
Rhydycar West, Merthyr Tydfil

Response to Merthyr Tydfil County Borough Council

784-B023905

For Information

Rhydycar West

November 2023

Document prepared on behalf of Tetra Tech Limited. Registered in England number: 01959704



DOCUMENT CONTROL

Document:	Response to Merthyr Tydfil County Borough Council
Project:	Rhydycar West, Merthyr Tydfil
Client:	Rhydycar West
Project Number:	784-B023905
File Origin:	\\lds-dc-vm-101\Data\Projects\784-B023905 Rhydycar West Restart\B023905 Transport\40 Reports\784-B023905 231113 Response to MTCBC.docx

Revision:	00001	Prepared by:	BM
Date:	November 2023	Checked by:	AP
Status:	Draft	Approved By:	AP
Description of Revision:	Draft for Client Review		

Revision:		Prepared by:	
Date:		Checked by:	
Status:		Approved By:	
Description of Revision:			

Revision:		Prepared by:	
Date:		Checked by:	
Status:		Approved By:	
Description of Revision:			

Revision:		Prepared by:	
Date:		Checked by:	
Status:		Approved By:	
Description of Revision:			

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1.0 INTRODUCTION

BRIEF

- 1.1 Tetra Tech has been commissioned to act as the transport and highways consultant in support of a planning application for land west of the A470 and to the south of the village of Heolgerrig in Merthyr Tydfil County Borough Council (MTCBC).
- 1.2 Planning Application P/23/0065 proposes the development of:
 - 39,200 sqm Indoor Snowdome.
 - 7,500 sqm Water Park.
 - 27,400 sqm Hotel (418 beds).
 - 24,000 sqm Indoor / Outdoor Activity Centre; and,
 - 30 Forest Lodges (up to 2,000 sqm).
- 1.3 Merthyr Tydfil County Borough Council (MTCBC) appointed Mott MacDonald to prepare a comprehensive, independent review of the Transport Assessment and Travel Plan prepared in support of Application P/23/0065.
- 1.4 Following their review, MTCBC have raised a highway objection for the following reasons:
 - **Point 1:** The proposed secondary emergency access is sub-standard, and its use would result in traffic hazards to the detriment of highway safety and the free flow of traffic.
 - **Point 2:** Insufficient information has been submitted to demonstrate that the proposed off-street parking provision of 830 spaces for vehicles is sufficient to meet the development's demands at peak times, resulting in the potential for on-street parking demand in the vicinity to the detriment of highway safety and the free flow of traffic.
- 1.5 This report has been prepared to provide technical information to address the matters raised by MTCBC.

2.0 SITE ACCESS

INTRODUCTION

2.1 This chapter provides information to address **Point 1**.

SINGLE ACCESS STRATEGY

- 2.2 The car park will be served through an extension of the western arm of the A470 / A4102 roundabout. The A470 forms part of the strategic road network and is under the management of Welsh Government. The connection to the A470 / A4102 roundabout has been designed in accordance with DMRB CD116.
- 2.3 The site access road will connect the internal network of the site to the A470 / A4102 will not be adopted and as such has been designed assuming a 30-mph design speed in accordance with MfS and MfS2. The proposed access arrangement is provided at **Appendix A**.

EMERGENCY SITE ACCESS

- 2.4 Due to the site operating under a single access strategy, a designated emergency access is proposed as part of the scheme. This access leads from an unnamed road under the A470 and connects to Dragon Parc Road serving the Abercanaid Industrial Estate, linked to the Merthyr Road / Pentrebach Road roundabout.
- 2.5 Swept Path Assessments were conducted to validate the carriageway's suitability for emergency vehicles. The assessment affirms the safe passage of fire engines on the emergency access, including turning movements to and from the public highway. The A470 bridge has a 4.2m clearance, which can accommodate 3.3m high fire engines. The Swept Path Assessments are provided at **Appendix B**.
- 2.6 This access is exclusively reserved for emergency use and is not intended for use by employee or customer vehicles. It is premature to confirm how the access will be managed, but it will likely be through a gate or bollard that will be able to open by the emergency services. The details of this can be secured by planning condition.

SUMMARY

- 2.7 The request for additional information outlined in Point 1 has been fulfilled. The information submitted confirms that the proposed secondary emergency access has an appropriate layout, and its usage will not pose traffic hazards that could compromise highway safety or impede the flow of traffic.

3.0 REVIEW OF TRIP GENERATION

INTRODUCTION

- 3.1 This chapter provides information to address **Point 2** and delves into the methodology presented in the Transport Assessment. It also presents the results of a validation exercise, which informed the fundamental approach to trip generation and advice on predicted car park operation. For the purpose of assessment, the Assessment 1 dataset has been discussed, which advises on the forecast operation of the development scheme.

TRIP GENERATION METHODOLOGY

- 3.2 The Transport Assessment provides a comprehensive methodology for estimating the volume of trips anticipated from the site. The TRICS database was used to calculate the expected trip volume for the development proposal, where appropriate. Due to the unique features of some of the on-site facilities within the development scheme, a first-principles approach was necessary to determine trip levels for some elements of the development.
- 3.3 The TRICS database was used to calculate forecast trips for the following elements of the development:
- Hotels; and,
 - Forest Lodges.
- 3.4 A first-principles approach was used for the following onsite facilities, due to the bespoke nature of these elements with their type not being included within the TRICS database.
- Snow Centre.
 - Water Park; and,
 - Indoor / Outdoor Activity Centre.
- 3.5 The first-principles approach for considering how many trips these facilities could attract was derived from two sources of information:
- 1) Customer and staff forecasts provided by Rhydyar West for the Snow Centre, Water Park, and Indoor / Outdoor Activity Centre. This information is derived from the Business Case for the scheme, which is informed from similar facilities across the world.
 - 2) A review of information against material submitted in support of Application S/OUT/15/0943. Application S/OUT/15/0943 used customer data obtained from Snozone Milton Keynes and Snozone Castleford and is a consented scheme. This dataset was used to audit the first-principles process from a highway planning perspective, to conclude whether the Business Case information provided by Rhydyar West would be representative of tourism related travel behaviour in Great Britain.
- 3.6 It is important to acknowledge that the facilities outlined in **paragraph 3.4** are expected to attract visitors from both local and national catchments. In our modelling study of this specific area, we have consolidated these movements to evaluate their impact on the local community, with a specific

emphasis on Merthyr Tydfil, site access points, and the car park. This is especially pertinent as the site will also feature a hotel and forest lodges, which will further expand the catchment area for trips generated, both locally and more broadly, in the long term.

FIRST-PRINCIPLES TRIP RATE VALIDATION EXERCISE

Snow Centre Customer Trip Movements

- 3.7 A review has been undertaken to advise on the suitability of the forecast volume of traffic generated by the site against consented material. This review was assessed using data consented under Application S/OUT/15/0943.
- 3.8 Application S/OUT/15/0943 used trip data obtained from Snozone Milton Keynes and Snozone Castleford and was calculate against a customer attraction of 210,000 customers per annum. The customer trip profile for the scheme is outlined at **Table 3.1**.

Table 3.1 – Application S/OUT/15/0943: Snow Centre Swindon Customer Trip Rate

Snow Centre Swindon Annual Customer Forecast	Based upon Submitted 210,000 Customers per Annum	
Average Month Customers	8.33% of annual customers	17,493 customers
Weekly Customers	25.0% of monthly customers	4,373 customers
Busiest Weekday (Friday)	13.3% of weekly customers	582 customers
Busiest Day (Saturday)	25.4% of weekly customers	1,111 customers
Size of Development (sqm)	15,800sqm	
Weekday Daily Trip Rate	Per 100 sqm	3.68 trips per 100 sqm
Weekend Daily Trip Rate	Per 100 sqm	7.03 trips per 100 sqm

- 3.9 **Table 3.1** outlines that the snow centre is expected to generate 3.68 customer trips per 100 sqm during the average weekday and 7.03 customer trips per 100 sqm on an average weekend.
- 3.10 The methodology consented under c was used to determine the volume of daily trips generated by the developments Snow Centre, which is forecast by Rhydycar West to attract 750,000 customers per annum. The customer trip profile for the scheme is outlined at **Table 3.2**.

Table 3.2 – Rhydyar West: Snow Centre Forecast Customer Trip Rate using Application S/OUT/15/0943 Methodology

Rhydyar West Annual Visitor Forecast	750,000 visitors	
Average Month Visitors	8.33% of annual visitors	62,475 visitors
Weekly Visitors	25.0% of monthly visitors	15,619 visitors
Busiest Weekday (Friday)	13.3% of weekly visitors	2,077 visitors
Busiest Day (Saturday)	25.4% of weekly visitors	3,967 visitors
Size of Development (sqm)	39,200 sqm	
Weekday Daily Trip Rate	Per 100 sqm	5.30 trips per 100 sqm
Weekend Daily Trip Rate	Per 100 sqm	10.12 trips per 100 sqm

- 3.11 **Table 3.2** outlines that the snow centre for the development scheme is expected to generate 5.30 customer trips per 100 sqm during the average weekday and 10.12 customer trips per 100 sqm on an average weekend.
- 3.12 Upon reviewing the materials submitted under Application S/OUT/15/0943, it was identified that the profiles considered only a 4-week month when calculating weekly visitor movements, despite there being 52 weeks in a year, with February being the exception with its 4-week (28-day) month. To rectify this, the datasets were adjusted using a factor of 4.3 to better represent the number of weeks in a year. The resulting data is presented in **Table 3.3**.

Table 3.3 – Rhydyar West: Snow Centre Forecast Customer Trip Rate using Factored Application S/OUT/15/0943 Methodology

Rhydyar West Annual Visitor Forecast	750,000 visitors	
Average Month Visitors	8.33% of annual visitors	62,475 visitors
Weekly Visitors	23.25% of monthly visitors	14,423 visitors
Busiest Weekday (Friday)	13.3% of weekly visitors	1,920 visitors
Busiest Day (Saturday)	25.4% of weekly visitors	3,689 visitors
Size of Development (sqm)	39,200 sqm	
Weekday Daily Trip Rate	Per 100 sqm	4.93 trips per 100 sqm
Weekend Daily Trip Rate	Per 100 sqm	9.41 trips per 100 sqm

- 3.13 **Table 3.2** outlines that the snow centre for the development scheme is expected to generate 4.93 customer trips per 100 sqm during the average weekday and 9.41 customer trips per 100 sqm on an average weekend.
- 3.14 The first-principles approach employed for calculating the operations of the Snow Centre results in higher trip generation figures per 100 sqm when compared to the trip rate approved under Application S/OUT/15/0943.

Vehicle Trip Movements

- 3.15 Application S/OUT/15/0943 assumed that all visitors would arrive by car, with a car occupancy rate of 2.0 people per vehicle. The vehicle trip rate consented under Application S/OUT/15/0943 is outlined at **Table 3.4**.

Table 3.4 - Application S/OUT/15/0943: Snow Centre Swindon Customer Vehicle Trip Rate

Customer Movements	
Weekday Daily	3.68 trips per 100 sqm
Weekend Daily	7.03 trips per 100 sqm
Customer Vehicle Movements (50% Car Drivers)	
Weekday Daily	1.84 vehicle trips per 100 sqm
Weekend Daily	3.52 vehicle trips per 100 sqm

- 3.16 **Table 3.4** illustrates that Application S/OUT/15/0943 has been consented using a vehicle trip rate of 1.84 vehicle trips per 100 sqm during a weekday in an average period, and 3.52 vehicle trips per 100 sqm during a weekend in an average period.
- 3.17 As Application S/OUT/15/0943 is in England and utilises datasets from English planning applications, it was deemed inappropriate to estimate travel behaviour for the site without incorporating Welsh travel data.
- 3.18 Since data from the 2021 Census was unavailable for assessment, we identified the 2012 National Travel Survey dataset titled 'Average distance travelled by purpose and main mode: Great Britain, 2012' as the most suitable option. This dataset was chosen because it includes travel behaviour information for leisure journeys categorised by travel mode. Given that the Rhydyar West site is a unique leisure and tourism complex, this dataset was deemed the most appropriate for understanding how people in Wales access various leisure activities. This dataset advised that 84% of customers would access the site by car, which would comprise 41% car drivers and 43% as car sharers.
- 3.19 The dataset underwent a review in comparison to the local area's transportation options. The site benefits from accessible walking and cycling connections, making it feasible for approximately 3% of customers to access the site by walking, cycling, and utilising a bus as part of their journey. An additional 1% was projected to travel by motorcycle.
- 3.20 However, due to the railway station's distance from the site and the segregation created by the A470, it was considered unlikely that 10% of customers would choose rail as their mode of transportation. This would involve continuing their journey through a combination of taxi, bus, and walking to reach the site. Therefore, the 10% rail mode share was halved to 5%, and the reallocated 5% was assigned to car drivers. As a result, 89% of customers were expected to access the site by car, comprising 44% as car drivers and 45% as car sharers.
- 3.21 This approach was undertaken to make sure a robust approach was taken to quantify car demand to the site, thus making sure that the car park can operate should demand spike for any reason. This amendment will not change the wider strategy for the site, which will be to support customers in their travel choices and encourage travel by non-car modes, including by rail.

- 3.22 It should be noted that one of the development objectives for the scheme is to implement a dedicated shuttle bus service. This service will be used to transport staff and visitors from Merthyr Tydfil to the site, ensuring their safe arrival. The shuttle service will include a stop at the railway station, and it plays a pivotal role in the Travel Plan by promoting the use of the railway for traveling to and from the site. While the specific details of the shuttle bus strategy for the site are not finalised, the principles of the service (including that it will be free to use for staff and customers) are set out in the Transport Assessment and Framework Travel Plan and the applicant has committed to its provision, to be secured via a Planning Condition/Obligation.
- 3.23 The resultant vehicle mode share for the scheme is outlined at **Table 3.5**.

Table 3.5 – Rhydyar West: Snow Centre Forecast Customer Vehicle Trip Rate

Average Period	
Customer Movements	
Weekday Daily	4.93 trips per 100 sqm
Weekend Daily	9.41 trips per 100 sqm
Customer Car Movements (44% Car Drivers)	
Weekday Daily	2.17 vehicle trips per 100 sqm
Weekend Daily	4.14 vehicle trips per 100 sqm

- 3.24 **Table 3.5** illustrates that Rhydyar West has used a vehicle trip rate of 2.17 vehicle trips per 100 sqm during a weekday in an average period, and 4.14 vehicle trips per 100 sqm during a weekend in an average period.
- 3.25 The first-principles approach employed for calculating the operations of the Snow Centre results in higher figures per 100 sqm when compared to the trip rate approved under Application S/OUT/15/0943.

Validation Assessment Outcome

- 3.26 The validation exercise indicates that the trip rates used by the development scheme exceed those approved in Application S/OUT/15/0943. Consequently, the first-principles trip rates for calculating Snow Dome customer movements are deemed suitable.
- 3.27 The Water Park and Indoor/Outdoor Activity Centre, much like the Snow Dome, are expected to draw visitors from across the country. Since survey data for such unique leisure facilities is lacking, it is appropriate to utilise the Snow Dome's first-principles approach to deriving trip rates, given their similarity as leisure destinations.
- 3.28 Trip generation data for the hotel and forest lodges was sourced from the TRICS database, encompassing information on customers, visitors, and staff lengths as indicated in the survey outputs.
- 3.29 A decision was made to not discount instances of double counting, including cross-link trips, and transferred trips between all the facilities outlined at paragraph 3.4. This approach was adopted to

introduce a level of contingency in the assessment, ensuring the suitability of access points and reducing potential impacts on the surrounding area.

- 3.30 The decision not to discount double counting and the validation exercise confirming higher first-principles trip rates than those in Application S/OUT/15/0943 justify the assumption that staff movements are accounted for within the first-principles methodology, along with a contingency factor.
- 3.31 Staff and customer movements can be effectively managed through the development of a Full Travel Plan, aligned with the principles of the Framework Travel Plan and MTCBC Travel Plan policy in effect at the time of submission. This Full Travel Plan may potentially be established as a Planning Obligation.

TRIP PROFILE CALCULATION SUMMARY

- 3.32 This section provides a summary of the methodology used within the Transport Assessment, to forecast the operation of the development site. The data within this section is detailed within **Appendix C**, which is a reproduction of materials submitted within the Transport Assessment.
- 3.33 The datasets that were used within the assessments presented in the Transport Assessment are as follows:
- First-principles datasets:
 - Snow Centre.
 - Water Park; and
 - Indoor / Outdoor Activity Centre.
 - The TRICS:
 - Hotels; and,
 - Forest Lodges.
- 3.34 The trip profile for the first-principles datasets were calculated using methodologies sourced by Application S/OUT/15/0943, and factor against forecast customer profiles. This calculation is shown at **Appendix C**, at **Table C1**.
- 3.35 **Table C2** presents forecasts for the daily volume of visitor movements at the Snow Dome, Water Park, and Indoor/Outdoor Activity Centre. To create these forecasts, we utilised a daily trip profile dataset, which is available in **Table C2** within **Appendix C** and was sourced from Application S/OUT/15/0943.
- 3.36 The dataset in **Table C2** indicates that users of the Snow Dome, Water Park, and Indoor/Outdoor Activity Centre are expected to spend approximately two hours on site, on average.
- 3.37 The information within **Table C2** was applied to the data outputted by **Table C1**, to forecast the arrivals and departures of users of the Snow Dome, Water Park, and Indoor/Outdoor Activity Centre. The result output is shown at **Table C3, C4** and **C5**.
- 3.38 The hotels and forest lodges trip profiles were derived from the TRICS database, with the resultant outputs outlined at **Table C6** and **C7**. The TRICS outputs are provided within the Transport Assessment, at Appendices D and E.

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- 3.39 **Table C8** provides guidance on the overall travel profile for the site. However, it is important to note that the trip profile presented in Table D8 does not account for any discounts related to cross-visitation.
- 3.40 The site serves as a multi-purpose leisure facility, and it is probable that the projected number of trips will decrease when we consider how people enter and exit the site. This decrease is because the data in **Table C8** reflects the movement of individuals within the site itself, entering and exiting onsite facilities. As a result, it overestimates the arrivals and departures taking place within the larger transportation network and at the site's entrances. This leads to an overestimation of customer traffic on both the network and at the site entrance.
- 3.41 This approach provides a level of contingency in the assessment, providing capacity to consider potential spikes in parking, associated with staff or other factors. Thereby ensuring the suitability of access points and reducing the potential for impacts on the surrounding area.

FORECAST CAR PARK OPERATION

- 3.42 The operation of the car park relies on data extracted from the TRICS database and materials approved under Application S/OUT/15/0943.
- 3.43 The hotel and lodges have incorporated trip profiles from the TRICS database, which consider the movement of both staff and visitors generated by these facilities.
- 3.44 The trip profile for the Snow Dome, Water Park, and Indoor/Outdoor Activity Centre is based on materials approved under Application S/OUT/15/0943. According to this application, it is estimated that, on average, customers will spend approximately two hours on site attending a facility. This information outputted by Application S/OUT/15/0943 has been used within the assessment presented within the Transport Assessment and is reproduced within **Appendix C**, at **Tables C2 to C5**.
- 3.45 To support employees in accessing the site using alternative transportation methods, a Framework Travel Plan has been developed. This plan proposes the provision of a shuttle bus for employees commuting through Merthyr Tydfil and offers incentives to encourage walking and cycling.
- 3.46 In addition to the above, a range of parking management measures may be employed, as deemed appropriate, to effectively regulate car park demand and inform on parking operations. this is discussed further in **Chapter 4**.
- 3.47 Nevertheless, a thoughtful approach has been taken, utilising representative datasets and knowledge. The site functions as a multi-purpose leisure facility, and it is likely that the projected number of trips will decrease when considering how people access and exit the site. This discrepancy arises because the data in **Table C8** primarily reflects the movement of individuals within the site itself as they enter and exit on-site facilities. Consequently, it overestimates the arrivals and departures within the broader transportation network and at the site's entrances, resulting in an overestimation of customer traffic on both the network and at the site entrance. Despite this, this data has been used to inform car park operations and presented at **Table 3.6**, and is informed by an amalgamation of the resultant outputs of **Tables C3 to C7**, within **Appendix C**.

Table 3.6 – Car Park Accumulation

Time of Day	Weekday			Saturday		
	Arrivals	Departures	Car Park Capacity	Arrivals	Departures	Car Park Capacity
08:00	84	124	0	151	122	29
09:00	188	85	103	172	106	95
10:00	123	90	136	338	186	247
11:00	258	169	225	325	202	370
12:00	111	110	226	389	307	452
13:00	159	275	110	479	289	642
14:00	185	132	163	460	387	715
15:00	114	166	111	527	436	806
16:00	278	180	209	501	488	819
17:00	260	125	344	427	523	723
18:00	102	248	198	134	468	389
19:00	520	191	527	605	385	609
20:00	277	34	770	224	92	741
21:00	100	499	371	100	536	305
22:00	0	211	160	0	130	175
23:00	0	45	115	0	54	121

- 3.48 **Table 3.6** illustrates that the weekday car park demand is forecast to peak between 20:00-21:00, peaking at 770 vehicles. On a Saturday, the car park demand is forecast to peak between 16:00-17:00, peaking at 819 vehicles.
- 3.49 The application proposes an 830-space car park, with the results of the car park accumulation assessment highlighting that the car parking demand is forecast to peak at 820 vehicles. The car park is therefore considered appropriate for the Rhydyrcar West development.
- 3.50 It is proposed that the car park strategy is refined through the design process, where concise details on servicing, maintenance, staff, and customer operations can be confirm with MTCBC. This can be achieved through a Car Park Management Plan that may potentially be established as a Planning Obligation.

SUMMARY

- 3.51 Information within this Chapter demonstrates that the trip profile for the development scheme is derived from the TRICS database and first-principles calculations that were informed by materials consented under Application S/OUT/15/0943 and Welsh datasets.
- 3.52 Datasets have been submitted which have advised on the methodology use to quantify the person and vehicle trip generation for the site. This analysis has informed the design process, advising that the proposed 830 spaced car park is evidenced to be sufficient to meet the developments demands at peak times, reducing the potential for on-street parking demand in the vicinity of the site.
- 3.53 It is acknowledged that the car park will need to be under long-term management to ensure its continued provision as a safe facility for on-site users, and this management strategy is discussed in **Chapter 4**.
- 3.54 It is considered that the matters discussed within this Chapter and proposed strategy to collaborate with MTCBC on a long-term parking management strategy provides reasonable information to address **Point 2**.

4.0 PREDICTED CAR PARK MANAGEMENT

INTRODUCTION

- 4.1 This chapter has been prepared to address matters discussed within **Point 2**, and to advise on the anticipated car park management strategy, addressing issues like potential nuisance parking, the expected user demographics for onsite facilities, and the sustainability of car park operations. The formal Car Park Management Strategy will be developed once site operations are finalised.

SITE USERS

- 4.2 Given the nature of the site and activities offered, the anticipated customer base for the car park is expected to primarily consist of families and individuals with luggage. It is believed that given the type of customer that will use the onsite facilities, there is a low probability of overspill parking.
- 4.3 The reasoning for this is due to the availability of alternative parking locations and their distance from the site.
- 4.4 Car parks local to the site are generally managed by private companies who restrict access and public operators who impose penalties for extended stays. For example, the Merthyr Tydfil Leisure Village allows a maximum 4 hour stay between 08:00 and 17:00, managed by CCTV.
- 4.5 Adjacent residential streets, as depicted in the Walking Isochrone in **Appendix D**, are also subject to various parking restrictions, including double yellow lines and on-street residential permit schemes, reducing the availability of parking provision. On-street parking is also predominantly utilised by residents, making the provision of available on street parking sporadic. Furthermore, given the distance of these streets from the site, customers may perceive concerns about vehicle security.
- 4.6 These factors collectively make street parking generally impractical for our customers. Given that customers may have luggage, equipment, or children in tow, undertaking an extended walk from such areas may not be a viable option for many.
- 4.7 It is essential to recognise that certain customers may have specific requirements that necessitate on-site parking, which may not always be available. In such cases, customers will be provided information about alternative methods for accessing the site, such as arriving by rail and utilising the site's shuttle bus service. Notably, designated disabled parking spaces will be reserved for disabled users. This will be advertised to customers by the website and activity booking process.
- 4.8 Regarding employees, it is acknowledged that some may face mobility challenges, have medical conditions, or rely on their vehicles for work-related purposes. To address this, the car park is designed to accommodate fluctuating parking demand, which may include staff car parking. This is discussed further at **Chapter 5**.
- 4.9 To effectively manage the considerations outlined above and provide safe parking solutions that meet the needs of both customers and employees, Rhydyar West proposes to implement a comprehensive Car Park Management Strategy.
- 4.10 The primary goal of this strategy is to ensure the efficient, well-organised, and secure use of parking spaces while meeting the facility users' requirements and aligning with our broader business

objectives. To maintain its effectiveness, this strategy will remain dynamic, undergoing regular reviews and updates to adapt to evolving circumstances and changing customer expectations.

Customer Parking Operations

- 4.11 Given the customised services offered by the site, customers will be required to pre-book their on-site activities. Customers will need confirm their mode of transportation to the site, with the option to reserve a parking space within the car park.
- 4.12 The site will offer a diverse array of experiences, each with varying durations of stay, such as weekend breaks. The parking duration is anticipated to be two hours per activity, and overnight for hotels and lodges.
- 4.13 In the scenario where individuals book two activities, the methodology used predicts distinct entries and exits for each activity. However, for the purpose of this review, we are specifically examining site-generated trips in isolation, by facility type, and the corresponding time vehicles spend parked in the car park. By taking this approach, a vehicle remaining for two hours, followed by another vehicle for an additional two hours using a different facility, is equivalent to a single vehicle staying for four hours.
- 4.14 The car park operation is solely focused on capacity, not individual movements, as the parking space remains occupied, regardless of if it is used by one user, or two users through a changeover of vehicles within the space. It is important to note that by using a two-hour movement, it will intensify traffic movements at the site entrance, emphasising the need to ensure that the internal network of the car park does not face congestion or blockage. Capacity assessments presented within the Transport Assessment confirms that no congestion or blockage will occur at the site access, and subsequently, within the car park.
- 4.15 In booking an activity, customers will be informed of the expected length of their activity, enabling them to plan their stay at Rhydycar West accordingly.
- 4.16 The preceding analysis overlooks the potential impact of cross-visitation within the car park, a factor that could alleviate parking demand throughout the entire facility. This is due to the absence of vehicle turnover when customers attend multiple activities, thereby diminishing the need for parking and for vehicles to find parking spaces.
- 4.17 Nonetheless, it is unlikely that the car park will exceed capacity, as customer parking will be allocated accordingly and many of the onsite facilities will experience cross visitation trips.

Employee Parking Operations

- 4.18 It is recognised that fair parking arrangements will need to be provided to employees. The strategy will therefore prioritise parking allocation based on employees' needs, with an emphasis on fairness and accessibility. Parking spaces will be allocated based on specific needs, such as employees with mobility challenges, medical conditions, or those relying on their vehicles for work-related purposes.
- 4.19 Employees will be supported in exploring alternative transportation options, such as carpooling, public transportation, walking or cycling, to reduce the demand for parking spaces and minimise the site's environmental impact. The proposed shuttle bus, which will travel a loop of the town centre

and will provide free travel to the site for staff as well as customers, will further encourage sustainable modes of travel.

- 4.20 These initiatives include the implementation of a Full Travel Plan, Shuttle Bus Transport Strategy and Car Park management Strategy.
- 4.21 The site will also operate a shift working pattern, further reducing the demand of employee parking in the car park.

Summary

- 4.22 The operational procedures for customer parking at the site necessitate pre-booking of on-site activities and securing parking spaces within the designated car park. Parking durations are tailored to the specific activities booked, and customers will receive information regarding the expected length of their stay.
- 4.23 Different facilities have varying anticipated stay durations, and measures have been implemented to ensure parking allocation aligns seamlessly with demand. On average, visitors are expected to spend two hours on site per facility, with overnight stays applicable for lodges or hotel accommodations. The current assessments do not account for the potential impact of cross-visitation, which will contribute to a reduction in parking demand.

MANAGING CAR PARK DEMAND

Shuttle Bus Transport Strategy

- 4.24 It should be noted that one of the development objectives for the scheme is to implement a dedicated shuttle bus service. This service will be used to transport staff and visitors from Merthyr Tydfil to the site, ensuring their safe arrival. It is proposed that the service will be free to customers and staff but will require pre-booking. This is achieved through the staff administration team and online booking system.
- 4.25 It is proposed that the shuttlebus service will include a stop at the railway station, and it plays a pivotal role in the Travel Plan by promoting the use of the railway for traveling to and from the site. Furthermore, it will be routed to collection points with residential parts of Merthyr Tydfil, to support the movement of staff to and from Merthyr Tydfil.
- 4.26 While the specific details of the shuttle bus strategy for the site are not finalised, it is proposed that the Shuttle Bus Strategy be established as a Planning Obligation and can be prepared in collaboration with MTCBC. Once adopted, the strategy will undergo annual reviews to ensure that it effectively addresses user needs, remains an appealing transportation option, and remains viable.

Full Travel Plan

- 4.27 A comprehensive Travel Plan Framework has been designed for the site, aiming to reduce the reliance on private cars for all individuals accessing the location. It will actively encourage both our staff and customers to opt for alternative transportation methods, such as public transport.

-
- 4.28 Travel Plan initiatives will be prominently featured on the website and during the activity booking process, ensuring that customers receive guidance on accessing the site through walking, cycling, public transport, and a staff and customer site specific shuttle bus.
- 4.29 Initiatives will be regularly communicated to employees through various channels, including workplace meetings, the site-wide intranet, and presentations. The dedicated Travel Plan Coordinator will also provide personalised journey planning advice to employees, ensuring they remain well-informed about their transportation options for accessing their workplace.

Car Park Management Plan

- 4.30 In addition to the above, a range of parking management measures may be employed, as deemed appropriate, to effectively regulate car park demand and inform on parking operations. These measures may include:
- Utilising ANPR Cameras to regulate car park access and monitor the length of stay.
 - Employing car park wardens for on-site supervision.
 - Implementing fines for nuisance parking.
 - Collaborating with MTCBC on additional potential measures to reduce nuisance parking, such as the implementation of Traffic Regulation Orders.
 - Monitoring of the car park by the Travel Plan Coordinator, to determine effectiveness of the Car Park Management Strategy.
 - Travel Plan Coordinator annually reviewing the Public Transport Strategy to suit staff and customer requirements.
- 4.31 The above could be achieved through a Car Park Management Strategy, which could potentially be established as a Planning Obligation, with details submitted for review once site wide operation is confirmed.

SUMMARY

- 4.32 The strategy outlined in this chapter aims to establish a comprehensive long-term management plan, ensuring the car park remains a secure facility for on-site users. This approach assists in mitigating the risk of on-street parking demand in the surrounding area, which could otherwise jeopardise highway safety and disrupt traffic flow.
- 4.33 The following is also proposed:
- Shuttle Bus Transport Strategy that will define bus routes, frequency, and operational details. The shuttle bus service will be accessible to both staff, and for customers, it will be integrated into their activity purchase, making it a convenient and attractive option. This strategy could be established as a Planning Obligation.
 - Full Travel Plan, to refine the initiatives of the Framework, potentially established as a Planning Obligation.
 - Car Park management Strategy, to advise on the detailed aspects of car park operations and outline the long-term management strategy for parking across the site, potentially established as a Planning Obligation.
- 4.34 It is considered that the matters discussed within this Chapter and proposed strategies on a long-term parking management strategy provides reasonable information to inform on **Point 2**.

5.0 CAR PARK SENSIVITY ASSESSMENT

INTRODUCTION

- 5.1 This section considers a sensitivity assessment, to advise on actual car park operations and the availability of parking capacity to accommodate potential spikes in parking, whether attributed to staff or other factors.

DATASETS

- 5.2 User movements for the Snow Dome, Water Park and Indoor / Outdoor Activity Centre have been generated independently, with no consideration of cross visitation. The duration of stay for Snow Dome, Water Park and Indoor / Outdoor Activity Centre users are forecast to be for approximately two hours. This duration has been determined from Application S/OUT/15/0943, which used customer data obtained from Snozone Milton Keynes and Snozone Castleford.
- 5.3 The concern of individuals remaining for more than two hours is addressed through the appraisal focusing on parked vehicles rather than their movements (arrivals/departures). This approach is taken because a vehicle parked for two hours within the car park and replaced by another vehicle for an additional two hours, generated by a different facility, would be the equivalent to a single vehicle occupying a parking space for four hours. This is due to the appraisal being based solely on capacity, not movements, as the space remains continuously occupied.
- 5.4 It is important to note that a two-hour movement exacerbates traffic flows at the site access, with modelling studies presented within the Transport Assessment confirming that the site is assess is appropriate to accommodate this level of traffic.
- 5.5 The datasets prepared for the Snow Dome, Water Park and Indoor / Outdoor Activity Centre do not include employee movements, or cross visitation.
- 5.6 The TRICS Research Report 05/1 forecast that the inclusion of cross visitation would reduce Snow Dome, Water Park, and Indoor / Outdoor Activity Centre traffic on average by 20%. It is considered that by not using this reduction, it provides a worst-case assessment, which would account for the assigning of employees to the car park.
- 5.7 The Snow Dome, Water Park and Indoor / Outdoor Activity Centre datasets are therefore considered reasonable to advise on car park capacity and operation.
- 5.8 The lodges and hotel datasets are derived from the TRICS database, and as such considered reasonable to advise on car park capacity and operation.

TRANSPORT ASSESSMENT METHODOLOGY AND OUTPUT

- 5.9 The datasets presented within the Transport Assessment, outlined at paragraphs 5.2 to 5.3, did not include cross visitation. This was to provide a conservative / worst case scenario for the car park to advise on its capacity to accommodate potential spikes in parking, whether attributed to staff or other factors. The resultant output was that the car park would experience a peak of 819 vehicles parking within the car park, which has capacity for 830 vehicles. All other hours would experience a

level of parking that comprises 0 to 806 vehicles. This parking profile is outlined at **Table 3.6** which is also duplicated as **Table C9** in **Appendix C**.

STAFF MOVEMENTS

- 5.10 The Transport Assessment incorporated staff movement into the trip profile assessment, utilising data from the TRICS database, specifically from the hotel and lodges. The first-principles assessments did not discount double counting between site facilities, this being cross visitation trips. It was considered by using this methodology, a level of contingency was provided in user movements, to accommodate potential spikes in parking, whether attributed to staff or other factors.
- 5.11 The use of the car park by staff has been raised by MTCBC. It is acknowledged that in certain situations, opting for sustainable travel to access the site might be less practical. This is particularly relevant for employees involved in maintenance and cleaning, where vehicles may be necessary for transporting equipment. In such cases, it is anticipated that any vehicles used by this group would likely be confined to the service yards linked to onsite facilities or designated ‘service’ parking spaces near the buildings.
- 5.12 Additionally, it is recognised that there may be instances during operational hours when sustainable transport may not be the most viable option. This is exemplified by staff engaged in evening functions and night-time activities, such as bar work and security. While it is possible that these trips may occur in the broader car park, careful management will ensure minimal impact on peak facility operations, and parking permits may be required.
- 5.13 For the reasons mentioned earlier, a sensitivity assessment has been conducted to provide guidance on car parking arrangements. During this evaluation, careful consideration was given to the information presented in **Table 3.6**, which is also duplicated as **Table C9** in **Appendix C**.
- 5.14 **Table 3.6** offers insights into site-wide movements entering and exiting the car park, encompassing double counting (cross-visitation trips) and staff movements related to the hotel and forest lodges, sourced from TRICS datasets.
- 5.15 The site anticipates a workforce of 842 members, with 241 on-site concurrently. At this stage of the design process, it is expected that the actual demand for employees to use the car park will be minimal, given the careful management of their travel behaviour through the Shuttle Bus Transport Strategy, Full Travel Plan, and Car Park Management Strategy.
- 5.16 To estimate the potential for employee generated car trips, the NTS leisure datasets has been applied, with the projection indicating 106 potential car trips generated by employees. A breakdown of employees that may be concurrently onsite is provided a **Table 5.1**, which also includes details of the anticipated distribution of staff among onsite facilities,

Table 5.1 – Site Wide Employee Levels

Onsite Facility	Volume of Onsite Employees %	Volume of Onsite Employees %	Volume of Onsite Employees That May Travel by Car
Snow Dome	30%	72	32
Water Park	15%	36	16
Indoor / Outdoor Activity Centre	15%	36	16
Hotel	30%	72	32
Lodges	10%	24	11
Total	100%	72	106

ONSITE FACILITY CROSS VISITATIONS

- 5.17 In the Transport Assessment, cross-visitation trips were not factored into the car park operations. The decision to exclude these trips was made to present a more conservative or worst-case scenario for the car park's operational impact on traffic and site access.
- 5.18 Cross-visitation will be generated by the site, involving the movement or visits of individuals between various facilities or destinations. The inclusion of cross-visitation is expected to result in a decrease in vehicle parking demand, a factor not reflected in the outputs provided in **Table C9**.
- 5.19 To accurately represent cross-visitation trips based on the information in **Table C9**, it is necessary to exclude the employment trips generated by the hotel and lodges. Cross-visitation does not impact employment levels, and thus, their inclusion would skew the data.
- 5.20 In assessing the sensitivity of the car park, these trips are required to be removed. This has comprised the 08:00 arrival column within **Table C9** being reduced by 43 vehicles, and the 23:00 departure column having a similar reduction. This adjustment accounts for the 43 spaces within the car park associated with hotel and lodge staff, as indicated by the outputs from the TRICS database and expected employee occupation.
- 5.21 The results of this adjustment are presented in **Table C10** in **Appendix C**. This discount allows the dataset to be appropriate for use in advising on the level of impact of customers completing cross-visitation type trips.
- 5.22 Cross-visitation refers to a person using more than one facility on-site. The business case for the scheme targets a 40% cross-visitation rate, achievable through promotions, discounts, and tailored packages.
- 5.23 Referencing the TRICS Research Report 05/1 "Trip Attraction Rates of Developments with Multiple Retail and Leisure Uses," from December 2005, guidance is provided on how linked trips in developments similar to the Proposed Development might be considered. The report's Executive Summary states that multi-use sites with four or more developments typically reduce the total number of external trips by about 20%.

- 5.24 As the development scheme comprises a multi-use site with several bespoke facilities, a conservative estimate of cross-visitation is provided by applying a 10% discount to customer trips. This approach aims to introduce a contingency level for car park operations, and the outcome of this calculation is detailed in **Table C11** in **Appendix C**.
- 5.25 The assessment outcome provides recommendations for car park operations, with the stipulation that staff are not permitted to park within the facility. These findings are detailed in **Appendix C12** and summarised in **Table 5.2**.

Table 5.2 – Site-wide Car Park Accumulation - Spare Capacity

Time of Day	Weekday			Saturday		
	Car Park Capacity	%	Residual Spaces	Car Park Capacity	%	Residual Spaces
08:00	0	0%	830	0	0%	830
09:00	93	11%	737	59	7%	771
10:00	122	15%	708	196	24%	634
11:00	203	24%	628	307	37%	523
12:00	203	25%	627	381	46%	449
13:00	99	12%	731	552	66%	278
14:00	147	18%	683	617	74%	213
15:00	100	12%	730	699	84%	131
16:00	188	23%	642	711	86%	119
17:00	310	37%	520	625	75%	205
18:00	178	21%	652	324	39%	506
19:00	474	57%	356	522	63%	308
20:00	693	83%	137	641	77%	189
21:00	334	40%	496	248	30%	582
22:00	144	17%	686	131	16%	699
23:00	142	17%	688	122	15%	709

- 5.26 **Table 5.2** projects that customer parking alone will occupy the car park at a range of 83% to 86%, ensuring a minimum of 119 available spaces (Saturday: 86%) during peak times. This figure can suitably accommodate the 106 staff that have the potential to be generated.
- 5.27 The car park provides reasonable capacity to cater to customer parking needs safely and effectively, with the provision resilient to fluctuations in parking demand. A reasonable surplus capacity is in place to accommodate potential spikes in parking, whether attributed to staff or other factors.
- 5.28 Nevertheless, the development scheme is committed to fostering initiatives that encourage future employees to access the site through non-car modes. These initiatives will be implemented through the Shuttle Bus Transport Strategy, Full Travel Plan, and Car Park Management Plan.

SUMMARY

- 5.29 The car park provides reasonable capacity to cater to customer parking needs safely and effectively, with arrangements resilient to fluctuations in parking demand. A reasonable surplus capacity is in place to accommodate potential spikes in parking, whether attributed to staff or other factors, mitigating the risk of nuisance parking within adjacent areas.
- 5.30 The level of parking proposed by this application is not sensitive to periods of increased parking demands, and the risk of congestion within the car park, capacity being reached, or nuisance parking is immaterial.

DRAFT

6.0 SUMMARY

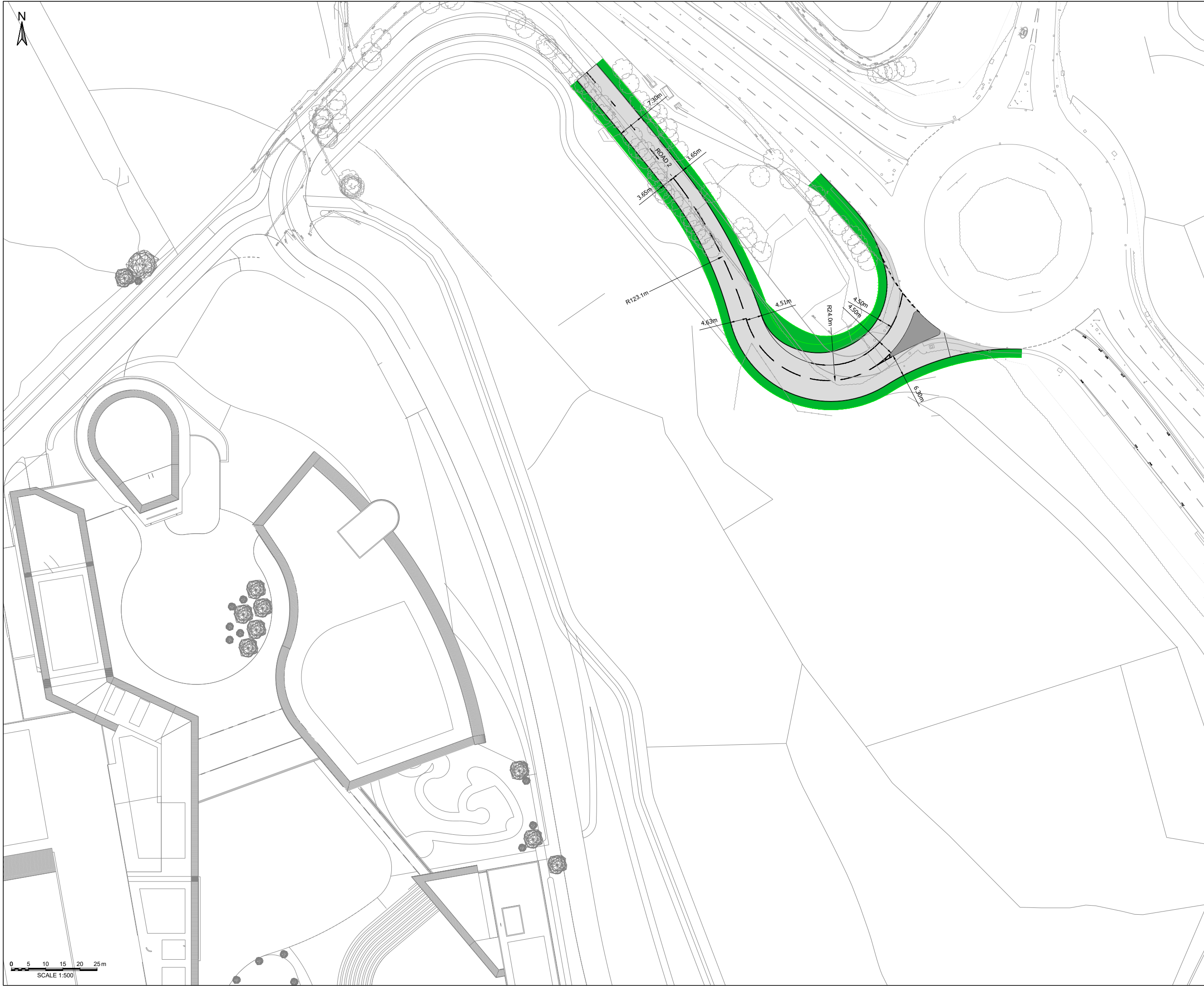
SUMMARY

- 6.1 The document has been prepared to provide additional information on matters raised by MTCBC, which comprise:
- **Point 1:** The proposed secondary emergency access is sub-standard, and its use would result in traffic hazards to the detriment of highway safety and the free flow of traffic.
 - **Point 2:** Insufficient information has been submitted to demonstrate that the proposed off-street parking provision of 830 spaces for vehicles is sufficient to meet the developments demands at peak times, resulting in the potential for on-street parking demand in the vicinity to the detriment of highway safety and the free flow of traffic.
- 6.2 Information on Point 1 is provided within Chapter 2, which confirms that the proposed secondary emergency access has an appropriate layout, and its usage will not pose traffic hazards that could compromise highway safety or impede the flow of traffic.
- 6.3 Information to advise on Point 2 is provided at Chapters 3, 4 and 5. These chapters contain information that outlines the methodology used to quantify the trips generated by the site, describes the characteristics of site users, and presents strategies aimed at promoting sustainable travel among users while ensuring safe and appropriate car park operations.
- 6.4 It is also proposed that the following could be provided to give confidence that these matters will be considered further at the appropriate planning stage(s):
- Shuttle Bus Transport Strategy that will define bus routes, frequency, and operational details. The shuttle bus service will be accessible to both staff, and for customers, it will be integrated into their activity purchase, making it a convenient and attractive option. This strategy could be established as a Planning Obligation.
 - Full Travel Plan, to refine the initiatives of the Framework, potentially established as a Planning Obligation.
 - Car Park management Strategy, to advise on the detailed aspects of car park operations and outline the long-term management strategy for parking across the site, potentially established as a Planning Obligation.
- 6.5 Assessments within the Transport Assessment provide a reasonable and cautious approach, projecting an overestimated car parking demand with a forecasted peak at 99% capacity (820 vehicles).
- 6.6 The car park is likely to reach a maximum capacity of approximately 86% (119 vehicles) due to cross visitation, and this peak is expected for just an hour, leaving significant residual capacity during other operational periods. The development ensures safe and well-suited parking arrangements, featuring reasonable spare capacity to accommodate any increased parking demand, whether from customers or other factors. The scheme effectively mitigates the risk to the adjacent road network in terms of vehicle parking through its thoughtfully designed parking provision and wider strategies.

CONCLUSION

- 6.7 Evidence has been presented to confirm that emergency access can be implemented and managed without causing disruptions to non-site users.
- 6.8 The assessment methodology outlined in the Transport Assessment has been validated, with the assessments showing that the provision of an 830-space car park is adequate to meet the development's demands during peak periods. A strategy has also been discussed to support travel by sustainable modes and reduce the risk of nuisance parking.
- 6.9 The car park provides reasonable capacity to cater to customer parking needs safely and effectively, with arrangements resilient to fluctuations in parking demand. A reasonable surplus capacity is in place to accommodate potential spikes in parking, whether attributed to staff or other factors, mitigating the risk of nuisance parking within adjacent areas.
- 6.10 It is considered that the matters discussed within this Chapter and proposed strategy to collaborate with MTCBC on a long-term parking management strategy provides reasonable information to address **Point 1** and **2**. This is inclusive of committing to providing MTCBC a Car Park Management Strategy, Public Transport Strategy and Full Travel plan at the appropriate design and planning stage.

APPENDIX A: SITE ACCESS LAYOUT



- KEY
- Carriageway
 - Footway/Cycleway-Footway
 - Verge

PRELIMINARY ISSUE

P03	DESIGN UPDATED TO TOPOGRAPHIC SURVEY	04.08.2022	AT	BM	AP				
P02	REVISED MASTERPLAN	19.04.2022	BM	AP	AP				
P01	PRELIMINARY FIRST ISSUE	15.10.2021	AT	BM	AP				
Rev	Description	Date	Drawn	Checked	Approved				

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Client:
MARVEL LTD

Project Name:
RHYDYCAR WEST, MERTHYR TYDFIL

Sheet Title:
GENERAL ARRANGEMENT

TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale @ A1	Suitability
784-B023905	AT	Oct '21	BM	Oct '21	AP	Oct '21	1:500	S0
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B023905	- TTE	- 00	- ZZ	- DR	- CH	- SK001	P03	

APPENDIX B: SWEEP PATH ASSESSMENT

APPENDIX C: CALCULATION TABLES

Table C1: Trip Profiles for First Principal Datasets

Land Use	Annual Visitors	Month %*	Month Visitors	Weekly Profile Factor	Weekend Share (from Snowdome)*	Weekday Visitors	Weekend Visitors
Snow Dome	750000	8.3%	62500	23.3%	25.4%	1920	3658
Water Park	560000		46667			1433	2731
Indoor / Outdoor Adv	270000		22500			691	1317

*Source: Application S/OUT/15/0943

Table C2: Daily Trip Profile*

Friday		Saturday	
Arrivals	Departures	Arrivals	Departures
2%	0%	2%	0%
6%	0%	2%	0%
4%	2%	7%	2%
12%	6%	6%	2%
4%	4%	9%	7%
6%	12%	10%	6%
7%	4%	11%	9%
3%	6%	13%	10%
11%	7%	11%	11%
7%	3%	9%	13%
0%	11%	0%	11%
25%	7%	14%	9%
12%	0%	4%	0%
3%	25%	2%	14%
0%	12%	0%	4%
0%	3%	0%	2%
100%	100%	100%	100%

*Source: Application S/OUT/15/0943

Table C3: Snow Dome Trip Profile

Time Period	Movement Profile				Trip Profile				Trip Profile - Vehicles 44%*			
	Friday		Saturday		Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	2%	0%	2%	0%	29	0	58	0	13	0	26	0
09:00	6%	0%	2%	0%	111	0	68	0	49	0	30	0
10:00	4%	2%	7%	2%	68	29	252	58	30	13	111	26
11:00	12%	6%	6%	2%	237	111	237	68	104	49	104	30
12:00	4%	4%	9%	7%	77	68	319	252	34	30	141	111
13:00	6%	12%	10%	6%	116	237	382	237	51	104	168	104
14:00	7%	4%	11%	9%	131	77	416	319	57	34	183	141
15:00	3%	6%	13%	10%	58	116	489	382	26	51	215	168
16:00	11%	7%	11%	11%	203	131	397	416	89	57	175	183
17:00	7%	3%	9%	13%	140	58	324	489	62	26	143	215
18:00	0%	11%	0%	11%	0	203	0	397	0	89	0	175
19:00	25%	7%	14%	9%	479	140	523	324	211	62	230	143
20:00	12%	0%	4%	0%	237	0	140	0	104	0	62	0
21:00	3%	25%	2%	14%	48	479	58	523	21	211	26	230
22:00	0%	12%	0%	4%	0	227	0	140	0	100	0	62
23:00	0%	3%	0%	2%	0	48	0	58	0	21	0	26
Total	100%	100%	100%	100%	1920	1920	3658	3658	845	845	1609	1609

*Source, NTS Average distance travelled by purpose and main mode: Great Britain, 2012 - Leisure Category Category

Table C4: Water Park Trip Profile

Time Period	Movement Profile				Trip Profile				Trip Profile - Vehicles 44%*			
	Friday		Saturday		Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	2%	0%	2%	0%	22	0	43	0	10	0	19	0
09:00	6%	0%	2%	0%	83	0	51	0	37	0	22	0
10:00	4%	2%	7%	2%	51	22	188	43	22	10	83	19
11:00	12%	6%	6%	2%	177	83	177	51	78	37	78	22
12:00	4%	4%	9%	7%	58	51	238	188	25	22	105	83
13:00	6%	12%	10%	6%	87	177	285	177	38	78	126	78
14:00	7%	4%	11%	9%	97	58	311	238	43	25	137	105
15:00	3%	6%	13%	10%	43	87	365	285	19	38	161	126
16:00	11%	7%	11%	11%	152	97	296	311	67	43	130	137
17:00	7%	3%	9%	13%	105	43	242	365	46	19	107	161
18:00	0%	11%	0%	11%	0	152	0	296	0	67	0	130
19:00	25%	7%	14%	9%	357	105	390	242	157	46	172	107
20:00	12%	0%	4%	0%	177	0	105	0	78	0	46	0
21:00	3%	25%	2%	14%	36	357	43	390	16	157	19	172
22:00	0%	12%	0%	4%	0	170	0	105	0	75	0	46
23:00	0%	3%	0%	2%	0	36	0	43	0	16	0	19
Total	100%	100%	100%	100%	1433	1433	2731	2731	631	631	1202	1202

*Source, NTS Average distance travelled by purpose and main mode: Great Britain, 2012 - Leisure Category Category

Table C5: Activity Centre Trip Profile

Time Period	Movement Profile				Trip Profile				Trip Profile - Vehicles 44%*			
	Friday		Saturday		Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	2%	0%	2%	0%	10	0	21	0	5	0	9	0
09:00	6%	0%	2%	0%	40	0	24	0	18	0	11	0
10:00	4%	2%	7%	2%	24	10	91	21	11	5	40	9
11:00	12%	6%	6%	2%	85	40	85	24	38	18	38	11
12:00	4%	4%	9%	7%	28	24	115	91	12	11	51	40
13:00	6%	12%	10%	6%	42	85	138	85	18	38	61	38
14:00	7%	4%	11%	9%	47	28	150	115	21	12	66	51
15:00	3%	6%	13%	10%	21	42	176	138	9	18	77	61
16:00	11%	7%	11%	11%	73	47	143	150	32	21	63	66
17:00	7%	3%	9%	13%	50	21	117	176	22	9	51	77
18:00	0%	11%	0%	11%	0	73	0	143	0	32	0	63
19:00	25%	7%	14%	9%	172	50	188	117	76	22	83	51
20:00	12%	0%	4%	0%	85	0	51	0	38	0	22	0
21:00	3%	25%	2%	14%	17	172	21	188	8	76	9	83
22:00	0%	12%	0%	4%	0	82	0	51	0	36	0	22
23:00	0%	3%	0%	2%	0	17	0	21	0	8	0	9
Total	100%	100%	100%	100%	691	691	1317	1317	304	304	579	579

*Source, NTS Average distance travelled by purpose and main mode: Great Britain, 2012 - Leisure Cateogry Category

Table C6: Hotel Trip Profile*

Time Period	Movement Profile				Trip Profile				Trip Profile - Vehicles 44%**			
	Friday		Saturday		Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	0.134	0.290	0.228	0.286	129	278	219	275	57	123	96	121
09:00	0.199	0.195	0.254	0.246	191	187	244	236	84	82	107	104
10:00	0.139	0.139	0.243	0.304	133	133	233	292	59	59	103	128
11:00	0.086	0.146	0.243	0.322	83	140	233	309	36	62	103	136
12:00	0.088	0.105	0.210	0.167	84	101	202	160	37	44	89	71
13:00	0.116	0.127	0.286	0.156	111	122	275	150	49	54	121	66
14:00	0.146	0.139	0.167	0.210	140	133	160	202	62	59	71	89
15:00	0.137	0.134	0.167	0.188	132	129	160	180	58	57	71	79
16:00	0.204	0.134	0.308	0.236	196	129	296	227	86	57	130	100
17:00	0.297	0.163	0.293	0.159	285	156	281	153	125	69	124	67
18:00	0.234	0.135	0.312	0.232	225	130	300	223	99	57	132	98
19:00	0.176	0.139	0.280	0.195	169	133	269	187	74	59	118	82
20:00	0.132	0.079	0.218	0.215	127	76	209	206	56	33	92	91
21:00	0.128	0.128	0.107	0.120	123	123	103	115	54	54	45	51
22:00	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
23:00	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
Total	2.216	2.053	3.316	3.036	2128	1971	3184	2915	936	867	1401	1282

*Source: TRICS

**Source, NTS Average distance travelled by purpose and main mode: Great Britain, 2012 - Leisure Cateogry Category

Table C7: Lodges Trip Profile*

Time Period	Movement Profile				Trip Profile				Trip Profile - Vehicles 44%**			
	Friday		Saturday		Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	0.030	0.041	0.023	0.039	2	3	2	3	1	1	1	1
09:00	0.045	0.092	0.052	0.086	3	6	4	6	1	3	2	3
10:00	0.056	0.136	0.081	0.107	4	9	6	7	2	4	2	3
11:00	0.066	0.131	0.098	0.088	5	9	7	6	2	4	3	3
12:00	0.074	0.101	0.126	0.091	5	7	9	6	2	3	4	3
13:00	0.073	0.072	0.137	0.092	5	5	9	6	2	2	4	3
14:00	0.083	0.072	0.127	0.085	6	5	9	6	3	2	4	3
15:00	0.093	0.070	0.119	0.079	6	5	8	5	3	2	4	2
16:00	0.104	0.071	0.108	0.093	7	5	7	6	3	2	3	3
17:00	0.136	0.074	0.100	0.105	9	5	7	7	4	2	3	3
18:00	0.109	0.075	0.076	0.084	8	5	5	6	3	2	2	3
19:00	0.067	0.057	0.062	0.064	5	4	4	4	2	2	2	2
20:00	0.061	0.033	0.045	0.042	4	2	3	3	2	1	1	1
21:00	0.030	0.023	0.035	0.025	2	2	2	2	1	1	1	1
22:00	0.015	0.018	0.009	0.006	1	1	1	0	0	1	0	0
23:00	0.000	0.000	0.000	0.000	0	0	0	0	0	0	0	0
Total	1.042	1.066	1.198	1.086	72	73	83	75	32	32	36	33

*Source: TRICS **Source, NTS Average distance travelled by purpose and main mode: Great Britain, 2012 - Leisure Cateogry Category

Table C8: Site-wide Trip Profile

Time Period	Trip Profile				Trip Profile - Vehicles 44%**			
	Friday		Saturday		Friday		Saturday	
	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures	Arrivals	Departures
08:00	192	281	343	277	84	124	151	122
09:00	428	194	390	242	189	85	172	107
10:00	280	204	769	422	123	90	338	185
11:00	586	383	739	458	258	169	325	201
12:00	253	250	883	697	111	110	389	307
13:00	361	626	1089	656	159	275	479	288
14:00	421	301	1046	880	185	133	460	387
15:00	260	378	1198	991	114	166	527	436
16:00	631	409	1139	1110	278	180	501	488
17:00	590	284	971	1189	260	125	427	523
18:00	232	563	305	1064	102	248	134	468
19:00	1182	433	1374	875	520	190	605	385
20:00	630	78	508	209	277	34	224	92
21:00	227	1133	227	1218	100	499	100	536
22:00	1	480	1	296	0	211	0	130
23:00	0	102	0	122	0	45	0	54
Total	6243	6089	10972	10695	2747	2679	4828	4706

Table C9: Site-wide Car Park Accumulation

Time of Day	Weekday			Saturday		
	Arrivals	Departures	Car Park Capacity	Arrivals	Departures	Car Park Capacity
08:00	84	124	0	151	122	29
09:00	188	85	103	172	106	95
10:00	123	90	136	338	186	247
11:00	258	169	225	325	202	370
12:00	111	110	226	389	307	452
13:00	159	275	110	479	289	642
14:00	185	132	163	460	387	715
15:00	114	166	111	527	436	806
16:00	278	180	209	501	488	819
17:00	260	125	344	427	523	723
18:00	102	248	198	134	468	389
19:00	520	191	527	605	385	609
20:00	277	34	770	224	92	741
21:00	100	499	371	100	536	305
22:00	0	211	160	0	130	175
23:00	0	45	115	0	54	121

Table C10: Site-wide Car Park Accumulation - Hotel and Lodge Staff Movement Discount

Time of Day	Weekday			Saturday		
	Arrivals	Departures	Car Park Capacity	Arrivals	Departures	Car Park Capacity
08:00	41	124	0	108	122	0
09:00	188	85	103	172	106	66
10:00	123	90	136	338	186	218
11:00	258	169	225	325	202	341
12:00	111	110	226	389	307	423
13:00	159	275	110	479	289	613
14:00	185	132	163	460	387	686
15:00	114	166	111	527	436	777
16:00	278	180	209	501	488	790
17:00	260	125	344	427	523	694
18:00	102	248	198	134	468	360
19:00	520	191	527	605	385	580
20:00	277	34	770	224	92	712
21:00	100	499	371	100	536	276
22:00	0	211	160	0	130	146
23:00	0	2	158	0	11	135

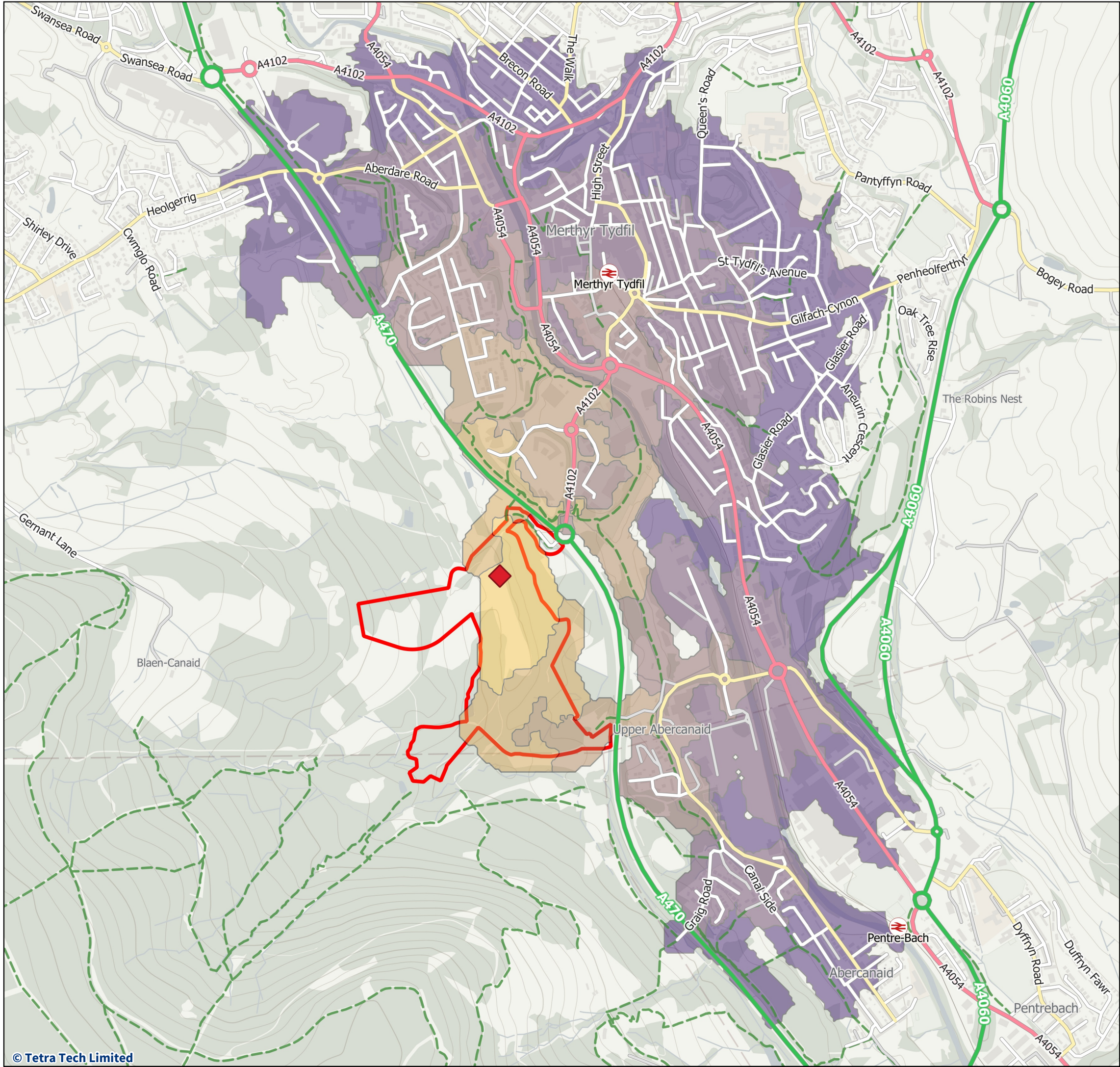
Table C11: Site-wide Car Park Accumulation - Cross Visitation Factor

Time of Day	Weekday			Saturday		
	Arrivals	Departures	Car Park Capacity	Arrivals	Departures	Car Park Capacity
08:00	37	112	0	97	110	0
09:00	169	77	93	155	95	59
10:00	111	81	122	304	167	196
11:00	232	152	203	293	182	307
12:00	100	99	203	350	276	381
13:00	143	248	99	431	260	552
14:00	167	119	147	414	348	617
15:00	103	149	100	474	392	699
16:00	250	162	188	451	439	711
17:00	234	113	310	384	471	625
18:00	92	223	178	121	421	324
19:00	468	172	474	545	347	522
20:00	249	31	693	202	83	641
21:00	90	449	334	90	482	248
22:00	0	190	144	0	117	131
23:00	0	2	142	0	10	122

Table C12: Site-wide Car Park Accumulation - Spare Capacity

Time of Day	Weekday			Saturday		
	Car Park Capacity	%	Residual Spaces	Car Park Capacity	%	Residual Spaces
08:00	0	0%	830	0	0%	830
09:00	93	11%	737	59	7%	771
10:00	122	15%	708	196	24%	634
11:00	203	24%	628	307	37%	523
12:00	203	25%	627	381	46%	449
13:00	99	12%	731	552	66%	278
14:00	147	18%	683	617	74%	213
15:00	100	12%	730	699	84%	131
16:00	188	23%	642	711	86%	119
17:00	310	37%	520	625	75%	205
18:00	178	21%	652	324	39%	506
19:00	474	57%	356	522	63%	308
20:00	693	83%	137	641	77%	189
21:00	334	40%	496	248	30%	582
22:00	144	17%	686	131	16%	699
23:00	142	17%	688	122	15%	709

APPENDIX D: WALKING ISOCHRONE



Accessibility by Walking (Main Site)

Rhydyar West
Marvel Ltd

Legend



Site

Access by Walking

- 0-5 mins / 0-400m
- 5-10 mins / 400-800m
- 10-15 mins / 800-1.2km
- 15-20 mins / 1.2-1.6km
- 20-25 mins / 1.6-2.0km
- 25-30 mins / 2.0-2.4km



Isochrone Origin



Public Rights of Way

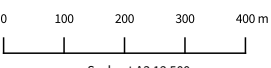
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Checked by: AP

Office: Cardiff

Drawing No.: 784-B023905-0005.1

Revision No.: 0001

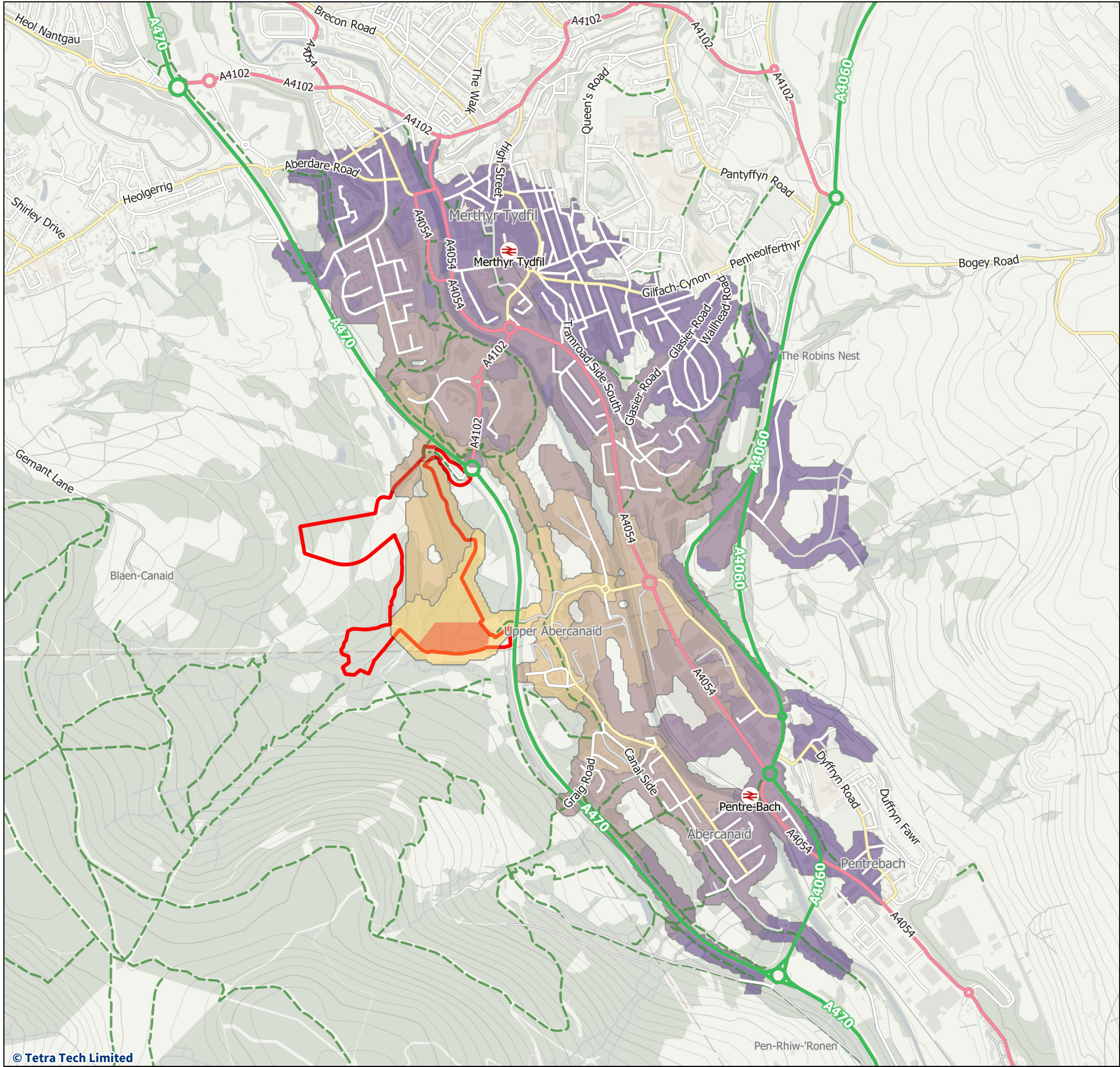


20 January 2022

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TETRA TECH



Accessibility by Walking (Forest Lodges)

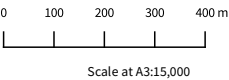
Rhydycar West
Marvel Ltd

Legend

- Site
- Isochrone Origin
- Access by Walking**
 - 0-5 mins / 0-400m
 - 5-10 mins / 400-800m
 - 10-15 mins / 800-1.2km
 - 15-20 mins / 1.2-1.6km
 - 20-25 mins / 1.6-2.0km
 - 25-30 mins / 2.0-2.4km
- Public Rights of Way

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Checked by: AP
Office: Cardiff

Drawing No.: 784-B023905-0005.2
Revision No.: 0001



20 January 2022

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