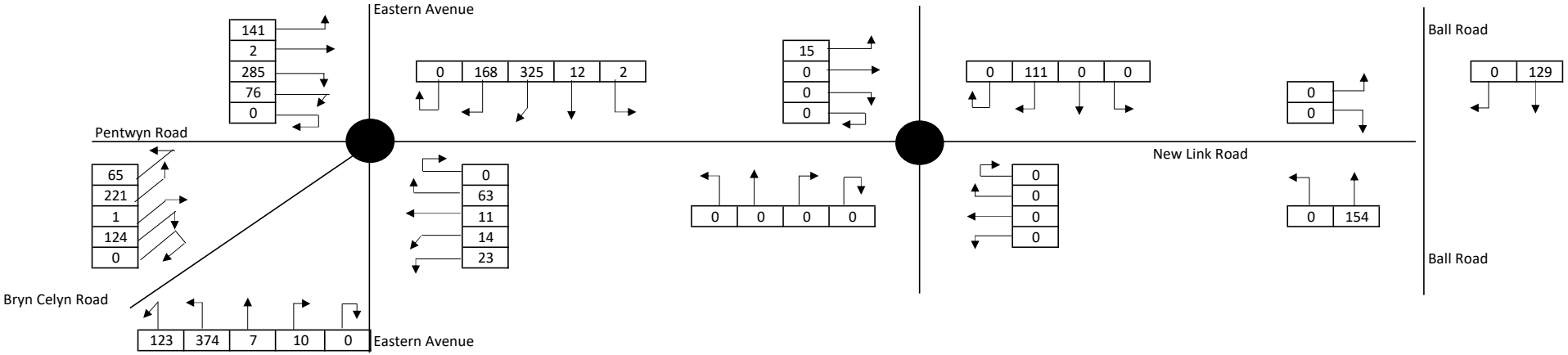
SLR Project No.: 425.067363.00001

1 December 2025

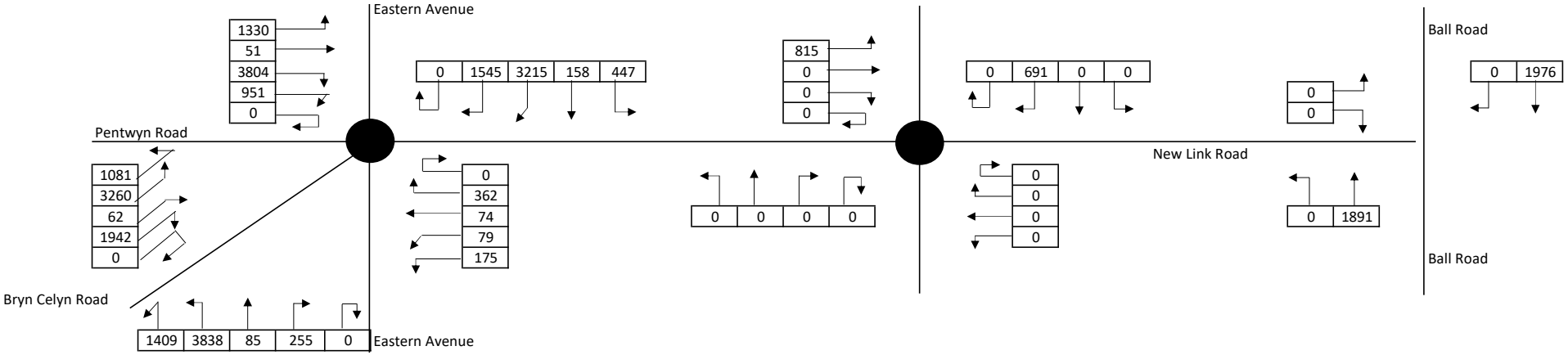
2022 Observed AM (08:00-09:00) - Vehicles



2022 Observed PM (17:00-18:00) - Vehicles



2022 Observed - 24hr AADT - Total Vehicles



Appendix B 2022 Traffic Data

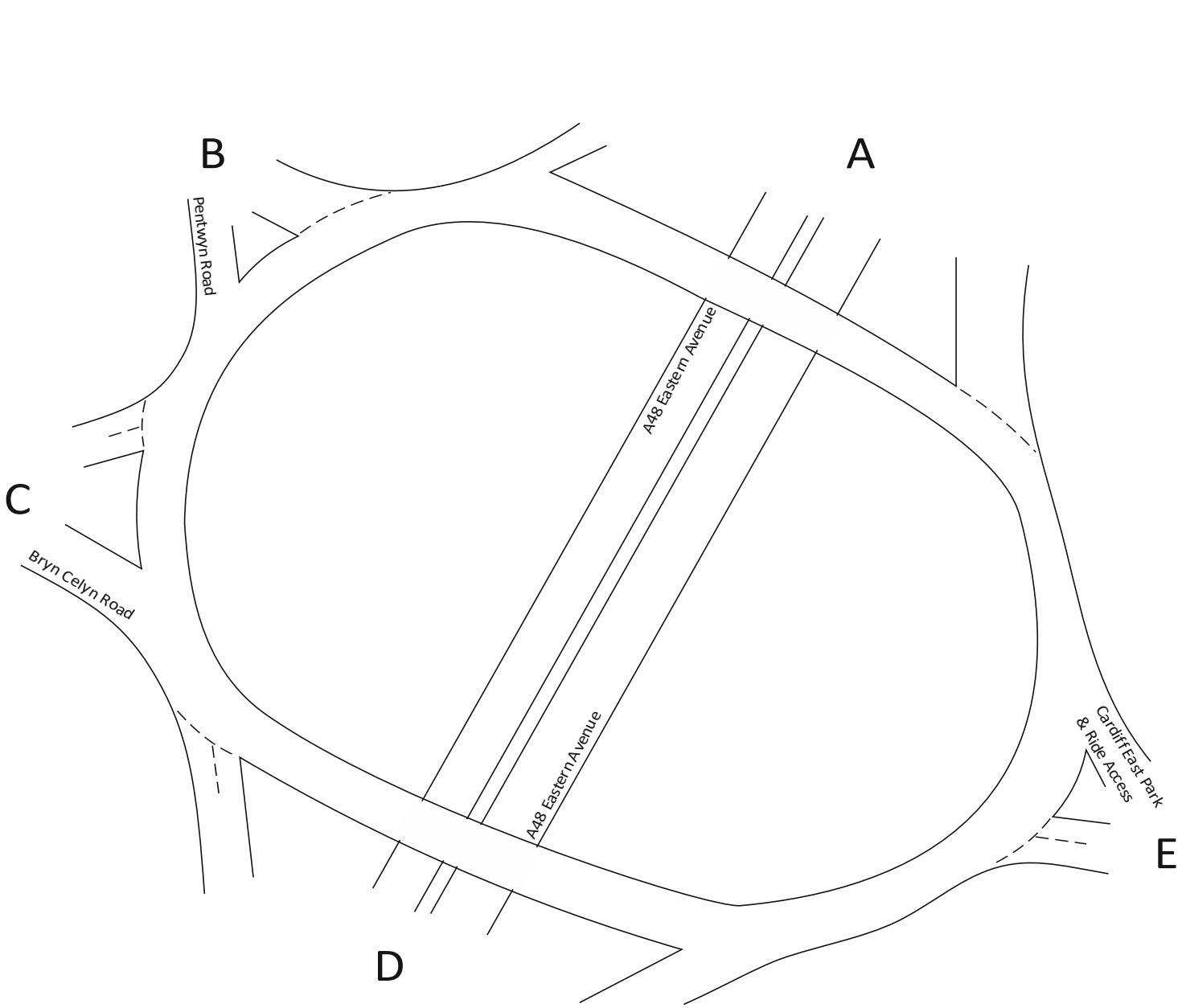
Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

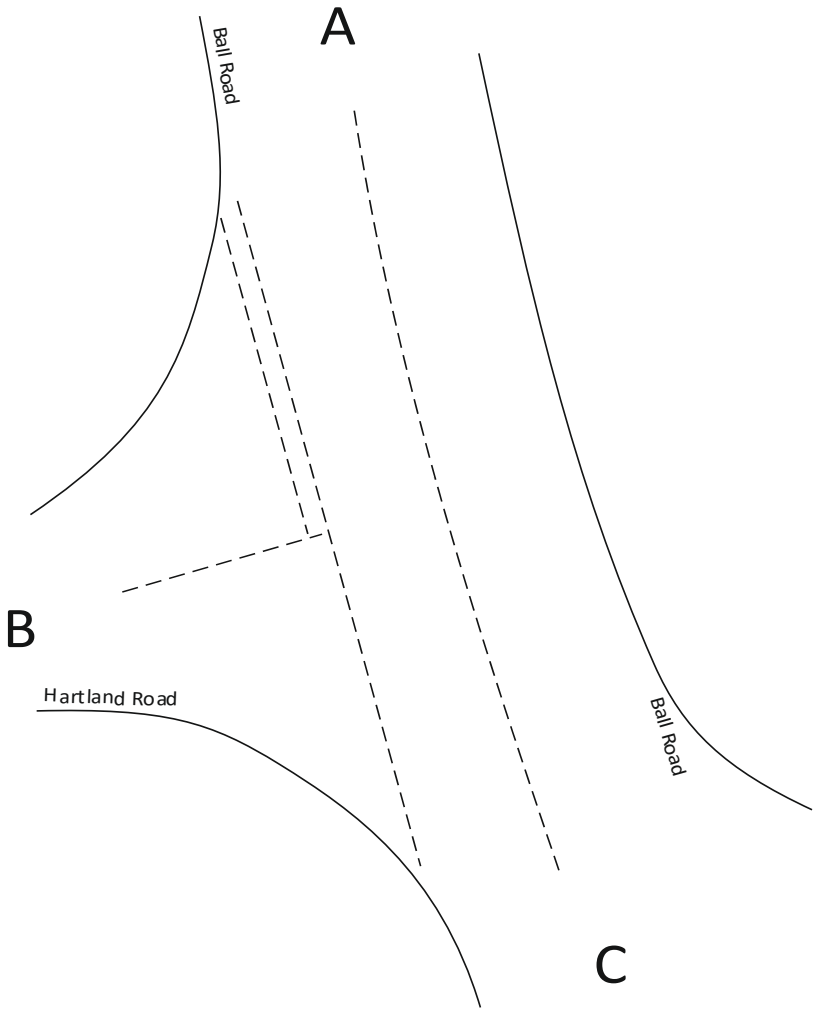
Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 01

Site: 1

Location: A48 Eastern Avenue / Pentwyn Road / Bryn Celyn Road / Cardiff East Park & Ride Access



N

TSL

For and on behalf of:

vectos. PART OF SLR

CARDIFF

Tuesday 15 February 2022

0700-1000
1600-1900

Drawing N°: 27178 - 02

Site: 2

Location: Ball Road / Hartland Road

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	0	0	0	0	0	0	9	1	0	0	0	0	0	0	1
07:15	22	0	0	0	0	0	0	22	1	0	0	0	0	0	0	1
07:30	24	3	0	0	0	0	0	27	1	0	0	0	0	0	0	1
07:45	26	0	0	0	0	0	0	26	2	0	0	0	0	0	0	2
H/TOT	81	3	0	0	0	0	0	84	5	0	0	0	0	0	0	5
08:00	20	0	0	0	0	0	0	20	1	1	0	0	0	0	0	2
08:15	22	1	0	0	0	0	0	23	3	1	1	0	0	0	0	5
08:30	29	0	0	0	0	0	0	29	4	0	0	0	0	0	0	4
08:45	5	0	0	0	0	0	0	5	1	2	1	1	0	0	0	5
H/TOT	76	1	0	0	0	0	0	77	9	4	2	1	0	0	0	16
09:00	6	1	1	0	0	0	0	8	2	2	0	1	0	0	0	5
09:15	5	0	0	0	0	0	0	5	1	0	0	0	0	0	0	1
09:30	4	0	0	0	0	0	0	4	0	1	0	0	0	0	0	1
09:45	4	0	0	0	0	0	0	4	2	0	0	0	0	0	0	2
H/TOT	19	1	1	0	0	0	0	21	5	3	0	1	0	0	0	9
P/TOT	176	5	1	0	0	0	0	182	19	7	2	2	0	0	0	30

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - E FROM A48 EASTERN AVENUE (N) TO CARDIFF EAST PARK & RIDE ACCESS								A - D FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
16:45	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	2
H/TOT	1	0	0	0	0	0	0	1	5	1	0	0	0	0	0	6
17:00	1	0	0	0	0	0	0	1	3	0	0	0	0	0	0	3
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
17:30	0	1	0	0	0	0	0	1	1	1	0	0	0	0	0	2
17:45	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	6
H/TOT	1	1	0	0	0	0	0	2	8	4	0	0	0	0	0	12
18:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
18:15	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
18:30	2	0	0	0	0	0	0	2	1	0	0	0	0	0	0	1
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	0	0	0	2	5	0	0	0	0	0	0	5
P/TOT	4	1	0	0	0	0	0	5	18	5	0	0	0	0	0	23

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	17	0	3	1	0	0	0	21	14	6	0	0	1	0	0	21
07:15	24	6	2	0	0	0	0	32	18	6	0	1	0	1	0	26
07:30	35	9	3	1	0	0	0	48	18	3	1	0	0	0	0	22
07:45	54	12	0	0	0	0	0	66	22	2	5	0	0	0	0	29
H/TOT	130	27	8	2	0	0	0	167	72	17	6	1	1	1	0	98
08:00	34	4	1	0	1	1	0	41	21	3	1	1	1	0	0	27
08:15	71	4	0	1	1	0	0	77	20	0	1	1	1	0	0	23
08:30	67	8	2	1	2	0	0	80	23	3	1	0	1	0	0	28
08:45	33	11	0	1	0	0	0	45	21	3	1	2	0	0	0	27
H/TOT	205	27	3	3	4	1	0	243	85	9	4	4	3	0	0	105
09:00	36	6	2	0	0	0	0	44	25	6	1	0	0	0	0	32
09:15	37	7	0	0	0	0	0	44	28	6	2	0	0	0	0	36
09:30	30	5	3	1	0	0	0	39	13	3	1	0	0	0	0	17
09:45	23	4	0	0	0	0	0	27	20	0	3	1	0	0	0	24
H/TOT	126	22	5	1	0	0	0	154	86	15	7	1	0	0	0	109
P/TOT	461	76	16	6	4	1	0	564	243	41	17	6	4	1	0	312

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - C FROM A48 EASTERN AVENUE (N) TO BRYN CELYN ROAD								A - B FROM A48 EASTERN AVENUE (N) TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	59	3	2	0	0	0	0	64	42	4	1	0	0	0	0	47
16:15	68	12	1	0	0	0	0	81	38	3	0	1	0	0	0	42
16:30	65	6	1	0	0	0	0	72	31	7	0	0	0	0	0	38
16:45	69	6	3	0	0	0	0	78	43	7	0	0	0	0	0	50
H/TOT	261	27	7	0	0	0	0	295	154	21	1	1	0	0	0	177
17:00	70	14	1	0	0	0	0	85	44	5	0	0	0	0	0	49
17:15	76	5	0	0	0	1	0	82	41	1	0	0	0	0	0	42
17:30	75	6	1	0	0	1	0	83	36	5	0	0	0	0	0	41
17:45	71	3	1	0	0	0	0	75	34	2	0	0	0	0	0	36
H/TOT	292	28	3	0	0	2	0	325	155	13	0	0	0	0	0	168
18:00	66	9	0	0	0	0	0	75	28	4	0	0	0	0	0	32
18:15	52	3	0	0	0	0	0	55	24	1	1	0	0	0	0	26
18:30	34	1	1	0	0	0	0	36	23	1	0	0	0	0	0	24
18:45	43	5	0	0	0	0	0	48	21	2	0	1	0	0	0	24
H/TOT	195	18	1	0	0	0	0	214	96	8	1	1	0	0	0	106
P/TOT	748	73	11	0	0	2	0	834	405	42	2	2	0	0	0	451

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	11	3	2	0	0	0	0	16
07:15	0	0	0	0	0	0	0	0	16	7	1	0	0	0	0	24
07:30	0	0	0	0	0	0	0	0	15	1	0	0	0	0	0	16
07:45	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	60	13	4	0	0	0	0	77
08:00	0	0	0	0	0	0	0	0	21	3	1	0	0	0	0	25
08:15	0	0	0	0	0	0	0	0	22	2	1	0	0	0	0	25
08:30	0	0	0	0	0	0	0	0	18	2	2	1	0	0	0	23
08:45	0	0	0	0	0	0	0	0	14	4	3	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	75	11	7	1	0	0	0	94
09:00	0	0	0	0	0	0	0	0	15	0	1	0	0	0	0	16
09:15	0	0	0	0	0	0	0	0	11	2	2	2	0	0	0	17
09:30	0	0	0	0	0	0	0	0	16	5	2	0	0	0	0	23
09:45	0	0	0	0	0	0	0	0	13	8	2	0	0	0	0	23
H/TOT	0	0	0	0	0	0	0	0	55	15	7	2	0	0	0	79
P/TOT	0	0	0	0	0	0	0	0	190	39	18	3	0	0	0	250

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	A - A FROM A48 EASTERN AVENUE (N) TO A48 EASTERN AVENUE (N)								B - A FROM PENTWYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	35	2	0	1	0	0	0	38
16:15	0	0	0	0	0	0	0	0	35	6	2	0	0	2	0	45
16:30	0	0	0	0	0	0	0	0	30	3	0	0	0	0	0	33
16:45	0	0	0	0	0	0	0	0	39	4	0	0	0	0	0	43
H/TOT	0	0	0	0	0	0	0	0	139	15	2	1	0	2	0	159
17:00	0	0	0	0	0	0	0	0	40	3	1	1	0	0	0	45
17:15	0	0	0	0	0	0	0	0	26	7	1	1	0	0	0	35
17:30	0	0	0	0	0	0	0	0	37	2	0	0	0	1	0	40
17:45	0	0	0	0	0	0	0	0	20	1	0	0	0	0	0	21
H/TOT	0	0	0	0	0	0	0	0	123	13	2	2	0	1	0	141
18:00	0	0	0	0	0	0	0	0	21	0	0	0	0	0	0	21
18:15	0	0	0	0	0	0	0	0	23	1	0	0	0	0	0	24
18:30	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	20
18:45	0	0	0	0	0	0	0	0	22	0	0	0	0	0	0	22
H/TOT	0	0	0	0	0	0	0	0	86	1	0	0	0	0	0	87
P/TOT	0	0	0	0	0	0	0	0	348	29	4	3	0	3	0	387

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	2	0	0	0	0	0	0	2	31	8	0	0	1	0	0	40
07:15	3	0	0	0	1	0	0	4	63	15	1	0	0	0	0	79
07:30	4	0	0	0	0	0	0	4	61	5	1	2	0	0	0	69
07:45	2	0	0	0	1	0	0	3	75	5	2	0	1	0	0	83
H/TOT	11	0	0	0	2	0	0	13	230	33	4	2	2	0	0	271
08:00	3	0	0	0	0	0	0	3	97	8	1	0	0	0	0	106
08:15	2	0	0	0	0	0	0	2	92	10	3	0	1	0	0	106
08:30	1	0	0	0	0	0	0	1	91	8	1	0	1	1	0	102
08:45	0	0	0	0	1	0	0	1	66	4	1	2	0	0	0	73
H/TOT	6	0	0	0	1	0	0	7	346	30	6	2	2	1	0	387
09:00	2	0	1	0	0	0	0	3	76	13	2	0	1	0	1	93
09:15	1	0	0	0	1	0	0	2	54	6	0	1	1	0	0	62
09:30	0	0	0	0	1	0	0	1	53	9	6	1	0	0	0	69
09:45	0	0	0	0	0	0	0	0	56	8	2	0	0	0	0	66
H/TOT	3	0	1	0	2	0	0	6	239	36	10	2	2	0	1	290
P/TOT	20	0	1	0	5	0	0	26	815	99	20	6	6	1	1	948

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - E FROM PENTWYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								B - D FROM PENTWYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	1	0	0	1	58	1	2	1	0	0	0	62
16:15	0	0	0	0	0	0	0	0	71	4	1	0	0	0	0	76
16:30	0	0	0	0	0	0	0	0	73	2	1	1	1	0	0	78
16:45	0	0	0	0	1	0	0	1	76	4	1	0	0	0	0	81
H/TOT	0	0	0	0	2	0	0	2	278	11	5	2	1	0	0	297
17:00	0	0	0	0	0	0	0	0	69	1	1	0	0	0	0	71
17:15	0	0	0	0	1	0	0	1	57	3	0	0	0	0	0	60
17:30	0	0	0	0	0	0	0	0	88	2	0	0	1	0	0	91
17:45	0	0	0	0	1	0	0	1	60	3	0	0	0	0	0	63
H/TOT	0	0	0	0	2	0	0	2	274	9	1	0	1	0	0	285
18:00	1	0	0	0	0	0	0	1	67	4	0	0	0	0	0	71
18:15	0	0	0	0	0	0	0	0	67	1	0	0	0	0	0	68
18:30	0	0	0	0	1	0	0	1	70	0	0	0	0	0	0	70
18:45	0	0	0	0	0	0	0	0	71	2	0	0	1	0	0	74
H/TOT	1	0	0	0	1	0	0	2	275	7	0	0	1	0	0	283
P/TOT	1	0	0	0	5	0	0	6	827	27	6	2	3	0	0	865

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	1	0	0	0	0	3	0	0	0	0	0	0	0	0
07:15	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
07:30	4	1	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:45	13	5	2	0	0	0	0	20	0	0	0	0	0	0	0	0
H/TOT	20	7	3	0	2	0	0	32	0	0	0	0	0	0	0	0
08:00	14	0	0	0	1	0	0	15	0	0	0	0	0	0	0	0
08:15	22	3	0	0	2	0	0	27	0	0	0	0	0	0	0	0
08:30	16	4	0	0	0	0	0	20	0	0	0	0	0	0	0	0
08:45	23	4	1	0	2	0	0	30	0	0	0	0	0	0	0	0
H/TOT	75	11	1	0	5	0	0	92	0	0	0	0	0	0	0	0
09:00	29	1	0	0	1	0	0	31	0	0	0	0	0	0	0	0
09:15	24	1	0	0	0	0	0	25	0	0	0	0	0	0	0	0
09:30	8	0	1	0	1	0	0	10	0	0	0	0	0	0	0	0
09:45	7	0	1	0	1	0	0	9	0	0	0	0	0	0	0	0
H/TOT	68	2	2	0	3	0	0	75	0	0	0	0	0	0	0	0
P/TOT	163	20	6	0	10	0	0	199	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	B - C FROM PENTWYN ROAD TO BRYN CELYN ROAD								B - B FROM PENTWYN ROAD TO PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	7	1	0	1	0	0	16	0	0	0	0	0	0	0	0
16:15	16	2	0	0	3	0	0	21	0	0	0	0	0	0	0	0
16:30	11	2	0	0	0	0	0	13	0	0	0	0	0	0	0	0
16:45	26	5	0	0	1	0	0	32	0	0	0	0	0	0	0	0
H/TOT	60	16	1	0	5	0	0	82	0	0	0	0	0	0	0	0
17:00	20	1	0	0	0	0	0	21	0	0	0	0	0	0	0	0
17:15	19	2	0	0	2	0	0	23	0	0	0	0	0	0	0	0
17:30	13	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0
17:45	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
H/TOT	70	4	0	0	2	0	0	76	0	0	0	0	0	0	0	0
18:00	22	0	1	0	0	0	0	23	0	0	0	0	0	0	0	0
18:15	18	1	0	0	0	0	0	19	0	0	0	0	0	0	0	0
18:30	25	3	0	0	0	0	0	28	0	0	0	0	0	0	0	0
18:45	9	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0
H/TOT	74	4	1	0	0	0	0	79	0	0	0	0	0	0	0	0
P/TOT	204	24	2	0	7	0	0	237	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	3	0	0	0	0	0	7	36	9	2	0	0	0	0	47
07:15	7	0	1	0	0	0	0	8	47	11	1	0	0	1	0	60
07:30	7	1	0	0	1	0	0	9	66	5	1	0	0	0	0	72
07:45	15	2	0	0	0	0	0	17	65	5	1	0	0	0	0	71
H/TOT	33	6	1	0	1	0	0	41	214	30	5	0	0	1	0	250
08:00	20	3	0	0	1	0	0	24	65	6	1	0	0	0	0	72
08:15	13	1	0	0	0	0	0	14	84	10	1	0	0	0	0	95
08:30	31	1	1	0	0	0	0	33	84	6	0	0	0	0	0	90
08:45	53	1	1	0	0	0	0	55	91	6	1	0	0	0	0	98
H/TOT	117	6	2	0	1	0	0	126	324	28	3	0	0	0	0	355
09:00	26	0	0	0	1	0	0	27	57	6	0	0	0	0	0	63
09:15	21	1	1	0	1	0	0	24	29	7	0	1	0	0	0	37
09:30	4	1	0	0	2	0	0	7	32	4	0	0	0	0	0	36
09:45	8	2	0	0	1	0	0	11	33	10	0	0	0	0	0	43
H/TOT	59	4	1	0	5	0	0	69	151	27	0	1	0	0	0	179
P/TOT	209	16	4	0	7	0	0	236	689	85	8	1	0	1	0	784

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - B FROM BRYN CELYN ROAD TO PENTWYN ROAD								C - A FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	18	2	0	0	2	0	0	22	48	5	0	0	0	0	0	53
16:15	16	0	0	0	0	0	0	16	63	10	1	0	0	0	0	74
16:30	25	0	1	0	2	0	0	28	71	11	0	0	0	0	0	82
16:45	23	0	0	0	0	0	0	23	56	8	0	0	0	0	0	64
H/TOT	82	2	1	0	4	0	0	89	238	34	1	0	0	0	0	273
17:00	16	1	0	0	2	0	0	19	53	5	1	0	0	0	0	59
17:15	11	0	0	0	0	0	0	11	58	9	0	0	0	0	0	67
17:30	18	0	0	0	1	0	0	19	60	5	0	0	0	0	0	65
17:45	14	1	0	0	1	0	0	16	26	2	0	1	0	1	0	30
H/TOT	59	2	0	0	4	0	0	65	197	21	1	1	0	1	0	221
18:00	15	1	0	0	1	0	0	17	44	4	0	0	0	0	0	48
18:15	19	2	0	0	0	0	0	21	44	4	1	0	0	0	0	49
18:30	19	0	2	0	0	0	0	21	34	0	0	0	0	0	0	34
18:45	14	1	0	0	0	0	0	15	28	5	0	0	0	0	0	33
H/TOT	67	4	2	0	1	0	0	74	150	13	1	0	0	0	0	164
P/TOT	208	8	3	0	9	0	0	228	585	68	3	1	0	1	0	658

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	4	0	0	0	0	0	0	4	19	6	0	0	0	0	0	25
07:15	4	0	0	0	0	0	0	4	26	4	0	0	0	0	0	30
07:30	2	0	0	0	0	0	0	2	19	10	0	0	0	0	0	29
07:45	2	0	0	0	0	0	0	2	33	3	0	0	0	0	0	36
H/TOT	12	0	0	0	0	0	0	12	97	23	0	0	0	0	0	120
08:00	3	0	0	0	0	0	0	3	52	9	0	0	0	0	0	61
08:15	3	0	0	0	1	0	0	4	39	6	1	0	0	1	0	47
08:30	2	0	0	0	0	0	0	2	49	6	2	0	0	0	0	57
08:45	1	0	0	0	0	0	0	1	46	8	0	0	0	0	0	54
H/TOT	9	0	0	0	1	0	0	10	186	29	3	0	0	1	0	219
09:00	2	0	0	0	0	0	0	2	43	7	0	0	0	0	0	50
09:15	0	0	0	0	0	0	0	0	32	4	1	0	0	0	0	37
09:30	0	0	0	0	0	0	0	0	28	2	1	1	0	0	0	32
09:45	0	0	0	0	0	0	0	0	16	1	2	0	0	0	0	19
H/TOT	2	0	0	0	0	0	0	2	119	14	4	1	0	0	0	138
P/TOT	23	0	0	0	1	0	0	24	402	66	7	1	0	1	0	477

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - E FROM BRYN CELYN ROAD TO CARDIFF EAST PARK & RIDE ACCESS								C - D FROM BRYN CELYN ROAD TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	0	0	0	1	41	4	0	0	0	0	0	45
16:15	0	0	0	0	0	0	0	0	33	3	0	0	0	0	0	36
16:30	0	0	0	0	0	0	0	0	48	4	0	0	0	0	0	52
16:45	0	0	0	0	0	0	0	0	43	2	0	0	0	0	0	45
H/TOT	1	0	0	0	0	0	0	1	165	13	0	0	0	0	0	178
17:00	0	0	0	0	0	0	0	0	26	3	0	0	0	0	1	30
17:15	1	0	0	0	0	0	0	1	32	1	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	32	2	0	0	0	0	0	34
17:45	0	0	0	0	0	0	0	0	23	4	0	0	0	0	0	27
H/TOT	1	0	0	0	0	0	0	1	113	10	0	0	0	0	1	124
18:00	1	0	0	0	0	0	0	1	22	0	0	0	0	0	0	22
18:15	0	0	0	0	0	0	0	0	29	0	1	0	0	0	0	30
18:30	0	0	0	0	0	0	0	0	25	1	0	0	1	0	0	27
18:45	0	0	0	0	0	0	0	0	37	3	0	0	0	0	0	40
H/TOT	1	0	0	0	0	0	0	1	113	4	1	0	1	0	0	119
P/TOT	3	0	0	0	0	0	0	3	391	27	1	0	1	0	1	421

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	9
07:15	0	0	0	0	0	0	0	0	11	3	0	0	0	0	0	14
07:30	0	0	0	0	0	0	0	0	18	2	1	0	0	0	0	21
07:45	0	0	0	0	0	0	0	0	23	6	0	0	0	0	0	29
H/TOT	0	0	0	0	0	0	0	0	60	12	1	0	0	0	0	73
08:00	0	0	0	0	0	0	0	0	16	3	0	0	0	0	0	19
08:15	0	0	0	0	0	0	0	0	29	5	0	0	0	0	0	34
08:30	0	0	0	0	0	0	0	0	30	3	1	0	0	0	0	34
08:45	0	0	0	0	0	0	0	0	33	6	0	0	0	0	0	39
H/TOT	0	0	0	0	0	0	0	0	108	17	1	0	0	0	0	126
09:00	0	0	0	0	0	0	0	0	27	1	0	1	0	0	0	29
09:15	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
09:30	0	0	0	0	0	0	0	0	9	5	0	0	0	0	0	14
09:45	0	0	0	0	0	0	0	0	10	6	1	0	0	0	0	17
H/TOT	0	0	0	0	0	0	0	0	75	15	1	1	0	0	0	92
P/TOT	0	0	0	0	0	0	0	0	243	44	3	1	0	0	0	291

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	C - C FROM BRYN CELYN ROAD TO BRYN CELYN ROAD								D - C FROM A48 EASTERN AVENUE (S) TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0	28	5	1	0	0	0	0	34
16:15	0	0	0	0	0	0	0	0	23	5	0	0	0	0	0	28
16:30	0	0	0	0	0	0	0	0	23	3	0	0	0	0	0	26
16:45	0	0	0	0	0	0	0	0	22	6	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	96	19	1	0	0	0	0	116
17:00	0	0	0	0	0	0	0	0	29	3	0	0	0	0	0	32
17:15	0	0	0	0	0	0	0	0	29	4	0	0	0	0	0	33
17:30	0	0	0	0	0	0	0	0	21	4	0	0	0	0	0	25
17:45	0	0	0	0	0	0	0	0	31	2	0	0	0	0	0	33
H/TOT	0	0	0	0	0	0	0	0	110	13	0	0	0	0	0	123
18:00	0	0	0	0	0	0	0	0	33	2	0	0	0	0	0	35
18:15	0	0	0	0	0	0	0	0	36	2	1	0	0	1	0	40
18:30	0	0	0	0	0	0	0	0	31	1	1	0	0	0	0	33
18:45	0	0	0	0	0	0	0	0	26	2	0	0	0	0	0	28
H/TOT	0	0	0	0	0	0	0	0	126	7	2	0	0	1	0	136
P/TOT	0	0	0	0	0	0	0	0	332	39	3	0	0	1	0	375

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	33	7	3	0	1	0	0	44	0	1	0	0	0	0	0	1
07:15	42	6	0	2	2	0	0	52	0	1	0	0	0	0	0	1
07:30	39	4	1	0	0	0	1	45	0	0	0	0	0	0	0	0
07:45	55	7	1	0	0	0	0	63	3	0	0	0	0	0	0	3
H/TOT	169	24	5	2	3	0	1	204	3	2	0	0	0	0	0	5
08:00	54	10	0	0	0	0	0	64	0	1	0	0	0	0	0	1
08:15	67	3	4	1	0	0	0	75	0	0	0	0	0	0	0	0
08:30	54	10	0	0	3	0	0	67	5	0	0	0	0	0	0	5
08:45	85	5	5	1	1	1	0	98	0	0	2	0	0	0	0	2
H/TOT	260	28	9	2	4	1	0	304	5	1	2	0	0	0	0	8
09:00	72	14	1	0	0	0	0	87	0	0	0	1	0	0	0	1
09:15	57	10	1	0	0	0	0	68	1	0	0	0	0	0	0	1
09:30	49	9	5	0	0	0	0	63	0	1	1	0	0	0	0	2
09:45	48	13	0	0	1	0	0	62	1	1	0	0	0	0	0	2
H/TOT	226	46	7	0	1	0	0	280	2	2	1	1	0	0	0	6
P/TOT	655	98	21	4	8	1	1	788	10	5	3	1	0	0	0	19

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - B FROM A48 EASTERN AVENUE (S) TO PENTWYN ROAD								D - A FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	83	8	1	0	0	1	0	93	0	1	0	0	0	0	0	1
16:15	80	5	0	0	0	0	0	85	4	0	0	0	0	0	0	4
16:30	77	6	1	1	0	0	0	85	2	0	0	0	0	0	0	2
16:45	101	10	1	0	0	0	1	113	0	0	0	0	0	0	0	0
H/TOT	341	29	3	1	0	1	1	376	6	1	0	0	0	0	0	7
17:00	81	7	1	0	0	1	0	90	1	1	0	0	0	0	0	2
17:15	101	12	1	0	0	0	0	114	2	0	0	0	0	0	0	2
17:30	82	5	1	0	0	0	0	88	2	0	0	0	0	0	0	2
17:45	77	5	0	0	0	0	0	82	1	0	0	0	0	0	0	1
H/TOT	341	29	3	0	0	1	0	374	6	1	0	0	0	0	0	7
18:00	81	5	1	0	0	1	0	88	0	1	0	0	0	0	0	1
18:15	76	4	0	0	0	0	0	80	1	0	0	0	0	0	0	1
18:30	59	1	2	0	0	0	0	62	1	0	1	0	0	0	0	2
18:45	63	1	0	0	1	0	0	65	3	1	0	0	0	0	0	4
H/TOT	279	11	3	0	1	1	0	295	5	2	1	0	0	0	0	8
P/TOT	961	69	9	1	1	3	1	1045	17	4	1	0	0	0	0	22

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
07:15	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
07:30	6	0	0	0	1	0	0	7	0	0	0	0	0	0	0	0
07:45	9	0	0	0	1	0	0	10	0	0	0	0	0	0	0	0
H/TOT	24	0	0	0	4	0	0	28	0	0	0	0	0	0	0	0
08:00	6	0	0	0	2	0	0	8	0	0	0	0	0	0	0	0
08:15	14	0	0	0	2	0	0	16	0	0	0	0	0	0	0	0
08:30	4	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
08:45	4	0	0	0	2	0	0	6	0	0	0	0	0	0	0	0
H/TOT	28	0	0	0	7	0	0	35	0	0	0	0	0	0	0	0
09:00	2	0	0	0	2	0	0	4	0	0	0	0	0	0	0	0
09:15	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
09:30	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
09:45	3	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	6	0	0	15	0	0	0	0	0	0	0	0
P/TOT	61	0	0	0	17	0	0	78	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	D - E FROM A48 EASTERN AVENUE (S) TO CARDIFF EAST PARK & RIDE ACCESS								D - D FROM A48 EASTERN AVENUE (S) TO A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
16:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
16:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	5	0	0	6	0	0	0	0	0	0	0	0
17:00	3	0	0	0	2	0	0	5	0	0	0	0	0	0	0	0
17:15	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
17:30	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
17:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	4	0	0	0	6	0	0	10	0	0	0	0	0	0	0	0
18:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
18:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
18:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
18:45	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
H/TOT	1	0	0	0	6	0	0	7	0	0	0	0	0	0	0	0
P/TOT	6	0	0	0	17	0	0	23	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
07:30	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
07:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	4	0	0	6	1	0	0	0	0	0	0	1
08:00	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0
08:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
08:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	6	0	0	8	0	0	0	0	0	0	0	0
09:00	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:15	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:30	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
09:45	2	0	0	0	1	0	0	3	0	0	0	0	0	0	0	0
H/TOT	3	0	0	0	4	0	0	7	0	0	0	0	0	0	0	0
P/TOT	7	0	0	0	14	0	0	21	1	0	0	0	0	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - D FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (S)								E - C FROM CARDIFF EAST PARK & RIDE ACCESS TO BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	2	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
16:15	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
16:30	2	0	0	0	1	0	0	3	2	0	0	0	0	0	0	2
16:45	6	0	0	0	2	0	0	8	1	0	0	0	0	0	0	1
H/TOT	10	0	0	0	5	0	0	15	6	0	0	0	0	0	0	6
17:00	4	0	0	0	0	0	0	4	4	0	0	0	0	0	0	4
17:15	3	0	0	0	2	0	0	5	1	0	0	0	0	0	0	1
17:30	8	1	0	0	1	0	0	10	5	0	0	0	0	0	0	5
17:45	2	0	0	0	2	0	0	4	4	0	0	0	0	0	0	4
H/TOT	17	1	0	0	5	0	0	23	14	0	0	0	0	0	0	14
18:00	1	0	0	0	1	0	0	2	1	0	0	0	0	0	0	1
18:15	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
18:30	5	0	0	0	1	0	0	6	0	0	0	0	0	0	0	0
18:45	1	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
H/TOT	9	0	0	0	4	0	0	13	1	0	0	0	0	0	0	1
P/TOT	36	1	0	0	14	0	0	51	21	0	0	0	0	0	0	21

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
07:45	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
H/TOT	2	0	0	0	1	0	0	3	1	0	0	0	0	0	0	1
08:00	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	2	0	0	2	1	0	0	0	0	0	0	1
09:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
09:15	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	1
09:30	1	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0
09:45	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
H/TOT	2	0	0	0	2	0	0	4	2	0	1	0	0	0	0	3
P/TOT	4	0	0	0	5	0	0	9	4	0	1	0	0	0	0	5

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - B FROM CARDIFF EAST PARK & RIDE ACCESS TO PENTWYN ROAD								E - A FROM CARDIFF EAST PARK & RIDE ACCESS TO A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	0	0	0	1	0	0	4	7	0	0	0	0	0	0	7
16:15	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	6
16:30	2	0	0	0	1	0	0	3	14	1	0	0	0	0	0	15
16:45	1	0	0	0	0	0	0	1	24	0	0	0	0	0	0	24
H/TOT	6	0	0	0	2	0	0	8	51	1	0	0	0	0	0	52
17:00	6	0	0	0	1	0	0	7	14	0	0	0	0	0	0	14
17:15	0	0	0	0	0	0	0	0	14	1	0	0	0	0	0	15
17:30	3	0	0	0	1	0	0	4	27	0	0	0	0	0	0	27
17:45	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	7
H/TOT	9	0	0	0	2	0	0	11	62	1	0	0	0	0	0	63
18:00	1	0	0	0	0	0	0	1	9	0	0	0	0	0	0	9
18:15	1	0	0	0	1	0	0	2	2	0	0	0	0	0	0	2
18:30	1	0	0	0	1	0	0	2	9	0	0	0	0	0	0	9
18:45	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5
H/TOT	3	0	0	0	2	0	0	5	25	0	0	0	0	0	0	25
P/TOT	18	0	0	0	6	0	0	24	138	2	0	0	0	0	0	140

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	1	0	0	1
07:15	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	1	0	0	1
08:00	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
09:00	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0
09:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	1	0	0	1

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	E - E FROM CARDIFF EAST PARK & RIDE ACCESS TO CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0
H/TOT	0	0	0	0	0	0	0	0
P/TOT	0	0	0	0	0	0	0	0

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	48	13	4	0	0	0	0	65	41	6	3	1	1	0	0	52
07:15	63	19	2	0	0	1	0	85	65	12	2	1	0	1	0	81
07:30	81	6	1	0	0	0	0	88	78	15	4	1	0	0	0	98
07:45	86	7	2	0	0	0	0	95	104	14	5	0	0	0	0	123
H/TOT	278	45	9	0	0	1	0	333	288	47	14	3	1	1	0	354
08:00	86	10	2	0	0	0	0	98	76	8	2	1	2	1	0	90
08:15	107	12	2	0	0	0	0	121	116	6	2	2	2	0	0	128
08:30	107	8	2	1	0	0	0	118	123	11	3	1	3	0	0	141
08:45	105	10	6	0	0	0	0	121	60	16	2	4	0	0	0	82
H/TOT	405	40	12	1	0	0	0	458	375	41	9	8	7	1	0	441
09:00	73	6	1	1	0	0	0	81	69	15	4	1	0	0	0	89
09:15	42	9	2	3	0	0	0	56	71	13	2	0	0	0	0	86
09:30	48	10	3	0	0	0	0	61	47	9	4	1	0	0	0	61
09:45	47	19	3	0	0	0	0	69	49	4	3	1	0	0	0	57
H/TOT	210	44	9	4	0	0	0	267	236	41	13	3	0	0	0	293
P/TOT	893	129	30	5	0	1	0	1058	899	129	36	14	8	2	0	1088

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM A A48 EASTERN AVENUE (N)								FROM ARM A A48 EASTERN AVENUE (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	90	8	0	1	0	0	0	99	101	7	3	0	0	0	0	111
16:15	108	16	3	0	0	2	0	129	108	15	1	1	0	0	0	125
16:30	117	15	0	0	0	0	0	132	98	13	1	0	0	0	0	112
16:45	119	12	0	0	0	0	0	131	114	14	3	0	0	0	0	131
H/TOT	434	51	3	1	0	2	0	491	421	49	8	1	0	0	0	479
17:00	108	9	2	1	0	0	0	120	118	19	1	0	0	0	0	138
17:15	100	17	1	1	0	0	0	119	118	6	0	0	0	1	0	125
17:30	126	7	0	0	0	1	0	134	112	13	1	0	0	1	0	127
17:45	54	3	0	1	0	1	0	59	108	8	1	0	0	0	0	117
H/TOT	388	36	3	3	0	2	0	432	456	46	3	0	0	2	0	507
18:00	74	5	0	0	0	0	0	79	95	13	0	0	0	0	0	108
18:15	70	5	1	0	0	0	0	76	79	4	1	0	0	0	0	84
18:30	64	0	1	0	0	0	0	65	60	2	1	0	0	0	0	63
18:45	58	6	0	0	0	0	0	64	64	7	0	1	0	0	0	72
H/TOT	266	16	2	0	0	0	0	284	298	26	2	1	0	0	0	327
P/TOT	1088	103	8	4	0	4	0	1207	1175	121	13	2	0	2	0	1313

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	16	3	0	2	0	0	72	45	12	3	0	1	0	0	61
07:15	67	12	1	3	2	1	0	86	84	22	2	0	2	0	0	110
07:30	65	8	2	0	2	0	1	78	84	7	1	2	1	0	0	95
07:45	93	11	6	0	0	0	0	110	108	12	5	0	2	0	0	127
H/TOT	276	47	12	3	6	1	1	346	321	53	11	2	6	0	0	393
08:00	95	16	1	1	3	0	0	116	135	11	2	0	1	0	0	149
08:15	100	4	5	2	1	0	0	112	138	15	4	0	3	0	0	160
08:30	108	14	2	0	4	0	0	128	126	14	3	1	1	1	0	146
08:45	159	9	7	3	2	1	0	181	103	12	5	2	3	0	0	125
H/TOT	462	43	15	6	10	1	0	537	502	52	14	3	8	1	0	580
09:00	123	20	2	0	1	0	0	146	122	14	4	0	2	0	1	143
09:15	106	17	4	0	2	0	0	129	90	9	2	3	2	0	0	106
09:30	67	13	6	0	3	0	0	89	77	14	9	1	2	0	0	103
09:45	77	15	3	1	2	0	0	98	76	16	5	0	1	0	0	98
H/TOT	373	65	15	1	8	0	0	462	365	53	20	4	7	0	1	450
P/TOT	1111	155	42	10	24	2	1	1345	1188	158	45	9	21	1	1	1423

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM B PENTWYN ROAD								FROM ARM B PENTWYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	146	14	2	0	3	1	0	166	100	10	3	2	2	0	0	117
16:15	134	8	0	1	0	0	0	143	122	12	3	0	3	2	0	142
16:30	135	13	2	1	3	0	0	154	114	7	1	1	1	0	0	124
16:45	168	17	1	0	0	0	1	187	141	13	1	0	2	0	0	157
H/TOT	583	52	5	2	6	1	1	650	477	42	8	3	8	2	0	540
17:00	147	13	1	0	3	1	0	165	129	5	2	1	0	0	0	137
17:15	153	13	1	0	0	0	0	167	102	12	1	1	3	0	0	119
17:30	139	10	1	0	2	0	0	152	138	4	0	0	1	1	0	144
17:45	125	8	0	0	1	0	0	134	98	5	0	0	1	0	0	104
H/TOT	564	44	3	0	6	1	0	618	467	26	3	2	5	1	0	504
18:00	125	10	1	0	1	1	0	138	111	4	1	0	0	0	0	116
18:15	120	7	1	0	1	0	0	129	108	3	0	0	0	0	0	111
18:30	102	2	4	0	1	0	0	109	115	3	0	0	1	0	0	119
18:45	98	4	0	1	1	0	0	104	102	2	0	0	1	0	0	105
H/TOT	445	23	6	1	4	1	0	480	436	12	1	0	2	0	0	451
P/TOT	1592	119	14	3	16	3	1	1748	1380	80	12	5	15	3	0	1495

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	26	2	4	1	0	0	0	33	63	18	2	0	0	0	0	83
07:15	37	9	2	0	1	0	0	49	84	15	2	0	0	1	0	102
07:30	58	12	4	1	1	0	0	76	94	16	1	0	1	0	0	112
07:45	90	23	2	0	0	0	0	115	115	10	1	0	0	0	0	126
H/TOT	211	46	12	2	2	0	0	273	356	59	6	0	1	1	0	423
08:00	64	7	1	0	2	1	0	75	140	18	1	0	1	0	0	160
08:15	122	12	0	1	3	0	0	138	139	17	2	0	1	1	0	160
08:30	113	15	3	1	2	0	0	134	166	13	3	0	0	0	0	182
08:45	89	21	1	1	2	0	0	114	191	15	2	0	0	0	0	208
H/TOT	388	55	5	3	9	1	0	461	636	63	8	0	2	1	0	710
09:00	92	8	2	1	1	0	0	104	128	13	0	0	1	0	0	142
09:15	90	11	0	0	0	0	0	101	82	12	2	1	1	0	0	98
09:30	47	10	4	1	1	0	0	63	64	7	1	1	2	0	0	75
09:45	40	10	2	0	1	0	0	53	57	13	2	0	1	0	0	73
H/TOT	269	39	8	2	3	0	0	321	331	45	5	2	5	0	0	388
P/TOT	868	140	25	7	14	1	0	1055	1323	167	19	2	8	2	0	1521

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM C BRYN CELYN ROAD								FROM ARM C BRYN CELYN ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	96	15	4	0	1	0	0	116	108	11	0	0	2	0	0	121
16:15	108	19	1	0	3	0	0	131	112	13	1	0	0	0	0	126
16:30	101	11	1	0	0	0	0	113	144	15	1	0	2	0	0	162
16:45	118	17	3	0	1	0	0	139	122	10	0	0	0	0	0	132
H/TOT	423	62	9	0	5	0	0	499	486	49	2	0	4	0	0	541
17:00	123	18	1	0	0	0	0	142	95	9	1	0	2	0	1	108
17:15	125	11	0	0	2	1	0	139	102	10	0	0	0	0	0	112
17:30	114	10	1	0	0	1	0	126	110	7	0	0	1	0	0	118
17:45	124	6	1	0	0	0	0	131	63	7	0	1	1	1	0	73
H/TOT	486	45	3	0	2	2	0	538	370	33	1	1	4	1	1	411
18:00	122	11	1	0	0	0	0	134	82	5	0	0	1	0	0	88
18:15	106	6	1	0	0	1	0	114	92	6	2	0	0	0	0	100
18:30	90	5	2	0	0	0	0	97	78	1	2	0	1	0	0	82
18:45	78	7	0	0	0	0	0	85	79	9	0	0	0	0	0	88
H/TOT	396	29	4	0	0	1	0	430	331	21	4	0	2	0	0	358
P/TOT	1305	136	16	0	7	3	0	1467	1187	103	7	1	10	1	1	1310

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	51	14	0	0	1	0	0	66	46	9	3	0	2	0	0	60
07:15	90	19	1	0	2	0	0	112	57	10	0	2	3	0	0	72
07:30	83	15	1	2	1	0	0	102	63	6	2	0	1	0	1	73
07:45	110	8	2	0	2	0	0	122	90	13	1	0	1	0	0	105
H/TOT	334	56	4	2	6	0	0	402	256	38	6	2	7	0	1	310
08:00	150	18	1	0	2	0	0	171	76	14	0	0	2	0	0	92
08:15	134	17	5	0	2	1	0	159	110	8	4	1	2	0	0	125
08:30	145	14	3	0	2	1	0	165	93	13	1	0	4	0	0	111
08:45	114	14	2	3	2	0	0	135	122	11	7	1	3	1	0	145
H/TOT	543	63	11	3	8	2	0	630	401	46	12	2	11	1	0	473
09:00	122	22	2	1	2	0	1	150	101	15	1	2	2	0	0	121
09:15	87	10	1	1	2	0	0	101	90	13	1	0	1	0	0	105
09:30	81	12	7	2	1	0	0	103	59	15	6	0	2	0	0	82
09:45	76	9	4	0	1	0	0	90	62	20	1	0	2	0	0	85
H/TOT	366	53	14	4	6	0	1	444	312	63	9	2	7	0	0	393
P/TOT	1243	172	29	9	20	2	1	1476	969	147	27	6	25	1	1	1176

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM D A48 EASTERN AVENUE (S)								FROM ARM D A48 EASTERN AVENUE (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	101	5	2	1	0	0	0	109	111	14	2	0	2	1	0	130
16:15	106	7	1	0	2	0	0	116	108	10	0	0	1	0	0	119
16:30	125	6	1	1	2	0	0	135	102	9	1	1	1	0	0	114
16:45	126	7	1	0	2	0	0	136	123	16	1	0	1	0	1	142
H/TOT	458	25	5	2	6	0	0	496	444	49	4	1	5	1	1	505
17:00	102	4	1	0	0	0	1	108	114	11	1	0	2	1	0	129
17:15	93	4	0	0	2	0	0	99	133	16	1	0	1	0	0	151
17:30	129	6	0	0	2	0	0	137	105	9	1	0	2	0	0	117
17:45	88	10	0	0	2	0	0	100	109	7	0	0	1	0	0	117
H/TOT	412	24	1	0	6	0	1	444	461	43	3	0	6	1	0	514
18:00	91	4	0	0	1	0	0	96	114	8	1	0	2	1	0	126
18:15	101	1	1	0	0	0	0	103	113	6	1	0	1	1	0	122
18:30	101	1	0	0	2	0	0	104	92	2	4	0	1	0	0	99
18:45	109	5	0	0	3	0	0	117	92	4	0	0	3	0	0	99
H/TOT	402	11	1	0	6	0	0	420	411	20	6	0	7	2	0	446
P/TOT	1272	60	7	2	18	0	1	1360	1316	112	13	1	18	4	1	1465

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	0	0	0	2	0	0	22	1	0	0	0	1	0	0	2
07:15	33	0	0	0	2	0	0	35	0	0	0	0	2	0	0	2
07:30	36	3	0	0	1	0	0	40	4	0	0	0	2	0	0	6
07:45	39	0	0	0	2	0	0	41	1	0	0	0	1	0	0	2
H/TOT	128	3	0	0	7	0	0	138	6	0	0	0	6	0	0	12
08:00	32	0	0	0	2	0	0	34	0	0	0	0	3	0	0	3
08:15	41	1	0	0	3	0	0	45	1	0	0	0	1	0	0	2
08:30	36	0	0	0	1	0	0	37	1	0	0	0	1	0	0	2
08:45	10	0	0	0	3	0	0	13	1	0	0	0	3	0	0	4
H/TOT	119	1	0	0	9	0	0	129	3	0	0	0	8	0	0	11
09:00	12	1	2	0	2	0	0	17	2	0	0	0	1	0	0	3
09:15	9	0	0	0	2	0	0	11	1	0	0	0	2	0	0	3
09:30	5	0	0	0	3	0	0	8	1	0	0	0	2	0	0	3
09:45	7	0	0	0	1	0	0	8	3	0	1	0	1	0	0	5
H/TOT	33	1	2	0	8	0	0	44	7	0	1	0	6	0	0	14
P/TOT	280	5	2	0	24	0	0	311	16	0	1	0	20	0	0	37

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 1 **DATE:** 15/02/2022

LOCATION: A48 EASTERN AVENUE / PENTWYN ROAD / BRYN CELYN ROAD / CARDIFF EAST PARK & RIDE ACCESS **DAY:** TUESDAY

TIME	TO ARM E CARDIFF EAST PARK & RIDE ACCESS								FROM ARM E CARDIFF EAST PARK & RIDE ACCESS							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	1	0	0	0	3	0	0	4	14	0	0	0	1	0	0	15
16:15	1	0	0	0	1	0	0	2	7	0	0	0	2	0	0	9
16:30	0	0	0	0	1	0	0	1	20	1	0	0	2	0	0	23
16:45	1	0	0	0	2	0	0	3	32	0	0	0	2	0	0	34
H/TOT	3	0	0	0	7	0	0	10	73	1	0	0	7	0	0	81
17:00	4	0	0	0	2	0	0	6	28	0	0	0	1	0	0	29
17:15	2	0	0	0	2	0	0	4	18	1	0	0	2	0	0	21
17:30	0	1	0	0	2	0	0	3	43	1	0	0	2	0	0	46
17:45	0	0	0	0	2	0	0	2	13	0	0	0	2	0	0	15
H/TOT	6	1	0	0	8	0	0	15	102	2	0	0	7	0	0	111
18:00	2	0	0	0	2	0	0	4	12	0	0	0	1	0	0	13
18:15	0	0	0	0	1	0	0	1	5	0	0	0	1	0	0	6
18:30	3	0	0	0	2	0	0	5	15	0	0	0	2	0	0	17
18:45	0	0	0	0	2	0	0	2	6	0	0	0	2	0	0	8
H/TOT	5	0	0	0	7	0	0	12	38	0	0	0	6	0	0	44
P/TOT	14	1	0	0	22	0	0	37	213	3	0	0	20	0	0	236

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	15	8	0	0	0	0	0	23	1	1	0	0	0	0	0	2
07:15	19	4	0	0	2	0	0	25	0	0	0	0	0	0	0	0
07:30	26	7	0	0	0	0	0	33	2	0	0	0	0	0	0	2
07:45	34	7	0	0	0	0	0	41	1	1	0	0	0	0	0	2
H/TOT	94	26	0	0	2	0	0	122	4	2	0	0	0	0	0	6
08:00	31	2	2	0	0	0	0	35	2	0	0	0	0	0	0	2
08:15	30	9	2	0	2	0	0	43	3	0	0	0	0	0	0	3
08:30	44	6	0	0	0	1	0	51	4	1	0	0	0	0	0	5
08:45	40	1	1	0	1	0	0	43	18	0	0	0	0	0	0	18
H/TOT	145	18	5	0	3	1	0	172	27	1	0	0	0	0	0	28
09:00	31	3	1	0	0	0	0	35	3	0	0	0	0	0	0	3
09:15	23	4	1	0	0	0	0	28	0	0	0	0	0	0	0	0
09:30	28	5	0	0	1	0	0	34	1	0	0	0	0	0	0	1
09:45	18	2	0	0	1	0	0	21	0	0	0	0	0	0	0	0
H/TOT	100	14	2	0	2	0	0	118	4	0	0	0	0	0	0	4
P/TOT	339	58	7	0	7	1	0	412	35	3	0	0	0	0	0	38

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	A - C FROM BALL ROAD (N) TO BALL ROAD (S)								A - B FROM BALL ROAD (N) TO HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	28	6	0	0	1	0	0	35	1	0	0	0	0	0	0	1
16:15	31	5	0	0	0	0	0	36	1	0	0	0	0	0	0	1
16:30	22	2	0	0	1	0	0	25	2	0	1	0	0	0	0	3
16:45	24	3	1	0	0	1	0	29	5	0	0	0	0	0	0	5
H/TOT	105	16	1	0	2	1	0	125	9	0	1	0	0	0	0	10
17:00	30	1	0	0	0	0	0	31	1	0	0	0	0	0	0	1
17:15	35	2	0	0	0	0	0	37	2	1	0	0	0	0	0	3
17:30	37	7	0	0	0	0	0	44	4	0	0	0	0	0	0	4
17:45	28	2	1	0	0	0	0	31	1	0	0	0	0	0	0	1
H/TOT	130	12	1	0	0	0	0	143	8	1	0	0	0	0	0	9
18:00	28	1	0	0	1	0	0	30	2	1	0	0	0	0	0	3
18:15	20	2	0	0	0	0	0	22	0	0	0	0	0	0	0	0
18:30	30	1	1	0	1	0	0	33	5	0	0	0	0	0	0	5
18:45	15	1	0	0	0	0	0	16	2	0	0	0	0	0	0	2
H/TOT	93	5	1	0	2	0	0	101	9	1	0	0	0	0	0	10
P/TOT	328	33	3	0	4	1	0	369	26	2	1	0	0	0	0	29

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0	5
07:45	1	0	0	0	0	0	0	1	5	2	0	0	0	0	0	7
H/TOT	2	0	0	0	0	0	0	2	17	7	0	0	0	0	0	24
08:00	0	1	0	0	0	0	0	1	6	2	0	0	0	0	0	8
08:15	5	0	0	0	0	0	0	5	2	5	0	0	0	0	0	7
08:30	3	0	0	0	0	0	0	3	3	0	0	0	0	0	0	3
08:45	7	1	0	0	0	0	0	8	23	1	0	0	0	0	0	24
H/TOT	15	2	0	0	0	0	0	17	34	8	0	0	0	0	0	42
09:00	13	0	0	0	0	0	0	13	33	3	0	0	0	0	0	36
09:15	0	0	0	0	0	0	0	0	6	2	0	0	0	0	0	8
09:30	1	2	0	0	0	0	0	3	2	3	0	0	0	0	0	5
09:45	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
H/TOT	14	2	0	0	0	0	0	16	45	9	0	0	0	0	0	54
P/TOT	31	4	0	0	0	0	0	35	96	24	0	0	0	0	0	120

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	B - A FROM HARTLAND ROAD TO BALL ROAD (N)								B - C FROM HARTLAND ROAD TO BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	3	1	0	0	0	0	0	4	5	1	0	0	0	0	0	6
16:15	1	1	0	0	0	0	0	2	6	3	0	0	0	0	0	9
16:30	1	0	0	0	0	0	0	1	3	1	0	0	0	0	0	4
16:45	3	2	0	0	0	0	0	5	3	1	0	0	0	0	0	4
H/TOT	8	4	0	0	0	0	0	12	17	6	0	0	0	0	0	23
17:00	3	0	0	0	0	0	0	3	4	1	1	0	0	0	0	6
17:15	4	0	0	0	0	0	0	4	4	1	0	0	0	0	0	5
17:30	0	1	0	0	0	0	0	1	6	0	0	0	0	0	0	6
17:45	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
H/TOT	7	1	0	0	0	0	0	8	18	2	1	0	0	0	0	21
18:00	7	0	0	0	0	0	0	7	55	1	0	0	0	0	0	56
18:15	1	0	0	0	0	0	0	1	8	1	0	0	0	0	0	9
18:30	1	0	0	0	0	0	0	1	5	0	0	0	0	0	0	5
18:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
H/TOT	9	0	0	0	0	0	0	9	69	2	0	0	0	0	0	71
P/TOT	24	5	0	0	0	0	0	29	104	10	1	0	0	0	0	115

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	0	0	0	0	0	0	0	0	8	2	0	0	0	0	0	10
07:15	0	0	0	0	0	0	0	0	13	2	2	0	0	1	1	19
07:30	3	1	0	0	0	0	0	4	13	1	1	0	0	0	0	15
07:45	3	2	0	0	0	0	0	5	15	3	1	0	4	0	0	23
H/TOT	6	3	0	0	0	0	0	9	49	8	4	0	4	1	1	67
08:00	3	2	0	0	0	0	0	5	13	2	1	0	1	0	0	17
08:15	4	1	0	0	0	0	0	5	27	4	2	0	1	0	0	34
08:30	15	1	0	0	0	0	0	16	21	2	0	0	0	0	0	23
08:45	30	3	0	0	0	0	0	33	39	5	3	0	1	0	0	48
H/TOT	52	7	0	0	0	0	0	59	100	13	6	0	3	0	0	122
09:00	11	3	0	0	0	0	0	14	30	5	2	0	0	0	0	37
09:15	5	2	0	0	0	0	0	7	15	1	0	0	3	0	0	19
09:30	1	0	0	0	0	0	0	1	18	5	0	0	0	0	0	23
09:45	4	2	0	0	0	0	0	6	14	2	2	0	2	0	0	20
H/TOT	21	7	0	0	0	0	0	28	77	13	4	0	5	0	0	99
P/TOT	79	17	0	0	0	0	0	96	226	34	14	0	12	1	1	288

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	C - B FROM BALL ROAD (S) TO HARTLAND ROAD								C - A FROM BALL ROAD (S) TO BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	7	3	0	0	0	0	0	10	33	4	0	0	0	0	0	37
16:15	5	2	0	0	0	0	0	7	41	5	0	0	0	0	0	46
16:30	18	2	0	0	0	0	0	20	46	3	2	0	2	1	1	55
16:45	29	0	0	0	0	0	0	29	24	9	1	0	0	0	0	34
H/TOT	59	7	0	0	0	0	0	66	144	21	3	0	2	1	1	172
17:00	25	0	0	0	0	0	0	25	42	10	0	0	0	1	1	54
17:15	6	0	0	0	0	0	0	6	41	4	0	0	0	0	1	46
17:30	14	0	0	0	0	0	0	14	28	3	0	0	1	0	0	32
17:45	12	0	0	0	0	0	0	12	44	3	0	0	0	0	0	47
H/TOT	57	0	0	0	0	0	0	57	155	20	0	0	1	1	2	179
18:00	10	2	0	0	0	0	0	12	40	2	2	0	0	0	0	44
18:15	4	0	0	0	0	0	0	4	45	2	0	0	0	0	1	48
18:30	5	0	0	0	0	0	0	5	27	2	0	0	1	0	1	31
18:45	2	1	0	0	0	0	0	3	28	2	1	0	0	0	0	31
H/TOT	21	3	0	0	0	0	0	24	140	8	3	0	1	0	2	154
P/TOT	137	10	0	0	0	0	0	147	439	49	6	0	4	2	5	505

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	9	2	0	0	0	0	0	11	16	9	0	0	0	0	0	25
07:15	13	2	2	0	0	1	1	19	19	4	0	0	2	0	0	25
07:30	13	1	1	0	0	0	0	15	28	7	0	0	0	0	0	35
07:45	16	3	1	0	4	0	0	24	35	8	0	0	0	0	0	43
H/TOT	51	8	4	0	4	1	1	69	98	28	0	0	2	0	0	128
08:00	13	3	1	0	1	0	0	18	33	2	2	0	0	0	0	37
08:15	32	4	2	0	1	0	0	39	33	9	2	0	2	0	0	46
08:30	24	2	0	0	0	0	0	26	48	7	0	0	0	1	0	56
08:45	46	6	3	0	1	0	0	56	58	1	1	0	1	0	0	61
H/TOT	115	15	6	0	3	0	0	139	172	19	5	0	3	1	0	200
09:00	43	5	2	0	0	0	0	50	34	3	1	0	0	0	0	38
09:15	15	1	0	0	3	0	0	19	23	4	1	0	0	0	0	28
09:30	19	7	0	0	0	0	0	26	29	5	0	0	1	0	0	35
09:45	14	2	2	0	2	0	0	20	18	2	0	0	1	0	0	21
H/TOT	91	15	4	0	5	0	0	115	104	14	2	0	2	0	0	122
P/TOT	257	38	14	0	12	1	1	323	374	61	7	0	7	1	0	450

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM A BALL ROAD (N)								FROM ARM A BALL ROAD (N)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	36	5	0	0	0	0	0	41	29	6	0	0	1	0	0	36
16:15	42	6	0	0	0	0	0	48	32	5	0	0	0	0	0	37
16:30	47	3	2	0	2	1	1	56	24	2	1	0	1	0	0	28
16:45	27	11	1	0	0	0	0	39	29	3	1	0	0	1	0	34
H/TOT	152	25	3	0	2	1	1	184	114	16	2	0	2	1	0	135
17:00	45	10	0	0	0	1	1	57	31	1	0	0	0	0	0	32
17:15	45	4	0	0	0	0	1	50	37	3	0	0	0	0	0	40
17:30	28	4	0	0	1	0	0	33	41	7	0	0	0	0	0	48
17:45	44	3	0	0	0	0	0	47	29	2	1	0	0	0	0	32
H/TOT	162	21	0	0	1	1	2	187	138	13	1	0	0	0	0	152
18:00	47	2	2	0	0	0	0	51	30	2	0	0	1	0	0	33
18:15	46	2	0	0	0	0	1	49	20	2	0	0	0	0	0	22
18:30	28	2	0	0	1	0	1	32	35	1	1	0	1	0	0	38
18:45	28	2	1	0	0	0	0	31	17	1	0	0	0	0	0	18
H/TOT	149	8	3	0	1	0	2	163	102	6	1	0	2	0	0	111
P/TOT	463	54	6	0	4	2	5	534	354	35	4	0	4	1	0	398

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	1	1	0	0	0	0	0	2	6	2	0	0	0	0	0	8
07:15	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	5
07:30	5	1	0	0	0	0	0	6	3	2	0	0	0	0	0	5
07:45	4	3	0	0	0	0	0	7	6	2	0	0	0	0	0	8
H/TOT	10	5	0	0	0	0	0	15	19	7	0	0	0	0	0	26
08:00	5	2	0	0	0	0	0	7	6	3	0	0	0	0	0	9
08:15	7	1	0	0	0	0	0	8	7	5	0	0	0	0	0	12
08:30	19	2	0	0	0	0	0	21	6	0	0	0	0	0	0	6
08:45	48	3	0	0	0	0	0	51	30	2	0	0	0	0	0	32
H/TOT	79	8	0	0	0	0	0	87	49	10	0	0	0	0	0	59
09:00	14	3	0	0	0	0	0	17	46	3	0	0	0	0	0	49
09:15	5	2	0	0	0	0	0	7	6	2	0	0	0	0	0	8
09:30	2	0	0	0	0	0	0	2	3	5	0	0	0	0	0	8
09:45	4	2	0	0	0	0	0	6	4	1	0	0	0	0	0	5
H/TOT	25	7	0	0	0	0	0	32	59	11	0	0	0	0	0	70
P/TOT	114	20	0	0	0	0	0	134	127	28	0	0	0	0	0	155

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM B HARTLAND ROAD								FROM ARM B HARTLAND ROAD							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	8	3	0	0	0	0	0	11	8	2	0	0	0	0	0	10
16:15	6	2	0	0	0	0	0	8	7	4	0	0	0	0	0	11
16:30	20	2	1	0	0	0	0	23	4	1	0	0	0	0	0	5
16:45	34	0	0	0	0	0	0	34	6	3	0	0	0	0	0	9
H/TOT	68	7	1	0	0	0	0	76	25	10	0	0	0	0	0	35
17:00	26	0	0	0	0	0	0	26	7	1	1	0	0	0	0	9
17:15	8	1	0	0	0	0	0	9	8	1	0	0	0	0	0	9
17:30	18	0	0	0	0	0	0	18	6	1	0	0	0	0	0	7
17:45	13	0	0	0	0	0	0	13	4	0	0	0	0	0	0	4
H/TOT	65	1	0	0	0	0	0	66	25	3	1	0	0	0	0	29
18:00	12	3	0	0	0	0	0	15	62	1	0	0	0	0	0	63
18:15	4	0	0	0	0	0	0	4	9	1	0	0	0	0	0	10
18:30	10	0	0	0	0	0	0	10	6	0	0	0	0	0	0	6
18:45	4	1	0	0	0	0	0	5	1	0	0	0	0	0	0	1
H/TOT	30	4	0	0	0	0	0	34	78	2	0	0	0	0	0	80
P/TOT	163	12	1	0	0	0	0	176	128	15	1	0	0	0	0	144

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
07:00	20	10	0	0	0	0	0	30	8	2	0	0	0	0	0	10
07:15	23	5	0	0	2	0	0	30	13	2	2	0	0	1	1	19
07:30	29	9	0	0	0	0	0	38	16	2	1	0	0	0	0	19
07:45	39	9	0	0	0	0	0	48	18	5	1	0	4	0	0	28
H/TOT	111	33	0	0	2	0	0	146	55	11	4	0	4	1	1	76
08:00	37	4	2	0	0	0	0	43	16	4	1	0	1	0	0	22
08:15	32	14	2	0	2	0	0	50	31	5	2	0	1	0	0	39
08:30	47	6	0	0	0	1	0	54	36	3	0	0	0	0	0	39
08:45	63	2	1	0	1	0	0	67	69	8	3	0	1	0	0	81
H/TOT	179	26	5	0	3	1	0	214	152	20	6	0	3	0	0	181
09:00	64	6	1	0	0	0	0	71	41	8	2	0	0	0	0	51
09:15	29	6	1	0	0	0	0	36	20	3	0	0	3	0	0	26
09:30	30	8	0	0	1	0	0	39	19	5	0	0	0	0	0	24
09:45	22	3	0	0	1	0	0	26	18	4	2	0	2	0	0	26
H/TOT	145	23	2	0	2	0	0	172	98	20	4	0	5	0	0	127
P/TOT	435	82	7	0	7	1	0	532	305	51	14	0	12	1	1	384

MANUAL CLASSIFIED COUNTS

JOB REF: 27178

JOB NAME: CARDIFF

SITE: 2 **DATE:** 15/02/2022

LOCATION: BALL ROAD / HARTLAND ROAD **DAY:** TUESDAY

TIME	TO ARM C BALL ROAD (S)								FROM ARM C BALL ROAD (S)							
	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT	CAR	LGV	OGV1	OGV2	PSV	MCL	PCL	TOT
16:00	33	7	0	0	1	0	0	41	40	7	0	0	0	0	0	47
16:15	37	8	0	0	0	0	0	45	46	7	0	0	0	0	0	53
16:30	25	3	0	0	1	0	0	29	64	5	2	0	2	1	1	75
16:45	27	4	1	0	0	1	0	33	53	9	1	0	0	0	0	63
H/TOT	122	22	1	0	2	1	0	148	203	28	3	0	2	1	1	238
17:00	34	2	1	0	0	0	0	37	67	10	0	0	0	1	1	79
17:15	39	3	0	0	0	0	0	42	47	4	0	0	0	0	1	52
17:30	43	7	0	0	0	0	0	50	42	3	0	0	1	0	0	46
17:45	32	2	1	0	0	0	0	35	56	3	0	0	0	0	0	59
H/TOT	148	14	2	0	0	0	0	164	212	20	0	0	1	1	2	236
18:00	83	2	0	0	1	0	0	86	50	4	2	0	0	0	0	56
18:15	28	3	0	0	0	0	0	31	49	2	0	0	0	0	1	52
18:30	35	1	1	0	1	0	0	38	32	2	0	0	1	0	1	36
18:45	16	1	0	0	0	0	0	17	30	3	1	0	0	0	0	34
H/TOT	162	7	1	0	2	0	0	172	161	11	3	0	1	0	2	178
P/TOT	432	43	4	0	4	1	0	484	576	59	6	0	4	2	5	652

27178		CARDIFF							
		FEBRUARY 2022							
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Total Vehicles**	**5 Day Ave.**	**7 Day Ave.**	**Average 85%ile Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	13738	2101	1963	32.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		12873	1973	1839	32.4

27178		CARDIFF FEBRUARY 2022				
Site	**Location**	**Direction**	**Start Date**	**End Date**	**Posted Speed Limit (PSL)**	**Average Mean Speed**
Site No: 27178001	Site 1 - Ball Road (att to T/P) OSGR - ST 21596 80926	Channel: Northbound	Thu 10-Feb-22	Wed 16-Feb-22	30	27.0
		Channel: Southbound	Thu 10-Feb-22	Wed 16-Feb-22		26.0

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**19**	3	16	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	1	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
04:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
05:00	**13**	0	11	1	1	0	0	0	0	0	0	0	0	0
06:00	**20**	0	16	3	0	0	1	0	0	0	0	0	0	0
07:00	**75**	2	55	12	1	3	2	0	0	0	0	0	0	0
08:00	**180**	2	164	10	1	2	1	0	0	0	0	0	0	0
09:00	**125**	1	104	15	1	2	2	0	0	0	0	0	0	0
10:00	**92**	0	83	6	2	1	0	0	0	0	0	0	0	0
11:00	**127**	0	105	19	3	0	0	0	0	0	0	0	0	0
12:00	**112**	0	102	7	1	2	0	0	0	0	0	0	0	0
13:00	**133**	2	114	14	2	1	0	0	0	0	0	0	0	0
14:00	**143**	0	133	8	2	0	0	0	0	0	0	0	0	0
15:00	**203**	1	183	16	1	2	0	0	0	0	0	0	0	0
16:00	**183**	6	160	13	3	1	0	0	0	0	0	0	0	0
17:00	**154**	1	135	15	1	2	0	0	0	0	0	0	0	0
18:00	**143**	4	128	10	1	0	0	0	0	0	0	0	0	0
19:00	**123**	4	113	5	1	0	0	0	0	0	0	0	0	0
20:00	**96**	2	85	7	2	0	0	0	0	0	0	0	0	0
21:00	**68**	1	59	6	0	1	1	0	0	0	0	0	0	0
22:00	**44**	1	38	5	0	0	0	0	0	0	0	0	0	0
23:00	**31**	1	29	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1670**	**19**	**1466**	**145**	**19**	**16**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1977**	**26**	**1739**	**166**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2052**	**28**	**1806**	**172**	**22**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2110**	**32**	**1857**	**174**	**23**	**17**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
01:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**5**	1	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	1	5	1	0	0	0	0	0	0	0	0	0	0
06:00	**23**	1	21	1	0	0	0	0	0	0	0	0	0	0
07:00	**47**	1	36	7	1	2	0	0	0	0	0	0	0	0
08:00	**159**	0	147	9	1	2	0	0	0	0	0	0	0	0
09:00	**112**	2	97	9	3	1	0	0	0	0	0	0	0	0
10:00	**99**	0	86	10	2	1	0	0	0	0	0	0	0	0
11:00	**119**	1	105	10	2	1	0	0	0	0	0	0	0	0
12:00	**144**	3	124	15	1	1	0	0	0	0	0	0	0	0
13:00	**119**	0	105	13	1	0	0	0	0	0	0	0	0	0
14:00	**160**	2	143	11	2	2	0	0	0	0	0	0	0	0
15:00	**221**	1	203	14	2	1	0	0	0	0	0	0	0	0
16:00	**205**	4	179	18	2	1	1	0	0	0	0	0	0	0
17:00	**164**	3	147	13	1	0	0	0	0	0	0	0	0	0
18:00	**164**	2	154	6	0	2	0	0	0	0	0	0	0	0
19:00	**152**	3	140	6	3	0	0	0	0	0	0	0	0	0
20:00	**85**	0	82	2	0	1	0	0	0	0	0	0	0	0
21:00	**66**	1	59	5	1	0	0	0	0	0	0	0	0	0
22:00	**57**	0	52	4	0	1	0	0	0	0	0	0	0	0
23:00	**46**	2	42	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1713**	**19**	**1526**	**135**	**18**	**14**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**2039**	**24**	**1828**	**149**	**22**	**15**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2142**	**26**	**1922**	**155**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2186**	**28**	**1963**	**156**	**22**	**16**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**25**	2	22	1	0	0	0	0	0	0	0	0	0	0
01:00	**14**	0	14	0	0	0	0	0	0	0	0	0	0	0
02:00	**20**	1	19	0	0	0	0	0	0	0	0	0	0	0
03:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
04:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
05:00	**15**	0	13	1	1	0	0	0	0	0	0	0	0	0
06:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
07:00	**25**	0	22	2	1	0	0	0	0	0	0	0	0	0
08:00	**60**	0	54	5	1	0	0	0	0	0	0	0	0	0
09:00	**87**	1	78	6	2	0	0	0	0	0	0	0	0	0
10:00	**101**	0	92	6	3	0	0	0	0	0	0	0	0	0
11:00	**139**	1	131	6	0	1	0	0	0	0	0	0	0	0
12:00	**150**	1	139	7	2	1	0	0	0	0	0	0	0	0
13:00	**157**	2	146	7	2	0	0	0	0	0	0	0	0	0
14:00	**111**	4	94	12	1	0	0	0	0	0	0	0	0	0
15:00	**138**	2	132	3	0	1	0	0	0	0	0	0	0	0
16:00	**112**	1	103	6	2	0	0	0	0	0	0	0	0	0
17:00	**118**	1	111	5	1	0	0	0	0	0	0	0	0	0
18:00	**132**	1	124	5	0	2	0	0	0	0	0	0	0	0
19:00	**121**	0	117	2	0	2	0	0	0	0	0	0	0	0
20:00	**83**	0	79	3	0	1	0	0	0	0	0	0	0	0
21:00	**61**	1	60	0	0	0	0	0	0	0	0	0	0	0
22:00	**53**	0	52	0	1	0	0	0	0	0	0	0	0	0
23:00	**49**	0	44	4	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1330**	**14**	**1226**	**70**	**15**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**15**	**1494**	**75**	**15**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1709**	**15**	**1590**	**79**	**16**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1799**	**18**	**1674**	**81**	**17**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

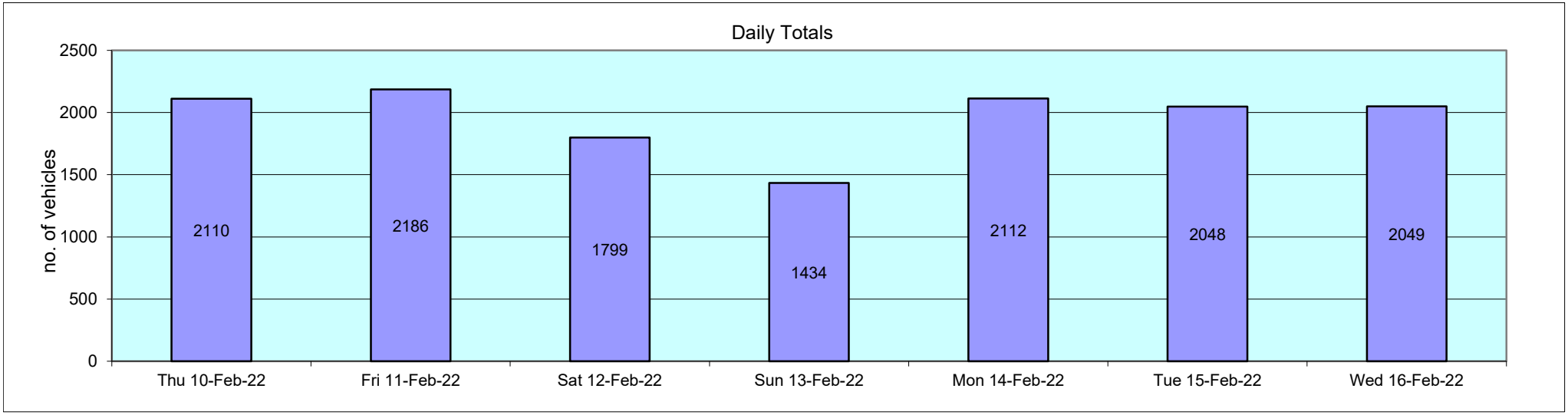
27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**20**	1	18	1	0	0	0	0	0	0	0	0	0	0
01:00	**26**	0	25	1	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
03:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**16**	0	15	0	0	1	0	0	0	0	0	0	0	0
07:00	**21**	0	21	0	0	0	0	0	0	0	0	0	0	0
08:00	**25**	0	24	0	0	1	0	0	0	0	0	0	0	0
09:00	**36**	0	33	2	1	0	0	0	0	0	0	0	0	0
10:00	**63**	0	61	1	0	1	0	0	0	0	0	0	0	0
11:00	**96**	0	88	6	2	0	0	0	0	0	0	0	0	0
12:00	**117**	0	107	8	2	0	0	0	0	0	0	0	0	0
13:00	**124**	3	114	5	1	1	0	0	0	0	0	0	0	0
14:00	**124**	0	111	11	1	1	0	0	0	0	0	0	0	0
15:00	**133**	3	122	7	1	0	0	0	0	0	0	0	0	0
16:00	**115**	0	108	4	2	1	0	0	0	0	0	0	0	0
17:00	**117**	0	112	5	0	0	0	0	0	0	0	0	0	0
18:00	**110**	1	103	4	0	2	0	0	0	0	0	0	0	0
19:00	**78**	1	73	3	0	1	0	0	0	0	0	0	0	0
20:00	**66**	0	63	2	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	45	1	0	1	0	0	0	0	0	0	0	0
22:00	**35**	1	31	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	18	2	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1081**	**7**	**1004**	**53**	**10**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1288**	**8**	**1200**	**59**	**10**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1344**	**10**	**1249**	**63**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1434**	**11**	**1336**	**65**	**10**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**15**	1	14	0	0	0	0	0	0	0	0	0	0	0
01:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	23	1	0	1	0	0	0	0	0	0	0	0
07:00	**67**	0	51	11	1	4	0	0	0	0	0	0	0	0
08:00	**171**	1	149	17	1	2	1	0	0	0	0	0	0	0
09:00	**130**	2	113	13	0	2	0	0	0	0	0	0	0	0
10:00	**93**	1	79	9	2	1	1	0	0	0	0	0	0	0
11:00	**131**	2	116	11	2	0	0	0	0	0	0	0	0	0
12:00	**123**	3	110	8	1	1	0	0	0	0	0	0	0	0
13:00	**105**	1	90	10	1	2	0	0	1	0	0	0	0	0
14:00	**146**	1	134	9	0	2	0	0	0	0	0	0	0	0
15:00	**221**	4	200	14	2	0	1	0	0	0	0	0	0	0
16:00	**202**	2	183	14	1	2	0	0	0	0	0	0	0	0
17:00	**166**	1	147	16	2	0	0	0	0	0	0	0	0	0
18:00	**127**	3	119	4	0	1	0	0	0	0	0	0	0	0
19:00	**125**	3	115	6	0	1	0	0	0	0	0	0	0	0
20:00	**91**	0	86	4	0	1	0	0	0	0	0	0	0	0
21:00	**60**	0	57	2	1	0	0	0	0	0	0	0	0	0
22:00	**51**	0	48	2	1	0	0	0	0	0	0	0	0	0
23:00	**38**	0	38	0	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1682**	**21**	**1491**	**136**	**13**	**17**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**24**	**1772**	**149**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**24**	**1858**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**25**	**1897**	**151**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
01:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
02:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	0	0	0	1	0	0	0	0	0	0	0
04:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	9	0	0	0	0	0	0	0	0	0	0	0
06:00	**25**	0	20	4	1	0	0	0	0	0	0	0	0	0
07:00	**76**	1	54	17	0	3	1	0	0	0	0	0	0	0
08:00	**156**	1	137	14	3	0	1	0	0	0	0	0	0	0
09:00	**107**	0	89	12	1	5	0	0	0	0	0	0	0	0
10:00	**95**	0	81	12	1	1	0	0	0	0	0	0	0	0
11:00	**114**	0	94	17	1	1	1	0	0	0	0	0	0	0
12:00	**124**	1	107	14	0	2	0	0	0	0	0	0	0	0
13:00	**110**	1	93	13	2	1	0	0	0	0	0	0	0	0
14:00	**133**	2	119	9	0	2	0	0	1	0	0	0	0	0
15:00	**207**	0	186	18	1	2	0	0	0	0	0	0	0	0
16:00	**187**	4	171	10	1	1	0	0	0	0	0	0	0	0
17:00	**180**	1	172	6	1	0	0	0	0	0	0	0	0	0
18:00	**158**	0	150	7	0	1	0	0	0	0	0	0	0	0
19:00	**111**	1	100	8	1	1	0	0	0	0	0	0	0	0
20:00	**82**	2	73	6	1	0	0	0	0	0	0	0	0	0
21:00	**56**	0	54	2	0	0	0	0	0	0	0	0	0	0
22:00	**54**	2	50	1	1	0	0	0	0	0	0	0	0	0
23:00	**27**	1	25	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1647**	**11**	**1453**	**149**	**11**	**19**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1921**	**14**	**1700**	**169**	**14**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2002**	**17**	**1775**	**171**	**15**	**20**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2048**	**17**	**1818**	**173**	**15**	**20**	**4**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**17**	0	17	0	0	0	0	0	0	0	0	0	0	0
01:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
02:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
03:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
04:00	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	0	7	1	0	0	0	0	0	0	0	0	0	0
06:00	**28**	0	22	5	0	1	0	0	0	0	0	0	0	0
07:00	**65**	1	50	11	0	3	0	0	0	0	0	0	0	0
08:00	**174**	0	158	14	2	0	0	0	0	0	0	0	0	0
09:00	**114**	1	92	17	2	2	0	0	0	0	0	0	0	0
10:00	**102**	0	91	8	2	1	0	0	0	0	0	0	0	0
11:00	**118**	4	101	9	0	4	0	0	0	0	0	0	0	0
12:00	**128**	1	111	13	1	2	0	0	0	0	0	0	0	0
13:00	**113**	0	99	11	0	3	0	0	0	0	0	0	0	0
14:00	**128**	0	112	13	2	1	0	0	0	0	0	0	0	0
15:00	**214**	0	191	19	1	2	1	0	0	0	0	0	0	0
16:00	**185**	2	168	12	2	0	1	0	0	0	0	0	0	0
17:00	**145**	0	130	14	1	0	0	0	0	0	0	0	0	0
18:00	**164**	0	149	14	0	1	0	0	0	0	0	0	0	0
19:00	**107**	0	99	6	1	0	1	0	0	0	0	0	0	0
20:00	**73**	0	67	4	0	1	0	0	1	0	0	0	0	0
21:00	**73**	1	71	1	0	0	0	0	0	0	0	0	0	0
22:00	**46**	0	43	2	1	0	0	0	0	0	0	0	0	0
23:00	**32**	0	30	0	0	0	2	0	0	0	0	0	0	0
12H,7-19	**1650**	**9**	**1452**	**155**	**13**	**19**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1931**	**10**	**1711**	**171**	**14**	**21**	**3**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2009**	**10**	**1784**	**173**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2049**	**10**	**1822**	**175**	**15**	**21**	**5**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Daily Totals														
Thu 10-Feb-22	**2110**	32	1857	174	23	17	7	0	0	0	0	0	0	0
Fri 11-Feb-22	**2186**	28	1963	156	22	16	1	0	0	0	0	0	0	0
Sat 12-Feb-22	**1799**	18	1674	81	17	9	0	0	0	0	0	0	0	0
Sun 13-Feb-22	**1434**	11	1336	65	10	12	0	0	0	0	0	0	0	0
Mon 14-Feb-22	**2112**	25	1897	151	15	20	3	0	1	0	0	0	0	0
Tue 15-Feb-22	**2048**	17	1818	173	15	20	4	0	1	0	0	0	0	0
Wed 16-Feb-22	**2049**	10	1822	175	15	21	5	0	1	0	0	0	0	0
Total Vehicles														
[--]	**13738**	141	12367	975	117	115	20	0	3	0	0	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22															
00:00	19	31.3	25.9	0	3	12	3	0	0	1	0	0	0	0	0
01:00	9	-	32.9	0	0	2	7	0	0	0	0	0	0	0	0
02:00	6	-	25.8	0	1	4	1	0	0	0	0	0	0	0	0
03:00	6	-	19.7	0	3	3	0	0	0	0	0	0	0	0	0
04:00	5	-	30	0	0	2	3	0	0	0	0	0	0	0	0
05:00	13	30.3	26.2	0	2	9	2	0	0	0	0	0	0	0	0
06:00	20	29.6	26.6	0	1	17	2	0	0	0	0	0	0	0	0
07:00	75	30.9	25.2	2	13	44	15	1	0	0	0	0	0	0	0
08:00	180	29.4	25.5	1	19	142	17	0	0	1	0	0	0	0	0
09:00	125	29.1	25.4	1	14	96	14	0	0	0	0	0	0	0	0
10:00	92	32.3	26.5	0	2	71	19	0	0	0	0	0	0	0	0
11:00	127	33.2	27	0	16	74	34	3	0	0	0	0	0	0	0
12:00	112	34.5	28.3	0	8	64	37	3	0	0	0	0	0	0	0
13:00	133	31.1	26.8	0	12	92	27	1	0	1	0	0	0	0	0
14:00	143	31	26	0	15	97	30	1	0	0	0	0	0	0	0
15:00	203	30.5	26.1	0	16	152	34	0	1	0	0	0	0	0	0
16:00	183	31.4	26.8	1	14	122	43	3	0	0	0	0	0	0	0
17:00	154	33.2	27.8	0	7	104	39	4	0	0	0	0	0	0	0
18:00	143	32.4	28	0	3	92	44	2	2	0	0	0	0	0	0
19:00	123	31.6	27	1	8	88	25	1	0	0	0	0	0	0	0
20:00	96	31.9	26.4	0	7	65	23	0	0	1	0	0	0	0	0
21:00	68	32.8	28.4	0	3	41	22	1	0	1	0	0	0	0	0
22:00	44	33.5	27.5	0	5	27	9	2	1	0	0	0	0	0	0
23:00	31	37.6	28.8	0	3	18	6	3	0	1	0	0	0	0	0
12H,7-19	1670	31.5	26.6	5	139	1150	353	18	3	2	0	0	0	0	0
16H,6-22	1977	31.5	26.7	6	158	1361	425	20	3	4	0	0	0	0	0
18H,6-24	2052	31.5	26.8	6	166	1406	440	25	4	5	0	0	0	0	0
24H,0-24	2110	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**15**	38.4	30.1	0	0	8	6	1	0	0	0	0	0	0	0
01:00	**9**	-	30.4	0	0	5	2	2	0	0	0	0	0	0	0
02:00	**6**	-	34.9	0	0	2	1	3	0	0	0	0	0	0	0
03:00	**2**	-	24.9	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**5**	-	20.6	0	3	1	1	0	0	0	0	0	0	0	0
05:00	**7**	-	23.3	0	2	5	0	0	0	0	0	0	0	0	0
06:00	**23**	35.9	28	0	1	14	8	0	0	0	0	0	0	0	0
07:00	**47**	32	27	0	5	28	13	1	0	0	0	0	0	0	0
08:00	**159**	31.5	27.9	0	3	119	34	3	0	0	0	0	0	0	0
09:00	**112**	30.8	27	0	5	80	26	1	0	0	0	0	0	0	0
10:00	**99**	32.8	28	0	4	70	24	1	0	0	0	0	0	0	0
11:00	**119**	32.5	28.3	0	6	73	34	5	1	0	0	0	0	0	0
12:00	**144**	32.4	27.1	2	9	102	26	4	0	0	0	0	1	0	0
13:00	**119**	31.4	26.1	1	12	80	22	2	1	1	0	0	0	0	0
14:00	**160**	33.2	28	0	6	109	38	6	1	0	0	0	0	0	0
15:00	**221**	31.4	27	0	10	164	44	3	0	0	0	0	0	0	0
16:00	**205**	32.2	27.4	0	11	144	46	3	1	0	0	0	0	0	0
17:00	**164**	31.1	26.5	1	12	115	34	2	0	0	0	0	0	0	0
18:00	**164**	32.7	27.1	0	12	113	37	1	1	0	0	0	0	0	0
19:00	**152**	33.2	28.2	0	4	103	38	4	3	0	0	0	0	0	0
20:00	**85**	32.3	27.6	0	7	52	24	2	0	0	0	0	0	0	0
21:00	**66**	33	28.2	1	2	39	23	1	0	0	0	0	0	0	0
22:00	**57**	34	29.3	0	0	35	19	2	0	0	1	0	0	0	0
23:00	**46**	36.6	27.1	1	6	25	12	1	1	0	0	0	0	0	0
12H,7-19	**1713**	**32**	**27.3**	**4**	**95**	**1197**	**378**	**32**	**5**	**1**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**2039**	**32.2**	**27.4**	**5**	**109**	**1405**	**471**	**39**	**8**	**1**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**2142**	**32.3**	**27.5**	**6**	**115**	**1465**	**502**	**42**	**9**	**1**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**2186**	**32.3**	**27.5**	**6**	**120**	**1488**	**512**	**48**	**9**	**1**	**1**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22															
00:00	**25**	30.5	25.1	0	3	18	4	0	0	0	0	0	0	0	0
01:00	**14**	38.5	29	0	1	9	3	1	0	0	0	0	0	0	0
02:00	**20**	34	28.2	0	1	13	5	0	1	0	0	0	0	0	0
03:00	**12**	38.2	30	0	0	8	4	0	0	0	0	0	0	0	0
04:00	**4**	-	30.1	0	0	2	2	0	0	0	0	0	0	0	0
05:00	**15**	38.2	28.6	0	2	9	3	0	1	0	0	0	0	0	0
06:00	**12**	34.7	29.5	0	0	7	4	1	0	0	0	0	0	0	0
07:00	**25**	32.7	27.5	0	1	16	7	1	0	0	0	0	0	0	0
08:00	**60**	33.1	26.1	0	10	35	15	0	0	0	0	0	0	0	0
09:00	**87**	31.8	26.8	0	6	56	24	0	1	0	0	0	0	0	0
10:00	**101**	31.8	27	0	7	73	19	2	0	0	0	0	0	0	0
11:00	**139**	32.2	26.8	0	14	87	36	2	0	0	0	0	0	0	0
12:00	**150**	31.7	27.1	0	5	109	33	1	2	0	0	0	0	0	0
13:00	**157**	32	27.4	0	9	111	35	2	0	0	0	0	0	0	0
14:00	**111**	33.4	28.1	1	6	72	28	3	1	0	0	0	0	0	0
15:00	**138**	33.7	28.1	1	6	82	45	1	3	0	0	0	0	0	0
16:00	**112**	33.1	28	0	7	73	29	1	2	0	0	0	0	0	0
17:00	**118**	33.3	27.5	1	5	79	33	0	0	0	0	0	0	0	0
18:00	**132**	29.9	26.8	1	6	107	13	3	1	0	1	0	0	0	0
19:00	**121**	31.1	25.8	0	20	79	20	1	1	0	0	0	0	0	0
20:00	**83**	34.6	27.8	0	10	50	16	3	2	0	1	0	0	0	1
21:00	**61**	33.8	27.8	0	3	43	12	2	1	0	0	0	0	0	0
22:00	**53**	32.1	27.1	0	6	28	18	1	0	0	0	0	0	0	0
23:00	**49**	33.3	28.1	0	5	28	14	0	2	0	0	0	0	0	0
12H,7-19	**1330**	**32.3**	**27.3**	**4**	**82**	**900**	**317**	**16**	**10**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1607**	**32.3**	**27.3**	**4**	**115**	**1079**	**369**	**23**	**14**	**0**	**2**	**0**	**0**	**0**	**1**
18H,6-24	**1709**	**32.3**	**27.3**	**4**	**126**	**1135**	**401**	**24**	**16**	**0**	**2**	**0**	**0**	**0**	**1**
24H,0-24	**1799**	**32.4**	**27.3**	**4**	**133**	**1194**	**422**	**25**	**18**	**0**	**2**	**0**	**0**	**0**	**1**

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**20**	36	28.2	0	2	12	5	1	0	0	0	0	0	0	0
01:00	**26**	41.4	31.1	0	1	11	9	4	1	0	0	0	0	0	0
02:00	**8**	-	27.5	0	0	5	3	0	0	0	0	0	0	0	0
03:00	**15**	30.3	24.6	0	2	11	2	0	0	0	0	0	0	0	0
04:00	**12**	32.4	26.9	0	1	9	1	0	1	0	0	0	0	0	0
05:00	**9**	-	34	0	0	4	3	0	1	1	0	0	0	0	0
06:00	**16**	36.8	28.6	0	0	11	3	2	0	0	0	0	0	0	0
07:00	**21**	33.9	27.1	0	2	12	7	0	0	0	0	0	0	0	0
08:00	**25**	32.2	27.5	0	1	18	5	1	0	0	0	0	0	0	0
09:00	**36**	33.7	26.7	0	5	21	10	0	0	0	0	0	0	0	0
10:00	**63**	34.6	27.7	0	11	35	12	4	0	1	0	0	0	0	0
11:00	**96**	31.6	27.4	0	6	68	21	1	0	0	0	0	0	0	0
12:00	**117**	34	28.1	0	12	63	37	3	1	1	0	0	0	0	0
13:00	**124**	33.9	28	1	11	71	39	1	0	1	0	0	0	0	0
14:00	**124**	32.6	27.8	0	5	84	33	1	1	0	0	0	0	0	0
15:00	**133**	33.6	28.6	1	6	84	36	4	1	0	0	0	1	0	0
16:00	**115**	33.6	27.9	0	12	66	34	2	1	0	0	0	0	0	0
17:00	**117**	31.5	27.2	1	7	81	27	1	0	0	0	0	0	0	0
18:00	**110**	31.2	26.6	0	9	78	22	1	0	0	0	0	0	0	0
19:00	**78**	33.5	28.2	0	4	50	19	2	2	1	0	0	0	0	0
20:00	**66**	33.8	28.3	0	4	37	25	0	0	0	0	0	0	0	0
21:00	**47**	35	28.7	0	2	27	17	1	0	0	0	0	0	0	0
22:00	**35**	34.1	29	0	2	19	12	0	0	1	1	0	0	0	0
23:00	**21**	34.1	29.2	1	0	10	9	0	0	1	0	0	0	0	0
12H,7-19	**1081**	**32.9**	**27.7**	**3**	**87**	**681**	**283**	**19**	**4**	**3**	**0**	**0**	**1**	**0**	**0**
16H,6-22	**1288**	**33.1**	**27.8**	**3**	**97**	**806**	**347**	**24**	**6**	**4**	**0**	**0**	**1**	**0**	**0**
18H,6-24	**1344**	**33.2**	**27.8**	**4**	**99**	**835**	**368**	**24**	**6**	**6**	**1**	**0**	**1**	**0**	**0**
24H,0-24	**1434**	**33.3**	**27.9**	**4**	**105**	**887**	**391**	**29**	**9**	**7**	**1**	**0**	**1**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**15**	46.1	31.4	0	1	8	2	2	1	1	0	0	0	0	0
01:00	**8**	-	27.1	0	0	7	1	0	0	0	0	0	0	0	0
02:00	**6**	-	30.3	0	0	4	2	0	0	0	0	0	0	0	0
03:00	**2**	-	28.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**2**	-	27.7	0	0	2	0	0	0	0	0	0	0	0	0
05:00	**7**	-	27	0	0	7	0	0	0	0	0	0	0	0	0
06:00	**25**	37.4	28.5	0	2	15	5	2	0	1	0	0	0	0	0
07:00	**67**	31.8	27.1	0	7	44	16	0	0	0	0	0	0	0	0
08:00	**171**	31.4	26.2	0	23	112	34	0	2	0	0	0	0	0	0
09:00	**130**	31.8	27.6	0	10	88	28	3	0	1	0	0	0	0	0
10:00	**93**	33.9	27	0	10	60	20	3	0	0	0	0	0	0	0
11:00	**131**	30.8	26.7	0	5	103	21	2	0	0	0	0	0	0	0
12:00	**123**	34.9	28	1	6	73	39	2	2	0	0	0	0	0	0
13:00	**105**	31.2	26.9	0	8	70	25	2	0	0	0	0	0	0	0
14:00	**146**	31.5	26.8	1	13	97	34	0	1	0	0	0	0	0	0
15:00	**221**	32	26.3	1	22	152	44	2	0	0	0	0	0	0	0
16:00	**202**	31.4	27.2	0	8	153	37	2	1	1	0	0	0	0	0
17:00	**166**	32.4	27.6	0	7	113	45	1	0	0	0	0	0	0	0
18:00	**127**	31.1	26	0	21	83	20	3	0	0	0	0	0	0	0
19:00	**125**	32.7	27.4	0	10	81	32	1	1	0	0	0	0	0	0
20:00	**91**	31.6	27.1	0	1	73	16	1	0	0	0	0	0	0	0
21:00	**60**	35.4	29.2	0	1	36	20	2	1	0	0	0	0	0	0
22:00	**51**	31.4	27.4	0	3	37	8	2	0	1	0	0	0	0	0
23:00	**38**	31.5	26.9	0	2	29	5	1	0	1	0	0	0	0	0
12H,7-19	**1682**	**31.8**	**26.9**	**3**	**140**	**1148**	**363**	**20**	**6**	**2**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1983**	**31.9**	**27**	**3**	**154**	**1353**	**436**	**26**	**8**	**3**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**2072**	**31.9**	**27**	**3**	**159**	**1419**	**449**	**29**	**8**	**5**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2112**	**31.9**	**27.1**	**3**	**160**	**1449**	**454**	**31**	**9**	**6**	**0**	**0**	**0**	**0**	**0**

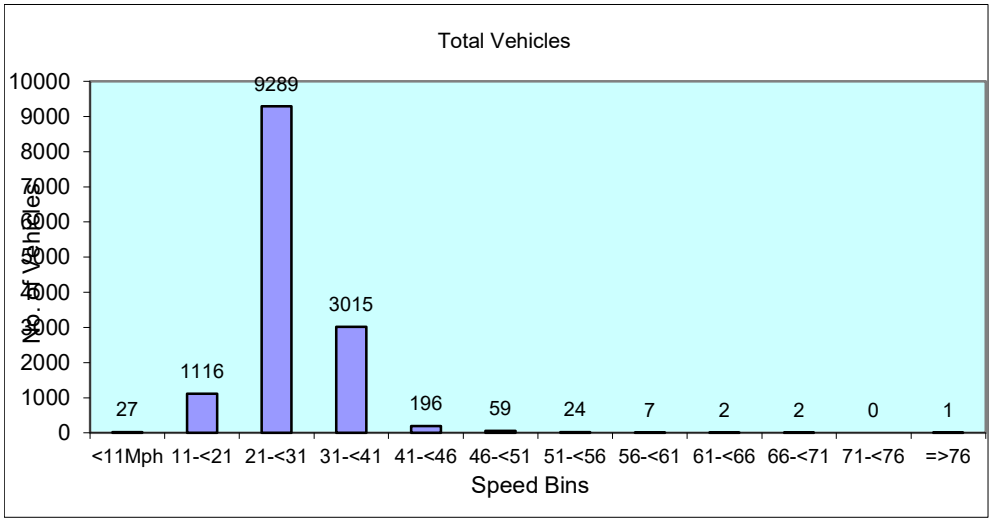
Data produced by
Transport Surveys Ltd

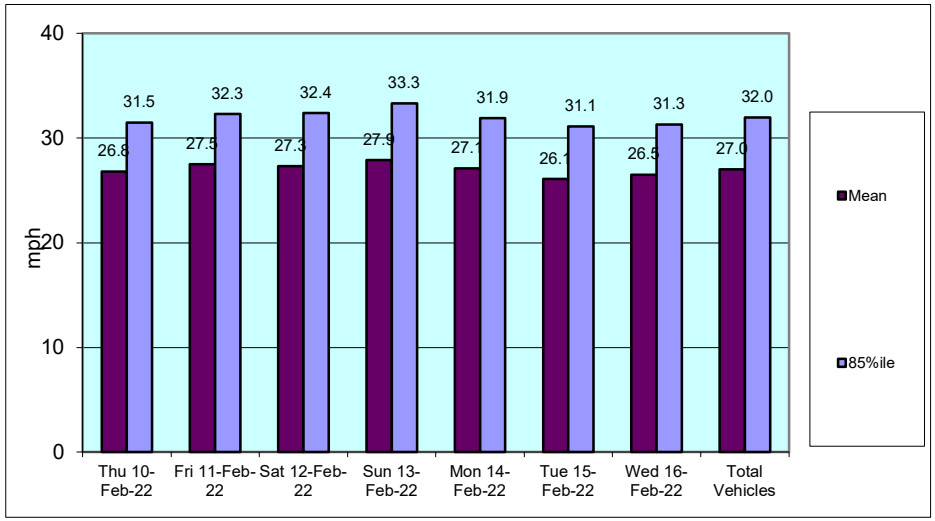
27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	12	40.4	28.3	0	0	9	1	1	1	0	0	0	0	0	0
01:00	10	-	26.8	0	0	10	0	0	0	0	0	0	0	0	0
02:00	10	-	31.7	0	0	3	7	0	0	0	0	0	0	0	0
03:00	3	-	30.8	0	0	1	2	0	0	0	0	0	0	0	0
04:00	2	-	28.2	0	0	1	1	0	0	0	0	0	0	0	0
05:00	9	-	30.7	0	0	4	5	0	0	0	0	0	0	0	0
06:00	25	32	26.7	0	2	18	5	0	0	0	0	0	0	0	0
07:00	76	32.9	26.5	0	8	49	18	1	0	0	0	0	0	0	0
08:00	156	28.4	24.2	0	28	114	14	0	0	0	0	0	0	0	0
09:00	107	28.8	23.5	0	25	71	11	0	0	0	0	0	0	0	0
10:00	95	29.3	25.5	0	12	71	11	0	0	0	1	0	0	0	0
11:00	114	29.3	25	0	18	84	11	0	0	1	0	0	0	0	0
12:00	124	30.9	25.9	0	13	86	24	1	0	0	0	0	0	0	0
13:00	110	30.5	26.6	0	4	81	25	0	0	0	0	0	0	0	0
14:00	133	31.3	25.9	0	18	85	28	2	0	0	0	0	0	0	0
15:00	207	31.1	26.4	0	16	150	39	1	1	0	0	0	0	0	0
16:00	187	31.5	27.1	0	11	134	39	1	2	0	0	0	0	0	0
17:00	180	30.5	26.3	0	12	137	31	0	0	0	0	0	0	0	0
18:00	158	30.7	26.3	0	10	117	30	1	0	0	0	0	0	0	0
19:00	111	32.5	27.3	0	11	68	29	2	1	0	0	0	0	0	0
20:00	82	34.4	26.5	0	12	49	19	1	0	1	0	0	0	0	0
21:00	56	32.8	26.5	0	10	31	12	2	1	0	0	0	0	0	0
22:00	54	32.3	27.6	0	3	32	18	1	0	0	0	0	0	0	0
23:00	27	34.6	25.5	0	4	18	5	0	0	0	0	0	0	0	0
12H,7-19	1647	30.5	25.9	0	175	1179	281	7	3	1	1	0	0	0	0
16H,6-22	1921	30.9	26	0	210	1345	346	12	5	2	1	0	0	0	0
18H,6-24	2002	30.9	26	0	217	1395	369	13	5	2	1	0	0	0	0
24H,0-24	2048	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**17**	33.8	27.5	0	2	10	5	0	0	0	0	0	0	0	0
01:00	**5**	-	24.8	0	0	5	0	0	0	0	0	0	0	0	0
02:00	**8**	-	23	0	3	5	0	0	0	0	0	0	0	0	0
03:00	**2**	-	26.1	0	0	2	0	0	0	0	0	0	0	0	0
04:00	**0**	-	-	0	0	0	0	0	0	0	0	0	0	0	0
05:00	**8**	-	26.8	0	0	7	1	0	0	0	0	0	0	0	0
06:00	**28**	33.9	27.6	0	3	18	5	1	0	1	0	0	0	0	0
07:00	**65**	32.8	26	0	15	39	8	2	1	0	0	0	0	0	0
08:00	**174**	29.8	26.5	0	7	143	22	1	0	1	0	0	0	0	0
09:00	**114**	31.1	26.2	1	15	77	20	1	0	0	0	0	0	0	0
10:00	**102**	31.7	27	0	7	70	25	0	0	0	0	0	0	0	0
11:00	**118**	32.6	25.6	0	19	71	27	0	1	0	0	0	0	0	0
12:00	**128**	30.8	25.8	0	21	84	18	4	1	0	0	0	0	0	0
13:00	**113**	32.4	26.9	0	15	69	26	3	0	0	0	0	0	0	0
14:00	**128**	31.9	27.5	0	8	84	33	3	0	0	0	0	0	0	0
15:00	**214**	30.1	25.7	0	14	167	33	0	0	0	0	0	0	0	0
16:00	**185**	30.5	26	1	22	126	35	1	0	0	0	0	0	0	0
17:00	**145**	32.1	26.7	0	13	95	35	1	1	0	0	0	0	0	0
18:00	**164**	31.9	26.4	2	16	110	32	2	0	0	1	1	0	0	0
19:00	**107**	31.7	26.3	0	14	70	20	2	0	0	0	1	0	0	0
20:00	**73**	31.1	27.1	0	3	54	14	1	0	0	1	0	0	0	0
21:00	**73**	33.2	28	0	8	43	21	1	0	0	0	0	0	0	0
22:00	**46**	31.8	26.8	0	0	38	8	0	0	0	0	0	0	0	0
23:00	**32**	35.2	28.1	0	1	23	7	1	0	0	0	0	0	0	0
12H,7-19	**1650**	**31.2**	**26.3**	**4**	**172**	**1135**	**314**	**18**	**4**	**1**	**1**	**1**	**0**	**0**	**0**
16H,6-22	**1931**	**31.3**	**26.4**	**4**	**200**	**1320**	**374**	**23**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
18H,6-24	**2009**	**31.3**	**26.5**	**4**	**201**	**1381**	**389**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**
24H,0-24	**2049**	**31.3**	**26.5**	**4**	**206**	**1410**	**395**	**24**	**4**	**2**	**2**	**2**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Daily Totals															
Thu 10-Feb-22	**2110**	31.5	26.8	6	175	1438	456	25	4	6	0	0	0	0	0
Fri 11-Feb-22	**2186**	32.3	27.5	6	120	1488	512	48	9	1	1	0	1	0	0
Sat 12-Feb-22	**1799**	32.4	27.3	4	133	1194	422	25	18	0	2	0	0	0	1
Sun 13-Feb-22	**1434**	33.3	27.9	4	105	887	391	29	9	7	1	0	1	0	0
Mon 14-Feb-22	**2112**	31.9	27.1	3	160	1449	454	31	9	6	0	0	0	0	0
Tue 15-Feb-22	**2048**	31.1	26.1	0	217	1423	385	14	6	2	1	0	0	0	0
Wed 16-Feb-22	**2049**	31.3	26.5	4	206	1410	395	24	4	2	2	2	0	0	0
Total Vehicles															
[--]	**13738**	32.0	27.0	27	1116	9289	3015	196	59	24	7	2	2	0	1





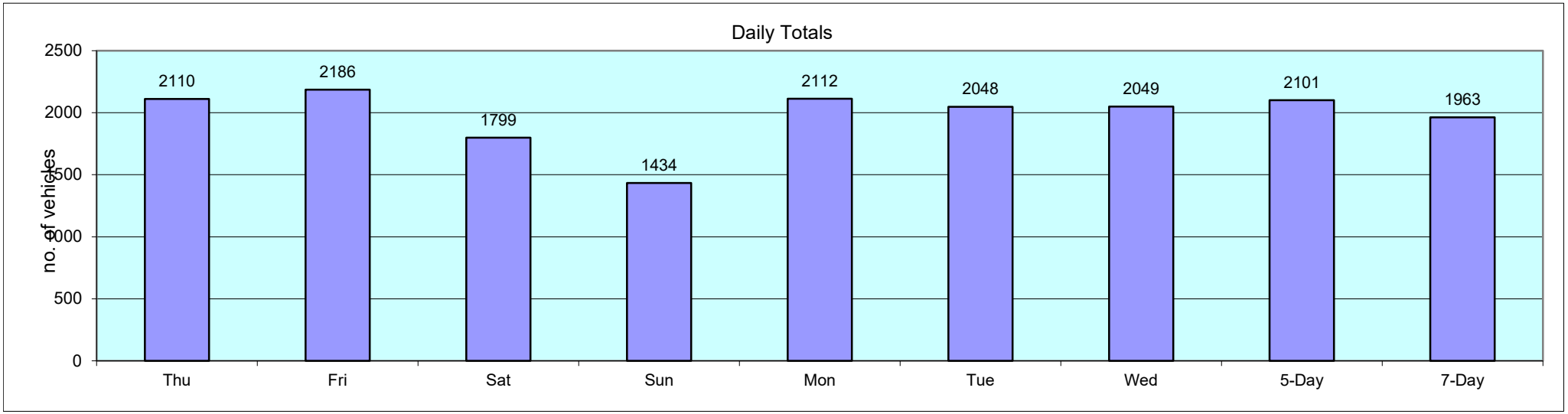
Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Northbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Northbound		Location	Site 1 - Ball Road (att to T/P)		
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**19**	15	25	20	15	12	17	16	18
01:00	**9**	9	14	26	8	10	5	8	12
02:00	**6**	6	20	8	6	10	8	7	9
03:00	**6**	2	12	15	2	3	2	3	6
04:00	**5**	5	4	12	2	2	0	3	4
05:00	**13**	7	15	9	7	9	8	9	10
06:00	**20**	23	12	16	25	25	28	24	21
07:00	**75**	47	25	21	67	76	65	66	54
08:00	**180**	159	60	25	171	156	174	168	132
09:00	**125**	112	87	36	130	107	114	118	102
10:00	**92**	99	101	63	93	95	102	96	92
11:00	**127**	119	139	96	131	114	118	122	121
12:00	**112**	144	150	117	123	124	128	126	128
13:00	**133**	119	157	124	105	110	113	116	123
14:00	**143**	160	111	124	146	133	128	142	135
15:00	**203**	221	138	133	221	207	214	213	191
16:00	**183**	205	112	115	202	187	185	192	170
17:00	**154**	164	118	117	166	180	145	162	149
18:00	**143**	164	132	110	127	158	164	151	143
19:00	**123**	152	121	78	125	111	107	124	117
20:00	**96**	85	83	66	91	82	73	85	82
21:00	**68**	66	61	47	60	56	73	65	62
22:00	**44**	57	53	35	51	54	46	50	49
23:00	**31**	46	49	21	38	27	32	35	35
12H,7-19	**1670**	**1713**	**1330**	**1081**	**1682**	**1647**	**1650**	**1672**	**1539**
16H,6-22	**1977**	**2039**	**1607**	**1288**	**1983**	**1921**	**1931**	**1970**	**1821**
18H,6-24	**2052**	**2142**	**1709**	**1344**	**2072**	**2002**	**2009**	**2055**	**1904**
24H,0-24	**2110**	**2186**	**1799**	**1434**	**2112**	**2048**	**2049**	**2101**	**1963**
Am	**08:00**	**08:00**	**11:00**	**11:00**	**08:00**	**08:00**	**08:00**		
Peak	**180**	**159**	**139**	**96**	**171**	**156**	**174**		
Pm	**15:00**	**15:00**	**13:00**	**15:00**	**15:00**	**15:00**	**15:00**		
Peak	**203**	**221**	**157**	**133**	**221**	**207**	**214**		

27178	CARDIFF	Site No: 27178001	Location	Site 1 - Ball Road (att to T/P)
		Channel: Northbound		

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)				
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Thu 10-Feb-22														
00:00	**9**	2	7	0	0	0	0	0	0	0	0	0	0	0
01:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**7**	0	7	0	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**40**	2	35	2	0	1	0	0	0	0	0	0	0	0
06:00	**63**	1	51	10	0	0	1	0	0	0	0	0	0	0
07:00	**123**	3	102	15	0	2	1	0	0	0	0	0	0	0
08:00	**220**	3	196	14	0	4	3	0	0	0	0	0	0	0
09:00	**120**	1	105	9	0	3	2	0	0	0	0	0	0	0
10:00	**106**	2	92	9	0	3	0	0	0	0	0	0	0	0
11:00	**127**	2	115	6	0	2	1	0	1	0	0	0	0	0
12:00	**117**	0	110	4	0	3	0	0	0	0	0	0	0	0
13:00	**102**	4	85	9	1	2	1	0	0	0	0	0	0	0
14:00	**149**	1	135	10	0	2	1	0	0	0	0	0	0	0
15:00	**172**	1	157	8	0	4	2	0	0	0	0	0	0	0
16:00	**149**	2	132	9	0	3	3	0	0	0	0	0	0	0
17:00	**129**	3	114	8	0	3	1	0	0	0	0	0	0	0
18:00	**109**	3	100	4	0	1	1	0	0	0	0	0	0	0
19:00	**94**	1	88	3	0	1	1	0	0	0	0	0	0	0
20:00	**76**	2	69	4	0	1	0	0	0	0	0	0	0	0
21:00	**40**	2	34	3	0	1	0	0	0	0	0	0	0	0
22:00	**26**	0	23	2	0	1	0	0	0	0	0	0	0	0
23:00	**20**	1	18	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**25**	**1443**	**105**	**1**	**32**	**16**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31**	**1685**	**125**	**1**	**35**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**32**	**1726**	**127**	**1**	**37**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**36**	**1796**	**131**	**1**	**38**	**18**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Fri 11-Feb-22														
00:00	**6**	1	5	0	0	0	0	0	0	0	0	0	0	0
01:00	**6**	0	5	1	0	0	0	0	0	0	0	0	0	0
02:00	**5**	0	5	0	0	0	0	0	0	0	0	0	0	0
03:00	**3**	0	2	1	0	0	0	0	0	0	0	0	0	0
04:00	**15**	0	14	1	0	0	0	0	0	0	0	0	0	0
05:00	**23**	0	21	1	0	1	0	0	0	0	0	0	0	0
06:00	**48**	1	41	6	0	0	0	0	0	0	0	0	0	0
07:00	**123**	3	105	13	0	2	0	0	0	0	0	0	0	0
08:00	**198**	2	180	12	0	3	0	0	1	0	0	0	0	0
09:00	**133**	2	118	10	0	2	1	0	0	0	0	0	0	0
10:00	**98**	0	88	7	0	2	1	0	0	0	0	0	0	0
11:00	**101**	1	93	4	0	3	0	0	0	0	0	0	0	0
12:00	**123**	1	110	9	0	2	1	0	0	0	0	0	0	0
13:00	**100**	3	85	9	0	3	0	0	0	0	0	0	0	0
14:00	**143**	1	131	8	0	2	1	0	0	0	0	0	0	0
15:00	**196**	0	182	7	1	4	1	1	0	0	0	0	0	0
16:00	**159**	2	143	11	0	2	1	0	0	0	0	0	0	0
17:00	**152**	6	136	6	0	3	1	0	0	0	0	0	0	0
18:00	**128**	3	122	1	0	2	0	0	0	0	0	0	0	0
19:00	**92**	1	88	2	0	1	0	0	0	0	0	0	0	0
20:00	**70**	0	66	3	0	1	0	0	0	0	0	0	0	0
21:00	**47**	0	42	4	0	1	0	0	0	0	0	0	0	0
22:00	**37**	1	32	2	0	1	1	0	0	0	0	0	0	0
23:00	**30**	1	27	1	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1654**	**24**	**1493**	**97**	**1**	**30**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**26**	**1730**	**112**	**1**	**33**	**7**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**28**	**1789**	**115**	**1**	**35**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**2036**	**29**	**1841**	**119**	**1**	**36**	**8**	**1**	**1**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sat 12-Feb-22														
00:00	**16**	0	15	1	0	0	0	0	0	0	0	0	0	0
01:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
02:00	**3**	0	3	0	0	0	0	0	0	0	0	0	0	0
03:00	**5**	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	**11**	0	11	0	0	0	0	0	0	0	0	0	0	0
05:00	**16**	0	13	2	0	1	0	0	0	0	0	0	0	0
06:00	**26**	0	24	1	0	0	1	0	0	0	0	0	0	0
07:00	**40**	1	35	3	0	1	0	0	0	0	0	0	0	0
08:00	**91**	2	78	9	0	2	0	0	0	0	0	0	0	0
09:00	**109**	1	100	5	0	3	0	0	0	0	0	0	0	0
10:00	**130**	0	117	10	0	2	1	0	0	0	0	0	0	0
11:00	**121**	0	109	8	0	3	1	0	0	0	0	0	0	0
12:00	**144**	0	132	7	0	2	3	0	0	0	0	0	0	0
13:00	**142**	1	133	4	0	1	2	0	1	0	0	0	0	0
14:00	**117**	2	103	10	0	1	1	0	0	0	0	0	0	0
15:00	**82**	2	75	2	0	2	1	0	0	0	0	0	0	0
16:00	**94**	1	86	6	0	1	0	0	0	0	0	0	0	0
17:00	**115**	1	106	5	0	3	0	0	0	0	0	0	0	0
18:00	**94**	0	89	4	0	1	0	0	0	0	0	0	0	0
19:00	**103**	0	97	4	0	1	1	0	0	0	0	0	0	0
20:00	**71**	0	68	3	0	0	0	0	0	0	0	0	0	0
21:00	**47**	1	45	0	0	1	0	0	0	0	0	0	0	0
22:00	**45**	0	42	3	0	0	0	0	0	0	0	0	0	0
23:00	**33**	0	29	3	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1279**	**11**	**1163**	**73**	**0**	**22**	**9**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**12**	**1397**	**81**	**0**	**24**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**12**	**1468**	**87**	**0**	**25**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**12**	**1525**	**91**	**0**	**26**	**11**	**0**	**1**	**0**	**0**	**0**	**0**	**0**

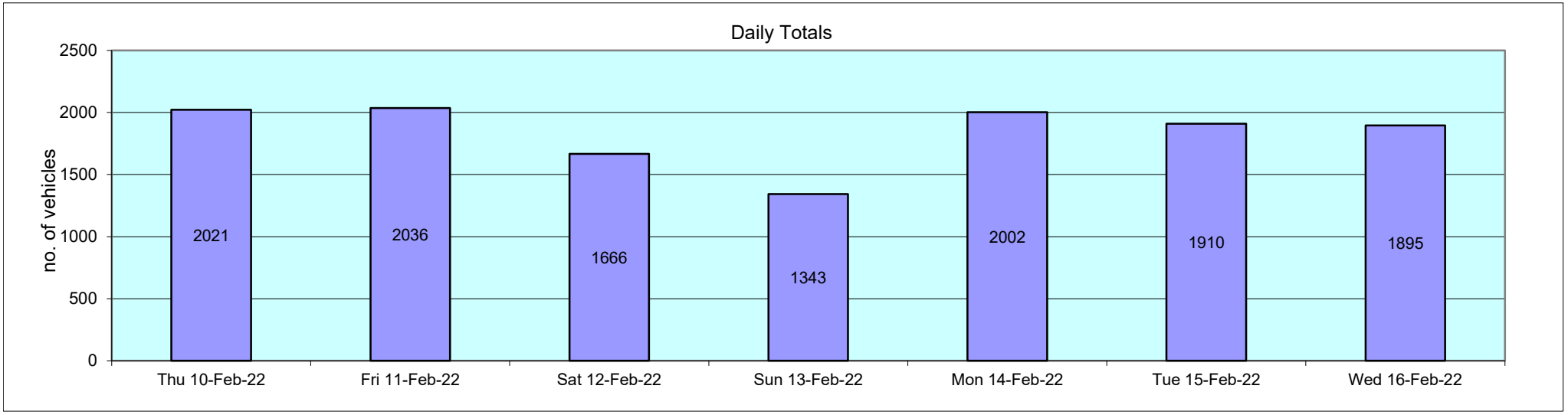
27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Sun 13-Feb-22														
00:00	**13**	0	12	1	0	0	0	0	0	0	0	0	0	0
01:00	**13**	1	11	1	0	0	0	0	0	0	0	0	0	0
02:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
03:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	12	0	0	0	0	0	0	0	0	0	0	0
05:00	**9**	0	8	1	0	0	0	0	0	0	0	0	0	0
06:00	**15**	0	15	0	0	0	0	0	0	0	0	0	0	0
07:00	**29**	0	27	1	0	1	0	0	0	0	0	0	0	0
08:00	**37**	0	33	3	0	1	0	0	0	0	0	0	0	0
09:00	**66**	0	64	1	1	0	0	0	0	0	0	0	0	0
10:00	**98**	1	92	2	0	2	1	0	0	0	0	0	0	0
11:00	**91**	1	82	5	0	2	1	0	0	0	0	0	0	0
12:00	**133**	1	126	2	0	2	2	0	0	0	0	0	0	0
13:00	**104**	0	97	4	0	2	1	0	0	0	0	0	0	0
14:00	**118**	1	110	5	0	2	0	0	0	0	0	0	0	0
15:00	**96**	1	88	5	0	2	0	0	0	0	0	0	0	0
16:00	**99**	1	94	2	0	2	0	0	0	0	0	0	0	0
17:00	**102**	0	94	6	0	2	0	0	0	0	0	0	0	0
18:00	**90**	1	84	4	0	1	0	0	0	0	0	0	0	0
19:00	**78**	1	74	1	0	1	1	0	0	0	0	0	0	0
20:00	**55**	0	51	3	0	1	0	0	0	0	0	0	0	0
21:00	**36**	0	35	0	0	1	0	0	0	0	0	0	0	0
22:00	**24**	0	21	1	0	1	1	0	0	0	0	0	0	0
23:00	**11**	0	10	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1063**	**7**	**991**	**40**	**1**	**19**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**8**	**1166**	**44**	**1**	**22**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**8**	**1197**	**45**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1343**	**9**	**1254**	**48**	**1**	**24**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Mon 14-Feb-22														
00:00	**6**	0	6	0	0	0	0	0	0	0	0	0	0	0
01:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	3	1	0	0	0	0	0	0	0	0	0	0
04:00	**16**	0	14	2	0	0	0	0	0	0	0	0	0	0
05:00	**31**	0	29	1	0	1	0	0	0	0	0	0	0	0
06:00	**55**	1	41	8	0	3	1	0	0	0	1	0	0	0
07:00	**116**	2	92	16	0	4	2	0	0	0	0	0	0	0
08:00	**205**	0	189	13	0	2	1	0	0	0	0	0	0	0
09:00	**118**	0	99	14	0	3	2	0	0	0	0	0	0	0
10:00	**109**	4	90	12	0	3	0	0	0	0	0	0	0	0
11:00	**143**	1	127	12	0	2	1	0	0	0	0	0	0	0
12:00	**118**	0	108	6	0	3	1	0	0	0	0	0	0	0
13:00	**93**	3	77	11	0	2	0	0	0	0	0	0	0	0
14:00	**137**	1	127	6	0	3	0	0	0	0	0	0	0	0
15:00	**179**	0	167	8	0	4	0	0	0	0	0	0	0	0
16:00	**160**	4	144	10	0	0	2	0	0	0	0	0	0	0
17:00	**135**	1	122	8	0	2	2	0	0	0	0	0	0	0
18:00	**110**	3	103	3	0	1	0	0	0	0	0	0	0	0
19:00	**101**	2	95	2	0	1	1	0	0	0	0	0	0	0
20:00	**67**	2	65	0	0	0	0	0	0	0	0	0	0	0
21:00	**39**	1	35	1	0	1	1	0	0	0	0	0	0	0
22:00	**33**	1	29	2	0	1	0	0	0	0	0	0	0	0
23:00	**21**	1	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**19**	**1445**	**119**	**0**	**29**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**25**	**1681**	**130**	**0**	**34**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1939**	**27**	**1729**	**132**	**0**	**36**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**2002**	**27**	**1787**	**136**	**0**	**37**	**14**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Tue 15-Feb-22														
00:00	3	0	2	1	0	0	0	0	0	0	0	0	0	0
01:00	8	0	7	1	0	0	0	0	0	0	0	0	0	0
02:00	4	0	3	1	0	0	0	0	0	0	0	0	0	0
03:00	5	0	4	1	0	0	0	0	0	0	0	0	0	0
04:00	10	0	9	1	0	0	0	0	0	0	0	0	0	0
05:00	35	1	31	2	0	1	0	0	0	0	0	0	0	0
06:00	55	0	45	7	0	3	0	0	0	0	0	0	0	0
07:00	114	1	96	15	0	2	0	0	0	0	0	0	0	0
08:00	192	1	179	5	0	4	3	0	0	0	0	0	0	0
09:00	111	1	101	8	0	1	0	0	0	0	0	0	0	0
10:00	84	0	68	13	0	3	0	0	0	0	0	0	0	0
11:00	127	0	111	14	0	1	1	0	0	0	0	0	0	0
12:00	118	1	102	12	0	3	0	0	0	0	0	0	0	0
13:00	91	0	79	5	0	3	4	0	0	0	0	0	0	0
14:00	149	3	134	10	0	2	0	0	0	0	0	0	0	0
15:00	199	1	179	13	0	4	2	0	0	0	0	0	0	0
16:00	137	4	121	9	0	2	1	0	0	0	0	0	0	0
17:00	148	0	138	9	0	0	1	0	0	0	0	0	0	0
18:00	103	0	97	3	0	2	1	0	0	0	0	0	0	0
19:00	79	1	74	4	0	0	0	0	0	0	0	0	0	0
20:00	56	0	51	4	0	0	1	0	0	0	0	0	0	0
21:00	28	0	27	0	0	1	0	0	0	0	0	0	0	0
22:00	34	1	29	4	0	0	0	0	0	0	0	0	0	0
23:00	20	0	19	0	0	1	0	0	0	0	0	0	0	0
12H,7-19	1573	12	1405	116	0	27	13	0	0	0	0	0	0	0
16H,6-22	1791	13	1602	131	0	31	14	0	0	0	0	0	0	0
18H,6-24	1845	14	1650	135	0	32	14	0	0	0	0	0	0	0
24H,0-24	1910	15	1706	142	0	33	14	0	0	0	0	0	0	0

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	TOTAL VEHICLES	MOTOR-CYCLES	CARS OR CAR-BASED LGV	LIGHT GOODS VEHICLES	BUSES	TWO AXLE, SIX TYRE, RIGID/BUSES	THREE AXLE RIGID	FOUR OR MORE AXLE RIGID	FOUR OR LESS AXLE ARTIC	FIVE AXLE ARTIC	SIX OR MORE AXLE ARTIC	FIVE OR LESS AXLE MULTI-TRAILER ARTIC	SIX AXLE MULTI-TRAILER ARTIC	SEVEN OR MORE AXLE ARTIC
Wed 16-Feb-22														
00:00	**8**	0	8	0	0	0	0	0	0	0	0	0	0	0
01:00	**2**	0	2	0	0	0	0	0	0	0	0	0	0	0
02:00	**2**	0	1	1	0	0	0	0	0	0	0	0	0	0
03:00	**4**	0	4	0	0	0	0	0	0	0	0	0	0	0
04:00	**12**	0	11	1	0	0	0	0	0	0	0	0	0	0
05:00	**35**	0	33	1	0	1	0	0	0	0	0	0	0	0
06:00	**63**	2	54	3	0	3	1	0	0	0	0	0	0	0
07:00	**117**	1	104	10	0	2	0	0	0	0	0	0	0	0
08:00	**192**	0	170	18	1	2	1	0	0	0	0	0	0	0
09:00	**126**	1	113	8	0	2	2	0	0	0	0	0	0	0
10:00	**103**	0	91	9	1	2	0	0	0	0	0	0	0	0
11:00	**107**	4	99	3	0	1	0	0	0	0	0	0	0	0
12:00	**111**	4	95	9	1	2	0	0	0	0	0	0	0	0
13:00	**95**	1	87	6	0	1	0	0	0	0	0	0	0	0
14:00	**133**	1	122	5	1	1	3	0	0	0	0	0	0	0
15:00	**190**	0	168	18	1	1	2	0	0	0	0	0	0	0
16:00	**127**	1	121	4	0	1	0	0	0	0	0	0	0	0
17:00	**138**	1	126	9	1	1	0	0	0	0	0	0	0	0
18:00	**118**	1	100	14	0	0	3	0	0	0	0	0	0	0
19:00	**86**	0	85	1	0	0	0	0	0	0	0	0	0	0
20:00	**51**	0	51	0	0	0	0	0	0	0	0	0	0	0
21:00	**43**	1	40	1	0	1	0	0	0	0	0	0	0	0
22:00	**22**	0	20	0	0	1	1	0	0	0	0	0	0	0
23:00	**10**	0	9	1	0	0	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**15**	**1396**	**113**	**6**	**16**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1800**	**18**	**1626**	**118**	**6**	**20**	**12**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
18H,6-24	**1832**	**18**	**1655**	**119**	**6**	**21**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
24H,0-24	**1895**	**18**	**1714**	**122**	**6**	**22**	**13**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound		Location	Site 1 - Ball Road (att to T/P)					
TIME PERIOD	**TOTAL VEHICLES**	**MOTOR-CYCLES**	**CARS OR CAR-BASED LGV**	**LIGHT GOODS VEHICLES**	**BUSES**	**TWO AXLE, SIX TYRE, RIGID/BUSES**	**THREE AXLE RIGID**	**FOUR OR MORE AXLE RIGID**	**FOUR OR LESS AXLE ARTIC**	**FIVE AXLE ARTIC**	**SIX OR MORE AXLE ARTIC**	**FIVE OR LESS AXLE MULTI-TRAILER ARTIC**	**SIX AXLE MULTI-TRAILER ARTIC**	**SEVEN OR MORE AXLE ARTIC**
Daily Totals														
Thu 10-Feb-22	**2021**	36	1796	131	1	38	18	0	1	0	0	0	0	0
Fri 11-Feb-22	**2036**	29	1841	119	1	36	8	1	1	0	0	0	0	0
Sat 12-Feb-22	**1666**	12	1525	91	0	26	11	0	1	0	0	0	0	0
Sun 13-Feb-22	**1343**	9	1254	48	1	24	7	0	0	0	0	0	0	0
Mon 14-Feb-22	**2002**	27	1787	136	0	37	14	0	0	0	1	0	0	0
Tue 15-Feb-22	**1910**	15	1706	142	0	33	14	0	0	0	0	0	0	0
Wed 16-Feb-22	**1895**	18	1714	122	6	22	13	0	0	0	0	0	0	0
Total Vehicles														
[--]	**12873**	146	11623	789	9	216	85	1	3	0	1	0	0	0



27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Thu 10-Feb-22																
00:00	**9**	-	25.2	0	2	5	2	0	0	0	0	0	0	0	0
01:00	**3**	-	30.9	0	0	2	1	0	0	0	0	0	0	0	0
02:00	**5**	-	30.8	0	0	2	3	0	0	0	0	0	0	0	0
03:00	**7**	-	30	0	0	3	4	0	0	0	0	0	0	0	0
04:00	**15**	37.8	31.9	0	0	6	8	0	1	0	0	0	0	0	0
05:00	**40**	34.5	29.6	0	2	19	18	1	0	0	0	0	0	0	0
06:00	**63**	35.5	29	0	3	35	23	0	0	1	1	0	0	0	0
07:00	**123**	32	25.9	1	21	73	26	1	0	1	0	0	0	0	0
08:00	**220**	29.4	23.5	0	62	131	27	0	0	0	0	0	0	0	0
09:00	**120**	31.4	24.9	1	23	72	22	2	0	0	0	0	0	0	0
10:00	**106**	30.6	25.2	1	19	68	18	0	0	0	0	0	0	0	0
11:00	**127**	32.2	26.5	0	16	75	34	2	0	0	0	0	0	0	0
12:00	**117**	32.5	26.9	0	17	58	39	2	0	1	0	0	0	0	0
13:00	**102**	31.8	25.3	0	27	55	14	5	0	0	1	0	0	0	0
14:00	**149**	30.8	24.7	0	38	83	27	1	0	0	0	0	0	0	0
15:00	**172**	29.1	22.9	0	59	91	20	2	0	0	0	0	0	0	0
16:00	**149**	31.6	24.5	0	48	69	30	2	0	0	0	0	0	0	0
17:00	**129**	31.9	26.2	0	19	77	30	2	1	0	0	0	0	0	0
18:00	**109**	32.8	26.2	0	20	58	28	2	0	1	0	0	0	0	0
19:00	**94**	32.4	26.4	0	12	61	18	2	1	0	0	0	0	0	0
20:00	**76**	33.4	26.5	0	13	39	22	1	1	0	0	0	0	0	0
21:00	**40**	35.4	26.3	0	8	22	9	0	0	1	0	0	0	0	0
22:00	**26**	36.8	29	0	3	14	7	2	0	0	0	0	0	0	0
23:00	**20**	35.8	28.4	0	0	13	6	0	1	0	0	0	0	0	0
12H,7-19	**1623**	**31.4**	**25**	**3**	**369**	**910**	**315**	**21**	**1**	**3**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1896**	**31.7**	**25.3**	**3**	**405**	**1067**	**387**	**24**	**3**	**5**	**2**	**0**	**0**	**0**	**0**
18H,6-24	**1942**	**31.8**	**25.4**	**3**	**408**	**1094**	**400**	**26**	**4**	**5**	**2**	**0**	**0**	**0**	**0**
24H,0-24	**2021**	**32**	**25.6**	**3**	**412**	**1131**	**436**	**27**	**5**	**5**	**2**	**0**	**0**	**0**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Fri 11-Feb-22															
00:00	**6**	-	25.9	0	1	4	1	0	0	0	0	0	0	0	0
01:00	**6**	-	29	0	1	4	0	0	0	1	0	0	0	0	0
02:00	**5**	-	30.4	0	0	3	2	0	0	0	0	0	0	0	0
03:00	**3**	-	30.5	0	0	1	2	0	0	0	0	0	0	0	0
04:00	**15**	35.1	29.1	0	0	10	4	1	0	0	0	0	0	0	0
05:00	**23**	34	29.7	0	1	10	11	0	0	1	0	0	0	0	0
06:00	**48**	33.3	27.4	0	5	29	12	1	0	1	0	0	0	0	0
07:00	**123**	33.8	27.8	0	13	65	41	3	0	1	0	0	0	0	0
08:00	**198**	32.1	26.2	0	39	108	46	3	1	1	0	0	0	0	0
09:00	**133**	31.5	25.7	0	27	75	31	0	0	0	0	0	0	0	0
10:00	**98**	32.6	26.8	0	15	54	26	3	0	0	0	0	0	0	0
11:00	**101**	33.3	26.8	1	18	52	24	5	1	0	0	0	0	0	0
12:00	**123**	31.1	24.8	0	30	71	21	1	0	0	0	0	0	0	0
13:00	**100**	29.8	24.3	0	23	65	11	1	0	0	0	0	0	0	0
14:00	**143**	31.9	25.3	0	32	79	31	1	0	0	0	0	0	0	0
15:00	**196**	30.1	23.7	0	72	94	25	4	1	0	0	0	0	0	0
16:00	**159**	31.2	24.2	0	50	78	30	0	0	1	0	0	0	0	0
17:00	**152**	31.3	25.5	0	37	85	26	2	1	1	0	0	0	0	0
18:00	**128**	31.7	26.2	0	24	77	23	1	2	1	0	0	0	0	0
19:00	**92**	33.5	26.5	0	17	47	23	5	0	0	0	0	0	0	0
20:00	**70**	34.1	28.1	0	9	34	23	2	1	1	0	0	0	0	0
21:00	**47**	35.9	29.6	0	3	25	16	2	0	0	1	0	0	0	0
22:00	**37**	34.5	27.4	1	6	17	12	0	0	0	1	0	0	0	0
23:00	**30**	32.9	27.2	0	8	14	6	1	0	0	0	0	1	0	0
12H,7-19	**1654**	**31.7**	**25.5**	**1**	**380**	**903**	**335**	**24**	**6**	**5**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1911**	**31.9**	**25.8**	**1**	**414**	**1038**	**409**	**34**	**7**	**7**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1978**	**32**	**25.8**	**2**	**428**	**1069**	**427**	**35**	**7**	**7**	**2**	**0**	**1**	**0**	**0**
24H,0-24	**2036**	**32**	**25.9**	**2**	**431**	**1101**	**447**	**36**	**7**	**9**	**2**	**0**	**1**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sat 12-Feb-22																
00:00	**16**	37.3	28.6	0	2	8	5	1	0	0	0	0	0	0	0
01:00	**11**	40.6	28.6	0	1	6	3	0	1	0	0	0	0	0	0
02:00	**3**	-	25.3	0	0	2	1	0	0	0	0	0	0	0	0
03:00	**5**	-	24.9	0	0	5	0	0	0	0	0	0	0	0	0
04:00	**11**	40.6	32.7	0	0	5	5	0	0	1	0	0	0	0	0
05:00	**16**	37	27.7	0	3	9	3	1	0	0	0	0	0	0	0
06:00	**26**	39.5	30.4	0	0	16	7	1	2	0	0	0	0	0	0
07:00	**40**	34	27.1	0	6	22	10	2	0	0	0	0	0	0	0
08:00	**91**	31.5	25.4	1	20	50	17	2	1	0	0	0	0	0	0
09:00	**109**	32.9	27.6	0	13	57	36	3	0	0	0	0	0	0	0
10:00	**130**	31.8	26	0	25	76	28	1	0	0	0	0	0	0	0
11:00	**121**	31.1	25.6	0	23	74	23	0	1	0	0	0	0	0	0
12:00	**144**	31.2	25.5	0	29	84	28	3	0	0	0	0	0	0	0
13:00	**142**	32.8	25.3	1	36	70	32	2	1	0	0	0	0	0	0
14:00	**117**	33.4	26.9	0	16	69	28	2	1	0	1	0	0	0	0
15:00	**82**	31.7	26.6	0	14	45	22	1	0	0	0	0	0	0	0
16:00	**94**	33.4	26.7	1	17	48	23	4	1	0	0	0	0	0	0
17:00	**115**	32.9	26.8	0	15	62	37	1	0	0	0	0	0	0	0
18:00	**94**	33	26.1	0	18	54	20	2	0	0	0	0	0	0	0
19:00	**103**	32.9	26.4	0	16	57	29	0	1	0	0	0	0	0	0
20:00	**71**	33.5	26.7	0	11	39	18	3	0	0	0	0	0	0	0
21:00	**47**	34.5	26.8	0	8	23	16	0	0	0	0	0	0	0	0
22:00	**45**	31.7	26.8	0	4	30	10	1	0	0	0	0	0	0	0
23:00	**33**	33.4	29.6	0	1	17	14	0	0	1	0	0	0	0	0
12H,7-19	**1279**	**32.5**	**26.2**	**3**	**232**	**711**	**304**	**23**	**5**	**0**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1526**	**32.8**	**26.3**	**3**	**267**	**846**	**374**	**27**	**8**	**0**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1604**	**32.8**	**26.4**	**3**	**272**	**893**	**398**	**28**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
24H,0-24	**1666**	**32.8**	**26.5**	**3**	**278**	**928**	**415**	**30**	**9**	**2**	**1**	**0**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound				Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Sun 13-Feb-22															
00:00	**13**	37.4	28.8	0	2	6	4	0	0	0	1	0	0	0	0
01:00	**13**	37.2	29.1	0	2	5	5	1	0	0	0	0	0	0	0
02:00	**6**	-	33.7	0	0	2	3	1	0	0	0	0	0	0	0
03:00	**8**	-	26.6	0	0	7	1	0	0	0	0	0	0	0	0
04:00	**12**	34.8	28	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**9**	-	33.9	0	0	3	4	1	1	0	0	0	0	0	0
06:00	**15**	35.7	28	0	0	12	2	1	0	0	0	0	0	0	0
07:00	**29**	33.3	27.9	0	2	17	10	0	0	0	0	0	0	0	0
08:00	**37**	33.8	27.9	0	4	20	13	0	0	0	0	0	0	0	0
09:00	**66**	32.9	27.1	0	7	42	16	1	0	0	0	0	0	0	0
10:00	**98**	34.4	29.1	0	1	63	28	4	2	0	0	0	0	0	0
11:00	**91**	33.3	26.1	0	15	53	21	2	0	0	0	0	0	0	0
12:00	**133**	32.5	25.9	0	24	75	31	3	0	0	0	0	0	0	0
13:00	**104**	33.1	26.2	0	27	47	24	3	2	1	0	0	0	0	0
14:00	**118**	34.1	27	0	18	66	32	1	0	0	1	0	0	0	0
15:00	**96**	35.3	27.3	1	15	46	30	4	0	0	0	0	0	0	0
16:00	**99**	34.3	27.7	0	14	50	33	2	0	0	0	0	0	0	0
17:00	**102**	32.3	26.6	1	15	57	26	2	1	0	0	0	0	0	0
18:00	**90**	35.5	27.3	0	12	51	22	4	1	0	0	0	0	0	0
19:00	**78**	33.8	28.8	0	5	40	30	3	0	0	0	0	0	0	0
20:00	**55**	34.8	28.4	0	3	27	24	0	1	0	0	0	0	0	0
21:00	**36**	33.8	28	0	5	17	13	0	1	0	0	0	0	0	0
22:00	**24**	33.2	28.8	0	1	16	6	0	0	0	1	0	0	0	0
23:00	**11**	45.3	29.6	0	2	5	2	1	0	0	0	1	0	0	0
12H,7-19	**1063**	**33.4**	**27**	**2**	**154**	**587**	**286**	**26**	**6**	**1**	**1**	**0**	**0**	**0**	**0**
16H,6-22	**1247**	**33.6**	**27.3**	**2**	**167**	**683**	**355**	**30**	**8**	**1**	**1**	**0**	**0**	**0**	**0**
18H,6-24	**1282**	**33.6**	**27.3**	**2**	**170**	**704**	**363**	**31**	**8**	**1**	**2**	**1**	**0**	**0**	**0**
24H,0-24	**1343**	**33.8**	**27.4**	**2**	**175**	**733**	**385**	**34**	**9**	**1**	**3**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Mon 14-Feb-22															
00:00	**6**	-	34.2	0	1	2	1	0	1	0	1	0	0	0	0
01:00	**4**	-	25.5	0	1	1	2	0	0	0	0	0	0	0	0
02:00	**2**	-	30.3	0	0	1	1	0	0	0	0	0	0	0	0
03:00	**4**	-	30.9	0	0	1	3	0	0	0	0	0	0	0	0
04:00	**16**	38.1	30.5	0	0	10	5	0	1	0	0	0	0	0	0
05:00	**31**	35.1	30.1	0	2	14	14	0	0	0	1	0	0	0	0
06:00	**55**	33.8	27	1	10	24	19	1	0	0	0	0	0	0	0
07:00	**116**	32.8	27	0	17	64	32	3	0	0	0	0	0	0	0
08:00	**205**	32.7	25.1	0	61	92	51	0	0	1	0	0	0	0	0
09:00	**118**	31.5	25.5	0	27	58	32	0	1	0	0	0	0	0	0
10:00	**109**	32.1	26.1	1	21	61	23	1	1	1	0	0	0	0	0
11:00	**143**	31.1	25.7	1	26	82	33	1	0	0	0	0	0	0	0
12:00	**118**	31.8	26.3	0	21	61	36	0	0	0	0	0	0	0	0
13:00	**93**	32.4	26.8	0	7	57	29	0	0	0	0	0	0	0	0
14:00	**137**	32.5	26.1	0	24	80	29	2	2	0	0	0	0	0	0
15:00	**179**	31.9	24.1	0	58	86	33	2	0	0	0	0	0	0	0
16:00	**160**	30.8	24.3	0	47	83	26	3	1	0	0	0	0	0	0
17:00	**135**	32.4	24.8	0	40	69	23	2	0	1	0	0	0	0	0
18:00	**110**	32.2	25.6	0	25	57	24	2	1	1	0	0	0	0	0
19:00	**101**	31.3	24.4	0	27	51	22	1	0	0	0	0	0	0	0
20:00	**67**	33.2	27.4	0	8	40	14	4	0	1	0	0	0	0	0
21:00	**39**	45.4	32.3	0	5	13	15	0	2	1	1	2	0	0	0
22:00	**33**	39.7	28.4	0	4	18	7	3	0	1	0	0	0	0	0
23:00	**21**	32.1	26.7	0	4	13	4	0	0	0	0	0	0	0	0
12H,7-19	**1623**	**32**	**25.5**	**2**	**374**	**850**	**371**	**16**	**6**	**4**	**0**	**0**	**0**	**0**	**0**
16H,6-22	**1885**	**32.1**	**25.7**	**3**	**424**	**978**	**441**	**22**	**8**	**6**	**1**	**2**	**0**	**0**	**0**
18H,6-24	**1939**	**32.2**	**25.7**	**3**	**432**	**1009**	**452**	**25**	**8**	**7**	**1**	**2**	**0**	**0**	**0**
24H,0-24	**2002**	**32.3**	**25.9**	**3**	**436**	**1038**	**478**	**25**	**10**	**7**	**3**	**2**	**0**	**0**	**0**

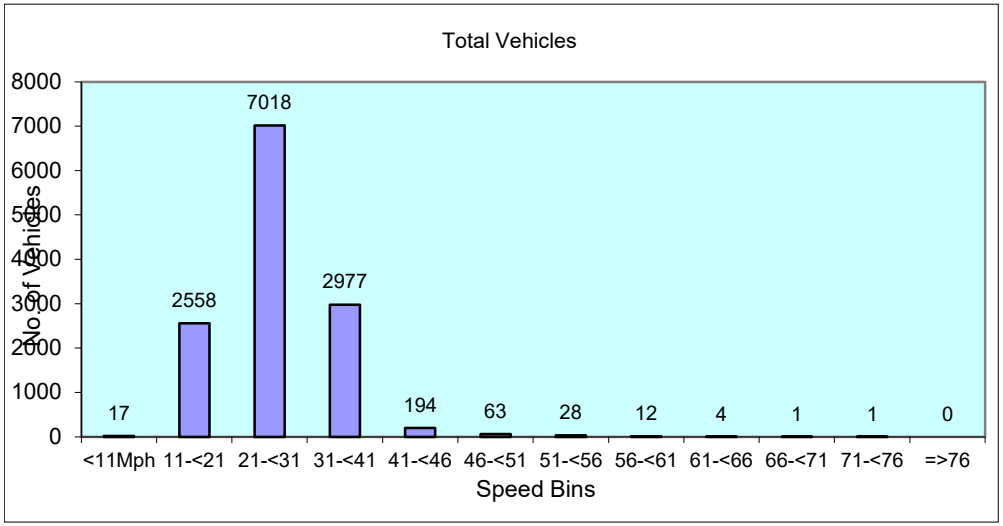
Data produced by
Transport Surveys Ltd

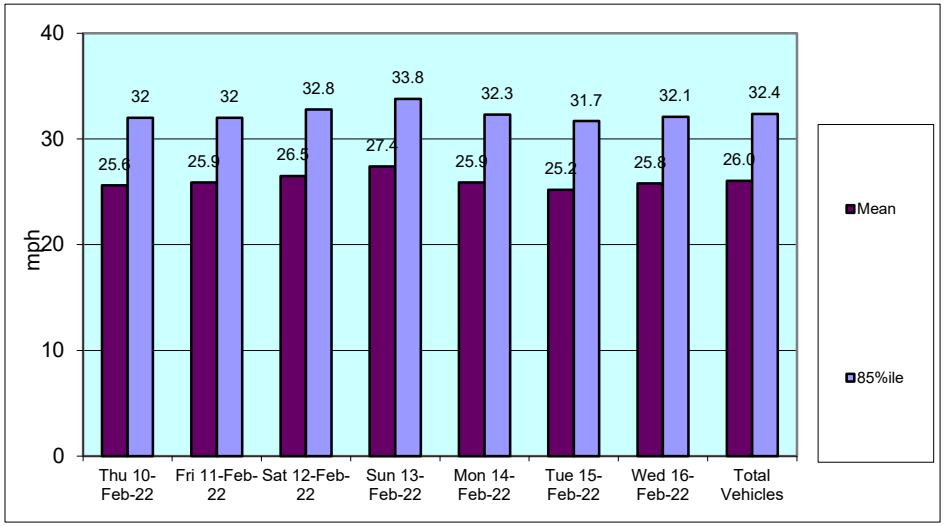
27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)						
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Tue 15-Feb-22															
00:00	**3**	-	32.4	0	0	1	2	0	0	0	0	0	0	0	0
01:00	**8**	-	26.2	0	2	4	1	1	0	0	0	0	0	0	0
02:00	**4**	-	30.7	0	0	2	1	1	0	0	0	0	0	0	0
03:00	**5**	-	30.2	0	0	3	2	0	0	0	0	0	0	0	0
04:00	**10**	-	28.5	0	0	6	4	0	0	0	0	0	0	0	0
05:00	**35**	36.3	30.7	0	0	18	15	0	1	1	0	0	0	0	0
06:00	**55**	33.4	27.6	0	5	29	21	0	0	0	0	0	0	0	0
07:00	**114**	30.8	25.9	0	18	72	23	1	0	0	0	0	0	0	0
08:00	**192**	30.3	23.5	0	70	90	30	2	0	0	0	0	0	0	0
09:00	**111**	28.2	23.6	0	26	70	15	0	0	0	0	0	0	0	0
10:00	**84**	29.6	24.2	0	25	48	10	1	0	0	0	0	0	0	0
11:00	**127**	31.2	25.7	0	30	66	27	2	2	0	0	0	0	0	0
12:00	**118**	31.9	25	0	28	66	22	1	1	0	0	0	0	0	0
13:00	**91**	32.7	26.1	0	18	51	19	2	0	0	1	0	0	0	0
14:00	**149**	31.5	25.3	0	34	88	24	2	1	0	0	0	0	0	0
15:00	**199**	30	24.3	0	61	109	26	1	1	0	0	0	0	1	0
16:00	**137**	30.9	24	0	44	67	23	1	2	0	0	0	0	0	0
17:00	**148**	32.9	25.6	0	37	68	41	2	0	0	0	0	0	0	0
18:00	**103**	30.8	24.4	0	24	61	17	1	0	0	0	0	0	0	0
19:00	**79**	34.6	27	0	14	40	21	3	1	0	0	0	0	0	0
20:00	**56**	36.3	27.5	0	10	29	13	1	2	1	0	0	0	0	0
21:00	**28**	36.7	28.3	0	2	16	9	0	1	0	0	0	0	0	0
22:00	**34**	30.5	24.9	0	6	22	6	0	0	0	0	0	0	0	0
23:00	**20**	27.4	23.8	0	4	14	2	0	0	0	0	0	0	0	0
12H,7-19	**1573**	**30.9**	**24.7**	**0**	**415**	**856**	**277**	**16**	**7**	**0**	**1**	**0**	**0**	**1**	**0**
16H,6-22	**1791**	**31.5**	**25.1**	**0**	**446**	**970**	**341**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
18H,6-24	**1845**	**31.4**	**25**	**0**	**456**	**1006**	**349**	**20**	**11**	**1**	**1**	**0**	**0**	**1**	**0**
24H,0-24	**1910**	**31.7**	**25.2**	**0**	**458**	**1040**	**374**	**22**	**12**	**2**	**1**	**0**	**0**	**1**	**0**

Data produced by
Transport Surveys Ltd

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76
Wed 16-Feb-22															
00:00	**8**	-	29.9	0	0	5	3	0	0	0	0	0	0	0	0
01:00	**2**	-	27.4	0	0	1	1	0	0	0	0	0	0	0	0
02:00	**2**	-	17.1	0	2	0	0	0	0	0	0	0	0	0	0
03:00	**4**	-	28.9	0	0	3	1	0	0	0	0	0	0	0	0
04:00	**12**	35.6	29.3	0	1	6	5	0	0	0	0	0	0	0	0
05:00	**35**	34.3	29.6	0	1	17	15	2	0	0	0	0	0	0	0
06:00	**63**	34.2	28.5	0	4	36	22	1	0	0	0	0	0	0	0
07:00	**117**	33	26.8	1	20	62	32	1	0	1	0	0	0	0	0
08:00	**192**	30.8	24.6	0	44	113	34	1	0	0	0	0	0	0	0
09:00	**126**	31.4	26.3	0	15	81	29	0	1	0	0	0	0	0	0
10:00	**103**	31.8	25.9	0	17	65	20	1	0	0	0	0	0	0	0
11:00	**107**	32.5	26.3	1	16	60	27	3	0	0	0	0	0	0	0
12:00	**111**	30.9	24.3	1	30	61	17	1	1	0	0	0	0	0	0
13:00	**95**	32.4	25.5	0	18	49	28	0	0	0	0	0	0	0	0
14:00	**133**	32.7	26.3	0	27	69	33	3	0	0	0	1	0	0	0
15:00	**190**	30.2	23.9	0	61	95	33	0	1	0	0	0	0	0	0
16:00	**127**	31.1	24.4	0	38	65	21	2	1	0	0	0	0	0	0
17:00	**138**	32.5	26.1	0	23	73	39	2	1	0	0	0	0	0	0
18:00	**118**	31.1	24.6	1	27	65	23	0	2	0	0	0	0	0	0
19:00	**86**	32.3	26.7	0	14	48	20	2	2	0	0	0	0	0	0
20:00	**51**	32.8	27	0	4	36	8	1	1	1	0	0	0	0	0
21:00	**43**	35.2	28.7	0	4	22	17	0	0	0	0	0	0	0	0
22:00	**22**	34.9	29.8	0	0	11	10	0	1	0	0	0	0	0	0
23:00	**10**	-	26.1	0	2	4	4	0	0	0	0	0	0	0	0
12H,7-19	**1557**	**31.5**	**25.3**	**4**	**336**	**858**	**336**	**14**	**7**	**1**	**0**	**1**	**0**	**0**	**0**
16H,6-22	**1800**	**31.8**	**25.6**	**4**	**362**	**1000**	**403**	**18**	**10**	**2**	**0**	**1**	**0**	**0**	**0**
18H,6-24	**1832**	**31.9**	**25.7**	**4**	**364**	**1015**	**417**	**18**	**11**	**2**	**0**	**1**	**0**	**0**	**0**
24H,0-24	**1895**	**32.1**	**25.8**	**4**	**368**	**1047**	**442**	**20**	**11**	**2**	**0**	**1**	**0**	**0**	**0**

27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	**Total Vehicles**	**85%ile Speed**	**Mean Speed**	**<11Mph**	**11-<21**	**21-<31**	**31-<41**	**41-<46**	**46-<51**	**51-<56**	**56-<61**	**61-<66**	**66-<71**	**71-<76**	**=>76**
Daily Totals															
Thu 10-Feb-22	**2021**	32	25.6	3	412	1131	436	27	5	5	2	0	0	0	0
Fri 11-Feb-22	**2036**	32	25.9	2	431	1101	447	36	7	9	2	0	1	0	0
Sat 12-Feb-22	**1666**	32.8	26.5	3	278	928	415	30	9	2	1	0	0	0	0
Sun 13-Feb-22	**1343**	33.8	27.4	2	175	733	385	34	9	1	3	1	0	0	0
Mon 14-Feb-22	**2002**	32.3	25.9	3	436	1038	478	25	10	7	3	2	0	0	0
Tue 15-Feb-22	**1910**	31.7	25.2	0	458	1040	374	22	12	2	1	0	0	1	0
Wed 16-Feb-22	**1895**	32.1	25.8	4	368	1047	442	20	11	2	0	1	0	0	0
Total Vehicles															
[--]	**12873**	32.4	26.0	17	2558	7018	2977	194	63	28	12	4	1	1	0



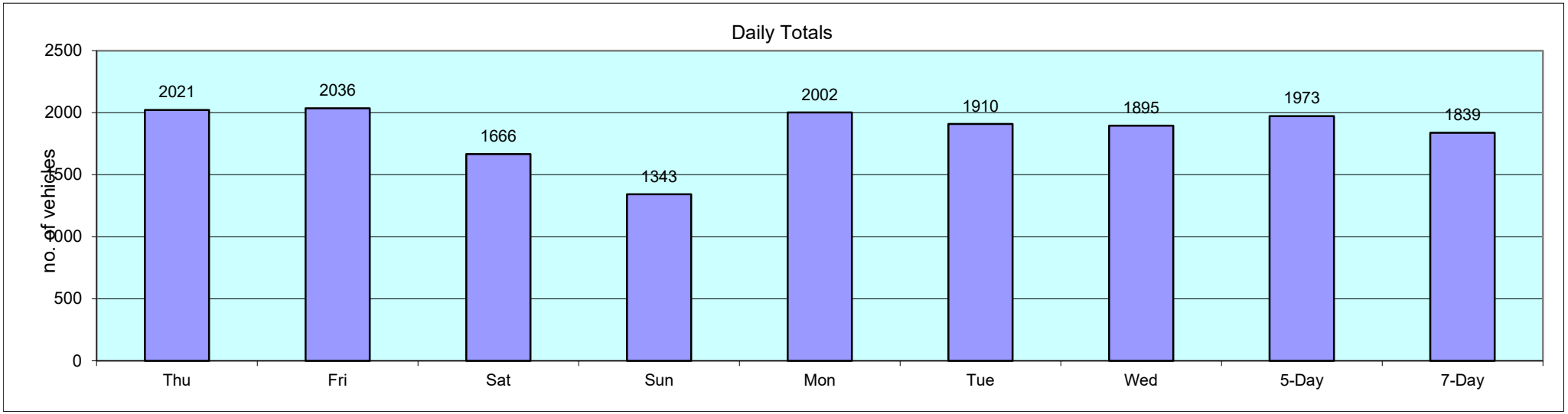


27178			CARDIFF			Site No: 27178001 Channel: Southbound			Location	Site 1 - Ball Road (att to T/P)					
Time Period	Total Vehicles	85%ile Speed	Mean Speed	<11Mph	11-<21	21-<31	31-<41	41-<46	46-<51	51-<56	56-<61	61-<66	66-<71	71-<76	=>76

27178		CARDIFF		Site No: 27178001 Channel: Southbound		Location		Site 1 - Ball Road (att to T/P)	
TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av
Week Begin: 10-Feb-22									
00:00	**9**	6	16	13	6	3	8	6	9
01:00	**3**	6	11	13	4	8	2	5	7
02:00	**5**	5	3	6	2	4	2	4	4
03:00	**7**	3	5	8	4	5	4	5	5
04:00	**15**	15	11	12	16	10	12	14	13
05:00	**40**	23	16	9	31	35	35	33	27
06:00	**63**	48	26	15	55	55	63	57	46
07:00	**123**	123	40	29	116	114	117	119	95
08:00	**220**	198	91	37	205	192	192	201	162
09:00	**120**	133	109	66	118	111	126	122	112
10:00	**106**	98	130	98	109	84	103	100	104
11:00	**127**	101	121	91	143	127	107	121	117
12:00	**117**	123	144	133	118	118	111	117	123
13:00	**102**	100	142	104	93	91	95	96	104
14:00	**149**	143	117	118	137	149	133	142	135
15:00	**172**	196	82	96	179	199	190	187	159
16:00	**149**	159	94	99	160	137	127	146	132
17:00	**129**	152	115	102	135	148	138	140	131
18:00	**109**	128	94	90	110	103	118	114	107
19:00	**94**	92	103	78	101	79	86	90	90
20:00	**76**	70	71	55	67	56	51	64	64
21:00	**40**	47	47	36	39	28	43	39	40
22:00	**26**	37	45	24	33	34	22	30	32
23:00	**20**	30	33	11	21	20	10	20	21
12H,7-19	**1623**	**1654**	**1279**	**1063**	**1623**	**1573**	**1557**	**1606**	**1482**
16H,6-22	**1896**	**1911**	**1526**	**1247**	**1885**	**1791**	**1800**	**1857**	**1722**
18H,6-24	**1942**	**1978**	**1604**	**1282**	**1939**	**1845**	**1832**	**1907**	**1775**
24H,0-24	**2021**	**2036**	**1666**	**1343**	**2002**	**1910**	**1895**	**1973**	**1839**
Am	**08:00**	**08:00**	**10:00**	**10:00**	**08:00**	**08:00**	**08:00**		
Peak	**220**	**198**	**130**	**98**	**205**	**192**	**192**		
Pm	**15:00**	**15:00**	**12:00**	**12:00**	**15:00**	**15:00**	**15:00**		
Peak	**172**	**196**	**144**	**133**	**179**	**199**	**190**		

27178	CARDIFF	Site No: 27178001 Channel: Southbound	Location	Site 1 - Ball Road (att to T/P)

TIME PERIOD	Thu 10/02/22	Fri 11/02/22	Sat 12/02/22	Sun 13/02/22	Mon 14/02/22	Tue 15/02/22	Wed 16/02/22	5-Day Av	7-Day Av



Classification Schemes

Scheme F Classification Scheme (Non-metric)

Scheme F is an attempt to implement the FWHA's visual classification scheme as an axle-based classification scheme. This is one of several interpretations.

Class	Vehicle Type	No. of Axles	Axle spacing in feet				
			Axle 1 to 2	Axle 2 to 3	Axle 3 to 4	Axle 4 to 5	Axle 5 to 6
1	motorcycle	2	<6.0				
2	passenger car	2	6.0 - 10.0				
	car + 1 axle trailer	3	<10.0	10.0 - 18.0			
	car + 2 axle trailer	4	<10.0		<3.5		
3	pickup	2	10.0 - 15.0				
	pickup + 1 axle trailer	3	10.0 - 15.0	10.0 - 18.0			
	pickup + 2 axle trailer	4	10.0 -15.0		<3.5		
	pickup + 3 axle trailer	5	9.9 - 15.0			<3.5	
4	Traditional bus/coach	2	>20.0				
	Traditional bus/coach	3	>19.0				
5	single unit truck/bus - dual rear axle	2	14.9 - 20.0			<3.5	
6	3 axle truck	3		<18.0			
7	4 axle truck	4					
8	2S1	3		>18.0			
	2S2	4		>5.0	>3.5		
	3S1	4		<5.0	>10.0		
9	3S2	5		<6.1		3.5 - 8.0	
	5 axle combination	5					
10	6 axle combination	6			3.5 - 5.0		
	3S3	6					
11	2S1-2	5		>6.0			
12	3S1-2	6					>10.0
13	truck	7 or more					

Appendix C Collision Data

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

MG NSRF/A

ACCIDENT STATISTICS

*FATAL / SERIOUS / SLIGHT

Incident URN

Other ref.

1.3 ACCIDENT REFERENCE

1.9 TIME H H M M

DAY* Su M T W Th F S

1.7 DATE D D M M 2 0 Y Y

1st Road Class & No. or (Unclassified - UC) (Not Known - NK)

1st Road Name

Outside House No. or Name or Marker Post No.

at junction with / or metres N S E W * of

2nd Road Class & No. or (Unclassified - UC) (Not Known - NK)

2nd Road Name

Town

Sector /Beat No.

County or Borough

Parish No. or Name

1.10 Local Auth No. (if known)

1.11 Grid Reference E — N

REPORTING OFFICER Name

Number

BCU/Stn

1.2 Force

Tel Number

1.5 Number of vehicles

1.6 Number of casualties

1.14 ROAD TYPE

		✗
Roundabout	1	
One way street	2	
Dual carriageway	3	
Single carriageway	6	
Slip road	7	
Unknown	9	

1.15 Speed Limit (Permanent)

1.16 JUNCTION DETAIL

		✗
Not at or within 20 metres of junction	00	
Roundabout	01	
Mini roundabout	02	
T or staggered junction	03	
Slip road	05	
Crossroads	06	
Junction more than four arms (not RAB)	07	
Using private drive or entrance	08	
Other junction	09	

JUNCTION ACCIDENTS ONLY

1.17 JUNCTION CONTROL

		✗
Authorised person	1	
Automatic traffic signal	2	
Stop sign	3	
Give way or uncontrolled	4	

1.20a PEDESTRIAN CROSSING - HUMAN CONTROL

		✗
None within 50 metres	0	
Control by school crossing patrol	1	
Control by other authorised person	2	

1.20b PEDESTRIAN CROSSING - PHYSICAL FACILITIES

		✗
No physical crossing facility within 50m	0	
Zebra crossing	1	
Pelican, puffin, toucan or similar non-junction pedestrian light crossing	4	
Pedestrian phase at traffic signal junction	5	
Footbridge or subway	7	
Central refuge — no other controls	8	

1.22 WEATHER

		✗
Fine without high winds	1	
Raining without high winds	2	
Snowing without high winds	3	
Fine with high winds	4	
Raining with high winds	5	
Snowing with high winds	6	
Fog or mist — if hazard	7	
Other	8	
Unknown	9	

1.23 ROAD SURFACE CONDITION

		✗
Dry	1	
Wet / Damp	2	
Snow	3	
Frost / Ice	4	
Flood (surface water over 3cm deep)	5	

1.21 LIGHT CONDITIONS

		✗
Daylight:	1	
Darkness: street lights present and lit	4	
Darkness: street lights present but unlit	5	
Darkness: no street lighting	6	
Darkness: street lighting unknown	7	

1.24 SPECIAL CONDITIONS AT SITE

		✗
None	0	
Auto traffic signal out	1	
Auto traffic signal partially defective	2	
Permanent road signing or marking defective or obscured	3	
Roadworks	4	
Road surface defective	5	
Oil or diesel	6	
Mud	7	

1.25 CARRIAGEWAY HAZARDS

		✗
None	0	
Dislodged vehicle load in carriageway	1	
Other object in carriageway	2	
Involvement with previous accident	3	
Pedestrian in carriageway - not injured	6	
Any animal in carriageway (except ridden horse)	7	

1.26 Did a police officer attend the scene and obtain the details for this report?

		✗
Yes	1	
No	2	

Subject to local directions, boxes with a grey background need not be completed if already recorded

** Circle as appropriate*

VEHICLE RECORD

2.26 VEHICLE REGISTRATION MARK

Vehicle 001	
Vehicle 002	
Vehicle 003	
Vehicle 004	

2.35 WAS THE VEHICLE LEFT HAND DRIVE ✗

		VEHICLE 1	2	3	4
No	1				
Yes	2				

2.5 / 2.5a TYPE OF VEHICLE ✗

Car	09				
Taxi / Private hire car	08				
Van - Goods vehicle 3.5 tonnes mgw and under	19				
Goods vehicle over 3.5 tonnes mgw and under 7.5 tonnes mgw	20				
Goods vehicle 7.5 tonnes mgw & over	21				
Goods vehicle - unknown weight	98				
M/cycle 50cc and under	02				
M/cycle over 50cc and up to 125cc	03				
M/cycle over 125cc and up to 500cc	04				
Motorcycle over 500cc	05				
Motorcycle - cc unknown	97				
Electric Motorcycle	23				
Pedal cycle	01				
Bus or coach (17 or more passenger seats)	11				
Minibus (8-16 passenger seats)	10				
Agricultural vehicle (include diggers etc)	17				
Ridden horse	16				
Mobility scooter	22				
Tram / Light rail	18				
Other vehicle 1	90				
Other vehicle 2	90				
Other vehicle 3	90				
Other vehicle 4	90				

2.6 TOWING AND ARTICULATION ✗

No tow or articulation	0				
Articulated vehicle	1				
Double or multiple trailer	2				
Caravan	3				
Single trailer	4				
Other tow	5				

2.22 AGE OF DRIVER (Estimate if necessary)

Vehicle 001		Vehicle 002	
Vehicle 003		Vehicle 004	

2.27 DRIVER HOME POSTCODE

or Code: 1- Unknown 2- Non UK Resident 3 - Parked & unattended

Vehicle 001		
Vehicle 002		
Vehicle 003		
Vehicle 004		

2.23 BREATH TEST ✗

		VEHICLE 1	2	3	4
Not applicable	0				
Positive	1				
Negative	2				
Not requested	3				
Refused to provide	4				
Driver not contacted at time of col'	5				
Not provided (medical reasons)	6				

2.24 HIT AND RUN ✗

Not hit and run	0				
Hit and run	1				
Non-stop vehicle, not hit	2				

2.21 SEX OF DRIVER ✗

Male	1				
Female	2				
Not known	3				

2.9 VEHICLE LOCATION AT TIME OF ACCIDENT RESTRICTED LANE/AWAY FROM MAIN C'WAY ✗

On main carriageway not in restricted lane	00				
Tram / Light rail track	01				
Bus lane	02				
Busway (inc. guided busway)	03				
Cycle lane (on main carriageway)	04				
Cycleway or shared use footway (not part of main carriageway)	05				
On lay-by / hard shoulder	06				
Entering lay-by/ hard shoulder	07				
Leaving lay-by / hard shoulder	08				
Footway (pavement)	09				

2.10 JUNCTION LOCATION OF VEHICLE ✗

Not at or within 20m of junction	0				
Approaching junction or waiting /parked at junction approach	1				
Cleared junction or waiting/ parked at junction exit	2				
Leaving roundabout	3				
Entering roundabout	4				
Leaving main road	5				
Entering main road	6				
Entering from slip road	7				
Mid junction– on roundabout or on main road	8				

2.7 MANOEUVRES ✗

Reversing	01				
Parked	02				
Waiting to go ahead but held up	03				
Slowing or stopping	04				
Moving off	05				
U turn	06				
Turning left	07				
Waiting to turn left	08				
Turning right	09				
Waiting to turn right	10				
Changing lane to left	11				
Changing lane to right	12				
O'taking moving veh on its offside	13				
O'taking stationary veh on its offside	14				
Overtaking on nearside	15				
Going ahead left hand bend	16				
Going ahead right hand bend	17				
Going ahead other	18				

2.11 SKIDDING AND OVERTURNING ✗

		VEHICLE 1	2	3	4
No skidding, jack-knifing or overturning	0				
Skidded	1				
Skidded and overturned	2				
Jack - knifed	3				
Jack - knifed and overturned	4				
Overturned	5				

2.12 HIT OBJECT IN CARRIAGEWAY ✗

None	00				
Previous accident	01				
Roadworks	02				
Parked vehicle	04				
Bridge - roof	05				
Bridge - side	06				
Bollard / Refuge	07				
Open door of vehicle	08				
Central island of roundabout	09				
Kerb	10				
Any animal (except ridden horse)	12				
Other object	11				

2.13 VEHICLE LEAVING CARRIAGEWAY ✗

Did not leave carriageway	0				
Left carriageway nearside	1				
Left carriageway nearside and rebounded	2				
Left carriageway straight ahead at junction	3				
Left carriageway offside onto central reservation	4				
Left carriageway offside onto central reserve and rebounded	5				
Left carriageway offside and crossed central reservation	6				
Left carriageway offside	7				
Left carriageway offside and rebounded	8				

2.14 FIRST OBJECT HIT OFF CARRIAGEWAY ✗

None	00				
Road sign / Traffic signal	01				
Lamp post	02				
Telegraph pole / Electricity pole	03				
Tree	04				
Bus stop / Bus shelter	05				
Central crash barrier	06				
Nearside or offside crash barrier	07				
Submerged in water (completely)	08				
Entered ditch	09				
Wall or fence	11				
Other permanent object	10				

2.16 FIRST POINT OF IMPACT ✗

Did not impact	0				
Front	1				
Back	2				
Offside	3				
Nearside	4				

2.29 JOURNEY PURPOSE OF DRIVER/RIDER ✗

Journey as part of work	1				
Commuting to / from work	2				
Taking school pupil to/from school	3				
Pupil riding to / from school	4				
Other	5				
Not known	6				

Subject to local directions, boxes with a grey background need not be completed if already recorded

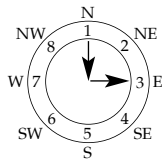
2.8 DIRECTION OF VEHICLE TRAVEL

1. Using the Example shown complete the FROM and TO boxes for the vehicles concerned, indicating direction of travel FROM and TO
2. If PARKED enter '00'

Vehicle 001		*Vehicle 002*	
FROM	TO	FROM	TO
Vehicle 003		*Vehicle 004*	
FROM	TO	FROM	TO

EXAMPLE

FROM	TO
1	3



CASUALTY RECORD

3.4 VEHICLE REFERENCE NUMBER
Enter VEH No. which CASUALTY occupied (for pedestrians, code vehicle that struck them first) e.g. 001,002 etc.

Casualty 001	0	Casualty 002	0
Casualty 003	0	Casualty 004	0
Casualty 005	0	Casualty 006	0

3.18 CASUALTY HOME POSTCODE
or Code: 1- Unknown
2- Non UK Resident

Casualty 001	
Casualty 002	
Casualty 003	
Casualty 004	
Casualty 005	
Casualty 006	

3.7 SEX OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Male	1						
Female	2						

3.8 AGE OF CASUALTY (Estimate if necessary)
For children less than a year enter 00

Casualty 001		Casualty 002	
Casualty 003		Casualty 004	
Casualty 005		Casualty 006	

3.6 CASUALTY CLASS ✗

		CASUALTY 1	2	3	4	5	6
Driver/Rider	1						
Veh./pillion Passenger	2						
Pedestrian	3						

3.9 SEVERITY OF CASUALTY ✗

		CASUALTY 1	2	3	4	5	6
Fatal	1						
Serious	2						
Slight	3						

3.20 CYCLE HELMET WORN ✗

		CASUALTY 1	2	3	4	5	6
Not a cyclist	0						
Yes	1						
No	2						
Not known	3						

3.15 CAR PASSENGER (not driver) ✗

Not a car passenger	0						
Front seat passenger	1						
Rear seat passenger	2						

3.16 BUS OR COACH PASSENGER ✗
(17 passenger seats or more)

Not a bus or coach passenger	0						
Boarding	1						
Alighting	2						
Standing passenger	3						
Seated passenger	4						

3.14 SEAT BELT IN USE ✗

Not applicable	0						
Worn and independently confirmed	1						
Worn but not independently confirmed	2						
Not worn	3						
Unknown	4						

LOCAL STATISTICS

PEDESTRIAN CASUALTIES ONLY

3.10 PEDESTRIAN LOCATION ✗

		CASUALTY 1	2	3	4	5	6
In carriageway, crossing on pedestrian crossing facility	01						
In carriageway, crossing within zig-zag lines at crossing approach	02						
In carriageway, crossing within zig-zag lines at crossing exit	03						
In carriageway, crossing elsewhere within 50m of pedestrian crossing	04						
In carriageway, crossing elsewhere	05						
On footway or verge	06						
On refuge, central island or central reservation	07						
In centre of carriageway, not on refuge, island or central reservation	08						
In carriageway, not crossing	09						
Unknown or other	10						

3.12 PEDESTRIAN DIRECTION ✗

		CASUALTY 1	2	3	4	5	6
Standing still	0						
Northbound	1						
Northeast bound	2						
Eastbound	3						
Southeast bound	4						
Southbound	5						
Southwest bound	6						
Westbound	7						
Northwest bound	8						
Unknown	9						

3.19 PEDESTRIAN ROAD MAINTENANCE WORKER ✗

No / not applicable	0						
Yes	1						
Not known	2						

3.11 PEDESTRIAN MOVEMENT ✗

		CASUALTY 1	2	3	4	5	6
Crossing from driver's nearside	1						
Crossing from driver's nearside-masked by parked or stationary veh'	2						
Crossing from driver's offside	3						
Crossing from driver's offside-masked by parked or stationary veh'	4						
In carriageway, stationary - not crossing (standing or playing)	5						
In carriageway, stationary -not crossing (standing or playing), masked by parked or stationary veh'	6						
Walking along in carriageway-facing traffic	7						
Walking along in carriageway-back to traffic	8						
Unknown or other	9						

CONTRIBUTORY FACTORS

1. Select up to six factors from the grid, relevant to the accident.
2. Factors may be shown in any order, but an indication must be given of whether each factor is ***very likely (A)*** or ***possible (B).***
3. Only include factors that you consider contributed to the accident. (i.e. do NOT include "Poor road surface" unless relevant).
4. More than one factor may, if appropriate, be related to the same road user.
5. The same factor may be related to more than one road user.
6. The participant should be identified by the relevant vehicle or casualty ref no. (e.g. 001, 002 etc.), preceded by "V" if the factor applies to a vehicle, driver/rider or the road environment (e.g. V002), or "C" if the factor relates to a pedestrian or passenger casualty (e.g. C001).
7. Enter U000 if the factor relates to an uninjured pedestrian.

Road Environment Contributed	***103*** Slippery road (due to weather)	***102*** Deposit on road (e.g. oil, mud, chippings)	***101*** Poor or defective road surface	***110*** Sunken, raised or slippery inspection cover	***108*** Road layout (e.g. bend, hill, narrow carriageway)	***107*** Temporary road layout (e.g. contraflow)	***109*** Animal or object in carriageway	***104*** Inadequate or masked signs or road markings	***105*** Defective traffic signals	***106*** Traffic calming (e.g. speed cushions, road humps, chicanes)
Vehicle Defects	***201*** Tyres illegal, defective or under-inflated	***202*** Defective lights or indicators	***203*** Defective brakes	***204*** Defective steering or suspension	***205*** Defective or missing mirrors	***206*** Overloaded or poorly loaded vehicle or trailer				
Driver/Rider Only (Includes Pedal Cycles and Horse Riders) Injudicious Action	***308*** Following too close	***306*** Exceeding speed limit	***302*** Disobeyed Give Way or Stop sign or markings	***301*** Disobeyed automatic traffic signal	***307*** Travelling too fast for conditions	***310*** Cyclist entering road from pavement	***305*** Illegal turn or direction of travel	***304*** Disobeyed pedestrian crossing facility	***309*** Vehicle travelling along pavement	***303*** Disobeyed double white lines
Driver/ Rider Error or Reaction	***405*** Failed to look properly	***406*** Failed to judge other person's path or speed	***403*** Poor turn or manoeuvre	***408*** Sudden braking	***409*** Swerved	***401*** Junction overshoot	***402*** Junction restart (moving off at junction)	***404*** Failed to signal or misleading signal	***407*** Too close to cyclist, horse or pedestrian	***410*** Loss of control
Impairment or Distraction	***501*** Impaired by alcohol	***502*** Impaired by drugs (illicit or medicinal)	***508*** Driver using mobile phone	***503*** Fatigue	***509*** Distraction in vehicle	***510*** Distraction outside vehicle	***505*** Illness or disability, mental or physical	***504*** Uncorrected, defective eyesight	***507*** Rider wearing dark clothing	***506*** Not displaying lights at night or in poor visibility
Behaviour or Inexperience	***602*** Careless, reckless or in a hurry	***605*** Learner or inexperienced driver/rider	***601*** Aggressive driving	***603*** Nervous, uncertain or panic	***607*** Unfamiliar with model of vehicle	***606*** Inexperience of driving on the left	***604*** Driving too slow for conditions or slow vehicle (e.g. tractor)			
Vision Affected by	***701*** Stationary or parked vehicle(s)	***703*** Road layout (e.g. bend, winding road, hill crest)	***706*** Dazzling sun	***707*** Rain, sleet, snow or fog	***708*** Spray from other vehicles	***705*** Dazzling headlights	***710*** Vehicle blind spot	***702*** Vegetation	***704*** Buildings, road signs, street furniture	***709*** Visor or windscreen dirty, scratched or frosted etc.
Pedestrian Only (Casualty or Uninjured)	***802*** Failed to look properly	***808*** Careless, reckless or in a hurry	***803*** Failed to judge vehicle's path or speed	***801*** Crossing road masked by stationary or parked vehicle	***806*** Impaired by alcohol	***807*** Impaired by drugs (illicit or medicinal)	***805*** Dangerous action in carriageway (e.g. playing)	***804*** Wrong use of pedestrian crossing facility	***809*** Pedestrian wearing dark clothing at night	***810*** Disability or illness, mental or physical
Special Codes	***901*** Stolen vehicle	***902*** Vehicle in course of crime	***903*** Emergency vehicle on a call	***904*** Vehicle door opened or closed negligently						****999*** Other – Please specify below

	1st	***2nd***	***3rd***	***4th***	***5th***	***6th***
Factor in the accident						
Which participant? (e.g. V001, C001, U000)						
Very likely (A) or Possible (B)						

*If 999 Other, give brief details

(Note: Only use if another factor contributed to the accident ***and include it in the text description of how the accident occurred***)

These factors reflect the reporting officer's opinion at the time of reporting and may not be the result of extensive investigation

accident_index	accident_year	accident_reference	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to	vehicle_location_restricted_lane
2.02362E+12	2023	622300193	1	19	0	18	5	1	0
2.02362E+12	2023	622300193	2	9	0	3	5	1	0
2.02162E+12	2021	622200017	1	9	0	5	4	8	0
2.02162E+12	2021	622200017	2	9	0	3	4	8	0

collision_index	collision_year	collision_ref_no	vehicle_reference	vehicle_type	towing_and_articulation	vehicle_manoeuvre_historic	vehicle_manoeuvre	vehicle_direction_from	vehicle_direction_to
2.02462E+12	2024	622400220	1	9	0	7	7	6	8

junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway	first_point_of_impact	vehicle_left_hand_drive
4	0	0	0	0	1	1
1	0	0	3	6	2	1
4	0	0	0	0	1	1
4	0	0	0	0	2	1

vehicle_location_restricted_lane_historic	vehicle_location_restricted_lane	junction_location	skidding_and_overturning	hit_object_in_carriageway	vehicle_leaving_carriageway	hit_object_off_carriageway
0	0	3	1	0	1	0

journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code	age_of_vehicle	generic_make_model	driver_imd_decile
6	1	58	9	2402	2	16	FORD TRANSIT	1
6	1	33	6	1339	1	16	HONDA JAZZ	3
6	1	18	4	1229	1	13	VAUXHALL CORSA	6
6	2	49	8	1333	1	0	RENAULT CAPTUR	10

first_point_of_impact	vehicle_left_hand_drive	journey_purpose_of_driver_historic	journey_purpose_of_driver	sex_of_driver	age_of_driver	age_band_of_driver	engine_capacity_cc	propulsion_code
1	1	6	6	1	35	6	2401	2

driver_home_area_type	lsoa_of_driver	escooter_flag	dir_from_e	dir_from_n	dir_to_e	dir_to_n	driver_distance_banding	
1	W01001884	0	NULL	NULL	NULL	NULL	1	
1	W01001875	0	NULL	NULL	NULL	NULL	1	
1	W01001814	0	NULL	NULL	NULL	NULL	1	
1	W01001841	0	NULL	NULL	NULL	NULL	1	
age_of_vehicle	generic_make_model	driver_imd_decile	lsoa_of_driver	escooter_flag	driver_distance_banding			
22	VOLVO S60	3	W01001805	0	1			

Appendix D Illustrative Site Layout and PRoW Network

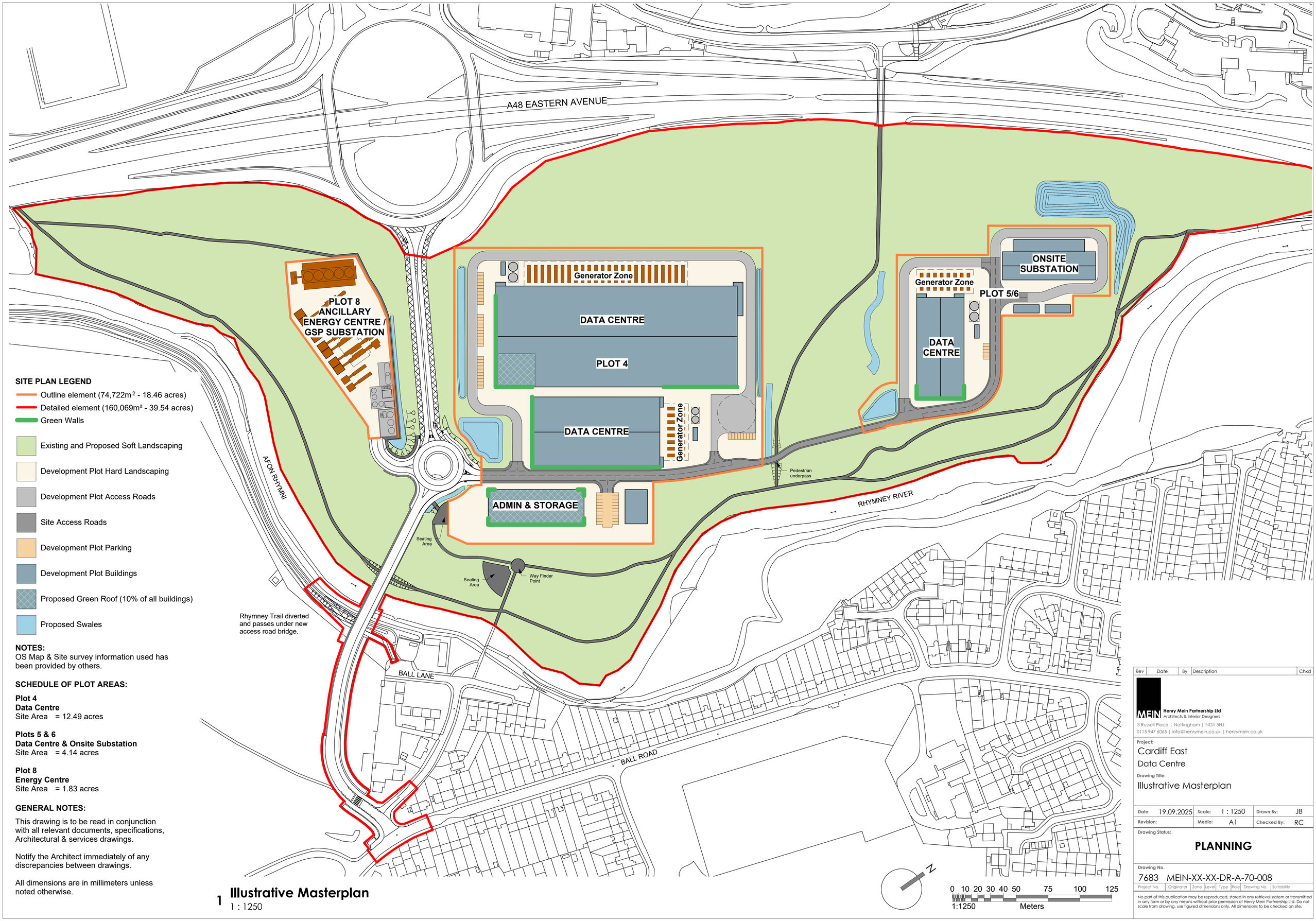
Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025



SITE PLAN LEGEND

- Outline element (74,722m² - 18.46 acres)
- Detailed element (160,069m² - 39.54 acres)
- Green Walls
- Existing and Proposed Soft Landscaping
- Development Plot Hard Landscaping
- Development Plot Access Roads
- Site Access Roads
- Development Plot Parking
- Development Plot Buildings
- Proposed Green Roof (10% of all buildings)
- Proposed Swales

NOTES:
OS Map & Site survey information used has been provided by others.

SCHEDULE OF PLOT AREAS:

Plot 4
Data Centre
Site Area = 12.49 acres

Plots 5 & 6
Data Centre & Onsite Substation
Site Area = 4.14 acres

Plot 8
Energy Centre
Site Area = 1.83 acres

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

1 Illustrative Masterplan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East
Data Centre

Drawing Title:
Illustrative Masterplan

Date:	19.09.2025	Scale:	1 : 1250	Drawn By:	JB
Revision:		Media:	A1	Checked By:	RC

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-008

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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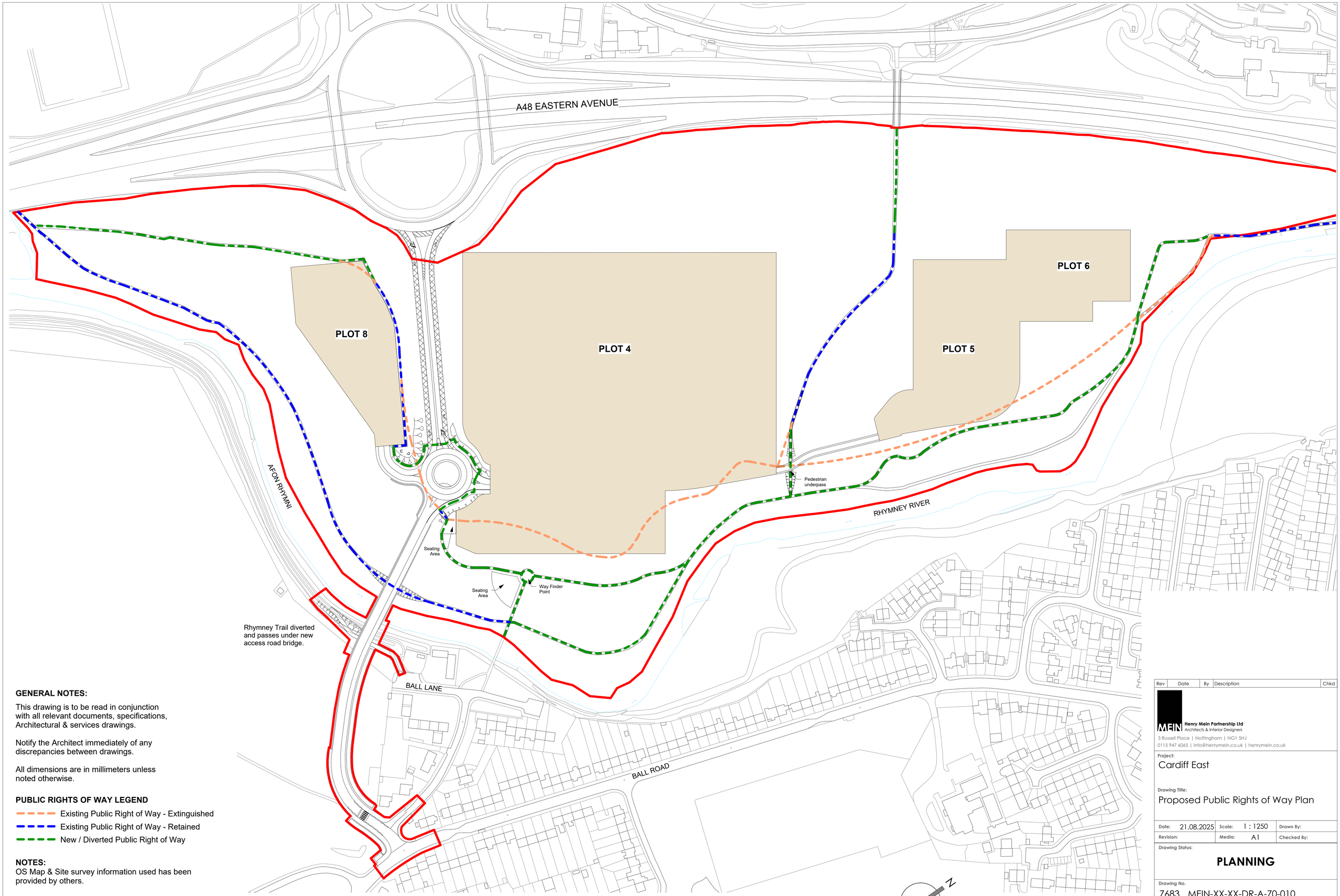

GENERAL NOTES:

This drawing is to be read in conjunction with all relevant documents, specifications, Architectural & services drawings.

Notify the Architect immediately of any discrepancies between drawings.

All dimensions are in millimeters unless noted otherwise.

PUBLIC RIGHTS OF WAY LEGEND

- Existing Public Right of Way - Extinguished
- Existing Public Right of Way - Retained
- New / Diverted Public Right of Way

NOTES:
OS Map & Site survey information used has been provided by others.

1 Proposed Public Rights of Way Plan
1 : 1250

Rev	Date	By	Description	Chkd

Henry Mein Partnership Ltd
Architects & Interior Designers
3 Russell Place | Nottingham | NG1 5HJ
0115 947 6065 | info@henrymein.co.uk | henrymein.co.uk

Project:
Cardiff East

Drawing Title:
Proposed Public Rights of Way Plan

Date:	21.08.2025	Scale:	1 : 1250	Drawn By:
Revision:		Media:	A1	Checked By:

Drawing Status:
PLANNING

Drawing No.
7683 MEIN-XX-XX-DR-A-70-010

Project No.	Originator	Zone	Level	Type	Role	Drawing No.	Suitability

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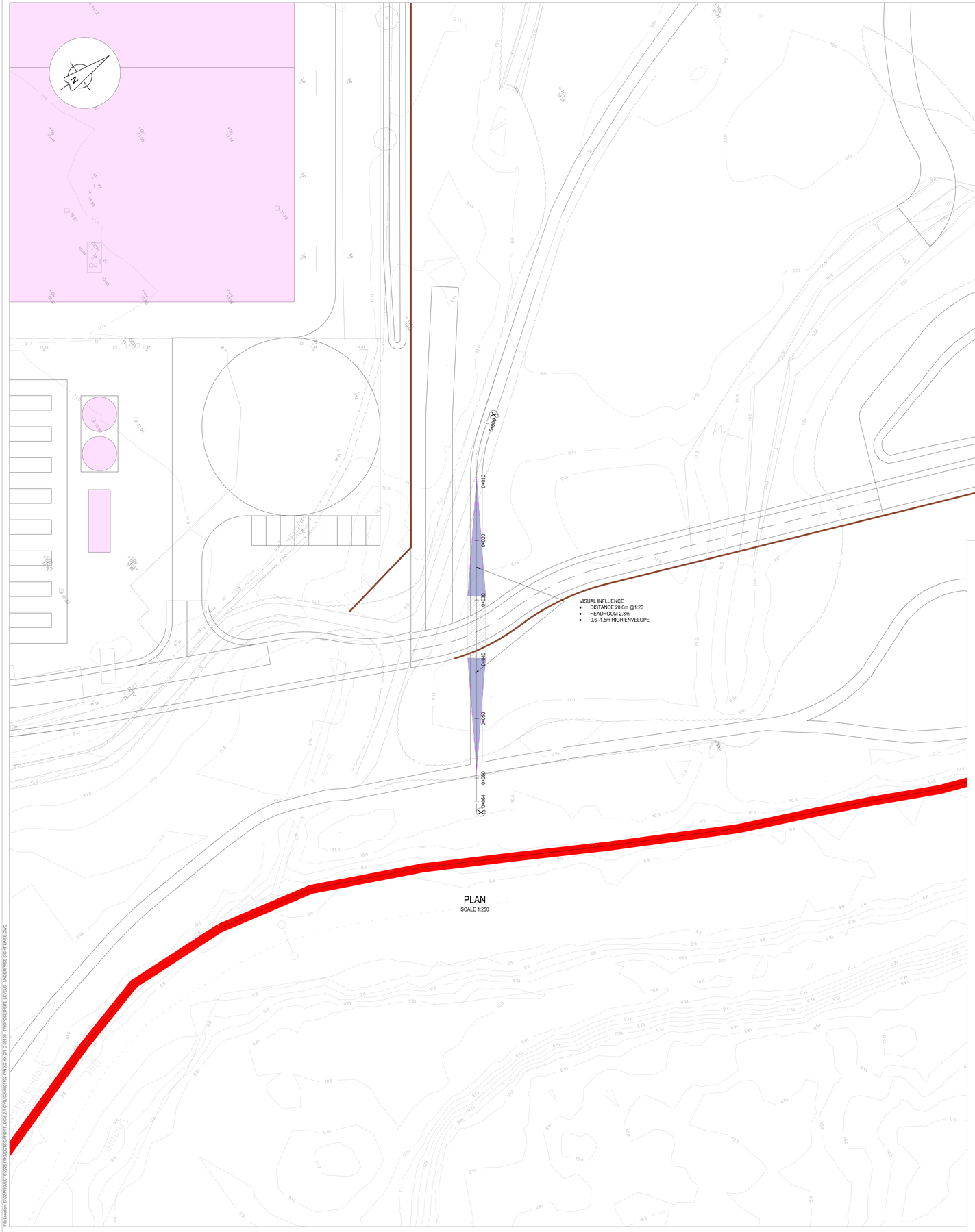
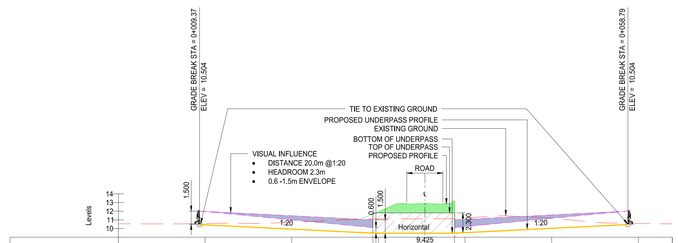


PLAN
SCALE 1:250



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	63.911
EXISTING LEVELS	10.540	10.567	10.720	11.115	11.211	11.162	10.579	10.531
PROPOSED LEVELS		10.473	9.973	9.504	9.564	10.064		
DIFFERENCE BETWEEN EXISTING & PROPOSED		-0.094	-0.747	-1.611	-1.647	-1.118		
VERTICAL GEOMETRY		G:-5.00% L:20.00		G:0.00% L:9.42		G:5.00% L:20.00		
HORIZONTAL GEOMETRY	L =1.576	R: 25.000 L: 7.738	L =1.683	L =52.914				

SECTION X-X (VISUAL PROFILE)
SCALE: H 1:250,V 1:250. DATUM: 9.000

GENERAL NOTES

1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ENGINEERS, ARCHITECTS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.
5. THIS DRAWING IS TO BE PRINTED IN COLOUR.
6. THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION PURPOSES UNLESS EXPRESSLY STATED. / IS TO BE USED FOR CONSTRUCTION PURPOSES.
7. EXISTING SITE AND LEVEL INFORMATION TAKEN FROM EXISTING LEVELS AND TOPOGRAPHICAL SURVEY DRAWINGFROM WSP.
8. THIS DRAWING USES THE GREAT BRITAIN COORDINATE SYSTEM "OSGB1936,NationalGrid".
9. THIS DRAWING HAS BEEN PREPARED USING THE PROPOSED SITE LAYOUT FROM MEIN 19.09.25
10. EMBANKMENTS TIE TO EXISTING LEVELS - THIS MAY VARY DUE TO TOP SOIL STRIPS ETC.

SCALE 1:250
0 2.5 5 7.5 10 12.5m
DIMENSIONS IN METRES

DRAFT -
FOR INFORMATION

REV	DESCRIPTION	BY	CHK / APP	DATE
0	PLANNING (WIP)	AMB	SOR	18/11/25

CLIENT
Curtis Hall Ltd

PROJECT
CARDIFF EAST
DATA CENTRE

DRAWING TITLE
UNDERPASS SIGHT LINES

PINNACLE CONSULTING ENGINEERS
PINNACLE HOUSE,
MAPLE WAY,
BROADLAND GATE,
NORWICH.
NR13 5HB. TELEPHONE: 01603 327 170
WELWYN GARDEN CITY ■ LONDON ■ DUBLIN ■ THE HAGUE ■ FRANKFURT

DRAWING STATUS				
INFORMATION (WIP)				
SCALE @ A0	DATE	DRAWN BY	CHECKED	APPROVED
As shown	NOV '25	AMB	SOR	JM
DRG NO.				REV.
C250801192-PIN-XX-XX-DR-C-02110				0

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File Location: S:\02.PROJECTS\2025 PROJECTS\CARDIFF_DCK\2.3 CIVIL\C250801192-PIN-XX-XX-DR-C-02100 - PROPOSED SITE LEVELS - UNDERPASS SIGHT LINES.DWG

Appendix E Internal Site Drawings

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

UNCONTROLLED CROSSING

FLOW CONTROL WITHIN CHAMBER SET AT 0.5 L/S

REALIGNED CARRIAGEWAY TO TIE INTO EXISTING ACCESS ROAD

NEW 3.5m SHARED FOOTWAY TO TIE INTO PARK & RIDE DEVELOPMENT

0.5M HARDSTANDING TO INNER ISLAND, TO HOUSE ROAD SIGNAGE

HEADWALL FOR SWALE OUTFALL

FLOW CONTROL WITHIN CHAMBER SET AT 1.5 L/S

CENTRAL ISLAND TO HOUSE BIO-RETENTION AREA, WITH WITH LOW LEVEL PLANTING. 1:8 GRADED 0.5m DEEP DEPRESSION WITHIN THE CENTRAL AREA.

ATTENUATION BASIN TO RECEIVE FLOWS FROM BRIDGE DECK, AND RAINGARDENS

0.5M DEEP SWALE

WING WALLS

MAINTENANCE BAY FOR BASIN

REINFORCED CONCRETE WALL

NEW 2M FOOTWAY TO TIE INTO NEW DEVELOPMENT

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

WEST PIER

1.4m CYCLE PARAPET

CENTRAL PIER

CONTAINMENT N1 PARAPET

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE HEADROOM AT BRIDGE

600MM HARD VERGE

EAST PIER

PROW TO RAMP DOWN AT 1:20 FOR 15M TO ACHIEVE MINIMUM 2.4M HEADROOM AT BRIDGE, DRAINAGE PROVIDED TO AVOID PONDING

NEW HEADWALL WITH NON-RETURN FLAP VALVE

FACE OF BRIDGE ABUTMENT/BEARING PLINTH

DIVERTED RUMNEY TRAIL TO TIE BACK INTO PATH ALONGSIDE DCWW FACILITY

CULVERTS (FLOOD PLAIN CONNECTIVITY)

RUMNEY TRAIL DIVERTED DOWN FROM HIGH LEVEL TO LOW LEVEL (MAXIMUM GRADIENT 1:25) UNDERPASS PROVIDED

REINFORCED CONCRETE WALL

REINFORCED CONCRETE WALL

SWALE TO RECEIVE HIGHWAY RUNOFF

BALL LANE JUNCTION FORMED WITH NEW CARRIAGEWAY

CYCLE DROP OFF

2.4m X 25M VISION SPLAY FOR 20MPH

2.4m X 25M VISION SPLAY FOR 20MPH

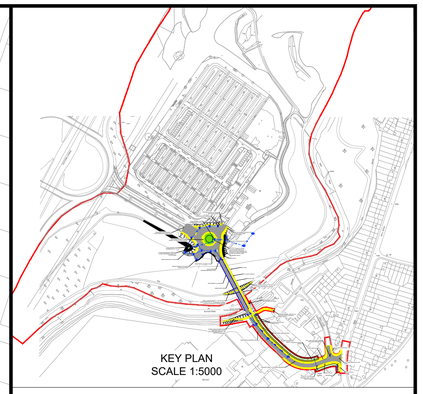
FORWARD VISIBILITY FOR 20MPH @22MM SSD

CYCLE PICK UP

CYCLE PICK UP

MAINTENANCE BAY

PARALLEL CONTROLLED CROSSING, DE611 ACTIVE TRAVEL GUIDANCE



KEY PLAN
SCALE 1:5000

NOTES
1. DO NOT SCALE FROM THIS DRAWING, USE FIGURED DIMENSIONS ONLY.
2. ALL LEVELS ARE IN METRES ABOVE ORDNANCE DATUM (AOD)
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES

KEY

- DEVELOPMENT PLANNING BOUNDARY
- BITUMINOUS CARRIAGEWAY
- BITUMINOUS FOOTWAY/ CYCLEWAY
- HIGHWAY VERGE/ EMBANKMENT / CUTTING
- BRIDGE PARAPET/ RETAINING WALL
- PROPOSED STREET LIGHTING
- EXISTING STREET LIGHTING

LADDER PAVING GREY COLOUR (4 FLAT RIBS PER SLAB) TO MARK THE BOUNDARY BETWEEN FOOTWAY AND SHARED FOOTWAY CYCLE WAY.

TACTILE PAVING AT CONTROLLED CROSSING TO BE RED BLISTER
TACTILE PAVING AT UNCONTROLLED CROSSING TO BE BUFF BLISTER

Rev.	Date	Description	By	Eng° Ch'k	Disc° Ch'k	App'd
P05	14/12/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P04	14/12/23	ATTENUATION BASIN/SWALE AMENDED	GW	GW	GW	GW
P03	10/03/23	BATTER REMOVED, R/W ADDED	SID	SID	SID	GW
P02	DEC-22	AMENDMENTS FOLLOWING SAB CONSULTATION	SID	SID	SID	GW

Suitability: FOR PLANNING

Status: -

wsp
1 Capital Quarter
Tyndall St
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CF10 4BZ, UK

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wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
GENERAL ARRANGEMENT

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-101

Design Stage: -

Revision: P05

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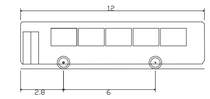
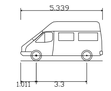
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
4. THIS DRAWING IS FOR PLANNING PURPOSES ONLY AND IS SUBJECT TO DETAILED DESIGN
5. HIGHWAY GEOMETRY & DESIGN IS SUBJECT TO TECHNICAL APPROVAL OF THE ADOPTING HIGHWAY AUTHORITIES



'Standard' Rigid Bus

Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	3.069m
Min Body Ground Clearance	0.309m
Track Width	2.350m
Lock to lock time	4.00s
Wall to Wall Turning Radius	10.771m



3.5t Panel Van

Overall Length	5.339m
Overall Width	1.986m
Overall Body Height	2.565m
Min Body Ground Clearance	0.338m
Track Width	1.986m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.400m

Rev.	Date	Description	By	Eng' Ch'k	Discr' Ch'k	App'd
P03	28.11.25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	GW	GW	GW
P01	28/10/22	FIRST ISSUE FOR APPROVAL-	SID	SID	GW	GW

Suitability: FOR PLANNING

Status: -

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Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
SWEPT PATHS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number	Design Stage	Revision
70071035-WSP-XX-XX-CE-DR-102	-	P03

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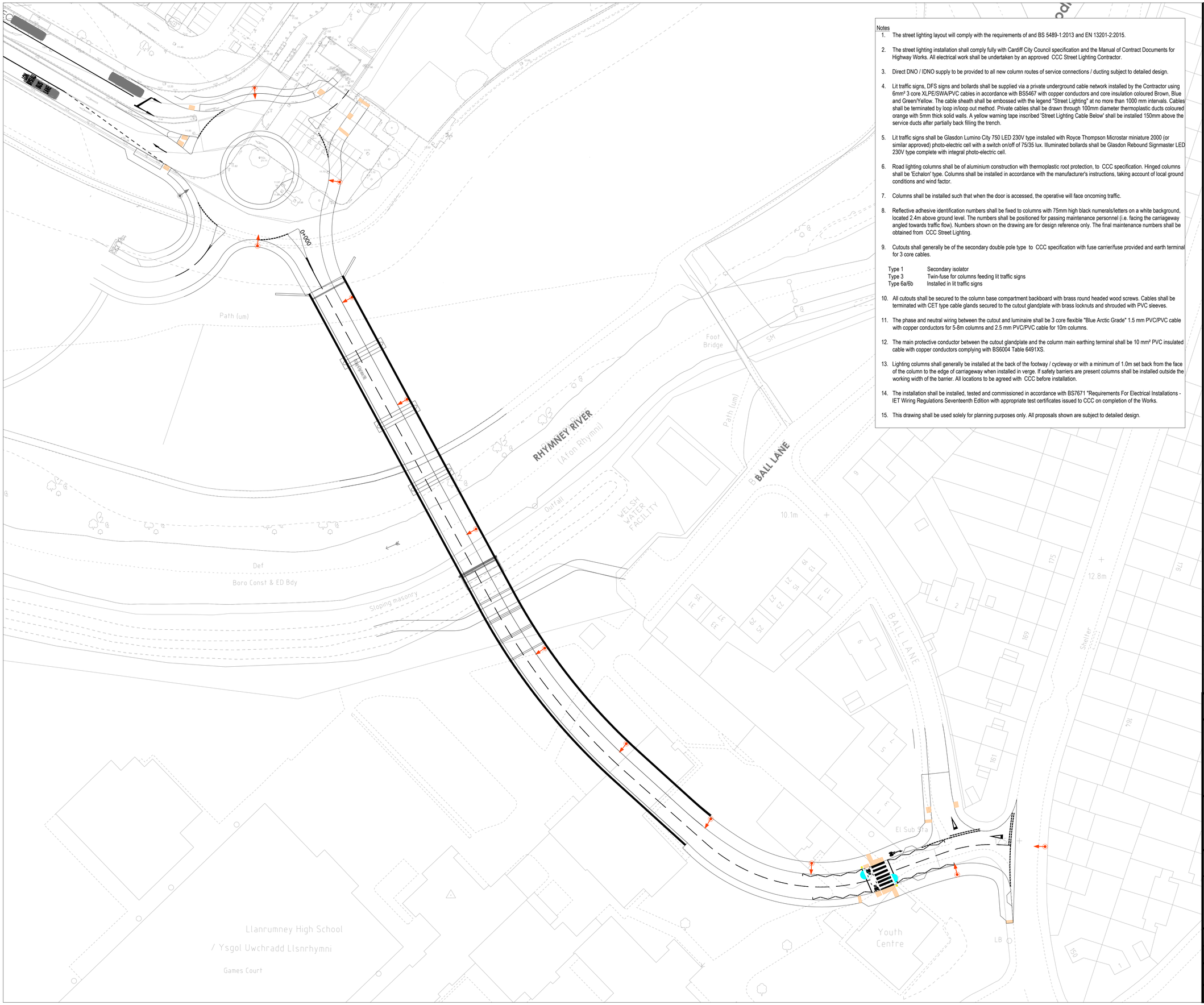
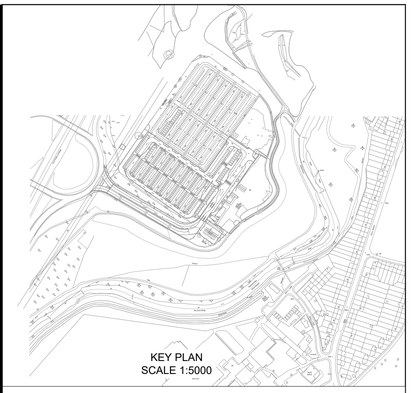


Notes

1. The street lighting layout will comply with the requirements of and BS 5489-1:2013 and EN 13201-2:2015.
2. The street lighting installation shall comply fully with Cardiff City Council specification and the Manual of Contract Documents for Highway Works. All electrical work shall be undertaken by an approved CCC Street Lighting Contractor.
3. Direct DNO / IDNO supply to be provided to all new column routes of service connections / ducting subject to detailed design.
4. Lit traffic signs, DFS signs and bollards shall be supplied via a private underground cable network installed by the Contractor using 6mm² 3 core XLPE/SWA/PVC cables in accordance with BS5467 with copper conductors and core insulation coloured Brown, Blue and Green/Yellow. The cable sheath shall be embossed with the legend "Street Lighting" at no more than 1000 mm intervals. Cables shall be terminated by loop in/loop out method. Private cables shall be drawn through 100mm diameter thermoplastic ducts coloured orange with 5mm thick solid walls. A yellow warning tape inscribed 'Street Lighting Cable Below' shall be installed 150mm above the service ducts after partially back filling the trench.
5. Lit traffic signs shall be Glasdon Lumino City 750 LED 230V type installed with Royce Thompson Microstar miniature 2000 (or similar approved) photo-electric cell with a switch on/off of 75/35 lux. Illuminated bollards shall be Glasdon Rebound Signmaster LED 230V type complete with integral photo-electric cell.
6. Road lighting columns shall be of aluminium construction with thermoplastic root protection, to CCC specification. Hinged columns shall be 'Echalon' type. Columns shall be installed in accordance with the manufacturer's instructions, taking account of local ground conditions and wind factor.
7. Columns shall be installed such that when the door is accessed, the operative will face oncoming traffic.
8. Reflective adhesive identification numbers shall be fixed to columns with 75mm high black numerals/letters on a white background, located 2.4m above ground level. The numbers shall be positioned for passing maintenance personnel (i.e. facing the carriageway angled towards traffic flow). Numbers shown on the drawing are for design reference only. The final maintenance numbers shall be obtained from CCC Street Lighting.
9. Cutouts shall generally be of the secondary double pole type to CCC specification with fuse carrier/fuse provided and earth terminal for 3 core cables.

Type 1	Secondary isolator
Type 3	Twin-fuse for columns feeding lit traffic signs
Type 6a/6b	Installed in lit traffic signs

10. All cutouts shall be secured to the column base compartment backboard with brass round headed wood screws. Cables shall be terminated with CET type cable glands secured to the cutout glandplate with brass locknuts and shrouded with PVC sleeves.
11. The phase and neutral wiring between the cutout and luminaire shall be 3 core flexible "Blue Arctic Grade" 1.5 mm PVC/PVC cable with copper conductors for 5-8m columns and 2.5 mm PVC/PVC cable for 10m columns.
12. The main protective conductor between the cutout glandplate and the column main earthing terminal shall be 10 mm² PVC insulated cable with copper conductors complying with BS6004 Table 6491XS.
13. Lighting columns shall generally be installed at the back of the footway / cycleway or with a minimum of 1.0m set back from the face of the column to the edge of carriageway when installed in verge. If safety barriers are present columns shall be installed outside the working width of the barrier. All locations to be agreed with CCC before installation.
14. The installation shall be installed, tested and commissioned in accordance with BS7671 "Requirements For Electrical Installations - IET Wiring Regulations Seventeenth Edition with appropriate test certificates issued to CCC on completion of the Works.
15. This drawing shall be used solely for planning purposes only. All proposals shown are subject to detailed design.



KEY PLAN
SCALE 1:5000

KEY

8M TAPERED ALUMINUM LIGHTING COLUMN COUPLED WITH DIMMABLE LED LUMINAIRE TO VOG / CCC APPROVED SPECIFICATION

PROPOSED SIMMONSIGNS MIDUBEL COMBINED BELISHA BEACON AND ROAD LIGHTING POST OF 6M NOMINAL HEIGHT WITH A POST TOP MOUNTED (AT 0° TILT) SIGNIFY LUMA GEN2 MINI BGP703 DPL1 NW LED LUMINAIRE WITH A 8.0KLM (DIMMED TO 60%) OUTPUT COMPLETE WITH ELECTRONIC DRIVER AND SIGNIFY CITY TOUCH CMS NODE. FULL COWELS TO BE FITTED.

Rev.	Date	Description	By	Eng' Ch'k	Darc' Ch'k	App'd
P02	28/11/25	UPDATED FOR NOVEMBER 2025 PLANNING APPLICATION SUBMISSION	VL	VL	GW	GW

Suitability: FOR PLANNING
Status: -

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CF10 4BZ, UK

T+ 44 (0) 292 076 9200
wsp.com

Client: CARDIFF CAERDYDD

Project Title: CARDIFF EAST PARK AND RIDE

Drawing Title: LLANRHYMNEY PARK AND RIDE
HIGHWAY LIGHTING & SIGNALS

Scale	Drawn	Eng. Check	Approved
AS SHOWN	KKR	SID	GW
Original Size	Date	Date	Date
A1	17/03/2022	27/10/22	27/10/2022

Drawing Number: 70071035-WSP-XX-XX-CE-DR-1300
Design Stage: -
Revision: P02

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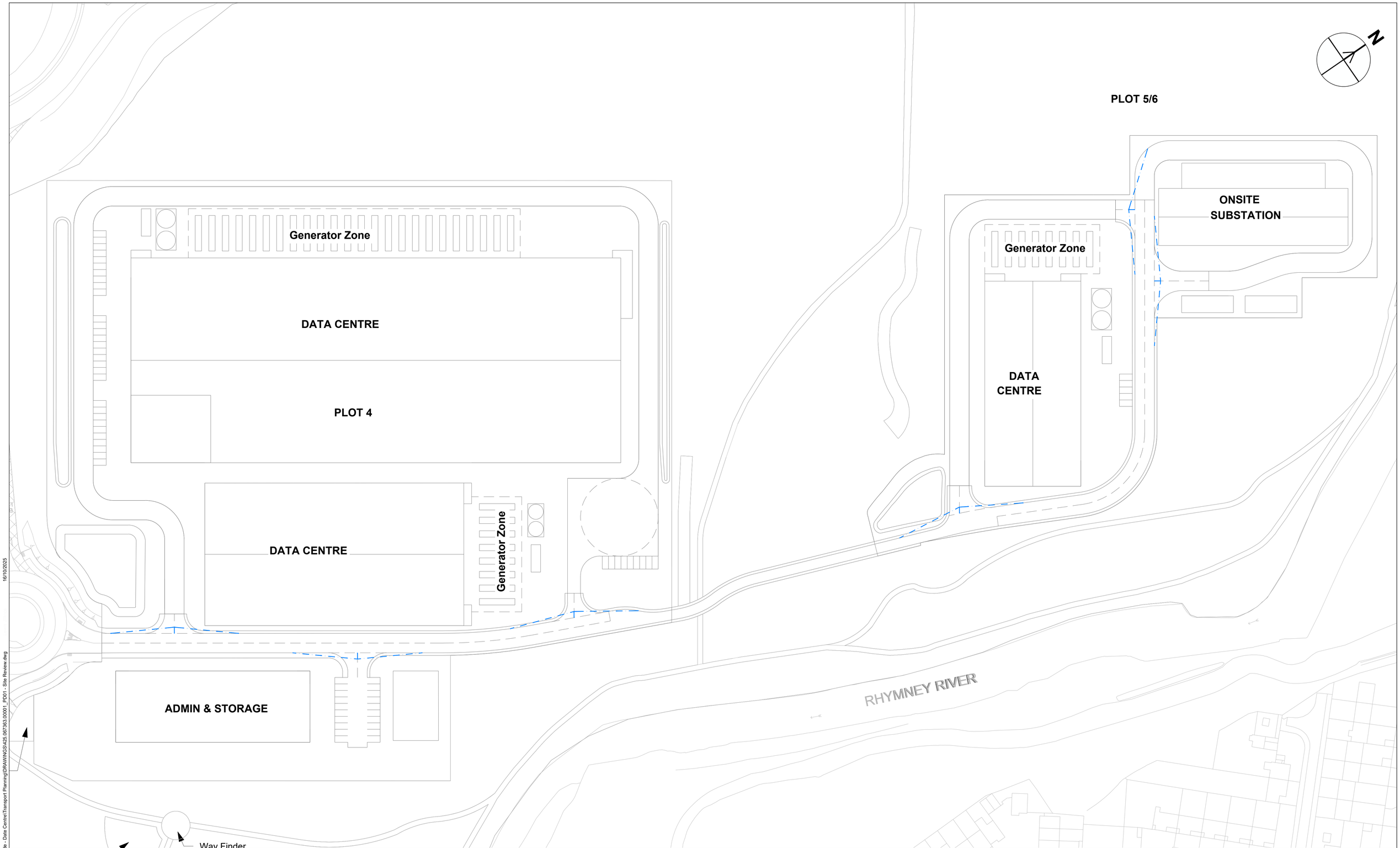


16/10/2025

X:\Projects\250000\425.067363.00001 - Pentwyn Park & Ride - Date Centre\Transport Planning\DRAWINGS\425.067363.00001 - PD01 - Site Review.dwg

SLR

www.slrconsulting.com

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Status & Suitability Code:

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date: 15.10.25	Date: 15.10.25	Date: 15.10.25	Date: 15.10.25

Drawing Title: Proposed Plots 4, 5 & 6 Visibility Assessment

Drawing Number: PD01 | Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

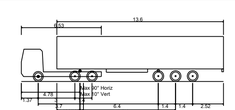
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

2.4 x 25m Visibility Splay (20 mph MFS)



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

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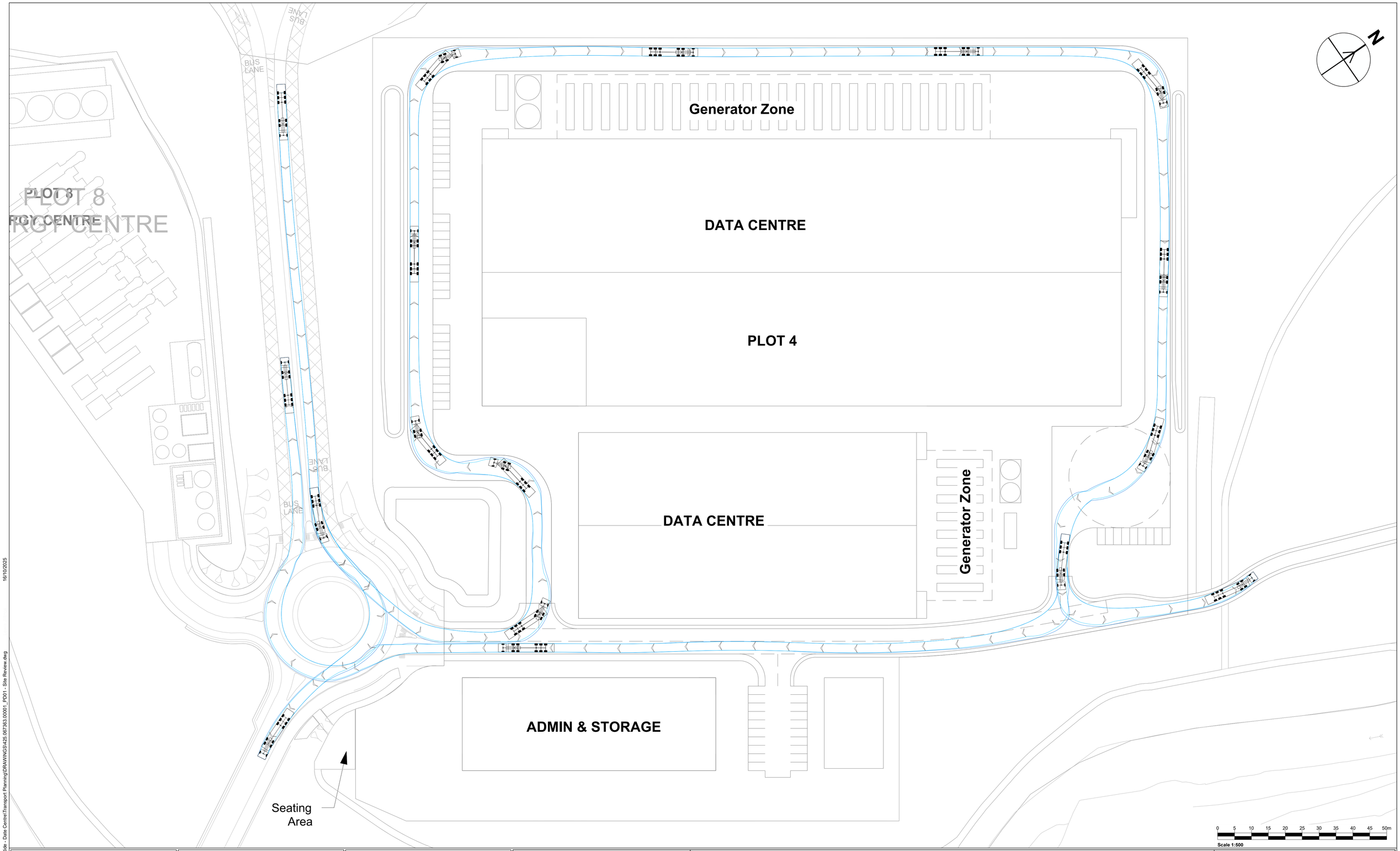


SLR	Client: Curtis Hall Ltd		
www.slrconsulting.com	Project: Pentwyn Park & Ride		
Drawing Status & Suitability Code			
Designed: LJ / Date: 15.10.25	Drawn: LJ / Date: 15.10.25	Checked: ST / Date: 15.10.25	Authorised: ST / Date: 15.10.25
Drawing Title: Swept Path Analysis - 16.5m HGV Plot 4 Access			
Drawing Number: PD01_AT01	Rev.	Scale: 1:500 @ A1	SLR Project No.: 425.067363.00001

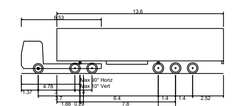
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

Vehicle Detail:



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

16/10/2025

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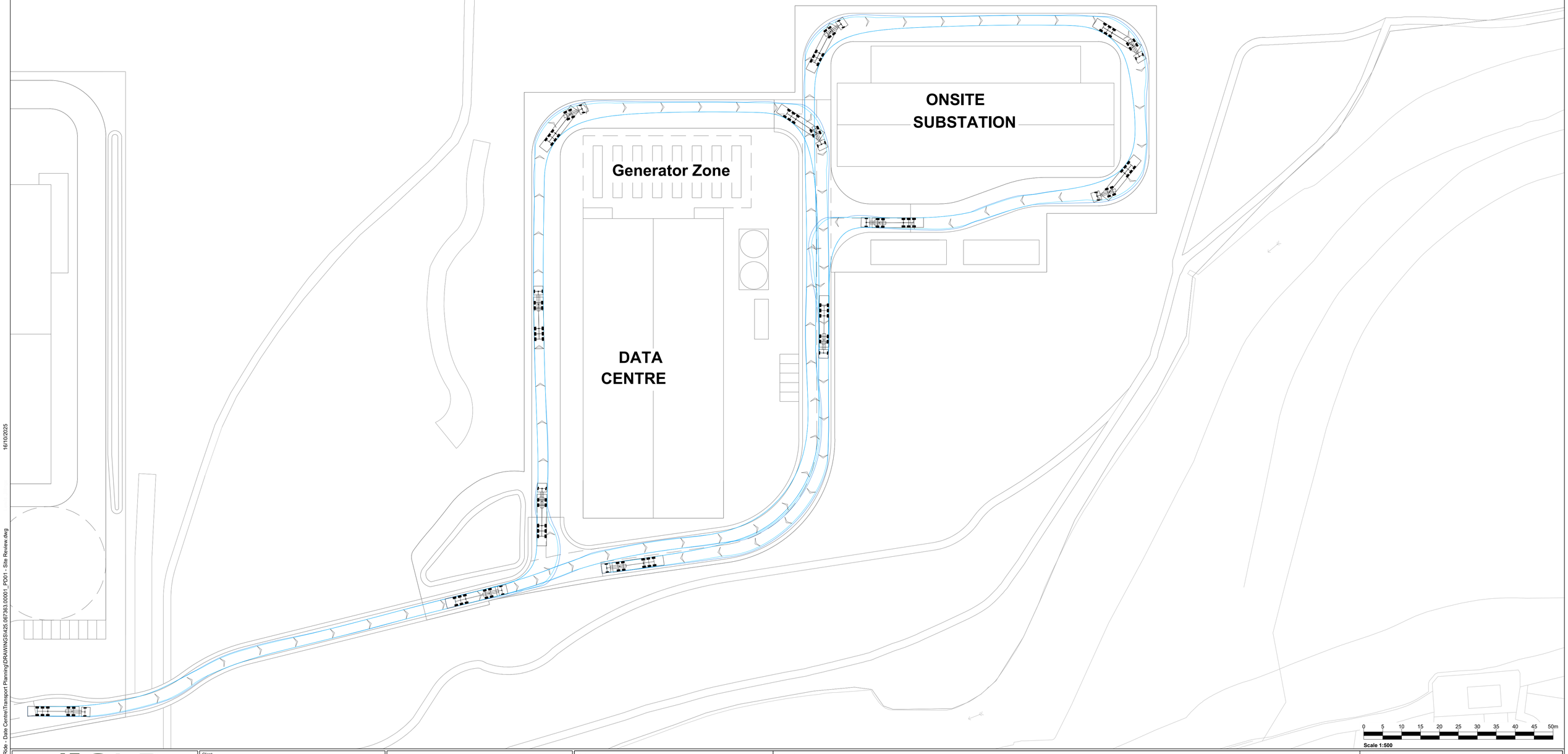
PLOT 5/6



0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

SLR	Client: Curtis Hall Ltd	Notes:	Vehicle Detail:
www.slrconsulting.com	Project: Pentwyn Park & Ride	Legend:	
Drawing Status & Suitability Code			
Designed: LJ / Drawn: LJ / Checked: ST / Authorised: ST	Drawing Title: Swept Path Analysis - 16.5m HGV Plot 5/6 Access		
Date: 15.10.25 / 15.10.25 / 15.10.25 / 15.10.25			
Drawing Number: PD01_AT02 / Rev.	Scale: 1:500 @ A1 / SLR Project No.: 425.067363.00001		

1. This is not a construction drawing and is intended for illustrative purposes only.
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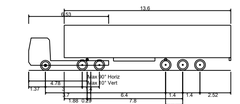

Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

Rev	Amendments	Date	By	Chk	Auth

16/10/2025

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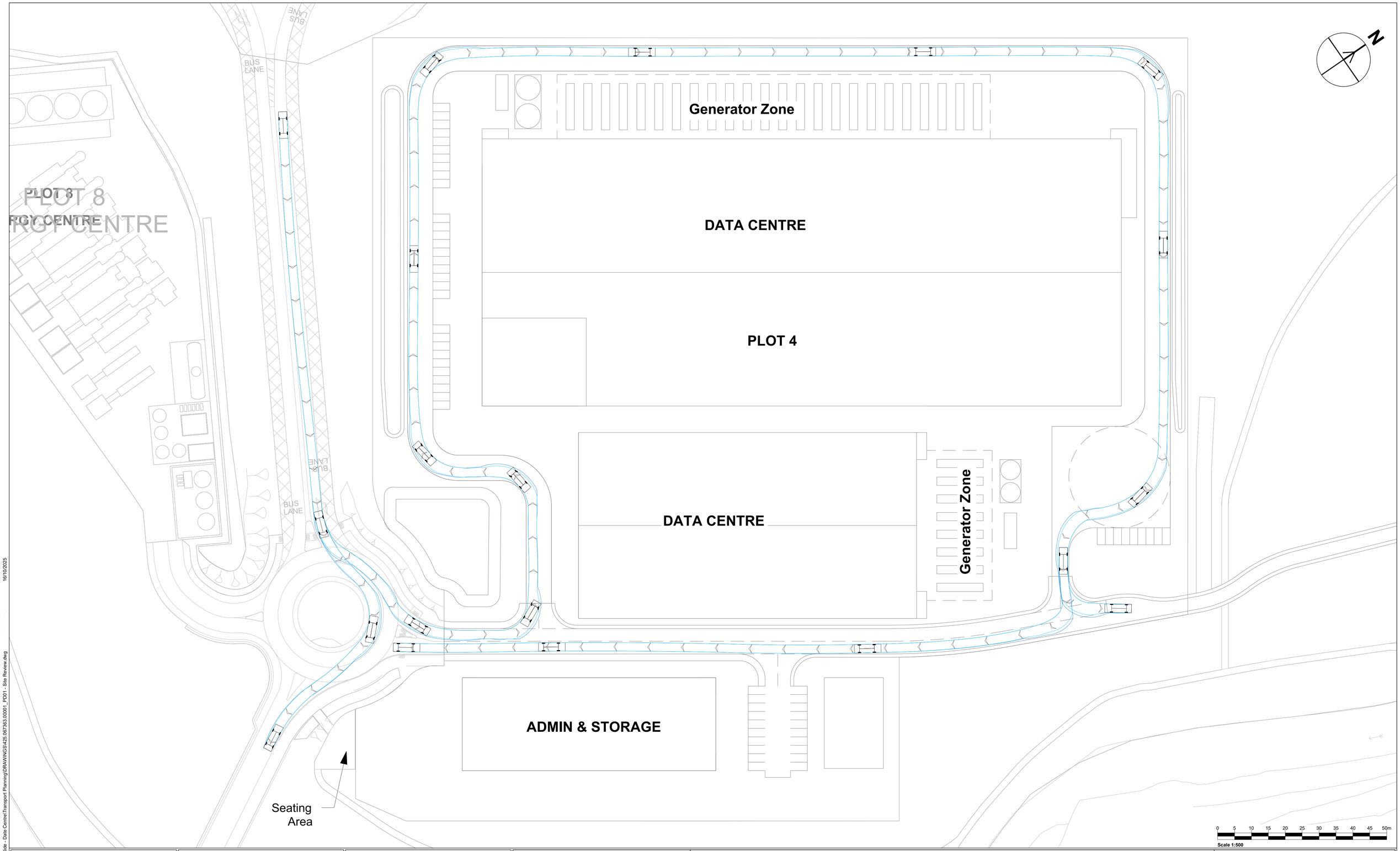


SLR

www.slrconsulting.com

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Status & Suitability Code:

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date: 15.10.25	Date: 15.10.25	Date: 15.10.25	Date: 15.10.25

Drawing Title: Swept Path Analysis - Fire Tender
Plot 4 Access

Drawing Number: PD01_AT03

Rev.:

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

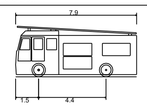
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

Vehicle Detail:



Pumping Appliance	
Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

16/10/2025

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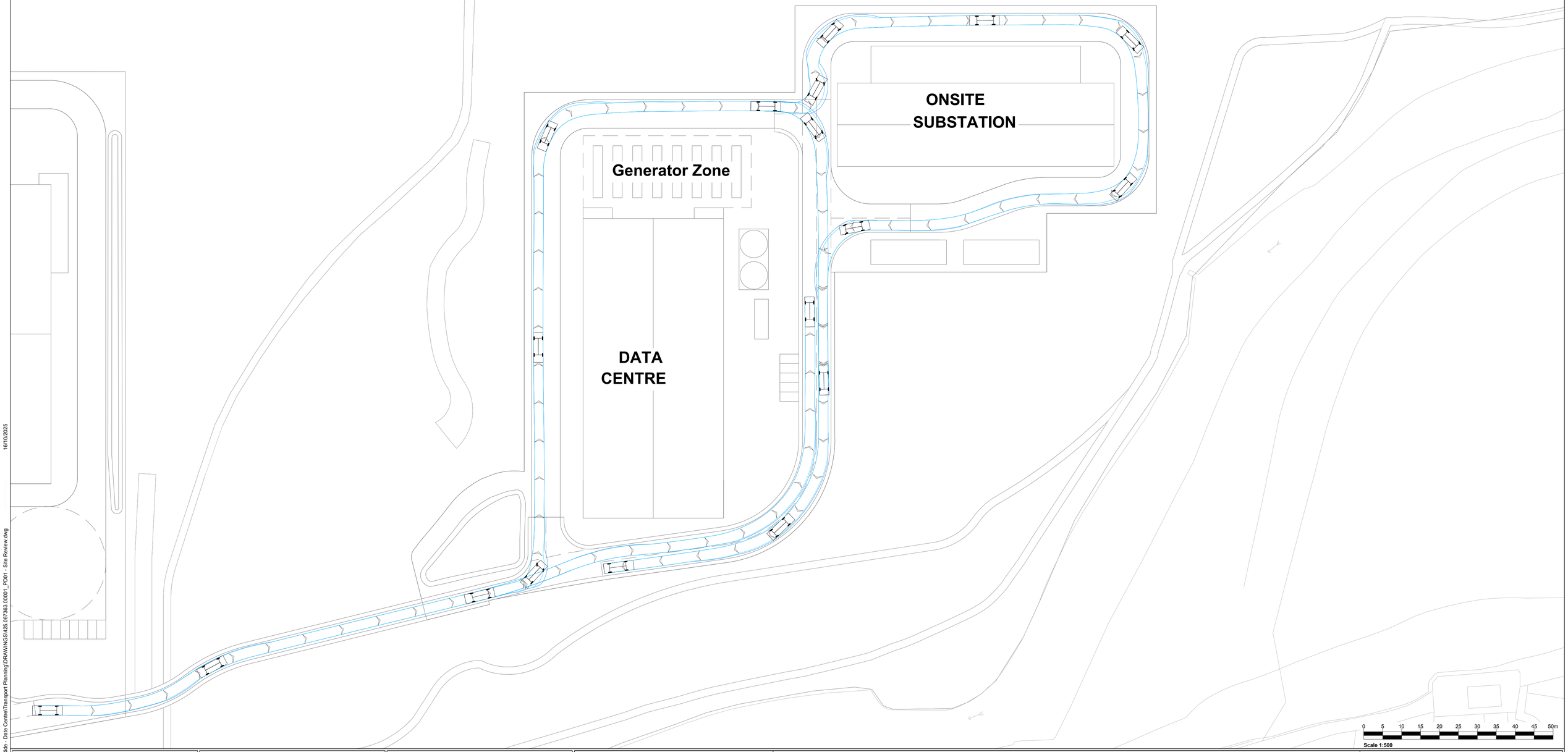
PLOT 5/6



0 5 10 15 20 25 30 35 40 45 50m

Scale 1:500

16/10/2025

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SLR

www.slrconsulting.com

Drawing Status & Suitability Code

Designed	Drawn	Checked	Authorised
LJ	LJ	ST	ST
Date 15.10.25	Date 15.10.25	Date 15.10.25	Date 15.10.25

Drawing Number: **PD01_AT04** Rev.

Client: Curtis Hall Ltd

Project: Pentwyn Park & Ride

Drawing Title: Swept Path Analysis - Fire Tender
Plot 5/6 Access

Scale: 1:500 @ A1

SLR Project No.: 425.067363.00001

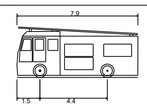
Rev	Amendments	Date	By	Chk	Auth

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Legend:

Vehicle Detail:



Pumping Appliance

Overall Length	7.900m
Overall Width	2.500m
Overall Body Height	3.300m
Min Body Ground Clearance	0.140m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	7.750m

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Appendix F Sample Workplace Travel Survey

Travel Plan

Cardiff East Park and Ride, Llanrumney

Curtis Hall Limited (Ltd.)

SLR Project No.: 425.067363.00001

1 December 2025

Employee Travel Survey

All information provided is anonymous. Thank you for you cooperation.

Q1 Full home postcode: ……

Q2 Gender:

- Male ☐
- Female ☐

Q3 Are you:

- Full Time ☐
- Part Time ☐

Q4 Age:

- Under 25 ☐
- 25 -34 ☐
- 35 – 44 ☐
- 45 – 54 ☐
- 55 or over ☐

Q5 Do you have any disability which affects your travel arrangements?

- Yes ☐
- No ☐

Q6 How do you usually travel to work?

- Bus ☐
- Bicycle ☐
- Car driver (on your own) ☐
- Car driver (with a passenger) ☐
- Car passenger ☐
- Walk ☐
- Motorcycle / Moped / Scooter ☐
- Train ☐
- Other …….

Q7 If you drive to work where do you normally park?

- Staff Car Park ☐
- Nearby Street ☐
- Other ……. ☐

Q8 How often do you travel to and from work by the mode of transport specified in Question 6?

- 5 or more times a week ☐
- 2-4 times a week ☐
- Once a week ☐
- Less than once a week ☐

Q9 Which of the following do you occasionally use instead of your usual form of transport?

- Bus ☐
- Bicycle ☐
- Car driver (on your own) ☐
- Car driver (with a passenger) ☐
- Car passenger ☐
- Walk ☐
- Motorcycle / Moped / Scooter ☐
- Train ☐
- Other …….
- No alternative used ☐

Q10 How far away is your residence from work approximately?

- 0-1 mile ☐
- 1-2 miles ☐
- 2-5 miles ☐
- 5-10 miles ☐
- 10+ miles ☐

Q11 How long does it usually take for you to travel to and from work?

	To work	From work
0 – 15 min	☐	☐
16 – 30 min	☐	☐
31 – 60 min	☐	☐
61 – 90 min	☐	☐
Over 90 min	☐	☐

Q12 If you regularly come to work by car what is you main reason?

- Get a lift ☐
- Health reasons ☐
- Lack of an alternative ☐
- Convenience ☐
- Car essential to perform job ☐
- Dropping off / collecting children ☐
- Personal safety ☐
- Car cheaper than public transport ☐

Q13 Are you prepared to car share?

Yes – Individually (or already do)	☐
Yes – should an in-house scheme exist	☐
No	☐

Q15 Which of the following changes would encourage you to cycle to work? (If you already do cycle which would you most like to see?)

Safer, better lit cycle routes	☐
Improved cycle parking near site	☐
Improved/ provision of showers on site	☐
Discount or loan to buy a bike	☐
Cycle training to improve skills	☐
Other …….	
Nothing	☐

Q16 Which of the following would encourage you to use the bus to travel to work? (If you already use the bus which would you most like to see?)

More frequent services	☐
More reliable services	☐
Improved public transport information	☐
Improved pedestrian conditions around bus stops	☐
Bus stops within closer proximity to home / work	☐
Cleaner and more comfortable buses	☐
Improved facilities at bus stops	☐
Cheaper / subsidised fares	☐
Other ……	
None	☐

Q17 Which of the following would encourage you to use the train to travel to work? (If you already use the train which would you most like to see?)

More frequent services	☐
More reliable services	☐
Improved public transport information	☐
Improved pedestrian conditions around train station	☐
Train stations within closer proximity to home	☐
Cleaner and more comfortable trains	☐
Improved facilities at train stations	☐
Cheaper / subsidised fares	☐
Other ……	
None	☐

Q18 Do you have any comments about your travel to work?

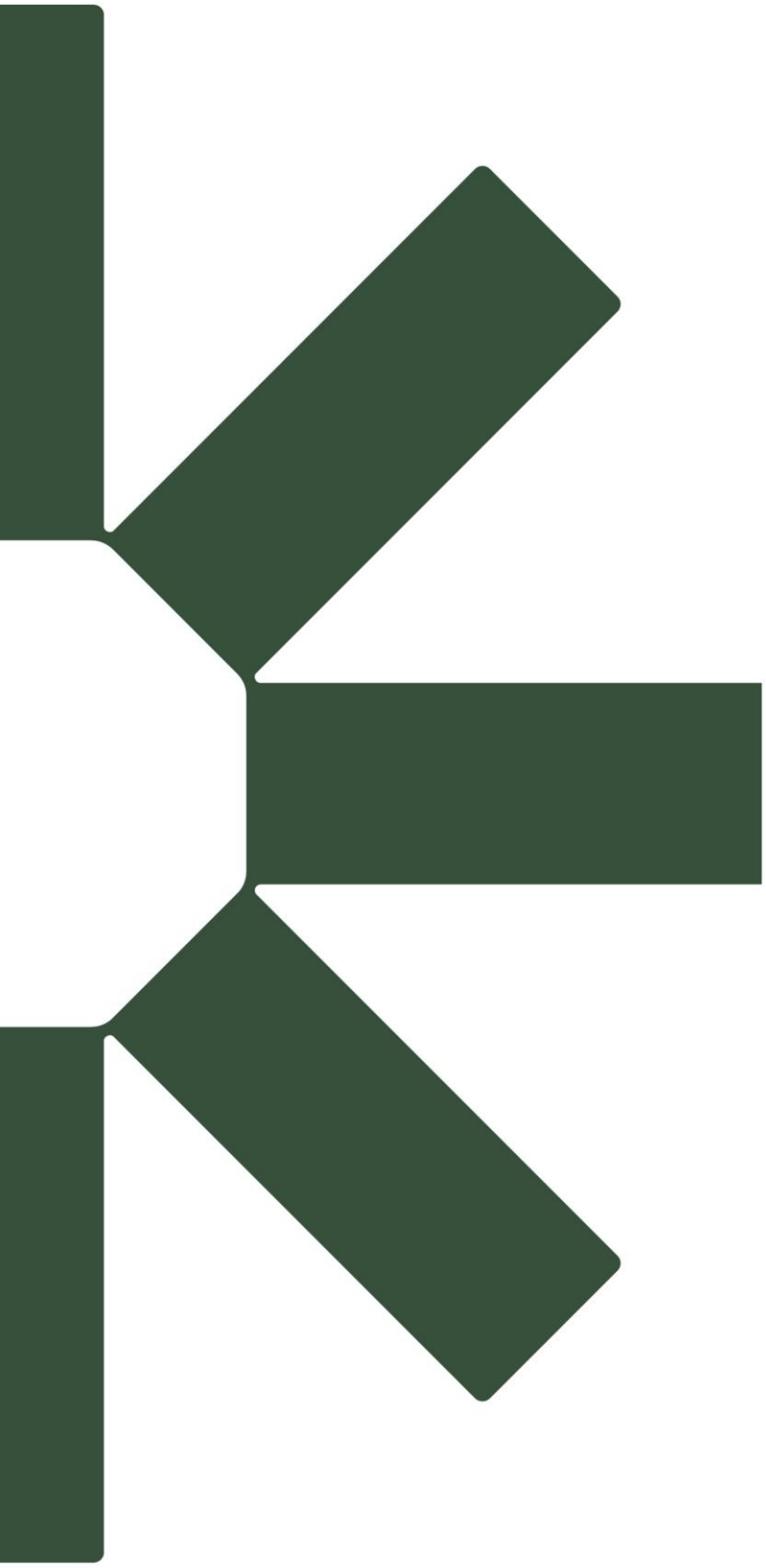
……..

……..

……..

……..

……..



Making Sustainability Happen

Appendix 11.1 Schedule of Mitigation Measures in the ES

Summary of Proposed Mitigation Measures

Impact	Mitigation and Monitoring	Means of Securing
Vol I Chapter 4: Air Quality		
Construction	• Adherence to IAQM good practice measures	• To be secured through suitably worded planning condition
Operational	• Implementation and adherence to Travel Plan	• To be secured through suitably worded planning condition
Vol I Chapter 5: Ecology and Biodiversity		
Construction effects	• Mitigation identified as a result of the Stage 2 (Appropriate Assessment) of the HRA; • Adherence to the CEMP, including TPOs; • Implementation of WMP and ISMP; • Additional surveys of T8, T9, T12 and T13; • Pre-works checks by an ECoW; • Installation of bat boxes; • Pre-works check within 48 hours prior to vegetation clearance (if outside main breeding season); • Detailed pre-works check prior to works, with work to proceed within following 24 hours; • Adherence to the future Green infrastructure and Landscape Ecological Management Plan	• To be secured through suitably worded planning condition • To be secured through grant of appropriate license from NRW

Impact	Mitigation and Monitoring	Means of Securing
	(GILEMP) (e.g. species rich habitat mosaics to provide a resource for a range of species); • Pre-works check to be carried immediately prior to works; • Adherence to the PMoW; • Installation of otter ledges; • Vegetation clearance in the presence of an ECoW; • Pre-clearance mat deployment, hand searches, and destructive searches prior to topsoil removal; • Implementation of Reptile Mitigation Strategy; • Exclusion zones around setts; • Off-Site Dormouse Habitat Planting Area along with 50 dormouse nest boxes, dormouse bridges, vegetation clearance in accordance with dormouse EPSL; • Long term habitat and dormouse monitoring.	
Operational effects	• On-site containment, treatment and controlled discharge of fire-water using industry best practice systems to prevent uncontrolled release; • Implementation of WMP; • Implementation of dormouse EPSL; • Implementation of GILEMP; • Implementation of Reptile Mitigation Strategy; • Implementation of Lighting Strategy; • Sensitive habitat management during operation.	• To be secured through suitably worded planning condition • To be secured through grant of appropriate license from NRW
Vol I Chapter 6: Landscape and Visual Impact		
Landscape and visual effects	• Adherence to the Landscape Strategy Plan (BCA drawing 2190/21-40)	• To be secured through suitably worded planning condition
Vol I Chapter 7: Socio-Economics		

Impact	Mitigation and Monitoring	Means of Securing
Construction effects	• No mitigation action required but increase in employment during construction could be enhanced through the use of local businesses and offering local training/employment initiatives.	
Vol I Chapter 8: Transport		
Construction Effects	• Adherence to the CEMP	• To be secured through suitably worded planning condition
Operational effects	• Implementation of the Travel Plan	• To be secured through suitably worded planning condition
Vol I Chapter 9: Water Resources and Flood Risk		
Please refer to Chapter 9 of the Environmental Statement.		
Vol I Chapter 10: Climate Change		
Construction Effects	• Adherence to the CEMP, CTMP, SWMP, and MMP	• To be secured through suitably worded planning condition
Operational Effects	• Monitoring of operational energy usage	• To be secured through suitably worded planning condition