CHAPTER 8 – HIGHWAYS AND TRANSPORTATION

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List of Acronyms

APCR	Air Pollution Control Residue
ATC	Automatic Traffic Counter
Development	All activities within the red line planning boundary (see Drawing ECL-BQ-000 in Technical Appendix TA1-1)
Development Site	The physical site on which the Development is to be located as defined by the red line planning boundary (see Drawing ECL-BQ-000 in Technical Appendix TA1-1)
DMRB	Design Manual for Roads and Bridges ERF Energy Recovery Facility
HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management and Assessment
HZI	Hitachi Zosen Inova AG
IBA	Incinerator Bottom Ash
ITL	Intermodal Transportation Ltd
KEA	Key Environmental Aspect
LGV	Light Goods Vehicle
LHA	Local Highway Authority
LHA	Local Highway Authority
NTM	National Transport Model
NTS	National Travel Survey
ONS	Office for National Statistics
PPW	Planning Policy Wales
PIA	Personal Injury Accident
PINS	Planning Inspectorate Wales
PICADY	Priority Intersection Capacity and Delay
RFC	Reference of Flow to Capacity
TA	Transport Assessment
TRANSYT	Traffic Network Study Tool
TEMPRO	Trip End Model Presentation Program

List of Amendments

- Personal Injury Accident data has been updated from 2016/2017/2018 to cover the latest available 3 year period 2017/2018/2019.
- Further detail on the construction phase vehicle movements and tonnage to be extracted has been added.

8. HIGHWAYS AND TRANSPORTATION

8.1. Introduction

8.1.1. This chapter sets out the likely effects that would result from the proposed Buttington Energy Recovery Facility ("ERF") from a highways and transportation perspective.

8.1.2. The chapter is supported by Appendix 8.1 which contains the Transport Assessment ("TA") for the proposal.

8.1.3. This chapter considers the relevant aspects of the TA from an environmental impact perspective.

8.1.4. This chapter has been prepared by Intermodal Transportation Ltd ("ITL").

8.1.5. Once operational, it is proposed that vehicular access to the ERF would be achieved via a new priority 'T' junction with a dedicated ghosted right turn lane. The new junction would be located approximately 170m to the north of the existing access junction and would be provided to contemporary design standards. Once the new junction is opened the existing quarry access would be downgraded to provide access to the residential property known as Brookside only. The delivery of the new access junction would require widening / straightening of the A458 on its eastern side adjacent to the site along with cutting and embankment works. The layout of the new access junction has previously been approved under planning permission P/2015/0439. The works necessary within the public highway will be to deliver the access junction are likely to be secured by condition and undertaken pursuant to a section 278 agreement.

8.1.6. This chapter has been informed by the scoping direction issued by PINS. In addition, the Welsh Government Office, Powys County Council, Shropshire County Council and Highways England have all been consulted in relation to the scope of the necessary investigations undertaken in conjunction with the production of this chapter. The scope of the investigations was agreed with the Transport Network Management Division at the Welsh Government Office and also Powys County Council highway department prior to its preparation. In addition, Highways England confirmed that assessment of the performance of trunk roads within England was not required as part of this assessment as the proposal would be likely to add modest traffic levels only to the road network within England .

8.2. Relevant Legislation, Planning Policy & Guidance

8.2.1. The relevant planning documents, from a transport planning perspective, at a National level are Planning Policy Wales 2018 Edition 10[I] ("PPW"), The Wales Transport Strategy[II], The National Transport Finance Plan[III] and Technical Advice Notes, whilst the Mid Wales Joint Local Transport Plan[IV] and the Powys Adopted Local Development Plan[V] represent the relevant planning documents at the local level.

National Transportation Planning Policies

8.2.2. PPW states that opportunities to reduce the use of cars and promote the use of alternative modes of transportation are limited in rural areas. In that regard, the PPW indicates at paragraph 3.35 that:

"For most rural areas the opportunities for reducing car use and increasing walking, cycling and use of public transport are more limited than in urban areas…"

8.2.3. It is noted within section 4 of the TA that given the rural location of the site opportunities to access the Development by non-car modes are limited. However, given the nature of the Development (i.e. an industrial installation) and the above quotation from PPW it is considered that from a non-car mode access perspective the development proposal should be regarded as acceptable.

8.2.4. At paragraph 4.1.56, PPW indicates that:

"Transport Assessments are an important mechanism for setting out the scale of anticipated impacts a proposed development, or redevelopment, is likely to have. They assist in helping to anticipate the impacts of development so that they can be understood and catered for appropriately."

8.2.5. As previously indicated a comprehensive TA has been prepared to examine the effects of the Development on the local transport networks. As such, the Development should be regarded to comply with the above requirement of PPW.

8.2.6. One Wales: Connecting The Nation - The Wales Transport Strategy and The National Transport Finance Plan 2018 Update are strategic planning documents and are not considered of relevance from an individual site perspective.

8.2.7. At paragraph 3.8 Technical Advice Note 18: Transport[VI] indicates that:

"Development sites which are car dependent and unlikely to be well served by new public transport, walking and cycling should only be allocated or reallocated in development plans for uses which are not travel intensive."

8.2.8. It is demonstrated in the TA that the Development would not be travel intensive, i.e. it would not attract notable levels of light and heavy goods movements once operational, and subsequently would not have a notable effect on the operation of the local transport networks. As such, the provision of the Buttington ERF should be regarded as acceptable from a highway and transportation perspective.

8.2.9. At paragraph 8.12 Technical Advice Note 18: Transport indicates that:

"Development which attracts substantial movements of freight (including large scale warehousing, distribution and manufacturing which uses bulky raw materials or produces bulky products) should be located away from congested inner areas and residential neighbourhoods. Development plans should identify and allocate sites for distribution, warehousing and bulk-consuming/ producing manufacturing which have direct access to the rail network and/or to the local distributor road network, trunk or principal road network."

8.2.10. This paragraph indicates that development that results in the need to transport bulky products, such as the Development, should be located away from congested inner areas and residential neighbourhoods and should have direct access to the rail network and/or to the local distributor road network, trunk or principal road network. The Development would be located away from built up areas and would take direct access from the A458 trunk road and should, therefore, be regarded to comply with the above requirement of Technical Advice Note 18.

Local Transportation Planning Policies

8.2.11. Section 4.2.7 of the Mid Wales Joint Local Transport Plan includes Figure 4.4, which provides a highway safety risk rating of the key roads within the Mid Wales road network. There are five rating values and the majority of the roads within the immediate vicinity of the Development, including the A458 passing the site, are rated at the centre of the scale as medium risk roads only. There are no high risk roads within the vicinity of the site.

8.2.12. Policy W2 of the Adopted Powys Local Development Plan 2011 – 2026[VII] non exclusively indicates that waste management proposals will be permitted where:

"W2. The highway network is suitable for use by heavy goods vehicles or can be improved to accommodate such vehicles."

8.2.13. The Development would be accessed directly from the A458, which, as a trunk road is by definition a road that would be expected to carry HGV traffic. As such, it is considered that the Development would be ideally located in relation to the highway network and that as a result the proposal would comply with the above aspect of Policy W2 of the Adopted Powys Local Development Plan.

8.3. The Existing Environment

Environmental Assessment Boundary

8.3.1. The assessment area for the transport investigations was agreed with the Transport Network Management Division at the Welsh Government Office and consists of:

- the A458 from a point 500m north of the proposed site access junction to and including the roundabout junction of the A458 / A483 in the south west; and
- the A483 between and inclusive of its roundabout junctions with the A458 and the B4381 / Smithfield Road.

8.3.2. Figure 8-1 shows the agreed study area / local road network.

8.3.3. The proportional increase in traffic levels on the A458 as a result of the development traffic has been calculated within the TA report for the proposal and the performance of the following key junctions has also been assessed:

- Junction 1: A483 / A458 Roundabout Junction;
- Junction 2: A483 / Salop Road Priority Junction; and
- Junction 3: A483 / B4381 / Smithfield Road Roundabout Junction.

8.3.4. In addition, the TA report includes analysis of Personal Injury Accident ("PIA") data for the latest available 3 year period, 2017 / 2018 / 2019, within the assessment area and also considers. Accessibility of the site by non-car modes.

Base Line Conditions

8.3.5. The base line condition of the Development is the existing physical current state of the environment, which from a Transportation and Highways perspective assumes that the site is accessed via the existing access junction. However, it should be noted that there is an extant planning permission for access to the Installation (reference P/2015/0439), which has not yet been implemented, consequently a part of the development proposal there is a new access proposed which is of the same design as the extant planning permission.]

8.3.6. The following has been undertaken in order to confirm existing conditions:

- a review of baseline conditions, including the layout of the local road network, the site access arrangements, the haul route arrangements and confirmation of the existing pedestrian, cyclist and public transport networks;
- analysis of January 2019 Automatic Traffic Count data for the A458 at a point just north of the existing site access junction;
- analysis of January 2019 manual classified traffic count results at the above identified key junctions;
- identification of any committed developments within the study area that are likely to attract / generate traffic on the local road network and which should be included within the cumulative analyses; and
- consideration of historic and existing traffic levels associated with the development.

8.3.7. It should be noted that only developments that have planning permission and have been implemented (regardless of the state of completion) are considered to form the baseline (i.e. committed developments). Other developments that are being determined (at time the TIA was undertaken, February 2019), or that have planning permission, but are not yet implemented, are considered to form the part of cumulative assessment. However, given that the NTM/TEMPRO derived traffic growth have been applied within the TA assessments, then it is considered that the transport assessment investigations should be regarded as robust.

Local Road Network

8.3.8. The Development lies northwest of Buttington, 2.3 km along the A458. [Access to / egress from the Development would be achieved via the approved access junction to the north east of the existing quarry access junction, which was originally approved under planning permission P/2015/0439 and granted an extension in September 2020 under planning permission 20/0575/REM.]

8.3.9. The existing access from the A458 is a simple priority junction and does not have a ghosted right turn lane for traffic wishing to turn right into the existing quarry and industrial area.

As a result, traffic that is turning right to the minor arm may be required to wait for a gap in the oncoming traffic flow and delay northbound traffic on the A458.

8.3.10. The A458 has a width of 6.9m in proximity of the existing access junction. The existing access overall measures 9.1m in width between the security gating installed, which are approximately 10m back from the edge of the carriageway. Figure 8-1 shows a view of the existing access and the security gates.

8.3.11. It is proposed that during the construction phase of the development proposal vehicular access to the site would be achieved via the existing access junction. The new access junction discussed above at paragraph 8.1.5 would be constructed and bought in to operation to serve the site, including the development, prior to the opening of the facility. The layout of the new access junction has previously been approved under planning permission P/2015/0439. Once the new junction is opened the existing quarry access would be downgraded to provide access to the residential property known as Brookside only.

Figure 8-1: A view of the existing access junction

8.3.12. The A458 is a single carriageway road and is subject to a 50mph speed limit within the vicinity of the site. There is a double white marking prohibiting overtaking within the vicinity of the site. Footway provisions are intermittent along the A458 as is the provision of street lighting.

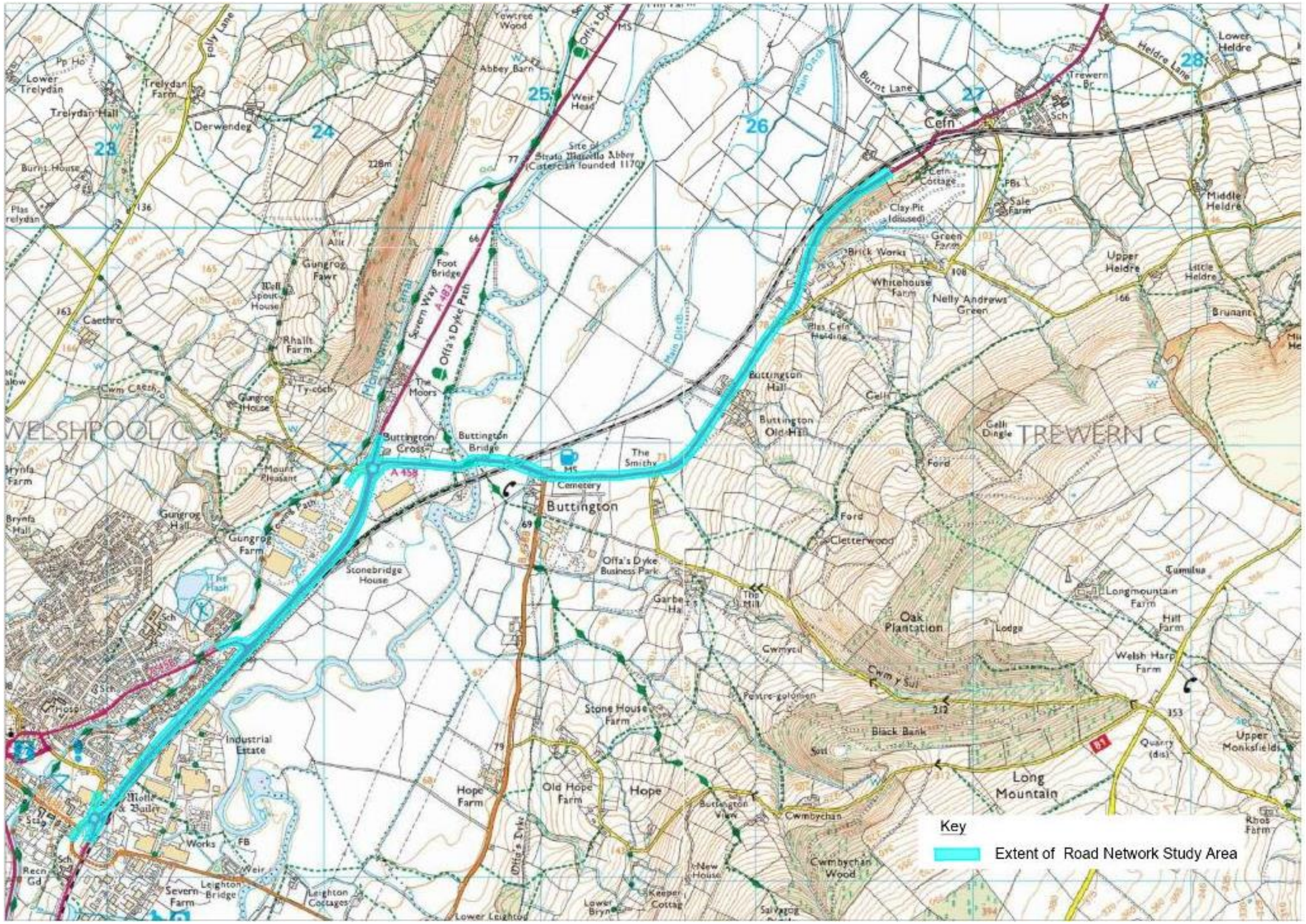
8.3.13. The A458 forms a five arm roundabout junction with the A483, Rhallt Lane and a private access road to the Livestock Market approximately 3km to the south of the site. The A483 forms two arms of this roundabout. The speed limit increases to the national speed limit for single carriageway roads on the A458 prior to the roundabout.

8.3.14. The A483 forms a single lane dualling junction with Salop Road approximately 1km to the south of the aforementioned roundabout. A dedicated right turn area is provided on the A483 for vehicles intending to turn right into Salop Road.

8.3.15. Salop Road runs south westwards towards Welshpool town centre from the junction with the A483. The speed limit changes to 30mph on Salop Road approximately 100m from the junction with the A483 and there is a footway on the northern side of the road.

8.3.16. Approximately 1km south west of the junction of Salop Road with the A483 the latter forms a roundabout junction with the B4381 and Smithfield Road. The speed limit reduces to 30mph on the A483 just prior to the roundabout. Smithfield Road runs northwards from the roundabout towards Welshpool town centre, whilst the A483 runs southwards towards Newtown.

Figure 8-2: Local Road Network



Accessibility by Non–Car Transport Modes - Walking and Cycling

8.3.17. Walking and cycling are the two most sustainable modes of travel and can significantly contribute to improvements in health as well as promoting social inclusion within society. Government statistics indicate that 22% of all journeys by UK households are made on foot (source DFT LTN1/04[VIII]) and the results of the 2018 National Travel Survey[IX] ("NTS") indicate that 80% of trips of less than 1 mile (or 1.6km) are undertaken on foot. It is therefore reasonable to consider that this distance should be regarded as applicable in terms of defining the walking catchment of a new development such as the Development.

8.3.18. The pedestrian environment in close proximity to the Development is typical of a rural area in that the presence of footways along the A458 and the access road leading from it is limited, and street lighting is intermittent.

8.3.19. In the light of the above, given the nature of the land use and its location, it is considered that walking is unlikely to play a key role in travel to / from the site.

8.3.20. The former national planning guidance PPG13[X] paragraph 77 stated that:

"Cycling also has potential to substitute for short car trips, particularly those less than 5 kilometres, and to form part of a longer journey by public transport".

There has been no recent advice that supersedes this and therefore the PPG 13 advice remains the most recent in this respect.

8.3.21. The site is approximately 3.5km from the nearest point of National Cycle Route 6. The route is approximately 230km long and runs from Aberystwyth to Wolverhampton. Locally the route passes through nearby towns and villages Welshpool, Berriew, Newton and Crewgreen.

8.3.22. Cyclists would be able to undertake cycling journeys between the Development and the surrounding areas using the local road network given the rural nature of roads within the vicinity of the Development. However, cyclists would need to be confident and proficient to ride on the A458 which is subject to 50mph speed limit.

Public Transport

8.3.23. The nearest bus stop to the development is located approximately 250 metres from the site access on the A458 in the vicinity of its junction with the Heldre Lane.

8.3.24. There are two bus services available that pass by Heldre Lane near the site but only one that is in regular service five days a week, namely the x75 service.

8.3.25. As identified within Sections 9.3.14 and 9.3.15 above, there is little pedestrian connectivity in the vicinity of the development. However, there is potential for colleagues to arrange multi modal commutes, whereby a member of the workforce arriving at an appropriate bus stop is collected by another who would be passing in their car.

8.3.26. Welshpool railway station is the nearest railway station to the Development and is approximately 7.2 km from the site, i.e. notably in excess of the typically recognised 1km threshold walking distance of heavy rail services. The station could, however, be accessed via the x75 bus service.

8.3.27. Given the nature of the land use and its comparatively remote location, it is considered that alternative modes of transport are unlikely to play a key role in travel to / from the site.

Existing Traffic Levels

8.3.28. In order to obtain the existing traffic levels within the study area, an Automatic Traffic Counter ("ATC") was placed on the A458, within the vicinity of the site access for seven days commencing 14th January 2019. A copy of the ATC data is contained at Appendix C of the TA. It should be noted that the 12 hour traffic flows are taken as 5 day average and not 7 day average. The observed traffic levels are provided in Table 8-1.

Table 8-1: Observed Traffic On The A458 Adjacent To The Development

Time Period	Northbound on A458	Southbound on A458	Total Two–Way Traffic
AM Peak Hour (08:00–09:00)	311	373	684
PM Peak Hour (17:00–18:00)	344	305	649
12 Hour (07:00–19:00)	3272	3140	6412

8.3.29. In addition to the ATC survey, manual classified turning counts were undertaken at the following key junctions on Thursday 17th January 2019 between 07:30 and 10:30 hours and again between 16:30 and 19:30 hours.

- Junction 1: A483 / A458 Roundabout Junction;
- Junction 2: A483 / Salop Road Priority Junction; and
- Junction 3: A483 / B4381 / Smithfield Road Roundabout Junction.

8.3.30. Turning movement diagrams showing the observed weekday AM and PM peak hour flows at the above key junctions are contained at Appendix I of the TA report.

8.3.31. In order to raise the observed flows to the assumed opening year (2025) and the design year (2030, i.e. 5 years post opening, of the development, growth factors were calculated from the latest versions of the National Transport Model ("NTM") 2009[XI] and TEMPRO 6.2[XII]. The growth factors are shown in Table 8-2.

Table 8-2: NTM / TEMPRO Growth Factors

Growth Period	AM Peak	PM Peak
2019 – 2025	1.089	1.085
2019 – 2030	1.145	1.141

8.3.32. The ‘baseline’ 2025 and 2030 weekday AM and PM peak hour traffic flows are shown on traffic flow diagrams at Appendix I of the TA report which may be found in Technical Appendix 8-1.

Pedestrian Capacity

8.3.33. Pedestrian capacity is rarely an issue unless large crowds are expected to a single event at the same time. Pedestrian capacity in the context of the development of the Buttington ERF is limited to consideration of the existing footways and crossing points and using professional judgement to identify any potential problem areas. The level of pedestrian activity associated with the Development is not expected to be large enough to cause a capacity concern.

Pedestrian Severance

8.3.34. Pedestrian severance can be described as the diversion required to walk from one point (origin) to another (destination) when compared to a straight line between the two points. In the context of the Design Manual for Roads and Bridges (“DMRB”) the consideration of severance is related to changes in traffic flow along a road, or new road, which would impact on pedestrian movements across it. It is considered within this study whether the Buttington ERF would materially affect pedestrian severance within the vicinity of the Development.

Pedestrian Delay

8.3.35. Increases in traffic flow along an existing road would potentially increase the waiting time for pedestrians to cross. Professional judgement is required in the absence of any quantitative guidance contained in the IEMA Guidelines. It is considered in this study whether the Buttington ERF would materially affect pedestrian delay within the vicinity of the Development.

Pedestrian Amenity

8.3.36. The IEMA Guidelines describe the pedestrian amenity as the pleasantness of a walking journey. It can be adversely affected by traffic flow and the quality of the route surroundings. This is generally a matter of professional judgement; however where traffic flows are significantly increased this could be regarded as a dis-benefit in respect to pedestrian amenity. It is considered in this study whether the Buttington ERF would materially affect pedestrian amenity within the vicinity of the Development.

Pedestrian Fear and Intimidation

8.3.37. Pedestrian fear and intimidation is closely related to pedestrian amenity and is heavily influenced by the volume of traffic on adjacent roads, the volume of HGVs within that traffic and the commodiousness of footways to provide separation from the vehicular carriageway. It is considered in this study whether the Buttington ERF would materially affect pedestrian fear and intimidation within the vicinity of the Development.

Driver Delay

8.3.38. Analyses of the operation of the agreed key junctions on the local road network under the baseline scenario and confirms that the key junctions would operate within capacity during the typical weekday peak hours in 2025 and 2030.

Visual Impact

8.3.39. The A458 is a trunk road, which by definition is expected to carry large commercial vehicles. As such, it is concluded that the road is not sensitive from a visual impact perspective to HGV traffic.

Accidents and Safety

8.3.40. The Transport Assessment contains detailed analyses of the Personal Injury Accident record of the local road network and confirms that there is not an existing HGV related accident problem.

Likely Future Conditions

8.3.41. If the development proposal is not approved and activity at the site was to remain as existing then the future conditions on the local road network from a traffic flow perspective are indicated by the 2025 and 2030 weekday AM and PM peak hour base flows shown on the traffic flow diagrams at Appendix I of the TA report which may be found in Technical Appendix 8-1.

8.3.42. However, ITL is advised that if the Development does not go ahead, quarrying activities would continue at the permitted levels and traffic movements, particularly HGVs, would substantially increase. In addition, once the site was quarried out to a flat development platform, additional small to medium industrial units would be constructed. It should be noted that the site is zoned for employment use, however development of these units would be subject to obtaining planning permission. It can be reasonably anticipated that planning permission would be granted given the zoning in the LDP.

8.3.43. If the development proposal is not approved the proposed new site access junction would still be constructed and therefore the geometry of the local road network would be changed from the existing arrangement.

8.4. Environmental Effects Assessment

Construction Phase - Traffic

8.4.1. The impact of the Buttington ERF, in terms of vehicular movements to/from the Development, during the construction phase has been considered. In this regard, there are two clear elements to consider; firstly travel by construction staff by private vehicles, i.e. travel by light goods vehicles (“LGVs”) and cars; and secondly deliveries to the Development and the removal of materials from the site, .i.e. heavy goods vehicle (“HGV”) movements.

8.4.2. The construction phase traffic levels were provided by Hitachi Zosen Inova AG (“HZI") and are provided in Table 8-3. Whilst the likely vehicle movements during the construction phase have been provided, as that phase of the development is temporary only, the junction capacity assessments for this study have only been undertaken for the permanent operational phase of the development.

Table 8-3: Daily Traffic Levels During Construction Phase

Phase	Level of Daily Traffic Attracted			
	Cars		HGVs	
	Arrivals	Departures	Arrivals	Departures
Construction Phase enabling stage (6 months)	108	108	141	141
Construction Phase worst case (2 months only)	384	384	13	13
Construction Phase average (excluding enabling stage)	108	108	13	13

8.4.3. The assessed HGV movements during the construction phase, in particular the enabling phase, assume that excavated material would be removed off-site. However, it is intended that as much of the excavated material as possible would be re-used on site and as such the assessment of construction HGV movements should be regarded as a robust worst case. In that regard, during the enabling phase it has been calculated that it would be necessary to excavate in the order of 334,635$m^3$of material of which in the order of 172,400m^3 would be re-used on site. This leaves a volume of 162,235m^3 of material to be removed. Using a figure of 1.8 tonnes per m^3 this would give a tonnage of 292,023.

8.4.4. On the basis of an average vehicle payload of 20 tonnes and a 5.5 day week operation, and a 26 week enabling stage there would on average be 103 HGV arrivals and 103 HGV departures per day during the construction enabling phase of the development associated with the removal off site of in the order of 292,023 tonnes of material. With reference to the HGV movements expected for the other phases of the construction of the development it can, therefore, be seen that the allowance of 141 daily HGV arrivals and departures during the construction enabling phase could be regarded as robust.

8.4.5. The construction HGV movements are likely to be split 50% to and from the north and 50% to and from the south.

Construction Phase - Pedestrian Severance

8.4.6. The construction traffic would enter and leave the development via the A458 and thereafter HGV movements would be concentrated on the major road network. Footways provided along the A458 and the A483 are intermittent and due to the rural location of the site and lack of pedestrian facilities within the vicinity of the site, the locality is not expected to have notable levels of pedestrian activity. As such, it is considered that HGV construction traffic would not materially affect pedestrian severance.

Construction Phase – Pedestrian Delay, Amenity, Fear and Intimidation

8.4.7. HGV construction traffic would be concentrated on the major road network where pedestrian facilities are intermittent and consequently pedestrian activity is low. As such, it is considered that HGV construction traffic would not materially affect pedestrian delay, amenity, fear and intimidation.

Construction Phase – Vehicle Trackout

8.4.8. Appropriate measures would be put in place at the site during the construction phase, including the provision of wheel wash facilities, in order to ensure that dust and dirt is not transferred to the public highway. As such, it is not considered that HGV construction traffic would give rise notable levels of dust and dirt on the public highway.

Construction Phase – Visual Impact

8.4.9. The A458 is a trunk road, which by definition is expected to carry large commercial vehicles. As such, it is concluded that the use of the road by HGVs associated with the construction phase of the Development proposal would not lead to a material change in terms of the visual impact of vehicles using the road.

Construction Phase – Driver Delay

8.4.10. The Transport Assessment contains detailed analyses of the operation of the agreed key junctions on the local road network and confirms that significant levels of additional driver delay would not accrue as a result of the operation of the Development. It is considered that the average flows expected during the construction phase of the development, which would include lower HGV flows, would be unlikely to lead to a significant increase in driver delay at off-site junctions on the local road network. In addition, the construction phase traffic flows should be viewed in the context that they would be temporary only.

Construction Phase – Accidents and Safety

8.4.11. The Transport Assessment contains detailed analyses of the Personal Injury Accident record of the local road network and confirms that there is not an existing HGV related accident problem, consequently, it is considered that the use of the local road network by construction phase HGV traffic should not give rise to highway safety concerns.

Construction Phase – Construction of new access

8.4.12. It is proposed that general construction traffic would utilise the existing site access junction in order to access / egress the site. However, the new access junction would be constructed and bought in to operation prior to the operational and decommissioning phases of the development proposal. As such, and in accordance with the PINS Scoping Direction, within this chapter the effect of the construction of the new access from a transport environmental perspective is assessed. In that regard, the temporary effect of the construction of the site access from a traffic delay perspective is considered.

8.4.13. In order to assess the effect of the construction of the access from a traffic delay perspective a TRANSYT (signal) assessment of the operation of temporary traffic signals on the A458 adjacent to the site was undertaken. The assessment assumed a maximum works length of 250m, a 2 stage arrangement with northbound traffic running in one stage and southbound the other stage and a 120 second cycle time with a 20 second intergreen period. The assessment was undertaken on a worst case basis for the typical weekday AM and PM peak hours. The results of the TRANSYT assessment are summarised below in Table 8-4, whilst the full output files are contained in Technical Appendix 8-3.

Table 8-4: 2025 AM and PM peak Hour TRANSYT Assessment of Temporary Traffic Signals at the Site Access

	Degree of Saturation	Queue
Weekday AM Peak Hour		
A458 Northbound	70%	14 (14.23)
A458 Southbound	71%	16 (15.71)
Weekday PM Peak Hour		
A458 Northbound	62%	12 (12.02)
A458 Southbound	60%	13 (12.49)

8.4.14. The TRANSYT results summarised above confirm that queueing at the temporary traffic signals that would be utilised during the construction of the new access junction would be moderate only during the typical weekday peak hours in 2025.

Construction Phase - Mitigation

8.4.15. It is considered that the mitigation measures required during the construction phase would consist of wheel wash facilities at the site, a construction / HGV management plan and a traffic management plan during the construction of the new access junction.

Operational Phase – Traffic

8.4.16. The development would process a maximum of 167,000tpa of non-recyclable waste.

8.4.17. Deliveries of waste are based on a 278 working day year (5.5 day week minus 8 public holiday days) and an average load of 15 tonnes per vehicle. Additionally, taking into account deliveries of consumables and the collection of Incinerator Bottom Ash ("IBA") residues and Air Pollution Control ("APCR") residues the average daily HGV levels attracted to Buttington ERF is expected to comprise 50 vehicular loads per day. A summary of the expected level of HGV traffic attracted to the Buttington ERF on a typical weekday is provided within Table 8-5.

Table 8-5: Likely Level Of HGV Traffic Attracted By The Development On A Typical Weekday

Development Aspect	Total	
	HGV Loads	Two Way HGV Movements
167,000 tonnes per annum of waste materials	40	80
IBA Residues	7	14
APCR Residues	1	2
Consumables	2	4

8.4.18. The Buttington ERF would accept deliveries of waste for up to 12 hours on weekdays and 5 hours on Saturdays. Assuming equal numbers of HGV trips during each hour, there would be an average of 4 HGV arrivals and 4 HGV departures during each hour on a typical weekday. On that basis, Table 8-6 shows the expected HGV arrivals and departures during the weekday AM and PM peak hours.

Table 8-6: HGV Related Vehicular Trips On A Typical Weekday

Time Period	Arrivals	Departures	Total
AM Peak Hour (08:00–09:00)	4	4	8
PM Peak Hour (17:00–18:00)	4	4	8

8.4.19. The development is likely to employ 30 staff members. The staff modal split has been calculated from the Office for National Statistics ("ONS") Method of Travel to Work survey undertaken in 2011 (Nomis: WP703EW[XIII])` In the Nomis database, the Powys middle layer super output area W35001315, which includes the majority of the development, was selected, this is provided in Table 8-7.

Table 8-7: Person Trip Attraction (Staff)

Time Period	Proportion of Staff Travelling By Each Mode	Number of Staff Travelling by Each Mode
Walk	6%	2
Cycle	1%	0
Car (Driver)	74%	22
Car (Passenger)	11%	3
Taxi	0%	0
Motorcycle	2%	1
Bus, Mini–Bus or Coach	2%	1
Train	1%	0
Underground, Metro, Light Rail or Tram	0%	0
Other Mode of Travel to Work	2%	1
Total	100%	30

Note: Staff assumed to arrive and depart by the same mode of travel. As such, staff numbers shown in table should be doubled to derive number of daily staff related trips by each mode

8.4.20. The 3 staff members (11%) who would commute as passengers in a car are assumed to travel with the staff members driving a car, i.e. car sharing. On this basis, there could be 22 (74%) vehicular arrivals in the morning and 22 (74%) corresponding departures in the afternoon as shown in Table 9-9. However, it should be noted that the end operator of the Installation, Hitachi Zosen Inova AG, has advised that shift patterns are likely to be operated at the site. As such, the traffic flows shown in Table 8-9 should be regarded to represent a worst case in terms of the likely development traffic levels occurring during the typical weekday peak hours.

Table 8-8: Staff Related Vehicular Trips On A Typical Weekday

Time Period	Arrivals	Departures	Total
AM Peak Hour (08:00–09:00)	22	0	22
PM Peak Hour (17:00–18:00)	0	22	22

8.4.21. During the operational stage the HGV traffic attracted by the development is likely to be split 40% from a northerly direction and 60% from the south. The non–HGV traffic is likely to be split 70% from the north and 30% from the south. Table 8-9 shows the distribution of the HGV traffic. Deliveries of consumables and the collection of IBA and APCR residues have been assumed to be distributed in accordance with the HGV distribution.

Table 8-9: Distribution of HGV Movements on the A458 On A Typical Weekday

Time Period	Arrivals		Departures		Total	
	Right In (FS)	Left In (FN)	Right Out (TN)	Left Out (TS)	To/from north	To/from south
AM Peak Hour (08:00–09:00)	2	2	2	2	4	4
PM Peak Hour (17:00–18:00)	2	2	2	2	4	4
12 Hour (07:00–17:00)	20	20	20	20	40	40

Note to Table
FS = From south on A458
FN = From north on A458
TN = To north on the A458
TS = To South on A458

8.4.22. Table 8-10 shows the staff vehicular movements arriving and departing the site access.

Table 8-10: Distribution of Staff Vehicular Movements on the A458 On A Typical Weekday

Time Period	Arrivals		Departures		Total	
	Right In (FS)	Left In (FN)	Right Out (TN)	Left Out (TS)	To/from north	To/from south
AM Peak Hour (08:00–09:00)	7	15	0	0	15	7
PM Peak Hour (17:00–18:00)	0	0	15	7	15	7
12 Hour (07:00–19:00)	7	15	15	7	30	14

Note to Table
FS = From south on A458
FN = From north on A458
TN = To north on the A458
TS = To South on A458

8.4.23. Traffic flow diagrams are included at Appendix I of the TA report in Technical Appendix 8-1, showing the expected weekday AM and PM peak hour development traffic movements distributed on the local road network.

8.4.24. Table 8-11 below shows the 2030 baseline and 2030 baseline plus development peak hour and 12 hour traffic flows on the A458 within the vicinity of the site and also shows the proportional increase with the development traffic.

Table 8-11: Impact of Development Traffic

Time Period	Traffic Movement	Baseline Traffic	Baseline + Development	% Increase
Weekday AM Peak Hour (08:00–09:00)	Northbound	338	(338+11)	3.3%
	Southbound	406	(406+19)	4.7%
Weekday PM Peak Hour (17:00–18:00)	Northbound	373	(373+19)	5.1%
	Southbound	331	(331+11)	3.3%
Weekday 12 Hour (07:00–19:00)	Northbound	3560	(3560+62)	1.7%
	Southbound	3416	(3416+62)	1.8%

Operational Phase - Pedestrian Severance

8.4.25. The operational development traffic, which as demonstrated above would be modest only, would enter and leave the development via the A458. Footways provided along the A458 are intermittent. However, due to the rural location of the site and lack of pedestrian facilities within the vicinity of the site, the locality is not expected to have notable levels of pedestrian activity. As such, the operational phase of the development is not expected to materially affect pedestrian severance.

Operational Phase - Pedestrian Amenity, Delay, Fear and Intimidation

8.4.26. The additional traffic levels would represent a very small increase compared to the baseline situation (see Table 8-10). As such, the operational phase of the development is not expected to materially affect pedestrian amenity, delay, fear or intimidation.

Operational Phase – Visual Impact

8.4.27. The A458 is a trunk road, which by definition is expected to carry large commercial vehicles. As such, it is concluded that the use of the road by HGVs associated with the operational phase of the Development proposal would not lead to a material change in terms of the visual impact of vehicles using the road.

Operational Phase – Driver Delay

8.4.28. The Transport Assessment contains detailed analyses of the operation of the agreed key junctions on the local road network and confirms that significant levels of additional driver delay would not accrue as a result of the operation of the Development.

8.4.29. Furthermore, the improved site access junction arrangement proposed includes a ghosted right turn storage area for traffic turning into the site and therefore provides a notable highway safety / operational benefit.

Operational Phase – Accidents and Safety

8.4.30. The Transport Assessment contains detailed analyses of the Personal Injury Accident record of the local road network and confirms that there is not an existing HGV related accident problem. As such, it is considered that the use of the local road network by the operational phase HGVs should not give rise to highway safety concerns.

Operational Phase – Use of New Access Junction

8.4.31. As indicated above, the new access junction would be constructed and bought in to operation prior to the operational and decommissioning phases of the development proposal. As such, and in accordance with the PINS Scoping Direction, within this chapter the effect of the operation of the new access from a transport environmental perspective is assessed. In that regard, the effect of the operation of the site access from a traffic delay perspective is considered.

8.4.32. In order to assess the effect of the operation of the access during the operational stage of the development from a traffic delay perspective a PICADY assessment of the operation of the new access was undertaken during the typical weekday AM and PM peak hours. The results of the PICADY assessment are summarised below in Table 8-12, whilst the full output files are contained in the Transport Assessment at Technical Appendix 8-1.

Table 8-12: 2030 Typical Weekday AM and PM peak Hour PICADY Assessment of Site Access Junction

Approach	**Worst Case RFC**	
	RFC	**Queue**
Weekday AM Peak Hour		
Site Access Right Turn	0.07	0.07
Site Access Left Turn	0.04	0.04
A458 South Right Turn to Site	0.05	0.05
Weekday PM Peak Hour		
Site Access Right Turn	0.11	0.12
Site Access Left Turn	0.05	0.06
A458 South Right Turn to Site	0.03	0.04

8.4.33. The PICADY results summarised above confirm that the site access junction would operate comfortably within capacity during the typical weekday peak hours in the design year of 2030. In that regard, there would not be queuing of any note at the junction and the proposed right turn lane would comfortably accommodate the very modest forecast level of queuing for vehicles waiting to turn right into the site. It should also be recognised that the provision of the new access junction to replace the existing junction would potentially improve traffic flow conditions and highway safety within the vicinity of the site.

Operational Phase - Mitigation

8.4.34. Direct mitigation is not considered to be required, however, both Broad Energy and HZI are aware that HGV traffic would be a concern to local residents and the Highway Authority. As such HGVs would be operated and maintained to the highest standards in order to minimise any impacts on the environment and road safety.

8.4.35. Notwithstanding the above, it should be recognised that, as discussed above at paragraph 8.1.5, it is proposed that vehicular access to the ERF would be achieved via a new priority 'T' junction with a dedicated ghosted right turn lane. The new junction would be located approximately 170m to the north of the existing access junction and would be provided to contemporary design standards. Once the new junction is opened the existing quarry access would be downgraded to provide access to the residential property known as Brookside only. The delivery of the new access junction would require widening / straightening of the A458 on its eastern side adjacent to the site along with cutting and embankment works. The layout of the new access junction has previously been approved under planning permission P/2015/0439. The works necessary within the public highway will be to deliver the access junction are likely to be secured by condition and undertaken pursuant to a section 278 agreement.

8.4.36. In addition, in order to reduce the level of car traffic associated with the operation of the development the operators propose to implement a Travel Plan, which would include measures such as car sharing.

Decommissioning Phase - Traffic

8.4.37. Activity at the site during the decommissioning phase would be the reverse of activity during the construction phase and as such it is considered that traffic levels would be the same as the construction phase flows provided by HZI, albeit that the enabling phase would not be required. It should also be noted that the decommissioning traffic would be access the site via the new access junction, which provides highway safety and operational benefits when compared to the existing access junction that would be used to serve the construction phase of the development.

8.4.38. The decommissioning flows are provided in Table 8-13. Whilst the likely vehicle movements during the decommissioning phase have been provided, as that phase of the Development is temporary only and no significant effects are expected, the junction capacity assessments for this study have only been undertaken for the permanent operational phase of the Development which is expected to have greater impacts by virtue of the fact that it would span a far longer time period and would, with the exception of the relatively short enabling phase, attract higher daily HGV levels.

Table 8-13: Daily Traffic Levels During Decommissioning Phase

Phase	Level of Daily Traffic Attracted			
	Cars		HGVs	
	Arrivals	Departures	Arrivals	Departures
Decommissioning Phase worst case (2 months only)	384	384	13	13
Decommissioning Phase average	108	108	13	13

Decommissioning Phase - Pedestrian Severance

8.4.39. The decommissioning phase traffic would enter and leave the Development via the A458 and thereafter HGV movements would be concentrated on the major road network. Footways provided along the A458 and the A483 are intermittent and due to the rural location of the site and lack of pedestrian facilities within the vicinity of the site, the locality is not expected to have notable levels of pedestrian activity. As such, it is considered that HGV traffic associated with the decommissioning phase would not materially affect pedestrian severance.

Decommissioning Phase – Pedestrian Delay, Amenity, Fear and Intimidation

8.4.40. HGV decommissioning phase traffic would be concentrated on the major road network where pedestrian facilities are intermittent and consequently pedestrian activity is low. As such, it is considered that HGV traffic associated with the decommissioning phase would not materially affect pedestrian delay, amenity, fear or intimidation.

Decommissioning Phase – Vehicle Trackout

8.4.41. Appropriate measures would be put in place at the site during the decommissioning phase, including if required by the Local Highway Authority (“LHA”) the provision of wheel wash facilities, in order to ensure that dust and dirt is not transferred to the public highway. It should, however, be recognised that at that decommissioning stage of the development the site would be served by the new access road which would have a metalled surface and thus would reduce the likelihood of dust and dirt being transferred to the public highway.

Decommissioning Phase – Visual Impact

8.4.42. The A458 is a trunk road, which by definition is expected to carry large commercial vehicles. As such, it is concluded that the use of the road by HGVs associated with the decommissioning phase of the development proposal would not lead to a material change in terms of the visual impact of vehicles using the road.

Decommissioning Phase – Driver Delay

8.4.43. The Transport Assessment contains detailed analyses of the operation of the agreed key junctions on the local road network and confirms that significant levels of additional driver delay would not accrue as a result of the operation of the Development. It is considered that the average flows expected during the decommissioning phase of the Development, which would include lower HGV flows, would be unlikely to lead to a significant increase in driver delay. In addition, the decommissioning phase traffic flows should be viewed in the context that they would be temporary only.

Decommissioning Phase – Accidents and Safety

8.4.44. The Transport Assessment contains detailed analyses of the Personal Injury Accident record of the local road network and confirms that there is not an existing HGV related accident problem.

Decommissioning Phase – Use of New Access Junction

8.4.45. As indicated above, the new access junction would be constructed and bought in to operation prior to the operational and decommissioning phases of the development proposal. As such, and in accordance with the PINS Scoping Direction, within this chapter the effect of the use of the new access from a transport environmental perspective is assessed. In that regard, the effect of the operation of the site access from a traffic delay perspective is considered.

8.4.46. In order to assess the effect of the operation of the access during the decommissioning stage of the development from a traffic delay perspective a PICADY assessment of the operation of the new access was undertaken during the typical weekday AM and PM peak hours. The development has a 30 year life span and therefore the assessments were undertaken for the future year of 2055. The results of the PICADY assessment are summarised below in Table 8-14, whilst the full output files are contained in the Technical Appendix 8-2.

Table 8-14: 2055 Typical Weekday AM and PM peak Hour PICADY Assessment of Site Access Junction

Approach	Worst Case RFC	
	RFC	Queue
Weekday AM Peak Hour		
Site Access Right Turn	0.18	0.21
Site Access Left Turn	0.07	0.07
A458 South Right Turn to Site	0.20	0.24
Weekday PM Peak Hour		
Site Access Right Turn	0.09	0.09
Site Access Left Turn	0.03	0.04
A458 South Right Turn to Site	0.05	0.06

8.4.47. The PICADY results summarised above confirm that the site access junction would operate comfortably within capacity during the typical weekday peak hours in 2055. In that regard, there would not be queuing of any note at the junction and the proposed right turn lane would comfortably accommodate the very modest forecast level of queuing for vehicles waiting to turn right into the site.

Decommissioning Phase – Mitigation

8.4.48. It is considered that the mitigation measures required during the decommissioning phase would consist of wheel wash facilities at the site and a construction / HGV management plan.

The Development Overall

8.4.49. All aspects of the Development have been considered in the environmental effects assessment. The effect of the permanent operational Development traffic flows on the local road network is considered to have the greatest impact rather than the effect of the construction or decommissioning traffic flows by virtue of the fact that the operational phase spans a far longer time period and, with the exception of the relatively short enabling phase, includes higher daily HGV levels. Hence only the permanent operational phase has been assessed in detail (see Table 8-15). This approach is adopted because the construction and decommissioning flows would be temporary only and no significant effects are likely and as such detailed assessment of these flows is not deemed to be necessary.

The Development in Combination with Other Developments

8.4.50. The observed traffic levels do not include for traffic associated with any approved but as of yet un-implemented 'committed' developments. As such, as requested by the Local

Highway Authority ("LHA") during scoping discussions, in order to ensure that a cumulative assessment is undertaken the key committed developments within the vicinity of the site were identified and the level of traffic attracted to / generated by those developments was calculated.

8.4.51. The committed development traffic calculations are also set out in Chapter 5 of the TA report in Technical Appendix 8-1, whilst turning movement diagrams contained at Appendix I of the TA report show the weekday AM and PM peak hour committed development traffic flows distributed on the local road network.

8.4.52. Consideration must be given to the cumulative effects of the Development in conjunction with other developments – both existing and proposed. For the existing highway network, junction capacity assessments were undertaken at three key junctions and are discussed in full within the TA report. Those assessments were undertaken on a cumulative impact basis with committed development traffic allowances included within the assessment flows.

8.4.53. Table 8-15 compares the worst case forecast reference to flow capacity ("RFC") for the most critical arm at each junction under the 2030 baseline scenario and the 2030 (cumulative) baseline plus committed development plus operational development traffic scenario.

Table 8-15: 2030 Cumulative Junction Impact Assessment Summary

Arm	**Time Period**	**Worst Case RFC**	
		Baseline Scenario	**Baseline plus Committed Developments Plus Operational Development (cumulative) Scenario Traffic**
Junction 1 – A483 / A458 Roundabout			
A458	AM	0.57	0.64
	PM	0.53	0.56
Junction 2 – A483 / Salop Road Priority Junction			
Salop Road	AM	0.49	0.66
	PM	0.51	0.52
Junction 3 – A483 / B4381 / Smithfield Road Roundabout			
Smithfield Road	AM	0.63	0.71
	PM	0.75	0.76

8.4.54. The assessment results confirm that the three key junctions analysed would operate within the limit of their practical reserve capacity during the typical weekday AM and PM peak hours under the cumulative traffic scenarios tested.

Interactive Effects

8.4.55. Consideration must be given to the interactive effects associated with the Development in terms of the relationship between the various KEAs considered. Likely interactive effects are discussed in Table 8-16.

Table 8-16: Interactive Effects on KEA

KEA Interaction	Interactive Effects
Transport and Noise	Increased traffic movements have the potential to increase noise levels. The impact of noise from traffic has been considered in Chapter 14 Noise.
Transport and Air Quality	Increased traffic movements have the potential to decrease air quality. The impact of emissions from traffic has been considered in Chapter 6 Air Quality.

8.5. Environmental Effects Analysis

8.5.1. Based on the Environmental Effect Assessment for all Development phases discussed in Section 8.4, a detailed environmental effects analysis is provided in Table 8-17 to 8-19.

8.5.2. The significance criteria provided in Table 8-17 are considered relevant in respect of the impact of traffic flows associated with the Development within the study area and have been used to describe the effects.

Table 8-17: Environmental Effects Assessment Evaluation Criteria

Criteria	Description
Magnitude of Impact (Mg) Operational Traffic	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible - The bearing of the impact is too small to be measured meaningfully (0 to 10%) • Minor - Slight, very short or highly localised impact of no significant consequences (10 % to 30 % change). • Moderate - Limited impact (by extent, duration or magnitude) which may be considered significant (30 % to 60 % change). • Major - Considerable impact (by extent, duration or magnitude) or more than local significance or in breach of recognised acceptability, legislation, policy or standards (greater than 60 % change).
Magnitude of Impact (Mg) Construction Traffic	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible - Construction traffic flows less than 25 HGVs per day on all roads • Minor - Construction traffic flows less than 100 HGVs per day on major road network, or less than 25 HGVs on minor roads • Moderate – Construction traffic flows greater than 100 HGVs per day on major road network, or greater than 25 HGVs per day on minor roads. • Major - Construction traffic flows greater than 200 HGVs per day on major road network or greater than 50 HGVs per day on minor roads.

Table 8-17: Environmental Effects Assessment Evaluation Criteria (cont)

Criteria	Description
Magnitude of Impact (Mg) Effect of Junctions	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible - Negligible change to operational performance of highway network • Minor - Change that leads to perception of a minor increase or decrease in delays and congestion • Moderate Change that leads to perception of a moderate increase or decrease in delays and congestion • Major - Change that leads to perception of a major increase or decrease in delays and congestion
Magnitude of Impact (Mg) Pedestrian Severance, Delay, Amenity, Fear and Intimidation	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible – the Development would add less than 25 HGVs per day on all roads where regular pedestrian movements are likely; • Minor – the Development would add 100 HGVs per day on major road network, or less than 25 HGVs on minor roads where regular pedestrian movements are likely; • Moderate – the Development would add greater than 100 HGVs per day on major road network, or greater than 25 HGVs per day on the minor road network where regular pedestrian movements are likely; • Major - the Development would add greater than 200 HGVs per day on major road network or greater than 50 HGVs per day on minor roads where regular pedestrian movements are likely.
Magnitude of Impact (Mg) Effect of Construction of Site Access Junction on traffic flow	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible - Negligible change to operational performance of highway network • Minor - Change that leads to perception of a minor increase or decrease in delays and congestion • Moderate Change that leads to perception of a moderate increase or decrease in delays and congestion • Major - Change that leads to perception of a major increase or decrease in delays and congestion

Table 8-17: Environmental Effects Assessment Evaluation Criteria (cont)

Criteria	Description
Magnitude of Impact (Mg) Effect of Operation of Site Access Junction on traffic flow	• Unknown - there is insufficient evidence to indicate the magnitude of the effect; • Negligible - Negligible change to operational performance of highway network • Minor - Change that leads to perception of a minor increase or decrease in delays and congestion • Moderate Change that leads to perception of a moderate increase or decrease in delays and congestion • Major - Change that leads to perception of a major increase or decrease in delays and congestion
Geographic Extent of Impact (GE)	• Within ERF Boundary – 0km • Up to 2km from ERF • Up to 10km from ERF • Over 10km from ERF
Frequency of Impact (F)	• Single event • Annual activity • Monthly occurrence • Continuous activity
Duration of Impact (D)	• 1 week • 1 month • 2-6 months • 6-12 months • 12-36 months • Over 36 months
Reversibility of Impact (R)	• Unknown - there is insufficient research/experience to indicate whether the environmental effect is reversible • High - previous research/experience indicates the environmental effect is reversible • Medium - previous research/experience indicates the environmental effect may be reversible • Low - previous research/ experience indicates that there is a small likelihood that the environmental effect is reversible • Nil - previous research/ experience indicates that the environmental effect is irreversible
Ecological, Cultural and Socio-economic Context of Impact (ESC)	• Relatively pristine area not adversely affected by human activity • Evidence of human activity • High level of human activity

Table 8-18 : Environmental Effects Analysis – Transport Construction Phase

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Construction Traffic	Traffic congestion	Minor	<10km	Cont	12-36M	H	E
	Conclusion: The environmental impact of traffic congestion in the construction phase is considered not significant as daily HGV levels would be less than 100 on the major road network. Notwithstanding the above some mitigation is proposed as outlined below.						
	Mitigation Implementation of HGV routing strategy to be agreed with the Local Highways Authority						
Walking in the vicinity of the Development	Pedestrian severance, delay, Amenity, fear and intimidation	Negligible	<10km	Cont	12 - 36M	H	E
	Conclusion: HGV decommissioning phase traffic would be concentrated on the major road network where pedestrian facilities are intermittent and consequently pedestrian activity is low. As such, it is considered that HGV traffic associated with the decommissioning phase would not materially affect pedestrian severance, delay, amenity, fear or intimidation.						
	Mitigation No mitigation considered to be required.						
Construction Traffic	Mud and debris track out on to local highways	Minor	<2km	Cont	12-36M	H	E
	Conclusion: The environmental impact of mud and debris and track out on to local highways is considered as not significant as it can be managed with the mitigation measures set out below.						
	Mitigation • Wheel wash facilities to be provided at the Development • Road sweeper to be used during construction phase						
Large construction vehicles	Visual Impact	Minor	<2km	Cont	12-36M	H	E
	Conclusion: The visual impact of large construction vehicles is considered as not significant as the Development would attract only low numbers of HGVs during the construction phase and is accessed directly from a trunk road which by definition is expected to carry large commercial vehicles.						
	Mitigation: No mitigation is required.						

Table 8-18: Environmental Effects Analysis – Transport Construction Phase (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Construction traffic	Driver Delay	Minor	<10km	Cont	12-36M	H	E
	Conclusion: It is considered that driver delays due to the construction traffic associated with the Development would be minor only due to the low numbers of HGV numbers expected.						
	Mitigation No mitigation considered to be required.						
Construction of new access	Effect on Traffic Flow	Moderate	0km	Cont	2-6M	H	H
	Conclusion: It is considered that delays due to the construction of the site access junction would be moderate only and would only occur on a temporary basis for a limited period of time.						
	Mitigation • Provision of traffic management plan in order to ensure that temporary road works accord with guidelines and minimise delays for passing traffic.						

Table 8-19 : Environmental Effects Analysis – Transport Operational Phase

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
AM Peak Hour (08:00-09:00)	Traffic congestion on key links	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The operation of the key links would not be significantly affected by the operational development traffic during the typical weekday AM peak hour.						
	Mitigation None required						
PM Peak Hour (17:00-18:00)	Traffic congestion on key links	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The operation of the key links would not be significantly affected by the operational development traffic during the typical weekday PM peak hour.						
	Mitigation • None required						
12 Hour (07:00-19:00)	Traffic congestion on key links	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The operation of the key links would not be significantly affected by the operational development traffic over the course of the operational day on a typical weekday.						
	Mitigation • None required						

Table 8-19 : Environmental Effects Analysis – Transport Operational Phase (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Walking in the vicinity of the Development	Pedestrian severance, delay, Amenity, fear and intimidation	Minor	<10km	Cont	Over 36M	H	E
	Conclusion: The operational development traffic, which would be modest only, would enter and leave the development via the A458. Footways provided along the A458 are intermittent. However, due to the rural location of the site and lack of pedestrian facilities within the vicinity of the site, the locality is not expected to have notable levels of pedestrian activity. As such, the operational phase of the development is not expected to materially affect pedestrian severance, delay, amenity, fear or intimidation.						
	Mitigation No mitigation considered to be required.						
Operation of new access	Effect on Traffic Flow	Negligible	0km	Cont	Over 36M	N	H
	Conclusion: It is considered that delays due to the operation of the site access junction during the operational phase of the development would be negligible.						
	Mitigation None required.						

Table 8-20: Environmental Effects Analysis – Transport Decommissioning Phase

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Decommissioning Traffic	Traffic congestion	Minor	<10km	Cont	12-36M	H	E
	Conclusion: The environmental impact of traffic congestion in the decommissioning phase is considered not significant as daily HGV levels would be less than 100 on the major road network. Notwithstanding the above some mitigation is proposed as outlined below.						
	Mitigation • Implementation of HGV routing strategy to be agreed with the Local Highways Authority						

Table 8-20: Environmental Effects Analysis – Transport Decommissioning Phase (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Walking in the vicinity of the Development	Pedestrian severance, delay, Amenity, fear and intimidation	Negligible	<10km	Cont	12 - 36M	H	E
	Conclusion: HGV decommissioning phase traffic would be concentrated on the major road network where pedestrian facilities are intermittent and consequently pedestrian activity is low. As such, it is considered that HGV traffic associated with the decommissioning phase would not materially affect pedestrian severance, delay, amenity, fear or intimidation.						
	Mitigation No mitigation considered to be required.						
Decommissioning Traffic	Mud and debris track out on to local highways	Minor	<2km	Cont	12-36M	H	E
	Conclusion: The environmental impact of mud and debris and track out on to local highways is considered as not significant as it can be managed with the mitigation measures set out below.						
	Mitigation • Wheel wash facilities to be provided at the Development • Road sweeper to be used during construction phase						
Large decommissioning vehicles	Visual Impact	Minor	<2km	Cont	12-36M	H	E
	Conclusion: The visual impact of large vehicles during the decommissioning phase is considered as not significant as the Development would attract only low numbers of HGVs during the construction phase and is accessed directly from a trunk road which by definition is expected to carry large commercial vehicles.						
	Mitigation No mitigation considered to be required.						
Decommissioning traffic	Driver Delay	Minor	<10km	Cont	12-36M	H	E
	Conclusion: It is considered that driver delays due to the construction traffic associated with the Development would be minor only due to the low numbers of HGV numbers expected.						
	Mitigation No mitigation considered to be required.						

Table 8-20: Environmental Effects Analysis – Transport Decommissioning Phase (cont)

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Operation of new access	Effect on Traffic Flow	Negligible	0km	Cont	12-36M	N	H
	Conclusion: It is considered that delays due to the operation of the site access junction during the decommissioning phase of the development would be negligible.						
	Mitigation None required.						

Table 8-21: Environmental Effects Analysis – Transport In Combination

Activity	Potential Effect	Evaluation Criteria					
		Mg	GE	F	D	R	ESC
Combined Traffic Movements	Junction 1 – A483/A458 Roundabout	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The roundabout junction of the A483 / A458 would operate acceptably during both typical weekday peak hours following the opening of the Development.						
	Mitigation None required.						
	Junction 2 – A483/Salop Road	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The priority junction of the A483 / Salop Road would operate acceptably during both typical weekday peak hours following the opening of the Development.						
	Mitigation None required.						
	Junction 3 – A483/B4381/Smithfield Road	Negligible	<10km	Cont	Over 36M	H	H
	Conclusion: The roundabout junction of the A483 / B4381 / Smithfield Road would operate acceptably during both typical weekday peak hours following the opening of the Development.						
	Mitigation None required.						

8.6. Residual Environmental Effects

8.6.1. This section considers the residual environmental effects of the project, i.e. those effects which remain after the application of mitigation or engineering design.

8.6.2. In addition to the above significance rating the nature / type and duration of the impacts will be assessed using the following criteria

- Major (significant) residual environmental effect - An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor upon all local roads identified within the environmental assessment boundary;
- Moderate (significant) - An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor upon the majority of local roads identified within the environmental assessment boundary;
- Minor (not significant) - An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor upon some local roads identified within the environmental assessment boundary;
- Negligible (not significant) - An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor upon the Development area only;
- Beneficial - An impact that is considered to represent an improvement on the baseline or introduces a positive change.

8.6.3. The type of impact will also be defined according to the following criteria:

- Direct Impact – Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors.
- Indirect Impact - Impacts that result from other activities that are encouraged to happen as a consequence of the Project.

8.6.4. Residual adverse environmental effects for the Project are provided in Table 8-22.

Table 8-22: Summary of Residual Adverse Environmental Effects – Transport

Development Phase	Residual Adverse Environmental Effect	Significance	Likely Effect on the Environment
Construction	Increase in road traffic levels	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.
	Effect of construction of site access junction on traffic flow	Moderate Significant	Anticipated adverse environmental effects would not be permanent.
	Pedestrian severance	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.
	Pedestrian amenity, delay, fear and intimidation	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.
Operation	Increase in road traffic levels	Negligible Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable.
	Effect of traffic on operation of key junctions	Negligible Not Significant	Anticipated adverse environmental effects are small and may not be detectable.
	Effect of operation of site access junction on traffic flow	Negligible Not Significant	Anticipated adverse environmental effects are small and may not be detectable.
	Pedestrian severance	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable.
	Pedestrian amenity, delay, fear and intimidation	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable.

Table 8-22: Summary of Residual Adverse Environmental Effects – Transport (cont)

Development Phase	Residual Adverse Environmental Effect	Significance	Likely Effect on the Environment
Decommissioning	Increase in road traffic levels	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.
	Pedestrian severance	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.
	Pedestrian amenity, delay, fear and intimidation	Minor Not Significant Direct Impact	Anticipated adverse environmental effects are small and may not be detectable and would not be permanent.

8.7. Summary

8.7.1. This chapter is to be read in conjunction with the TA report for the Development and considers the relevant aspects of the TA from an environmental impact perspective. The scope of the TA report was agreed with the Transport Network Management Division at the Welsh Government Office and also Powys County Council highway department prior to its preparation.

8.7.2. In addition, scoping enquiries were also sent to Highways England and Shropshire County Council. The investigations undertaken as part of those scoping enquiries confirmed that the development would be likely to add modest traffic levels only to the road network within England and Highways England confirmed that as a result assessment of trunk roads within England was not required as part of this study.

8.7.3. The relevant National and Local transportation planning policies have been identified and it has been demonstrated that the proposal would comply with those policies.

8.7.4. The baseline transport conditions within the agreed study area have been established and that has included reference to the results of an ATC survey on the A458 and the results of manual classified traffic counts at the three agreed key junctions for this study. In addition, the level of traffic attracted to the identified but as of yet un-implemented 'committed' developments has been calculated.

8.7.5. The level of traffic attracted to the site during the construction and operational phases of the development has then been identified but as the construction and decommissioning phases would be temporary and, with the exception of the short construction period for the site access junction, no significant effects are likely, the junction capacity assessments for this study have only been undertaken for the operational phase of the development, which would span a far longer time period and would, with the exception of the relatively short enabling phase, attract higher daily HGV levels.

8.7.6. Notwithstanding the above, based on the assessment criteria set out in Table 8-17 and Section 8.6 it is considered that the construction vehicle movements would have a direct, temporary, minor adverse effect only on the operation of the local highway network. It is acknowledged that the construction of the new site access junction, which would lead to highway safety and operational gains once it replaces the existing access junction, would have a major, adverse effect on traffic flows on the A458 adjacent to the site but that effect would be for a very limited temporary period only.

8.7.7. Further to the above, based on the aforementioned assessment criteria it is considered that the operational development traffic would have a direct, permanent, negligible adverse effect only on the operation of the local highway network.

8.7.8. Likewise the decommissioning phase would have a direct, temporary, minor adverse effect only on the operation of the local highway network.

8.7.9. Finally, it is considered that during all phases of the development the traffic attracted to the site would have direct and minor adverse impact only on pedestrian severance, amenity, delay, fear and intimidation.

8.8. References

[I] Planning Policy Wales 2018 Edition 10
[II] One Wales: Connecting The Nation - The Wales Transport Strategy
[III] The National Transport Finance Plan 2018
[IV] Mid Wales Joint Local Transport Plan 2015-2020
[V] Powys Local Development Plan (2011-2026)
[VI] Technical Advice Note 18: Transport
[VII] Powys Local Development Plan (2011-2026)
[VIII] Department For Transport LTN1/04 – Policy, Planning and Design for Walking and Cycling
[IX] 2018 National Travel Survey
[X] Planning Policy Guidance Note 13:
[XI] National Transport Model 2009
[XII] TEMPRO 7.2
[XIII] NOMIS - Official Labour Market Statistics

Technical Appendix 8-1
Transport Impact Assessment

Proposed Energy Recovery Facility, Buttington Quarry, Welshpool

Transport Assessment

on behalf of

Broad Energy (Wales) Ltd

February 2021

INTERMODAL TRANSPORTATION

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IT1921

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DRAWINGS

APPENDICES

1 INTRODUCTION

1.1 Intermodal Transportation Ltd (ITL), an independent consultancy specialising in highway engineering and transportation planning, have been appointed by Environmental Compliance Ltd on behalf of Broad Energy (Wales) Ltd to produce a Transport Assessment (TA) to accompany the planning application for a proposed Energy Recovery Facility (ERF) at Buttington Quarry, Welshpool, Wales.

1.2 This report considers the highways and transportation issues associated with the development of the proposed ERF. The proposed ERF would process around 167,000 tonnes per annum (tpa) of Refuse-Derived Fuel (RDF) by means of moving grate incineration.

1.3 The scope of the study was agreed with the Transport Network Management Division at the Welsh Government Office and also Powys County Council highway department. Copies of the highway scoping correspondence for the proposal are contained at Appendix A of this report. In accordance with the scoping agreement, the following issues have been addressed and are included as part of the study.

- Description of the local road network in the vicinity of the proposed Development;
- Description of the development proposal;
- Consideration of accessibility of the site by alternative transport modes, i.e. walking, cycling and public transport;
- Calculation on a first principle basis of the likely level of traffic attracted to the proposal;
- Assessment of the capacity of the key junctions during the road network AM and PM peak hours;
  - A458 / A483 Roundabout Junction
  - A483 / Salop Road Priority Junction
  - A483 / Smithfield Road Roundabout Junction
  - A458 / Site Access Junction
- Examination of the Personal Injury Accident (PIA) record of the local road network;
- Consideration of access to / from the Development for service vehicles including undertaking AutoTrack swept path analysis; and

- Consideration of the proposed parking provision at the development in the context of the relevant local standards;

1.4 Due to the close proximity of the development proposal to the Wales / England border, scoping enquiries were also sent to Highways England (HE) and Shropshire County Council (SCC). Those scoping enquiries confirmed that the development would be likely to add modest traffic levels only to the road network within England and HE confirmed that no assessment was required of the trunk road network in England. At the time of the production of this report a response was awaited from SCC.

2 SITE LOCATION AND LOCAL ROAD NETWORK

Site Location

2.1 The site of Buttington Quarry is located between the villages of Buttington and Trewern. The site (OSGR: 326690, 310106) is located in the vicinity of the Welsh borders approximately 4km northeast of Welshpool and 24km west of Shrewsbury, within the County of Powys. It is located on the A458 Trunk road which bounds the site to the west. An existing quarry, and other commercial uses are located on the site at present. The site location in the local and wider context is shown on drawing IT1921/TA/01 of this report.

2.2 Principal access to the quarry is currently via an access road branching east from the A458 at a point 2.4km north of its junction with the A483.

Local Road Network

2.3 The proposed quarry lies northwest of Buttington, 2.3 km along the A458. Access to / egress from the Development would be via a new access, located 150m north of the existing access. Planning permission was originally granted for the new access in 1999 under the planning reference M1999/1032. The planning permission for the access has been renewed on a number of occasions through extensions of time for the originally granted and subsequent permissions with the most recent permission being reference P/2015/0439. A section 73 application to extend that permission was submitted in March 2020 and is currently pending.

2.4 The existing quarry access from the A458 is a simple priority junction and does not have a ghosted right turn lane for traffic wishing to turn right into the site. As a result traffic that is turning right to the minor arm may be required to wait for a gap in the oncoming traffic flow and delay northbound traffic on the A458. Plate 1 shows a photograph of site existing access junction.

Plate 1: A view of the existing site access junction

2.5 The A458 has a width of 6.9m within the vicinity of the existing access junction and the access overall measures 9.1m in width between the security gating installed approximately 10m back from the edge of the carriageway.

2.6 The A458 is a single carriageway road and is subject to a 50mph speed limit within the vicinity of the proposed development. There is a double white marking prohibiting overtaking within the vicinity of the proposed development. Footway provisions are intermittent along the A458 as is the provision of street lighting.

2.7 The A458 forms a 5 arm roundabout junction with the A483, Rhallt Lane and a private access road to the Livestock Market approximately 3km to the south of the proposed development. The A483 forms two arms of this roundabout. The speed limit increases to the national speed limit for single carriageway roads on the A458 prior to the roundabout. Plate 2 below shows a view of the A458 approach to the roundabout.

Plate 2: A458 / A483 Roundabout

2.8 The A483 forms a single lane dualling junction with Salop Road approximately 1km to the south of the aforementioned roundabout. A dedicated right turn area is provided on the A483 for vehicles intending to turn right into Salop Road.

2.9 Salop Road runs south westwards towards Welshpool town centre from the junction with the A483. The speed limit changes to 30mph on Salop Road approximately 100m from the junction with the A483 and there is a footway on the northern side of the road. Plate 3 over the page shows a view into Salop Road at its junction with the A483.

Plate 3: A483 / Salop Road Junction

2.10 Approximately 1km south west of the junction of Salop Road with the A483 the latter forms a roundabout junction with the B4381 and Smithfield Road. The speed limit reduces to 30mph on the A483 just prior to the roundabout. Smithfield Road runs northwards from the roundabout towards Welshpool town centre, whilst the A483 runs southwards towards Newtown. Plate 4 below shows a view of the A483 north approach to the roundabout.

Plate 4: A view of the A483 / B4381 / Smithfield Road Roundabout

3 PROPOSED DEVELOPMENT

3.1 The proposed Development comprises some 25ha (64 acres) of which the former brickworks occupies 2.1ha (5 acres). The site was first developed back in the late 1800's as a working quarry with associated brickworks, which continued to manufacture bricks until 1990. The business was sold to Aggregate Industries in 2004, and significant production continued until Aggregate Industries vacated the site in 2013. Stone extraction and aggregate production still continues now but at a lower level.

3.2 The site is allocated for B1, B2 and B8 employment development under the recently issued local development plan.

3.3 The scheme proposes the construction and operation of an ERF capable of generating around 13MW of low carbon and renewable electrical energy (when operational in full condensing mode) and heat through the thermal treatment of up to 167,000 tonnes per annum of Municipal Solid Waste (MSW) and MSW like waste from industrial and commercial sources. It would consist of material suitable for energy recovery sourced from Powys and surrounding areas.

3.4 The ERF would be capable of generating both electrical and heat energy from the thermal recovery of energy through the process and so would be classed as a Combined Heat and Power (CHP) plant.

3.5 The proposed ERF at Buttington Quarry would be developed to ensure that waste is managed effectively in accordance with Article 4 of the Waste Framework (2008/98/EC) which requires that waste is managed in accordance with the Waste Hierarchy. The intention is to support the management of waste fulfilling the aspirations of both the Welsh Government and PCC.

3.6 The operation of the proposed ERF would remove reliance on landfill for the disposal of residual waste and through the use of the proposed HZI moving grate technology to provide an efficient system of waste disposal that recovers energy thereby contributing to implementing the Towards Zero Waste strategy for Wales.

3.7 A layout plan for the development proposal is contained at Appendix B.

3.8 As previously indicated, vehicular access would be achieved via a new access, located 150m north of the existing access. Planning permission was originally granted for the new access in 1999 under the planning reference M1999/1032 and a copy of the approved layout plan is contained at Appendix C of this report. The planning permission for the access has been renewed on a number of occasions through extensions of time for the originally granted and subsequent permissions with the most recent permission being reference P/2015/0439. A section 73 application to extend that permission was submitted in March 2020 and is currently pending.

3.9 Since approval of the access junction layout shown on the drawing at Appendix C the speed limit has been reduced from 60mph to 50mph on the A458 adjacent to the proposed development. As such, discussions have been held with the Transport Network Management Division at the Welsh Government Office in relation to a corresponding reduction in the visibility splay provision at the new access junction. Copies of the correspondence with the Welsh Government Office are contained at Appendix D and confirm the agreement that visibility splays of 4.5m x 160m now represent the appropriate visibility splay provision at the proposed Development access junction.

3.10 In accordance with the discussions / correspondence with the Welsh Government Office, AutoTrack swept path tests of the proposed Development access junction layout have been undertaken using a max legal articulated HGV as the design vehicle. A sketch showing the AutoTrack swept path tests is contained at Appendix E.

3.11 Drawing IT1921/TA/02 of this report shows the proposed Development access junction layout amended in accordance with the recent investigations and the discussions / correspondence with the Welsh Government Office. The drawing shows the proposed dimensions of the access junction. The access would be provided with a metalled surface and would be constructed in accordance with the requirements of the Local Highway Authority (LHA). It is considered that the exact details of the construction of the access could be agreed with the LHA at the detailed design stage of the project. As requested by the Welsh Government Office a Geotechnical Assessment of the proposed Development access junction in accordance with HD22/08 of the Design Manual for Roads and Bridges has been prepared by Harrison Group Environmental Ltd and is included at Appendix L of this report.

4 ACCESSIBILITY BY ALTERNATIVE MODES

Walking

4.1 Walking and cycling are the two most sustainable modes of travel and can significantly contribute to improvements in health as well as promoting social inclusion within society. Government statistics indicate that 22% of all journeys by UK households are made on foot (source DFT LTN1/04) and the results of the 2017 National Travel Survey (NTS) indicate that 81% of trips of less than 1 mile (or 1.6km) are undertaken on foot. It is therefore reasonable to consider that this distance should be regarded as applicable in terms of defining the walking catchment of a new development such as the development proposal.

4.2 The pedestrian environment in close proximity to the proposed Development is typical of a rural area in that the presence of footways along the A458 and the access road leading from it is limited and the provision of street lighting is intermittent.

4.3 In the light of the above, given the nature of the land use and its location, it is considered that walking is unlikely to play a key role in travel to / from the proposed Development.

Cycling

4.4 Former planning guidance in the form of PPG13 stated at paragraph 77 that "*Cycling also has potential to substitute for short car trips, particularly those less than 5 kilometres, and to form part of a longer journey by public transport*". There has been no recent advice that supersedes this and therefore the PPG 13 advice remains the most recent in this respect. It is, however, acknowledged that PPG13 has been superseded by the National Planning Policy Framework (NPPF), which itself does not represent adopted policy in Wales.

4.5 The proposed Development would be located approximately 3.5km from the nearest point of National Cycle Route 6. The route is approximately 230km long and runs from Aberystwyth to Wolverhampton. Locally the route passes through nearby towns and villages Welshpool, Berriew, Newton and Crewgreen.

4.6 Cyclists would be able to undertake cycling journeys between the site and the surrounding areas using the local road network given the rural nature of roads within the vicinity of the proposed development. However, cyclists would need to be confident and proficient to ride on the A458 which is subject to a 50mph speed limit.

Public Transport

4.7 The nearest bus stops to the proposed Development are located approximately 250 metres from the proposed access on the A458 in the vicinity of its junction with the Heldre Lane.

4.8 There are 2 bus services available that pass by Heldre Lane near the proposed Development but only one that operates at a degree of regularity five days a week, i.e. the x75 service.

4.9 As identified within the pedestrian infrastructure section above, there are not footways on the A458 within the vicinity of the proposed Development. However, there is potential for colleagues to arrange multi modal commutes, whereby a member of the workforce arriving at an appropriate bus stop is collected by another who would be passing in their car.

4.10 Table 4.1 summarises the bus services calling at the stops within the vicinity of the site.

Table 4.1 Bus Services Calling At Stops Within The Vicinity Of The Site

Service	Route	Services	Frequency (buses per hour)
		Monday to Friday	
X75	Shrewsbury–Llanidloes via Newtown & Welshpool	10:03–18:47 No Services on Sundays or Bank Holidays	1 per 2 hours No Services on Sundays or Bank Holidays
X3	Newtown–Shrewsbury via Welshpool	9:15–15:05 Wednesday only	2 per day

4.11 Welshpool railway station is the nearest railway station to the site and is approximately 7.2 km from the site, i.e. notably in excess of the typically recognised 1km threshold walking distance of heavy rail services. The station could be accessed via the x75 bus service.

4.12 Given the nature of the land use and its comparatively remote location, it is considered that alternative modes of transport are unlikely to play a key role in travel to / from the proposed Development.

5 TRIP ATTRACTION AND NETWORK PERFORMANCE

Traffic / Trip Attraction

5.1 It is proposed that construction of the development would commence in 2022 and that the construction phase would last 36 months with the facility operational by 2025.

5.2 The proposed ERF would process around 167,000tpa of Refuse–Derived Fuel (RDF). On the basis of a 278 working day year (5.5 day week minus 8 public holiday days) the average daily traffic attracted to the proposed ERF is expected to comprise 40 HGV loads per day (80 movements) based on an average load of 15 tonnes. Additionally, from data provided by HZI there would be 7 HGV loads per day (14 movements) to transport Incinerator Bottom Ash (IBA) residue and 1 HGV load per day (2 movements) to transport Air Pollution Control Residue (APCR). Additionally, there would be 2 HGV loads per day (4 movements) relating to the transport of lime and ammonia.

5.3 On the basis of a 12 hour day on weekdays during the operational phase of the development there would, therefore be a worst case rounded average of 4 HGV arrivals and 4 HGV departures during each peak hour. Table 5.1 shows the weekday AM and PM peak hour HGV arrivals and departures during the operational phase of the development.

Table 5.1: HGV Related Vehicular Trips On a Typical Weekday

Time Period	Arrivals	Departures	Total
AM Peak Hour (08:00–09:00)	4*	4*	8*
PM Peak Hour (17:00–18:00)	4*	4*	8*
Daily 12 Hour (07:00–19:00)	50	50	100

* Represents rounded figure as calculated average is 4.16 vehicles

5.4 The proposed development is likely to employ 30 staff members. The staff modal split has been calculated from the Office for National Statistics (ONS) Method of Travel to Work survey undertaken as part of the 2011 Census (Nomis: WP7103EW). In the Nomis database, Powys W35001315, which includes majority portion of the proposed development, was selected as the *workplace zone*. Table 5.2 over the page shows the Census modal split applied to the number of proposed staff members at the proposed development.

Table 5.2: Person Trip Attraction (Staff)

Mode	Proportion of Staff Travelling By Each Mode	Number of Staff Travelling by Each Mode
Walk	6%	2
Cycle	1%	0
Car (Driver)	74%	22
Car (Passenger)	11%	3
Taxi	0%	0
Motorcycle	2%	1
Bus, Mini-Bus or Coach	2%	1
Train	1%	0
Underground, Metro, Light Rail or Tram	0%	0
Other Mode of Travel to Work	2%	1
Total	100%	30

5.5 The 3 staff members who would commute as passengers in a car are assumed to travel with the staff members driving a car, i.e. car sharing. On this basis, there could be 22 vehicular arrivals in the morning and 22 corresponding departures in the afternoon as shown in Table 5.3. However, it should be noted that the end operator of the facility, Hitachi Zosen Inova AG, has advised that shift patterns are likely to be operated at the Development. As such, the traffic flows shown in table 5.3 should be regarded to represent a worst case in terms of the likely staff traffic levels occurring during the typical weekday peak hours.

Table 5.3: Staff Related Vehicular Trips On A Typical Weekday

Time Period	Arrivals	Departures	Total
AM Peak Hour (08:00–09:00)	22	0	22
PM Peak Hour (17:00–18:00)	0	22	22
Daily 12 Hour (07:00–19:00)	22	22	44

5.6 Table 5.4 summarises the level of traffic attracted during the operational phase of the development and provides a comparison to the levels expected during the construction phase. The construction phase traffic levels were provided by the likely end user of the development proposal, Hitachi Zosen Inova AG. Whilst the likely vehicle movements during the construction phase have been provided, as that phase of the development is temporary only, the junction capacity assessments for this study have only been undertaken for the permanent operational phase of the development.

Table 5.4: Daily Traffic Levels Attracted During Development Phases

Phase	Level of Daily Traffic Attracted			
	Cars		HGVs	
	Arrivals	Departures	Arrivals	Departures
Operational Phase	22	22	40	40
Construction Phase enabling stage (6 months)	108	108	141	141
Construction Phase worst case (2 months only)	384	384	13	13
Construction Phase average	108	108	13	13

Traffic Distribution

5.7 Access to the Development would be achieved via the approved access located off the A458, with all traffic attracted to the development utilising existing routes via the A458.

5.8 The applicant has advised that, during the operational stage the HGV traffic attracted by the Development is likely to be split 40% north / 60% south from the Development access. Similarly, the non–HGV traffic is likely to be split 70% north / 30% south.

5.9 Table 5.5 shows the distribution of the HGV traffic on a typical weekday.

Table 5.5: Distribution Of HGV Movements On The A458 On A Typical Weekday

Time Period	Arrivals		Departures		Total	
	Right In (FS)	Left In (FN)	Right Out (TN)	Left Out (TS)	To / from the north	To / from the south
AM Peak Hour (08:00–09:00)	2	2	2	2	4	4
PM Peak Hour (17:00–18:00)	2	2	2	2	4	4
12 Hour (07:00–19:00)	30	20	20	30	40	60

Note: FS = From south on A458, TS = To South on A458, FN = From north on A458, TN = To north on the A458

5.10 As indicated previously, the staff vehicular moments attracted to the proposed development have been distributed in accordance with a 70% north / 30% south split and are shown in Table 5.6.

Table 5.6: Distribution Of Staff Vehicular Movements On The A458 On A Typical Weekday

Time Period	Arrivals		Departures		Total	
	Right In (FS)	Left In (FN)	Right Out (TN)	Left Out (TS)	To / from the north	To / from the south
AM Peak Hour (08:00–09:00)	7	15	0	0	15	7
PM Peak Hour (17:00–18:00)	0	0	15	7	15	7
12 Hour (07:00–19:00)	7	15	15	7	30	14

Note: FS = From south on A458, TS = To South on A458, FN = From north on A458, TN = To north on the A458

Network Performance

5.11 An Automatic Traffic Counter (ATC) was placed on the A458, just north of the existing access for 7 days commencing 14th January 2019. A copy of the ATC data is contained at Appendix F of this report and summarised in Table 5.7.

Table 5.7: Observed Traffic Levels On The A483 Adjacent To The Development

Time Period	Northbound on A458	Southbound on A458	Total Two–Way Traffic
AM Peak Hour (08:00–09:00)	311	373	684
PM Peak Hour (17:00–18:00)	344	305	649
12 Hour (07:00–19:00)	3272	3140	6412

5.12 Table 5.8 compares the proposed additional development related vehicular movements to the observed traffic flows on the A458 within the vicinity of the proposed Development. The data contained in Table 5.8 demonstrates that the proposal would only lead to a modest increase in traffic levels on the A458 during the typical weekday peak hours and over the course of a 12 hour day.

Table 5.8: Effect of Development Traffic on the A458

Time Period	Observed Two Way Traffic Flows on A458	Development Traffic Flows		% Impact	
		To / from north	To / from south	North of Access	South of Access
AM Peak Hour (08:00–09:00)	684	19	11	2.8%	1.6%
PM Peak Hour (17:00–18:00)	649	19	11	2.9%	1.7%
12 Hour (07:00–19:00)	6412	80	64	1.2%	1.0%

Existing Quarry & Other Commercial Developments at the site

5.13 The level of traffic that could be attracted to the existing quarry and that attracted to the other commercial developments at the site has been confirmed by the Client. Table 5.9 shows a summary of the existing traffic movements during the AM and PM peak hours.

Table 5.9: Existing Development Traffic Levels

Vehicle Type	AM Peak Hour (08:00–09:00)		PM Peak hour (17:00–18:00)	
	Arrivals	Departures	Arrivals	Departures
Light Vehicles	8	4	3	11
HGVs	17	17	17	17

5.14 The existing use traffic levels shown above in Table 5.9 would switch to the new access junction upon its completion.

Committed Developments

5.15 During scoping discussions, ITL were requested by the LHA to make traffic allowances within this assessment for committed developments along the A458, A483, Salop Road and Smithfield Road. ITL were provided with a list of committed developments and a copy of the list is contained in Appendix G.

5.16 The list of developments was examined and any which are already active and completed have not been included in the analysis given that trips generated by / attracted to those developments would have been recorded during the background traffic surveys for this study. Additionally, developments of less than 10 residential dwellings would generate negligible traffic which would not have a detrimental impact and have hence been omitted.

5.17 In addition to the above, ITL were requested to include an allowance for a commercial storage and distribution unit proposed by Border Hardcore at the study site, which would be 2340 sqm and located to the south of the Development.

5.18 On the basis of the above criteria, Table 5.10 shows the committed developments which are likely to generate / attract traffic within the study area.

Table 5.10: Committed Developments

Application No	Details	Comments
P/2017/0010	Outline: Residential development of up to 25 dwellings, construction of vehicular access and attenuation pond. Land Adjoining The Fron, Middletown, Welshpool, Powys, SY21 8EN	Allowance included for assessment
P/2017/0324	Extension to factory, D Sidoli & Sons Ltd Henfaes Lane, Welshpool, Powys, SY21 7BE	Proposal relates to 21 sqm extension, not considered worthy of inclusion in assessment.
P/2017/1008	Erection of a solar photovoltaic array, The Dingle Old, Mills Hill, Trewern, Welshpool, Powys, SY21 8ET	It is considered that given the nature of the proposal it would not attract notable traffic levels. Therefore, no allowance included for assessment
P/2017/1158	Demolition of building and erection of 33 lock up self-storage units and 36 car parking spaces. Former Wynnstay, Store Station Yard, Severn Road, Welshpool, SY21 7AZ	Allowance included for assessment
P/2017/1348	Demolition of existing building and erection of 17 no. flats, Welshpool Social Club, Bronybuckley, Welshpool, Powys, SY21 7NJ	TA reviewed, development would generate negligible traffic levels. Hence, no allowance included for assessment.
P/2018/0272	Erection of 54 dwellings, formation of access roads and all associated works, Land adj Gallowstree Bank, Gungrog Farm, Welshpool, Powys, SY21 7HF	Allowance included for assessment
P/2018/0337	Construction of 360 place English Medium Primary School and 55 place Early Years Nursery with new dedicated vehicular access works, ancillary car parking, landscaping, recreational space and infrastructure works. Land at Salop Road, Welshpool, Powys	Allowance included for assessment
20/0045/FUL	Construction of 2340 sqm storage and distribution warehouse at the study site	Allowance included for assessment

5.19 The TRICS database was interrogated in order to establish appropriate trip rates for calculating the likely level of traffic generated by / attracted to the identified residential and employment related committed developments.

5.20 The '*houses privately owned*' category within the *'residential'* land use of the TRICS database was interrogated in order to derive average residential trip rates for use in this study excluding sites in London, Ireland and Northern Ireland. Sites in *'Edge of Town'* and '*Neighbourhood Centre*' locations on the TRICS database were included in the search. The start date for the search was set to 5th May 1987 and the end date was set to 20th November 2018. The range of number of dwellings was set to 5–70 units.

5.21 Additionally, the '*warehousing (self–storage)*' category within the *'employment'* land use of the TRICS database was interrogated in order to derive average trip rates for use in this study excluding sites in London, Ireland and Northern Ireland. Additionally, sites in *'Edge of Town'* and '*suburban area*' locations on the TRICS database only were included in the search. The start date for the search was set to 8th March 2002 and the end date was set to 17th November 2016. The range number of parking spaces was set to 7–50 parking spaces.

5.22 The '*warehousing (commercial)*' category within the *'employment'* land use of the TRICS database was interrogated in order to derive average trip rates for use in this study excluding sites in London, Ireland and Northern Ireland. Additionally, sites in *'Free Standing'* location on the TRICS database only were included in the search. The start date for the search was set to 1st January 1990 and the end date was set to 29th March 2019. The gross floor area range was set to 190–5000 sqm.

5.23 The TRICS printouts from the interrogations are contained at Appendix H, whilst Table 5.11 shows the weekday AM and PM peak hour trip rates extracted from the database.

Table 5.11: TRICS Trip Rates

Use	AM Peak Hour (08:00–09:00)		PM Peak Hour (17:00–18:00)	
	Arrivals	Departures	Arrivals	Departures
Houses Privately Owned	0.167	0.383	0.330	0.142
Warehousing (Self–Storage)	0.280	0.164	0.092	0.222
Warehousing (Commercial)	0.227	0.354	0.354	0.607

5.24 Application of the above TRICS trip rates to the proposed number of committed dwellings and level of committed employment floorspace results in the calculation of the likely number of vehicular trips generated by / attracted to the proposed committed developments. The resulting calculated committed development traffic flows are shown in Table 5.12 below.

Table 5.12: Likely Traffic Levels Generated / Attracted by Committed Developments

Use	Parameter	AM Peak Hour (08:00–09:00)		PM Peak Hour (17:00–18:00)	
		Arrivals	Departures	Arrivals	Departures
Residential Houses	25 Dwellings	4	10	8	4
Residential Houses	54 Dwellings	9	21	18	8
Storage Units	36 Car Spaces	10	6	3	8
Commercial Warehouse	2340 sqm	5	8	8	14

5.25 The Transport Assessment (TA) report for the committed 360 place Primary School, prepared by WSP was reviewed. Table 5.13 below summarises the level of traffic attracted by the school which was obtained from the TA produced by WSP. The school PM peak hour is typically from 14:00 to 15:00 hours, which does not coincide with the road network PM peak period. Hence traffic flows during the PM peak hour have not been considered.

Table 5.13: Trips Attracted by the Proposed Primary School

Use	AM Peak Hour (08:00–09:00)			
	Arrivals		Departures	
	Left In	Right In	Left Out	Right Out
Primary School	97	129	71	108
Total	226		179	

Source : WSP Transport Assessment Report 2017

6 CAPACITY ASSESSMENT

Flow Derivation

6.1 As part of the scoping discussions for this project it was agreed with the Welsh Government office that, the performance of the following junctions would be assessed as part of this study:-

- Junction 1: A483 / A458 Roundabout Junction;
- Junction 2: A483 / Salop Road Priority Junction;
- Junction 3: A483 / B4381 / Smithfield Road Roundabout Junction;
- Junction 4: A458 / Site Access Junction

6.2 Accordingly manual classified turning counts were undertaken at the afformentioned junctions between 07:30 and 10:30 hours and again between 16:30 and 19:30 hours on Thursday 17th January 2019. In addition to the manual classified turning counts, an Automatic Traffic Counter (ATC) was installed on the A458 within the vicinity of the development access junction for 7 days commencing 14th January 2019. The results of the surveys are contained in Appendix F.

6.3 The road network AM and PM peak hours were extracted from the manual classified counts. In that regard it was calculated that the AM peak hour was from 08:00 to 09:00 hours whilst the PM peak hour was from 16:30 to 17:30 hours. The road network peak hours and the development peak hours do not coincide, however, for a robust assessment the traffic flows associated with the road network peak hour and the development peak hours were added in order to give the worst case assessment flow.

6.4 In order to raise the observed flows to the assumed opening year (2025) and the design year (2030) of the development, growth factors were calculated from the latest versions of the National Transport Model (NTM) 2009 and TEMPRO 6.2. The growth factors are shown in Table 6.1.

Table 6.1: NTM / TEMPRO Growth Factors

Growth Period	AM Peak	PM Peak
2019 – 2025	1.089	1.085
2019 – 2030	1.145	1.141

6.5 The adopted distribution of traffic flows attracted by the proposed development is discussed in paragraph 5.8 and shown in Tables 5.5 and 5.6. The trips associated with the development were added to the *2030 base* flows to ascertain the likely overall impact of the proposed development.

6.6 In terms of the committed developments, traffic attracted by the school has been distributed at the Salop Road / A483 priority junction in accordance with the WSP TA report. Whilst further afield the school traffic has been distributed in accordance with observed turning proportions. The traffic associated with the other committed developments has also been distributed in accordance with observed turning proportions.

6.7 Traffic flow diagrams showing the observed, development, committed, future year and assessment scenario flows are shown in Appendix I.

Network Assessment

6.8 The junction capacity assessments at each of the junctions listed at paragraph 6.1 are discussed separately below.

6.9 The junctions were initially to be tested for the *2025 base plus committed* AM and PM peak hour scenarios and then for the corresponding *2030 baseline plus committed plus development* scenarios. However, as the junctions were found to operate acceptably for the *2030 base plus committed* and *2030 base plus committed plus development* scenarios, i.e. with Reference of Flow to Capacity (RFC) values below 0.9, they have not been tested for the corresponding *2025* scenarios. The print outs from the PICADY assessments are contained in Appendix J.

Junction 1: A483 / A458 Roundabout Junction

6.10 The roundabout junction of the A483 / A458 was assessed using the ARCADY software package within the Junctions 8 software suite

6.11 The results of the *2030 base plus committed* and *2030 base plus committed plus development* AM and PM peak hour ARCADY assessment results at the junction are summarised in Table 6.2 over the page. The assessment results show that the performance of the junction does not materially alter following the addition of the development traffic and that the maximum calculated queue at the junction following the addition of the development traffic is 1.72 vehicles and would occur during the AM peak hour on the A458. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.64. As such it is considered that the junction would operate acceptably.

Table 6.2: ARCADY Assessment Results For The A483 / A458 Roundabout Junction

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2030 + Committed				
A483 (North)	0.97	0.49	0.53	0.35
A458	1.68	0.63	1.20	0.55
Private Access (Livestock Market)	0.00	0.00	0.01	0.01
A483 (South)	1.00	0.50	1.19	0.55
Rhallt Lane	0.11	0.10	0.31	0.24
Base 2030 + Committed + Development				
A483 (North)	0.98	0.50	0.53	0.35
A458	1.72	0.64	1.25	0.56
Private Access (Livestock Market)	0.00	0.00	0.01	0.01
A483 (South)	1.02	0.51	1.21	0.55
Rhallt Lane	0.11	0.10	0.31	0.24

Junction 2: A483 / Salop Road Priority Junction

6.12 The priority junction of the A483 / Salop Road was assessed using the PICADY software package within the Junctions 8 software suite

6.13 The results of the *2030 base plus committed* and *2030 base plus committed plus development* AM and PM peak hour PICADY assessment results at the junction are summarised in Table 6.3 over the page. The assessment results show that the performance of the junction does not materially alter following the addition of the development traffic and that the maximum calculated queue at the junction following the addition of the development traffic is 1.91 vehicles and would occur during the AM peak hour on Salop Road. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.66. As such it is considered that the junction would operate acceptably.

Table 6.3: PICADY Assessment Results For The A483 / Salop Road Priority Junction

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2030 + Committed				
Salop Road to A483	1.86	0.66	1.07	0.52
A483 (N) to Salop Road	0.47	0.32	0.57	0.37
Base 2030 + Committed + Development				
Salop Road to A483	1.91	0.66	1.08	0.52
A483 (N) to Salop Road	0.47	0.32	0.58	0.37

Junction 3: A483 / B4381 / Smithfield Road Roundabout Junction

6.14 The roundabout junction of the A483 / B4381 / Smithfield Road was assessed using the ARCADY software package within the Junctions 8 software suite

6.15 The results of the *2030 base plus committed* and *2030 base plus committed plus development* AM and PM peak hour ARCADY assessment results are summarised in Table 6.4 over the page. The assessment results show that the performance of the junction does not materially alter following the addition of the development traffic and that the maximum calculated queue at the junction following the addition of the development traffic is 3.07 vehicles and would occur during the PM peak hour on Smithfield Road. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.76. As such it is considered that the junction would operate acceptably.

Table 6.4: ARCADY Assessment Results For The A483 / B4381 / Smithfield Road Roundabout Junction

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2030 + Committed				
A483 (North)	1.64	0.62	1.30	0.57
A483 (South)	1.32	0.57	0.82	0.45

B4381	0.38	0.28	1.33	0.57
Private Access (Tesco)	0.00	0.00	0.00	0.00
Smithfield Road	2.34	0.71	3.07	0.76
Base 2030 + Committed + Development				
A483 (North)	1.66	0.63	1.31	0.57
A483 (South)	1.33	0.57	0.82	0.45
B4381	0.38	0.28	1.32	0.57
Private Access (Tesco)	0.00	0.00	0.00	0.00
Smithfield Road	2.37	0.71	3.06	0.76

Junction 4: A458 / Site Access Junction

6.16 The priority junction of the A458 / Site Access junction was assessed using the PICADY software package within the Junctions 8 software suite.

6.17 The results of the *2030 base plus committed plus development* AM and PM peak hour PICADY assessment results at the junction are summarised in Table 6.5. The assessment results show that the maximum calculated queue at the junction is 0.11 vehicles and would occur during the PM peak hour on the site access. The corresponding RFC (Ratio of Flow to Capacity), the measure of the traffic demand against the theoretical capacity is 0.12. As such it is considered that the junction would operate acceptably.

Table 6.5: PICADY Assessment Results For The A458 / Site Access Priority Junction

Arm	AM Peak Hour (08:00 – 09:00)		PM Peak Hour (16:30 – 17:30)	
	Max Queue	Max RFC	Max Queue	Max RFC
Base 2030 + Committed + Development				
Site Access to A458 (S)	0.04	0.04	0.06	0.05
Site Access to A458 (N)	0.08	0.07	0.12	0.11
A458 (S) to Site Access	0.05	0.05	0.04	0.03

7 CAR AND CYCLE PARKING

7.1 Table 7.1 sets out the car and cycle parking standards for Industrial use that are contained within the Wales Parking Standards 2008.

7.2 Parking standards set out in Table 7.1 are on the basis of Zones 5 & 6, i.e. Countryside and Deep Rural, which are the appropriate locations of the proposed development.

Table 7.1: Wales Parking Standards

Use	Maximum Vehicle Provision		Minimum Cycle Provision		Minimum Disabled Provision	Motorcycle Parking Provision
	Operational	Non Operational	Long Stay	Short Stay		
Industry	Varies depending on floor area	1 space per 80sqm	1 stand per 500 sqm	1 stand per 1000 sqm	5% of total capacity	5% of provision for car parking

Source: CSS Wales: Wales Parking Standards 2008

7.3 The layout plan contained in Appendix B, shows that 38 car parking spaces, 2 disabled parking spaces, 10 cycle parking spaces and 10 motorcycle parking spaces would be provided, which it is considered would satisfy the standards.

8 PERSONAL INJURY ACCIDENT ASSESSMENT

8.1 As agreed during the scoping stage of the project, ITL have investigated the Personal Injury Accident (PIA) record of the local road network. The CrashMap website was utilised to obtain PIA data for the latest available 3 year period, i.e. 2017, 2018 and 2019. CrashMap uses road accident data which is collected by the police when an injury accident occurs on roads in the UK. The data obtained from the CrashMap website is contained in Appendix K of this report.

8.2 The accident data shows that 21 accidents occurred within the study area, which includes the A458, the A483 and Cefn Bridge. The main focus of the PIA analysis is accidents involving HGVs and accidents occurring on Cefn Bridge. Out of the recorded accidents, 5 were coded to involve HGVs of less than 3.5 tonnes in weight and 1 accident involved HGVs of more than 7.5 tonnes in weight. The remaining 15 accidents did not involve HGVs.

8.3 Additionally, out of the 6 PIAs involving HGVs that were recorded to occur within the study area, during the analysis period obtained, 3 involved *slight* injuries and 3 involved serious injuries. A summary of the PIAs involving HGVs within the study area is provided below.

8.4 There were 5 accidents recorded on Cefn Bridge out of which 2 involved HGVs of less than 3.5 tonnes in weight and 1 accident involved HGVs of more than 7.5 tonnes in weight.

8.5 Furthermore, out of the 5 accidents occurring on Cefn Bridge, 2 involved slight injuries and 3 involved serious injuries.

8.6 A summary of the PIAs involving HGVs along with any additional PIAs recorded on the Cefn Bridge is provided below.

Accident Ref 201963D026719: Serious accident involving 2 cars and an HGV weighing less than 3.5 tonnes on the A458, within the vicinity of the junction with Heldre Lane. The accident occurred on 05/04/2019 at 08:12 hours. The road surface was wet and it is indicated that it was raining without high winds. The accident listing indicates that 1 car was proceeding normally on the carriageway and not on a bend, the other car was in the process of turning right and the HGV was stopping / slowing down.

Accident Ref 201963D070819: Slight accident involving 1 car and an HGV weighing less than 3.5 tonnes on the A458 at the priority junction with the B4388. The accident occurred on 05/07/2019 at 18:40 hours. The road surface was dry and weather conditions were fine. The accident listing indicates that the car was proceeding normally on the carriageway and not on a bend and the HGV was stopping / slowing down.

Accident Ref 201763D052317: Slight accident involving 2 cars and an HGV weighing less than 3.5 tonnes on the A483. The accident occurred on 07/06/2017 at 14:25 hours. The road surface was dry and weather conditions were fine. The accident listing indicates that the HGV was proceeding normally on the carriageway and not on a bend, one car was held up and the other car was stopping / slowing down.

Accident Ref 201763DP04017: Serious accident involving 2 cars on the A458 Cefn Bridge. The accident occurred on 03/03/2017 at 17:25 hours. The road surface was wet and it is indicated that it was raining without high winds. The accident listing indicates that both vehicles were proceeding normally along the carriageway and on a left hand bend.

Accident Ref 201763DP03917: Slight accident involving 3 cars on the A458 Cefn Bridge. The accident occurred on 27/01/2017 at 18:20 hours. The road surface was wet and weather conditions were fine without high winds. The accident listing indicates that all 3 vehicles were proceeding normally along the carriageway and not on a bend.

Accident Ref 201863D085418: Serious accident involving a car and an HGV weighing less than 3.5 tonnes on the A458 Cefn Bridge. The accident occurred on 09/09/2018 at 06:55 hours. The road surface was wet and weather conditions were fine without high winds. The accident listing indicates that the HGV was proceeding normally along the carriageway, on a left hand bend, whilst the car was proceeding on a right hand bend.

Accident Ref 201863D120118: Slight accident involving two HGVs weighing more than 7.5 tonnes on the A458 Cefn Bridge. The accident occurred on 18/12/2018 at 18:15 hours. The road surface was wet and weather conditions were fine without high winds. The accident listing indicates that one HGV was proceeding normally along the carriageway, on a left hand bend, whilst the other HGV was proceeding on a right hand bend.

Accident Ref 201963D069319: Serious accident involving a motorcycle and an HGV weighing less than 3.5 tonnes on the A458 Cefn Bridge. The accident occurred on 09/08/2019 at 14:00 hours. The road surface was wet and weather conditions were raining without high winds. The accident listing indicates that the motorcycle was proceeding normally along the carriageway, on a left hand bend, whilst the HGV was proceeding on a right hand bend.

8.7 It is acknowledged that there was a cluster of 5 accidents recorded on Cefn bridge over the railway line to the north of the proposed development and that 3 of the accidents involved HGVs. However, it is considered that the modest additional traffic levels associated with the development proposal would be unlikely to materially affect the safety record of the local road network and it is confirmed in this report that Highways England, who are the highway authority responsible for trunk roads in England, have confirmed that they do not require an assessment of the effects of the development traffic on the trunk road network within England, i.e. to the north of the site.

8.8 Finally, ITL would highlight that the A458 is designated as a trunk road and as such by definition it would be expected to carry HGV traffic. As such, it is considered that the road should be regarded as appropriate to carry HGV traffic associated with the development proposal.

9 CONCLUSIONS

9.1 Intermodal Transportation Ltd (ITL), an independent consultancy specialising in highway engineering and transportation planning, has been appointed by Environmental Compliance Ltd on behalf of Broad Energy (Wales) Ltd to produce a Transport Assessment (TA) report to support the planning application for the proposed Energy Recovery Facility (ERF) at Buttington Quarry, Welshpool, Wales.

9.2 The site of Buttington Quarry is located between the villages of Buttington and Trewern. The proposed Development would be located in the vicinity of the Welsh borders approximately 4km northeast of Welshpool and 24km west of Shrewsbury, within the County of Powys. It is located on the A458 trunk road which bounds the site to the west.

9.3 The proposed ERF would process around 167,000 tonnes per annum (tpa) of Refuse-Derived Fuel (RDF) by means of moving grate incinerator.

9.4 The scope of this study was agreed with the Transport Network Management Division at the Welsh Government Office and also Powys County Council highway department. In addition, due to the close proximity of the development proposal to the Wales / England border, scoping enquiries were also sent to Highways England (HE) and Shropshire County Council. Those scoping enquiries confirmed that the development would be likely to add modest traffic levels only to the road network within England and HE confirmed that no assessment was required of the trunk road network in England. At the time of the production of this report a response was awaited from SCC.

9.5 Vehicular access would be achieved via a new access, located 150m north of the existing access. Planning permission was originally granted for the new access in 1999 under the planning reference M1999/1032. The planning permission for the access has been renewed on a number of occasions through extensions of time for the originally granted and subsequent permissions with the most recent permission being reference P/2015/0439. A section 73 application to extend that permission was submitted in March 2020 and is currently pending. It is demonstrated in chapter 3 of this report that the proposed access junction should be regarded as acceptable from an operational and highway safety perspective. Furthermore, it should be considered that the site access junction is provided on to the A458 trunk road, which by its definition would be expected to carry HGV traffic and therefore the site is ideally positioned relative to the higher echelons of the local road network.

9.6 Accessibility of the proposed Development by non-car modes of transport has been examined as part of this study. However, given the nature of the land use and its comparatively remote location, it is considered that alternative modes of transport are unlikely to play a key role in travel to / from the proposed Development.

9.7 The levels of traffic likely to be attracted to the Development during the construction and operational phases of the development have been identified within this report. However, as the construction phase would be temporary only the performance of the local road network has only been considered under the operational phase.

9.8 Notwithstanding that the traffic calculations set out within this report demonstrate that the operational traffic levels associated with the development proposal would be modest only, at the scoping stage of this project the Transport Network Management Division at the Welsh Government Office requested that the performance of the following junctions be assessed as part of this study: -

- Junction 1: A483 / A458 Roundabout Junction;
- Junction 2: A483 / Salop Road Priority Junction;
- Junction 3: A483 / B4381 / Smithfield Road Roundabout Junction;
- Junction 4: A458 / Site Access

9.9 In order to provide the necessary background traffic flow information for use in the junction capacity assessments, manual classified turning counts were undertaken at the aforementioned junctions between 07:30 and 10:30 hours and again between 16:30 and 19:30 hours on Thursday 17th January 2019. In addition to the manual classified turning counts, an Automatic Traffic Counter (ATC) was installed on the A458 within the vicinity of the site for 7 days commencing 14th January 2019.

9.10 The assessments of the above junctions were undertaken for the 2030 base plus committed development AM and PM peak hour scenarios, i.e. 5 years post the proposed opening year of the facility, and then for the corresponding 2030 base plus committed plus development scenarios. The base scenario flows include traffic growth in accordance with the calculated NTM / TEMPRO growth factors.

9.11 The junction capacity assessments undertaken for this study demonstrate that the identified key junctions within the study area would operate acceptably during the typical weekday AM and PM peak hours in 2030 with the development proposal in place.

9.12 Personal Injury Accident data for the latest available 3 year period, i.e. 2017, 2018 and 2019 has been investigated. It is concluded that the local road network, which includes the A458 trunk road and as such by definition would be expected to carry HGV traffic, did not display an adverse HGV related accident problem along the proposed HGV routes for the development proposal.

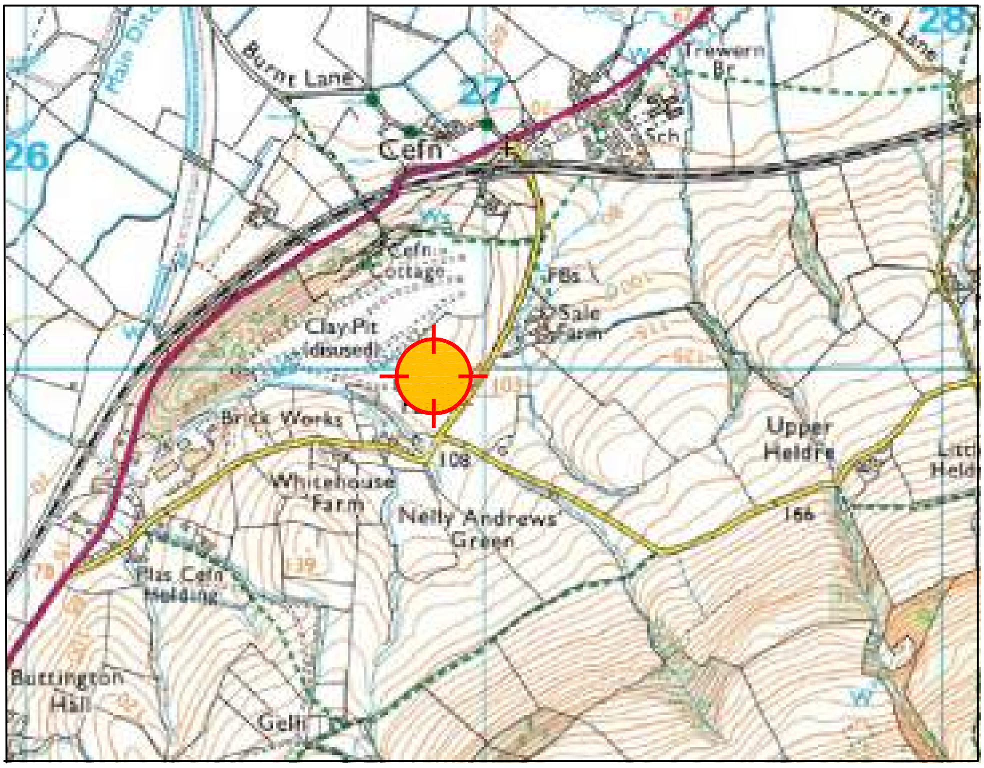
9.13 In the light of the assessments / investigations undertaken as part of this study it is concluded that the proposed ERF at Buttington Quarry, Welshpool, Wales should be regarded as acceptable from a highway and transportation perspective.

DRAWINGS

N

WIDER CONTEXT

LOCAL CONTEXT



SITE LOCATION

Rev	Description	Date

IT Project: Buttington Quarry, RCF

Rev: -

Drawing Title: SITE LOCATION IN THE LOCAL AND WIDER CONTEXT

Sheet 1 of 1

Client: Environmental Compliance Ltd

A4

Drawn By: SG

Approved By: JB

Drawing No: IT1921/TS/01

CAD File: IT1921_TS_01.DWG

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Date: JULY 2018

Scale: NTS

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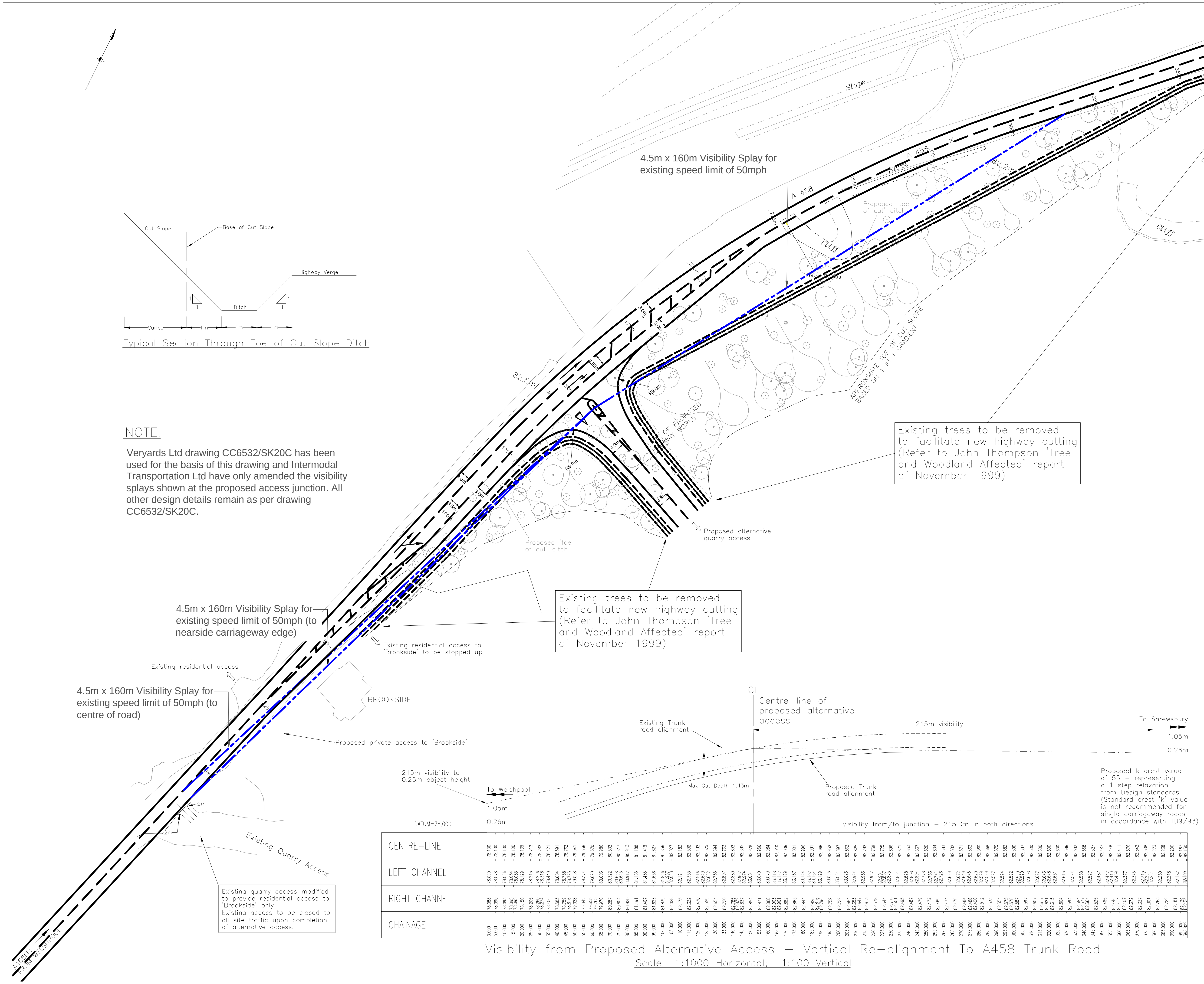

Rev	Description	Reviewer	Date

Drawing Title

SITE ACCESS JUNCTION ARRANGEMENT

Rev:

IT Project:

PROPOSED WASTE TO ENERGY PLANT, BUTTINGTON QUARRY, WELSHPOOL

Sheet 1 of 1

Client:

ENVIRONMENTAL COMPLIANCE LTD

A3

Drawing No:	CAD File:
IT1921/TA/02	IT1921/TA/02.dwg
Date: MARCH 2020	Scale: 1:1000
Drawn By: DS	Approved By: JB

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APPENDIX A

SCOPING CORRESPONDENCE

Devesh Shrivastava

From: [redacted]
Sent: 24 October 2018 16:00
To: [redacted]
Cc: [redacted]
Subject: RE: Buttington Quary, EIA Scoping

Good afternoon

Thank you for your call. To confirm, on Friday we agreed:

1) The access would be reviewed in line with the DMRB, ensuring it is suitable for the largest vehicle proposed to use the access.
2) We agreed your study area would include appropriate junctions along the A483 to the South. These would be;
    a. A483 / A458
    b. Salop Road / A483
    c. A483 / B4381 / Smithfield Road

    As stated – the study should include permitted developments in these areas.

Regards

Casey Dunn

Is-adran Rheoli'r Rhwydwaith - Network Management Division
Trafnidiaeth - Transport
Seilwaith yr Economi - Economic Infrastructure
Llywodraeth Cymru - Welsh Government
Sarn Mynach
Llandudno Junction
LL31 9RZ

[redacted]

From: Devesh Shrivastava <[redacted]
Sent: 22 October 2018 14:12
To: Dunn, Casey (ESNR-Transport-Network Management) <[redacted]
Cc: 'Justin Bass' <[redacted]
Subject: FW: Buttington Quary, EIA Scoping

Hello Casey

In relation to the EIA scoping direction for the Energy Recovery Facility at Buttington and following our conversation on Friday please see our original email sent to you on 15th October. We welcome your earliest response.

Regards

Devesh Shrivastava

Assistant Transport Planner
on behalf of
Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

From: Devesh Shrivastava <[redacted]
Sent: 15 October 2018 14:08
To: [redacted]
<[redacted]
Cc: [redacted] <[redacted] 'Justin Bass'
<[redacted] [redacted] <[redacted]
Subject: Buttington Quary, EIA Scoping

Dear Sir / Madam

For the Attention of Casey Dunn

Further to the EIA transport related scoping comments set out in the attached document regarding the Energy Recovery Facility at Buttington Quarry, we welcome the earliest confirmation following investigations would adequately address bullets 1 and 4 of the attached.

- We propose to examine the geometry of the site access junction, including visibility splays and undertake AutoTrack swept path tests. This would assess the suitability of the site access junction in accordance with the Design Manual for Roads and Bridges (DMRB).
- The final point states that a junction capacity assessment would be required. Could you please confirm whether this refers to the A483 / A458 roundabout junction?

We trust that this information is sufficient and welcome your earliest response. Please contact us if you have any queries or if you wish to discuss this matter further

Regards

Devesh Shrivastava
Assistant Transport Planner
on behalf of
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Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

Adran yr Economi a'r Seilwaith
Department for Economy and Infrastructure

Llywodraeth Cymru
Welsh Government

Development Control
Powys County Council
The Gwalia
Ithon Road
Llandrindod Wells
LD1 6AA

Eich cyf / Your ref 3201953

Ein cyf / Our ref 18/NM-1474

30 August 2018

Dear Sir/Madam,

TOWN AND COUNTRY PLANNING (DEVELOPMENT MANAGEMENT PROCEDURE) (WALES) ORDER 2012:

Buttington Quary, Buttington, Welshpool, SY21 8SZ
EIA Scoping Direction - Energy Recovery Facility (ERF) generating approx. 13MW of electricity through treatment of 150,000 tonnes / annum of residential, commercial, & industrial wastes.

I refer to your consultation of 09 August 2018 regarding the above planning application and advise that the Welsh Government as highway authority for the A458 trunk road wishes to respond with the following comments:

- The site access will require further assessment to deem if it is suitable for the proposed development in accordance with the Design Manual for Roads and Bridges (DMRB).
- The proposed study area is acceptable to the east, however to the west the study must review all arms of the A483 for a minimum 500m.
- The study should include any permitted developments along the route to the site and in addition any permitted developments adjacent to the A483 Welshpool bypass listed on the Powys County Council Planning Portal.
- A junction capacity assessment will be required.

If you have any further queries, please forward to the following Welsh Government Mailbox
[redacted]

Yours faithfully

[redacted]

Casey Dunn

BUDDSODDWR MEWN POBL
INVESTOR IN PEOPLE

Sarn Mynach
Cyfford Llandudno
LL31 9RZ

Sarn Mynach
Llandudno Junction
LL31 9RZ

Ebost/Email: [redacted]

APPENDIX B

ARCHITECT'S LAYOUT PLAN

Drawn by : MDO		Date : 06.08.18		Scale : 1 : 1250 @ A1	
Status	Preliminary	Presentation	Tender	Construction	Last Issue
Date :	06.08.18				
Approved by :	MDO				

Revision		Date	Drawn	Approved
P1	First Issue	06.08.18	MDO	DJS

Client :
Broad Energy

Project :
Buttington Quarry EfW

Nelly Andrew

Project No. : 3411-01
Drawing No. : 0203

Drawing Title :
BUT-RCA-00-ZZ-DR-A-0203-Overall_Arrangement_Plan S1 P1
[Project Code] [Originator] [Volume Div.] [Level Div.] [File Type] [Role] [File Number] [File Description] [Suitability.] [Rev.]

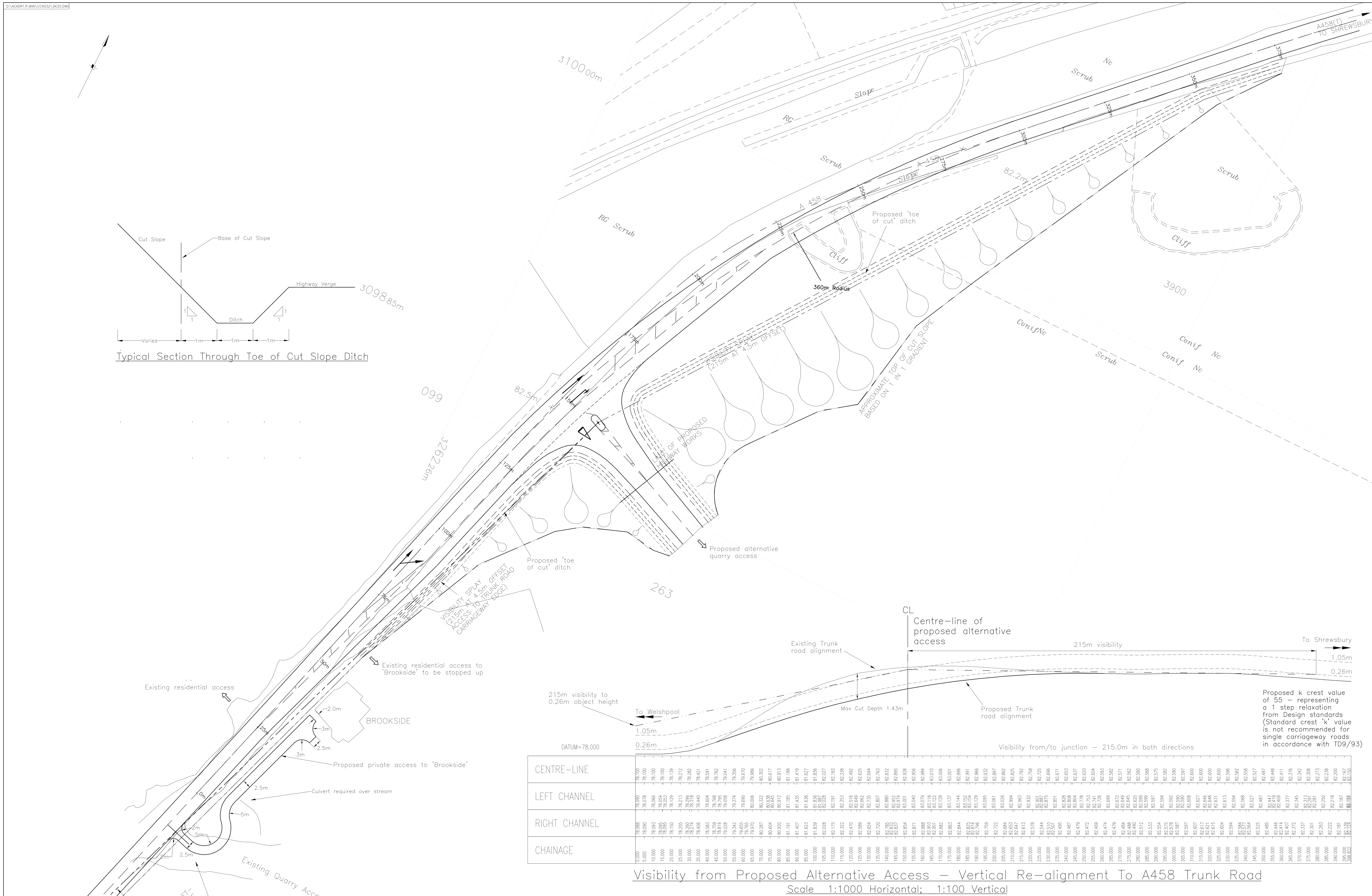
Sheffield Studio | 3 Vincent House | Solly Street | Sheffield | S1 4BB | 0114 273 7050
www.racecottam.com

RACE COTTAM ASSOCIATES

1 Overall_Site_Plan
1 : 1250

APPENDIX C

ACCESS JUNCTION LAYOUT



Visibility from Proposed Alternative Access – Vertical Re-alignment To A458 Trunk Road

Scale 1:1000 Horizontal; 1:100 Vertical

NOTE:

Proposed quarry access has been designed in accordance with TD42/95 – 'At-Grade' Ghost island junction.

No	Date	By	Details	Chk
A	22.3.99	AW	Long section added	GW
B	14.4.99	AW	Brookside access added	GW
C	18.10.99	AW	Alternative brookside access removed	

Project: A458 BORDER STONE ALTERNATIVE ACCESS

Title: PROPOSED ACCESS 170m NORTH OF EXISTING ACCESS – HORIZONTAL ALIGNMENT OF TRUNK ROAD ALTERED – 360m RADIUS

Scale	Date	Drawn	Checked
1:500	13.3.99	AjW	G.Walker

VERYARDS Ltd
CONSULTING ENGINEERS
TEL. 01222 552444 FAX. 01222 554447

No CC6532 / SK20 Rev. C

APPENDIX D

CORRESPONDENCE IN RELATION TO ACCESS JUNCTION

Devesh Shrivastava

From: [redacted]
Sent: 07 August 2019 11:05
To: [redacted]
Cc: [redacted]
Subject: RE: Buttington Quary, EIA Scoping

Good morning Devesh

To confirm our phone call – please submit all information below at the full planning stage as these will be used to determine the application. Most of which has already been provided but is required for the planning process.

1. A suitably scaled drawing detailing the proposed access off the A458 trunk road, which must incorporate the following aspects:-

    a) Visibility Splays in either direction from a suitable set-back.
    b) Gradient of the access road and the A458 trunk road carriageway
    c) Access width and radii dimensions
    d) Access surfacing type along with depth and width dimensions
    e) If a gate is to be installed on the access

The above aspects must conform to the Design Manual for Roads and Bridges (DMRB). Please note: The minimum visibility distances available for vehicles emerging from the proposed access / junction shall be 160 metres in each direction at a height of 1.05 metres, measured to a point 0.26 metres above **the nearer running edge of the trunk road carriageway**. These visibility distances shall be available at a point 4.5 metres from the nearer running edge of the trunk road, measured along the centreline of the access road. The visibility splay so formed shall be free of any growth or obstruction, which would interfere with the minimum visibility requirements.

2. Swept Path Drawings demonstrating the largest vehicle associated with the development can safely enter and exit the access without crossing the centre line of the carriageway.

3. Geotechnical Assessment in accordance with DMRB HD22/08-“Managing Geotechnical Risk”

Regards

Casey Dunn

Is-adran Rheoli'r Rhwydwaith - Network Management Division
Trafnidiaeth - Transport
Seilwaith yr Economi - Economic Infrastructure
Llywodraeth Cymru - Welsh Government
Sarn Mynach
Llandudno Junction
LL31 9RZ

[redacted]

From: Devesh Shrivastava <[redacted]
Sent: 23 July 2019 16:44
To: Dunn, Casey (ESNR-Transport-Network Management) <[redacted]
Cc: 'Sarah Burley' <[redacted] Justin Bass <[redacted]
Subject: RE: Buttington Quary, EIA Scoping

Casey

Thank you for your email below.

We would confirm that the access junction layout was last approved in 2015. We attach the decision notice relating to that approval for your information. Condition 3 of the attached permission specifies that prior to the commencement of works the developer shall submit detailed design drawings and calculations of the proposed new highway cutting. The condition also indicates that the submission must be prepared by a Geotechnical consultant in accordance with DMRB HD22/08-“Managing Geotechnical Risk” and be accompanied by a Geotechnical Certificate signed by the applicants Geotechnical Advisor.

In the light of the above we assume that the requirement for the input of the geotechnical specialist could also be a condition to the current application if approved and that as a result it would not be necessary to submit geotechnical information as part of the application. We would welcome your earliest confirmation in that regard.

Please do not hesitate to contact us should you have any queries or wish to discuss the above.

Regards

Devesh Shrivastava
Assistant Transport Planner
on behalf of
Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

From: [redacted] <[redacted]
Sent: 16 July 2019 13:38
To: [redacted]
Subject: RE: Buttington Quary, EIA Scoping

Good afternoon Devesh

Apologies again for the delay. Can you confirm when the access was formally approved please?

Our Geotechnical engineer has requested that the DMBR HD22/08 Managing Geotechnical risk process is followed to ensure compliance.

Regards

Casey Dunn

Is-adran Rheoli'r Rhwydwaith - Network Management Division
Trafnidiaeth - Transport
Seilwaith yr Economi - Economic Infrastructure
Llywodraeth Cymru - Welsh Government
Sarn Mynach
Llandudno Junction
LL31 9RZ

[redacted]

From: Devesh Shrivastava <[redacted]
Sent: 24 June 2019 10:42
To: Dunn, Casey (ESNR-Transport-Network Management) <[redacted]
Cc: Justin Bass <[redacted] 'Sarah Burley' <[redacted]
Subject: RE: Buttington Quary, EIA Scoping

Hello Casey

Thank you for your reply. At this stage, we believe that the maximum legal articulated vehicle would be used frequently along with a 9.5m long rigid vehicle. We propose to send an amended drawing along with the planning application and not at this stage. Additionally, since the site access junction has been previously formally approved, we assume that a Road Safety Audit is not required.

Whilst writing, could you please confirm whether you have heard back from the Geotechnical team?

We trust that this email is sufficient. Please contact us if you have any queries or wish to discuss this matter further.

Regards

Devesh Shrivastava
Assistant Transport Planner
on behalf of

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

From: [redacted] <[redacted]
Sent: 11 June 2019 11:32
To: [redacted]
Subject: RE: Buttington Quary, EIA Scoping

Good morning Davesh

Thanks for sending the drawings through – the access looks great. How often would the maximum legal articulated vehicle be using the access? Yes happy for your to amend the drawings to show 4.5m x 160m visibility splays. Do you want to amend them and return? In the meantime I'll get advice off our Geotechnical engineer to see what information he will require for the cutting.

Regards

Casey Dunn

Is-adran Rheoli'r Rhwydwaith - Network Management Division
Trafnidiaeth - Transport
Seilwaith yr Economi - Economic Infrastructure
Llywodraeth Cymru - Welsh Government
Sarn Mynach
Llandudno Junction
LL31 9RZ

[redacted]

From: Devesh Shrivastava <[redacted]
Sent: 25 April 2019 10:24
To: Dunn, Casey (ESNR-Transport-Network Management) <[redacted]
Cc: Justin Bass <[redacted]
Subject: FW: Buttington Quary, EIA Scoping

Hello Casey

Further to your email to us on 24th October 2018 as shown below, we have assessed the geometry of the previously approved access junction as shown on Veryards drawing CC6532/SK20C, a copy of which is attached for ease of reference. Our investigations have included undertaking Auto Track swept path analysis for a maximum legal articulated vehicle as shown in the attached Auto Track sketch. The vehicle would be able to comfortably access the site. However, it would marginally encroach the right turn bay while turning left from the site access. However, we do not consider that should give rise to safety concerns given that the 3.5m wide ghosted right turn bay would comfortably accommodate a 2.5m wide maximum legal articulated vehicle.

We note that the speed limit on the A458 has been reduced to 50mph within the vicinity of the proposed site access since the attached Veryards drawing was produced. Therefore, we would be grateful for your earliest confirmation that the Local Highway Authority would accept visibility splays of 4.5m x 160m, the DMRB requirement for a 50mph road, at the site access rather than the previously shown 4.5m x 215m splays, which equate to the DMRB requirement for national speed limit roads, i.e 60mph for single carriageway roads.

We trust that this information is sufficient for your needs and welcome your earliest response. In the meantime, however, please contact us if you have any queries or wish to discuss this matter further.

Regards

Devesh Shrivastava
Assistant Transport Planner
on behalf of
Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

From: [redacted] <[redacted]
Sent: 24 October 2018 16:00
To: [redacted]
Cc: [redacted]
Subject: RE: Buttington Quary, EIA Scoping

Good afternoon

Thank you for your call. To confirm, on Friday we agreed:

1) The access would be reviewed in line with the DMRB, ensuring it is suitable for the largest vehicle proposed to use the access.
2) We agreed your study area would include appropriate junctions along the A483 to the South. These would be;
    a. A483 / A458
    b. Salop Road / A483
    c. A483 / B4381 / Smithfield Road

    As stated – the study should include permitted developments in these areas.

Regards

Casey Dunn

Is-adran Rheoli'r Rhwydwaith - Network Management Division
Trafnidiaeth - Transport
Seilwaith yr Economi - Economic Infrastructure
Llywodraeth Cymru - Welsh Government
Sarn Mynach
Llandudno Junction
LL31 9RZ
[redacted]

From: Devesh Shrivastava <[redacted]
Sent: 22 October 2018 14:12
To: Dunn, Casey (ESNR-Transport-Network Management) <[redacted]
Cc: 'Justin Bass' <[redacted]
Subject: FW: Buttington Quary, EIA Scoping

Hello Casey

In relation to the EIA scoping direction for the Energy Recovery Facility at Buttington and following our conversation on Friday please see our original email sent to you on 15th October. We welcome your earliest response.

Regards

Devesh Shrivastava

Assistant Transport Planner
on behalf of
Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]
____

From: Devesh Shrivastava <[redacted]
Sent: 15 October 2018 14:08
To: '[redacted]
<[redacted]
Cc: '[redacted] <[redacted] 'Justin Bass'
<[redacted] '[redacted] <[redacted]
Subject: Buttington Quary, EIA Scoping

Dear Sir / Madam

For the Attention of Casey Dunn

Further to the EIA transport related scoping comments set out in the attached document regarding the Energy Recovery Facility at Buttington Quarry, we welcome the earliest confirmation following investigations would adequately address bullets 1 and 4 of the attached.

- We propose to examine the geometry of the site access junction, including visibility splays and undertake AutoTrack swept path tests. This would assess the suitability of the site access junction in accordance with the Design Manual for Roads and Bridges (DMRB).
- The final point states that a junction capacity assessment would be required. Could you please confirm whether this refers to the A483 / A458 roundabout junction?

We trust that this information is sufficient and welcome your earliest response. Please contact us if you have any queries or if you wish to discuss this matter further

Regards

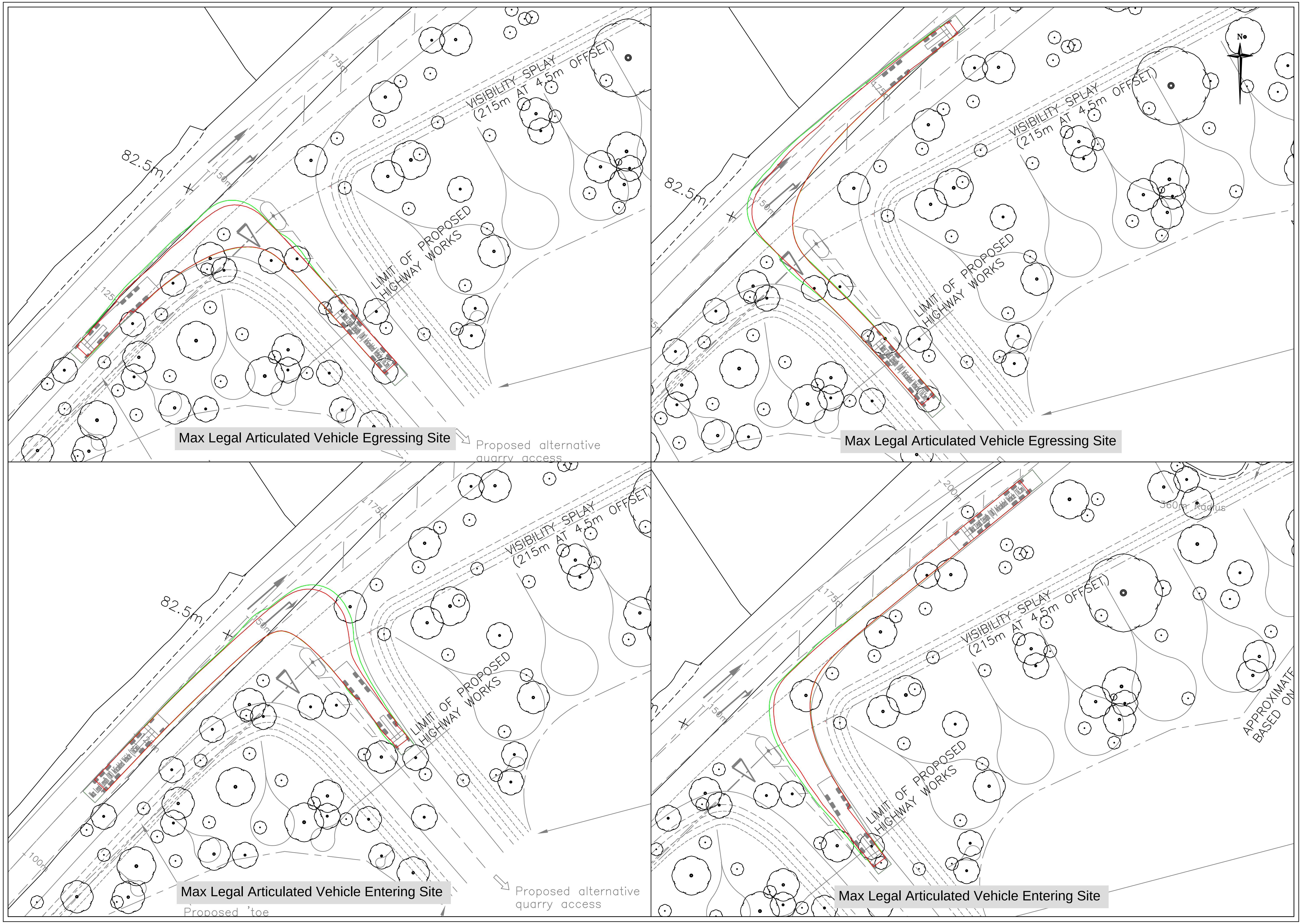
Devesh Shrivastava
Assistant Transport Planner
on behalf of
Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
[redacted]
e: [redacted]

Sganiwyd y neges hon am bob feirws hysbys wrth iddi adael Llywodraeth Cymru. Mae Llywodraeth Cymru yn cymryd o ddifrif yr angen i ddiogelu eich data. Os cysylltwch â Llywodraeth Cymru, mae ein hysbysiad preifatrwydd yn esbonio sut rydym yn defnyddio eich gwybodaeth a sut rydym yn diogelu eich preifatrwydd. Rydym yn croesawu gohebiaeth yn Gymraeg. Byddwn yn anfon ateb yn Gymraeg i ohebiaeth a dderbynnir yn Gymraeg ac ni fydd gohebu yn Gymraeg yn arwain at oedi. On leaving the Welsh Government this email was scanned for all known viruses. The Welsh Government takes the protection of your data seriously. If you contact the Welsh Government then our Privacy Notice explains how we use your information and the ways in which we protect your privacy. We welcome receiving correspondence in Welsh. Any correspondence received in Welsh will be answered in Welsh and corresponding in Welsh will not lead to a delay in responding.

Sganiwyd y neges hon am bob feirws hysbys wrth iddi adael Llywodraeth Cymru. Mae Llywodraeth Cymru yn cymryd o ddifrif yr angen i ddiogelu eich data. Os cysylltwch â Llywodraeth Cymru, mae ein hysbysiad preifatrwydd yn esbonio sut rydym yn defnyddio eich gwybodaeth a sut rydym yn diogelu eich preifatrwydd. Rydym yn croesawu gohebiaeth yn Gymraeg. Byddwn yn anfon ateb yn Gymraeg i ohebiaeth a dderbynnir yn Gymraeg ac ni fydd gohebu yn Gymraeg yn arwain at oedi. On leaving the Welsh Government this email was scanned for all known viruses. The Welsh Government takes the protection of your data seriously. If you contact the Welsh Government then our Privacy Notice explains how we use your information and the ways in which we protect your privacy. We welcome receiving correspondence in Welsh. Any correspondence received in Welsh will be answered in Welsh and corresponding in Welsh will not lead to a delay in responding.

APPENDIX E

AUTO TRACK SWEPTH PATHS


Max Legal Articulated Vehicle Egressing Site
Max Legal Articulated Vehicle Egressing Site
Max Legal Articulated Vehicle Entering Site
Max Legal Articulated Vehicle Entering Site
VISIBILITY SPLAY (215m AT 4.5m OFFSET)
LIMIT OF PROPOSED HIGHWAY WORKS
Proposed alternative quarry access
Proposed 'toe
82.5m
360m Radius
APPROXIMATE BASED ON
N

APPENDIX F

TRAFFIC SURVEY RESULTS

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (1) A483 / A458 / Livestock Market / Rhallt Lane

Approach: A483 (North)

	First Left to A458								Second Left to Livestock Market								Ahead to A483 (South)								Right to Rhallt Lane							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	2	0	0	0	0	**2**	0	0	0	0	0	0	0	**0**	0	0	64	11	3	2	0	**80**	0	0	3	1	0	0	0	**4**
0715 - 0730	0	0	5	0	0	0	0	**5**	0	0	0	0	0	0	0	**0**	0	0	56	9	2	2	1	**70**	0	0	5	3	0	0	0	**8**
0730 - 0745	0	0	7	1	0	0	0	**8**	0	0	0	1	0	0	0	**1**	0	0	75	17	2	1	1	**96**	0	0	6	1	0	0	0	**7**
0745 - 0800	0	0	6	0	0	0	0	**6**	0	0	0	0	0	0	0	**0**	0	0	77	15	5	9	1	**107**	0	0	12	2	0	1	0	**15**
Hourly Total	**0**	**0**	**20**	**1**	**0**	**0**	**0**	**21**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**272**	**52**	**12**	**14**	**3**	**353**	**0**	**0**	**26**	**7**	**0**	**1**	**0**	**34**
0800 - 0815	0	0	7	0	1	0	0	**8**	0	0	0	0	0	0	0	**0**	0	0	77	17	3	4	0	**101**	0	0	4	1	0	0	0	**5**
0815 - 0830	0	0	9	0	1	0	0	**10**	0	0	0	1	0	0	0	**1**	0	0	89	14	5	3	1	**112**	0	0	7	0	0	0	0	**7**
0830 - 0845	0	0	11	1	1	0	0	**13**	0	0	0	0	0	0	0	**0**	0	0	96	14	3	2	0	**115**	0	0	6	0	0	0	0	**6**
0845 - 0900	0	0	4	0	1	0	0	**5**	0	0	2	0	0	0	0	**2**	0	1	72	15	3	5	0	**96**	0	0	6	2	0	0	0	**8**
Hourly Total	**0**	**0**	**31**	**1**	**4**	**0**	**0**	**36**	**0**	**0**	**2**	**1**	**0**	**0**	**0**	**3**	**0**	**1**	**334**	**60**	**14**	**14**	**1**	**424**	**0**	**0**	**23**	**3**	**0**	**0**	**0**	**26**
0900 - 0915	0	0	3	0	0	0	0	**3**	0	0	0	0	0	0	0	**0**	0	0	74	6	4	3	0	**87**	0	0	5	1	1	0	0	**7**
0915 - 0930	0	0	3	0	0	0	0	**3**	0	0	0	2	1	0	0	**3**	0	0	62	17	10	3	0	**92**	0	0	5	0	1	0	0	**6**
0930 - 0945	0	0	3	0	1	1	0	**5**	0	0	0	0	0	0	0	**0**	0	0	43	15	3	2	0	**63**	0	0	3	1	0	0	0	**4**
0945 - 1000	0	0	3	1	0	0	0	**4**	0	0	0	0	0	0	0	**0**	0	0	47	18	5	1	0	**71**	0	0	0	2	1	0	0	**3**
Hourly Total	**0**	**0**	**12**	**1**	**1**	**1**	**0**	**15**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**226**	**56**	**22**	**9**	**0**	**313**	**0**	**0**	**13**	**4**	**3**	**0**	**0**	**20**
Session Total	**0**	**0**	**63**	**3**	**5**	**1**	**0**	**72**	**0**	**0**	**2**	**4**	**1**	**0**	**0**	**7**	**0**	**1**	**832**	**168**	**48**	**37**	**4**	**1090**	**0**	**0**	**62**	**14**	**3**	**1**	**0**	**80**
1600 - 1615	0	0	3	0	0	1	0	**4**	0	0	0	0	0	0	0	**0**	0	0	57	11	2	1	0	**71**	0	0	3	1	1	0	0	**5**
1615 - 1630	0	0	2	1	0	0	0	**3**	0	0	0	0	0	0	0	**0**	0	1	48	7	1	5	1	**63**	0	0	2	0	1	0	0	**3**
1630 - 1645	0	0	5	2	1	2	0	**10**	0	0	0	0	0	0	0	**0**	0	0	69	18	0	4	0	**91**	0	0	2	2	0	0	0	**4**
1645 - 1700	0	0	4	0	1	0	0	**5**	0	0	0	0	0	0	0	**0**	0	0	67	8	0	4	0	**79**	0	0	3	1	0	0	0	**4**
Hourly Total	**0**	**0**	**14**	**3**	**2**	**3**	**0**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**241**	**44**	**3**	**14**	**1**	**304**	**0**	**0**	**10**	**4**	**2**	**0**	**0**	**16**
1700 - 1715	0	0	6	1	2	1	0	**10**	0	0	0	0	0	0	0	**0**	0	0	57	12	1	3	2	**75**	0	0	3	1	0	0	0	**4**
1715 - 1730	0	0	5	0	0	0	0	**5**	0	0	0	0	0	0	0	**0**	0	0	62	8	1	2	0	**73**	0	0	7	0	0	0	0	**7**
1730 - 1745	0	0	7	0	0	0	0	**7**	0	0	0	0	0	0	0	**0**	0	0	61	7	0	3	0	**71**	0	0	6	1	0	0	0	**7**
1745 - 1800	0	0	3	1	0	0	0	**4**	0	0	0	0	0	0	0	**0**	0	0	79	3	1	9	0	**92**	0	0	4	0	0	0	0	**4**
Hourly Total	**0**	**0**	**21**	**2**	**2**	**1**	**0**	**26**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**259**	**30**	**3**	**17**	**2**	**311**	**0**	**0**	**20**	**2**	**0**	**0**	**0**	**22**
1800 - 1815	0	0	4	0	0	0	0	**4**	0	0	0	0	0	0	0	**0**	0	0	31	8	2	1	0	**42**	0	0	3	0	0	1	0	**4**
1815 - 1830	0	0	5	0	0	0	0	**5**	0	0	0	0	0	0	0	**0**	0	0	61	4	0	4	0	**69**	0	0	5	1	0	0	0	**6**
1830 - 1845	0	0	3	0	0	0	0	**3**	0	0	0	0	0	0	0	**0**	0	0	47	3	3	1	0	**54**	0	0	3	1	0	0	0	**4**
1845 - 1900	0	0	4	3	0	0	0	**7**	0	0	0	0	0	0	0	**0**	0	0	35	5	0	1	0	**41**	0	0	4	0	0	1	0	**5**
Hourly Total	**0**	**0**	**16**	**3**	**0**	**0**	**0**	**19**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**174**	**20**	**5**	**7**	**0**	**206**	**0**	**0**	**15**	**2**	**0**	**2**	**0**	**19**
Session Total	**0**	**0**	**51**	**8**	**4**	**4**	**0**	**67**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**674**	**94**	**11**	**38**	**3**	**821**	**0**	**0**	**45**	**8**	**2**	**2**	**0**	**57**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (1) A483 / A458 / Livestock Market / Rhallt Lane

Approach: A458

	First Left to Livestock Market								Second Left to A483 (South)								Ahead to Rhallt Lane								Right to A483 (North)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	**0**	0	0	19	10	2	4	0	**35**	0	0	1	0	0	1	0	**2**	0	0	1	2	1	0	0	**4**
0715 - 0730	0	0	0	0	0	0	0	**0**	0	0	30	14	1	1	0	**46**	0	0	5	0	0	1	0	**6**	0	0	4	0	0	2	0	**6**
0730 - 0745	0	0	0	0	0	0	0	**0**	0	0	38	15	6	5	1	**65**	0	1	6	2	0	3	0	**12**	0	0	5	2	0	0	0	**7**
0745 - 0800	0	0	0	0	0	0	0	**0**	0	0	44	13	3	3	1	**64**	0	0	10	1	0	1	0	**12**	0	0	7	0	1	1	0	**9**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**131**	**52**	**12**	**13**	**2**	**210**	**0**	**1**	**22**	**3**	**0**	**6**	**0**	**32**	**0**	**0**	**17**	**4**	**2**	**3**	**0**	**26**
0800 - 0815	0	0	0	0	0	0	0	**0**	0	0	47	25	5	8	0	**85**	0	0	8	1	0	0	0	**9**	0	0	4	0	0	0	0	**4**
0815 - 0830	0	0	0	0	0	0	0	**0**	0	0	42	12	3	3	0	**60**	0	0	4	3	2	0	0	**9**	0	0	12	0	0	0	0	**12**
0830 - 0845	0	0	0	0	0	0	0	**0**	0	0	86	14	2	6	2	**110**	0	0	10	1	1	1	0	**13**	0	0	5	1	0	0	0	**6**
0845 - 0900	0	0	1	1	0	0	0	**2**	0	0	98	12	2	4	0	**116**	0	0	5	1	0	0	0	**6**	0	0	6	1	2	0	0	**9**
Hourly Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**273**	**63**	**12**	**21**	**2**	**371**	**0**	**0**	**27**	**6**	**3**	**1**	**0**	**37**	**0**	**0**	**27**	**2**	**2**	**0**	**0**	**31**
0900 - 0915	0	0	0	0	0	0	0	**0**	0	0	50	13	5	2	0	**70**	0	0	2	0	1	0	0	**3**	0	0	2	1	0	0	0	**3**
0915 - 0930	0	0	0	0	0	0	0	**0**	0	0	33	14	5	3	1	**56**	0	0	2	1	2	0	0	**5**	0	0	2	0	0	0	0	**2**
0930 - 0945	0	0	0	0	0	0	0	**0**	0	0	49	13	6	4	1	**73**	0	0	2	2	0	1	0	**5**	0	0	6	0	0	0	0	**6**
0945 - 1000	0	0	0	0	0	0	0	**0**	0	0	35	13	0	8	0	**56**	0	0	4	3	0	0	0	**7**	0	0	12	2	0	1	1	**16**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**167**	**53**	**16**	**17**	**2**	**255**	**0**	**0**	**10**	**6**	**3**	**1**	**0**	**20**	**0**	**0**	**22**	**3**	**0**	**1**	**1**	**27**
Session Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**571**	**168**	**40**	**51**	**6**	**836**	**0**	**1**	**59**	**15**	**6**	**8**	**0**	**89**	**0**	**0**	**66**	**9**	**4**	**4**	**1**	**84**
1600 - 1615	0	0	0	0	0	0	0	**0**	0	0	86	15	0	3	0	**104**	0	0	2	2	0	0	0	**4**	0	0	8	0	0	0	0	**8**
1615 - 1630	0	0	0	0	0	0	0	**0**	0	0	68	13	1	4	0	**86**	0	0	2	3	0	1	0	**6**	0	0	3	1	0	0	0	**4**
1630 - 1645	0	0	0	0	0	0	0	**0**	0	0	72	13	1	1	1	**88**	0	0	5	1	0	0	0	**6**	0	0	3	0	0	1	0	**4**
1645 - 1700	0	0	0	0	0	0	0	**0**	0	0	82	15	2	3	0	**102**	0	0	8	1	0	1	0	**10**	0	0	1	0	1	0	0	**2**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**308**	**56**	**4**	**11**	**1**	**380**	**0**	**0**	**17**	**7**	**0**	**2**	**0**	**26**	**0**	**0**	**15**	**1**	**1**	**1**	**0**	**18**
1700 - 1715	0	0	0	0	0	0	0	**0**	0	0	95	8	3	1	0	**107**	0	1	3	0	0	0	0	**4**	0	0	11	2	0	0	0	**13**
1715 - 1730	0	0	0	0	0	0	0	**0**	0	0	87	10	0	3	1	**101**	0	0	6	3	0	1	0	**10**	0	0	9	0	0	0	0	**9**
1730 - 1745	0	0	0	0	0	0	0	**0**	0	0	93	12	0	2	0	**107**	0	0	5	0	0	0	0	**5**	0	0	6	0	0	0	0	**6**
1745 - 1800	0	0	0	0	0	0	0	**0**	0	0	91	5	1	2	0	**99**	0	0	4	1	0	0	0	**5**	0	0	5	0	0	0	0	**5**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**366**	**35**	**4**	**8**	**1**	**414**	**0**	**1**	**18**	**4**	**0**	**1**	**0**	**24**	**0**	**0**	**31**	**2**	**0**	**0**	**0**	**33**
1800 - 1815	0	0	0	0	0	0	0	**0**	0	0	85	12	1	0	0	**98**	0	0	4	0	0	0	0	**4**	0	0	5	1	1	1	0	**8**
1815 - 1830	0	0	0	0	0	0	0	**0**	0	0	65	7	2	2	1	**77**	0	0	3	0	0	0	0	**3**	0	0	2	0	0	0	0	**2**
1830 - 1845	0	0	0	0	0	0	0	**0**	0	0	60	4	0	0	1	**65**	0	0	5	0	0	0	0	**5**	0	0	2	1	0	0	0	**3**
1845 - 1900	0	0	0	0	0	0	0	**0**	0	0	56	2	0	3	0	**61**	0	0	5	0	0	1	0	**6**	0	0	4	0	0	0	0	**4**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**266**	**25**	**3**	**5**	**2**	**301**	**0**	**0**	**17**	**0**	**0**	**1**	**0**	**18**	**0**	**0**	**13**	**2**	**1**	**1**	**0**	**17**
Session Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**940**	**116**	**11**	**24**	**4**	**1095**	**0**	**1**	**52**	**11**	**0**	**4**	**0**	**68**	**0**	**0**	**59**	**5**	**2**	**2**	**0**	**68**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (1) A483 / A458 / Livestock Market / Rhallt Lane

Approach: Livestock Market

	First Left to A483 (South)								Second Left to Rhallt Lane								Right to A483 (North)								Last Right to A458							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0745 - 0800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0800 - 0815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0815 - 0830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0845 - 0900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0900 - 0915	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0915 - 0930	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
0930 - 0945	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0945 - 1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**2**	**1**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**2**	**1**	**1**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1600 - 1615	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
1615 - 1630	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1630 - 1645	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
1700 - 1715	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	1	0	0	0	0	1
1715 - 1730	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1730 - 1745	0	0	4	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1
1745 - 1800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**
1800 - 1815	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1815 - 1830	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830 - 1845	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1845 - 1900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
Session Total	**0**	**0**	**8**	**1**	**1**	**0**	**0**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**1**	**0**	**0**	**0**	**8**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**4**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (1) A483 / A458 / Livestock Market / Rhallt Lane

Approach: A483 (South)

	Left to Rhallt Lane								Ahead to A483 (North)								Right to A458								Last Right to Livestock Market								U-Turners							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	5	1	1	0	0	7	0	0	21	6	2	2	0	31	0	0	72	7	1	2	0	82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	13	6	0	1	0	20	0	0	32	7	1	1	1	42	0	0	65	8	4	2	1	80	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
0730 - 0745	0	0	13	0	0	0	0	13	0	0	43	6	1	5	0	55	0	0	59	5	4	2	0	70	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1
0745 - 0800	0	0	31	1	1	2	0	35	0	0	47	12	3	2	3	67	0	0	70	13	1	0	1	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	62	8	2	3	0	75	0	0	143	31	7	10	4	195	0	0	266	33	10	6	2	317	0	0	0	2	0	0	0	2	0	0	1	0	0	0	0	1
0800 - 0815	0	0	15	4	0	0	0	19	0	0	42	6	1	3	0	52	0	0	84	9	3	1	0	97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0815 - 0830	0	0	9	2	0	0	0	11	0	0	39	12	2	3	0	56	0	0	74	11	3	4	0	92	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
0830 - 0845	0	0	14	5	0	1	0	20	0	0	46	11	2	4	1	64	0	0	75	13	4	6	2	100	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1
0845 - 0900	0	0	12	1	1	0	0	14	0	0	37	16	3	2	0	58	0	0	56	13	2	9	3	83	0	0	6	0	0	0	0	6	0	0	0	0	0	0	0	0
Hourly Total	0	0	50	12	1	1	0	64	0	0	164	45	8	12	1	230	0	0	289	46	12	20	5	372	0	0	7	0	0	0	0	7	0	0	2	0	0	0	0	2
0900 - 0915	0	0	7	2	1	2	0	12	0	1	32	4	4	2	2	45	0	1	53	10	1	4	0	69	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
0915 - 0930	0	0	10	2	0	0	0	12	0	1	20	7	2	4	0	34	0	0	51	7	2	3	1	64	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1
0930 - 0945	0	0	6	4	0	0	0	10	0	0	36	13	2	3	0	54	0	0	43	5	6	0	0	54	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0
0945 - 1000	0	0	15	4	0	0	0	19	0	0	21	9	7	4	1	42	0	0	54	9	2	4	0	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	38	12	1	2	0	53	0	2	109	33	15	13	3	175	0	1	201	31	11	11	1	256	0	0	2	2	0	0	0	4	0	0	1	0	0	0	0	1
Session Total	0	0	150	32	4	6	0	192	0	2	416	109	30	35	8	600	0	1	756	110	33	37	8	945	0	0	9	4	0	0	0	13	0	0	4	0	0	0	0	4
1600 - 1615	0	0	13	0	1	0	0	14	0	0	81	19	3	3	3	109	0	0	60	15	1	8	0	84	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1615 - 1630	0	0	10	3	0	0	0	13	0	0	66	9	2	5	1	83	0	0	60	15	3	2	0	80	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
1630 - 1645	0	0	9	1	0	0	0	10	0	0	72	7	1	7	0	87	0	0	69	13	0	2	0	84	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1
1645 - 1700	0	0	14	3	0	0	0	17	0	0	70	19	0	0	0	89	0	0	59	13	1	5	1	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	46	7	1	0	0	54	0	0	289	54	6	15	4	368	0	0	248	56	5	17	1	327	0	0	2	1	0	0	0	3	0	0	1	0	0	0	0	1
1700 - 1715	0	1	13	1	1	1	0	17	0	0	106	10	1	7	0	124	0	0	72	13	5	2	1	93	0	0	1	1	0	0	0	2	0	0	0	0	0	0	0	0
1715 - 1730	0	0	22	4	0	0	0	26	0	0	104	12	0	2	0	118	0	0	78	6	0	4	0	88	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1730 - 1745	0	0	15	0	0	0	0	15	0	0	92	6	0	3	0	101	0	0	61	4	0	4	0	69	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1745 - 1800	0	0	12	0	1	0	0	13	0	0	73	7	0	1	1	82	0	0	61	6	2	1	0	70	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1
Hourly Total	0	1	62	5	2	1	0	71	0	0	375	35	1	13	1	425	0	0	272	29	7	11	1	320	0	0	2	1	0	0	0	3	0	0	3	0	0	0	0	3
1800 - 1815	0	0	16	1	0	1	0	18	0	0	66	6	2	2	0	76	0	0	66	7	4	2	0	79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815 - 1830	0	0	7	1	0	0	0	8	0	0	50	7	3	1	0	61	0	0	47	3	1	0	0	51	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
1830 - 1845	0	0	10	1	0	0	0	11	0	0	42	5	0	1	1	49	0	0	41	2	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1845 - 1900	0	0	6	0	0	0	0	6	0	0	32	3	0	0	0	35	0	0	38	1	1	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	0	0	39	3	0	1	0	43	0	0	190	21	5	4	1	221	0	0	192	13	6	2	0	213	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Session Total	0	1	147	15	3	2	0	168	0	0	854	110	12	32	6	1014	0	0	712	98	18	30	2	860	0	0	4	2	0	0	0	6	0	0	5	0	0	0	0	5

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (1) A483 / A458 / Livestock Market / Rhallt Lane

Approach: Rhallt Lane

	Left to A483 (North)								Ahead to A458							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	2	0	0	0	0	**2**	0	0	7	2	1	0	0	**10**
0715 - 0730	0	0	2	1	0	1	0	**4**	0	0	3	3	0	0	0	**6**
0730 - 0745	0	0	4	0	0	0	0	**4**	0	0	3	2	0	0	0	**5**
0745 - 0800	0	0	1	1	0	0	0	**2**	0	0	6	1	0	0	0	**7**
Hourly Total	**0**	**0**	**9**	**2**	**0**	**1**	**0**	**12**	**0**	**0**	**19**	**8**	**1**	**0**	**0**	**28**
0800 - 0815	0	0	1	1	0	1	0	**3**	0	0	0	2	1	0	0	**3**
0815 - 0830	0	0	2	0	0	0	0	**2**	0	0	5	1	0	0	0	**6**
0830 - 0845	0	0	0	2	0	0	0	**2**	0	0	4	2	1	0	0	**7**
0845 - 0900	0	0	2	2	1	1	0	**6**	0	0	2	1	0	0	0	**3**
Hourly Total	**0**	**0**	**5**	**5**	**1**	**2**	**0**	**13**	**0**	**0**	**11**	**6**	**2**	**0**	**0**	**19**
0900 - 0915	0	0	1	1	0	1	0	**3**	0	0	1	0	1	0	0	**2**
0915 - 0930	0	0	5	0	1	1	0	**7**	0	0	5	1	0	0	0	**6**
0930 - 0945	0	0	2	0	0	0	0	**2**	0	0	5	0	0	0	0	**5**
0945 - 1000	0	0	10	1	0	0	0	**11**	0	0	5	0	1	1	0	**7**
Hourly Total	**0**	**0**	**18**	**2**	**1**	**2**	**0**	**23**	**0**	**0**	**16**	**1**	**2**	**1**	**0**	**20**
Session Total	**0**	**0**	**32**	**9**	**2**	**5**	**0**	**48**	**0**	**0**	**46**	**15**	**5**	**1**	**0**	**67**
1600 - 1615	0	0	5	0	0	0	0	**5**	0	0	9	1	1	0	0	**11**
1615 - 1630	0	0	4	1	0	0	0	**5**	0	0	2	2	1	0	0	**5**
1630 - 1645	0	0	8	0	0	0	0	**8**	0	0	11	2	0	0	0	**13**
1645 - 1700	0	0	6	1	0	0	0	**7**	0	0	5	1	0	0	0	**6**
Hourly Total	**0**	**0**	**23**	**2**	**0**	**0**	**0**	**25**	**0**	**0**	**27**	**6**	**2**	**0**	**0**	**35**
1700 - 1715	0	0	21	0	0	0	0	**21**	0	0	13	1	0	0	0	**14**
1715 - 1730	0	0	8	1	1	0	0	**10**	0	0	13	1	0	0	0	**14**
1730 - 1745	0	0	7	0	1	0	0	**8**	0	0	10	1	0	0	0	**11**
1745 - 1800	0	0	8	0	0	0	0	**8**	0	0	8	2	0	0	0	**10**
Hourly Total	**0**	**0**	**44**	**1**	**2**	**0**	**0**	**47**	**0**	**0**	**44**	**5**	**0**	**0**	**0**	**49**
1800 - 1815	0	0	6	1	0	0	0	**7**	0	0	14	0	1	0	0	**15**
1815 - 1830	0	0	4	0	1	0	0	**5**	0	0	8	0	0	0	0	**8**
1830 - 1845	0	0	6	0	0	0	0	**6**	0	0	5	0	0	0	0	**5**
1845 - 1900	0	0	4	1	0	1	0	**6**	0	0	6	0	0	0	0	**6**
Hourly Total	**0**	**0**	**20**	**2**	**1**	**1**	**0**	**24**	**0**	**0**	**33**	**0**	**1**	**0**	**0**	**34**
Session Total	**0**	**0**	**87**	**5**	**3**	**1**	**0**	**96**	**0**	**0**	**104**	**11**	**3**	**0**	**0**	**118**

	Right to Livestock Market								Last Right to A483 (South)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	**0**	0	0	0	1	1	0	0	**2**
0715 - 0730	0	0	0	0	0	0	0	**0**	0	0	7	5	0	1	0	**13**
0730 - 0745	0	0	0	0	0	0	0	**0**	0	0	3	2	1	1	0	**7**
0745 - 0800	0	0	0	0	0	0	0	**0**	0	0	7	0	1	0	0	**8**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**17**	**8**	**3**	**2**	**0**	**30**
0800 - 0815	0	0	0	0	0	0	0	**0**	0	0	6	3	0	2	0	**11**
0815 - 0830	0	0	0	0	0	0	0	**0**	0	0	7	1	1	0	0	**9**
0830 - 0845	0	0	0	0	0	0	0	**0**	0	0	8	0	0	1	0	**9**
0845 - 0900	0	0	3	0	0	0	0	**3**	0	0	7	2	0	0	0	**9**
Hourly Total	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**28**	**6**	**1**	**3**	**0**	**38**
0900 - 0915	0	0	0	0	0	0	0	**0**	0	0	8	1	0	0	0	**9**
0915 - 0930	0	0	0	0	0	0	0	**0**	0	0	4	2	4	0	0	**10**
0930 - 0945	0	0	1	0	0	0	0	**1**	0	0	5	3	0	1	0	**9**
0945 - 1000	0	0	0	0	0	0	0	**0**	0	0	5	2	0	1	0	**8**
Hourly Total	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**22**	**8**	**4**	**2**	**0**	**36**
Session Total	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**67**	**22**	**8**	**7**	**0**	**104**
1600 - 1615	0	0	1	0	0	0	0	**1**	0	0	9	3	1	0	0	**13**
1615 - 1630	0	0	0	0	0	0	0	**0**	0	0	9	4	1	0	0	**14**
1630 - 1645	0	0	0	0	0	0	0	**0**	0	0	24	2	1	0	0	**27**
1645 - 1700	0	0	0	0	0	0	0	**0**	0	0	18	4	1	0	0	**23**
Hourly Total	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**60**	**13**	**4**	**0**	**0**	**77**
1700 - 1715	0	0	1	0	0	0	0	**1**	0	0	31	2	0	0	0	**33**
1715 - 1730	0	0	0	0	0	0	0	**0**	0	0	12	2	0	0	0	**14**
1730 - 1745	0	0	0	0	0	0	0	**0**	0	0	15	1	1	0	0	**17**
1745 - 1800	0	0	0	0	0	0	0	**0**	0	0	13	0	0	0	0	**13**
Hourly Total	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**71**	**5**	**1**	**0**	**0**	**77**
1800 - 1815	0	0	0	0	0	0	0	**0**	0	0	23	0	0	0	0	**23**
1815 - 1830	0	0	0	0	0	0	0	**0**	0	0	13	0	0	0	0	**13**
1830 - 1845	0	0	0	0	0	0	0	**0**	0	0	11	2	0	0	0	**13**
1845 - 1900	0	0	0	0	0	0	0	**0**	0	0	13	1	0	0	0	**14**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**60**	**3**	**0**	**0**	**0**	**63**
Session Total	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**191**	**21**	**5**	**0**	**0**	**217**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (2) A483 / A458

Approach: A483 (North)

	Ahead to A483 (South)								Right to A458							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**
0700 - 0715	0	0	76	22	5	4	0	**107**	0	0	8	1	0	1	0	**10**
0715 - 0730	0	0	80	26	3	7	1	**117**	0	0	12	0	0	0	0	**12**
0730 - 0745	0	0	103	32	9	5	0	**149**	0	0	9	3	1	0	1	**14**
0745 - 0800	0	0	113	25	8	10	2	**158**	0	0	15	2	0	1	0	**18**
Hourly Total	**0**	**0**	**372**	**105**	**25**	**26**	**3**	**531**	**0**	**0**	**44**	**6**	**1**	**2**	**1**	**54**
0800 - 0815	0	0	109	39	11	12	1	**172**	0	0	21	7	0	1	0	**29**
0815 - 0830	0	0	114	24	8	7	0	**153**	0	0	28	3	2	0	1	**34**
0830 - 0845	0	0	132	26	4	12	0	**174**	0	0	51	2	0	0	2	**55**
0845 - 0900	0	1	138	25	3	8	0	**175**	0	0	38	5	0	0	0	**43**
Hourly Total	**0**	**1**	**493**	**114**	**26**	**39**	**1**	**674**	**0**	**0**	**138**	**17**	**2**	**1**	**3**	**161**
0900 - 0915	0	0	109	21	8	5	0	**143**	0	0	28	3	3	0	0	**34**
0915 - 0930	0	0	77	30	15	8	0	**130**	0	0	24	2	2	0	1	**29**
0930 - 0945	0	0	67	27	10	6	0	**110**	0	0	24	4	0	0	0	**28**
0945 - 1000	0	0	75	25	5	9	1	**115**	0	0	16	5	0	0	0	**21**
Hourly Total	**0**	**0**	**328**	**103**	**38**	**28**	**1**	**498**	**0**	**0**	**92**	**14**	**5**	**0**	**1**	**112**
Session Total	**0**	**1**	**1193**	**322**	**89**	**93**	**5**	**1703**	**0**	**0**	**274**	**37**	**8**	**3**	**5**	**327**
1600 - 1615	0	0	119	27	4	4	0	**154**	0	0	32	5	0	0	0	**37**
1615 - 1630	0	1	90	20	2	8	1	**122**	0	0	36	2	0	1	0	**39**
1630 - 1645	0	0	121	28	3	7	0	**159**	0	0	39	7	0	0	1	**47**
1645 - 1700	0	0	122	22	4	5	0	**153**	0	0	39	6	0	0	0	**45**
Hourly Total	**0**	**1**	**452**	**97**	**13**	**24**	**1**	**588**	**0**	**0**	**146**	**20**	**0**	**1**	**1**	**168**
1700 - 1715	0	0	151	16	2	6	1	**176**	0	0	36	6	1	0	1	**44**
1715 - 1730	0	0	121	14	1	4	0	**140**	0	0	39	7	0	0	1	**47**
1730 - 1745	0	0	133	14	0	4	0	**151**	0	0	38	6	0	0	0	**44**
1745 - 1800	0	0	138	6	0	11	0	**155**	0	0	46	2	0	1	0	**49**
Hourly Total	**0**	**0**	**543**	**50**	**3**	**25**	**1**	**622**	**0**	**0**	**159**	**21**	**1**	**1**	**2**	**184**
1800 - 1815	0	0	104	18	2	2	0	**126**	0	0	37	2	0	0	0	**39**
1815 - 1830	0	0	109	10	3	5	1	**128**	0	0	30	1	0	0	0	**31**
1830 - 1845	0	0	95	5	2	1	0	**103**	0	0	25	3	0	0	1	**29**
1845 - 1900	0	0	86	8	0	4	0	**98**	0	0	15	1	0	0	0	**16**
Hourly Total	**0**	**0**	**394**	**41**	**7**	**12**	**1**	**455**	**0**	**0**	**107**	**7**	**0**	**0**	**1**	**115**
Session Total	**0**	**1**	**1389**	**188**	**23**	**61**	**3**	**1665**	**0**	**0**	**412**	**48**	**1**	**2**	**4**	**467**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (2) A483 / A458

Approach: A483 (South)

	Left to A458								Ahead to A483 (North)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**
0700 - 0715	0	0	2	0	0	0	0	**2**	0	0	73	12	2	2	0	**89**
0715 - 0730	0	0	3	0	0	0	0	**3**	0	0	77	16	1	5	1	**100**
0730 - 0745	0	0	7	0	0	0	0	**7**	0	0	84	6	5	6	0	**101**
0745 - 0800	0	0	8	1	0	1	0	**10**	0	0	109	21	7	2	1	**140**
Hourly Total	**0**	**0**	**20**	**1**	**0**	**1**	**0**	**22**	**0**	**0**	**343**	**55**	**15**	**15**	**2**	**430**
0800 - 0815	0	0	9	2	1	0	0	**12**	0	0	97	17	3	3	0	**120**
0815 - 0830	0	0	12	3	0	0	0	**15**	0	0	68	19	2	5	0	**94**
0830 - 0845	0	0	24	2	0	0	4	**30**	0	0	85	22	2	10	0	**119**
0845 - 0900	0	0	24	8	0	0	0	**32**	0	0	72	27	8	9	0	**116**
Hourly Total	**0**	**0**	**69**	**15**	**1**	**0**	**4**	**89**	**0**	**0**	**322**	**85**	**15**	**27**	**0**	**449**
0900 - 0915	0	0	10	4	0	0	0	**14**	0	2	65	11	3	7	1	**89**
0915 - 0930	0	0	10	0	0	0	0	**10**	0	0	61	10	5	7	0	**83**
0930 - 0945	0	0	7	1	0	2	0	**10**	0	0	63	17	6	4	0	**90**
0945 - 1000	0	0	9	2	0	1	0	**12**	0	0	65	16	6	9	0	**96**
Hourly Total	**0**	**0**	**36**	**7**	**0**	**3**	**0**	**46**	**0**	**2**	**254**	**54**	**20**	**27**	**1**	**358**
Session Total	**0**	**0**	**125**	**23**	**1**	**4**	**4**	**157**	**0**	**2**	**919**	**194**	**50**	**69**	**3**	**1237**
1600 - 1615	0	0	11	0	1	1	0	**13**	0	0	107	25	4	8	2	**146**
1615 - 1630	0	0	22	1	0	1	0	**24**	0	0	99	16	2	8	1	**126**
1630 - 1645	0	0	27	2	0	0	0	**29**	0	0	115	16	0	6	0	**137**
1645 - 1700	0	0	17	1	0	0	0	**18**	0	0	101	27	0	6	0	**134**
Hourly Total	**0**	**0**	**77**	**4**	**1**	**2**	**0**	**84**	**0**	**0**	**422**	**84**	**6**	**28**	**3**	**543**
1700 - 1715	0	0	28	1	0	0	0	**29**	0	1	144	13	6	10	0	**174**
1715 - 1730	0	0	22	1	0	0	0	**23**	0	0	142	15	0	5	0	**162**
1730 - 1745	0	0	25	0	0	0	0	**25**	0	0	130	7	0	6	0	**143**
1745 - 1800	0	0	21	1	0	0	0	**22**	0	0	101	8	1	4	1	**115**
Hourly Total	**0**	**0**	**96**	**3**	**0**	**0**	**0**	**99**	**0**	**1**	**517**	**43**	**7**	**25**	**1**	**594**
1800 - 1815	0	0	14	0	0	0	0	**14**	0	0	95	10	7	4	0	**116**
1815 - 1830	0	0	19	1	0	0	0	**20**	0	0	77	8	4	1	0	**90**
1830 - 1845	0	0	7	1	0	0	0	**8**	0	0	63	10	0	1	1	**75**
1845 - 1900	0	0	8	0	0	0	0	**8**	0	0	46	3	1	1	0	**51**
Hourly Total	**0**	**0**	**48**	**2**	**0**	**0**	**0**	**50**	**0**	**0**	**281**	**31**	**12**	**7**	**1**	**332**
Session Total	**0**	**0**	**221**	**9**	**1**	**2**	**0**	**233**	**0**	**1**	**1220**	**158**	**25**	**60**	**5**	**1469**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (2) A483 / A458

Approach: A458

	Left to A483 (North)								Right to A483 (South)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	**TOTAL**
0700 - 0715	0	0	27	3	1	0	0	**31**	0	0	0	0	0	0	0	**0**
0715 - 0730	0	0	33	6	3	0	0	**42**	0	0	0	0	0	0	0	**0**
0730 - 0745	0	0	30	7	0	1	0	**38**	0	0	0	0	0	0	0	**0**
0745 - 0800	0	0	39	4	0	1	3	**47**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**129**	**20**	**4**	**2**	**3**	**158**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0800 - 0815	0	0	40	3	1	1	0	**45**	0	0	0	0	0	0	0	**0**
0815 - 0830	0	0	56	5	2	1	0	**64**	0	0	0	0	0	0	0	**0**
0830 - 0845	0	0	52	7	2	2	3	**66**	0	0	0	0	0	0	0	**0**
0845 - 0900	0	0	39	5	0	2	3	**49**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**187**	**20**	**5**	**6**	**6**	**224**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0900 - 0915	0	0	26	5	1	0	1	**33**	0	0	0	0	0	0	0	**0**
0915 - 0930	0	1	18	8	0	0	1	**28**	0	0	0	0	0	0	0	**0**
0930 - 0945	0	0	25	5	2	0	0	**32**	0	0	0	0	0	0	0	**0**
0945 - 1000	0	0	25	5	3	0	1	**34**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**1**	**94**	**23**	**6**	**0**	**3**	**127**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**1**	**410**	**63**	**15**	**8**	**12**	**509**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1600 - 1615	0	0	52	9	2	1	1	**65**	0	0	0	0	0	0	0	**0**
1615 - 1630	0	0	38	13	2	0	0	**53**	0	0	0	0	0	0	0	**0**
1630 - 1645	0	0	33	7	1	2	0	**43**	0	0	0	0	0	0	0	**0**
1645 - 1700	0	0	39	6	1	0	1	**47**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**162**	**35**	**6**	**3**	**2**	**208**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1700 - 1715	0	0	49	13	0	1	1	**64**	0	0	0	0	0	0	0	**0**
1715 - 1730	0	0	63	8	0	0	0	**71**	0	0	0	0	0	0	0	**0**
1730 - 1745	0	0	37	2	0	0	0	**39**	0	0	0	0	0	0	0	**0**
1745 - 1800	0	0	38	4	0	0	0	**42**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**187**	**27**	**0**	**1**	**1**	**216**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800 - 1815	0	0	51	4	0	0	0	**55**	0	0	0	0	0	0	0	**0**
1815 - 1830	0	0	27	4	1	1	0	**33**	0	0	0	0	0	0	0	**0**
1830 - 1845	0	0	29	0	0	0	0	**29**	0	0	0	0	0	0	0	**0**
1845 - 1900	0	0	28	0	0	0	0	**28**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**135**	**8**	**1**	**1**	**0**	**145**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**484**	**70**	**7**	**5**	**3**	**569**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (3) Smithfield Road / A483 / B4381 / Tesco

Approach: Smithfield Road

	Left to A483 (North)								Ahead to A483 (South)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	6	2	1	0	0	9	0	0	17	2	0	0	0	19
0715 - 0730	0	0	14	2	1	1	0	18	0	0	23	5	0	0	0	28
0730 - 0745	0	0	18	2	1	0	0	21	0	0	26	4	0	0	0	30
0745 - 0800	0	0	31	6	0	1	0	38	0	0	33	14	0	0	0	47
Hourly Total	**0**	**0**	**69**	**12**	**3**	**2**	**0**	**86**	**0**	**0**	**99**	**25**	**0**	**0**	**0**	**124**
0800 - 0815	0	0	14	4	0	0	0	18	0	0	30	6	0	0	0	36
0815 - 0830	0	0	24	6	1	0	0	31	0	0	36	8	0	3	0	47
0830 - 0845	0	0	21	2	0	0	0	23	0	0	28	4	0	1	0	33
0845 - 0900	0	0	18	0	0	0	0	18	0	0	30	2	1	2	1	36
Hourly Total	**0**	**0**	**77**	**12**	**1**	**0**	**0**	**90**	**0**	**0**	**124**	**20**	**1**	**6**	**1**	**152**
0900 - 0915	0	0	23	1	1	1	0	26	0	0	25	3	0	0	0	28
0915 - 0930	0	0	15	0	0	0	0	15	0	0	23	6	1	0	0	30
0930 - 0945	0	0	13	4	0	0	0	17	0	0	28	2	0	0	0	30
0945 - 1000	0	0	16	5	0	0	0	21	0	0	17	2	1	1	0	21
Hourly Total	**0**	**0**	**67**	**10**	**1**	**1**	**0**	**79**	**0**	**0**	**93**	**13**	**2**	**1**	**0**	**109**
Session Total	**0**	**0**	**213**	**34**	**5**	**3**	**0**	**255**	**0**	**0**	**316**	**58**	**3**	**7**	**1**	**385**
1600 - 1615	0	0	35	2	0	2	0	39	0	0	54	5	2	0	0	61
1615 - 1630	0	0	34	3	0	0	0	37	0	0	61	11	2	0	0	74
1630 - 1645	0	0	23	3	0	1	0	27	0	0	49	4	0	0	0	53
1645 - 1700	0	0	31	6	0	0	0	37	0	0	54	3	0	0	0	57
Hourly Total	**0**	**0**	**123**	**14**	**0**	**3**	**0**	**140**	**0**	**0**	**218**	**23**	**4**	**0**	**0**	**245**
1700 - 1715	0	0	29	4	0	1	0	34	0	0	45	3	0	0	0	48
1715 - 1730	0	0	37	5	0	0	0	42	0	0	67	5	0	0	0	72
1730 - 1745	0	0	31	3	0	0	0	34	0	0	54	5	0	0	0	59
1745 - 1800	0	0	37	2	0	0	0	39	0	0	42	4	1	0	0	47
Hourly Total	**0**	**0**	**134**	**14**	**0**	**1**	**0**	**149**	**0**	**0**	**208**	**17**	**1**	**0**	**0**	**226**
1800 - 1815	0	0	27	4	0	0	0	31	0	0	46	1	0	0	0	47
1815 - 1830	0	0	26	0	0	0	0	26	0	0	43	4	0	0	0	47
1830 - 1845	0	0	18	5	0	0	1	24	0	0	28	1	0	0	0	29
1845 - 1900	0	0	15	0	0	0	0	15	0	0	31	0	0	0	0	31
Hourly Total	**0**	**0**	**86**	**9**	**0**	**0**	**1**	**96**	**0**	**0**	**148**	**6**	**0**	**0**	**0**	**154**
Session Total	**0**	**0**	**343**	**37**	**0**	**4**	**1**	**385**	**0**	**0**	**574**	**46**	**5**	**0**	**0**	**625**

	Right to B4381								Last Right to Tesco								U-Turn							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	12	1	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0715 - 0730	0	0	21	3	0	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0730 - 0745	0	0	29	7	1	0	0	37	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	1
0745 - 0800	0	0	55	13	0	0	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**117**	**24**	**1**	**0**	**0**	**142**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
0800 - 0815	0	0	35	8	1	0	0	44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0815 - 0830	0	0	48	9	0	0	0	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0830 - 0845	0	0	55	10	0	0	1	66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0845 - 0900	0	0	61	11	0	0	0	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Hourly Total	**0**	**0**	**199**	**38**	**1**	**0**	**1**	**239**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
0900 - 0915	0	0	32	3	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0915 - 0930	0	0	16	6	1	0	1	24	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
0930 - 0945	0	0	18	4	1	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0945 - 1000	0	0	26	4	0	0	2	32	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**92**	**17**	**2**	**0**	**3**	**114**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**408**	**79**	**4**	**0**	**4**	**495**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**3**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**
1600 - 1615	0	0	26	3	0	0	1	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1615 - 1630	0	0	38	4	0	0	0	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
1630 - 1645	0	0	36	5	0	0	0	41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1645 - 1700	0	0	33	5	2	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**133**	**17**	**2**	**0**	**1**	**153**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
1700 - 1715	0	1	19	2	0	1	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1715 - 1730	0	0	38	6	1	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1730 - 1745	0	0	26	3	0	0	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1745 - 1800	0	0	12	1	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**1**	**95**	**12**	**1**	**1**	**0**	**110**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800 - 1815	0	0	8	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1815 - 1830	0	0	13	0	0	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1830 - 1845	0	0	14	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1845 - 1900	0	0	11	0	0	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**46**	**0**	**0**	**0**	**0**	**46**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**1**	**274**	**29**	**3**	**1**	**1**	**309**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (3) Smithfield Road / A483 / B4381 / Tesco

Approach: A483 (North)

	Left to A483 (South)								Ahead to B4381							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	38	8	3	3	0	52	0	0	33	11	0	1	1	46
0715 - 0730	0	0	47	18	3	4	0	72	0	0	37	11	2	1	1	52
0730 - 0745	0	0	54	14	7	2	0	77	0	0	45	11	3	2	0	61
0745 - 0800	0	0	56	20	5	10	1	92	0	0	51	3	2	2	0	58
Hourly Total	**0**	**0**	**195**	**60**	**18**	**19**	**1**	**293**	**0**	**0**	**166**	**36**	**7**	**6**	**2**	**217**
0800 - 0815	0	0	68	18	5	11	1	103	0	0	39	15	5	1	0	60
0815 - 0830	0	0	59	12	6	7	0	84	0	0	47	7	1	0	0	55
0830 - 0845	0	0	61	14	1	12	0	88	0	0	49	10	1	1	0	61
0845 - 0900	0	1	54	17	4	5	0	81	0	0	63	8	0	2	0	73
Hourly Total	**0**	**1**	**242**	**61**	**16**	**35**	**1**	**356**	**0**	**0**	**198**	**40**	**7**	**4**	**0**	**249**
0900 - 0915	0	0	56	14	3	3	0	76	0	0	40	6	3	2	0	51
0915 - 0930	0	0	43	20	8	5	0	76	0	0	22	8	7	3	0	40
0930 - 0945	0	0	36	14	6	6	0	62	0	0	24	12	2	0	0	38
0945 - 1000	0	0	33	15	2	5	1	56	0	0	16	8	3	4	0	31
Hourly Total	**0**	**0**	**168**	**63**	**19**	**19**	**1**	**270**	**0**	**0**	**102**	**34**	**15**	**9**	**0**	**160**
Session Total	**0**	**1**	**605**	**184**	**53**	**73**	**3**	**919**	**0**	**0**	**466**	**110**	**29**	**19**	**2**	**626**
1600 - 1615	0	0	70	17	2	2	0	91	0	0	30	5	0	2	0	37
1615 - 1630	0	0	44	11	2	5	1	63	0	1	27	8	1	0	0	37
1630 - 1645	0	0	61	15	3	5	0	84	0	0	29	9	1	0	0	39
1645 - 1700	0	0	66	12	3	3	0	84	0	0	34	5	0	3	0	42
Hourly Total	**0**	**0**	**241**	**55**	**10**	**15**	**1**	**322**	**0**	**1**	**120**	**27**	**2**	**5**	**0**	**155**
1700 - 1715	0	0	79	7	0	2	0	88	0	0	39	6	1	4	1	51
1715 - 1730	0	0	71	8	1	3	0	83	0	0	32	2	1	0	0	35
1730 - 1745	0	0	70	8	0	2	0	80	0	0	34	4	0	0	0	38
1745 - 1800	0	0	61	5	0	10	0	76	0	0	44	2	0	2	0	48
Hourly Total	**0**	**0**	**281**	**28**	**1**	**17**	**0**	**327**	**0**	**0**	**149**	**14**	**2**	**6**	**1**	**172**
1800 - 1815	0	0	65	9	2	0	0	76	0	0	22	4	0	2	0	28
1815 - 1830	0	0	66	7	1	4	0	78	0	0	22	3	1	1	0	27
1830 - 1845	0	0	48	4	2	0	0	54	0	0	25	3	0	0	0	28
1845 - 1900	0	0	51	4	0	3	0	58	0	0	14	3	0	0	0	17
Hourly Total	**0**	**0**	**230**	**24**	**5**	**7**	**0**	**266**	**0**	**0**	**83**	**13**	**1**	**3**	**0**	**100**
Session Total	**0**	**0**	**752**	**107**	**16**	**39**	**1**	**915**	**0**	**1**	**352**	**54**	**5**	**14**	**1**	**427**

	Right to Tesco								Last Right to Smithfield Road								U-Turn							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	1	0	0	1	0	0	3	1	0	0	0	4	0	0	0	0	0	0	0	0
0715 - 0730	0	0	0	0	0	0	0	0	0	0	5	2	0	0	0	7	0	0	0	0	0	0	0	0
0730 - 0745	0	0	0	0	0	0	0	0	0	0	3	5	0	0	0	8	0	0	1	0	0	0	0	1
0745 - 0800	0	0	0	0	0	0	0	0	0	0	10	3	0	0	1	14	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**21**	**11**	**0**	**0**	**1**	**33**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
0800 - 0815	0	0	0	0	0	0	0	0	0	0	7	4	0	0	0	11	0	0	0	0	0	0	0	0
0815 - 0830	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	10	0	0	0	0	0	0	0	0
0830 - 0845	0	0	0	0	0	0	0	0	0	0	15	1	0	0	0	16	0	0	0	0	0	0	0	0
0845 - 0900	0	0	0	0	0	0	0	0	0	0	15	3	1	0	0	19	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**45**	**10**	**1**	**0**	**0**	**56**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0900 - 0915	0	0	0	0	0	0	0	0	0	0	11	5	1	0	0	17	0	0	0	0	0	0	0	0
0915 - 0930	0	0	0	0	0	0	0	0	0	0	13	2	2	0	0	17	0	0	0	0	0	0	0	0
0930 - 0945	0	0	0	0	0	0	0	0	0	0	8	1	1	0	0	10	0	0	0	0	0	0	0	0
0945 - 1000	0	0	0	0	0	0	0	0	0	0	18	1	1	0	0	20	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**50**	**9**	**5**	**0**	**0**	**64**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**116**	**30**	**6**	**0**	**1**	**153**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**
1600 - 1615	0	0	0	0	0	0	0	0	0	0	22	4	0	1	0	27	0	0	0	0	0	0	0	0
1615 - 1630	0	0	0	0	0	0	0	0	0	0	19	2	0	2	0	23	0	0	0	0	0	0	0	0
1630 - 1645	0	0	0	1	0	0	0	1	0	0	27	3	0	0	0	30	0	0	0	0	0	0	0	0
1645 - 1700	0	0	0	0	0	0	0	0	0	0	20	4	0	0	0	24	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**88**	**13**	**0**	**3**	**0**	**104**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1700 - 1715	0	0	0	0	0	0	0	0	0	0	26	5	0	1	0	32	0	0	0	0	0	0	0	0
1715 - 1730	0	0	0	0	0	0	0	0	0	0	21	3	0	1	0	25	0	0	0	0	0	0	0	0
1730 - 1745	0	0	0	0	0	0	0	0	0	0	28	1	0	1	0	30	0	0	0	0	0	0	0	0
1745 - 1800	0	0	0	0	0	0	0	0	0	0	31	3	0	0	0	34	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**106**	**12**	**0**	**3**	**0**	**121**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800 - 1815	0	0	0	0	0	0	0	0	0	0	18	5	1	0	0	24	0	0	0	0	0	0	0	0
1815 - 1830	0	0	0	0	0	0	0	0	0	0	18	0	0	0	1	19	0	0	0	0	0	0	0	0
1830 - 1845	0	0	0	0	0	0	0	0	0	0	21	0	0	1	0	22	0	0	0	0	0	0	0	0
1845 - 1900	0	0	0	0	0	0	0	0	0	0	21	3	0	1	0	25	0	0	0	0	0	0	0	0
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**78**	**8**	**1**	**2**	**1**	**90**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**272**	**33**	**1**	**8**	**1**	**315**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (3) Smithfield Road / A483 / B4381 / Tesco

Approach: A483 (South)

	First Left to B4381								Second Left to Tesco								Ahead to Smithfield Road								Right to A483 (North)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	4	2	1	0	0	**7**	0	0	0	0	0	0	0	**0**	0	0	11	1	0	0	0	**12**	0	0	58	8	0	1	0	**67**
0715 - 0730	0	0	9	5	0	0	0	**14**	0	0	0	0	0	0	0	**0**	0	0	8	1	1	0	0	**10**	0	0	65	11	0	2	1	**79**
0730 - 0745	0	0	14	6	0	0	0	**20**	0	0	0	0	0	0	0	**0**	0	0	11	2	0	0	0	**13**	0	0	59	6	1	4	0	**70**
0745 - 0800	0	0	25	10	1	0	0	**36**	0	0	0	0	0	0	0	**0**	0	0	18	4	0	0	1	**23**	0	0	81	11	5	0	0	**97**
Hourly Total	**0**	**0**	**52**	**23**	**2**	**0**	**0**	**77**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**48**	**8**	**1**	**0**	**1**	**58**	**0**	**0**	**263**	**36**	**6**	**7**	**1**	**313**
0800 - 0815	0	0	20	4	0	1	0	**25**	0	0	0	0	0	0	0	**0**	0	0	18	9	0	0	0	**27**	0	0	79	10	2	3	0	**94**
0815 - 0830	0	0	16	2	0	0	0	**18**	0	0	0	0	0	0	0	**0**	0	0	17	1	0	0	0	**18**	0	0	54	11	3	6	0	**74**
0830 - 0845	0	0	35	4	0	1	0	**40**	0	0	0	0	0	0	0	**0**	0	0	28	3	0	0	0	**31**	0	0	69	21	2	8	3	**103**
0845 - 0900	0	0	28	4	0	2	0	**34**	0	0	0	0	0	0	0	**0**	0	0	30	5	0	0	0	**35**	0	0	64	27	5	8	1	**105**
Hourly Total	**0**	**0**	**99**	**14**	**0**	**4**	**0**	**117**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**18**	**0**	**0**	**0**	**111**	**0**	**0**	**266**	**69**	**12**	**25**	**4**	**376**
0900 - 0915	0	0	27	3	2	1	0	**33**	0	0	0	0	0	0	0	**0**	0	0	21	1	0	0	0	**22**	0	2	42	6	0	6	1	**57**
0915 - 0930	0	0	15	2	0	1	0	**18**	0	0	0	0	0	0	0	**0**	0	0	30	4	0	0	0	**34**	0	0	42	11	3	5	0	**61**
0930 - 0945	0	0	15	3	0	0	0	**18**	0	0	0	0	0	0	0	**0**	0	0	23	4	0	0	0	**27**	0	0	46	9	6	5	0	**66**
0945 - 1000	0	0	11	2	1	0	0	**14**	0	0	0	0	0	0	0	**0**	0	0	14	2	2	0	0	**18**	0	0	48	12	5	8	0	**73**
Hourly Total	**0**	**0**	**68**	**10**	**3**	**2**	**0**	**83**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**88**	**11**	**2**	**0**	**0**	**101**	**0**	**2**	**178**	**38**	**14**	**24**	**1**	**257**
Session Total	**0**	**0**	**219**	**47**	**5**	**6**	**0**	**277**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**229**	**37**	**3**	**0**	**1**	**270**	**0**	**2**	**707**	**143**	**32**	**56**	**6**	**946**

1600 - 1615	0	0	8	3	0	1	0	**12**	0	0	0	0	0	0	0	**0**	0	0	44	4	0	0	0	**48**	0	0	65	23	2	7	2	**99**
1615 - 1630	0	1	11	7	1	2	2	**24**	0	0	0	0	0	0	0	**0**	0	0	32	2	0	0	0	**34**	0	0	60	9	2	9	1	**81**
1630 - 1645	0	0	15	2	0	0	0	**17**	0	0	0	0	0	0	0	**0**	0	0	25	5	0	1	0	**31**	0	0	63	18	1	3	0	**85**
1645 - 1700	0	0	6	5	2	0	0	**13**	0	0	0	0	0	0	0	**0**	0	0	31	3	0	0	0	**34**	0	0	69	17	0	7	0	**93**
Hourly Total	**0**	**1**	**40**	**17**	**3**	**3**	**2**	**66**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**132**	**14**	**0**	**1**	**0**	**147**	**0**	**0**	**257**	**67**	**5**	**26**	**3**	**358**
1700 - 1715	0	0	3	2	0	1	0	**6**	0	0	0	0	0	0	0	**0**	0	0	32	8	0	0	0	**40**	0	0	87	7	7	9	0	**110**
1715 - 1730	0	0	5	4	0	0	0	**9**	0	0	0	0	0	0	0	**0**	0	0	32	4	0	0	0	**36**	0	0	88	8	0	5	0	**101**
1730 - 1745	0	0	8	1	0	0	0	**9**	0	0	0	0	0	0	0	**0**	0	0	35	2	1	0	0	**38**	0	0	72	5	0	6	1	**84**
1745 - 1800	0	0	7	1	1	0	0	**9**	0	0	0	0	0	0	0	**0**	0	0	31	3	0	0	0	**34**	0	0	68	6	0	4	0	**78**
Hourly Total	**0**	**0**	**23**	**8**	**1**	**1**	**0**	**33**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**130**	**17**	**1**	**0**	**0**	**148**	**0**	**0**	**315**	**26**	**7**	**24**	**1**	**373**
1800 - 1815	0	0	4	1	0	0	0	**5**	0	0	0	0	0	0	0	**0**	0	0	26	4	0	0	0	**30**	0	0	57	6	5	3	0	**71**
1815 - 1830	0	0	5	1	0	1	0	**7**	0	0	0	0	0	0	0	**0**	0	0	37	3	0	0	0	**40**	0	0	55	7	3	2	0	**67**
1830 - 1845	0	0	4	0	0	0	0	**4**	0	0	0	0	0	0	0	**0**	0	0	14	2	0	0	0	**16**	0	0	46	4	0	1	0	**51**
1845 - 1900	0	0	8	0	0	0	0	**8**	0	0	0	0	0	0	0	**0**	0	0	16	1	0	0	0	**17**	0	0	28	3	1	1	0	**33**
Hourly Total	**0**	**0**	**21**	**2**	**0**	**1**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**93**	**10**	**0**	**0**	**0**	**103**	**0**	**0**	**186**	**20**	**9**	**7**	**0**	**222**
Session Total	**0**	**1**	**84**	**27**	**4**	**5**	**2**	**123**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**355**	**41**	**1**	**1**	**0**	**398**	**0**	**0**	**758**	**113**	**21**	**57**	**4**	**953**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (3) Smithfield Road / A483 / B4381 / Tesco

Approach: B4381

	First Left to Tesco								Second Left to Smithfield Road								Ahead to A483 (North)								Right to A483 (South)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	**0**	0	0	5	2	0	0	0	**7**	0	0	4	2	2	1	0	**9**	0	0	4	1	0	0	0	**5**
0715 - 0730	0	0	0	0	0	0	0	**0**	0	0	8	0	0	0	0	**8**	0	0	6	3	1	3	0	**13**	0	0	0	1	3	2	0	**6**
0730 - 0745	0	0	0	0	0	0	0	**0**	0	0	8	4	0	0	0	**12**	0	0	11	2	2	0	0	**15**	0	0	3	1	1	1	0	**6**
0745 - 0800	0	0	0	0	1	0	0	**1**	0	0	8	9	0	0	0	**17**	0	0	8	6	1	2	1	**18**	0	0	6	6	0	0	1	**13**
Hourly Total	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**29**	**15**	**0**	**0**	**0**	**44**	**0**	**0**	**29**	**13**	**6**	**6**	**1**	**55**	**0**	**0**	**13**	**9**	**4**	**3**	**1**	**30**
0800 - 0815	0	0	0	0	0	0	0	**0**	0	0	13	11	0	0	0	**24**	0	0	8	4	1	0	0	**13**	0	0	5	9	1	0	0	**15**
0815 - 0830	0	0	0	0	0	0	0	**0**	0	0	10	10	0	0	0	**20**	0	0	12	6	0	0	0	**18**	0	0	7	7	2	0	0	**16**
0830 - 0845	0	0	0	0	0	0	0	**0**	0	0	19	9	0	0	0	**28**	0	0	17	1	0	1	0	**19**	0	0	6	1	0	0	0	**7**
0845 - 0900	0	0	0	0	0	0	0	**0**	0	0	34	5	0	0	0	**39**	0	0	12	5	2	1	0	**20**	0	0	6	8	0	1	0	**15**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**76**	**35**	**0**	**0**	**0**	**111**	**0**	**0**	**49**	**16**	**3**	**2**	**0**	**70**	**0**	**0**	**24**	**25**	**3**	**1**	**0**	**53**
0900 - 0915	0	0	0	0	0	0	0	**0**	0	0	20	5	0	0	0	**25**	0	0	15	3	2	0	0	**20**	0	0	6	4	1	1	0	**12**
0915 - 0930	0	0	0	1	0	0	0	**1**	0	0	12	6	1	0	1	**20**	0	0	14	2	2	2	0	**20**	0	0	3	2	0	0	0	**5**
0930 - 0945	0	0	0	0	0	0	0	**0**	0	0	8	3	0	0	0	**11**	0	0	10	4	0	0	0	**14**	0	0	6	4	3	1	0	**14**
0945 - 1000	0	0	0	0	0	0	0	**0**	0	0	25	4	1	0	2	**32**	0	0	9	4	1	3	0	**17**	0	0	7	1	0	4	0	**12**
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**65**	**18**	**2**	**0**	**3**	**88**	**0**	**0**	**48**	**13**	**5**	**5**	**0**	**71**	**0**	**0**	**22**	**11**	**4**	**6**	**0**	**43**
Session Total	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**	**0**	**0**	**170**	**68**	**2**	**0**	**3**	**243**	**0**	**0**	**126**	**42**	**14**	**13**	**1**	**196**	**0**	**0**	**59**	**45**	**11**	**10**	**1**	**126**
1600 - 1615	0	0	0	0	0	0	0	**0**	0	0	28	8	0	0	0	**36**	0	0	20	1	2	0	0	**23**	0	0	10	1	0	1	0	**12**
1615 - 1630	0	0	0	0	0	0	0	**0**	0	0	32	4	0	0	0	**36**	0	0	26	3	0	0	0	**29**	0	0	20	2	0	0	0	**22**
1630 - 1645	0	0	0	0	0	0	0	**0**	0	1	44	8	0	0	0	**53**	0	0	49	1	0	1	0	**51**	0	0	26	5	0	0	0	**31**
1645 - 1700	0	0	0	0	0	0	0	**0**	0	0	37	8	0	1	0	**46**	0	0	23	4	0	0	0	**27**	0	0	18	4	1	1	0	**24**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**141**	**28**	**0**	**1**	**0**	**171**	**0**	**0**	**118**	**9**	**2**	**1**	**0**	**130**	**0**	**0**	**74**	**12**	**1**	**2**	**0**	**89**
1700 - 1715	0	0	0	0	0	0	0	**0**	0	0	83	4	0	0	0	**87**	0	0	56	3	0	0	0	**59**	0	0	37	5	0	1	0	**43**
1715 - 1730	0	0	0	0	0	0	0	**0**	0	0	46	2	0	1	0	**49**	0	0	39	3	0	0	0	**42**	0	0	13	0	0	0	0	**13**
1730 - 1745	0	0	0	0	0	0	0	**0**	0	0	46	4	0	0	0	**50**	0	0	50	2	0	0	0	**52**	0	0	26	4	0	0	0	**30**
1745 - 1800	0	0	0	0	0	0	0	**0**	0	0	16	1	0	1	0	**18**	0	0	20	1	1	0	0	**22**	0	0	6	3	0	0	0	**9**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**191**	**11**	**0**	**2**	**0**	**204**	**0**	**0**	**165**	**9**	**1**	**0**	**0**	**175**	**0**	**0**	**82**	**12**	**0**	**1**	**0**	**95**
1800 - 1815	0	0	0	0	0	0	0	**0**	0	0	23	2	0	0	0	**25**	0	0	23	1	2	0	0	**26**	0	0	8	0	0	0	0	**8**
1815 - 1830	0	0	0	0	0	0	0	**0**	0	0	14	0	0	0	0	**14**	0	0	16	1	1	0	0	**18**	0	0	4	0	0	0	0	**4**
1830 - 1845	0	0	0	0	0	0	0	**0**	0	0	9	1	0	0	0	**10**	0	0	6	3	0	0	0	**9**	0	0	5	0	0	1	0	**6**
1845 - 1900	0	0	0	0	0	0	0	**0**	0	0	12	1	0	0	0	**13**	0	0	8	1	0	0	0	**9**	0	0	5	1	0	1	0	**7**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**58**	**4**	**0**	**0**	**0**	**62**	**0**	**0**	**53**	**6**	**3**	**0**	**0**	**62**	**0**	**0**	**22**	**1**	**0**	**2**	**0**	**25**
Session Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**390**	**43**	**0**	**3**	**0**	**437**	**0**	**0**	**336**	**24**	**6**	**1**	**0**	**367**	**0**	**0**	**178**	**25**	**1**	**5**	**0**	**209**

Buttington Quarry - Manual Traffic Survey, Thursday 17th January 2019

Junction: (3) Smithfield Road / A483 / B4381 / Tesco

Approach: Tesco

	First Left to Smithfield Road								Second Left to A483 (North)							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0715 - 0730	0	0	0	0	0	0	0	**0**	0	0	1	0	0	0	0	**1**
0730 - 0745	0	0	0	0	0	0	0	**0**	0	0	0	0	0	1	0	**1**
0745 - 0800	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**
0800 - 0815	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0815 - 0830	0	0	0	1	0	0	0	**1**	0	0	0	0	0	0	0	**0**
0830 - 0845	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0845 - 0900	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0900 - 0915	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0915 - 0930	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0930 - 0945	0	0	0	1	0	0	0	**1**	0	0	0	0	0	0	0	**0**
0945 - 1000	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**
1600 - 1615	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1615 - 1630	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1630 - 1645	0	0	0	1	0	0	0	**1**	0	0	0	0	0	0	0	**0**
1645 - 1700	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1700 - 1715	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1715 - 1730	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1730 - 1745	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1745 - 1800	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800 - 1815	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1815 - 1830	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1830 - 1845	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1845 - 1900	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Right to A483 (South)								Last Right to B4381							
TIME	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL	P/CYCLE	M/CYCLE	CAR	LGV	OGV1	OGV2	BUS	TOTAL
0700 - 0715	0	0	0	0	0	0	0	**0**	0	0	0	0	1	0	0	**1**
0715 - 0730	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0730 - 0745	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0745 - 0800	0	0	0	1	0	0	0	**1**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**
0800 - 0815	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0815 - 0830	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0830 - 0845	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0845 - 0900	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0900 - 0915	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0915 - 0930	0	0	0	0	0	0	0	**0**	0	0	0	1	0	0	0	**1**
0930 - 0945	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
0945 - 1000	0	0	0	0	0	0	0	**0**	0	0	0	0	1	0	0	**1**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**2**
Session Total	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	**3**
1600 - 1615	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1615 - 1630	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1630 - 1645	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1645 - 1700	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1700 - 1715	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1715 - 1730	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1730 - 1745	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1745 - 1800	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1800 - 1815	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1815 - 1830	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1830 - 1845	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
1845 - 1900	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	**0**
Hourly Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Session Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A458, Buttington Quarry, ATC

Site No. 467501 **Site Ref.** 467501

A458

Vehicle Count Report **Week Begin: 14 January 2019** **Channel:** Southbound

	Mon Jan 14	Tue Jan 15	Wed Jan 16	Thu Jan 17	Fri Jan 18	Sat Jan 19	Sun Jan 20	5-Day Ave.	7-Day Ave.
00:00	14	13	17	10	22	25	23	15	18
01:00	11	8	3	13	7	9	19	8	10
02:00	0	3	4	10	8	9	11	5	6
03:00	14	13	12	20	18	19	13	15	16
04:00	24	27	30	23	33	13	6	27	22
05:00	48	70	61	64	74	35	6	63	51
06:00	116	106	112	100	111	32	15	109	85
07:00	258	264	243	265	288	88	19	264	204
08:00	368	386	322	398	389	140	44	373	292
09:00	229	254	230	264	229	160	90	241	208
10:00	180	245	223	286	227	188	144	232	213
11:00	211	214	210	264	213	227	185	222	218
12:00	270	194	217	220	253	176	195	231	218
13:00	237	189	235	244	231	169	186	227	213
14:00	230	180	252	280	263	217	192	241	231
15:00	255	237	279	316	363	237	208	290	271
16:00	275	273	300	350	286	238	249	297	282
17:00	304	299	292	333	297	242	188	305	279
18:00	188	203	181	261	253	163	134	217	198
19:00	112	109	126	154	164	130	107	133	129
20:00	74	94	110	99	131	88	79	102	96
21:00	70	60	77	93	108	60	51	82	74
22:00	30	46	52	51	54	56	49	47	48
23:00	29	31	34	38	41	39	9	35	32
Total									
12H(7-19)	3005	2938	2984	3481	3292	2245	1834	3140	2826
16H(6-22)	3377	3307	3409	3927	3806	2555	2086	3565	3210
18H(6-24)	3436	3384	3495	4016	3901	2650	2144	3646	3289
24H(0-24)	3547	3518	3622	4156	4063	2760	2222	3781	3413
AM Peak	08:00	08:00	08:00	08:00	08:00	11:00	11:00	08:00	08:00
	368	386	322	398	389	227	185	373	292
PM Peak	17:00	17:00	16:00	16:00	15:00	17:00	16:00	17:00	16:00
	304	299	300	350	363	242	249	305	282

PCC Traffic Information Consultancy Ltd.

Site No. **467501** **Site Ref.** **467501**

A458

Vehicle Count Report **Week Begin: 14 January 2019** **Channel: Northbound**

	Mon Jan 14	Tue Jan 15	Wed Jan 16	Thu Jan 17	Fri Jan 18	Sat Jan 19	Sun Jan 20	5-Day Ave.	7-Day Ave.
00:00	12	10	11	17	17	15	26	13	15
01:00	6	8	11	4	8	10	27	7	11
02:00	8	7	1	8	6	8	13	6	7
03:00	18	9	8	7	11	6	8	11	10
04:00	59	31	34	37	21	12	6	36	29
05:00	71	58	47	70	48	18	12	59	46
06:00	134	140	137	135	127	48	32	135	108
07:00	287	288	229	281	243	99	47	266	211
08:00	279	316	354	315	291	147	57	311	251
09:00	223	221	240	236	252	203	122	234	214
10:00	222	236	264	243	239	287	250	241	249
11:00	238	239	266	258	244	307	334	249	269
12:00	269	243	229	263	304	268	310	262	269
13:00	260	243	236	277	291	328	352	261	284
14:00	314	289	247	281	343	283	307	295	295
15:00	313	299	278	312	320	264	286	304	296
16:00	276	292	291	336	231	255	269	285	279
17:00	363	367	356	348	285	189	231	344	306
18:00	201	204	256	222	216	185	185	220	210
19:00	117	125	127	146	145	110	119	132	127
20:00	51	59	73	100	73	77	87	71	74
21:00	47	49	47	66	56	42	56	53	52
22:00	39	44	55	45	41	34	20	45	40
23:00	26	19	16	22	25	25	10	22	20
Total									
12H(7-19)	3245	3237	3246	3372	3259	2815	2750	3272	3132
16H(6-22)	3594	3610	3630	3819	3660	3092	3044	3663	3493
18H(6-24)	3659	3673	3701	3886	3726	3151	3074	3729	3553
24H(0-24)	3833	3796	3813	4029	3837	3220	3166	3862	3671
AM Peak	07:00	08:00	08:00	08:00	08:00	11:00	11:00	08:00	11:00
	287	316	354	315	291	307	334	311	269
PM Peak	17:00	17:00	17:00	17:00	14:00	13:00	13:00	17:00	17:00
	363	367	356	348	343	328	352	344	306

PCC Traffic Information Consultancy Ltd.

Site No. **467501** **Site Ref.** **467501**

A458

Vehicle Count Report **Week Begin: 14 January 2019** **Channel: Total Flow**

	Mon Jan 14	Tue Jan 15	Wed Jan 16	Thu Jan 17	Fri Jan 18	Sat Jan 19	Sun Jan 20	5-Day Ave.	7-Day Ave.
00:00	26	23	28	27	39	40	49	29	33
01:00	17	16	14	17	15	19	46	16	21
02:00	8	10	5	18	14	17	24	11	14
03:00	32	22	20	27	29	25	21	26	25
04:00	83	58	64	60	54	25	12	64	51
05:00	119	128	108	134	122	53	18	122	97
06:00	250	246	249	235	238	80	47	244	192
07:00	545	552	472	546	531	187	66	529	414
08:00	647	702	676	713	680	287	101	684	544
09:00	452	475	470	500	481	363	212	476	422
10:00	402	481	487	529	466	475	394	473	462
11:00	449	453	476	522	457	534	519	471	487
12:00	539	437	446	483	557	444	505	492	487
13:00	497	432	471	521	522	497	538	489	497
14:00	544	469	499	561	606	500	499	536	525
15:00	568	536	557	628	683	501	494	594	567
16:00	551	565	591	686	517	493	518	582	560
17:00	667	666	648	681	582	431	419	649	585
18:00	389	407	437	483	469	348	319	437	407
19:00	229	234	253	300	309	240	226	265	256
20:00	125	153	183	199	204	165	166	173	171
21:00	117	109	124	159	164	102	107	135	126
22:00	69	90	107	96	95	90	69	91	88
23:00	55	50	50	60	66	64	19	56	52
Total									
12H(7-19)	6250	6175	6230	6853	6551	5060	4584	6412	5958
16H(6-22)	6971	6917	7039	7746	7466	5647	5130	7228	6702
18H(6-24)	7095	7057	7196	7902	7627	5801	5218	7375	6842
24H(0-24)	7380	7314	7435	8185	7900	5980	5388	7643	7083
AM Peak	08:00	08:00	08:00	08:00	08:00	11:00	11:00	08:00	08:00
	647	702	676	713	680	534	519	684	544
PM Peak	17:00	17:00	17:00	16:00	15:00	15:00	13:00	17:00	17:00
	667	666	648	686	683	501	538	649	585

PCC Traffic Information Consultancy Ltd.

A458, Buttington Quarry, ATC

Site No. 467501 **Site Ref.** 467501
A458
Speed Report (Speed Limit 60 Mph) **Week Begin: 14 January 2019** **Channel:** Southbound

	Total Volume	85th Percentile	Mean Average	Standard Deviation	Bin 1 <20Mph	Bin 2 20-<25	Bin 3 25-<30	Bin 4 30-<35	Bin 5 35-<40	Bin 6 40-<45	Bin 7 45-<50	Bin 8 50-<55	Bin 9 55-<60	Bin 10 60-<65	Bin 11 65-<70	Bin 12 70-<75	Bin 13 =>75
Mon 14 Jan	3547	48	43	6	22	20	30	114	756	1575	806	175	40	7	2	0	0
Tue 15 Jan	3518	48	42	6	16	30	32	142	794	1479	808	176	25	13	3	0	0
Wed 16 Jan	3622	48	42	6	26	33	62	134	756	1527	851	170	53	8	1	1	0
Thu 17 Jan	4156	48	42	6	33	41	48	131	932	1754	926	235	44	9	2	1	0
Fri 18 Jan	4063	48	42	6	27	41	35	151	922	1810	804	199	59	12	2	1	0
Sat 19 Jan	2760	50	45	5	2	19	16	17	279	1179	914	264	49	17	4	0	0
Sun 20 Jan	2222	50	45	6	5	4	20	38	267	877	657	277	61	10	4	2	0
5 Day Ave.	3781	48	42	6	25	33	41	134	832	1629	839	191	44	10	2	1	0
7 Day Ave.	3413	49	43	6	19	27	35	104	672	1457	824	214	47	11	3	1	0

PCC Traffic Information Consultancy Ltd.

Site No. 467501 **Site Ref.** 467501
A458
Speed Report (Speed Limit 60 Mph) **Week Begin: 14 January 2019** **Channel:** Northbound

	Total Volume	85th Percentile	Mean Average	Standard Deviation	Bin 1 <20Mph	Bin 2 20-<25	Bin 3 25-<30	Bin 4 30-<35	Bin 5 35-<40	Bin 6 40-<45	Bin 7 45-<50	Bin 8 50-<55	Bin 9 55-<60	Bin 10 60-<65	Bin 11 65-<70	Bin 12 70-<75	Bin 13 =>75
Mon 14 Jan	3833	52	46	6	10	15	24	92	370	1331	1257	502	166	46	11	7	2
Tue 15 Jan	3796	51	45	6	9	10	37	89	438	1311	1244	445	149	41	20	1	2
Wed 16 Jan	3813	51	45	6	22	28	57	110	448	1216	1259	478	142	41	8	3	1
Thu 17 Jan	4029	52	45	7	16	18	55	117	430	1257	1323	567	163	59	19	5	0
Fri 18 Jan	3837	52	45	6	18	14	46	87	423	1289	1206	534	144	46	23	5	2
Sat 19 Jan	3220	53	47	6	4	8	7	32	182	853	1239	601	209	57	23	5	0
Sun 20 Jan	3166	53	46	7	73	18	30	49	202	822	1128	541	207	66	22	6	2
5 Day Ave.	3862	52	45	6	15	17	44	99	422	1281	1258	505	153	47	16	4	1
7 Day Ave.	3671	52	46	6	22	16	37	82	356	1154	1237	524	169	51	18	5	1

PCC Traffic Information Consultancy Ltd.

Site No. 467501 **Site Ref.** 467501

A458

Speed Report (Speed Limit 60 Mph) **Week Begin: 14 January 2019** **Channel: Total Flow**

	Total Volume	85th Percentile	Mean Average	Standard Deviation	Bin 1 <20Mph	Bin 2 20-<25	Bin 3 25-<30	Bin 4 30-<35	Bin 5 35-<40	Bin 6 40-<45	Bin 7 45-<50	Bin 8 50-<55	Bin 9 55-<60	Bin 10 60-<65	Bin 11 65-<70	Bin 12 70-<75	Bin 13 =>75
Mon 14 Jan	7380	50	44	6	32	35	54	206	1126	2906	2063	677	206	53	13	7	2
Tue 15 Jan	7314	49	44	6	25	40	69	231	1232	2790	2052	621	174	54	23	1	2
Wed 16 Jan	7435	50	44	6	48	61	119	244	1204	2743	2110	648	195	49	9	4	1
Thu 17 Jan	8185	50	44	6	49	59	103	248	1362	3011	2249	802	207	68	21	6	0
Fri 18 Jan	7900	50	44	6	45	55	81	238	1345	3099	2010	733	203	58	25	6	2
Sat 19 Jan	5980	52	46	6	6	27	23	49	461	2032	2153	865	258	74	27	5	0
Sun 20 Jan	5388	52	46	7	78	22	50	87	469	1699	1785	818	268	76	26	8	2
5 Day Ave.	7643	50	44	6	40	50	85	233	1254	2910	2097	696	197	56	18	5	1
7 Day Ave.	7083	50	44	6	40	43	71	186	1028	2611	2060	738	216	62	21	5	1

PCC Traffic Information Consultancy Ltd.

APPENDIX G

LIST OF COMMITTED DEVELOPMENTS

Buttington - Cumulative Impacts Assessment – Potentially Relevant Planning Permission 08/02/2018

Notes:

1. Includes permissions going back three years to 2016 and in some cases older consents where these may still be valid;
2. The following excludes all discharge of conditions applications, NMAs, reserve matters applications, householder applications, single dwelling houses and other minor development or minor alterations to non-residential properties;
3. As PCC have no geographical based search facility on their public access there cannot be absolute certainty that the following list is complete;
4. The development status of the sites listed below is not known, i.e. whether the planning permissions have been implemented.

Reference	Details	Approval Date
M/1997/0088 (M96088)	Proposed Quarry Extension Area at Buttington Quarry, Buttington, Welshpool	14/04/1997
M/1997/0088	'A Mineral Review' which came into force as part of *The Environment Act 1995* aimed at keeping planning conditions from older mineral permissions up to date, Buttington Quarry, Buttington, Welshpool	14/04/1997
M/1999/1032	Construction of vehicular access to quarry and alteration of existing access to residential access, Buttington Quarry, Buttington, Welshpool	05/01/2001
M/2004/0439	Variation of condition 17 attached to planning permission M/96/088 to request an extension of time limit, Buttington Quarry, Buttington, Welshpool	26/07/2004
P/2005/0162	Renewal of Planning Permission for the Construction of vehicular access to quarry and alteration of existing access to residential access, Buttington Quarry, Buttington, Welshpool	06/05/2005
P/2008/0519	Section 73 application to vary condition 1 attached to planning permission M/2004/0439 to request an extension of time limit, Buttington Quarry, Buttington, Welshpool	07/01/2009
P/2010/0165	Section 73 application to vary condition 7 attached to Planning Permission M/1997/0088 to request a variation to hours of working at Buttington Quarry, Buttington, Welshpool	19/04/2011
P/2010/0400	Section 73 application to vary condition 1 attached to planning permission M/2005/0162 (Construction of vehicular access to quarry and alteration of existing access	28/12/2007

Reference	Details	Approval Date
	to residential access) – Extension of Time Limit, Buttington Quarry, Buttington, Welshpool	
P/2011/0402	Residential development, formation of road infrastructure and associated works together with provision of amenity / play areas, Land Off Red Bank Between Adeilade Drive (West) And Brynfa Avenue (East), Welshpool	23/02/2012
P/2011/0549	Variation of planning approval P/2008/0519 to extend the time limit for extraction of material for a period of 4 years from 31 May 2011 at Buttington Quarry, Buttington, Welshpool	28/06/2011
P/2012/0815	Application for Certificate of Lawful Use or Development for existing uses namely A1, B1, B2 and B8 at Buttington Quarry, Buttington, Welshpool	05/11/2012
P/2012/1445	Application for Certificate of Lawful Use or Development for an existing use namely use of land for overflow storage area to the decorative stone business, Buttington Quarry, Buttington, Welshpool	11/09/2012
P/2013/0713	Proposed erection of a general-purpose storage building at Border harcore and Rockery Stone Co. Ltd, Buttington Quarry, Buttington, Welshpool	07/10/2013
P/2014/1318	Section 73 application to vary condition 1 attached to planning permission P/2011/0549 to extend the time limit for extraction of material to 31st May 2020 at Land at Buttington Quarry, Buttington, Welshpool	06/08/2015
P/2015/0127	Full: Extension to factory to provide additional casting shop space, creation of new car park facility and utilization of existing access | 1 Fisher Road Offa's Dyke Business Park Welshpool. Powys. SY21 8JF	22/04/2015
P/2015/0144	Outline: Erection of 8 no. semi-detached dwelling houses, formation of vehicular access and all associated works, Land on Site of Former Little Chef, Buttington, Welshpool, Powys. SY21 8SZ	08/05/2017
P/2015/0439	Section 73 application to vary condition no.1 attached to planning permission P/2010/0400 in order to allow an extension of time to commence development namely construction of vehicular access and alteration of existing access to residential access, Buttington Quarry, Buttington, Welshpool, Powys, SY21 8SZ	18/06/2015
P/2015/0748	Erection a new building comprising single storey manufacturing space with two storey office accommodation and all associated works, Plot at Offas Dyke Business Park Fisher Road, Buttington, Welshpool, Powys, SY21 8JF	09/11/2015

Reference	Details	Approval Date
P/2015/1262	Erection of a building for storage and distribution (class B8 use) with 3 storey office accommodation, erection of an electricity substation building and all associated works, Land Off Fisher Road Offa's Dyke Business Park Welshpool, Powys, SY21 8JF	18/02/2016
P/2016/0357	Erection of manufacturing building and associated works, Offas Dyke Business Park Fisher Road, Buttington, Welshpool, SY21 8JF	26/05/2016
P/2016/0521	Erection of new foodstore and access with associated car parking and landscaping, Welshpool Livestock Market Land Off Mill Lane, Welshpool, Powys	22/07/2016
P/2016/0637	Construction of a petrol filling station and convenience store with offices above, car wash building, new vehicular access and all associated works, Land at Buttington Cross Enterprise Park Buttington Welshpool SY21 8SL	05/10/2016
P/2016/0953	Application for outline planning permission for a residential development and formation of new access with some matters reserved, Land North Of Heritage Green Heritage Green Ffordun Welshpool, Powys, SY21 8LH	20/07/2017
P/2016/1240	Extension to existing gypsy and traveller site to incorporate two additional pitches, an amenity building and parking together with the relocation of an existing field access, Leighton Arches Gypsy and Traveller Site, Leighton, Welshpool, SY21 8	22/02/2017
P/2017/0005	Outline development of 3 dwellings and associated shared vehicular access, Bronwylfa House, Maesowen, Welshpool, Powys, SY21 7RD	28/02/2017
P/2017/0010	Outline: Residential development of up to 25 dwellings, construction of vehicular access and attenuation pond, Land Adjoining The Fron, Middletown, Welshpool, Powys, SY21 8EN	04/04/2018
P/2017/0063	Erection of 2x holiday lets, Under Moorwood, Leighton, Welshpool, Powys, SY21 8LN	15/02/2108
P/2017/0161	Erection of a building for warehouse use (class B8), Technocover Ltd Unit C Henfaes Lane, Welshpool, Powys, SY21 7BE	30/03/2017
P/2017/0324	Erection of an extension to factory, D Sidoli & Sons Ltd Henfaes Lane, Welshpool, Powys, SY21 7BE	10/05/2017
P/2017/0501	Erection of 8 no. bungalows and 1 no. staff accommodation unit together with formation of vehicular access and roadway, parking and all associated works, Land at Foundry Lane, Welshpool, Powys, SY21 7TR	29/01/2018
P/2017/0574	Outline application for residential development for up to 9 dwellings, garages, improvement to vehicular access, demolition of existing buildings and all associated works | Land At Gate Farm, Criggion Lane, Trewern, Welshpool Powys, SY21 8DU	17/09/2017

Reference	Details	Approval Date
P/2017/0789	Outline: Erection of up to 3 no. dwellings and garages, formation of vehicular access, access road and all associated works (with some matters reserved), Land Adjoining Swan Bank, Pool Quay, Welshpool, Powys, SY21 9JS	15/03/2018
P/2017/1008	Full: Erection of a solar photovoltaic array, The Dingle Old, Mills Hill, Trewern, Welshpool, Powys, SY21 8ET	30/11/2017
P/2017/1158	Demolition of building and erection of 33 lock up self-storage units and 36 car parking spaces, Former Wynnstay, Store Station Yard, Severn Road, Welshpool, SY21 7AZ	14/12/2107
P/2017/1190	Outline: Residential Development of up to 5 dwellings, formation of vehicular access and associated works (Some matters reserved), Gate Farm, Criggion, Lane Trewern, Welshpool, Powys, SY21 8DU	Pending
P/2017/1346	Erection of extension to the existing poultry unit to accommodate a further 16000 birds (egg production, erection of feed silos and all other associated works, Pen-Y-Derw Forden, Welshpool, Powys, SY21 8NH	19/07/2018
P/2017/1348	Demolition of existing building and erection of 17 no. flats, Welshpool Social Club, Bronybuckley, Welshpool, Powys, SY21 7NJ	13/03/2018
18/0111/FUL	Erection of a residential unit comprising 2 no. apartments and all associated works, Land Rear Of 34 High Street, Welshpool, Powys, SY21 7AA	Pending
18/0190/OUT	Outline Erection of 4 dwellings, formation of vehicular access and all associated works, Land Adjacent West of Penyfoel, Middletown, Newtown, Powys, SY21 8DG	Pending
P/2018/0225	Erection of 2 dwellings and all associated works, Land at Bryn Tirion, Sale Lane, Trewern, Welshpool, Powys, SY21 8SY	07/06/2018
P/2018/0272	Erection of 54 dwellings, formation of access roads and all associated works, Land adj Gallowstree Bank, Gungrog Farm, Welshpool, Powys, SY21 7HF	17/09/2018
P/2018/0330	Erection of 3 no. dwelling houses, formation of new vehicular access including partial demolition / alterations of existing stone wall together with construction of new 1.8m high boundary wall and all associated works, Land Adjoining Ivy House, Middletown, Welshpool, Powys, SY21 8EL	06/07/2018
18/0471/OUT	Residential development and all associated works, Land at The Wallers, Buttington, Welshpool, Powys, SY21 8SZ	Pending
P/2018/0337	Construction of 360 place English Medium Primary School and 55 place Early Years Nursery with new dedicated vehicular access works, ancillary car parking, landscaping, recreational space and associated infrastructure works, Land at Salop Road, Welshpool, Powys	06/07/2018

Reference	Details	Approval Date
18/0471/OUT	Outline Residential development and all associated works, Land At The Wallers, Buttington, Welshpool, Powys, SY21 8SZ	Pending
P/2018/0474	Erection of a free-range egg production unit including silos and all associated works, Land Near Mulsop Farm, Trelystan, Leighton, Welshpool, Powys, SY21 8JA	Pending
P/2018/0486	Change of use of agricultural building to a lunch shoot building and installation of a septic tank, Agricultural Building Leighton House Estate, Leighton, Welshpool, Powys, SY21 8HX	Pending
18/0599/FUL	Erection of 9 dwelling houses (1 no. detached and 8 no. semi-detached), formation of vehicular access road and all associated works, Land East of Golfa Close, Middletown, Welshpool, Powys, SY21 8EZ	Pending
18/0837/FUL	Change of use from residential (C3) to veterinary practice and creation of new hardstanding, Nant Y Coed Buttington Welshpool Powys SY21 8HH	Pending

APPENDIX H

TRICS PRINTOUTS

Calculation Reference: AUDIT-731001-190321-0303

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : A - HOUSES PRIVATELY OWNED
VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	ES	EAST SUSSEX	1 days
03	SOUTH WEST		
	DC	DORSET	1 days
	SM	SOMERSET	1 days
04	EAST ANGLIA		
	NF	NORFOLK	1 days
	SF	SUFFOLK	1 days
05	EAST MIDLANDS		
	DS	DERBYSHIRE	1 days
	LE	LEICESTERSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	2 days
	ST	STAFFORDSHIRE	1 days
	WK	WARWICKSHIRE	1 days
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	1 days
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
	GM	GREATER MANCHESTER	2 days
	LC	LANCASHIRE	2 days
09	NORTH		
	CB	CUMBRIA	1 days
10	WALES		
	VG	VALE OF GLAMORGAN	1 days
11	SCOTLAND		
	EA	EAST AYRSHIRE	1 days
	HI	HIGHLAND	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary 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: Number of dwellings
Actual Range: 9 to 54 (units:)
Range Selected by User: 5 to 70 (units:)

Parking Spaces Range: Selected: 12 to 1726 Actual: 12 to 1726

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 05/05/87 to 20/11/18

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	5 days
Tuesday	3 days
Wednesday	6 days
Thursday	8 days
Friday	2 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	24 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:
Edge of Town 20

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:

Residential Zone	24

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.

Secondary Filtering selection:

Use Class:

C1	1 days
C3	23 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

1,001 to 5,000	2 days
5,001 to 10,000	4 days
10,001 to 15,000	8 days
15,001 to 20,000	3 days
20,001 to 25,000	2 days
25,001 to 50,000	4 days
50,001 to 100,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	1 days
25,001 to 50,000	3 days
50,001 to 75,000	3 days
75,001 to 100,000	7 days
100,001 to 125,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	4 days
500,001 or More	2 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	8 days
1.1 to 1.5	16 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:

Not Known	1 days
Yes	1 days
No	22 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	24 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 CB-03-A-03 SEMI DETACHED CUMBRIA
HAWKSHEAD AVENUE
WORKINGTON

Edge of Town
Residential Zone
Total Number of dwellings: 40
Survey date: THURSDAY 20/11/08 Survey Type: MANUAL

2 CH-03-A-05 DETACHED CHESHIRE
SYDNEY ROAD
CREWE
SYDNEY
Edge of Town
Residential Zone
Total Number of dwellings: 17
Survey date: TUESDAY 14/10/08 Survey Type: MANUAL

3 CH-03-A-09 TERRACED HOUSES CHESHIRE
GREYSTOKE ROAD
MACCLESFIELD
HURDSFIELD
Edge of Town
Residential Zone
Total Number of dwellings: 24
Survey date: MONDAY 24/11/14 Survey Type: MANUAL

4 DC-03-A-08 BUNGALOWS DORSET
HURSTDENE ROAD
BOURNEMOUTH
CASTLE LANE WEST
Edge of Town
Residential Zone
Total Number of dwellings: 28
Survey date: MONDAY 24/03/14 Survey Type: MANUAL

5 DS-03-A-01 SEMI D./TERRACED DERBYSHIRE
THE AVENUE
DRONFIELD
HOLMESDALE
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 20
Survey date: THURSDAY 22/06/06 Survey Type: MANUAL

6 EA-03-A-01 DETATCHED EAST AYRSHIRE
TALISKER AVENUE
KILMARNOCK

Edge of Town
Residential Zone
Total Number of dwellings: 39
Survey date: THURSDAY 05/06/08 Survey Type: MANUAL

7 ES-03-A-02 PRIVATE HOUSING EAST SUSSEX
SOUTH COAST ROAD
PEACEHAVEN

Edge of Town
Residential Zone
Total Number of dwellings: 37
Survey date: FRIDAY 18/11/11 Survey Type: MANUAL

8 GM-03-A-10 DETACHED/SEMI GREATER MANCHESTER
BUTT HILL DRIVE
MANCHESTER
PRESTWICH
Edge of Town
Residential Zone
Total Number of dwellings: 29
Survey date: WEDNESDAY 12/10/11 Survey Type: MANUAL

9 GM-03-A-11 TERRACED & SEMI-DETACHED GREATER MANCHESTER
RUSHFORD STREET
MANCHESTER
LEVENSHULME
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 37
Survey date: MONDAY 26/09/16 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

10 HI-03-A-13 HOUSING HIGHLAND
KINGSMILLS ROAD
INVERNESS

Edge of Town
Residential Zone
Total Number of dwellings: 9
Survey date: THURSDAY 21/05/09 Survey Type: MANUAL

11 LC-03-A-08 DETACHED LANCASHIRE
PRESTON ROAD
LONGRIDGE

Edge of Town
Residential Zone
Total Number of dwellings: 47
Survey date: TUESDAY 12/07/94 Survey Type: MANUAL

12 LC-03-A-31 DETACHED HOUSES LANCASHIRE
GREENSIDE
PRESTON
COTTAM
Edge of Town
Residential Zone
Total Number of dwellings: 32
Survey date: FRIDAY 17/11/17 Survey Type: MANUAL

13 LE-03-A-01 DETACHED LEICESTERSHIRE
REDWOOD AVENUE
MELTON MOWBRAY

Edge of Town
Residential Zone
Total Number of dwellings: 11
Survey date: TUESDAY 03/05/05 Survey Type: MANUAL

14 NF-03-A-03 DETACHED HOUSES NORFOLK
HALING WAY
THETFORD

Edge of Town
Residential Zone
Total Number of dwellings: 10
Survey date: WEDNESDAY 16/09/15 Survey Type: MANUAL

15 NY-03-A-11 PRIVATE HOUSING NORTH YORKSHIRE
HORSEFAIR
BOROUGHBRIDGE

Edge of Town
Residential Zone
Total Number of dwellings: 23
Survey date: WEDNESDAY 18/09/13 Survey Type: MANUAL

16 SF-03-A-05 DETACHED HOUSES SUFFOLK
VALE LANE
BURY ST EDMUNDS

Edge of Town
Residential Zone
Total Number of dwellings: 18
Survey date: WEDNESDAY 09/09/15 Survey Type: MANUAL

17 SH-03-A-05 SEMI-DETACHED/TERRACED SHROPSHIRE
SANDCROFT
TELFORD
SUTTON HILL
Edge of Town
Residential Zone
Total Number of dwellings: 54
Survey date: THURSDAY 24/10/13 Survey Type: MANUAL

18 SH-03-A-06 BUNGALOWS SHROPSHIRE
ELLESMERE ROAD
SHREWSBURY

Edge of Town
Residential Zone
Total Number of dwellings: 16
Survey date: THURSDAY 22/05/14 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

19 SM-03-A-01 DETACHED & SEMI SOMERSET
WEMBDON ROAD
BRIDGWATER
NORTHFIELD
Edge of Town
Residential Zone
Total Number of dwellings: 33
Survey date: THURSDAY 24/09/15 Survey Type: MANUAL

20 ST-03-A-08 DETACHED HOUSES STAFFORDSHIRE
SILKMORE CRESCENT
STAFFORD
MEADOWCROFT PARK
Edge of Town
Residential Zone
Total Number of dwellings: 26
Survey date: WEDNESDAY 22/11/17 Survey Type: MANUAL

21 VG-03-A-01 SEMI-DETACHED & TERRACED VALE OF GLAMORGAN
ARTHUR STREET
BARRY

Edge of Town
Residential Zone
Total Number of dwellings: 12
Survey date: MONDAY 08/05/17 Survey Type: MANUAL

22 WK-03-A-02 BUNGALOWS WARWICKSHIRE
NARBERTH WAY
COVENTRY
POTTERS GREEN
Edge of Town
Residential Zone
Total Number of dwellings: 17
Survey date: THURSDAY 17/10/13 Survey Type: MANUAL

23 WM-03-A-04 TERRACED HOUSES WEST MIDLANDS
OSBORNE ROAD
COVENTRY
EARLSDON
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 39
Survey date: MONDAY 21/11/16 Survey Type: MANUAL

24 WY-03-A-01 MIXED HOUSING WEST YORKSHIRE
SPRING VALLEY CRESCENT
LEEDS
BRAMLEY
Neighbourhood Centre (PPS6 Local Centre)
Residential Zone
Total Number of dwellings: 46
Survey date: WEDNESDAY 21/09/16 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 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	24	28	0.081	24	28	0.255	24	28	0.336
08:00 - 09:00	24	28	0.167	24	28	0.383	24	28	0.550
09:00 - 10:00	24	28	0.137	24	28	0.203	24	28	0.340
10:00 - 11:00	24	28	0.140	24	28	0.142	24	28	0.282
11:00 - 12:00	24	28	0.185	24	28	0.178	24	28	0.363
12:00 - 13:00	24	28	0.152	24	28	0.149	24	28	0.301
13:00 - 14:00	24	28	0.161	24	28	0.154	24	28	0.315
14:00 - 15:00	24	28	0.187	24	28	0.167	24	28	0.354
15:00 - 16:00	24	28	0.250	24	28	0.205	24	28	0.455
16:00 - 17:00	24	28	0.306	24	28	0.152	24	28	0.458
17:00 - 18:00	24	28	0.330	24	28	0.142	24	28	0.472
18:00 - 19:00	24	28	0.226	24	28	0.148	24	28	0.374
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.322			2.278			4.600

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.*

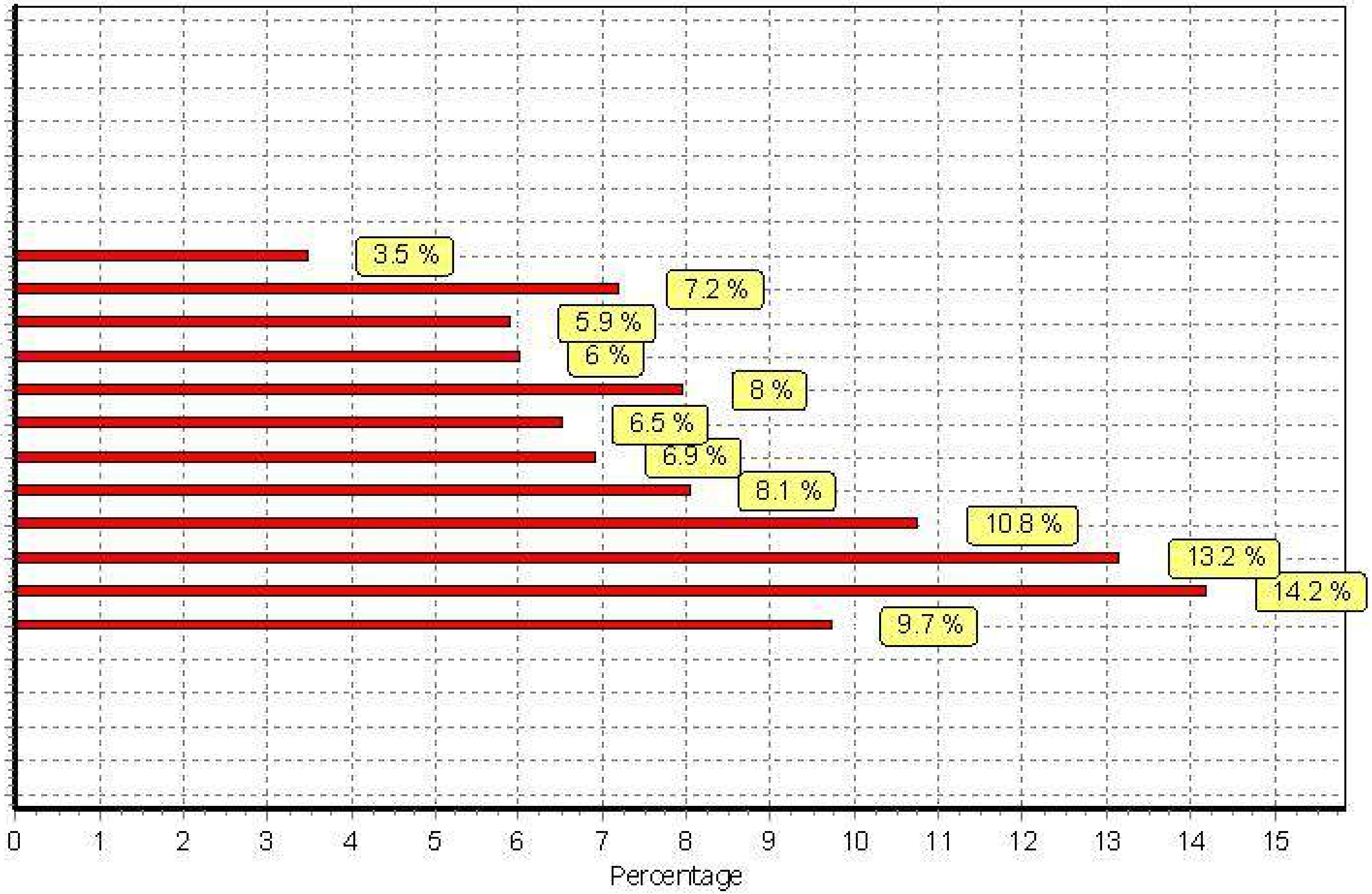
Parameter summary

Trip rate parameter range selected:	9 - 54 (units:)
Survey date date range:	05/05/87 - 20/11/18
Number of weekdays (Monday-Friday):	24
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	1
Surveys manually removed from selection:	0

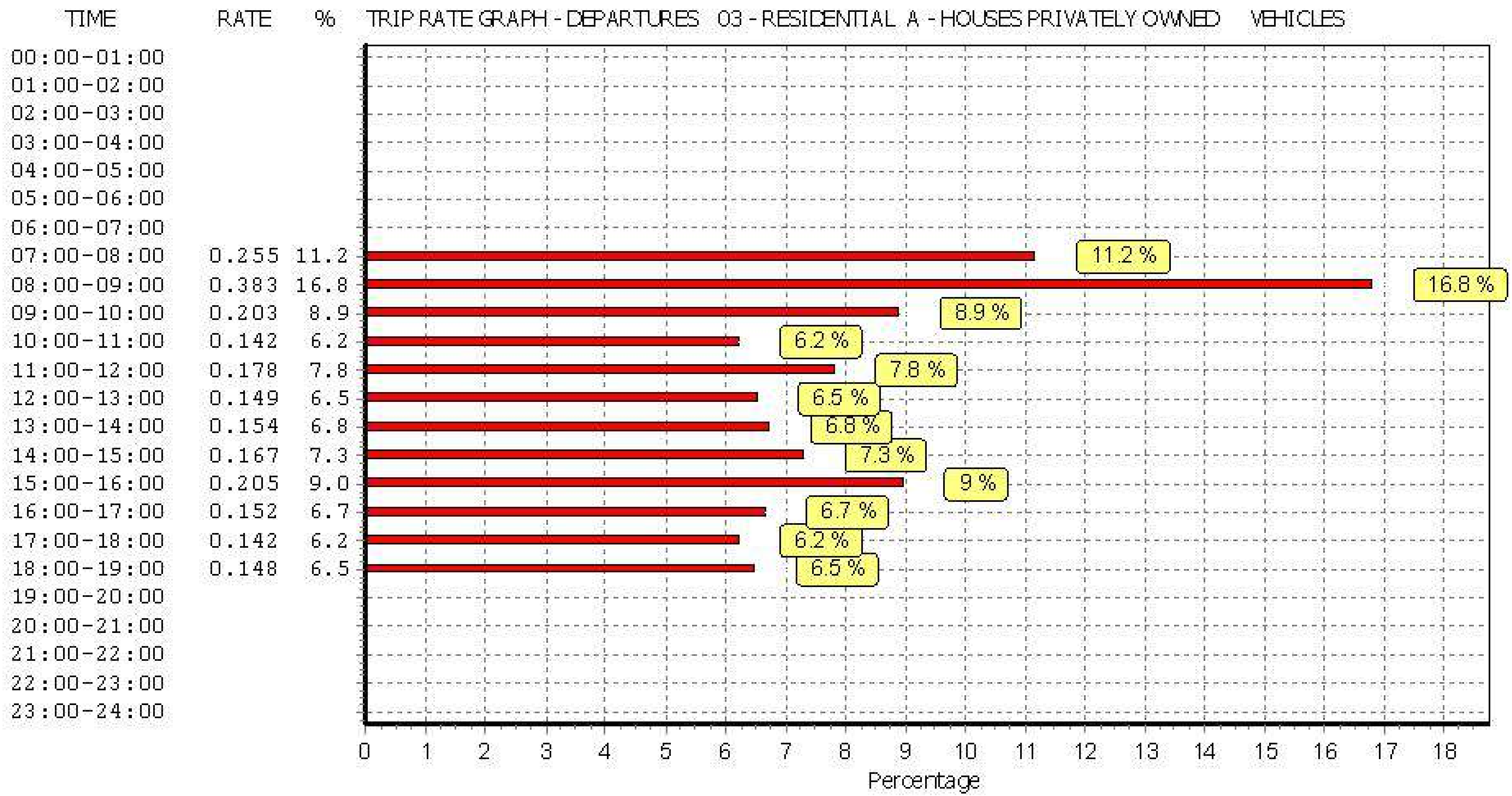
This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected 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 GRAPH - ARRIVALS 03 - RESIDENTIAL A - HOUSES PRIVATELY OWNED VEHICLES

TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.081	3.5
08:00-09:00	0.167	7.2
09:00-10:00	0.137	5.9
10:00-11:00	0.140	6.0
11:00-12:00	0.185	8.0
12:00-13:00	0.152	6.5
13:00-14:00	0.161	6.9
14:00-15:00	0.187	8.1
15:00-16:00	0.250	10.8
16:00-17:00	0.306	13.2
17:00-18:00	0.330	14.2
18:00-19:00	0.226	9.7
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		

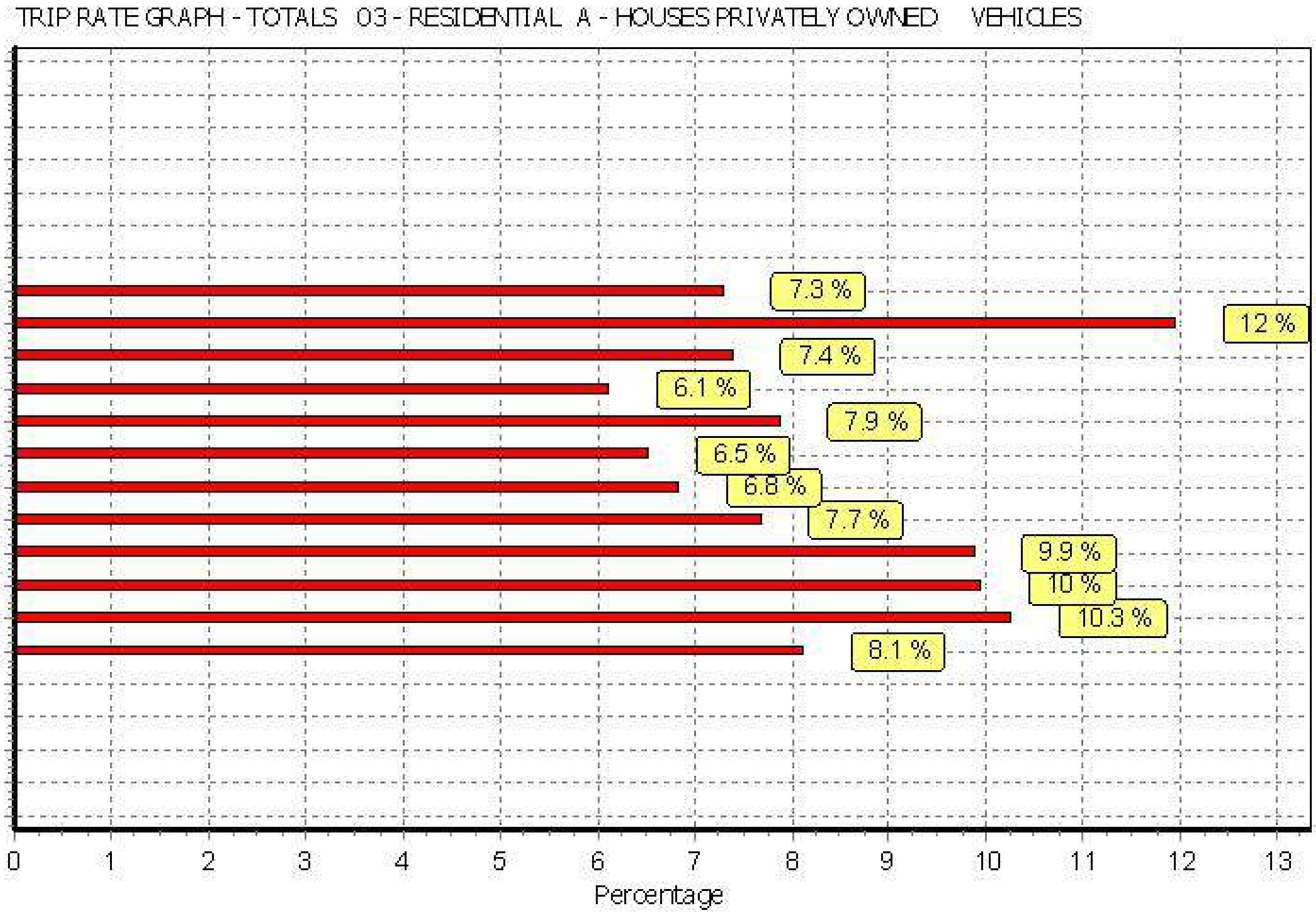


This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.336	7.3
08:00-09:00	0.550	12.0
09:00-10:00	0.340	7.4
10:00-11:00	0.282	6.1
11:00-12:00	0.363	7.9
12:00-13:00	0.301	6.5
13:00-14:00	0.315	6.8
14:00-15:00	0.354	7.7
15:00-16:00	0.455	9.9
16:00-17:00	0.458	10.0
17:00-18:00	0.472	10.3
18:00-19:00	0.374	8.1
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

Calculation Reference: AUDIT-731001-200224-0251

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : F - WAREHOUSING (COMMERCIAL)
VEHICLES

Selected regions and areas:

02	SOUTH EAST		
	SC	SURREY	1 days
11	SCOTLAND		
	HI	HIGHLAND	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary 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: 890 to 3065 (units: sqm)
Range Selected by User: 190 to 5000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/90 to 29/03/19

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:
Wednesday 1 days
Thursday 1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:
Manual count 2 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:
Free Standing (PPS6 Out of Town) 1
Not Known 1

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 2

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.

Secondary Filtering selection:

Use Class:
Not Known 1 days
B8 1 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Secondary Filtering selection (Cont.):

Population within 1 mile:

Not Known	1 days
1,000 or Less	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

Not Known	1 days
5,001 to 25,000	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

Not Known	1 days
0.5 or Less	1 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:

Not Known	1 days
No	1 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	2 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 HI-02-F-01 WAREHOUSING HIGHLAND
B9039
NEAR INVERNESS
DALCROSS IND. ESTATE
Free Standing (PPS6 Out of Town)
Industrial Zone
Total Gross floor area: 890 sqm
Survey date: WEDNESDAY 24/05/06 Survey Type: MANUAL

2 SC-02-F-02 DRINKS DISTRIBUTION SURREY
AVRO WAY
BYFLEET

Not Known
Industrial Zone
Total Gross floor area: 3065 sqm
Survey date: THURSDAY 05/07/90 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/F - WAREHOUSING (COMMERCIAL)
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 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30	1	**3065**	**0.489**	1	3065	0.098	1	3065	0.587
06:30 - 07:00	1	3065	0.457	1	3065	0.098	1	3065	0.555
07:00 - 07:30	2	1978	0.430	2	**1978**	**0.455**	2	**1978**	**0.885**
07:30 - 08:00	2	1978	0.379	2	1978	0.405	2	1978	0.784
08:00 - 08:30	2	1978	0.101	2	1978	0.152	2	1978	0.253
08:30 - 09:00	2	1978	0.126	2	1978	0.202	2	1978	0.328
09:00 - 09:30	2	1978	0.051	2	1978	0.000	2	1978	0.051
09:30 - 10:00	2	1978	0.025	2	1978	0.000	2	1978	0.025
10:00 - 10:30	2	1978	0.076	2	1978	0.025	2	1978	0.101
10:30 - 11:00	2	1978	0.051	2	1978	0.025	2	1978	0.076
11:00 - 11:30	2	1978	0.076	2	1978	0.076	2	1978	0.152
11:30 - 12:00	2	1978	0.051	2	1978	0.101	2	1978	0.152
12:00 - 12:30	2	1978	0.051	2	1978	0.076	2	1978	0.127
12:30 - 13:00	2	1978	0.076	2	1978	0.051	2	1978	0.127
13:00 - 13:30	2	1978	0.152	2	1978	0.126	2	1978	0.278
13:30 - 14:00	2	1978	0.126	2	1978	0.126	2	1978	0.252
14:00 - 14:30	2	1978	0.126	2	1978	0.202	2	1978	0.328
14:30 - 15:00	2	1978	0.101	2	1978	0.228	2	1978	0.329
15:00 - 15:30	2	1978	0.152	2	1978	0.076	2	1978	0.228
15:30 - 16:00	2	1978	0.202	2	1978	0.076	2	1978	0.278
16:00 - 16:30	2	1978	0.253	2	1978	0.278	2	1978	0.531
16:30 - 17:00	2	1978	0.228	2	1978	0.278	2	1978	0.506
17:00 - 17:30	2	1978	0.177	2	1978	0.278	2	1978	0.455
17:30 - 18:00	2	1978	0.177	2	1978	0.329	2	1978	0.506
18:00 - 18:30	2	1978	0.076	2	1978	0.228	2	1978	0.304
18:30 - 19:00	2	1978	0.051	2	1978	0.152	2	1978	0.203
19:00 - 19:30	1	3065	0.065	1	3065	0.163	1	3065	0.228
19:30 - 20:00	1	3065	0.033	1	3065	0.196	1	3065	0.229
20:00 - 20:30	1	3065	0.033	1	3065	0.131	1	3065	0.164
20:30 - 21:00	1	3065	0.000	1	3065	0.131	1	3065	0.131
21:00 - 21:30	1	3065	0.000	1	3065	0.000	1	3065	0.000
21:30 - 22:00	1	3065	0.000	1	3065	0.000	1	3065	0.000
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			4.391			4.762			9.153

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.*

Parameter summary

Trip rate parameter range selected:	890 - 3065 (units: sqm)
Survey date date range:	01/01/90 - 29/03/19
Number of weekdays (Monday-Friday):	2
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.

Calculation Reference: AUDIT-731001-190321-0310

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : E - WAREHOUSING (SELF STORAGE)
VEHICLES

Selected regions and and areas:

02	SOUTH EAST		
	BU	BUCKINGHAMSHIRE	1 days
	KC	KENT	2 days
	WS	WEST SUSSEX	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	2 days
	NF	NORFOLK	2 days
05	EAST MIDLANDS		
	NT	NOTTINGHAMSHIRE	1 days
06	WEST MIDLANDS		
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	1 days
08	NORTH WEST		
	MS	MERSEYSIDE	1 days
09	NORTH		
	TW	TYNE & WEAR	1 days
10	WALES		
	NW	NEWPORT	1 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Secondary 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: Parking spaces
Actual Range: 9 to 45 (units:)
Range Selected by User: 7 to 50 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 08/03/02 to 17/11/16

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	3 days
Tuesday	4 days
Wednesday	2 days
Thursday	2 days
Friday	3 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	14 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)	11
Edge of Town	3

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	9
Commercial Zone	1
Development Zone	2
Retail Zone	1
Built-Up Zone	1

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, Secondary Filtering selection:

Use Class:

B8	14 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 1 mile:

5,001 to 10,000	3 days
10,001 to 15,000	5 days
15,001 to 20,000	2 days
20,001 to 25,000	1 days
25,001 to 50,000	3 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

75,001 to 100,000	1 days
125,001 to 250,000	9 days
250,001 to 500,000	2 days
500,001 or More	2 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.5 or Less	2 days
0.6 to 1.0	4 days
1.1 to 1.5	8 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:

Not Known	1 days
No	13 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	14 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1 BU-02-E-01 BIG YELLOW STORAGE BUCKINGHAMSHIRE
SNOWDON DRIVE
MILTON KEYNES
WINTERHILL
Suburban Area (PPS6 Out of Centre)
Retail Zone
Total Parking spaces: 13
Survey date: FRIDAY 08/03/02 Survey Type: MANUAL

2 CA-02-E-01 SELF STORAGE CAMBRIDGESHIRE
WESTFIELD ROAD
PETERBOROUGH

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 24
Survey date: TUESDAY 22/07/03 Survey Type: MANUAL

3 CA-02-E-02 SELF STORAGE CAMBRIDGESHIRE
CLIFTON WAY
CAMBRIDGE

Suburban Area (PPS6 Out of Centre)
Built-Up Zone
Total Parking spaces: 22
Survey date: FRIDAY 16/10/09 Survey Type: MANUAL

4 KC-02-E-01 EASI STORE KENT
LONGFIELD ROAD
TUNBRIDGE WELLS

Edge of Town
Industrial Zone
Total Parking spaces: 14
Survey date: TUESDAY 01/12/09 Survey Type: MANUAL

5 KC-02-E-03 BIG YELLOW STORAGE KENT
LONGFIELD ROAD
TUNBRIDGE WELLS

Edge of Town
Industrial Zone
Total Parking spaces: 45
Survey date: TUESDAY 01/12/09 Survey Type: MANUAL

6 MS-02-E-01 BIG YELLOW MERSEYSIDE
MILL LANE
LIVERPOOL

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 9
Survey date: THURSDAY 09/09/10 Survey Type: MANUAL

7 NF-02-E-01 BIX BOX STORAGE NORFOLK
VULCAN ROAD NORTH
NORWICH
HELLESDON
Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 25
Survey date: WEDNESDAY 30/07/03 Survey Type: MANUAL

8 NF-02-E-02 BIG YELLOW STORAGE NORFOLK
CANARY WAY
NORWICH
RIVERSIDE
Suburban Area (PPS6 Out of Centre)
Development Zone
Total Parking spaces: 31
Survey date: WEDNESDAY 21/09/05 Survey Type: MANUAL

9 NT-02-E-02 BIG YELLOW SELF STORAGE NOTTINGHAMSHIRE
LENTON LANE
NOTTINGHAM

Suburban Area (PPS6 Out of Centre)
Development Zone
Total Parking spaces: 10
Survey date: THURSDAY 17/11/16 Survey Type: MANUAL

LIST OF SITES relevant to selection parameters (Cont.)

10 NW-02-E-01 STORAGE GIANT NEWPORT
LEEWAY COURT
NEWPORT
LEEWAY INDUSTRIAL EST.
Edge of Town
Commercial Zone
Total Parking spaces: 35
Survey date: FRIDAY 22/10/10 Survey Type: MANUAL

11 TW-02-E-01 1ST STORAGE TYNE & WEAR
STONEYGATE CLOSE
GATESHEAD

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 20
Survey date: MONDAY 13/06/16 Survey Type: MANUAL

12 WM-02-E-02 EXTRASPACE WEST MIDLANDS
101 LOCKHURST LANE
COVENTRY

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 11
Survey date: TUESDAY 31/01/06 Survey Type: MANUAL

13 WS-02-E-01 SELF STORAGE WEST SUSSEX
DURBAN ROAD
BOGNOR REGIS
SOUTH BERSTED
Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 24
Survey date: MONDAY 06/11/06 Survey Type: MANUAL

14 WY-02-E-01 SELF STORAGE WEST YORKSHIRE
ST ANDREWS ROAD
HUDDERSFIELD

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Parking spaces: 10
Survey date: MONDAY 17/03/03 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/E - WAREHOUSING (SELF STORAGE)
VEHICLES
Calculation factor: 1 PARKING SPACES
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. PARKING	Trip Rate	No. Days	Ave. PARKING	Trip Rate	No. Days	Ave. PARKING	Trip Rate
00:00 - 00:30									
00:30 - 01:00									
01:00 - 01:30									
01:30 - 02:00									
02:00 - 02:30									
02:30 - 03:00									
03:00 - 03:30									
03:30 - 04:00									
04:00 - 04:30									
04:30 - 05:00									
05:00 - 05:30									
05:30 - 06:00									
06:00 - 06:30									
06:30 - 07:00									
07:00 - 07:30	13	21	0.015	13	21	0.004	13	21	0.019
07:30 - 08:00	13	21	0.093	13	21	0.015	13	21	0.108
08:00 - 08:30	14	21	0.099	14	21	0.068	14	21	0.167
08:30 - 09:00	**14**	**21**	**0.181**	14	21	0.096	14	21	0.277
09:00 - 09:30	14	21	0.157	14	21	0.130	14	21	0.287
09:30 - 10:00	14	21	0.130	14	21	0.109	14	21	0.239
10:00 - 10:30	14	21	0.160	14	21	0.133	14	21	0.293
10:30 - 11:00	14	21	0.102	14	21	0.123	14	21	0.225
11:00 - 11:30	14	21	0.116	14	21	0.119	14	21	0.235
11:30 - 12:00	14	21	0.147	**14**	**21**	**0.171**	**14**	**21**	**0.318**
12:00 - 12:30	14	21	0.167	14	21	0.133	14	21	0.300
12:30 - 13:00	14	21	0.116	14	21	0.140	14	21	0.256
13:00 - 13:30	14	21	0.137	14	21	0.154	14	21	0.291
13:30 - 14:00	14	21	0.119	14	21	0.154	14	21	0.273
14:00 - 14:30	14	21	0.116	14	21	0.123	14	21	0.239
14:30 - 15:00	14	21	0.160	14	21	0.140	14	21	0.300
15:00 - 15:30	14	21	0.133	14	21	0.130	14	21	0.263
15:30 - 16:00	14	21	0.119	14	21	0.116	14	21	0.235
16:00 - 16:30	14	21	0.116	14	21	0.133	14	21	0.249
16:30 - 17:00	14	21	0.106	14	21	0.113	14	21	0.219
17:00 - 17:30	14	21	0.072	14	21	0.147	14	21	0.219
17:30 - 18:00	14	21	0.020	14	21	0.075	14	21	0.095
18:00 - 18:30	13	21	0.007	13	21	0.048	13	21	0.055
18:30 - 19:00	13	21	0.026	13	21	0.037	13	21	0.063
19:00 - 19:30									
19:30 - 20:00									
20:00 - 20:30									
20:30 - 21:00									
21:00 - 21:30									
21:30 - 22:00									
22:00 - 22:30									
22:30 - 23:00									
23:00 - 23:30									
23:30 - 24:00									
Total Rates:			2.614			2.611			5.225

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.

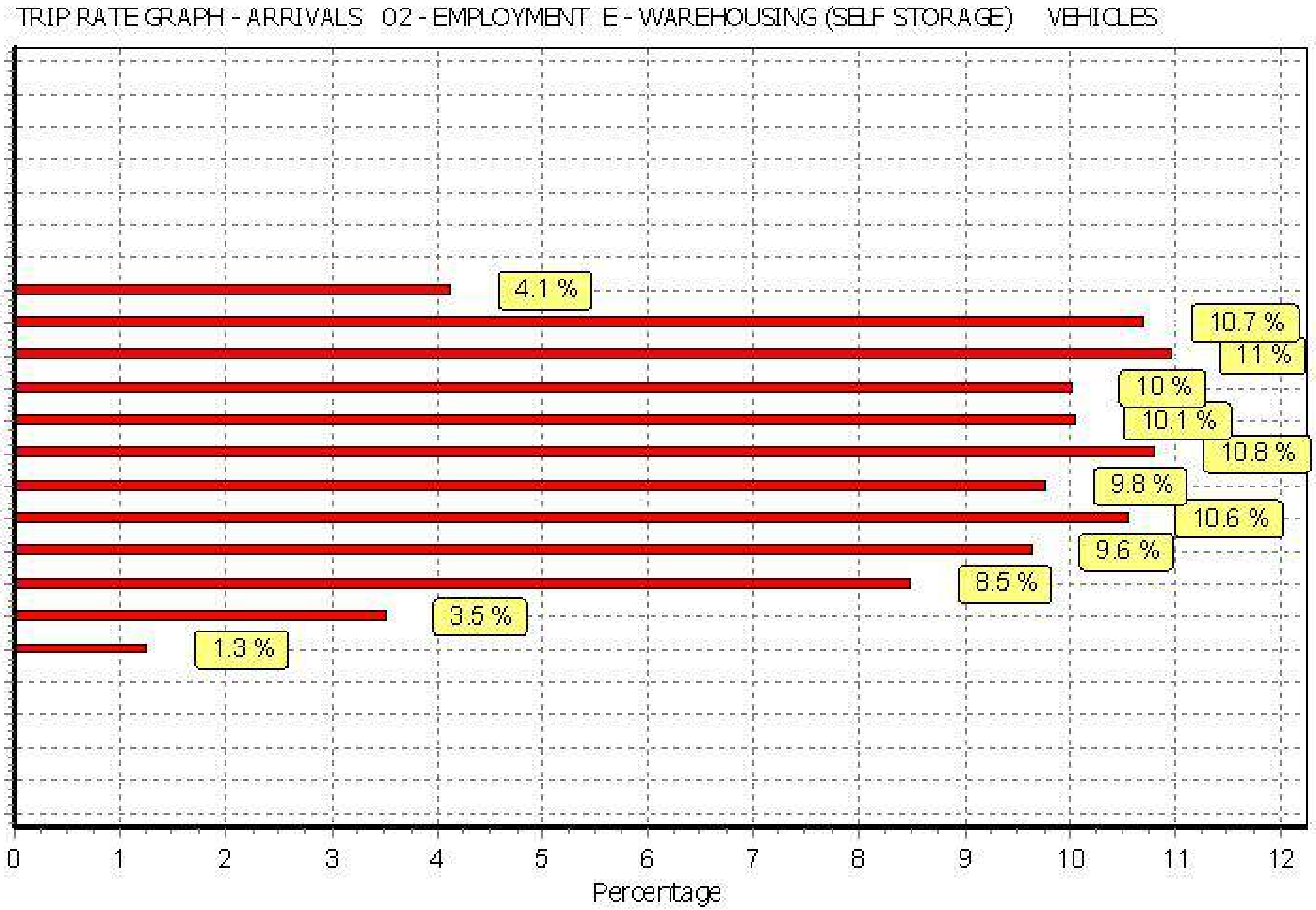
*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected 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.*

Parameter summary

Trip rate parameter range selected:	9 - 45 (units:)
Survey date date range:	08/03/02 - 17/11/16
Number of weekdays (Monday-Friday):	14
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.

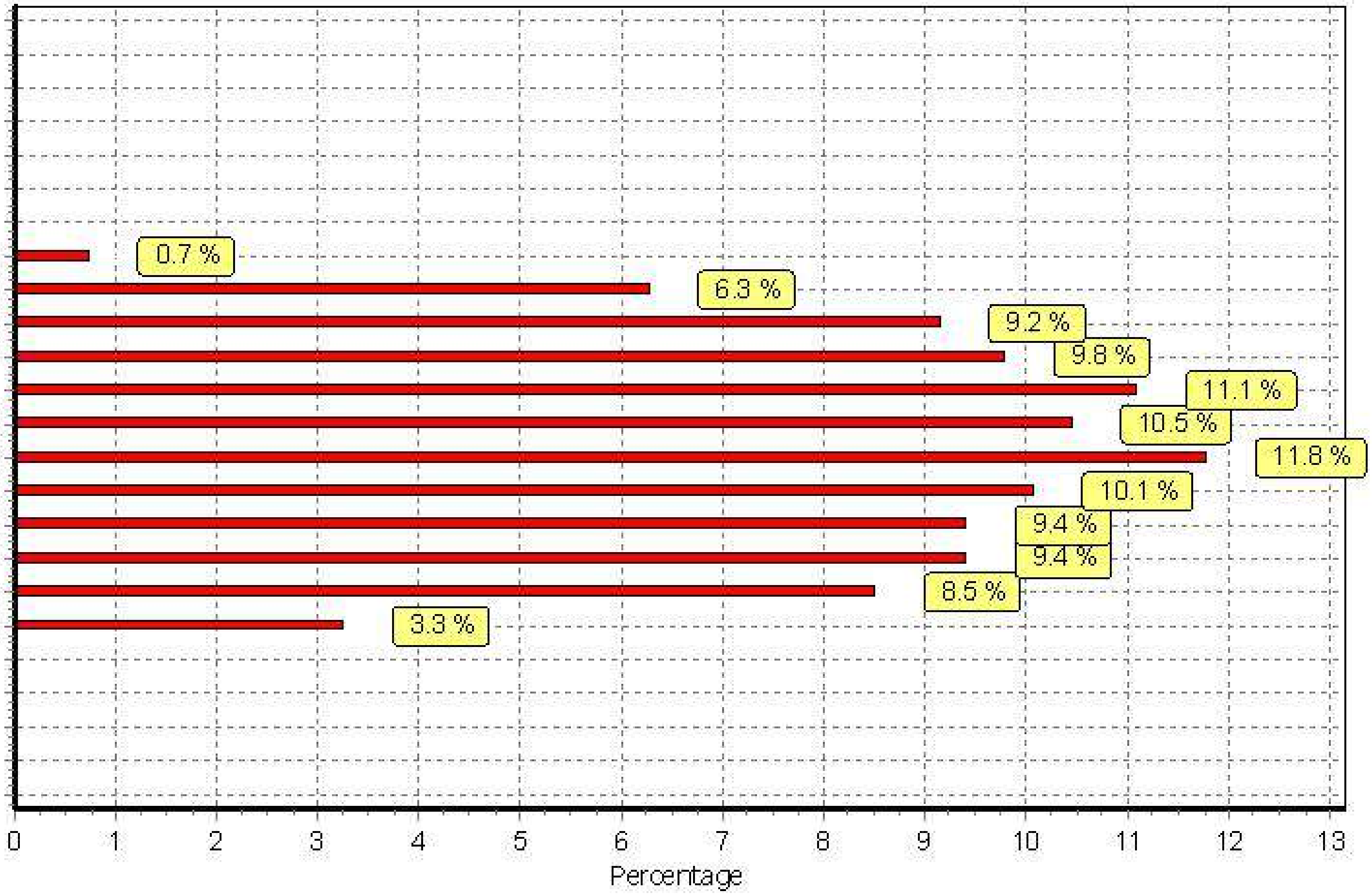
TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.108	4.1
08:00-09:00	0.280	10.7
09:00-10:00	0.287	11.0
10:00-11:00	0.262	10.0
11:00-12:00	0.263	10.1
12:00-13:00	0.283	10.8
13:00-14:00	0.256	9.8
14:00-15:00	0.276	10.6
15:00-16:00	0.252	9.6
16:00-17:00	0.222	8.5
17:00-18:00	0.092	3.5
18:00-19:00	0.033	1.3
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

TRIP RATE GRAPH - DEPARTURES 02 - EMPLOYMENT E - WAREHOUSING (SELF STORAGE) VEHICLES

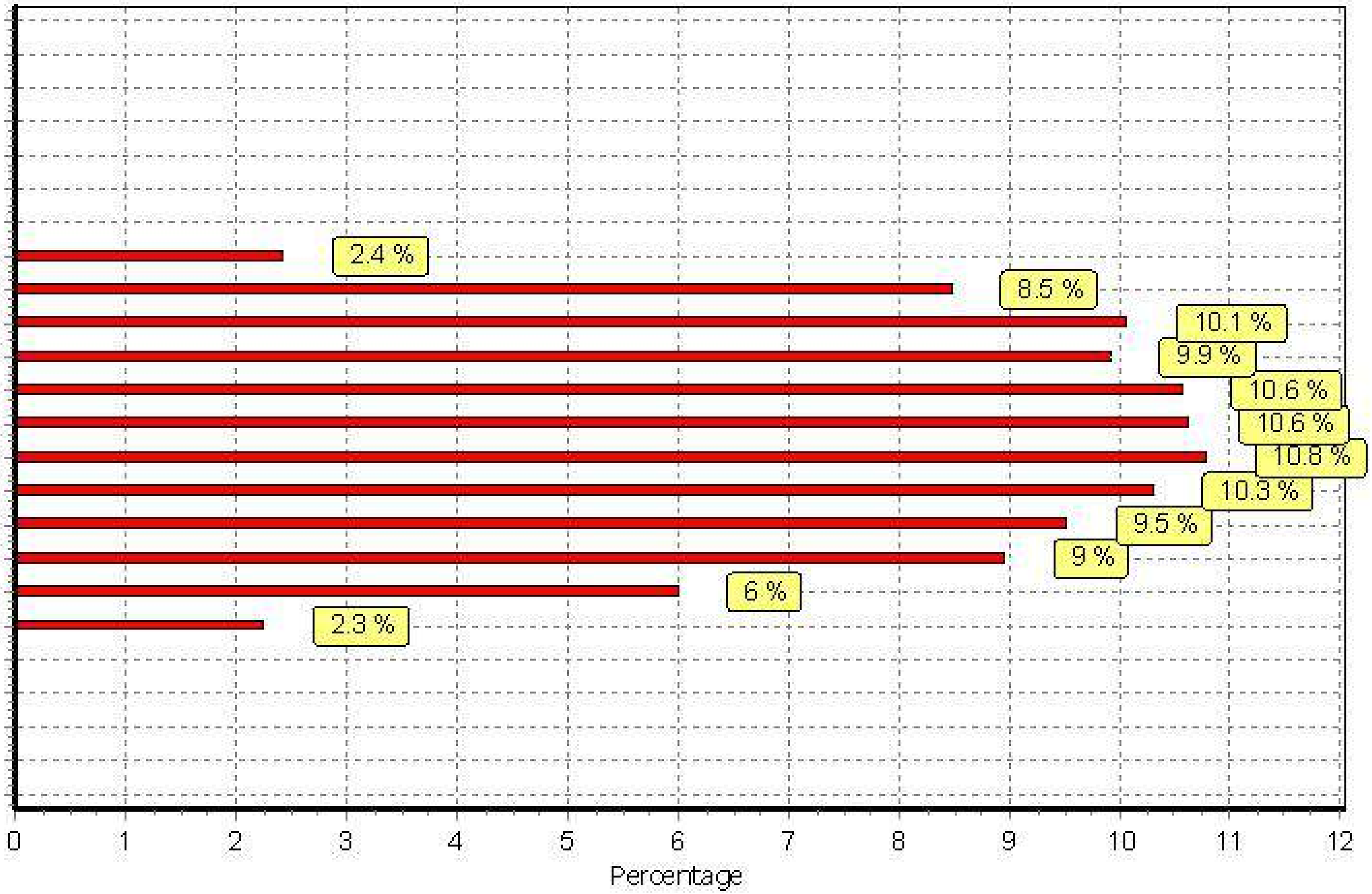
TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.019	0.7
08:00-09:00	0.164	6.3
09:00-10:00	0.239	9.2
10:00-11:00	0.256	9.8
11:00-12:00	0.290	11.1
12:00-13:00	0.273	10.5
13:00-14:00	0.308	11.8
14:00-15:00	0.263	10.1
15:00-16:00	0.246	9.4
16:00-17:00	0.246	9.4
17:00-18:00	0.222	8.5
18:00-19:00	0.085	3.3
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		



This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

TRIP RATE GRAPH - TOTALS 02 - EMPLOYMENT E - WAREHOUSING (SELF STORAGE) VEHICLES

TIME	RATE	%
00:00-01:00		
01:00-02:00		
02:00-03:00		
03:00-04:00		
04:00-05:00		
05:00-06:00		
06:00-07:00		
07:00-08:00	0.127	2.4
08:00-09:00	0.444	8.5
09:00-10:00	0.526	10.1
10:00-11:00	0.518	9.9
11:00-12:00	0.553	10.6
12:00-13:00	0.556	10.6
13:00-14:00	0.564	10.8
14:00-15:00	0.539	10.3
15:00-16:00	0.498	9.5
16:00-17:00	0.468	9.0
17:00-18:00	0.314	6.0
18:00-19:00	0.118	2.3
19:00-20:00		
20:00-21:00		
21:00-22:00		
22:00-23:00		
23:00-24:00		

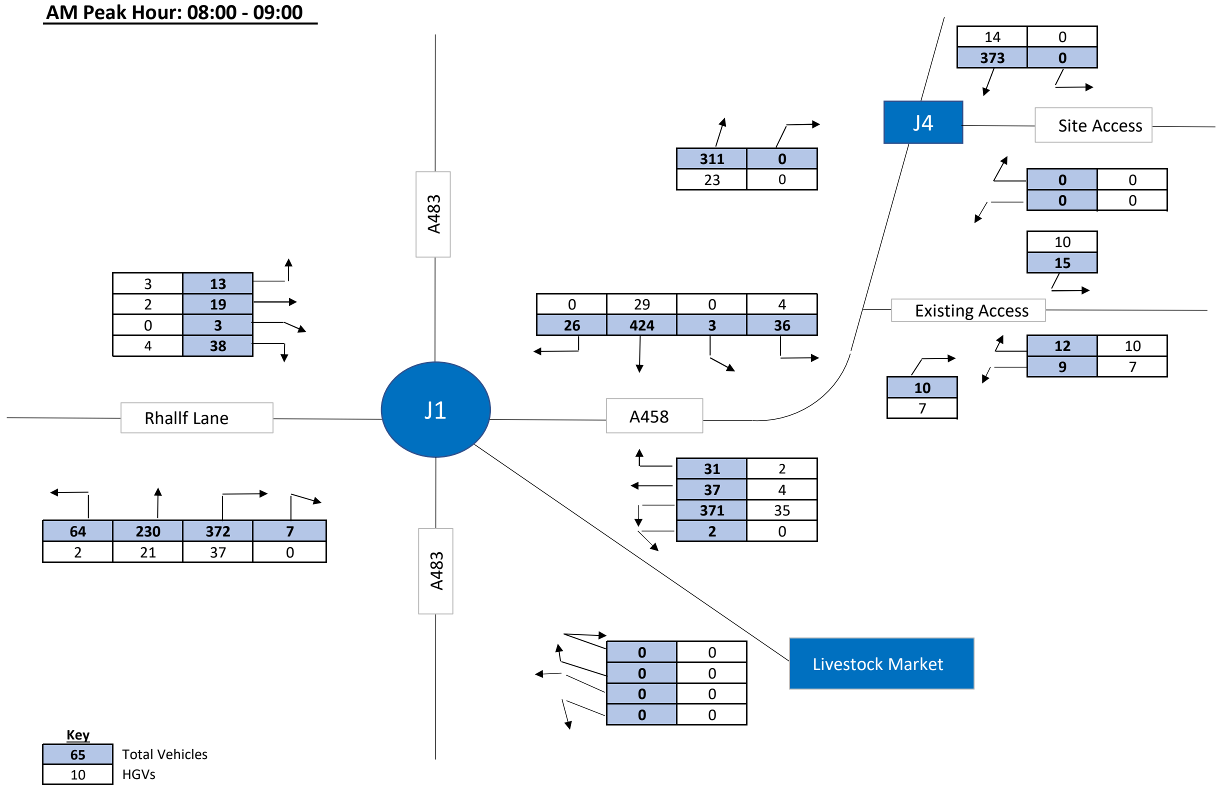


This graph is a visual representation of the trip rate calculation results screen. The same time periods and trip rates are displayed, but in addition there is an additional column showing the percentage of the total trip rate by individual time period, allowing peak periods to be easily identified through observation. Note that the type of count and the selected direction is shown at the top of the graph.

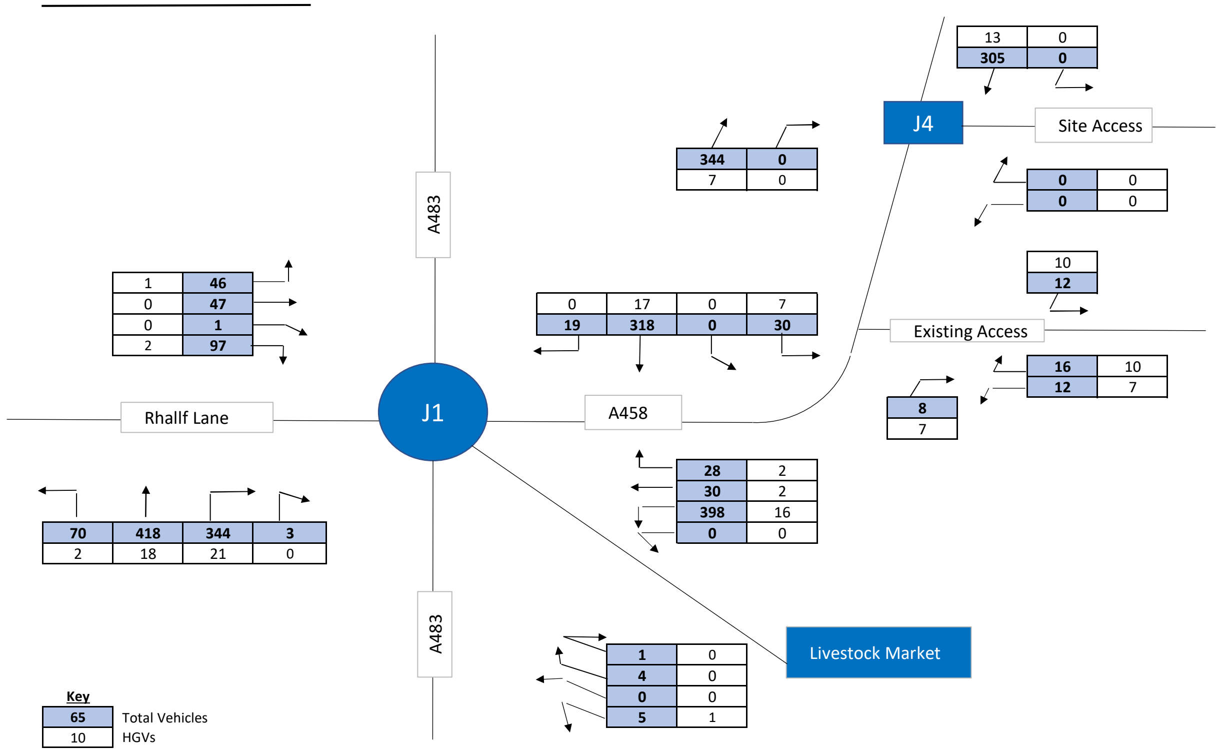
APPENDIX I

TRAFFIC FLOW DIAGRAMS

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev	Description	Date
Drawing Title: OBSERVED TRAFFIC FLOWS 2019 (J1 & J4)	**Drawing No:** FLOW DIAGRAM 1	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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Tel: +44 (0)1799 529529
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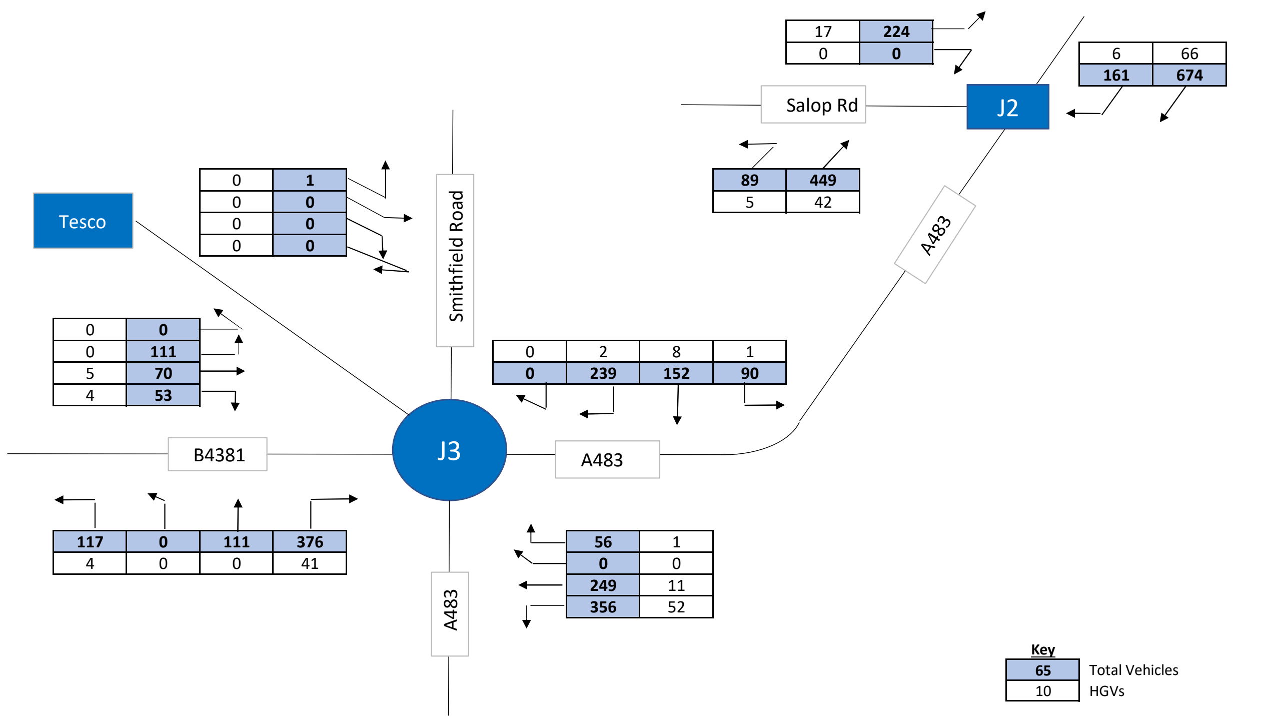
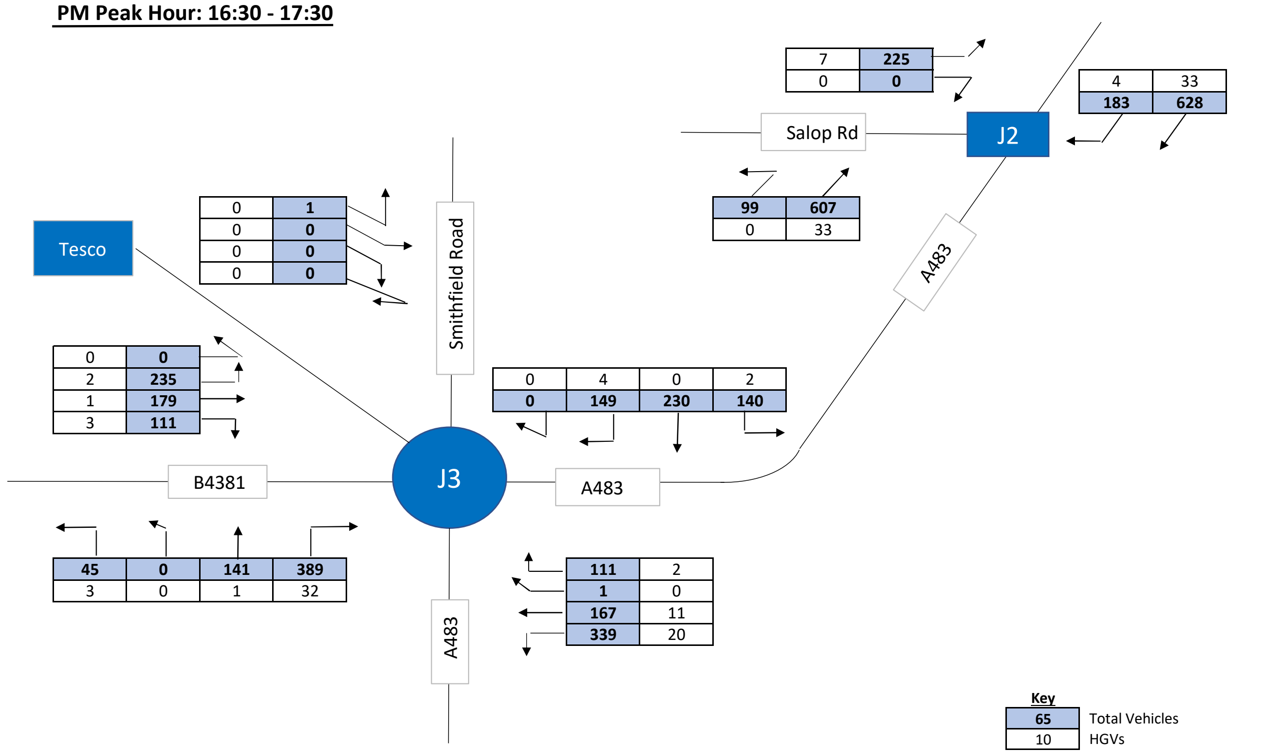
e[redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: OBSERVED TRAFFIC FLOWS 2019 (J2 & J3)	**Drawing No:** FLOW DIAGRAM 2	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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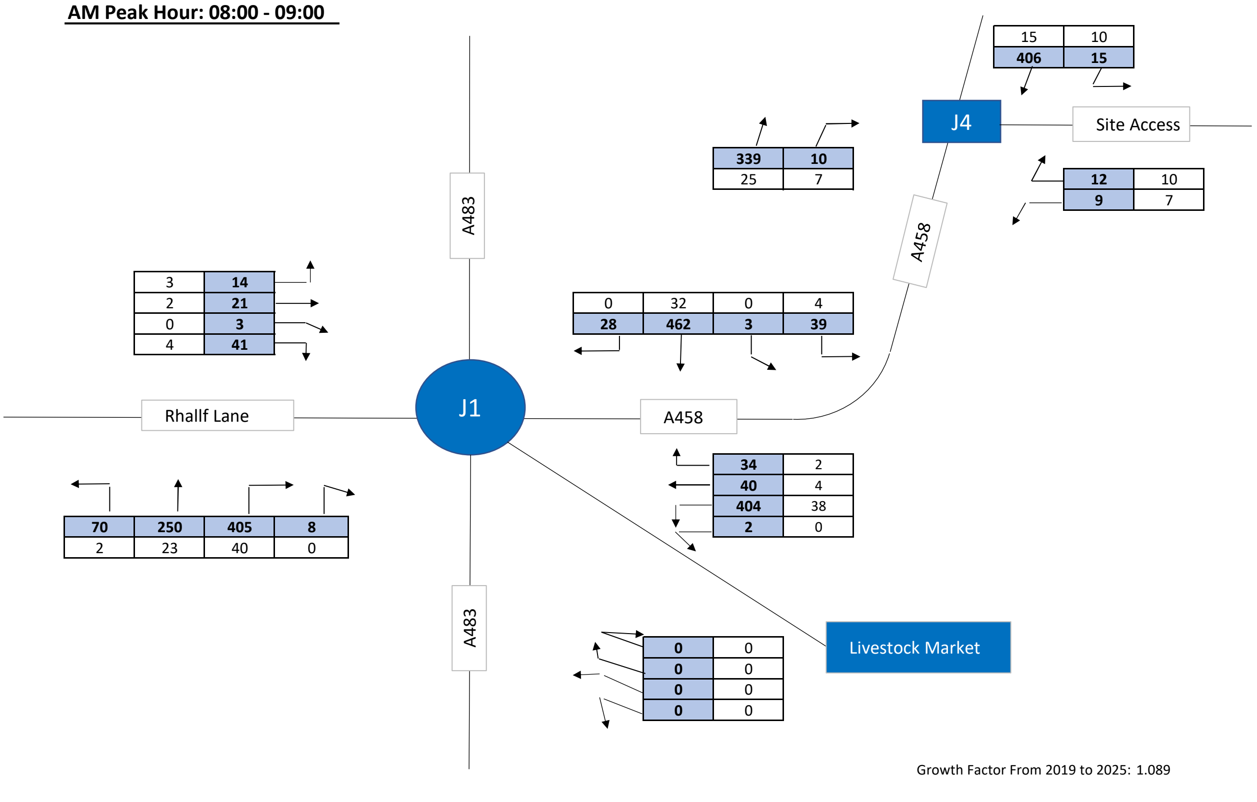
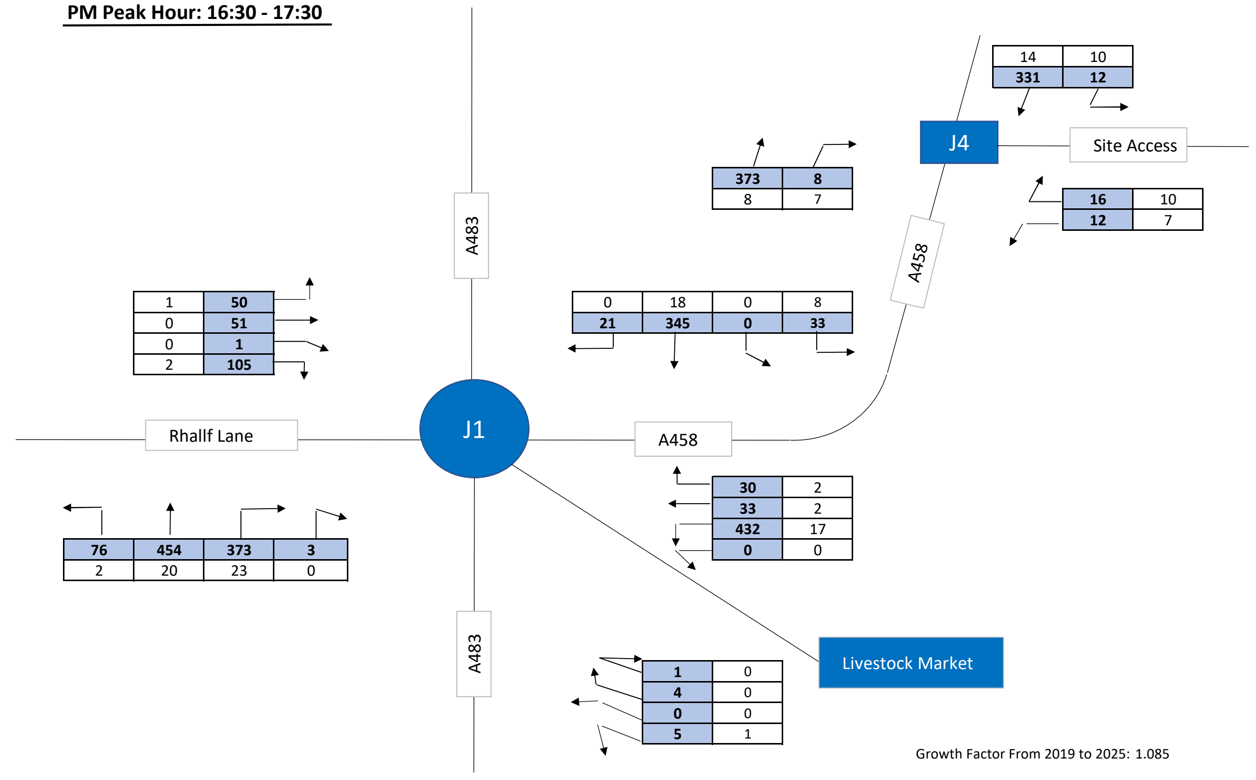
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev	Description	Date
Drawing Title: BASE TRAFFIC FLOWS 2025 (J1 & J4)	**Drawing No:** FLOW DIAGRAM 3	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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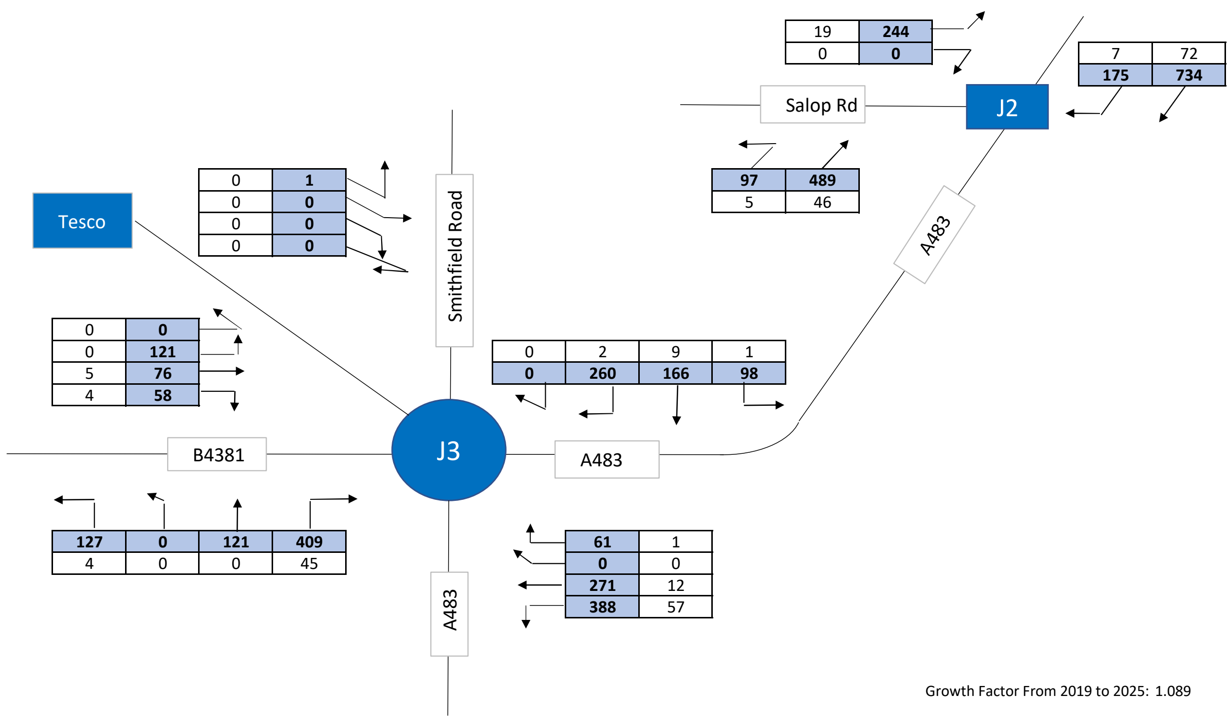
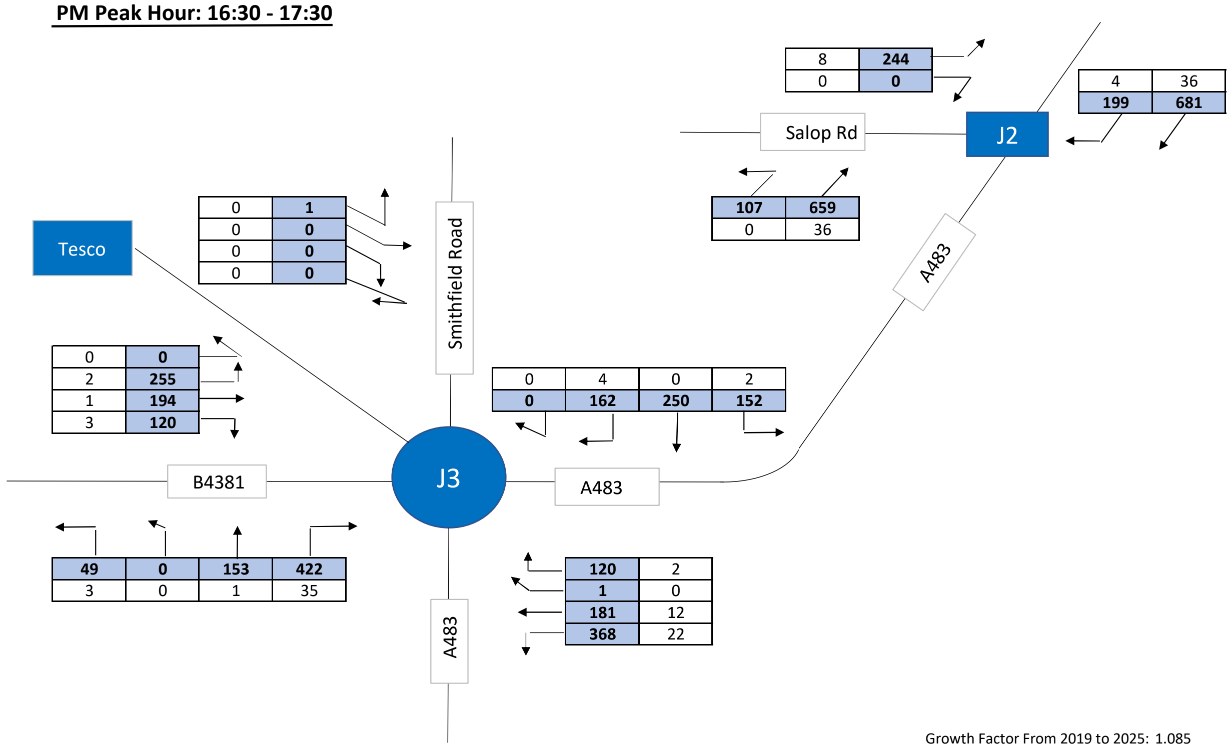
e: [redacted]

AM Peak Hour: 08:00 - 09:00

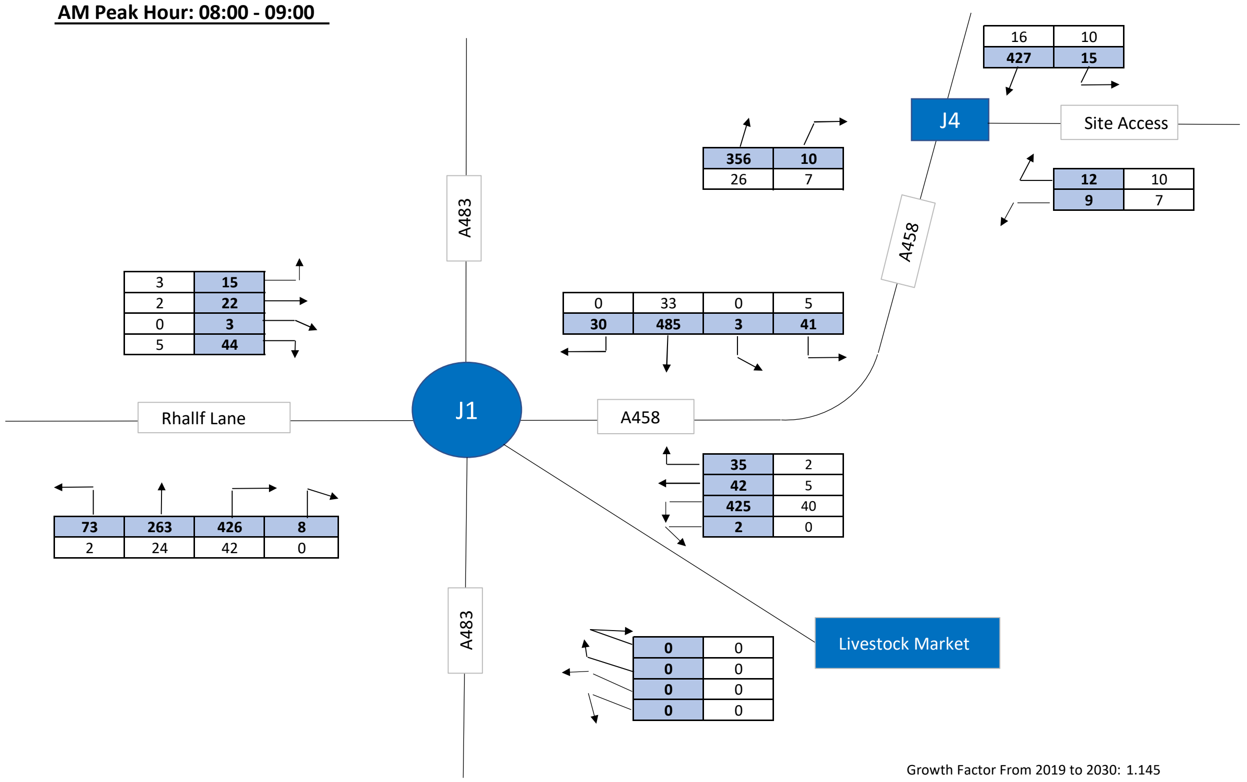


PM Peak Hour: 16:30 - 17:30



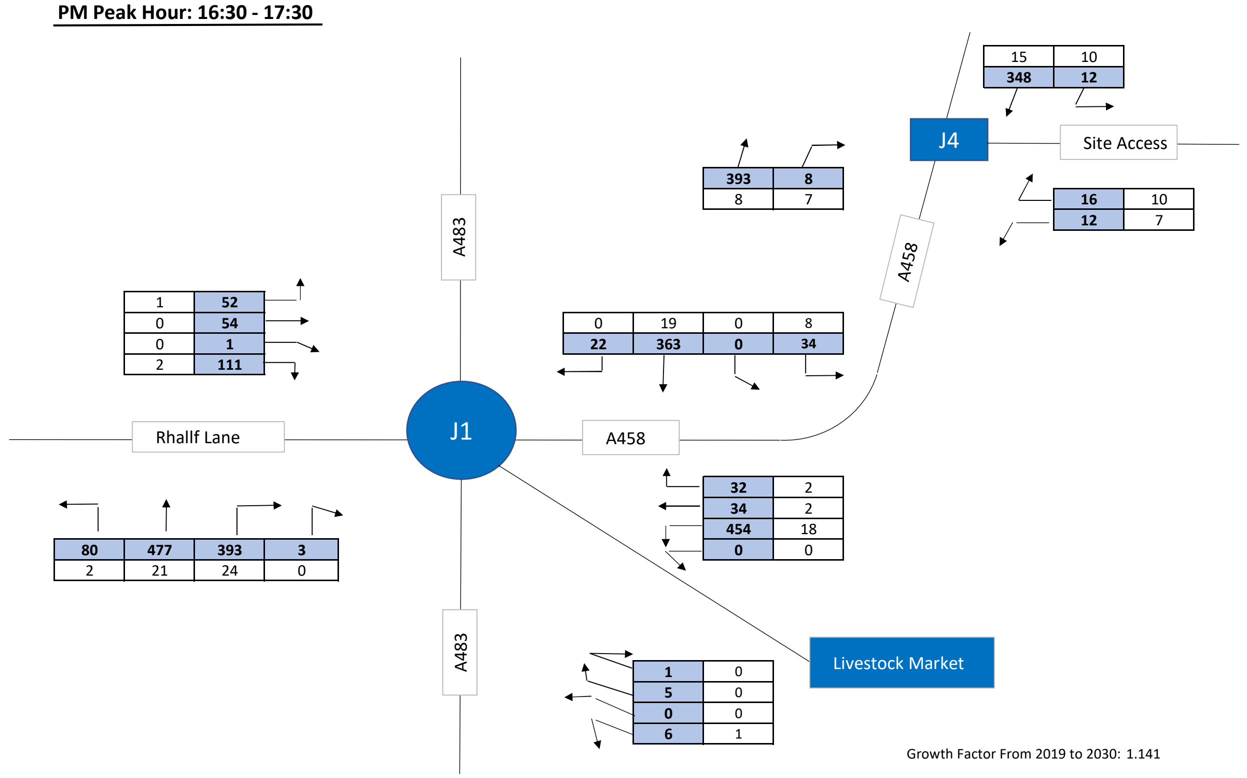
IT Project: BUTTINGTON QUARRY	Rev / Description / Date		Intermodal Transportation, Hunters Court, Debden Road, Saffron Walden, Essex CB11 4AA. Tel: +44 (0)1799 529529, Fax: +44 (0)1799 529530, e: [redacted]
Drawing Title: BASE TRAFFIC FLOWS 2025 (J2 & J3)	**Drawing No:** FLOW DIAGRAM 4	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

AM Peak Hour: 08:00 - 09:00



Growth Factor From 2019 to 2030: 1.145

PM Peak Hour: 16:30 - 17:30



Growth Factor From 2019 to 2030: 1.141

IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: BASE TRAFFIC FLOWS 2030 (J1 & J4)	**Drawing No:** FLOW DIAGRAM 5	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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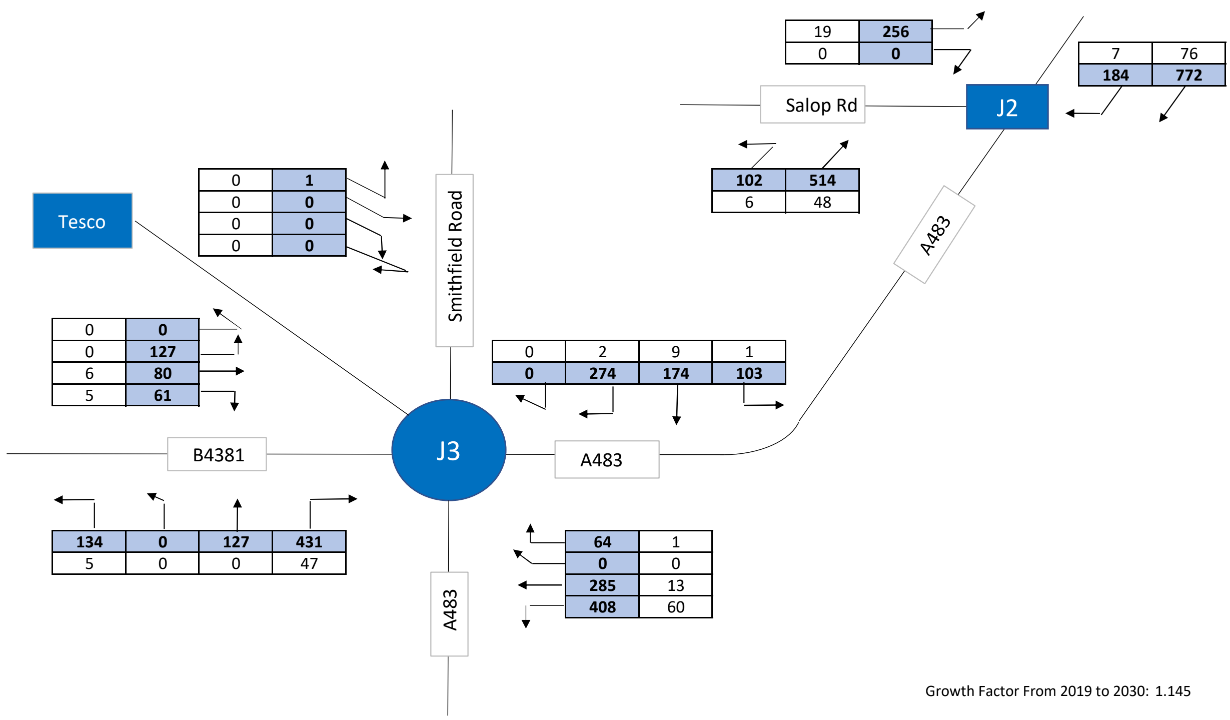
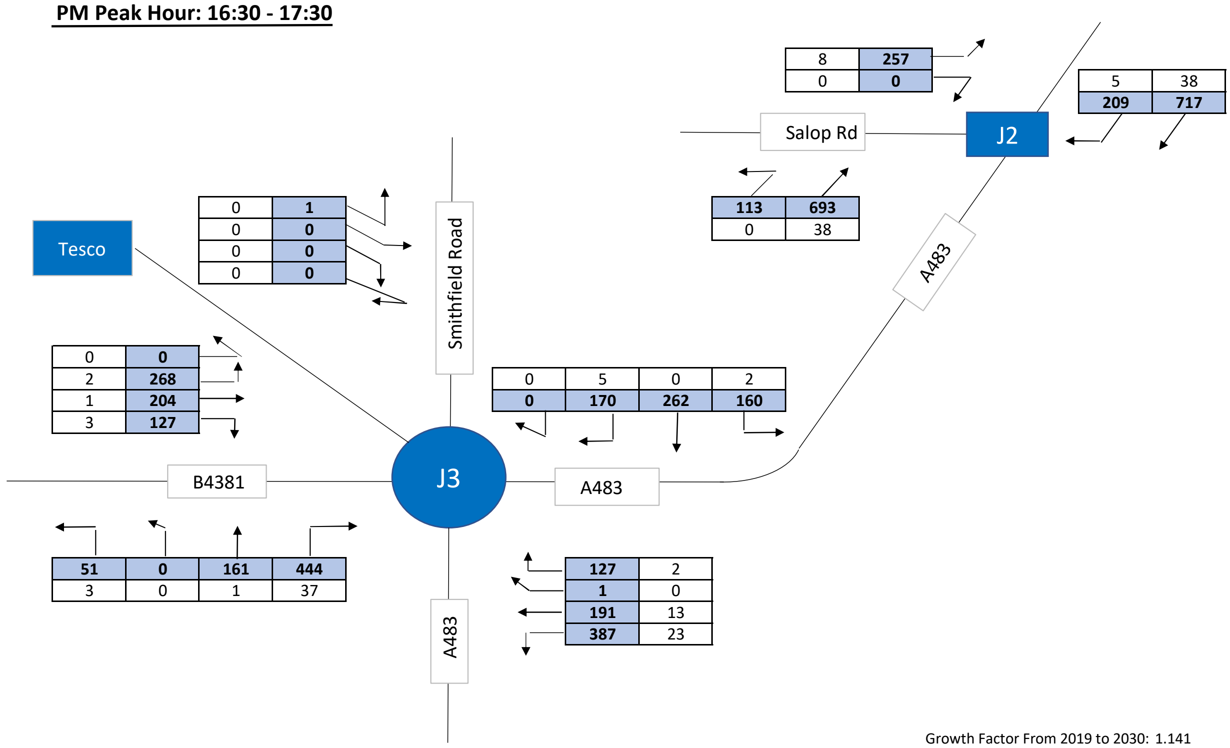
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: BASE TRAFFIC FLOWS 2030 (J2 & J3)	**Drawing No:** FLOW DIAGRAM 6	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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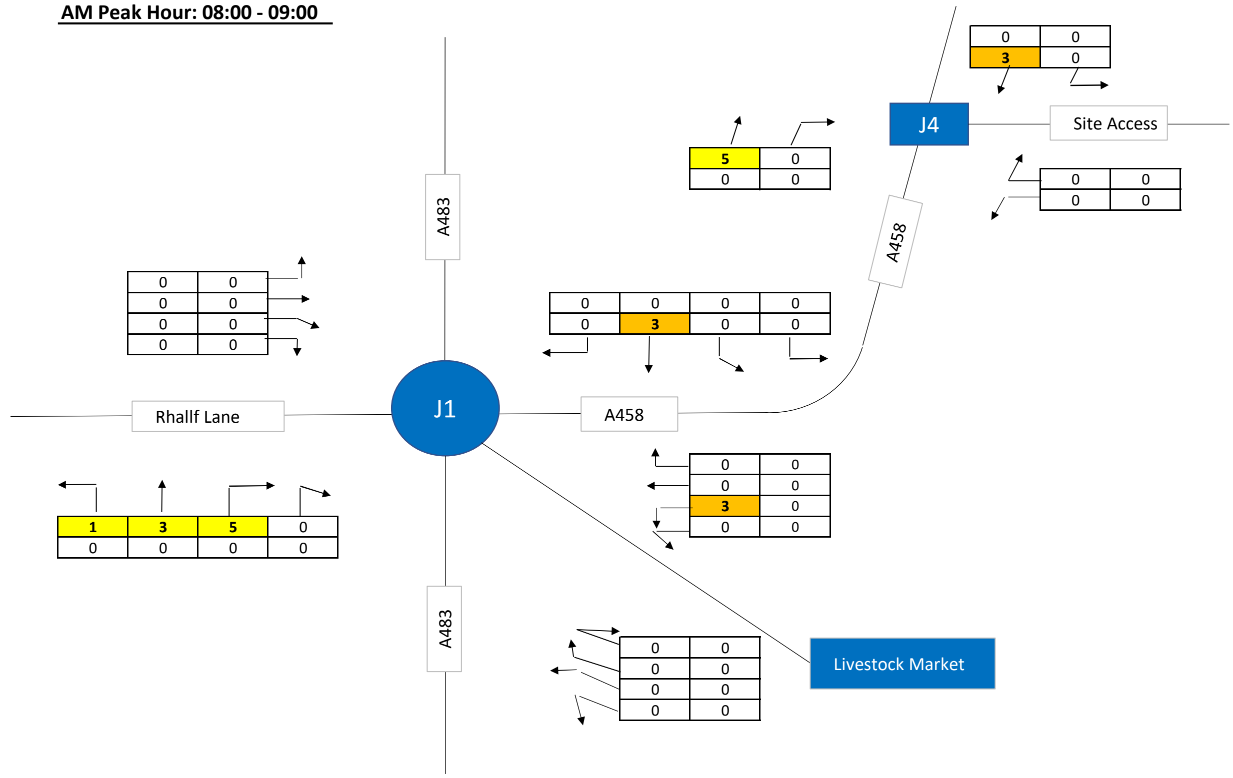
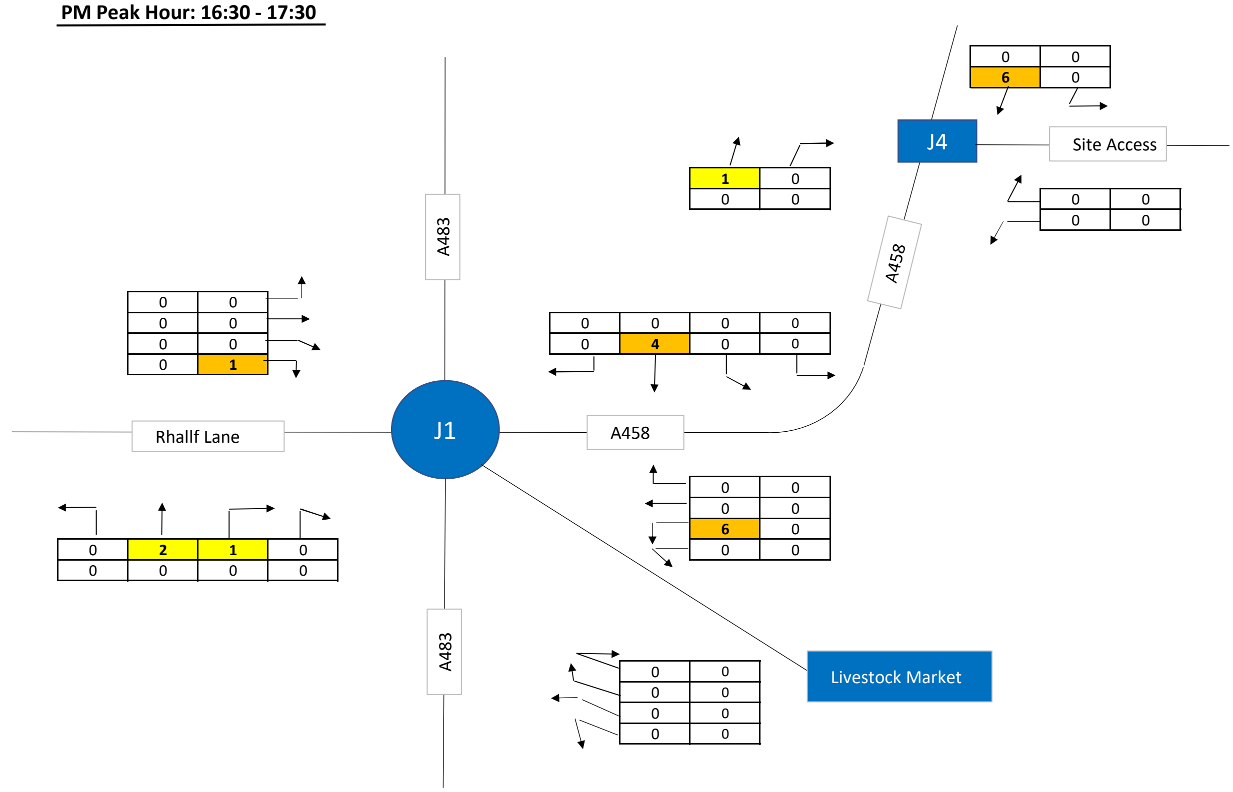
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (54 RESIDENTIAL DWELLING SCHEME)	**Drawing No:** FLOW DIAGRAM 7	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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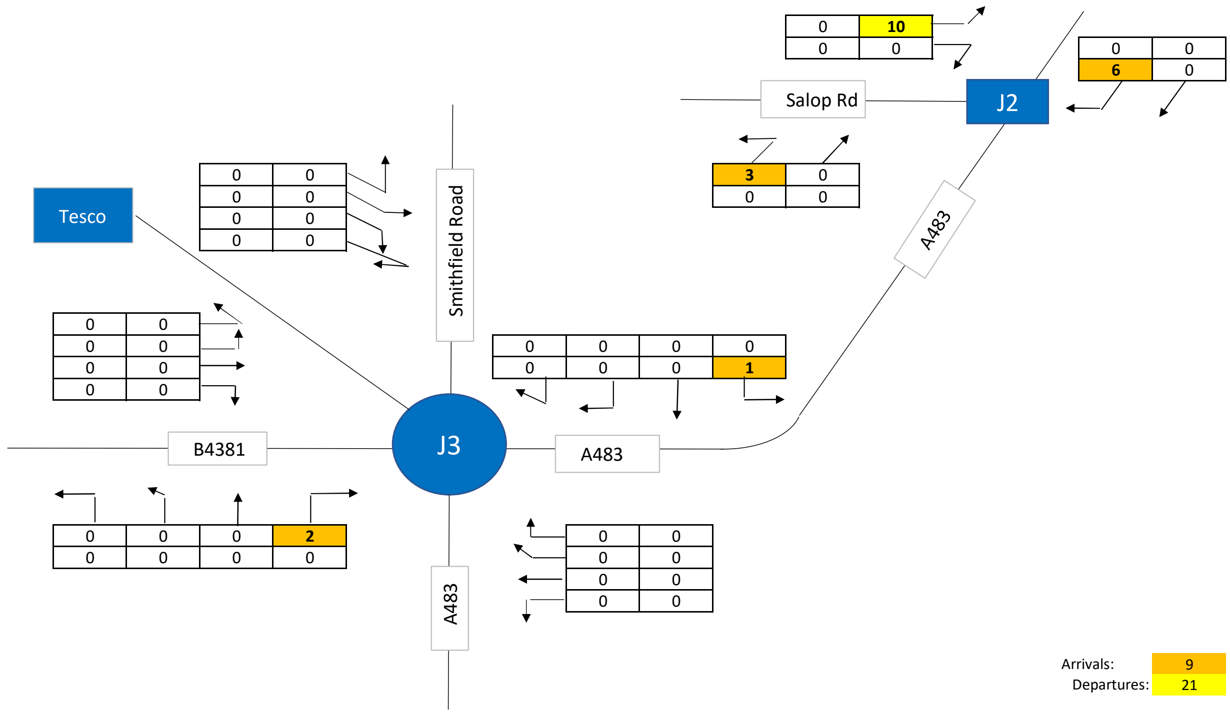
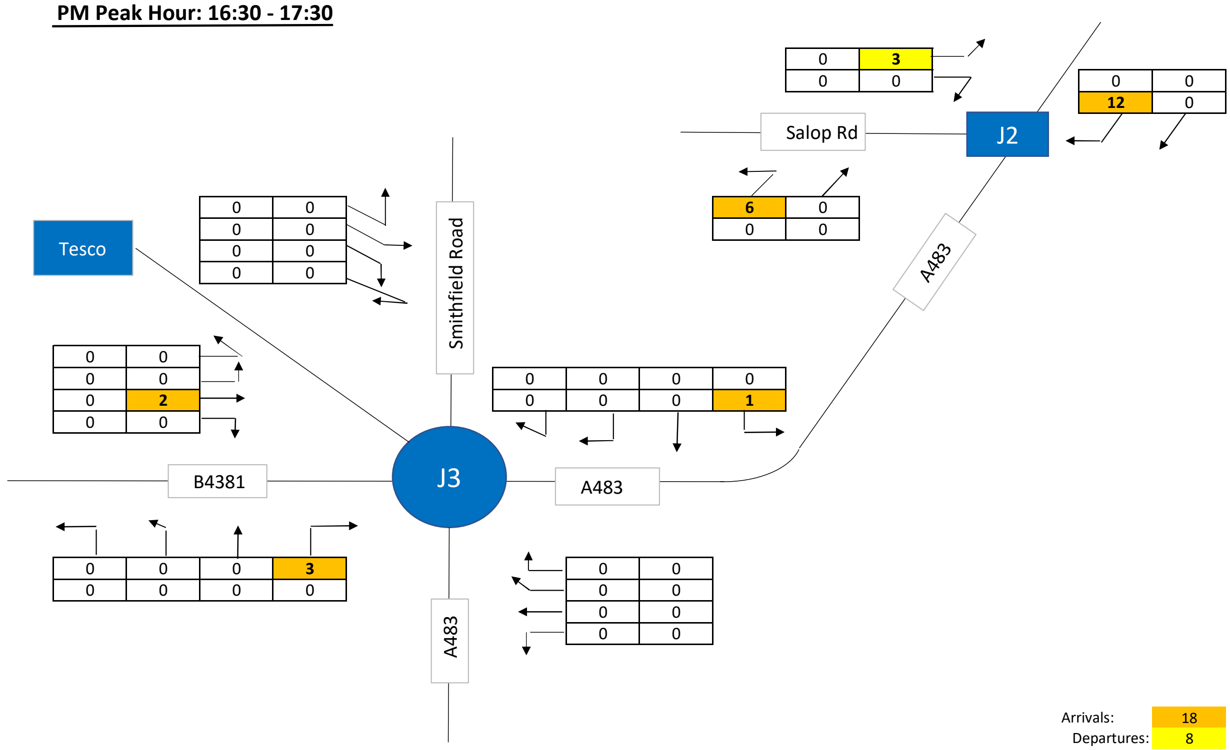
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (54 RESIDENTIAL DWELLING SCHEME)	**Drawing No:** FLOW DIAGRAM 8	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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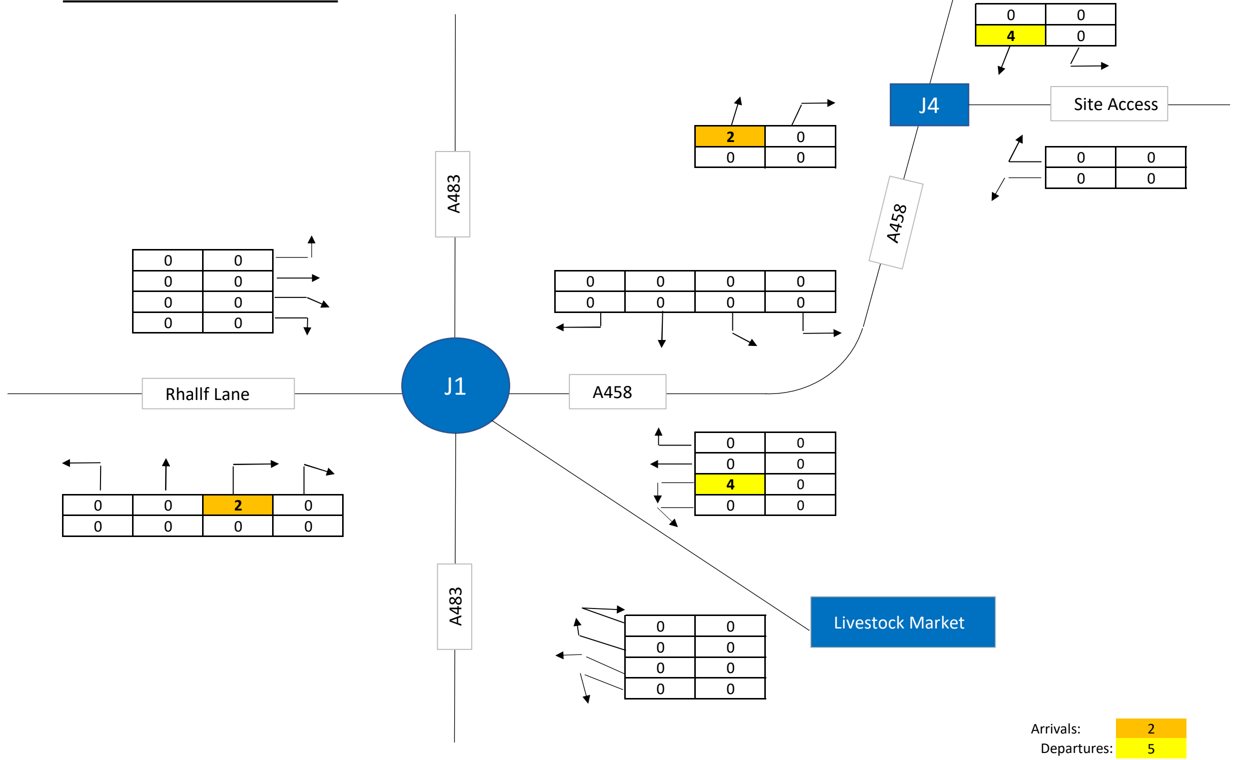
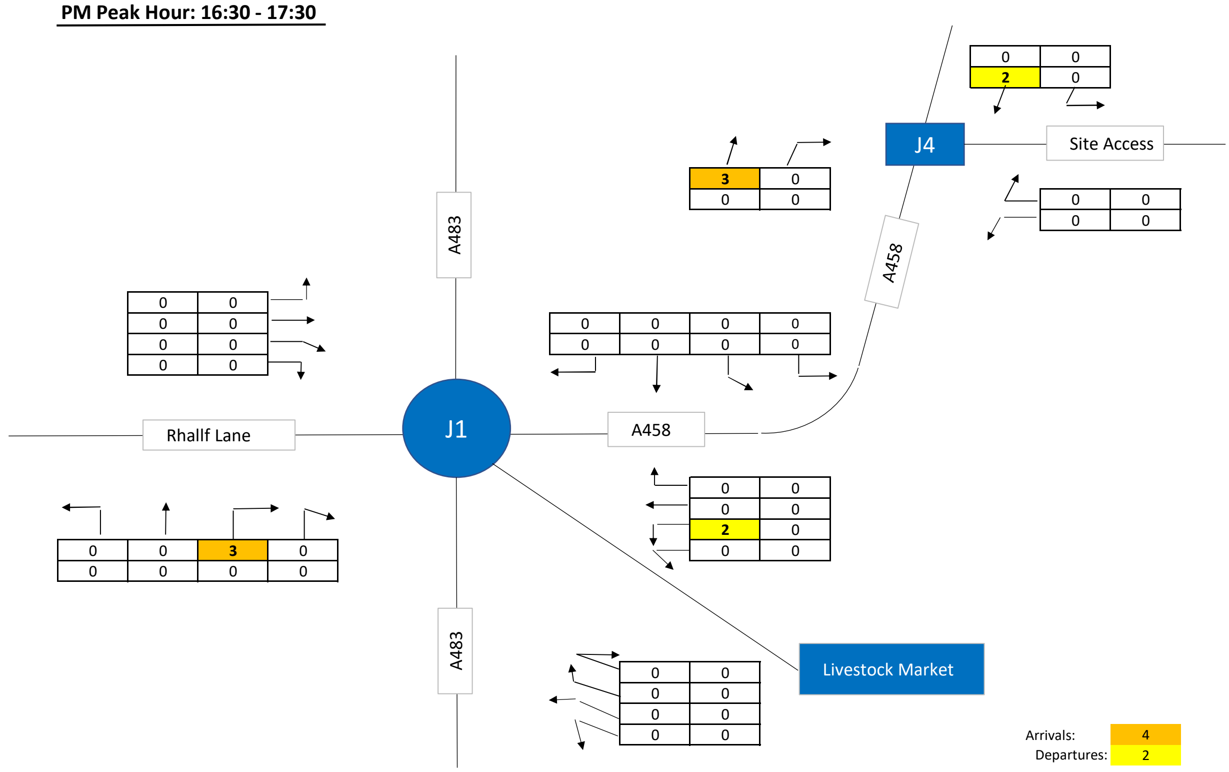
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev	Description	Date
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (25 RESIDENTIAL DWELLING SCHEME)	**Drawing No:** FLOW DIAGRAM 9	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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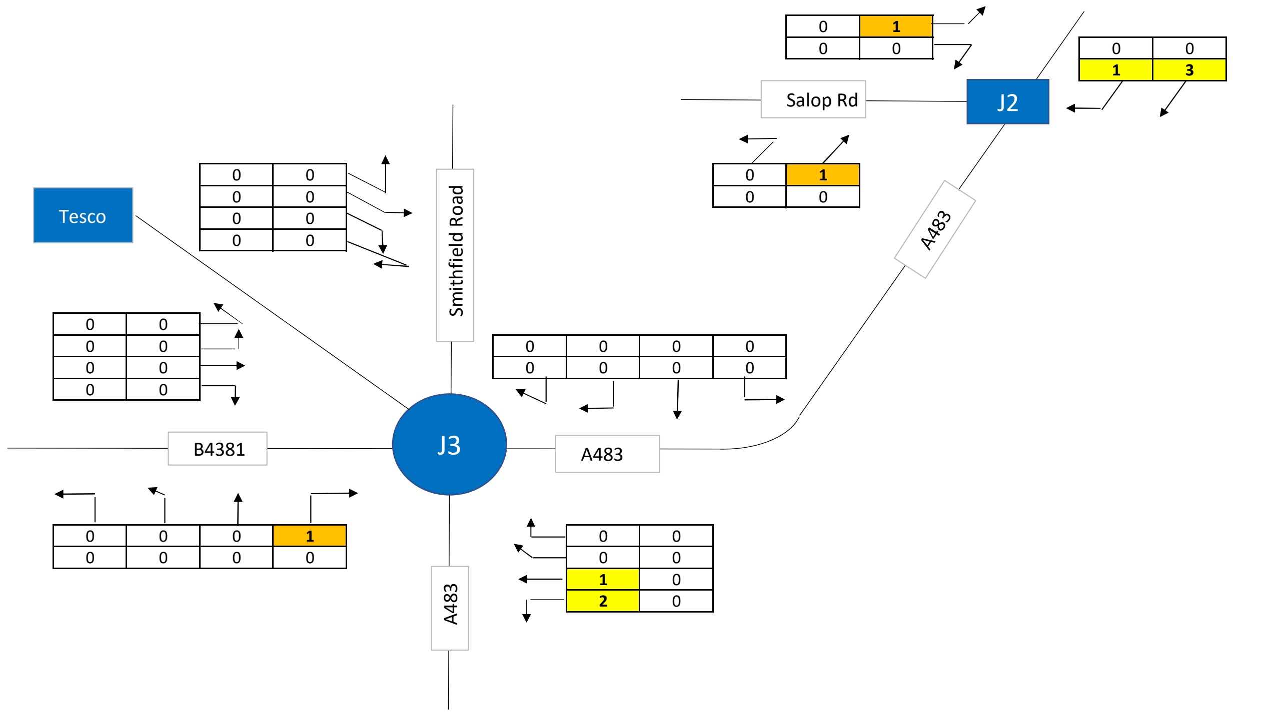
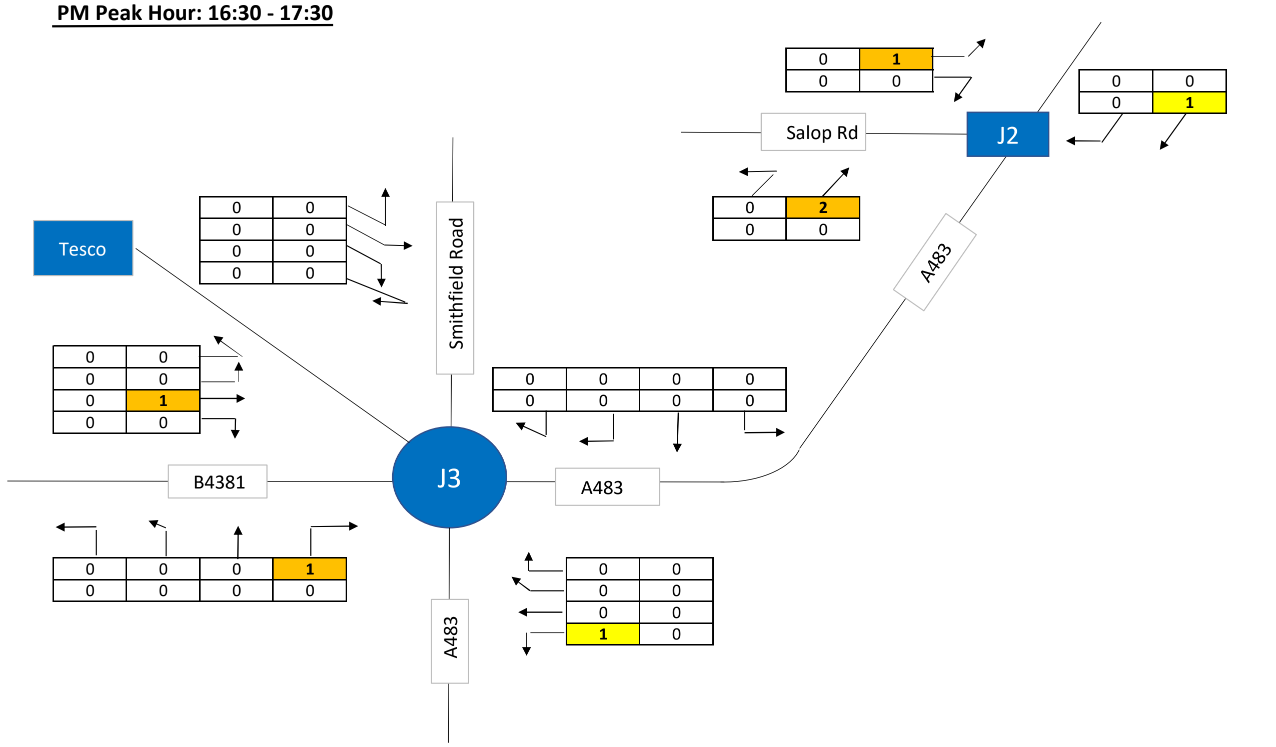
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (25 RESIDENTIAL DWELLING SCHEME)	**Drawing No:** FLOW DIAGRAM 10	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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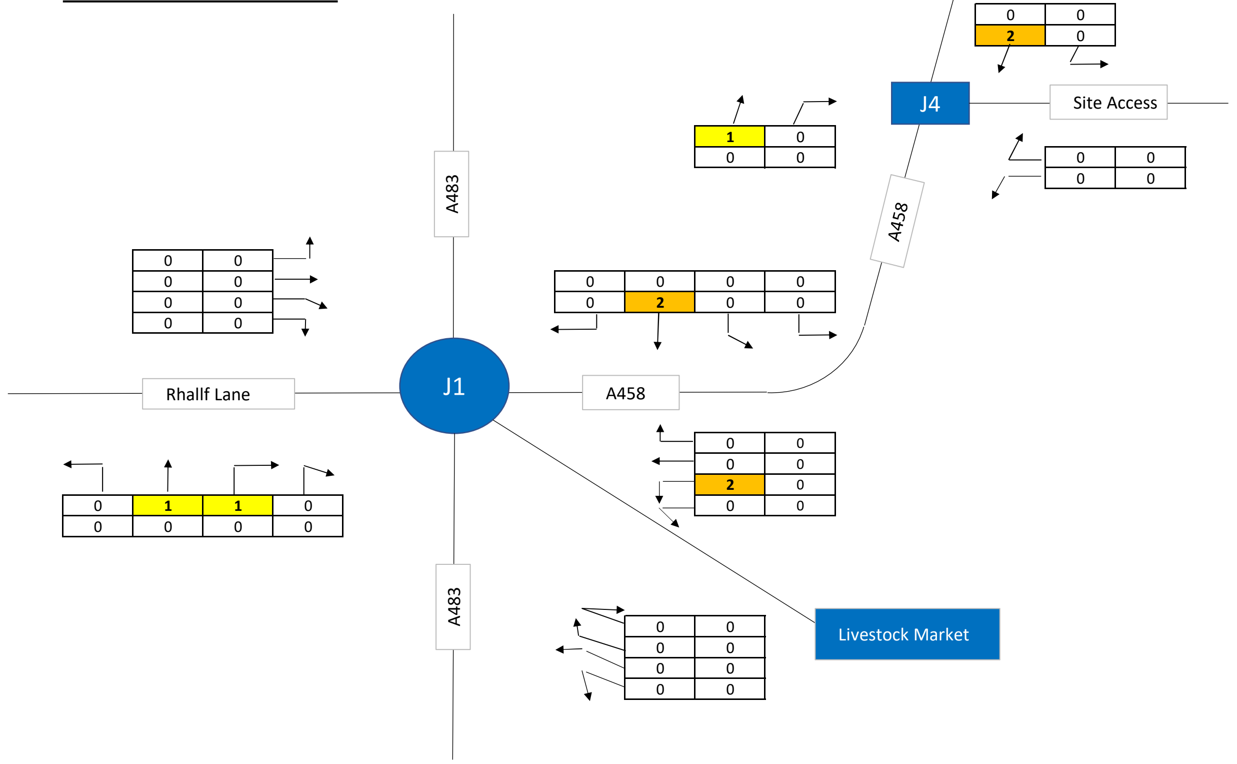
AM Peak Hour: 08:00 - 09:00



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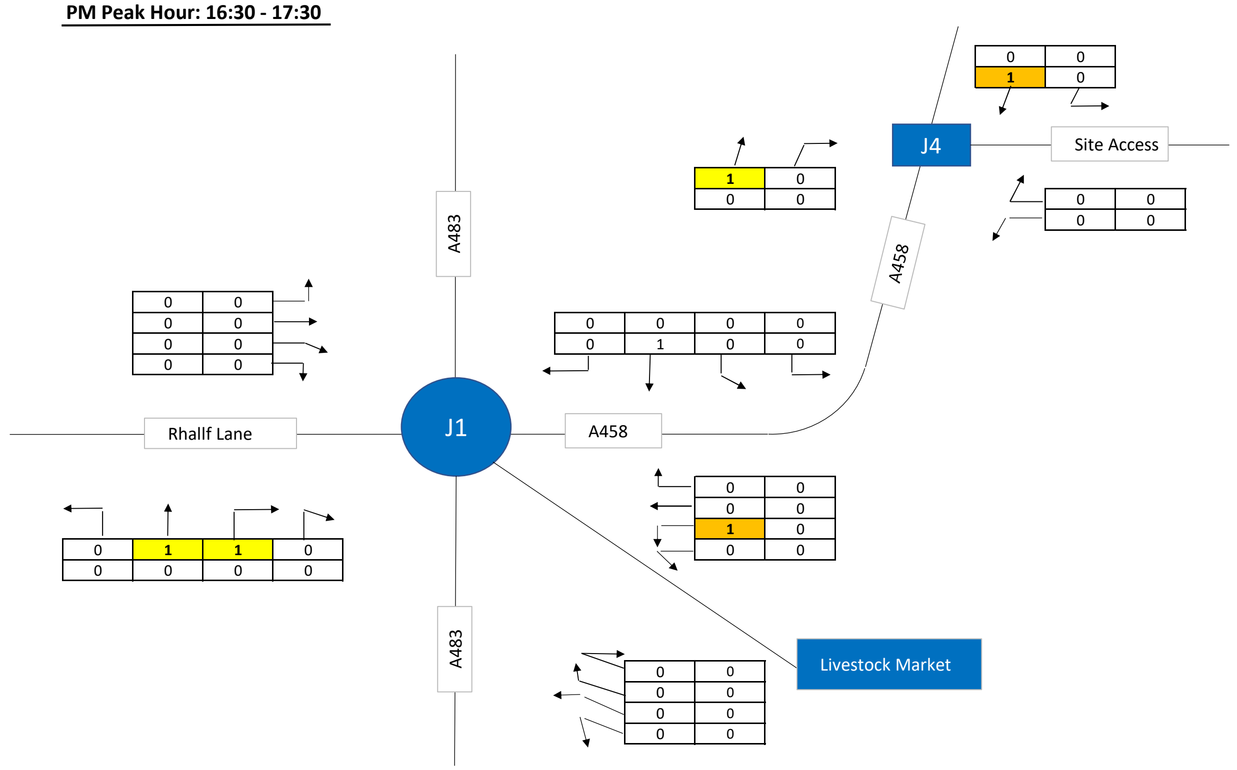

IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (PROPOSED STORAGE LOCKERS)	**Drawing No:** FLOW DIAGRAM 11	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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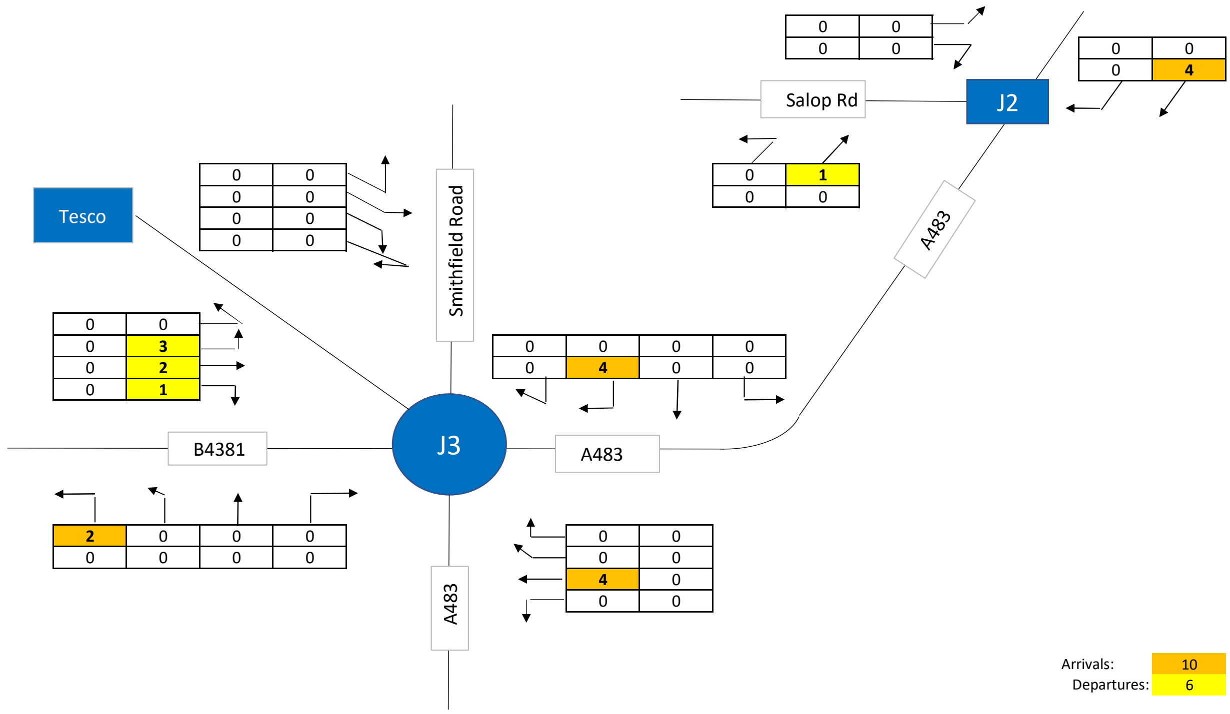
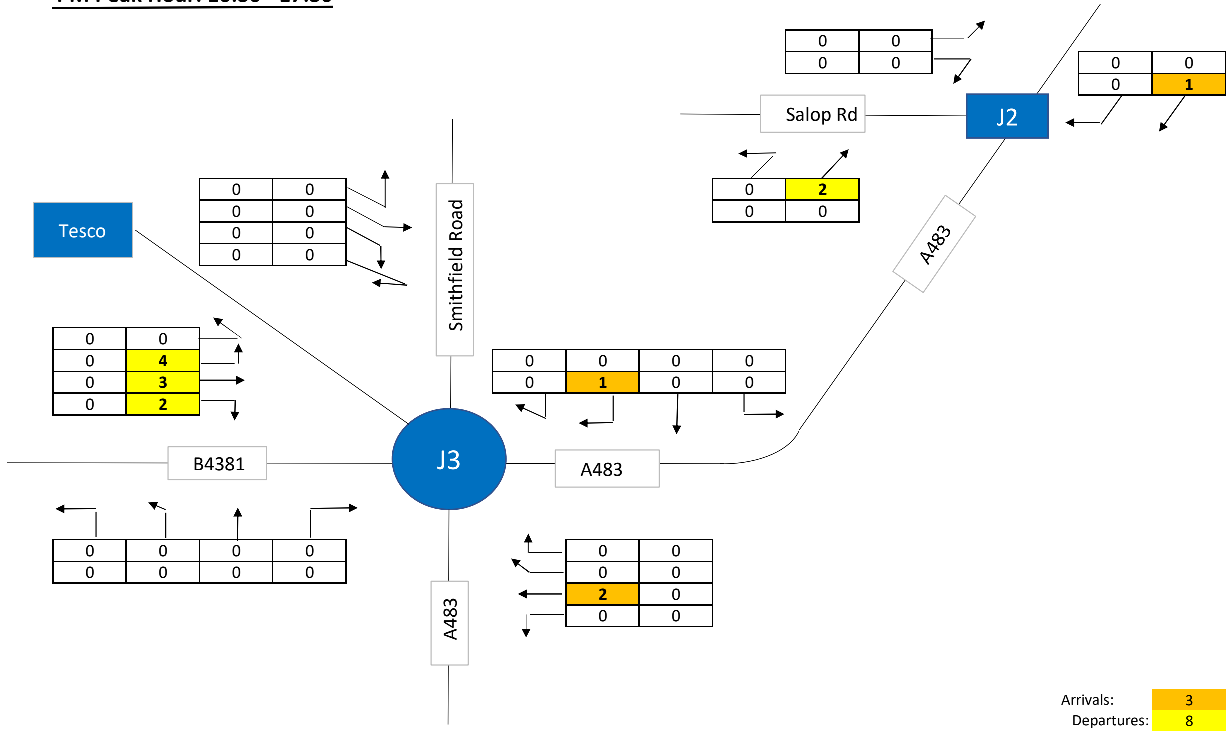
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		Intermodal Transportation
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (PROPOSED STORAGE LOCKERS)	**Drawing No:** FLOW DIAGRAM 12	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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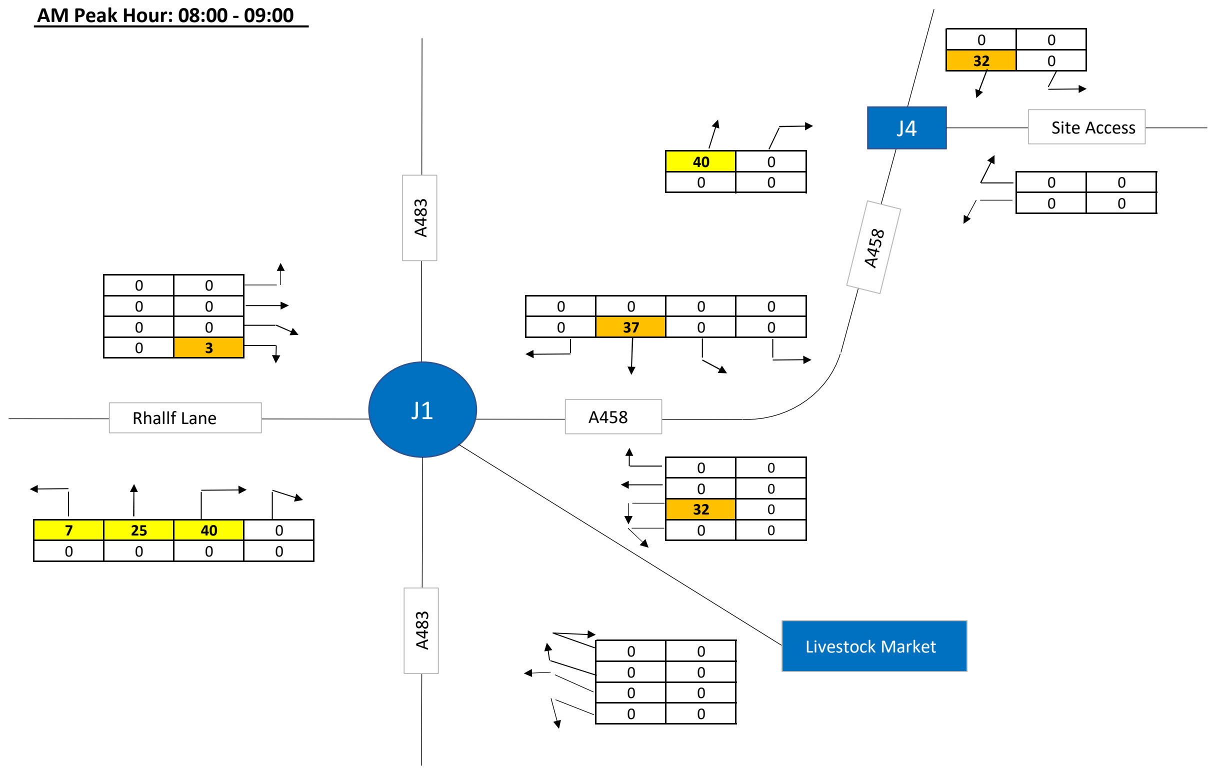
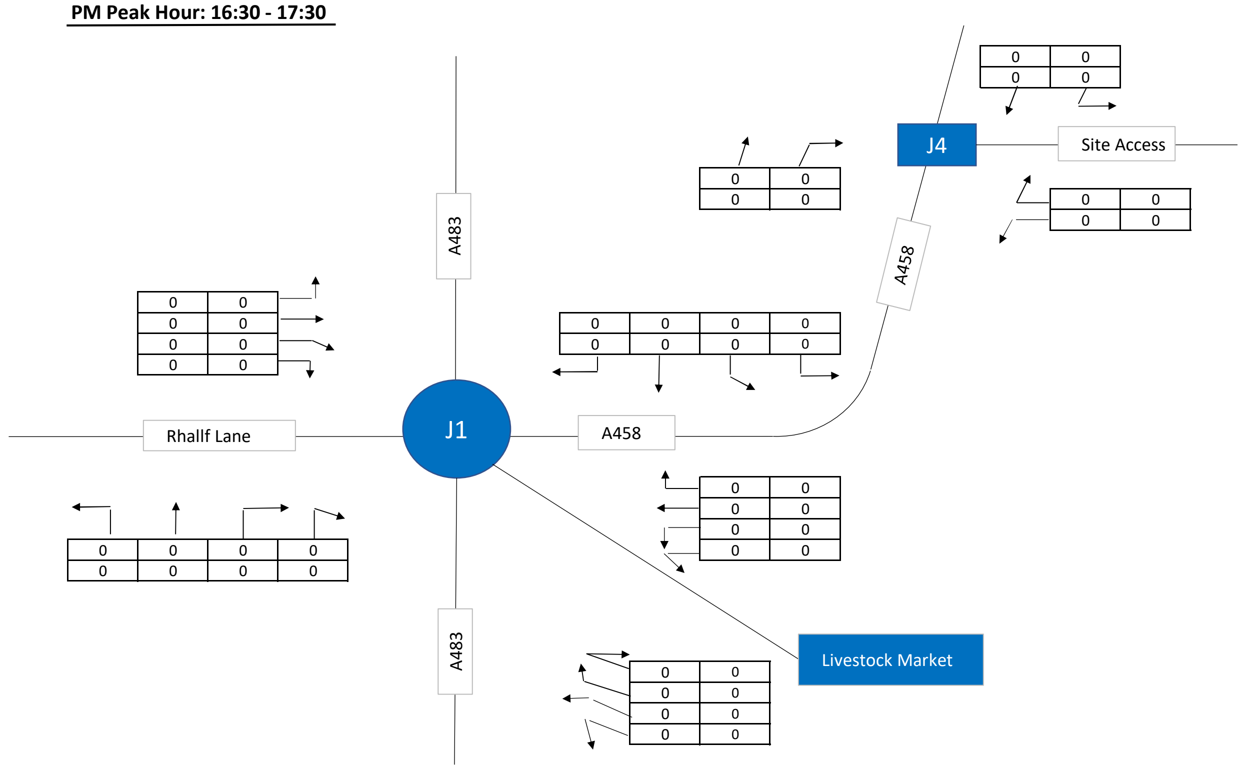
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (360 PLACE PRIMARY SCHOOL)	**Drawing No:** FLOW DIAGRAM 13	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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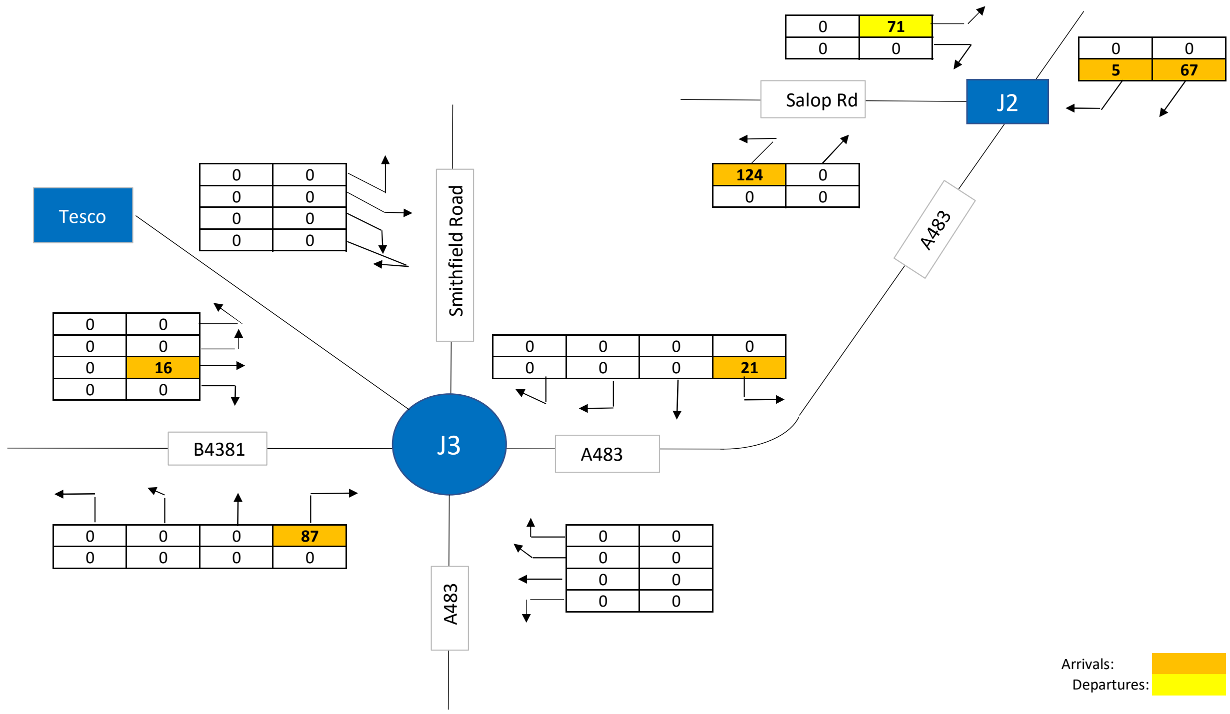
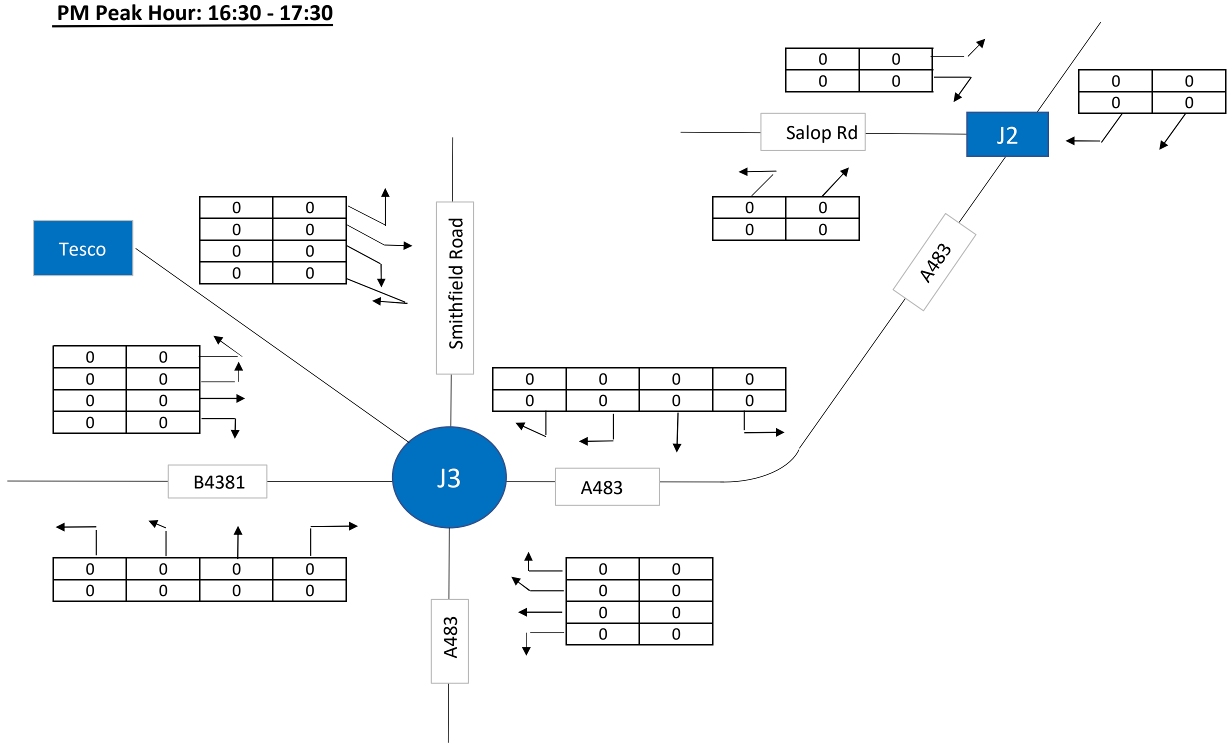
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (360 PLACE PRIMARY SCHOOL)	**Drawing No:** FLOW DIAGRAM 14	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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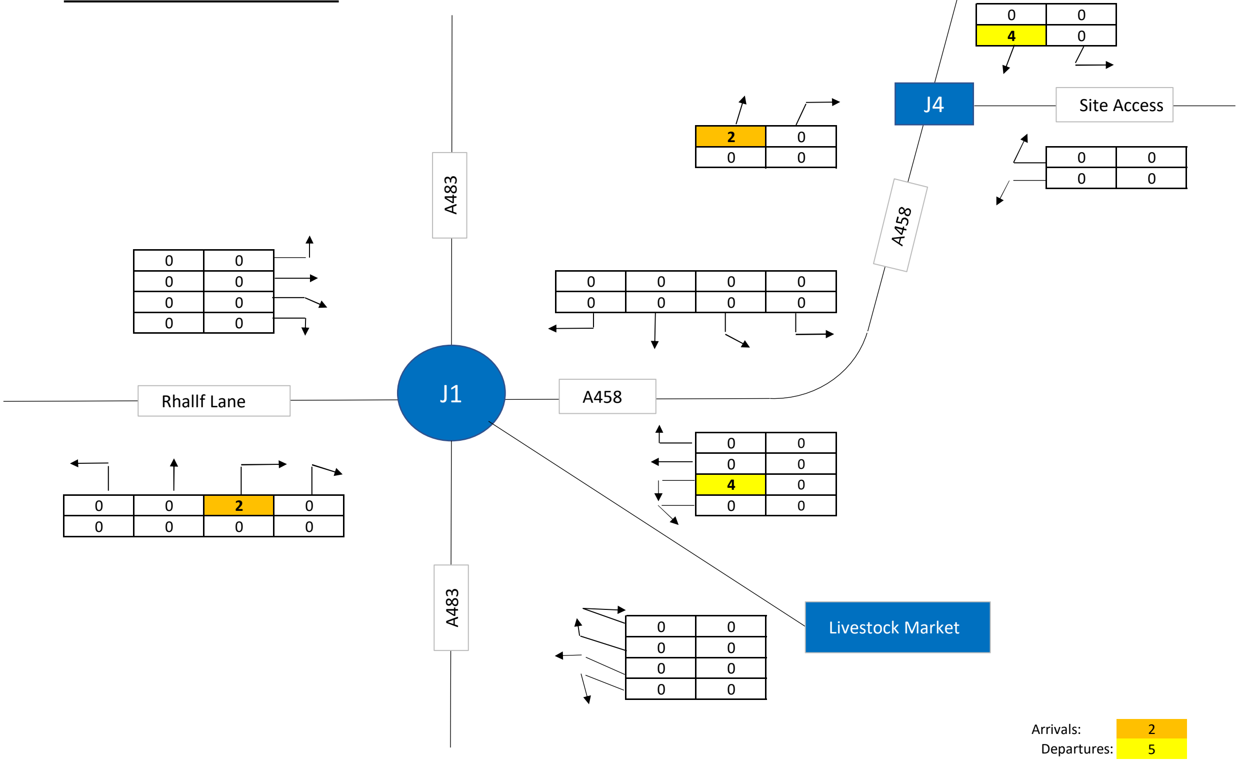
e: [redacted]

AM Peak Hour: 08:00 - 09:00



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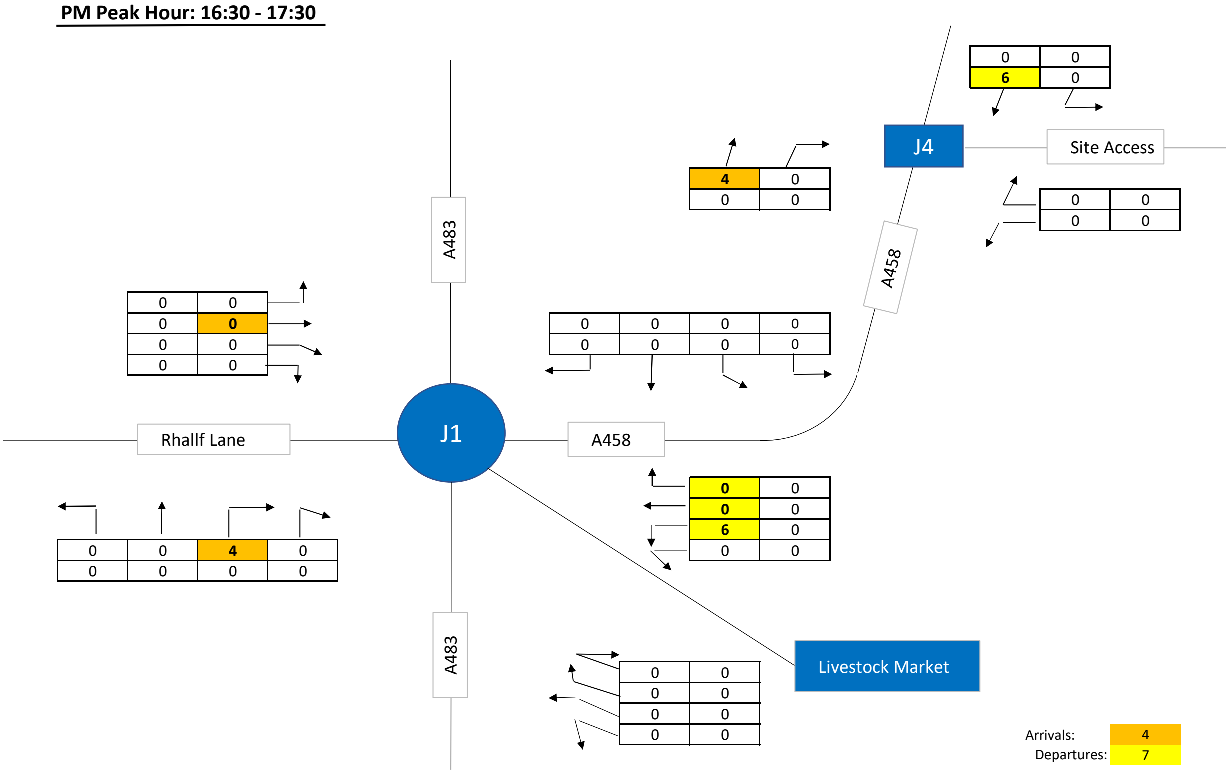

IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (COMMERCIAL WAREHOUSE)	**Drawing No:** FLOW DIAGRAM 15	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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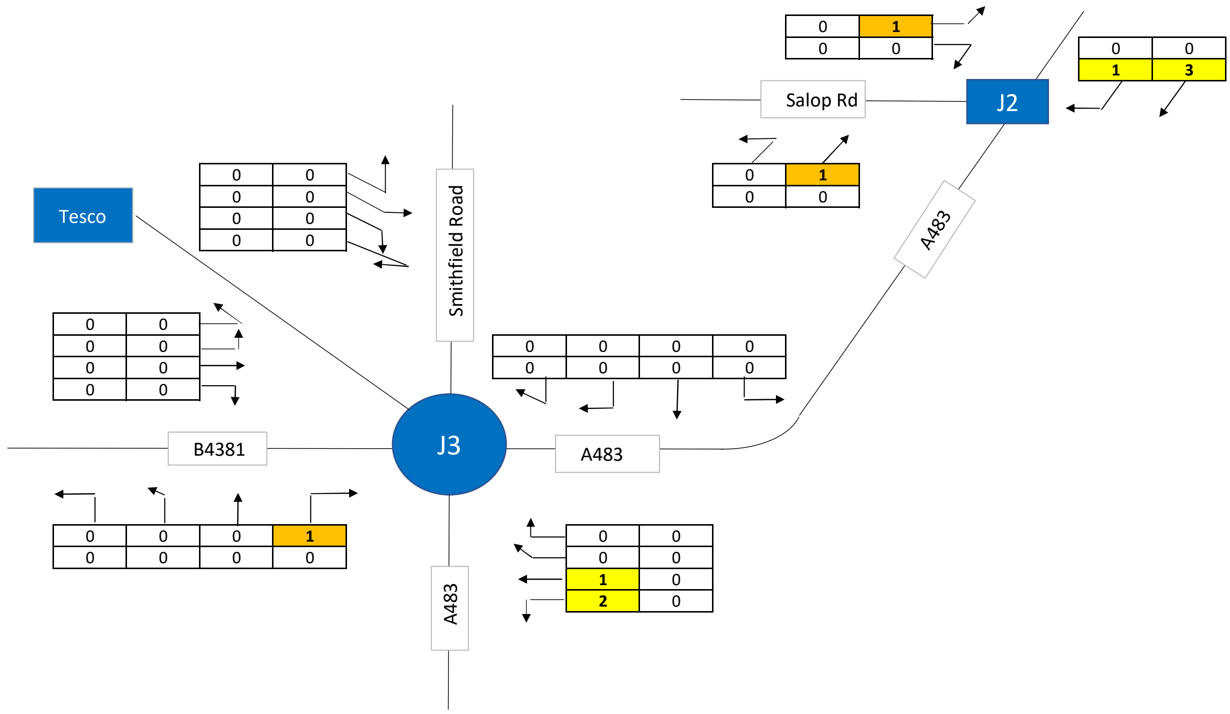
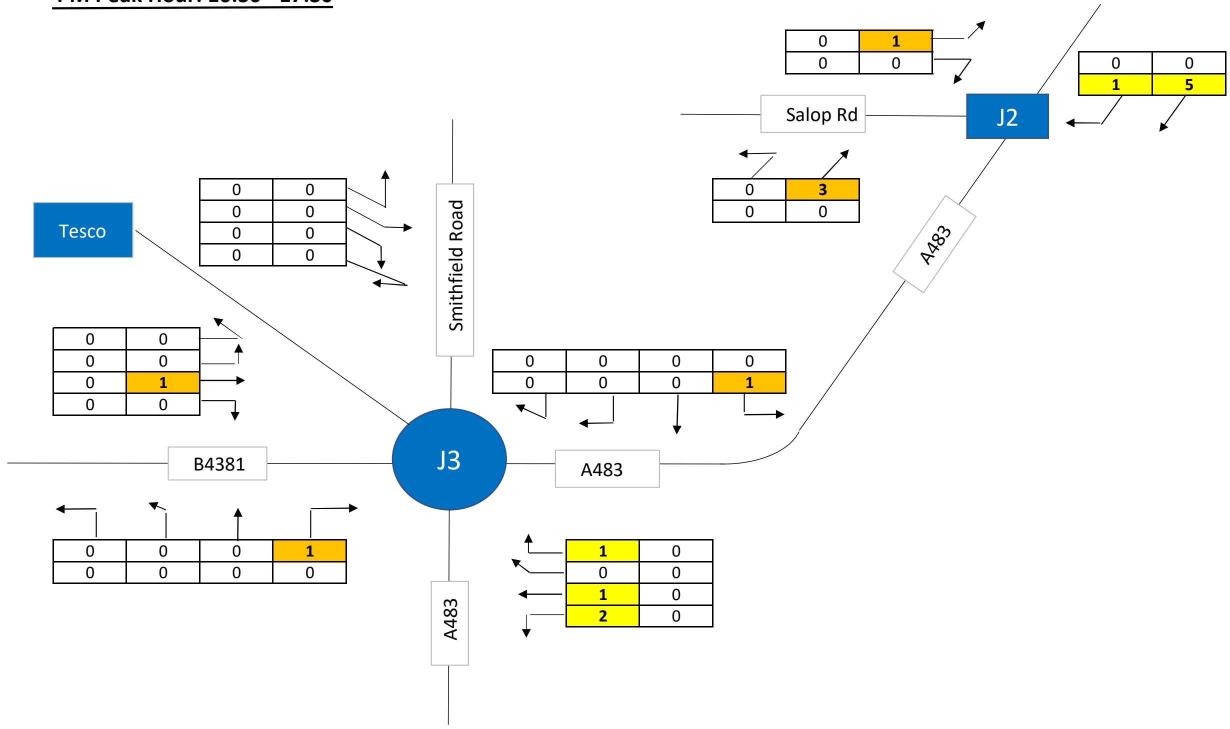
AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: COMMITTED DEVELOPMENTS DISTRIBUTION (COMMERCIAL WAREHOUSE)	**Drawing No:** FLOW DIAGRAM 16	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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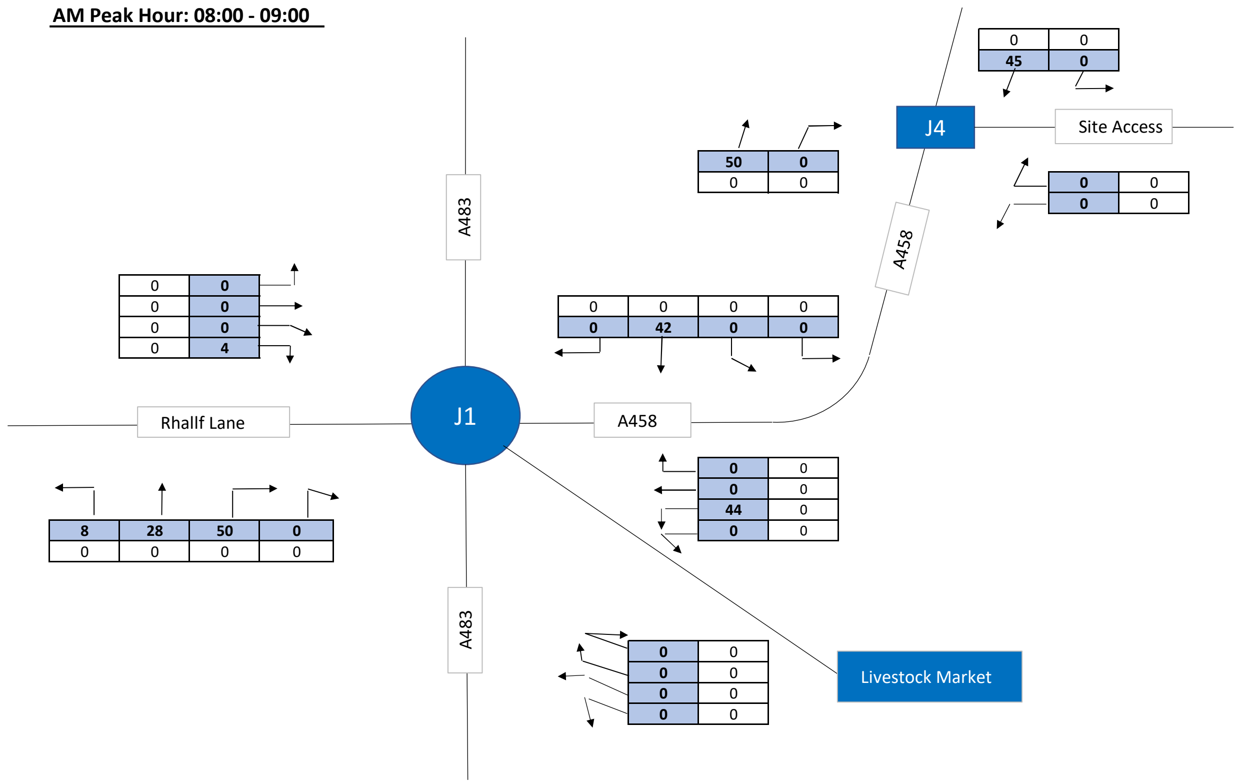
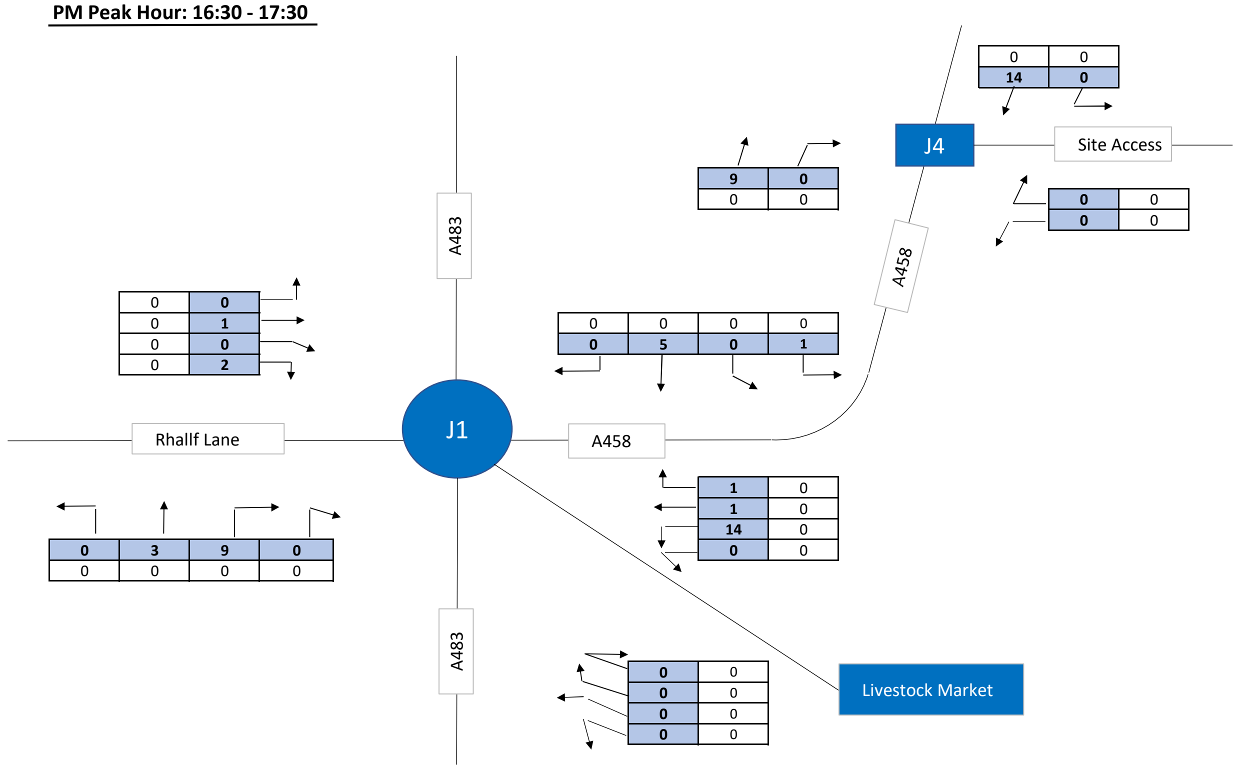
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		Intermodal Transportation
Drawing Title: TOTAL COMMITTED DEVELOPMENTS (J1 & J4)	**Drawing No:** FLOW DIAGRAM 17	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB	

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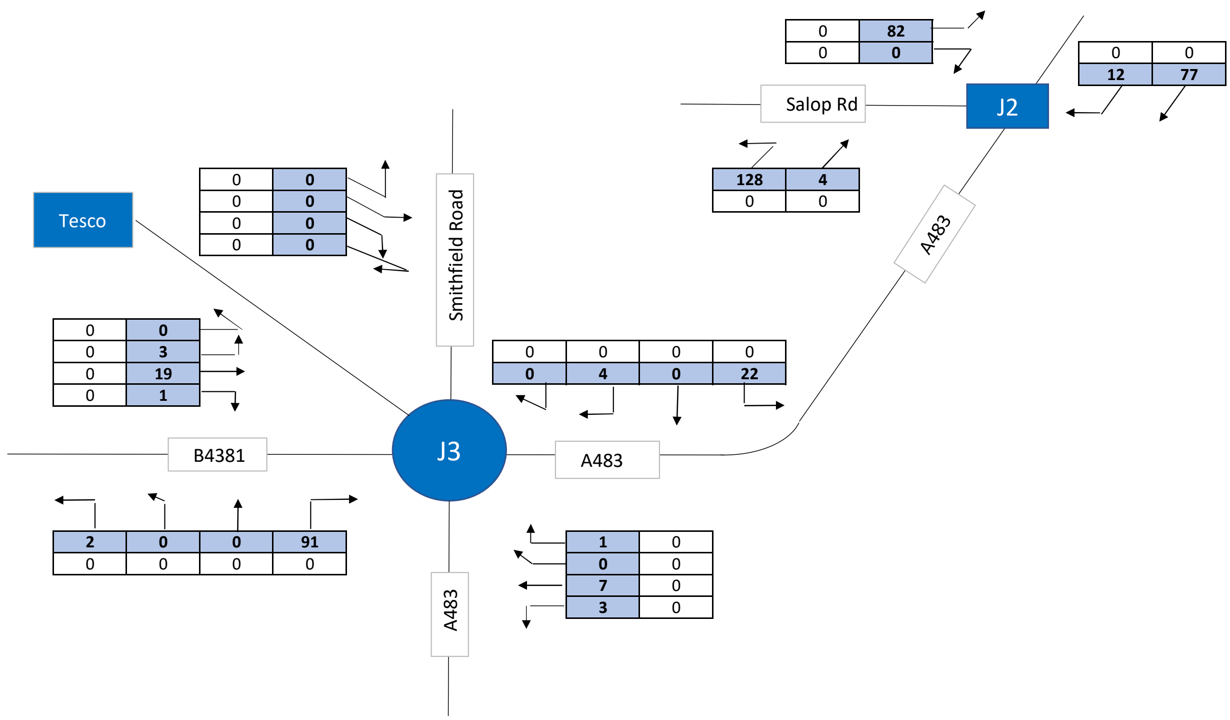
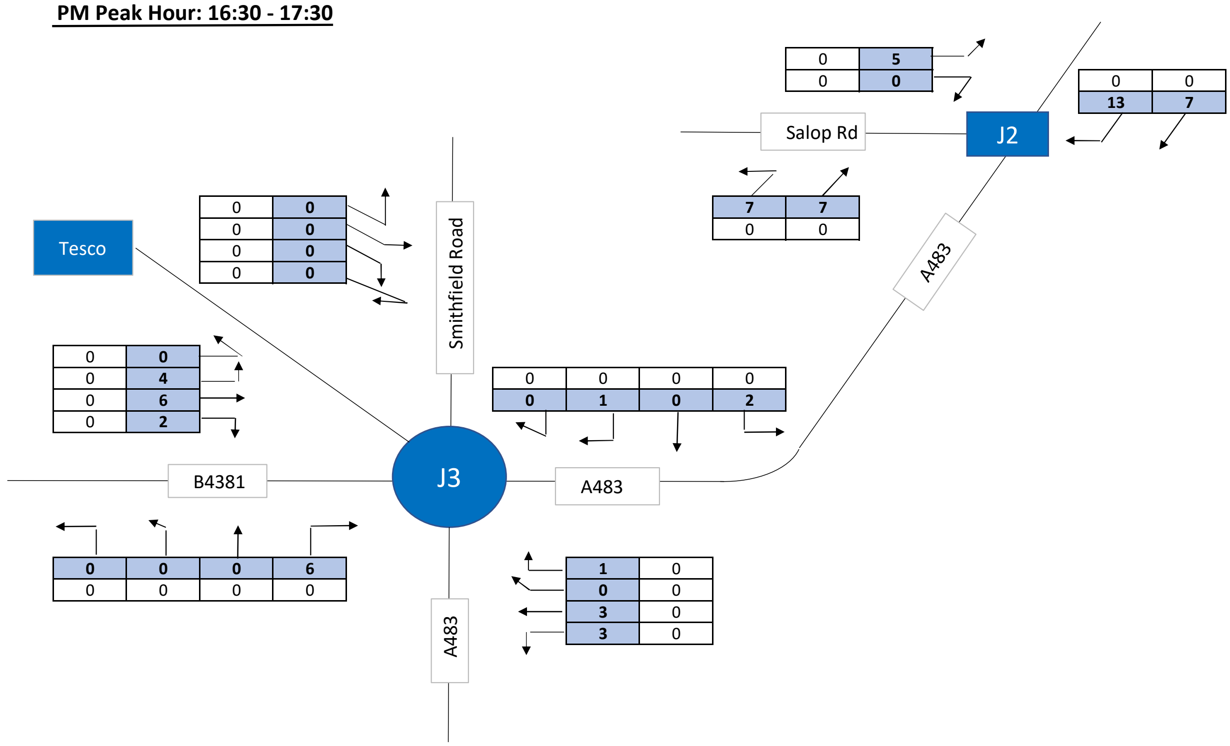
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date	
Drawing Title: TOTAL COMMITTED DEVELOPMENTS (J2 & J3)	**Drawing No:** FLOW DIAGRAM 18	**Date:** Dec-18
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB

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Essex CB11 4AA

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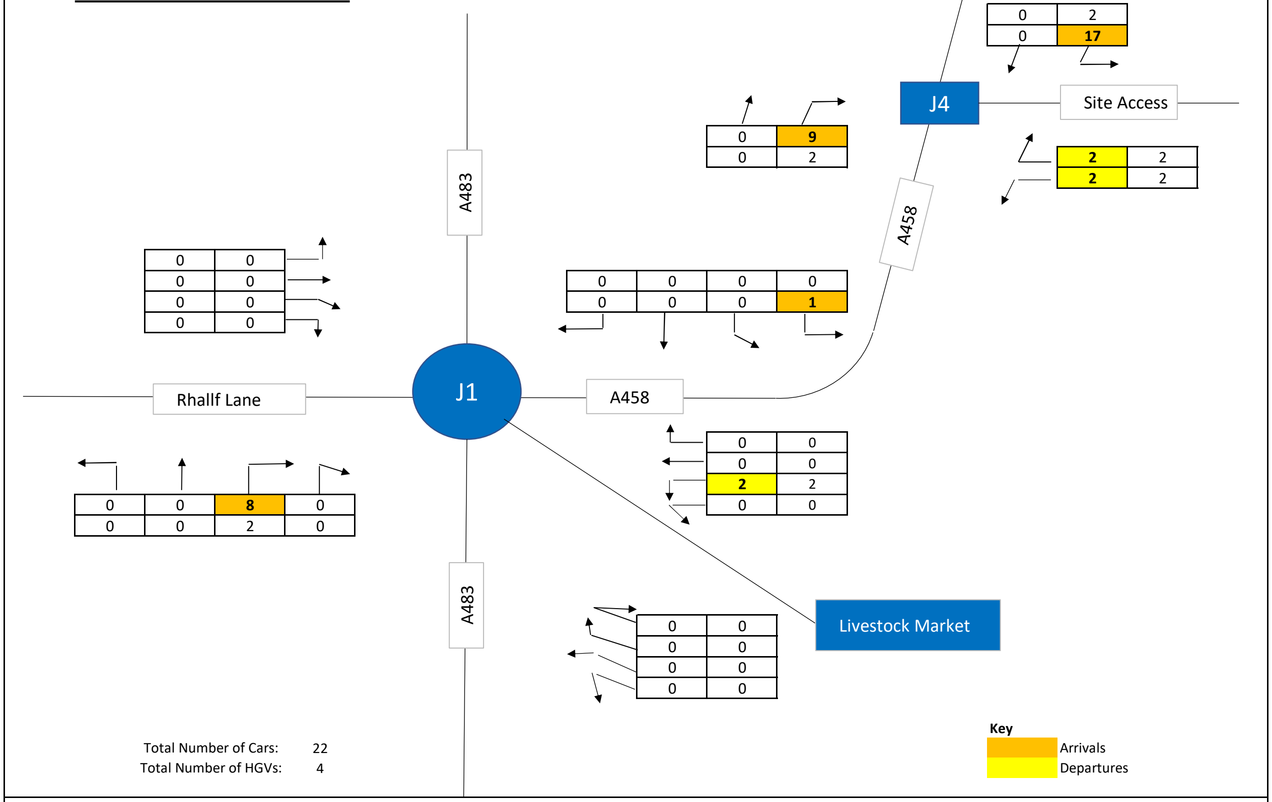
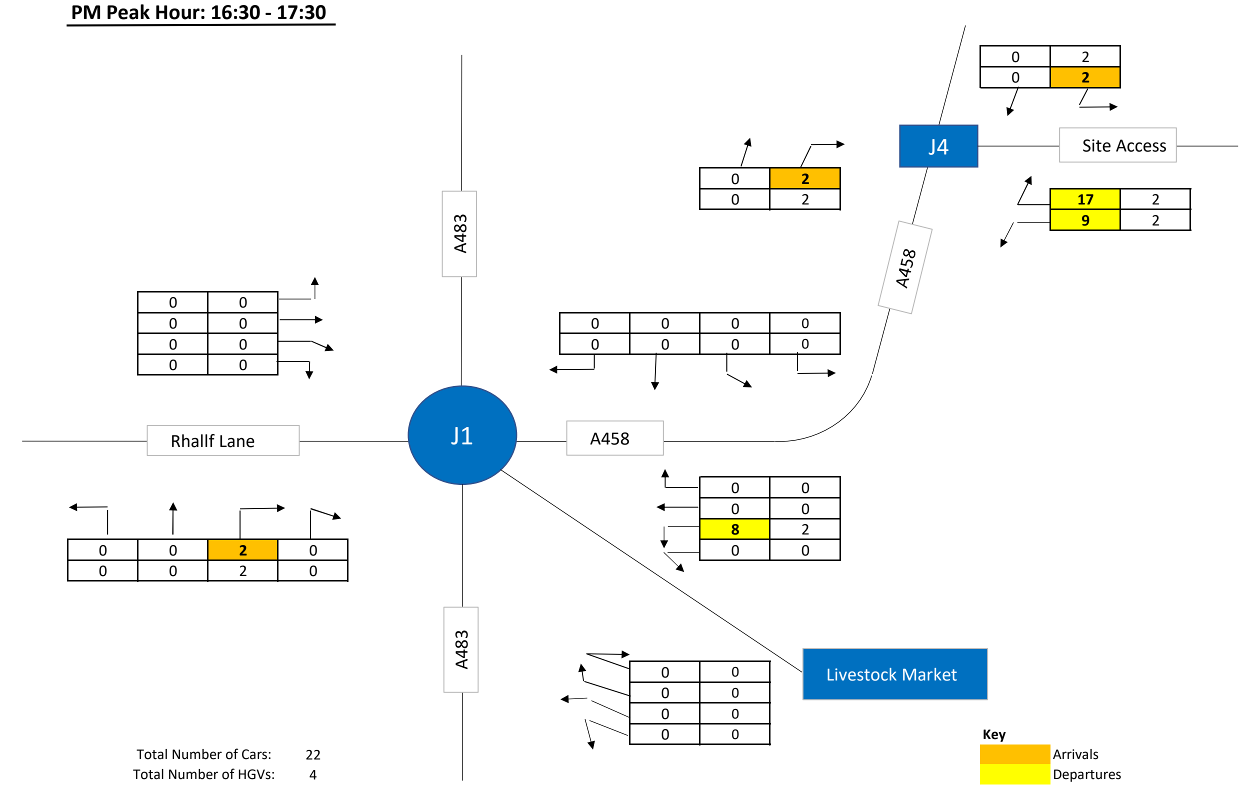
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project:

BUTTINGTON QUARRY

Rev | Description | Date

Drawing Title:

DEVELOPMENT TRAFFIC (J1 & J4)

Drawing No:

FLOW DIAGRAM 19

Date:

Dec-18

Client:

ENVIRONMENTAL COMPLIANCE LTD

Drawn By:

DS

Approved By :

JB

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Essex CB11 4AA

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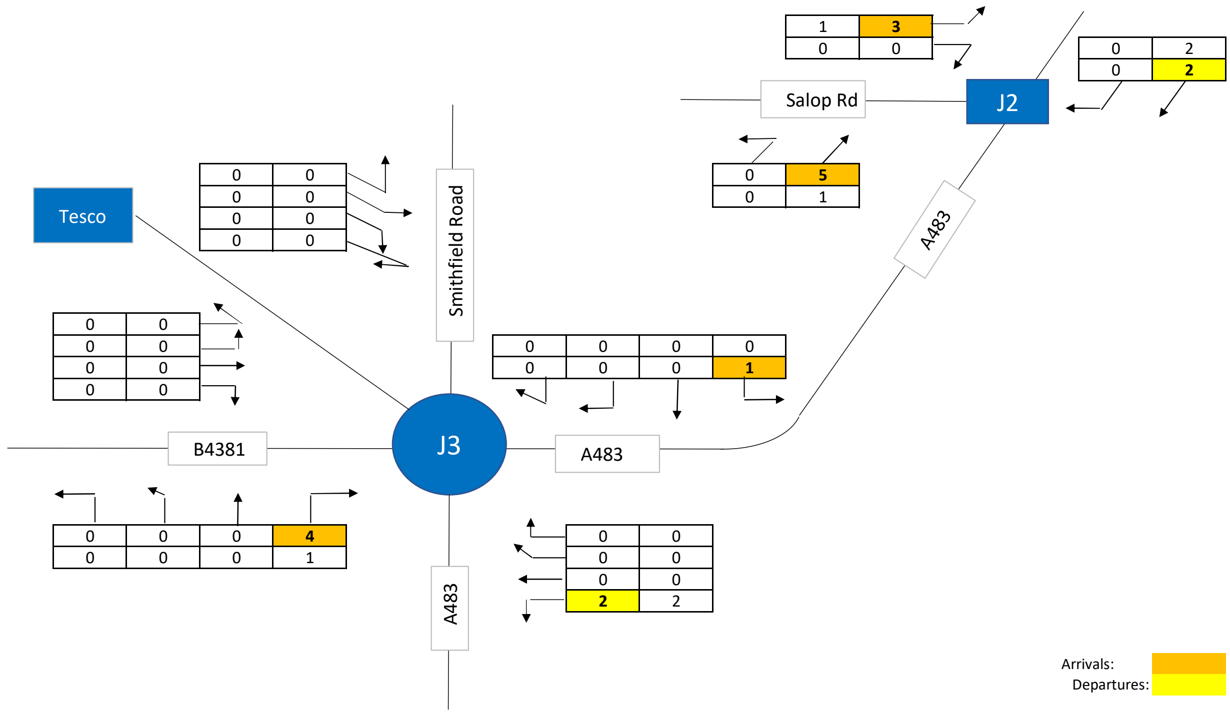
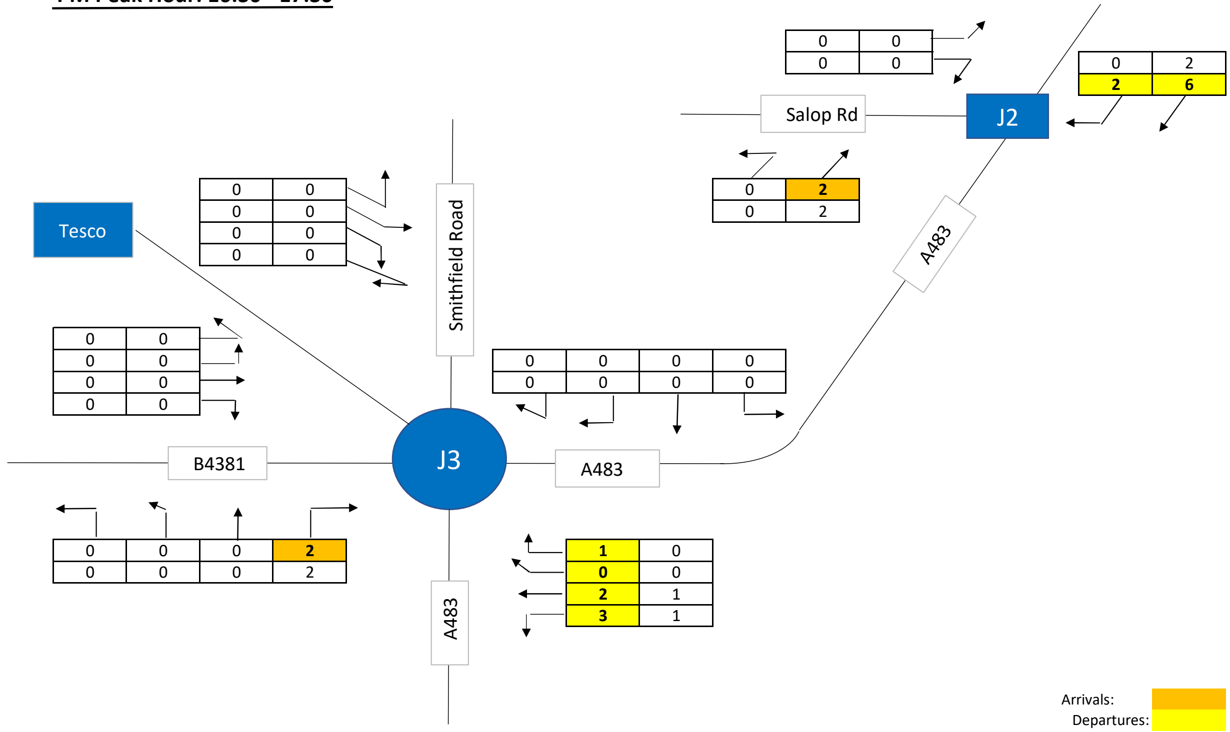
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		Intermodal Transportation
Drawing Title: DEVELOPMENT TRAFFIC (J2 & J3)	**Drawing No:** FLOW DIAGRAM 20	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

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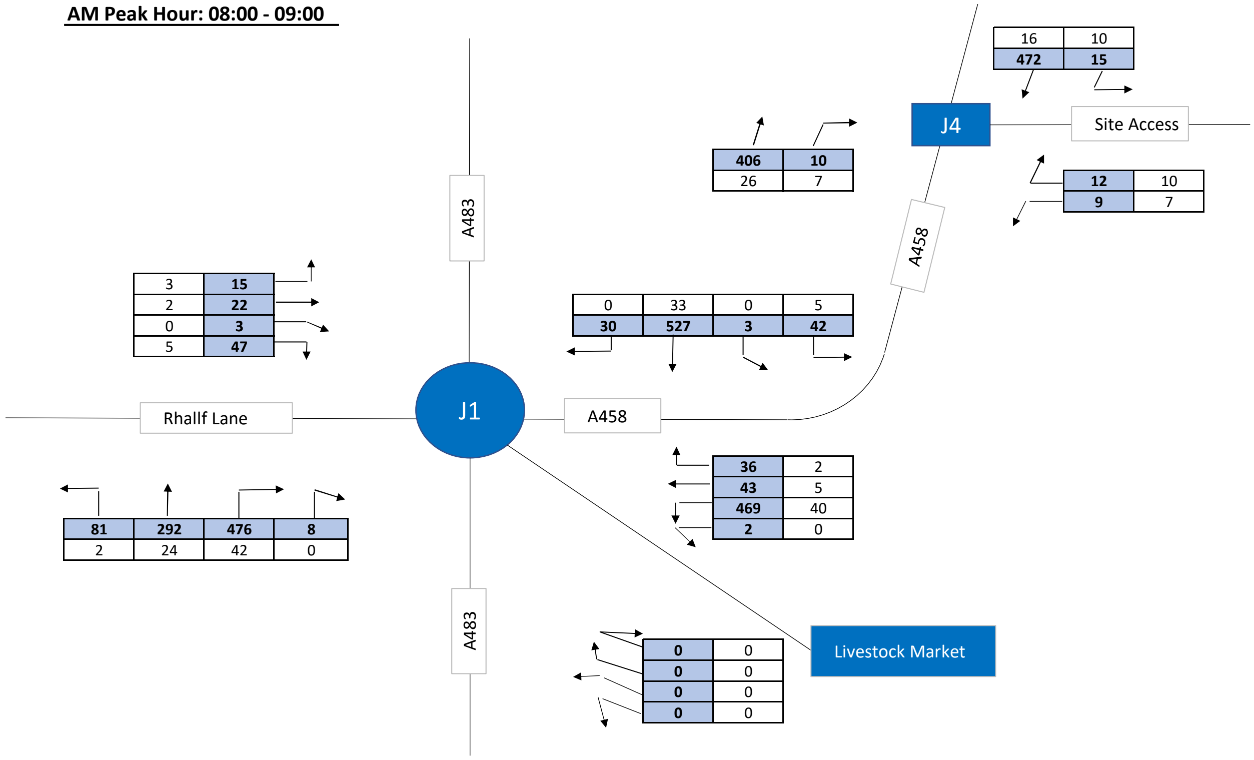
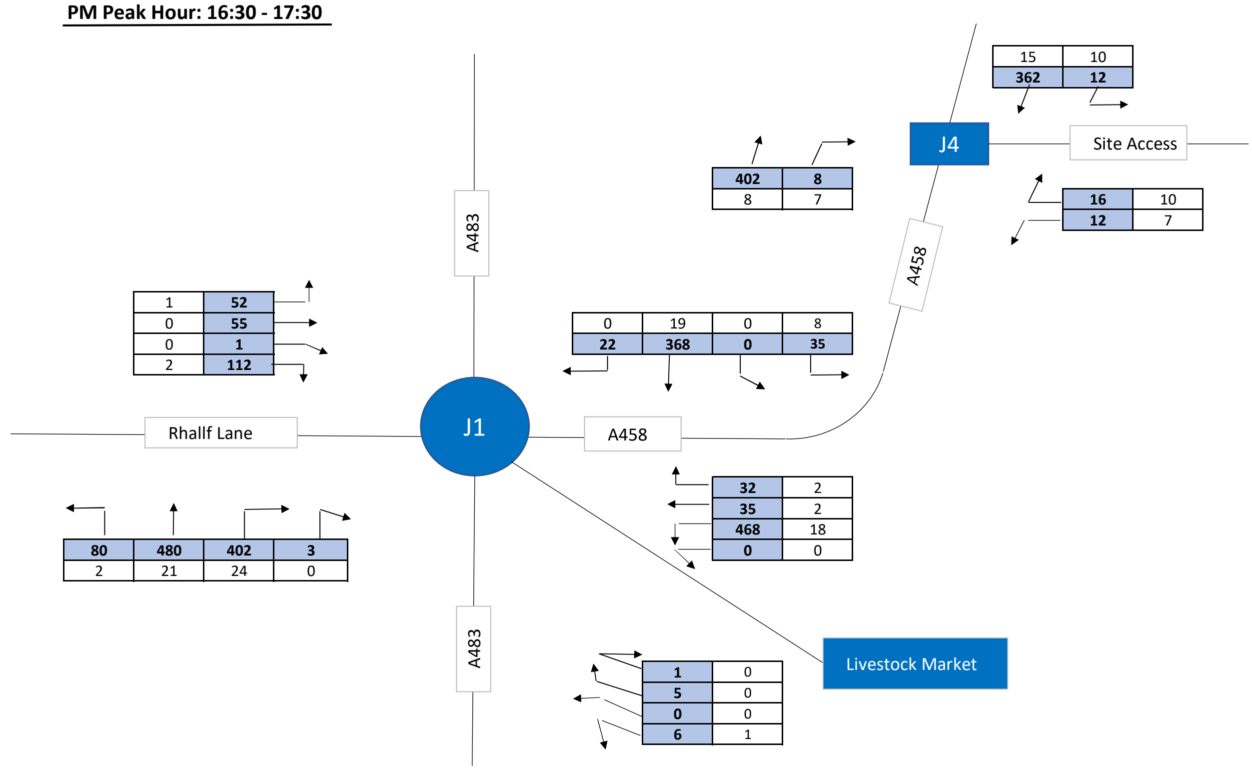
e:[redacted]

AM Peak Hour: 08:00 - 09:00



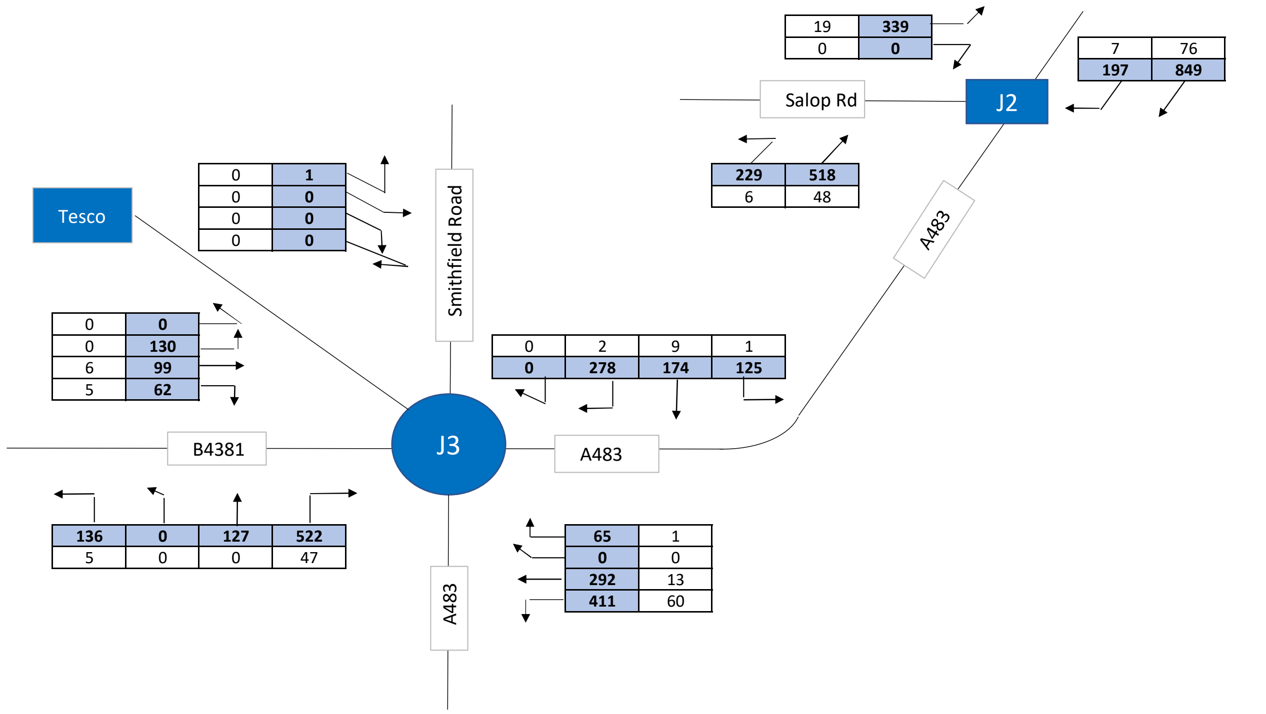
PM Peak Hour: 16:30 - 17:30



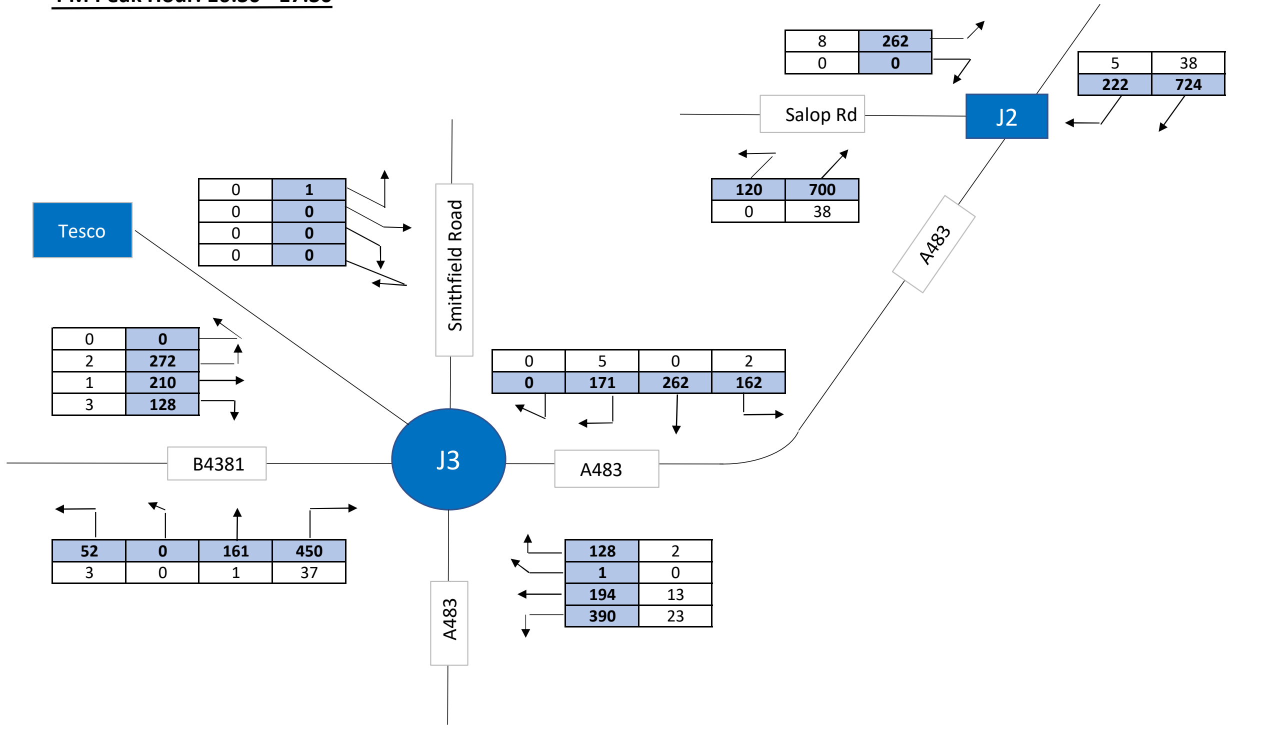
IT Project: BUTTINGTON QUARRY	Rev	Description	Date	
Drawing Title: BASE 2030 + COMMITTED DEVELOPMENT FLOWS (J1 & J4)	**Drawing No:** FLOW DIAGRAM 21	**Date:** Dec-18		
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** DS	**Approved By :** JB		

Intermodal
TRANSPORTATION
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA
Tel: +44 (0)1799 529529
Fax: +44 (0)1799 529530
e: [redacted]

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project:

BUTTINGTON QUARRY

Rev	Description	Date

Drawing Title:

BASE 2030 + COMMITTED DEVELOPMENT FLOWS (J2 & J3)

Drawing No: FLOW DIAGRAM 22

Date: Dec-18

Client:

ENVIRONMENTAL COMPLIANCE LTD

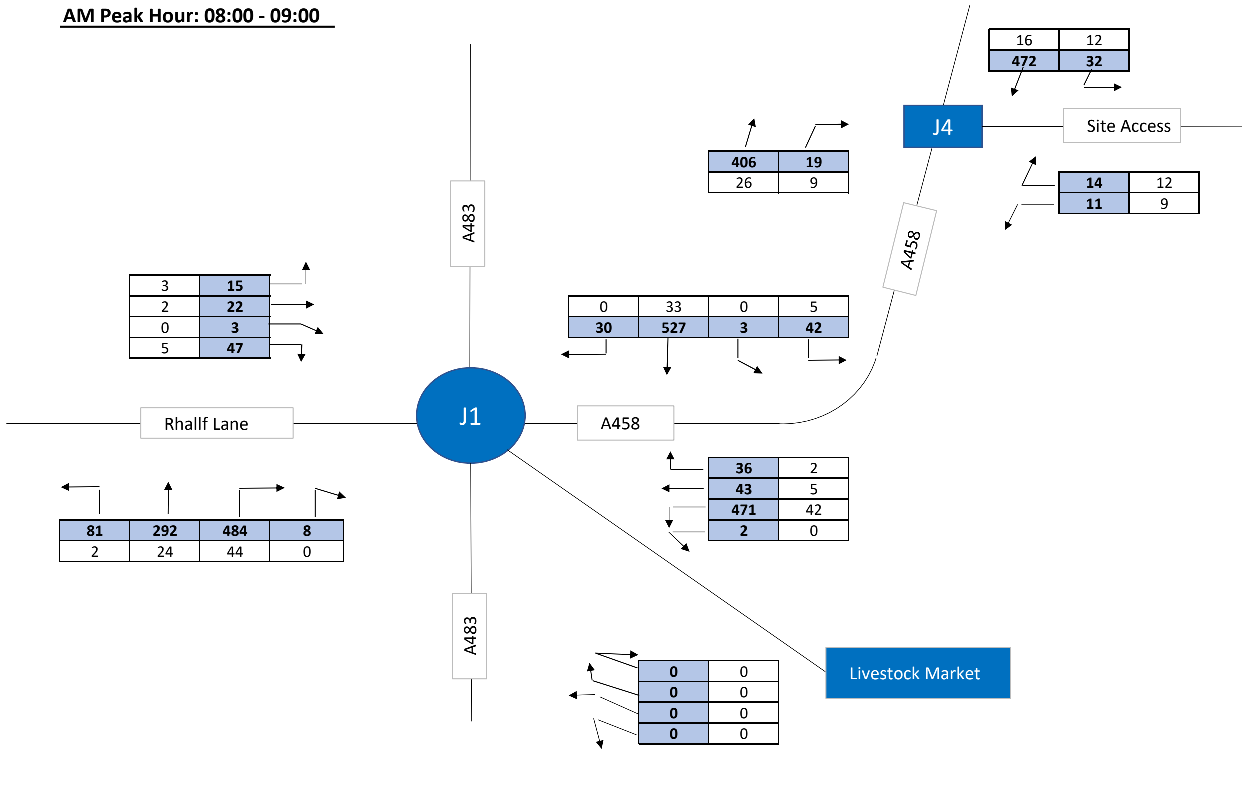
Drawn By: GH

Approved By : JB

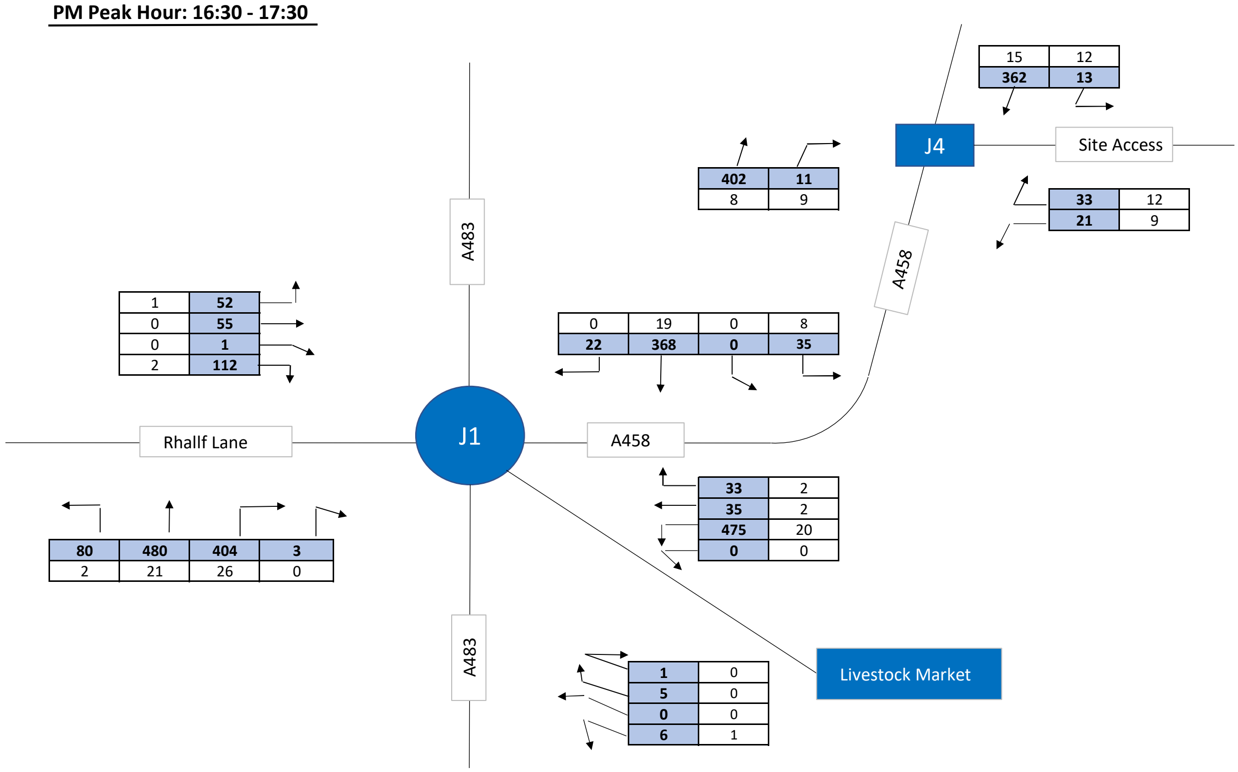
Intermodal Transportation
Hunters Court
Debden Road
Saffron Walden
Essex CB11 4AA

Tel: +44 (0)1799 529529
Fax: +44 (0)1799 529530
e: [redacted]

AM Peak Hour: 08:00 - 09:00

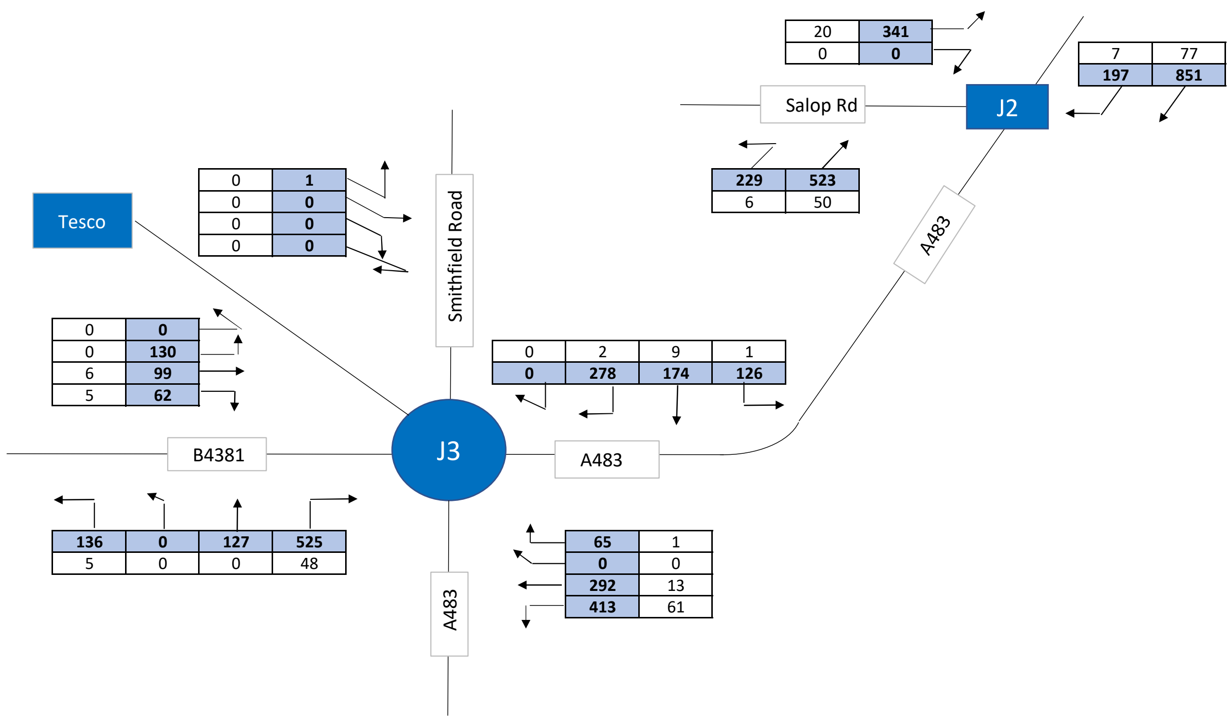


PM Peak Hour: 16:30 - 17:30

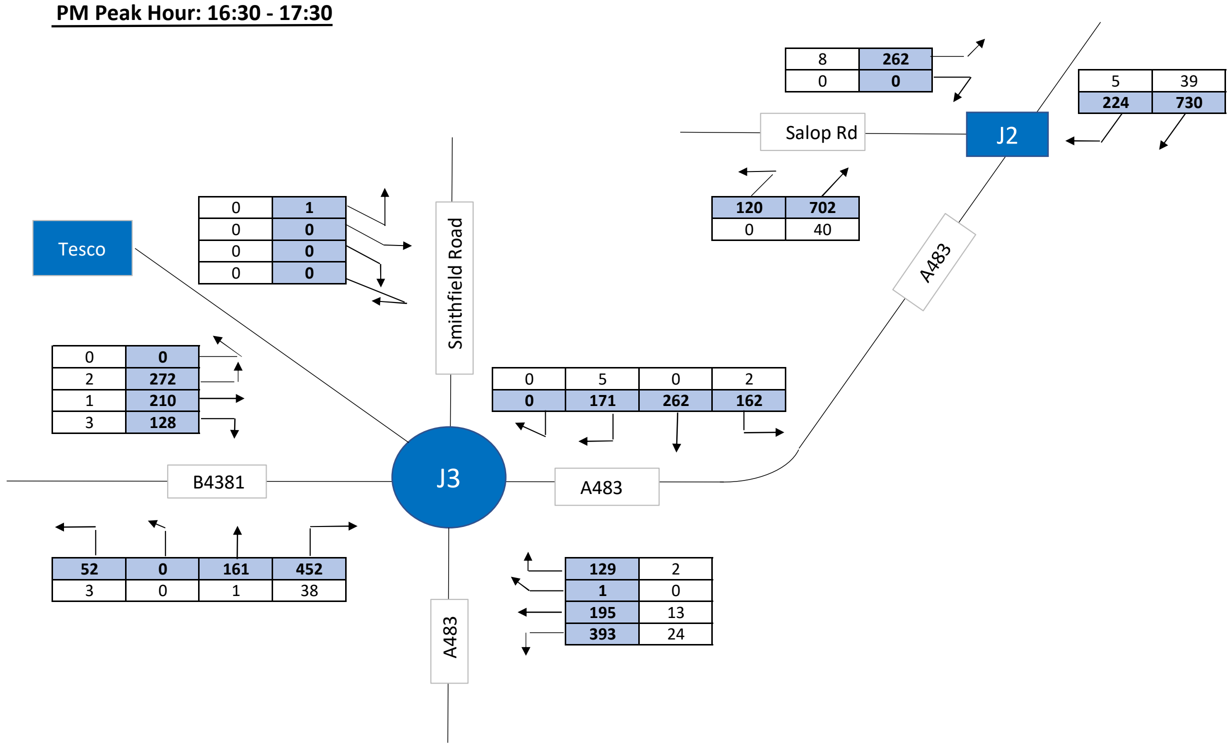


IT Project: BUTTINGTON QUARRY	Rev / Description / Date		Intermodal Transportation Hunters Court Debden Road Saffron Walden Essex CB11 4AA Tel: +44 (0)1799 529529 Fax: +44 (0)1799 529530 e: [redacted]
Drawing Title: BASE 2030 + COMMITTED + DEVELOPMENT FLOWS (J1 & J4)	Drawing No: FLOW DIAGRAM 23	Date: Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	Drawn By: DS	Approved By : JB	

AM Peak Hour: 08:00 - 09:00



PM Peak Hour: 16:30 - 17:30



IT Project: BUTTINGTON QUARRY	Rev / Description / Date		
Drawing Title: BASE 2030 + COMMITTED + DEVELOPMENT FLOWS (J2 & J3)	**Drawing No:** FLOW DIAGRAM 24	**Date:** Dec-18	
Client: ENVIRONMENTAL COMPLIANCE LTD	**Drawn By:** GH	**Approved By :** JB	

Intermodal Transportation
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APPENDIX J

CAPACITY ASSESSMENT RESULTS

Junctions 8

ARCADY 8 - Roundabout Module

Filename: A458-A483 RBT EIA.arc8
Path: C:\ITL Jobs\IT1921 Buttington Quarry\PICADY\Junction 1
Report generation date: 24/08/2020 12:56:07

» (Default Analysis Set) - Base 2030, AM
» (Default Analysis Set) - Base 2030, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030							
Arm 1	0.82	4.79	0.45	A	0.52	4.06	0.34	A
Arm 2	1.29	8.48	0.57	A	1.12	7.12	0.53	A
Arm 3	0.00	0.00	0.00	A	0.01	2.59	0.01	A
Arm 4	0.83	3.53	0.45	A	1.16	4.01	0.54	A
Arm 5	0.10	3.87	0.09	A	0.30	4.56	0.23	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030, AM " model duration: 07:45 - 09:15
"D2 - Base 2030, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 24/08/2020 12:56:06

File summary

Title	IT1921 - A458 -A483 RBT
Location	Buttington, Wales
Site Number	Junction 1
Date	11/02/2019
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	IT1921
Enumerator	ghill
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, AM	Base 2030	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			5.22	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	559.00	100.000
2	ONE HOUR	✓	504.00	100.000
3	ONE HOUR	✓	0.00	100.000
4	ONE HOUR	✓	770.00	100.000
5	ONE HOUR	✓	84.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	41.000	3.000	485.000	30.000
	2	35.000	0.000	2.000	425.000	42.000
	3	0.000	0.000	0.000	0.000	0.000
	4	263.000	426.000	8.000	0.000	73.000
	5	15.000	22.000	3.000	44.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.07	0.01	0.87	0.05
	2	0.07	0.00	0.00	0.84	0.08
	3	0.20	0.20	0.20	0.20	0.20
	4	0.34	0.55	0.01	0.00	0.09
	5	0.18	0.26	0.04	0.52	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.121	1.000	1.068	1.000
	2	1.057	1.000	1.000	1.094	1.119
	3	1.000	1.000	1.000	1.000	1.000
	4	1.091	1.099	1.000	1.000	1.027
	5	1.200	1.090	1.000	1.114	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	12.1	0.0	6.8	0.0
	2	5.7	0.0	0.0	9.4	11.9
	3	0.0	0.0	0.0	0.0	0.0
	4	9.1	9.9	0.0	0.0	2.7
	5	20.0	9.0	0.0	11.4	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.45	4.79	0.82	A
2	0.57	8.48	1.29	A
3	0.00	0.00	0.00	A
4	0.45	3.53	0.83	A
5	0.09	3.87	0.10	A

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	420.85	419.26	377.51	0.00	1474.60	0.285	0.40	3.407	A
2	379.44	377.30	429.77	0.00	1084.52	0.350	0.53	5.075	A
3	0.00	0.00	795.07	0.00	1733.85	0.000	0.00	0.000	A
4	579.70	577.94	80.14	0.00	1891.62	0.306	0.44	2.737	A
5	63.24	63.01	549.35	0.00	1167.22	0.054	0.06	3.260	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	502.53	501.96	451.82	0.00	1429.07	0.352	0.54	3.880	A
2	453.09	452.17	514.55	0.00	1040.16	0.436	0.76	6.112	A
3	0.00	0.00	952.35	0.00	1614.56	0.000	0.00	0.000	A
4	692.21	691.66	96.02	0.00	1881.33	0.368	0.58	3.024	A
5	75.51	75.45	657.48	0.00	1106.37	0.068	0.07	3.491	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	615.47	614.38	553.17	0.00	1366.97	0.450	0.81	4.776	A
2	554.91	552.85	629.81	0.00	979.86	0.566	1.28	8.390	A
3	0.00	0.00	1165.06	0.00	1453.23	0.000	0.00	0.000	A
4	847.78	846.80	117.44	0.00	1867.45	0.454	0.83	3.524	A
5	92.49	92.38	804.91	0.00	1023.41	0.090	0.10	3.866	A

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	615.47	615.46	553.80	0.00	1366.58	0.450	0.82	4.792	A
2	554.91	554.86	630.87	0.00	979.30	0.567	1.29	8.479	A
3	0.00	0.00	1168.11	0.00	1450.91	0.000	0.00	0.000	A
4	847.78	847.77	117.80	0.00	1867.21	0.454	0.83	3.530	A
5	92.49	92.48	805.94	0.00	1022.84	0.090	0.10	3.869	A

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	502.53	503.61	452.82	0.00	1428.46	0.352	0.55	3.896	A
2	453.09	455.13	516.18	0.00	1039.31	0.436	0.78	6.183	A
3	0.00	0.00	956.90	0.00	1611.09	0.000	0.00	0.000	A
4	692.21	693.19	96.56	0.00	1880.98	0.368	0.59	3.032	A
5	75.51	75.62	659.08	0.00	1105.48	0.068	0.07	3.497	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	420.85	421.42	379.05	0.00	1473.65	0.286	0.40	3.422	A
2	379.44	380.39	431.96	0.00	1083.37	0.350	0.54	5.129	A
3	0.00	0.00	800.29	0.00	1729.88	0.000	0.00	0.000	A
4	579.70	580.26	80.73	0.00	1891.24	0.307	0.44	2.746	A
5	63.24	63.30	551.67	0.00	1165.92	0.054	0.06	3.264	A

(Default Analysis Set) - Base 2030, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, PM	Base 2030	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			4.82	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	419.00	100.000
2	ONE HOUR	✓	520.00	100.000
3	ONE HOUR	✓	12.00	100.000
4	ONE HOUR	✓	953.00	100.000
5	ONE HOUR	✓	218.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	34.000	0.000	363.000	22.000
	2	32.000	0.000	0.000	454.000	34.000
	3	5.000	1.000	0.000	6.000	0.000
	4	477.000	393.000	3.000	0.000	80.000
	5	52.000	54.000	1.000	111.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.08	0.00	0.87	0.05
	2	0.06	0.00	0.00	0.87	0.07
	3	0.42	0.08	0.00	0.50	0.00
	4	0.50	0.41	0.00	0.00	0.08
	5	0.24	0.25	0.00	0.51	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.235	1.000	1.052	1.000
	2	1.063	1.000	1.000	1.040	1.059
	3	1.000	1.000	1.000	1.166	1.000
	4	1.044	1.061	1.000	1.000	1.025
	5	1.020	1.000	1.000	1.018	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	23.5	0.0	5.2	0.0
	2	6.3	0.0	0.0	4.0	5.9
	3	0.0	0.0	0.0	16.6	0.0
	4	4.4	6.1	0.0	0.0	2.5
	5	2.0	0.0	0.0	1.8	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.34	4.06	0.52	A
2	0.53	7.12	1.12	A
3	0.01	2.59	0.01	A
4	0.54	4.01	1.16	A
5	0.23	4.56	0.30	A

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	315.44	314.35	422.43	0.00	1464.28	0.215	0.27	3.127	A
2	391.48	389.49	375.10	0.00	1172.20	0.334	0.50	4.589	A
3	9.03	9.01	761.59	0.00	1643.11	0.006	0.01	2.202	A
4	717.47	715.19	70.45	0.00	1969.43	0.364	0.57	2.865	A
5	164.12	163.50	683.62	0.00	1220.58	0.134	0.15	3.404	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	376.67	376.32	505.63	0.00	1415.52	0.266	0.36	3.464	A
2	467.47	466.68	449.06	0.00	1132.54	0.413	0.70	5.399	A
3	10.79	10.78	912.14	0.00	1541.37	0.007	0.01	2.351	A
4	856.73	855.92	84.38	0.00	1960.26	0.437	0.77	3.258	A
5	195.98	195.77	818.18	0.00	1140.20	0.172	0.21	3.811	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	461.33	460.71	618.94	0.00	1349.10	0.342	0.52	4.050	A
2	572.53	570.86	549.74	0.00	1078.57	0.531	1.11	7.068	A
3	13.21	13.20	1116.20	0.00	1403.47	0.009	0.01	2.588	A
4	1049.27	1047.73	103.25	0.00	1947.85	0.539	1.16	3.993	A
5	240.02	239.64	1001.51	0.00	1030.67	0.233	0.30	4.549	A

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	461.33	461.32	619.86	0.00	1348.56	0.342	0.52	4.057	A
2	572.53	572.49	550.50	0.00	1078.16	0.531	1.12	7.119	A
3	13.21	13.21	1118.59	0.00	1401.86	0.009	0.01	2.591	A
4	1049.27	1049.25	103.49	0.00	1947.69	0.539	1.16	4.006	A
5	240.02	240.02	1003.01	0.00	1029.78	0.233	0.30	4.557	A

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	376.67	377.29	507.04	0.00	1414.69	0.266	0.36	3.474	A
2	467.47	469.12	450.25	0.00	1131.90	0.413	0.71	5.444	A
3	10.79	10.80	915.76	0.00	1538.92	0.007	0.01	2.355	A
4	856.73	858.25	84.75	0.00	1960.02	0.437	0.78	3.273	A
5	195.98	196.35	820.47	0.00	1138.83	0.172	0.21	3.820	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	315.44	315.80	424.36	0.00	1463.16	0.216	0.28	3.137	A
2	391.48	392.30	376.86	0.00	1171.25	0.334	0.51	4.627	A
3	9.03	9.04	766.15	0.00	1640.02	0.006	0.01	2.206	A
4	717.47	718.29	70.89	0.00	1969.13	0.364	0.58	2.879	A
5	164.12	164.33	686.65	0.00	1218.77	0.135	0.16	3.413	A

Junctions 8

ARCADY 8 - Roundabout Module

Filename: A458-A483 RBT.arc8
Path: P:\IT 1920- 1929\IT 1921 Buttington Quarry\Calcs & Drawings\Arcady\Junction 1
Report generation date: 27/02/2020 15:45:01

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030 + Committed							
Arm 1	0.97	5.32	0.49	A	0.53	4.12	0.35	A
Arm 2	1.68	10.12	0.63	B	1.20	7.39	0.55	A
Arm 3	0.00	0.00	0.00	A	0.01	2.62	0.01	A
Arm 4	1.00	3.84	0.50	A	1.19	4.06	0.55	A
Arm 5	0.11	4.06	0.10	A	0.31	4.61	0.24	A
	A1 - Base 2030 + Committed + Development							
Arm 1	0.98	5.36	0.50	A	0.53	4.13	0.35	A
Arm 2	1.72	10.29	0.64	B	1.25	7.59	0.56	A
Arm 3	0.00	0.00	0.00	A	0.01	2.63	0.01	A
Arm 4	1.02	3.88	0.51	A	1.21	4.10	0.55	A
Arm 5	0.11	4.09	0.10	A	0.31	4.64	0.24	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030 + Committed, AM " model duration: 07:45 - 09:15
"D2 - Base 2030 + Committed, PM" model duration: 16:15 - 17:45
"D3 - Base 2030 + Committed + Development, AM" model duration: 07:45 - 09:15
"D4 - Base 2030 + Committed + Development, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 27/02/2020 15:44:59

File summary

Title	IT1921 - A458 -A483 RBT
Location	Buttington, Wales
Site Number	Junction 1
Date	11/02/2019
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	IT1921
Enumerator	ghill
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030 + Committed, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, AM	Base 2030 + Committed	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			5.93	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	602.00	100.000
2	ONE HOUR	✓	551.00	100.000
3	ONE HOUR	✓	0.00	100.000
4	ONE HOUR	✓	857.00	100.000
5	ONE HOUR	✓	87.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	42.000	3.000	527.000	30.000
	2	36.000	0.000	2.000	470.000	43.000
	3	0.000	0.000	0.000	0.000	0.000
	4	292.000	476.000	8.000	0.000	81.000
	5	15.000	22.000	3.000	47.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.07	0.00	0.88	0.05
	2	0.07	0.00	0.00	0.85	0.08
	3	0.20	0.20	0.20	0.20	0.20
	4	0.34	0.56	0.01	0.00	0.09
	5	0.17	0.25	0.03	0.54	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.119	1.000	1.063	1.000
	2	1.055	1.000	1.000	1.085	1.116
	3	1.000	1.000	1.000	1.000	1.000
	4	1.082	1.088	1.000	1.000	1.025
	5	1.200	1.090	1.000	1.106	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	11.9	0.0	6.3	0.0
	2	5.5	0.0	0.0	8.5	11.6
	3	0.0	0.0	0.0	0.0	0.0
	4	8.2	8.8	0.0	0.0	2.5
	5	20.0	9.0	0.0	10.6	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.49	5.32	0.97	A
2	0.63	10.12	1.68	B
3	0.00	0.00	0.00	A
4	0.50	3.84	1.00	A
5	0.10	4.06	0.11	A

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	453.22	451.43	417.23	0.00	1458.49	0.311	0.45	3.569	A
2	414.82	412.34	463.44	0.00	1075.79	0.386	0.62	5.407	A
3	0.00	0.00	863.77	0.00	1685.52	0.000	0.00	0.000	A
4	645.19	643.16	81.62	0.00	1906.65	0.338	0.51	2.844	A
5	65.50	65.26	609.31	0.00	1140.77	0.057	0.06	3.347	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	541.19	540.50	499.39	0.00	1408.39	0.384	0.62	4.144	A
2	495.34	494.15	554.88	0.00	1027.79	0.482	0.92	6.731	A
3	0.00	0.00	1034.67	0.00	1556.65	0.000	0.00	0.000	A
4	770.43	769.74	97.78	0.00	1896.09	0.406	0.68	3.194	A
5	78.21	78.14	729.28	0.00	1073.58	0.073	0.08	3.615	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	662.82	661.42	611.35	0.00	1340.09	0.495	0.97	5.294	A
2	606.66	603.71	679.05	0.00	962.62	0.630	1.66	9.944	A
3	0.00	0.00	1265.19	0.00	1382.84	0.000	0.00	0.000	A
4	943.57	942.31	119.52	0.00	1881.91	0.501	1.00	3.826	A
5	95.79	95.67	892.69	0.00	982.06	0.098	0.11	4.061	A

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	662.82	662.79	612.16	0.00	1339.60	0.495	0.97	5.318	A
2	606.66	606.56	680.41	0.00	961.91	0.631	1.68	10.123	B
3	0.00	0.00	1269.35	0.00	1379.68	0.000	0.00	0.000	A
4	943.57	943.56	120.00	0.00	1881.59	0.501	1.00	3.836	A
5	95.79	95.79	894.01	0.00	981.33	0.098	0.11	4.065	A

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	541.19	542.56	500.63	0.00	1407.63	0.384	0.63	4.167	A
2	495.34	498.28	556.93	0.00	1026.72	0.482	0.95	6.851	A
3	0.00	0.00	1040.79	0.00	1552.01	0.000	0.00	0.000	A
4	770.43	771.68	98.48	0.00	1895.64	0.406	0.69	3.208	A
5	78.21	78.33	731.29	0.00	1072.45	0.073	0.08	3.623	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	453.22	453.92	419.04	0.00	1457.39	0.311	0.45	3.589	A
2	414.82	416.06	465.96	0.00	1074.46	0.386	0.63	5.477	A
3	0.00	0.00	869.96	0.00	1680.84	0.000	0.00	0.000	A
4	645.19	645.89	82.27	0.00	1906.22	0.338	0.51	2.857	A
5	65.50	65.57	612.03	0.00	1139.24	0.057	0.06	3.352	A

(Default Analysis Set) - Base 2030 + Committed, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, PM	Base 2030 + Committed	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			4.94	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	425.00	100.000
2	ONE HOUR	✓	535.00	100.000
3	ONE HOUR	✓	12.00	100.000
4	ONE HOUR	✓	965.00	100.000
5	ONE HOUR	✓	220.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	35.000	0.000	368.000	22.000
	2	32.000	0.000	0.000	468.000	35.000
	3	5.000	1.000	0.000	6.000	0.000
	4	480.000	402.000	3.000	0.000	80.000
	5	52.000	55.000	1.000	112.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.08	0.00	0.87	0.05
	2	0.06	0.00	0.00	0.87	0.07
	3	0.42	0.08	0.00	0.50	0.00
	4	0.50	0.42	0.00	0.00	0.08
	5	0.24	0.25	0.00	0.51	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.230	1.000	1.052	1.000
	2	1.063	1.000	1.000	1.038	1.057
	3	1.000	1.000	1.000	1.166	1.000
	4	1.043	1.059	1.000	1.000	1.025
	5	1.020	1.000	1.000	1.018	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	23.0	0.0	5.2	0.0
	2	6.3	0.0	0.0	3.8	5.7
	3	0.0	0.0	0.0	16.6	0.0
	4	4.3	5.9	0.0	0.0	2.5
	5	2.0	0.0	0.0	1.8	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.35	4.12	0.53	A
2	0.55	7.39	1.20	A
3	0.01	2.62	0.01	A
4	0.55	4.06	1.19	A
5	0.24	4.61	0.31	A

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	319.96	318.85	430.68	0.00	1460.46	0.219	0.28	3.150	A
2	402.78	400.70	379.59	0.00	1171.13	0.344	0.52	4.661	A
3	9.03	9.01	777.28	0.00	1632.86	0.006	0.01	2.216	A
4	726.50	724.18	71.19	0.00	1971.37	0.369	0.58	2.882	A
5	165.63	165.00	692.62	0.00	1215.81	0.136	0.16	3.424	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	382.07	381.71	515.51	0.00	1410.79	0.271	0.37	3.498	A
2	480.95	480.11	454.44	0.00	1130.96	0.425	0.73	5.524	A
3	10.79	10.78	930.95	0.00	1529.08	0.007	0.01	2.370	A
4	867.51	866.69	85.28	0.00	1962.09	0.442	0.79	3.285	A
5	197.78	197.56	828.95	0.00	1134.47	0.174	0.21	3.841	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	467.93	467.29	631.02	0.00	1343.13	0.348	0.53	4.108	A
2	589.05	587.22	556.32	0.00	1076.29	0.547	1.19	7.332	A
3	13.21	13.20	1139.14	0.00	1388.49	0.010	0.01	2.617	A
4	1062.48	1060.89	104.33	0.00	1949.55	0.545	1.19	4.043	A
5	242.22	241.83	1014.67	0.00	1023.65	0.237	0.31	4.602	A

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	467.93	467.93	631.97	0.00	1342.57	0.349	0.53	4.115	A
2	589.05	589.00	557.11	0.00	1075.87	0.548	1.20	7.393	A
3	13.21	13.21	1141.71	0.00	1386.76	0.010	0.01	2.620	A
4	1062.48	1062.46	104.59	0.00	1949.38	0.545	1.19	4.058	A
5	242.22	242.22	1016.22	0.00	1022.72	0.237	0.31	4.612	A

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	382.07	382.70	516.97	0.00	1409.93	0.271	0.37	3.508	A
2	480.95	482.76	455.67	0.00	1130.30	0.426	0.75	5.576	A
3	10.79	10.80	934.83	0.00	1526.47	0.007	0.01	2.376	A
4	867.51	869.09	85.67	0.00	1961.83	0.442	0.80	3.301	A
5	197.78	198.16	831.32	0.00	1133.05	0.175	0.21	3.852	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	319.96	320.33	432.66	0.00	1459.31	0.219	0.28	3.161	A
2	402.78	403.65	381.39	0.00	1170.16	0.344	0.53	4.701	A
3	9.03	9.04	782.04	0.00	1629.65	0.006	0.01	2.222	A
4	726.50	727.35	71.65	0.00	1971.06	0.369	0.59	2.895	A
5	165.63	165.84	695.71	0.00	1213.96	0.136	0.16	3.437	A

(Default Analysis Set) - Base 2030 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, AM	Base 2030 + Committed + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			6.01	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	602.00	100.000
2	ONE HOUR	✓	553.00	100.000
3	ONE HOUR	✓	0.00	100.000
4	ONE HOUR	✓	865.00	100.000
5	ONE HOUR	✓	87.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

	To					
From		1	2	3	4	5
	1	0.000	42.000	3.000	527.000	30.000
	2	36.000	0.000	2.000	472.000	43.000
	3	0.000	0.000	0.000	0.000	0.000
	4	292.000	484.000	8.000	0.000	81.000
	5	15.000	22.000	3.000	47.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

	To					
From		1	2	3	4	5
	1	0.00	0.07	0.00	0.88	0.05
	2	0.07	0.00	0.00	0.85	0.08
	3	0.20	0.20	0.20	0.20	0.20
	4	0.34	0.56	0.01	0.00	0.09
	5	0.17	0.25	0.03	0.54	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

	To					
From		1	2	3	4	5
	1	1.000	1.119	1.000	1.063	1.000
	2	1.055	1.000	1.000	1.090	1.116
	3	1.000	1.000	1.000	1.000	1.000
	4	1.082	1.090	1.000	1.000	1.025
	5	1.200	1.091	1.000	1.106	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

	To					
From		1	2	3	4	5
	1	0.0	11.9	0.0	6.3	0.0
	2	5.5	0.0	0.0	9.0	11.6
	3	0.0	0.0	0.0	0.0	0.0
	4	8.2	9.0	0.0	0.0	2.5
	5	20.0	9.1	0.0	10.6	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.50	5.36	0.98	A
2	0.64	10.29	1.72	B
3	0.00	0.00	0.00	A
4	0.51	3.88	1.02	A
5	0.10	4.09	0.11	A

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	453.22	451.42	423.23	0.00	1454.90	0.312	0.45	3.581	A
2	416.33	413.81	463.43	0.00	1071.65	0.388	0.63	5.452	A
3	0.00	0.00	865.24	0.00	1683.27	0.000	0.00	0.000	A
4	651.22	649.15	81.61	0.00	1904.53	0.342	0.52	2.862	A
5	65.50	65.25	615.30	0.00	1136.80	0.058	0.06	3.359	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	541.19	540.50	506.57	0.00	1403.97	0.385	0.62	4.165	A
2	497.13	495.93	554.88	0.00	1023.86	0.486	0.93	6.804	A
3	0.00	0.00	1036.44	0.00	1553.94	0.000	0.00	0.000	A
4	777.62	776.92	97.78	0.00	1893.99	0.411	0.69	3.221	A
5	78.21	78.14	736.45	0.00	1068.89	0.073	0.08	3.632	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	662.82	661.41	620.14	0.00	1334.57	0.497	0.98	5.337	A
2	608.86	605.83	679.04	0.00	958.97	0.635	1.69	10.107	B
3	0.00	0.00	1267.29	0.00	1379.58	0.000	0.00	0.000	A
4	952.38	951.08	119.51	0.00	1879.83	0.507	1.02	3.870	A
5	95.79	95.67	901.46	0.00	976.39	0.098	0.11	4.087	A

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	662.82	662.79	620.97	0.00	1334.06	0.497	0.98	5.362	A
2	608.86	608.76	680.41	0.00	958.26	0.635	1.72	10.293	B
3	0.00	0.00	1271.55	0.00	1376.34	0.000	0.00	0.000	A
4	952.38	952.36	120.00	0.00	1879.50	0.507	1.02	3.882	A
5	95.79	95.79	902.81	0.00	975.63	0.098	0.11	4.091	A

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	541.19	542.58	507.85	0.00	1403.19	0.386	0.63	4.189	A
2	497.13	500.16	556.95	0.00	1022.78	0.486	0.96	6.926	A
3	0.00	0.00	1042.69	0.00	1549.20	0.000	0.00	0.000	A
4	777.62	778.90	98.49	0.00	1893.52	0.411	0.70	3.235	A
5	78.21	78.33	738.53	0.00	1067.73	0.073	0.08	3.640	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	453.22	453.93	425.08	0.00	1453.77	0.312	0.46	3.605	A
2	416.33	417.59	465.97	0.00	1070.32	0.389	0.64	5.527	A
3	0.00	0.00	871.50	0.00	1678.53	0.000	0.00	0.000	A
4	651.22	651.93	82.28	0.00	1904.10	0.342	0.52	2.878	A
5	65.50	65.57	618.07	0.00	1135.25	0.058	0.06	3.364	A

(Default Analysis Set) - Base 2030 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, PM	Base 2030 + Committed + Development	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			5.02	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 North	
2	2	A458	
3	3	Private Access	
4	4	A483 South	
5	5	Rhallt Lane	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.20	9.10	11.10	20.70	55.10	40.60	
2	3.50	8.10	5.20	19.20	55.10	28.00	
3	7.20	8.10	2.70	14.10	55.10	21.20	
4	4.70	8.20	19.10	18.80	55.10	26.00	
5	4.10	7.50	7.00	22.50	55.10	30.50	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.596	1821.669
2		(calculated)	(calculated)	0.536	1431.326
3		(calculated)	(calculated)	0.702	2336.859
4		(calculated)	(calculated)	0.662	2115.114
5		(calculated)	(calculated)	0.576	1651.708

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	425.00	100.000
2	ONE HOUR	✓	544.00	100.000
3	ONE HOUR	✓	12.00	100.000
4	ONE HOUR	✓	968.00	100.000
5	ONE HOUR	✓	220.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	35.000	0.000	368.000	22.000
	2	33.000	0.000	0.000	476.000	35.000
	3	5.000	1.000	0.000	6.000	0.000
	4	480.000	405.000	3.000	0.000	80.000
	5	52.000	55.000	1.000	112.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.08	0.00	0.87	0.05
	2	0.06	0.00	0.00	0.88	0.06
	3	0.42	0.08	0.00	0.50	0.00
	4	0.50	0.42	0.00	0.00	0.08
	5	0.24	0.25	0.00	0.51	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.229	1.000	1.052	1.000
	2	1.060	1.000	1.000	1.042	1.057
	3	1.000	1.000	1.000	1.166	1.000
	4	1.044	1.064	1.000	1.000	1.025
	5	1.020	1.000	1.000	1.018	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	22.9	0.0	5.2	0.0
	2	6.0	0.0	0.0	4.2	5.7
	3	0.0	0.0	0.0	16.6	0.0
	4	4.4	6.4	0.0	0.0	2.5
	5	2.0	0.0	0.0	1.8	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.35	4.13	0.53	A
2	0.56	7.59	1.25	A
3	0.01	2.63	0.01	A
4	0.55	4.10	1.21	A
5	0.24	4.64	0.31	A

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	319.96	318.84	432.93	0.00	1458.41	0.219	0.28	3.156	A
2	409.55	407.41	379.59	0.00	1167.82	0.351	0.54	4.721	A
3	9.03	9.01	784.00	0.00	1627.55	0.006	0.01	2.223	A
4	728.76	726.42	71.94	0.00	1966.07	0.371	0.59	2.899	A
5	165.63	165.00	695.61	0.00	1213.10	0.137	0.16	3.433	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	382.07	381.70	518.19	0.00	1408.29	0.271	0.37	3.507	A
2	489.04	488.16	454.44	0.00	1127.77	0.434	0.76	5.620	A
3	10.79	10.78	939.01	0.00	1522.72	0.007	0.01	2.380	A
4	870.21	869.37	86.17	0.00	1956.72	0.445	0.80	3.311	A
5	197.77	197.56	832.53	0.00	1131.19	0.175	0.21	3.855	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	467.93	467.28	634.30	0.00	1340.04	0.349	0.53	4.122	A
2	598.95	597.02	556.31	0.00	1073.26	0.558	1.24	7.529	A
3	13.21	13.20	1148.94	0.00	1380.74	0.010	0.01	2.631	A
4	1065.79	1064.16	105.42	0.00	1944.09	0.548	1.20	4.084	A
5	242.22	241.83	1019.04	0.00	1019.62	0.238	0.31	4.626	A

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	467.93	467.92	635.27	0.00	1339.46	0.349	0.53	4.130	A
2	598.95	598.91	557.11	0.00	1072.83	0.558	1.25	7.592	A
3	13.21	13.21	1151.61	0.00	1378.93	0.010	0.01	2.635	A
4	1065.79	1065.76	105.69	0.00	1943.91	0.548	1.21	4.099	A
5	242.22	242.22	1020.63	0.00	1018.67	0.238	0.31	4.636	A

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	382.07	382.71	519.69	0.00	1407.41	0.271	0.37	3.514	A
2	489.04	490.95	455.68	0.00	1127.10	0.434	0.77	5.677	A
3	10.79	10.80	943.03	0.00	1519.99	0.007	0.01	2.384	A
4	870.21	871.82	86.58	0.00	1956.45	0.445	0.81	3.323	A
5	197.77	198.16	834.94	0.00	1129.74	0.175	0.21	3.865	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	319.96	320.33	434.93	0.00	1457.24	0.220	0.28	3.169	A
2	409.55	410.47	381.40	0.00	1166.85	0.351	0.55	4.764	A
3	9.03	9.04	788.85	0.00	1624.27	0.006	0.01	2.228	A
4	728.76	729.62	72.41	0.00	1965.75	0.371	0.59	2.915	A
5	165.63	165.84	698.74	0.00	1211.23	0.137	0.16	3.446	A

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.6.541 [19821,26/11/2015]

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Filename: A483 - Salop Road EIA.arc8
Path: C:\ITL Jobs\IT1921 Buttington Quarry\PICADY\Junction 2
Report generation date: 24/08/2020 12:57:51

» (Default Analysis Set) - Base 2030, AM
» (Default Analysis Set) - Base 2030, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030							
Stream B-AC	0.96	12.42	0.49	B	1.02	13.19	0.51	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.40	7.06	0.28	A	0.52	8.12	0.34	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030, AM " model duration: 07:45 - 09:15
"D2 - Base 2030, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 24/08/2020 12:57:50

File summary

Title	A483 - Salop Road Junction
Location	Buttington, Wales
Site Number	Junction 2
Date	08/02/2019
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	
Enumerator	ghill
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, AM	Base 2030	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	10.22	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	616.00	100.000
B	ONE HOUR	✓	256.00	100.000
C	ONE HOUR	✓	956.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	102.000	514.000
	B	0.000	0.000	256.000
	C	772.000	184.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.17	0.83
	B	0.00	0.00	1.00
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.059	1.093
	B	1.000	1.000	1.074
	C	1.098	1.038	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	5.9	9.3
	B	0.0	0.0	7.4
	C	9.8	3.8	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.49	12.42	0.96	B
C-A	-	-	-	-
C-B	0.28	7.06	0.40	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	192.73	190.93	0.00	614.04	0.314	0.45	8.474	A
C-A	581.20	581.20	0.00	-	-	-	-	-
C-B	138.52	137.66	0.00	773.00	0.179	0.22	5.660	A
A-B	76.79	76.79	0.00	-	-	-	-	-
A-C	386.97	386.97	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	230.14	229.47	0.00	596.18	0.386	0.62	9.797	A
C-A	694.01	694.01	0.00	-	-	-	-	-
C-B	165.41	165.15	0.00	747.68	0.221	0.28	6.177	A
A-B	91.70	91.70	0.00	-	-	-	-	-
A-C	462.08	462.08	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	281.86	280.54	0.00	571.49	0.493	0.95	12.314	B
C-A	849.99	849.99	0.00	-	-	-	-	-
C-B	202.59	202.14	0.00	712.68	0.284	0.39	7.045	A
A-B	112.30	112.30	0.00	-	-	-	-	-
A-C	565.92	565.92	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	281.86	281.81	0.00	571.49	0.493	0.96	12.421	B
C-A	849.99	849.99	0.00	-	-	-	-	-
C-B	202.59	202.58	0.00	712.68	0.284	0.40	7.056	A
A-B	112.30	112.30	0.00	-	-	-	-	-
A-C	565.92	565.92	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	230.14	231.42	0.00	596.18	0.386	0.64	9.905	A
C-A	694.01	694.01	0.00	-	-	-	-	-
C-B	165.41	165.85	0.00	747.68	0.221	0.29	6.191	A
A-B	91.70	91.70	0.00	-	-	-	-	-
A-C	462.08	462.08	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	192.73	193.43	0.00	614.04	0.314	0.46	8.574	A
C-A	581.20	581.20	0.00	-	-	-	-	-
C-B	138.52	138.79	0.00	773.00	0.179	0.22	5.680	A
A-B	76.79	76.79	0.00	-	-	-	-	-
A-C	386.97	386.97	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2030, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, PM	Base 2030	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	10.93	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	806.00	100.000
B	ONE HOUR	✓	257.00	100.000
C	ONE HOUR	✓	926.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	113.000	693.000
	B	0.000	0.000	257.000
	C	717.000	209.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.14	0.86
	B	0.00	0.00	1.00
	C	0.77	0.23	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.054
	B	1.000	1.000	1.031
	C	1.052	1.023	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	5.4
	B	0.0	0.0	3.1
	C	5.2	2.3	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.51	13.19	1.02	B
C-A	-	-	-	-
C-B	0.34	8.12	0.52	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	193.48	191.66	0.00	612.57	0.316	0.46	8.517	A
C-A	539.80	539.80	0.00	-	-	-	-	-
C-B	157.35	156.29	0.00	750.40	0.210	0.26	6.050	A
A-B	85.07	85.07	0.00	-	-	-	-	-
A-C	521.73	521.73	0.00	-	-	-	-	-

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	231.04	230.32	0.00	588.72	0.392	0.63	10.025	B
C-A	644.57	644.57	0.00	-	-	-	-	-
C-B	187.89	187.54	0.00	718.03	0.262	0.35	6.781	A
A-B	101.58	101.58	0.00	-	-	-	-	-
A-C	622.99	622.99	0.00	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	282.96	281.47	0.00	555.74	0.509	1.01	13.052	B
C-A	789.43	789.43	0.00	-	-	-	-	-
C-B	230.11	229.47	0.00	673.29	0.342	0.51	8.099	A
A-B	124.42	124.42	0.00	-	-	-	-	-
A-C	763.01	763.01	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	282.96	282.91	0.00	555.74	0.509	1.02	13.186	B
C-A	789.43	789.43	0.00	-	-	-	-	-
C-B	230.11	230.10	0.00	673.29	0.342	0.52	8.122	A
A-B	124.42	124.42	0.00	-	-	-	-	-
A-C	763.01	763.01	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	231.04	232.50	0.00	588.72	0.392	0.66	10.148	B
C-A	644.57	644.57	0.00	-	-	-	-	-
C-B	187.89	188.52	0.00	718.03	0.262	0.36	6.808	A
A-B	101.58	101.58	0.00	-	-	-	-	-
A-C	622.99	622.99	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	193.48	194.24	0.00	612.57	0.316	0.47	8.622	A
C-A	539.80	539.80	0.00	-	-	-	-	-
C-B	157.35	157.71	0.00	750.40	0.210	0.27	6.079	A
A-B	85.07	85.07	0.00	-	-	-	-	-
A-C	521.73	521.73	0.00	-	-	-	-	-

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.6.541 [19821,26/11/2015]

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Filename: A483 - Salop Road.arc8
Path: P:\IT 1920- 1929\IT 1921 Buttington Quarry\Calcs & Drawings\Arcady\Junction 2
Report generation date: 27/02/2020 16:11:02

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030 + Committed							
Stream B-AC	1.86	18.37	0.66	C	1.07	13.58	0.52	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.47	7.83	0.32	A	0.57	8.48	0.37	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-
	A1 - Base 2030 + Committed + Development							
Stream B-AC	1.91	18.83	0.66	C	1.08	13.62	0.52	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.47	7.87	0.32	A	0.58	8.54	0.37	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030 + Committed, AM " model duration: 07:45 - 09:15
"D2 - Base 2030 + Committed, PM" model duration: 16:15 - 17:45
"D3 - Base 2030 + Committed + Development, AM" model duration: 07:45 - 09:15
"D4 - Base 2030 + Committed + Development, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 27/02/2020 16:11:00

File summary

Title	A483 - Salop Road Junction
Location	Buttington, Wales
Site Number	Junction 2
Date	08/02/2019
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	
Enumerator	ghill
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030 + Committed, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, AM	Base 2030 + Committed	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	14.55	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	747.00	100.000
B	ONE HOUR	✓	339.00	100.000
C	ONE HOUR	✓	1047.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	229.000	518.000
	B	0.000	0.000	339.000
	C	850.000	197.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.31	0.69
	B	0.00	0.00	1.00
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.026	1.093
	B	1.000	1.000	1.057
	C	1.090	1.036	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	2.6	9.3
	B	0.0	0.0	5.7
	C	9.0	3.6	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.66	18.37	1.86	C
C-A	-	-	-	-
C-B	0.32	7.83	0.47	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	255.22	252.44	0.00	615.61	0.415	0.70	9.840	A
C-A	639.92	639.92	0.00	-	-	-	-	-
C-B	148.31	147.33	0.00	748.90	0.198	0.24	5.974	A
A-B	172.40	172.40	0.00	-	-	-	-	-
A-C	389.98	389.98	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	304.75	303.45	0.00	595.83	0.511	1.02	12.256	B
C-A	764.13	764.13	0.00	-	-	-	-	-
C-B	177.10	176.78	0.00	718.57	0.246	0.32	6.640	A
A-B	205.87	205.87	0.00	-	-	-	-	-
A-C	465.67	465.67	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	373.25	370.08	0.00	568.48	0.657	1.81	17.855	C
C-A	935.87	935.87	0.00	-	-	-	-	-
C-B	216.90	216.33	0.00	676.63	0.321	0.47	7.812	A
A-B	252.13	252.13	0.00	-	-	-	-	-
A-C	570.33	570.33	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	373.25	373.06	0.00	568.48	0.657	1.86	18.372	C
C-A	935.87	935.87	0.00	-	-	-	-	-
C-B	216.90	216.89	0.00	676.63	0.321	0.47	7.830	A
A-B	252.13	252.13	0.00	-	-	-	-	-
A-C	570.33	570.33	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	304.75	307.89	0.00	595.83	0.511	1.08	12.636	B
C-A	764.13	764.13	0.00	-	-	-	-	-
C-B	177.10	177.65	0.00	718.57	0.246	0.33	6.661	A
A-B	205.87	205.87	0.00	-	-	-	-	-
A-C	465.67	465.67	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	255.22	256.63	0.00	615.61	0.415	0.72	10.067	B
C-A	639.92	639.92	0.00	-	-	-	-	-
C-B	148.31	148.64	0.00	748.90	0.198	0.25	6.000	A
A-B	172.40	172.40	0.00	-	-	-	-	-
A-C	389.98	389.98	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2030 + Committed, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, PM	Base 2030 + Committed	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	11.25	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	820.00	100.000
B	ONE HOUR	✓	262.00	100.000
C	ONE HOUR	✓	946.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	120.000	700.000
	B	0.000	0.000	262.000
	C	724.000	222.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.15	0.85
	B	0.00	0.00	1.00
	C	0.77	0.23	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.054
	B	1.000	1.000	1.031
	C	1.052	1.023	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	5.4
	B	0.0	0.0	3.1
	C	5.2	2.3	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.52	13.58	1.07	B
C-A	-	-	-	-
C-B	0.37	8.48	0.57	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	197.25	195.37	0.00	610.96	0.323	0.47	8.624	A
C-A	545.07	545.07	0.00	-	-	-	-	-
C-B	167.13	165.99	0.00	747.55	0.224	0.29	6.179	A
A-B	90.34	90.34	0.00	-	-	-	-	-
A-C	527.00	527.00	0.00	-	-	-	-	-

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	235.53	234.78	0.00	586.80	0.401	0.66	10.204	B
C-A	650.86	650.86	0.00	-	-	-	-	-
C-B	199.57	199.18	0.00	714.64	0.279	0.38	6.984	A
A-B	107.88	107.88	0.00	-	-	-	-	-
A-C	629.29	629.29	0.00	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	288.47	286.87	0.00	553.39	0.521	1.06	13.426	B
C-A	797.14	797.14	0.00	-	-	-	-	-
C-B	244.43	243.69	0.00	669.13	0.365	0.57	8.448	A
A-B	132.12	132.12	0.00	-	-	-	-	-
A-C	770.71	770.71	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	288.47	288.41	0.00	553.39	0.521	1.07	13.577	B
C-A	797.14	797.14	0.00	-	-	-	-	-
C-B	244.43	244.41	0.00	669.13	0.365	0.57	8.476	A
A-B	132.12	132.12	0.00	-	-	-	-	-
A-C	770.71	770.71	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	235.53	237.09	0.00	586.80	0.401	0.68	10.341	B
C-A	650.86	650.86	0.00	-	-	-	-	-
C-B	199.57	200.29	0.00	714.64	0.279	0.39	7.008	A
A-B	107.88	107.88	0.00	-	-	-	-	-
A-C	629.29	629.29	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	197.25	198.05	0.00	610.96	0.323	0.48	8.735	A
C-A	545.07	545.07	0.00	-	-	-	-	-
C-B	167.13	167.54	0.00	747.55	0.224	0.29	6.212	A
A-B	90.34	90.34	0.00	-	-	-	-	-
A-C	527.00	527.00	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2030 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, AM	Base 2030 + Committed + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	14.87	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	753.00	100.000
B	ONE HOUR	✓	341.00	100.000
C	ONE HOUR	✓	1049.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	229.000	524.000
	B	0.000	0.000	341.000
	C	852.000	197.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.30	0.70
	B	0.00	0.00	1.00
	C	0.81	0.19	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.026	1.095
	B	1.000	1.000	1.059
	C	1.091	1.036	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	2.6	9.5
	B	0.0	0.0	5.9
	C	9.1	3.6	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.66	18.83	1.91	C
C-A	-	-	-	-
C-B	0.32	7.87	0.47	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	256.72	253.90	0.00	613.48	0.418	0.71	9.936	A
C-A	641.43	641.43	0.00	-	-	-	-	-
C-B	148.31	147.33	0.00	747.10	0.199	0.25	5.992	A
A-B	172.40	172.40	0.00	-	-	-	-	-
A-C	394.49	394.49	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	306.55	305.22	0.00	593.50	0.517	1.04	12.427	B
C-A	765.93	765.93	0.00	-	-	-	-	-
C-B	177.10	176.78	0.00	716.48	0.247	0.33	6.665	A
A-B	205.87	205.87	0.00	-	-	-	-	-
A-C	471.07	471.07	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	375.45	372.15	0.00	565.86	0.663	1.86	18.268	C
C-A	938.07	938.07	0.00	-	-	-	-	-
C-B	216.90	216.33	0.00	674.15	0.322	0.47	7.854	A
A-B	252.13	252.13	0.00	-	-	-	-	-
A-C	576.93	576.93	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	375.45	375.25	0.00	565.86	0.663	1.91	18.831	C
C-A	938.07	938.07	0.00	-	-	-	-	-
C-B	216.90	216.89	0.00	674.15	0.322	0.47	7.872	A
A-B	252.13	252.13	0.00	-	-	-	-	-
A-C	576.93	576.93	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	306.55	309.82	0.00	593.50	0.517	1.10	12.833	B
C-A	765.93	765.93	0.00	-	-	-	-	-
C-B	177.10	177.66	0.00	716.48	0.247	0.33	6.687	A
A-B	205.87	205.87	0.00	-	-	-	-	-
A-C	471.07	471.07	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	256.72	258.18	0.00	613.48	0.418	0.73	10.175	B
C-A	641.43	641.43	0.00	-	-	-	-	-
C-B	148.31	148.64	0.00	747.10	0.199	0.25	6.020	A
A-B	172.40	172.40	0.00	-	-	-	-	-
A-C	394.49	394.49	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2030 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, PM	Base 2030 + Committed + Development	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	11.29	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A483 South		Major
B	B	Salop Road		Minor
C	C	A483 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	12.00	✓	7.50	✓	5.00	250.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	4.00										69	104

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	708.979	0.082	0.207	0.130	0.295
1	B-C	758.430	0.086	0.217	-	-
1	C-B	937.767	0.269	0.269	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	822.00	100.000
B	ONE HOUR	✓	262.00	100.000
C	ONE HOUR	✓	954.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	120.000	702.000
	B	0.000	0.000	262.000
	C	730.000	224.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.15	0.85
	B	0.00	0.00	1.00
	C	0.77	0.23	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.057
	B	1.000	1.000	1.031
	C	1.053	1.022	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	5.7
	B	0.0	0.0	3.1
	C	5.3	2.2	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-AC	0.52	13.62	1.08	B
C-A	-	-	-	-
C-B	0.37	8.54	0.58	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	197.25	195.36	0.00	610.45	0.323	0.47	8.635	A
C-A	549.58	549.58	0.00	-	-	-	-	-
C-B	168.64	167.48	0.00	746.88	0.226	0.29	6.200	A
A-B	90.34	90.34	0.00	-	-	-	-	-
A-C	528.50	528.50	0.00	-	-	-	-	-

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	235.53	234.78	0.00	586.15	0.402	0.66	10.222	B
C-A	656.26	656.26	0.00	-	-	-	-	-
C-B	201.37	200.97	0.00	713.80	0.282	0.39	7.013	A
A-B	107.88	107.88	0.00	-	-	-	-	-
A-C	631.08	631.08	0.00	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	288.47	286.86	0.00	552.56	0.522	1.06	13.465	B
C-A	803.74	803.74	0.00	-	-	-	-	-
C-B	246.63	245.88	0.00	668.06	0.369	0.58	8.511	A
A-B	132.12	132.12	0.00	-	-	-	-	-
A-C	772.92	772.92	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	288.47	288.41	0.00	552.56	0.522	1.08	13.619	B
C-A	803.74	803.74	0.00	-	-	-	-	-
C-B	246.63	246.61	0.00	668.06	0.369	0.58	8.541	A
A-B	132.12	132.12	0.00	-	-	-	-	-
A-C	772.92	772.92	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	235.53	237.10	0.00	586.15	0.402	0.68	10.358	B
C-A	656.26	656.26	0.00	-	-	-	-	-
C-B	201.37	202.11	0.00	713.80	0.282	0.40	7.047	A
A-B	107.88	107.88	0.00	-	-	-	-	-
A-C	631.08	631.08	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-AC	197.25	198.05	0.00	610.45	0.323	0.48	8.746	A
C-A	549.58	549.58	0.00	-	-	-	-	-
C-B	168.64	169.05	0.00	746.88	0.226	0.29	6.234	A
A-B	90.34	90.34	0.00	-	-	-	-	-
A-C	528.50	528.50	0.00	-	-	-	-	-

Junctions 8

ARCADY 8 - Roundabout Module

Filename: A483 Roundabout EIA.arc8
Path: C:\ITL Jobs\IT1921 Buttington Quarry\PICADY\Junction 3
Report generation date: 24/08/2020 12:59:58

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030							
Arm 1	1.57	6.87	0.61	A	1.27	5.92	0.56	A
Arm 2	1.01	4.80	0.50	A	0.80	4.01	0.45	A
Arm 3	0.32	3.96	0.25	A	1.26	6.95	0.56	A
Arm 4	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Arm 5	1.69	10.17	0.63	B	2.92	16.61	0.75	C

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030, AM " model duration: 07:45 - 09:15
"D2 - Base 2030, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 24/08/2020 12:59:57

File summary

Title	A483 - Smithfield Road Roundabout
Location	Buttington, Wales
Site Number	Junction 3
Date	15/11/2018
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	IT1921
Enumerator	AP
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, AM	Base 2030	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			6.66	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	757.00	100.000
2	ONE HOUR	✓	692.00	100.000
3	ONE HOUR	✓	268.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	551.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	408.000	285.000	0.000	64.000
	2	431.000	0.000	134.000	0.000	127.000
	3	80.000	61.000	0.000	0.000	127.000
	4	0.000	0.000	0.000	0.000	1.000
	5	103.000	174.000	274.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.54	0.38	0.00	0.08
	2	0.62	0.00	0.19	0.00	0.18
	3	0.30	0.23	0.00	0.00	0.47
	4	0.00	0.00	0.00	0.00	1.00
	5	0.19	0.32	0.50	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.147	1.045	1.000	1.015
	2	1.109	1.000	1.037	1.000	1.000
	3	1.075	1.080	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000	1.000
	5	1.009	1.052	1.007	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	14.7	4.5	0.0	1.5
	2	10.9	0.0	3.7	0.0	0.0
	3	7.5	8.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.9	5.2	0.7	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.61	6.87	1.57	A
2	0.50	4.80	1.01	A
3	0.25	3.96	0.32	A
4	0.00	0.00	0.00	A
5	0.63	10.17	1.69	B

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	569.91	567.38	381.00	0.00	1465.64	0.389	0.63	3.996	A
2	520.98	519.14	466.61	0.00	1650.84	0.316	0.46	3.175	A
3	201.76	201.05	466.58	0.00	1330.10	0.152	0.18	3.187	A
4	0.00	0.00	667.63	0.00	811.83	0.000	0.00	0.000	A
5	414.82	412.32	429.11	0.00	1070.02	0.388	0.63	5.453	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	680.53	679.41	456.57	0.00	1420.02	0.479	0.91	4.854	A
2	622.10	621.38	558.96	0.00	1592.16	0.391	0.64	3.707	A
3	240.93	240.71	558.49	0.00	1276.85	0.189	0.23	3.474	A
4	0.00	0.00	799.21	0.00	748.31	0.000	0.00	0.000	A
5	495.34	494.15	513.66	0.00	1023.83	0.484	0.92	6.781	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	833.47	830.89	557.93	0.00	1358.81	0.613	1.56	6.785	A
2	761.91	760.44	683.27	0.00	1513.15	0.504	1.00	4.772	A
3	295.07	294.71	683.43	0.00	1204.46	0.245	0.32	3.955	A
4	0.00	0.00	978.14	0.00	661.93	0.000	0.00	0.000	A
5	606.66	603.71	628.68	0.00	961.01	0.631	1.66	9.992	A

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	833.47	833.40	560.34	0.00	1357.36	0.614	1.57	6.868	A
2	761.91	761.88	685.85	0.00	1511.52	0.504	1.01	4.802	A
3	295.07	295.07	684.81	0.00	1203.67	0.245	0.32	3.961	A
4	0.00	0.00	979.87	0.00	661.09	0.000	0.00	0.000	A
5	606.66	606.56	629.77	0.00	960.41	0.632	1.69	10.166	B

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	680.53	683.10	460.06	0.00	1417.92	0.480	0.93	4.915	A
2	622.10	623.55	562.71	0.00	1589.78	0.391	0.65	3.733	A
3	240.93	241.29	560.56	0.00	1275.66	0.189	0.23	3.480	A
4	0.00	0.00	801.84	0.00	747.04	0.000	0.00	0.000	A
5	495.34	498.29	515.31	0.00	1022.93	0.484	0.95	6.901	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	569.91	571.07	384.27	0.00	1463.68	0.389	0.64	4.039	A
2	520.98	521.71	470.18	0.00	1648.58	0.316	0.46	3.196	A
3	201.76	201.98	468.96	0.00	1328.72	0.152	0.18	3.194	A
4	0.00	0.00	670.94	0.00	810.23	0.000	0.00	0.000	A
5	414.82	416.07	431.20	0.00	1068.88	0.388	0.64	5.526	A

(Default Analysis Set) - Base 2030, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030, PM	Base 2030	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			8.07	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	706.00	100.000
2	ONE HOUR	✓	656.00	100.000
3	ONE HOUR	✓	599.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	592.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	387.000	191.000	1.000	127.000
	2	444.000	0.000	51.000	0.000	161.000
	3	204.000	127.000	0.000	0.000	268.000
	4	0.000	0.000	0.000	0.000	1.000
	5	160.000	262.000	170.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.55	0.27	0.00	0.18
	2	0.68	0.00	0.08	0.00	0.25
	3	0.34	0.21	0.00	0.00	0.45
	4	0.00	0.00	0.00	0.00	1.00
	5	0.27	0.44	0.29	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.059	1.068	1.000	1.016
	2	1.083	1.000	1.058	1.000	1.006
	3	1.005	1.024	1.000	1.000	1.007
	4	1.000	1.000	1.000	1.000	1.000
	5	1.013	1.000	1.029	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	5.9	6.8	0.0	1.6
	2	8.3	0.0	5.8	0.0	0.6
	3	0.5	2.4	0.0	0.0	0.7
	4	0.0	0.0	0.0	0.0	0.0
	5	1.3	0.0	2.9	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.56	5.92	1.27	A
2	0.45	4.01	0.80	A
3	0.56	6.95	1.26	A
4	0.00	0.00	0.00	A
5	0.75	16.61	2.92	C

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	531.51	529.35	418.14	0.00	1507.60	0.353	0.54	3.672	A
2	493.87	492.28	366.27	0.00	1731.82	0.285	0.40	2.900	A
3	450.96	448.92	549.98	0.00	1327.42	0.340	0.51	4.089	A
4	0.00	0.00	998.15	0.00	666.56	0.000	0.00	0.000	A
5	445.69	442.57	581.26	0.00	1010.50	0.441	0.78	6.305	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	634.68	633.78	500.97	0.00	1456.34	0.436	0.77	4.372	A
2	589.73	589.18	438.66	0.00	1684.55	0.350	0.54	3.284	A
3	538.49	537.59	658.28	0.00	1264.15	0.426	0.74	4.948	A
4	0.00	0.00	1194.97	0.00	574.37	0.000	0.00	0.000	A
5	532.20	530.32	695.84	0.00	950.08	0.560	1.25	8.536	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	777.32	775.37	610.44	0.00	1388.61	0.560	1.25	5.851	A
2	722.27	721.22	535.71	0.00	1621.16	0.446	0.80	3.997	A
3	659.51	657.45	805.73	0.00	1178.00	0.560	1.25	6.888	A
4	0.00	0.00	1462.08	0.00	449.23	0.000	0.00	0.000	A
5	651.80	645.51	851.44	0.00	868.02	0.751	2.82	15.747	C

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	777.32	777.27	615.17	0.00	1385.68	0.561	1.27	5.916	A
2	722.27	722.25	538.26	0.00	1619.51	0.446	0.80	4.012	A
3	659.51	659.47	807.03	0.00	1177.25	0.560	1.26	6.952	A
4	0.00	0.00	1465.38	0.00	447.70	0.000	0.00	0.000	A
5	651.80	651.41	853.25	0.00	867.08	0.752	2.92	16.611	C

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	634.68	636.62	507.67	0.00	1452.20	0.437	0.78	4.425	A
2	589.73	590.76	442.33	0.00	1682.16	0.351	0.54	3.300	A
3	538.49	540.54	660.26	0.00	1263.00	0.426	0.75	4.996	A
4	0.00	0.00	1199.90	0.00	572.08	0.000	0.00	0.000	A
5	532.20	538.65	698.54	0.00	948.67	0.561	1.31	8.914	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	531.51	532.45	422.51	0.00	1504.90	0.353	0.55	3.704	A
2	493.87	494.44	369.14	0.00	1729.95	0.285	0.40	2.914	A
3	450.96	451.89	552.53	0.00	1325.93	0.340	0.52	4.122	A
4	0.00	0.00	1003.66	0.00	663.99	0.000	0.00	0.000	A
5	445.69	447.70	584.36	0.00	1008.88	0.442	0.80	6.439	A

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: [redacted] Web: http://www.trlsoftware.co.uk

Filename: A483 Roundabout.arc8
Path: P:\IT 1920- 1929\IT 1921 Buttington Quarry\Calcs & Drawings\Arcady\Junction 3
Report generation date: 27/02/2020 16:55:50

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030 + Committed							
Arm 1	1.64	7.06	0.62	A	1.30	6.00	0.57	A
Arm 2	1.32	5.53	0.57	A	0.82	4.06	0.45	A
Arm 3	0.38	4.33	0.28	A	1.33	7.18	0.57	A
Arm 4	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Arm 5	2.34	13.53	0.71	B	3.07	17.44	0.76	C
	A1 - Base 2030 + Committed + Development							
Arm 1	1.66	7.11	0.63	A	1.31	6.04	0.57	A
Arm 2	1.33	5.56	0.57	A	0.82	4.05	0.45	A
Arm 3	0.38	4.34	0.28	A	1.32	7.14	0.57	A
Arm 4	0.00	0.00	0.00	A	0.00	0.00	0.00	A
Arm 5	2.37	13.71	0.71	B	3.06	17.35	0.76	C

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030 + Committed, AM " model duration: 07:45 - 09:15
"D2 - Base 2030 + Committed, PM" model duration: 16:15 - 17:45
"D3 - Base 2030 + Committed + Development, AM" model duration: 07:45 - 09:15
"D4 - Base 2030 + Committed + Development, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 27/02/2020 16:55:48

File summary

Title	A483 - Smithfield Road Roundabout
Location	Buttington, Wales
Site Number	Junction 3
Date	15/11/2018
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	IT1921
Enumerator	AP
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030 + Committed, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, AM	Base 2030 + Committed	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			7.72	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	768.00	100.000
2	ONE HOUR	✓	785.00	100.000
3	ONE HOUR	✓	291.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	577.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	411.000	292.000	0.000	65.000
	2	522.000	0.000	136.000	0.000	127.000
	3	99.000	62.000	0.000	0.000	130.000
	4	0.000	0.000	0.000	0.000	1.000
	5	125.000	174.000	278.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.54	0.38	0.00	0.08
	2	0.66	0.00	0.17	0.00	0.16
	3	0.34	0.21	0.00	0.00	0.45
	4	0.00	0.00	0.00	0.00	1.00
	5	0.22	0.30	0.48	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.146	1.045	1.000	1.015
	2	1.090	1.000	1.037	1.000	1.000
	3	1.061	1.080	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000	1.000
	5	1.008	1.052	1.007	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	14.6	4.5	0.0	1.5
	2	9.0	0.0	3.7	0.0	0.0
	3	6.1	8.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.8	5.2	0.7	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.62	7.06	1.64	A
2	0.57	5.53	1.32	A
3	0.28	4.33	0.38	A
4	0.00	0.00	0.00	A
5	0.71	13.53	2.34	B

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	578.19	575.60	384.53	0.00	1464.99	0.395	0.65	4.037	A
2	590.99	588.79	475.47	0.00	1658.89	0.356	0.55	3.357	A
3	219.08	218.27	535.50	0.00	1296.50	0.169	0.20	3.337	A
4	0.00	0.00	753.77	0.00	772.78	0.000	0.00	0.000	A
5	434.39	431.51	512.29	0.00	1029.51	0.422	0.72	5.991	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	690.41	689.25	460.78	0.00	1418.90	0.487	0.94	4.925	A
2	705.70	704.76	569.55	0.00	1598.61	0.441	0.78	4.023	A
3	261.60	261.34	641.00	0.00	1235.78	0.212	0.27	3.694	A
4	0.00	0.00	902.34	0.00	701.55	0.000	0.00	0.000	A
5	518.71	517.13	613.24	0.00	975.14	0.532	1.12	7.833	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	845.58	842.86	562.19	0.00	1357.61	0.623	1.62	6.955	A
2	864.30	862.22	695.64	0.00	1517.81	0.569	1.30	5.473	A
3	320.40	319.94	784.17	0.00	1153.37	0.278	0.38	4.318	A
4	0.00	0.00	1104.11	0.00	604.82	0.000	0.00	0.000	A
5	635.29	630.64	750.36	0.00	901.29	0.705	2.28	13.078	B

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	845.58	845.50	565.74	0.00	1355.47	0.624	1.64	7.056	A
2	864.30	864.25	699.00	0.00	1515.67	0.570	1.32	5.526	A
3	320.40	320.39	786.08	0.00	1152.27	0.278	0.38	4.327	A
4	0.00	0.00	1106.47	0.00	603.69	0.000	0.00	0.000	A
5	635.29	635.06	751.96	0.00	900.43	0.706	2.34	13.534	B

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	690.41	693.13	465.85	0.00	1415.85	0.488	0.96	5.001	A
2	705.70	707.76	574.38	0.00	1595.53	0.442	0.80	4.065	A
3	261.60	262.06	643.81	0.00	1234.16	0.212	0.27	3.704	A
4	0.00	0.00	905.87	0.00	699.86	0.000	0.00	0.000	A
5	518.71	523.41	615.63	0.00	973.85	0.533	1.16	8.074	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	578.19	579.40	388.34	0.00	1462.69	0.395	0.66	4.080	A
2	590.99	591.95	479.44	0.00	1656.35	0.357	0.56	3.384	A
3	219.08	219.34	538.44	0.00	1294.81	0.169	0.20	3.350	A
4	0.00	0.00	757.78	0.00	770.85	0.000	0.00	0.000	A
5	434.39	436.08	514.99	0.00	1028.06	0.423	0.74	6.100	A

(Default Analysis Set) - Base 2030 + Committed, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed, PM	Base 2030 + Committed	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			8.34	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	713.00	100.000
2	ONE HOUR	✓	663.00	100.000
3	ONE HOUR	✓	610.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	595.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	390.000	194.000	1.000	128.000
	2	450.000	0.000	52.000	0.000	161.000
	3	210.000	128.000	0.000	0.000	272.000
	4	0.000	0.000	0.000	0.000	1.000
	5	162.000	262.000	171.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.55	0.27	0.00	0.18
	2	0.68	0.00	0.08	0.00	0.24
	3	0.34	0.21	0.00	0.00	0.45
	4	0.00	0.00	0.00	0.00	1.00
	5	0.27	0.44	0.29	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.059	1.067	1.000	1.016
	2	1.082	1.000	1.058	1.000	1.006
	3	1.005	1.024	1.000	1.000	1.008
	4	1.000	1.000	1.000	1.000	1.000
	5	1.013	1.000	1.029	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	5.9	6.7	0.0	1.6
	2	8.2	0.0	5.8	0.0	0.6
	3	0.5	2.4	0.0	0.0	0.8
	4	0.0	0.0	0.0	0.0	0.0
	5	1.3	0.0	2.9	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.57	6.00	1.30	A
2	0.45	4.06	0.82	A
3	0.57	7.18	1.33	A
4	0.00	0.00	0.00	A
5	0.76	17.44	3.07	C

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	536.79	534.59	419.60	0.00	1506.99	0.356	0.55	3.695	A
2	499.14	497.53	370.00	0.00	1730.22	0.288	0.40	2.916	A
3	459.24	457.13	555.22	0.00	1324.29	0.347	0.53	4.141	A
4	0.00	0.00	1011.61	0.00	660.36	0.000	0.00	0.000	A
5	447.95	444.77	590.98	0.00	1005.66	0.445	0.79	6.383	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	640.98	640.05	502.72	0.00	1455.55	0.440	0.78	4.410	A
2	596.03	595.46	443.12	0.00	1682.46	0.354	0.55	3.310	A
3	548.38	547.44	664.55	0.00	1260.44	0.435	0.76	5.043	A
4	0.00	0.00	1211.10	0.00	566.93	0.000	0.00	0.000	A
5	534.89	532.95	707.49	0.00	944.28	0.566	1.28	8.710	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	785.03	783.02	612.31	0.00	1387.73	0.566	1.28	5.932	A
2	729.98	728.90	541.06	0.00	1618.49	0.451	0.82	4.041	A
3	671.62	669.42	813.40	0.00	1173.52	0.572	1.31	7.110	A
4	0.00	0.00	1481.71	0.00	440.18	0.000	0.00	0.000	A
5	655.10	648.37	865.65	0.00	860.93	0.761	2.96	16.436	C

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	785.03	784.97	617.33	0.00	1384.63	0.567	1.30	6.003	A
2	729.98	729.96	543.75	0.00	1616.75	0.452	0.82	4.059	A
3	671.62	671.57	814.73	0.00	1172.75	0.573	1.33	7.180	A
4	0.00	0.00	1485.19	0.00	438.56	0.000	0.00	0.000	A
5	655.10	654.65	867.56	0.00	859.94	0.762	3.07	17.437	C

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	640.98	642.97	509.83	0.00	1451.15	0.442	0.80	4.466	A
2	596.03	597.09	446.99	0.00	1679.95	0.355	0.55	3.327	A
3	548.38	550.57	666.59	0.00	1259.26	0.435	0.78	5.094	A
4	0.00	0.00	1216.26	0.00	564.53	0.000	0.00	0.000	A
5	534.89	541.82	710.34	0.00	942.80	0.567	1.34	9.126	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	536.79	537.74	424.08	0.00	1504.22	0.357	0.56	3.730	A
2	499.14	499.72	372.95	0.00	1728.30	0.289	0.41	2.930	A
3	459.24	460.21	557.82	0.00	1322.78	0.347	0.54	4.179	A
4	0.00	0.00	1017.28	0.00	657.71	0.000	0.00	0.000	A
5	447.95	450.04	594.18	0.00	1003.99	0.446	0.82	6.524	A

(Default Analysis Set) - Base 2030 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, AM	Base 2030 + Committed + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			7.79	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	770.00	100.000
2	ONE HOUR	✓	788.00	100.000
3	ONE HOUR	✓	291.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	578.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	413.000	292.000	0.000	65.000
	2	525.000	0.000	136.000	0.000	127.000
	3	99.000	62.000	0.000	0.000	130.000
	4	0.000	0.000	0.000	0.000	1.000
	5	126.000	174.000	278.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.54	0.38	0.00	0.08
	2	0.67	0.00	0.17	0.00	0.16
	3	0.34	0.21	0.00	0.00	0.45
	4	0.00	0.00	0.00	0.00	1.00
	5	0.22	0.30	0.48	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.148	1.045	1.000	1.015
	2	1.091	1.000	1.036	1.000	1.000
	3	1.060	1.080	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000	1.000
	5	1.008	1.053	1.007	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	14.8	4.5	0.0	1.5
	2	9.1	0.0	3.6	0.0	0.0
	3	6.0	8.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0
	5	0.8	5.3	0.7	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.63	7.11	1.66	A
2	0.57	5.56	1.33	A
3	0.28	4.34	0.38	A
4	0.00	0.00	0.00	A
5	0.71	13.71	2.37	B

Main Results for each time segment

Main results: (07:45-08:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	579.70	577.09	384.52	0.00	1463.30	0.396	0.65	4.051	A
2	593.25	591.03	475.46	0.00	1657.87	0.358	0.55	3.367	A
3	219.08	218.27	537.74	0.00	1295.40	0.169	0.20	3.341	A
4	0.00	0.00	756.01	0.00	771.53	0.000	0.00	0.000	A
5	435.15	432.25	514.53	0.00	1027.82	0.423	0.73	6.016	A

Main results: (08:00-08:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	692.21	691.04	460.77	0.00	1417.25	0.488	0.94	4.949	A
2	708.40	707.45	569.54	0.00	1597.62	0.443	0.79	4.040	A
3	261.60	261.34	643.69	0.00	1234.35	0.212	0.27	3.699	A
4	0.00	0.00	905.03	0.00	700.05	0.000	0.00	0.000	A
5	519.61	518.01	615.93	0.00	973.19	0.534	1.13	7.880	A

Main results: (08:15-08:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	847.78	845.02	562.12	0.00	1356.04	0.625	1.63	7.007	A
2	867.61	865.50	695.59	0.00	1516.88	0.572	1.32	5.509	A
3	320.40	319.93	787.46	0.00	1151.51	0.278	0.38	4.327	A
4	0.00	0.00	1107.39	0.00	602.99	0.000	0.00	0.000	A
5	636.39	631.65	753.64	0.00	899.00	0.708	2.31	13.233	B

Main results: (08:30-08:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	847.78	847.70	565.74	0.00	1353.86	0.626	1.66	7.109	A
2	867.61	867.56	698.99	0.00	1514.71	0.573	1.33	5.562	A
3	320.40	320.39	789.38	0.00	1150.40	0.279	0.38	4.336	A
4	0.00	0.00	1109.77	0.00	601.85	0.000	0.00	0.000	A
5	636.39	636.16	755.26	0.00	898.12	0.709	2.37	13.708	B

Main results: (08:45-09:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	692.21	694.96	465.92	0.00	1414.16	0.489	0.97	5.024	A
2	708.40	710.49	574.43	0.00	1594.50	0.444	0.81	4.083	A
3	261.60	262.06	646.54	0.00	1232.71	0.212	0.27	3.712	A
4	0.00	0.00	908.59	0.00	698.34	0.000	0.00	0.000	A
5	519.61	524.41	618.35	0.00	971.88	0.535	1.17	8.130	A

Main results: (09:00-09:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	579.70	580.92	388.35	0.00	1460.99	0.397	0.66	4.097	A
2	593.25	594.22	479.45	0.00	1655.32	0.358	0.56	3.397	A
3	219.08	219.34	540.70	0.00	1293.69	0.169	0.20	3.353	A
4	0.00	0.00	760.05	0.00	769.59	0.000	0.00	0.000	A
5	435.15	436.85	517.26	0.00	1026.35	0.424	0.74	6.123	A

(Default Analysis Set) - Base 2030 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, PM	Base 2030 + Committed + Development	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	(untitled)	Roundabout	1,2,3,4,5			8.31	A

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description
1	1	A483 N	
2	2	A483 S	
3	3	B4381	
4	4	Tesco Access	
5	5	Smithfield Road	

Capacity Options

Arm	Minimum Capacity (PCU/hr)	Maximum Capacity (PCU/hr)
1	0.00	99999.00
2	0.00	99999.00
3	0.00	99999.00
4	0.00	99999.00
5	0.00	99999.00

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	4.70	9.30	5.00	28.00	52.00	20.50	
2	5.00	11.00	10.10	18.70	52.00	35.50	
3	5.80	6.30	9.60	9.10	52.00	47.00	
4	4.10	5.60	1.10	9.40	52.00	56.00	
5	3.60	6.30	7.00	10.80	52.00	42.60	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.643	1860.927
2		(calculated)	(calculated)	0.666	2093.528
3		(calculated)	(calculated)	0.560	1665.386
4		(calculated)	(calculated)	0.453	1134.136
5		(calculated)	(calculated)	0.507	1332.566

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	718.00	100.000
2	ONE HOUR	✓	665.00	100.000
3	ONE HOUR	✓	610.00	100.000
4	ONE HOUR	✓	1.00	100.000
5	ONE HOUR	✓	595.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.000	393.000	195.000	1.000	129.000
	2	452.000	0.000	52.000	0.000	161.000
	3	210.000	128.000	0.000	0.000	272.000
	4	0.000	0.000	0.000	0.000	1.000
	5	162.000	262.000	171.000	0.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.00	0.55	0.27	0.00	0.18
	2	0.68	0.00	0.08	0.00	0.24
	3	0.34	0.21	0.00	0.00	0.45
	4	0.00	0.00	0.00	0.00	1.00
	5	0.27	0.44	0.29	0.00	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	1.000	1.060	1.066	1.000	1.016
	2	1.084	1.000	1.006	1.000	1.006
	3	1.005	1.002	1.000	1.000	1.008
	4	1.000	1.000	1.000	1.000	1.000
	5	1.013	1.000	1.024	1.000	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To				
		1	2	3	4	5
From	1	0.0	6.0	6.6	0.0	1.6
	2	8.4	0.0	0.6	0.0	0.6
	3	0.5	0.2	0.0	0.0	0.8
	4	0.0	0.0	0.0	0.0	0.0
	5	1.3	0.0	2.4	0.0	0.0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.57	6.04	1.31	A
2	0.45	4.05	0.82	A
3	0.57	7.14	1.32	A
4	0.00	0.00	0.00	A
5	0.76	17.35	3.06	C

Main Results for each time segment

Main results: (16:15-16:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	540.55	538.33	419.61	0.00	1508.27	0.358	0.56	3.704	A
2	500.65	499.03	371.50	0.00	1734.16	0.289	0.40	2.911	A
3	459.24	457.14	557.48	0.00	1328.82	0.346	0.52	4.120	A
4	0.00	0.00	1013.87	0.00	659.96	0.000	0.00	0.000	A
5	447.95	444.78	592.49	0.00	1007.03	0.445	0.79	6.367	A

Main results: (16:30-16:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	645.47	644.53	502.72	0.00	1457.18	0.443	0.79	4.426	A
2	597.82	597.25	444.91	0.00	1686.19	0.355	0.55	3.304	A
3	548.38	547.44	667.25	0.00	1264.34	0.434	0.76	5.015	A
4	0.00	0.00	1213.80	0.00	566.46	0.000	0.00	0.000	A
5	534.89	532.96	709.29	0.00	945.53	0.566	1.28	8.684	A

Main results: (16:45-17:00)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	790.53	788.49	612.34	0.00	1389.80	0.569	1.30	5.966	A
2	732.18	731.10	543.26	0.00	1621.92	0.451	0.82	4.036	A
3	671.62	669.43	816.69	0.00	1176.56	0.571	1.31	7.067	A
4	0.00	0.00	1485.02	0.00	439.60	0.000	0.00	0.000	A
5	655.11	648.42	867.86	0.00	862.03	0.760	2.95	16.359	C

Main results: (17:00-17:15)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	790.53	790.47	617.34	0.00	1386.72	0.570	1.31	6.037	A
2	732.18	732.16	545.95	0.00	1620.17	0.452	0.82	4.053	A
3	671.62	671.57	818.03	0.00	1175.78	0.571	1.32	7.139	A
4	0.00	0.00	1488.51	0.00	437.99	0.000	0.00	0.000	A
5	655.11	654.66	869.77	0.00	861.04	0.761	3.06	17.346	C

Main results: (17:15-17:30)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	645.47	647.50	509.80	0.00	1452.82	0.444	0.81	4.482	A
2	597.82	598.89	448.79	0.00	1683.67	0.355	0.55	3.321	A
3	548.38	550.56	669.29	0.00	1263.15	0.434	0.77	5.068	A
4	0.00	0.00	1218.96	0.00	564.07	0.000	0.00	0.000	A
5	534.89	541.78	712.13	0.00	944.06	0.567	1.34	9.097	A

Main results: (17:30-17:45)

Arm	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
1	540.55	541.52	424.07	0.00	1505.52	0.359	0.56	3.740	A
2	500.65	501.23	374.45	0.00	1732.23	0.289	0.41	2.925	A
3	459.24	460.21	560.08	0.00	1327.30	0.346	0.53	4.156	A
4	0.00	0.00	1019.54	0.00	657.32	0.000	0.00	0.000	A
5	447.95	450.04	595.69	0.00	1005.36	0.446	0.81	6.506	A

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.6.541 [19821,26/11/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: [redacted] Web: http://www.trlsoftware.co.uk

Filename: A458 - Site Access.arc8
Path: C:\ITL Jobs\IT1921 Buttington Quarry\PICADY\Junction 4
Report generation date: 05/08/2020 16:33:50

» (Default Analysis Set) - Base 2030 + Committed + Development, AM
» (Default Analysis Set) - Base 2030 + Committed + Development, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2030 + Committed + Development							
Stream B-C	0.04	11.63	0.04	B	0.06	8.98	0.05	A
Stream B-A	0.08	18.20	0.07	C	0.12	12.20	0.11	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.05	9.47	0.05	A	0.04	10.66	0.03	B
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2030 + Committed + Development, AM " model duration: 07:45 - 09:15
"D2 - Base 2030 + Committed + Development, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 05/08/2020 16:33:49

File summary

Title	A458 - Site Access Junction
Location	Buttington, Wales
Site Number	Junction 4
Date	31/07/2020
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	
Enumerator	Dshrivastava
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2030 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, AM	Base 2030 + Committed + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	13.12	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A458 North		Major
B	B	Site Access		Minor
C	C	A458 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00	✓	3.50	165.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	7.47	5.00	4.13	4.00		1.00	160	160

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	676.166	0.123	0.311	0.196	0.445
1	B-C	758.798	0.116	0.294	-	-
1	C-B	764.243	0.296	0.296	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	504.00	100.000
B	ONE HOUR	✓	25.00	100.000
C	ONE HOUR	✓	425.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	32.000	472.000
	B	14.000	0.000	11.000
	C	406.000	19.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.06	0.94
	B	0.56	0.00	0.44
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.375	1.034
	B	1.857	1.000	1.812
	C	1.064	1.474	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	37.5	3.4
	B	85.7	0.0	81.2
	C	6.4	47.4	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-C	0.04	11.63	0.04	B
B-A	0.07	18.20	0.08	C
C-A	-	-	-	-
C-B	0.05	9.47	0.05	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	8.28	8.19	0.00	353.31	0.023	0.02	10.429	B
B-A	10.54	10.37	0.00	260.95	0.040	0.04	14.358	B
C-A	305.66	305.66	0.00	-	-	-	-	-
C-B	14.30	14.17	0.00	438.13	0.033	0.03	8.488	A
A-B	24.09	24.09	0.00	-	-	-	-	-
A-C	355.35	355.35	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	9.89	9.87	0.00	340.15	0.029	0.03	10.900	B
B-A	12.59	12.53	0.00	240.94	0.052	0.05	15.758	C
C-A	364.99	364.99	0.00	-	-	-	-	-
C-B	17.08	17.05	0.00	422.51	0.040	0.04	8.879	A
A-B	28.77	28.77	0.00	-	-	-	-	-
A-C	424.32	424.32	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	12.11	12.08	0.00	321.87	0.038	0.04	11.619	B
B-A	15.41	15.33	0.00	213.21	0.072	0.08	18.184	C
C-A	447.01	447.01	0.00	-	-	-	-	-
C-B	20.92	20.87	0.00	400.91	0.052	0.05	9.471	A
A-B	35.23	35.23	0.00	-	-	-	-	-
A-C	519.68	519.68	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	12.11	12.11	0.00	321.75	0.038	0.04	11.625	B
B-A	15.41	15.41	0.00	213.24	0.072	0.08	18.197	C
C-A	447.01	447.01	0.00	-	-	-	-	-
C-B	20.92	20.92	0.00	400.91	0.052	0.05	9.473	A
A-B	35.23	35.23	0.00	-	-	-	-	-
A-C	519.68	519.68	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	9.89	9.92	0.00	339.92	0.029	0.03	10.911	B
B-A	12.59	12.67	0.00	241.02	0.052	0.06	15.770	C
C-A	364.99	364.99	0.00	-	-	-	-	-
C-B	17.08	17.13	0.00	422.51	0.040	0.04	8.882	A
A-B	28.77	28.77	0.00	-	-	-	-	-
A-C	424.32	424.32	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	8.28	8.31	0.00	353.00	0.023	0.02	10.444	B
B-A	10.54	10.59	0.00	261.04	0.040	0.04	14.379	B
C-A	305.66	305.66	0.00	-	-	-	-	-
C-B	14.30	14.34	0.00	438.13	0.033	0.03	8.495	A
A-B	24.09	24.09	0.00	-	-	-	-	-
A-C	355.35	355.35	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2030 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2030 + Committed + Development, PM	Base 2030 + Committed + Development	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	10.85	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A458 North		Major
B	B	Site Access		Minor
C	C	A458 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00	✓	3.50	165.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	7.47	5.00	4.13	4.00		1.00	160	160

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	684.613	0.125	0.315	0.198	0.450
1	B-C	748.821	0.115	0.290	-	-
1	C-B	764.243	0.296	0.296	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.
Streams may be combined, in which case capacity will be adjusted.
Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	375.00	100.000
B	ONE HOUR	✓	54.00	100.000
C	ONE HOUR	✓	413.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	13.000	362.000
	B	33.000	0.000	21.000
	C	402.000	11.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.61	0.00	0.39
	C	0.97	0.03	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.920	1.040
	B	1.360	1.000	1.430
	C	1.020	1.810	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	92.0	4.0
	B	36.0	0.0	43.0
	C	2.0	81.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-C	0.05	8.98	0.06	A
B-A	0.11	12.20	0.12	B
C-A	-	-	-	-
C-B	0.03	10.66	0.04	B
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	15.81	15.67	0.00	456.87	0.035	0.04	8.157	A
B-A	24.84	24.57	0.00	385.93	0.064	0.07	9.955	A
C-A	302.65	302.65	0.00	-	-	-	-	-
C-B	8.28	8.19	0.00	372.79	0.022	0.02	9.871	A
A-B	9.79	9.79	0.00	-	-	-	-	-
A-C	272.53	272.53	0.00	-	-	-	-	-

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	18.88	18.84	0.00	443.23	0.043	0.04	8.483	A
B-A	29.67	29.59	0.00	363.09	0.082	0.09	10.792	B
C-A	361.39	361.39	0.00	-	-	-	-	-
C-B	9.89	9.87	0.00	363.19	0.027	0.03	10.188	B
A-B	11.69	11.69	0.00	-	-	-	-	-
A-C	325.43	325.43	0.00	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	23.12	23.07	0.00	424.04	0.055	0.06	8.977	A
B-A	36.33	36.20	0.00	331.46	0.110	0.12	12.188	B
C-A	442.61	442.61	0.00	-	-	-	-	-
C-B	12.11	12.08	0.00	349.93	0.035	0.04	10.656	B
A-B	14.31	14.31	0.00	-	-	-	-	-
A-C	398.57	398.57	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	23.12	23.12	0.00	423.93	0.055	0.06	8.981	A
B-A	36.33	36.33	0.00	331.48	0.110	0.12	12.196	B
C-A	442.61	442.61	0.00	-	-	-	-	-
C-B	12.11	12.11	0.00	349.93	0.035	0.04	10.656	B
A-B	14.31	14.31	0.00	-	-	-	-	-
A-C	398.57	398.57	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	18.88	18.93	0.00	443.05	0.043	0.04	8.488	A
B-A	29.67	29.79	0.00	363.14	0.082	0.09	10.803	B
C-A	361.39	361.39	0.00	-	-	-	-	-
C-B	9.89	9.92	0.00	363.19	0.027	0.03	10.192	B
A-B	11.69	11.69	0.00	-	-	-	-	-
A-C	325.43	325.43	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	15.81	15.84	0.00	456.62	0.035	0.04	8.167	A
B-A	24.84	24.93	0.00	385.97	0.064	0.07	9.974	A
C-A	302.65	302.65	0.00	-	-	-	-	-
C-B	8.28	8.30	0.00	372.79	0.022	0.02	9.877	A
A-B	9.79	9.79	0.00	-	-	-	-	-
A-C	272.53	272.53	0.00	-	-	-	-	-

APPENDIX K

PERSONAL INJURY ACCIDENT ASSESSMENT

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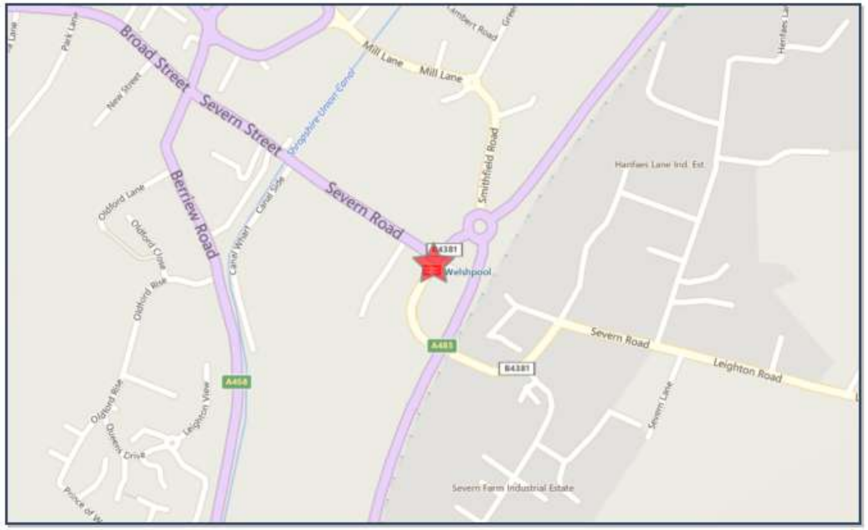
No

Crash Date: Wednesday, July 20, 2016 **Time of Crash:** 4:30:00 PM **Crash Reference:** **201663DP24016**

Highest Injury Severity:	Slight	**Road Number:**	B4381	**Number of Casualties:**	2
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	322870 307220
Weather Description:	Fine without high winds				
Road Surface Description:	Dry				
Speed Limit:	30				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Mini roundabout				
Junction Pedestrian Crossing:	Central refuge - no other controls				
Road Type:	Roundabout				
Junction Control:	Give way or uncontrolled				



For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
To subscribe to unlimited reports using CrashMap Pro visit *www.crashmap.co.uk/Home/Premium_Services*

No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	10	Female	16 - 20	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Other	None	None
2	Car (excluding private hire)	14	Male	56 - 65	Vehicle is in the act of turning right	Front	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Vehicle or pillion passenger	Female	0 - 5	Unknown or other	Unknown or other
2	2	Slight	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other

crashmap.co.uk

No

Crash Date:	Wednesday, June 07, 2017	**Time of Crash:**	2:25:00 PM	**Crash Reference:**	**201763D052317**
Highest Injury Severity:	Slight	**Road Number:**	A483	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	3
Local Authority:	Powys County			**OS Grid Reference:**	324380 309290

Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 60

Light Conditions: Daylight: regardless of presence of streetlights

Carriageway Hazards: None

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Not Applicable

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
To subscribe to unlimited reports using CrashMap Pro visit *www.crashmap.co.uk/Home/Premium_Services*

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Van or goods vehicle 3.5 tonnes mgw and under	-1	Male	36 - 45	Vehicle proceeding normally along the carriageway, not on a bend	Front	Journey as part of work	None	None
2	Car (excluding private hire)	7	Male	56 - 65	Vehicle is slowing down or stopping	Back	Other	None	None
3	Car (excluding private hire)	-1	Unknown	Unknown	Vehicle is waiting to proceed normally but is held up	Did not impact	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Vehicle or pillion passenger	Male	26 - 35	Unknown or other	Unknown or other

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No

Crash Date: Sunday, June 11, 2017 **Time of Crash:** 10:40:00 AM **Crash Reference:** **201763D053017**

Highest Injury Severity: Slight **Road Number:** A458 **Number of Casualties:** 1

Highway Authority: Powys **Number of Vehicles:** 1

Local Authority: Powys County **OS Grid Reference:** 325690 308960

Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 60

Light Conditions: Daylight: regardless of presence of streetlights

Carriageway Hazards: None

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Motorcycle over 500cc	15	Male	26 - 35	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Other	None	Other permanent object

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

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No

Crash Date: Sunday, June 18, 2017 **Time of Crash:** 5:00:00 PM **Crash Reference:** **201763D055217**

Highest Injury Severity: Serious **Road Number:** A458 **Number of Casualties:** 1

Highway Authority: Powys **Number of Vehicles:** 3

Local Authority: Powys County **OS Grid Reference:** 323180 307890

Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 30

Light Conditions: Daylight: regardless of presence of streetlights

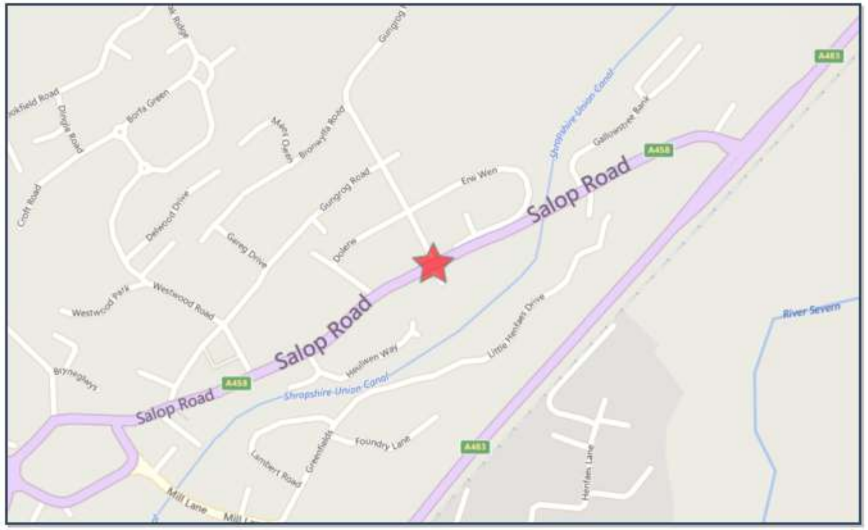
Carriageway Hazards: None

Junction Detail: T or staggered junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Give way or uncontrolled



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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	2	Male	46 - 55	Vehicle is in the act of turning right	Front	Other	None	None
2	Motorcycle over 500cc	2	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
3	Car (excluding private hire)	-1	Unknown	Unknown	Vehicle is waiting to proceed normally but is held up	Did not impact	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Serious	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other

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No

Crash Date:	Friday, June 23, 2017	**Time of Crash:**	4:50:00 PM	**Crash Reference:**	**201763D060017**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	1
Local Authority:	Powys County			**OS Grid Reference:**	325820 309170

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	7	Male	21 - 25	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	Other permanent object

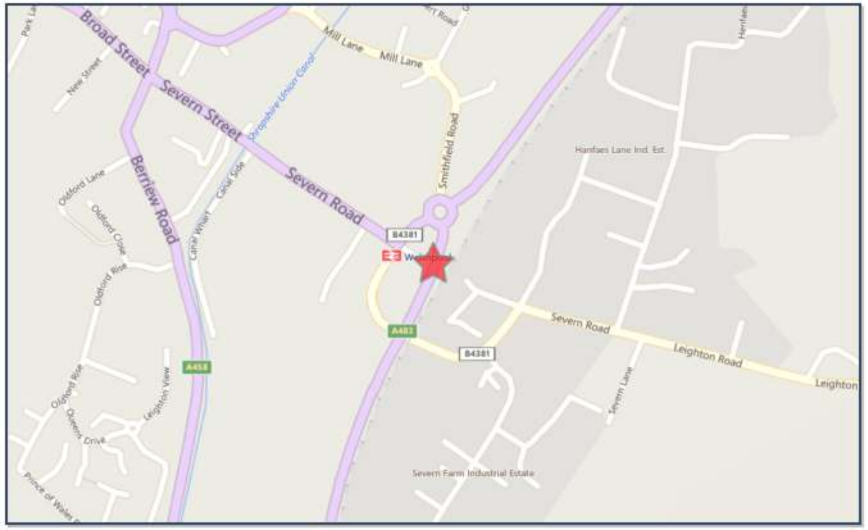
Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	21 - 25	Unknown or other	Unknown or other

No

Crash Date:	Friday, July 14, 2017	**Time of Crash:**	9:50:00 AM	**Crash Reference:**	**201763D073017**
Highest Injury Severity:	Serious	**Road Number:**	A483	**Number of Casualties:**	2
Highway Authority:	Powys			**Number of Vehicles:**	3
Local Authority:	Powys County			**OS Grid Reference:**	322930 307200

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Not Applicable



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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	8	Male	66 - 75	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Car (excluding private hire)	-1	Female	Over 75	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Other	None	None
3	Car (excluding private hire)	-1	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	Road sign/Traffic signal

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	66 - 75	Unknown or other	Unknown or other
3	2	Serious	Driver or rider	Male	46 - 55	Unknown or other	Unknown or other

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No

Crash Date:	Friday, September 08, 2017	**Time of Crash:**	2:25:00 PM	**Crash Reference:**	**201763D086617**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	3
Local Authority:	Powys County			**OS Grid Reference:**	325530 308870

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	11	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	Tree
2	Car (excluding private hire)	4	Male	26 - 35	Vehicle is waiting to proceed normally but is held up	Front	Other	None	Tree
3	Car (excluding private hire)	7	Female	46 - 55	Vehicle is waiting to turn right	Did not impact	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

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No

Crash Date:	Friday, November 10, 2017	**Time of Crash:**	9:19:00 PM	**Crash Reference:**	**201763D110417**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	1
Local Authority:	Powys County			**OS Grid Reference:**	326190 309730

Weather Description:	Raining without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	60
Light Conditions:	Darkness: no street lighting
Carriageway Hazards:	Dislodged vehicle load in carriageway
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Male	16 - 20	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	Telegraph pole/Electricity pole

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Vehicle or pillion passenger	Male	16 - 20	Unknown or other	Unknown or other

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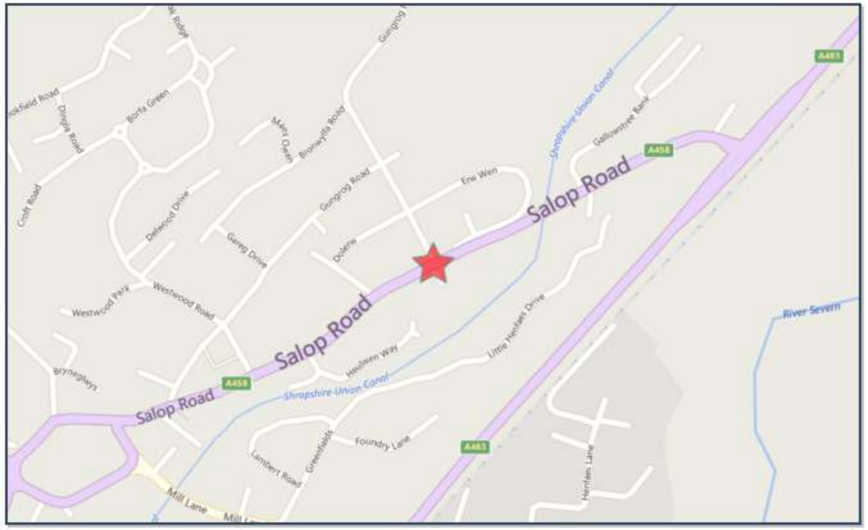
No

Crash Date: Monday, November 27, 2017 **Time of Crash:** 3:40:00 PM **Crash Reference:** **201763D124817**

Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	323180 307890

Weather Description:	Raining without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	30
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	Zebra crossing
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled



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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	3	Female	26 - 35	Vehicle is in the act of turning right	Front	Taking pupil to/from school	None	None
2	Car (excluding private hire)	1	Male	36 - 45	Vehicle proceeding normally along the carriageway, not on a bend	Nearside	Other	None	Other permanent object

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Male	36 - 45	Unknown or other	Unknown or other

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No

Crash Date: Friday, January 27, 2017 **Time of Crash:** 6:20:00 PM **Crash Reference:** **201763DP03917**

Highest Injury Severity: Slight

Road Number: A458

Number of Casualties: 2

Highway Authority: Powys

Number of Vehicles: 3

Local Authority: Powys County

OS Grid Reference: 326800 310380

Weather Description: Fine without high winds

Road Surface Description: Wet or Damp

Speed Limit: 60

Light Conditions: Darkness: no street lighting

Carriageway Hazards: None

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	9	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Car (excluding private hire)	2	Female	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Other	None	None
3	Car (excluding private hire)	4	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other
2	2	Slight	Driver or rider	Female	46 - 55	Unknown or other	Unknown or other

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No

Crash Date: Friday, March 03, 2017 **Time of Crash:** 5:25:00 PM **Crash Reference:** **201763DP04017**

Highest Injury Severity: Serious

Road Number: A458

Number of Casualties: 3

Highway Authority: Powys

Number of Vehicles: 2

Local Authority: Powys County

OS Grid Reference: 326810 310410

Weather Description: Raining without high winds

Road Surface Description: Wet or Damp

Speed Limit: 60

Light Conditions: Darkness: no street lighting

Carriageway Hazards: None

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Not Applicable

No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	16	Female	16 - 20	Vehicle proceeding normally along the carriageway, on a left hand bend	Front	Other	None	None
2	Car (excluding private hire)	8	Male	56 - 65	Vehicle proceeding normally along the carriageway, on a left hand bend	Front	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Female	16 - 20	Unknown or other	Unknown or other
2	2	Serious	Vehicle or pillion passenger	Female	66 - 75	Unknown or other	Unknown or other
2	3	Slight	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other

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No

Crash Date:	Sunday, September 09, 2018	**Time of Crash:**	6:55:00 AM	**Crash Reference:**	**201863D085418**
Highest Injury Severity:	Serious	**Road Number:**	A458	**Number of Casualties:**	3
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	326810 310390

Weather Description:	Fine without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	50
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Van or goods vehicle 3.5 tonnes mgw and under	5	Male	26 - 35	Vehicle proceeding normally along the carriageway, on a left hand bend	Front	Commuting to/from work	None	None
2	Car (excluding private hire)	16	Male	56 - 65	Vehicle proceeding normally along the carriageway, on a right hand bend	Front	Commuting to/from work	None	Other permanent object

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other
2	2	Serious	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other
2	3	Serious	Vehicle or pillion passenger	Male	56 - 65	Unknown or other	Unknown or other

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No

Crash Date:	Saturday, October 20, 2018	**Time of Crash:**	6:59:00 PM	**Crash Reference:**	**201863D101418**
Highest Injury Severity:	Serious	**Road Number:**	A458	**Number of Casualties:**	4
Highway Authority:	Powys			**Number of Vehicles:**	3
Local Authority:	Powys County			**OS Grid Reference:**	325930 309320

Weather Description:	Fine without high winds
Road Surface Description:	Dry
Speed Limit:	50
Light Conditions:	Darkness: no street lighting
Carriageway Hazards:	None
Junction Detail:	Using private drive or entrance
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	3	Female	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Car (excluding private hire)	8	Female	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	Other permanent object
3	Car (excluding private hire)	12	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Offside	Other	None	Other permanent object

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Female	46 - 55	Unknown or other	Unknown or other
2	2	Slight	Driver or rider	Female	56 - 65	Unknown or other	Unknown or other
3	3	Slight	Vehicle or pillion passenger	Male	46 - 55	Unknown or other	Unknown or other
3	4	Slight	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other

No

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No

Crash Date:	Tuesday, December 18, 2018	**Time of Crash:**	6:15:00 PM	**Crash Reference:**	**201863D120118**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	326810 310390

Weather Description:	Fine without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	50
Light Conditions:	Darkness: no street lighting
Carriageway Hazards:	None
Junction Detail:	Not at or within 20 metres of junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Goods vehicle 7.5 tonnes mgw and over	7	Male	46 - 55	Vehicle proceeding normally along the carriageway, on a right hand bend	Front	Journey as part of work	None	Other permanent object
2	Goods vehicle 7.5 tonnes mgw and over	11	Male	26 - 35	Vehicle proceeding normally along the carriageway, on a left hand bend	Front	Journey as part of work	None	Nearside or offside crash barrier

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

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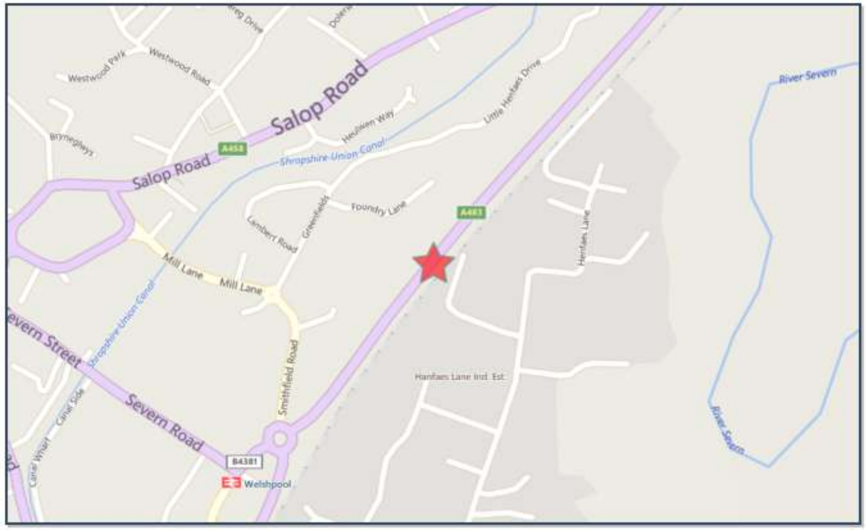
No

Crash Date: Saturday, February 23, 2019 **Time of Crash:** 10:57:00 AM **Crash Reference:** 201963D015319

Highest Injury Severity: Slight **Road Number:** A483 **Number of Casualties:** 1

Highway Authority: Powys **Number of Vehicles:** 3

Local Authority: Powys County **OS Grid Reference:** 323180 307540



Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 60

Light Conditions: Daylight: regardless of presence of streetlights

Carriageway Hazards: None

Junction Detail: Not at or within 20 metres of junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Not Applicable

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Motorcycle over 500cc	20	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Car (excluding private hire)	5	Female	36 - 45	Vehicle is passing a stationary vehicle on its offside	Back	Commuting to/from work	None	None
3	Car (excluding private hire)	-1	Unknown	Unknown	Vehicle is parked in the carriageway	Did not impact	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	46 - 55	Unknown or other	Unknown or other

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No

Crash Date:	Friday, March 15, 2019	**Time of Crash:**	7:30:00 AM	**Crash Reference:**	**201963D019019**

Highest Injury Severity:	Serious	**Road Number:**	A458	**Number of Casualties:**	3
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	325010 308840

Weather Description:	Raining with high winds
Road Surface Description:	Wet or Damp
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	6	Female	26 - 35	Vehicle is waiting to turn right	Back	Journey as part of work	None	None
2	Car (excluding private hire)	-1	Female	26 - 35	Vehicle proceeding normally along the carriageway, not on a bend	Front	Taking pupil to/from school	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Vehicle or pillion passenger	Female	11 - 15	Unknown or other	Unknown or other
2	2	Serious	Driver or rider	Female	26 - 35	Unknown or other	Unknown or other
2	3	Serious	Vehicle or pillion passenger	Male	11 - 15	Unknown or other	Unknown or other

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No

Crash Date:	Friday, April 05, 2019	**Time of Crash:**	8:12:00 AM	**Crash Reference:**	**201963D026719**

Highest Injury Severity:	Serious	**Road Number:**	A458	**Number of Casualties:**	2
Highway Authority:	Powys			**Number of Vehicles:**	3
Local Authority:	Powys County			**OS Grid Reference:**	326200 309760

Weather Description:	Raining without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Female	66 - 75	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Van or goods vehicle 3.5 tonnes mgw and under	13	Male	26 - 35	Vehicle is slowing down or stopping	Back	Journey as part of work	None	None
3	Car (excluding private hire)	18	Female	26 - 35	Vehicle is in the act of turning right	Back	Commuting to/from work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Female	66 - 75	Unknown or other	Unknown or other
1	2	Serious	Vehicle or pillion passenger	Male	46 - 55	Unknown or other	Unknown or other

crashmap.co.uk

No

Crash Date: Friday, August 09, 2019 **Time of Crash:** 2:00:00 PM **Crash Reference:** **201963D069319**

Highest Injury Severity:	Serious	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	326810 310390
Weather Description:	Raining without high winds				
Road Surface Description:	Wet or Damp				
Speed Limit:	60				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Not at or within 20 metres of junction				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Not Applicable				

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
To subscribe to unlimited reports using CrashMap Pro visit *www.crashmap.co.uk/Home/Premium_Services*

No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Motorcycle over 125cc and up to 500cc	52	Male	56 - 65	Vehicle proceeding normally along the carriageway, on a left hand bend	Offside	Other	None	None
2	Van or goods vehicle 3.5 tonnes mgw and under	7	Male	56 - 65	Vehicle proceeding normally along the carriageway, on a right hand bend	Offside	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Serious	Driver or rider	Male	56 - 65	Unknown or other	Unknown or other

crashmap.co.uk

No

Crash Date: Friday, July 05, 2019 **Time of Crash:** 6:40:00 PM **Crash Reference:** 201963D070819

Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	3
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	325000 308860
Weather Description:	Fine without high winds				
Road Surface Description:	Dry				
Speed Limit:	60				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	T or staggered junction				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Give way or uncontrolled				

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	6	Male	46 - 55	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Van or goods vehicle 3.5 tonnes mgw and under	5	Male	46 - 55	Vehicle is slowing down or stopping	Back	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Male	46 - 55	Unknown or other	Unknown or other
2	2	Slight	Vehicle or pillion passenger	Female	36 - 45	Unknown or other	Unknown or other
2	3	Slight	Vehicle or pillion passenger	Male	11 - 15	Unknown or other	Unknown or other

crashmap.co.uk

No

Crash Date:	Wednesday, September 04, 2019	**Time of Crash:**	12:55:00 PM	**Crash Reference:**	**201963D081019**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	3
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	326090 309550

Weather Description: Fine without high winds

Road Surface Description: Dry

Speed Limit: 50

Light Conditions: Daylight: regardless of presence of streetlights

Carriageway Hazards: None

Junction Detail: T or staggered junction

Junction Pedestrian Crossing: No physical crossing facility within 50 metres

Road Type: Single carriageway

Junction Control: Give way or uncontrolled

For more information about the data please visit: *www.crashmap.co.uk/home/Faq*
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No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Male	56 - 65	Vehicle proceeding normally along the carriageway, not on a bend	Front	Journey as part of work	None	None
2	Car (excluding private hire)	10	Female	21 - 25	Vehicle is waiting to turn right	Back	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Female	21 - 25	Unknown or other	Unknown or other
2	2	Slight	Vehicle or pillion passenger	Female	0 - 5	Unknown or other	Unknown or other
2	3	Slight	Vehicle or pillion passenger	Female	16 - 20	Unknown or other	Unknown or other

crashmap.co.uk

No

Crash Date:	Wednesday, December 11, 2019	**Time of Crash:**	7:45:00 AM	**Crash Reference:**	**201963D117219**
Highest Injury Severity:	Slight	**Road Number:**	A458	**Number of Casualties:**	1
Highway Authority:	Powys			**Number of Vehicles:**	2
Local Authority:	Powys County			**OS Grid Reference:**	325010 308850

Weather Description:	Fine without high winds
Road Surface Description:	Wet or Damp
Speed Limit:	60
Light Conditions:	Daylight: regardless of presence of streetlights
Carriageway Hazards:	None
Junction Detail:	T or staggered junction
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres
Road Type:	Single carriageway
Junction Control:	Give way or uncontrolled

crashmap.co.uk

No

Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Male	66 - 75	Vehicle is in the act of turning right	Front	Commuting to/from work	None	None
2	Motorcycle over 500cc	2	Male	36 - 45	Vehicle proceeding normally along the carriageway, on a right hand bend	Front	Journey as part of work	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
2	1	Slight	Driver or rider	Male	36 - 45	Unknown or other	Unknown or other

APPENDIX L

GEOTECHNICAL ASSESSMENT

Document:	**Preliminary Sources Study Report**
Project:	**Buttington Quarry, Welshpool**
Reference No:	**GC23128_PSSR**
Date:	**March 2020**
Prepared for:	**Broad Environmental Limited c/o Environmental Compliance Limited**

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ENGINEERING

A division of Harrison Group Environmental Limited

HARRISON GROUP ENVIRONMENTAL LIMITED

Document: Preliminary Sources Study Report

Project: Buttington Quarry, Welshpool

Reference No: GC23128_PSSR

Date: March 2020

Prepared for: Broad Environmental Limited
c/o Environmental Compliance Limited

REPORT STATUS

Revision	Comments	Prepared By	Approved By	Issued By	Audited By
0	First Issue	INITIALS IH DATE 09/03/20	INITIALS JAU DATE 10/03/20	INITIALS JAU DATE 10/03/20	INITIALS JAU DATE 10/03/20
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE

CONTENTS

FOREWORD

General Conditions Relating To Site Investigation

This investigation has been devised to generally comply with the relevant principles and requirements of B.S.10175:2011+A2:2017 'Investigation of potentially contaminated sites - Code of practice', science report SC050021/SR3 'Updated Technical Background to the CLEA Model' (Environment Agency, 2008), and Contaminated Land Report 11 'Model procedures for the management of contaminated land' (Department for Environment, Food and Rural Affairs and the Environment Agency, 2004) and BS EN 1997 (Eurocode 7). The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.

Boring and sampling procedures are undertaken in accordance with B.S.5930:2015 'Code of Practice for Ground Investigations'. Likewise in-situ and laboratory testing complies with B.S.1377:1990 'Methods of Tests for Soils for Civil Engineering Purposes' and B.S.22475:2011, unless stated otherwise in the text. Chemical Testing has been undertaken by a UKAS accredited laboratory.

The groundwater conditions entered on the boring records are those observed at the time of investigation. The normal rate of boring usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions.

Some items of the investigation have been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced in accordance with the scope of Harrison Group's appointment and is subject to the terms of appointment. Harrison Group accepts no liability for any use of this document other than by its client and only for the purposes, for which it was designed and produced. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

PRELIMINARY SOURCES SCOPING REPORT

FOR LAND AT

BUTTINGTON QUARRY, WELSHPOOL

1 TERMS OF REFERENCE & INTRODUCTION

The work covered by this report was requested by Environmental Compliance Ltd. and was undertaken on behalf of Broad Environmental Ltd in accordance Harrison Group Environmental Limited's quotation (GC23128_Q_JAU) dated 10th October 2019.

This Preliminary Sources Scoping Report (PSSR) should be read in conjunction with the Statement of Intent (ref. GC23128_SoI, dated December 2019). The purpose of the PSSR was to provide a review of available existing information, complete a walkover inspection and geotechnical assessment of the existing outer (eastern) quarry and area proposed to form a new access road.

The report was undertaken in order to address the requirements of the planning permission granted by Powys County Council (ref. P/2015/0439), Condition 3 which states:

> *Prior to the commencement of works the developer shall submit a scheme that includes detailed design drawings and calculations of the proposed new highway cutting, a catch ditch to prevent scree from obscuring highway visibility and exposure of rock formations of geological interest for the written approval of the Local Planning Authority. This submission must be prepared by a Geotechnical consultant in accordance with DMRB HD22/08- "Managing Geotechnical Risk" and be accompanied by a Geotechnical Certificate signed by the applicants Geotechnical Advisor. Upon written approval of the Local Planning Authority, the scheme shall be implemented in full.*

Since publication of the planning permission, HD22/08 has been superseded by CD 622 Managing Geotechnical Risk, Revision 1, dated August 2019.

Although the proposed works require the cutting of in-situ bedrock at a maximum angle of 1v:1h (45^{o}), this will be setback from the existing highway and a 1m deep catch trench is proposed. A such, this will provide an improvement to safety of the existing highway. Given the scale and nature of the proposed works, this is considered to fall into Geotechnical Category 1.

2 BACKGROUND

Butting Quarry lies to the northeast of Buttington village, immediately east of the A458 between Welshpool and Shrewsbury. The quarry has been historically worked since the late 1800's primarily as a brickworks, but also for the extraction of bulk and screened rock fill.

The main quarry has not been operational for around 20 years, although rock fill extraction is currently being undertaken in the vicinity of the proposed new site access road, which lies in the west of the site. The base of the quarry in this area is present at an elevation of 82-83m AOD, which is approximately coincident with the elevation of the adjacent A428 at the location of the proposed new site entrance.

3 SITE SETTING AND PROPOSED DEVELOPMENT

3.1 Site Setting

The existing site comprises the western fringe of the existing Buttington Quarry, immediately east of the adjacent A458. It lies 3.1km northeast of Welshpool and is shown on Drawing Ref. GC23128_DR001.

3.2 Proposed Development

The Development is for the construction and operation of an Energy Recovery Facility (ERF) capable of generating around 13MWe of low carbon and renewable electrical energy (when operational in full condensing mode) through the thermal treatment of up to 167,000 tonnes per annum of residual MSW and MSW like waste ("the feedstock"). The feedstock would arise from industrial and commercial sources and would consist of material suitable for energy recovery.

The ERF would be capable of generating both electrical and heat energy from the thermal recovery of energy through the process and so would be classed as a Combined Heat and Power plant, often referred to by the acronym CHP plant.

The proposed development relating to the highway adjacent to Buttington Quarry will include formation of a new access route as indicated on Drawing Ref. GC23128_DR001. The new site entrance will access from the existing A458 at National Grid Reference 326262, 309914 directly onto the site which lies to the east. It is proposed that as part of the access construction, improvements will be made to the visibility splay by cutting back the existing slope to form an open verge extending a distance of approximately 170m to the north.

The slope will be formed at a gradient of 1v:1h (45°) to a maximum height of approximately 16m. The toe of the cutting will also incorporate a 1m deep catch trench to prevent any spalling material from impacting on the verge or adjacent highway. This will result in a verge of up to 15m wide between the outer edge of the catch trench and the adjacent A458.

4 GEOLOGY

Review of records held by the British Geological Survey (BGS) indicates that the site is underlain from ground level by bedrock deposits of the Silurian age Cefn Formation (Cfn) in the north, which comprises interbedded mudstones and sandstones. To the south of the site lies the Tarannon Mudstone Formation (Tar), also of Silurian Age.

These are overlain by the Trewern Brook Mudstone (TBM) which lies to the southeast. To the northwest of the site, the Cefn Formation is unconformably underlain by the Stone House Shale Formation (StH), which is Ordovician in age.

An extract of the BGS mapping covering the site is presented below showing the distribution of each formation in relation to the proposed works.

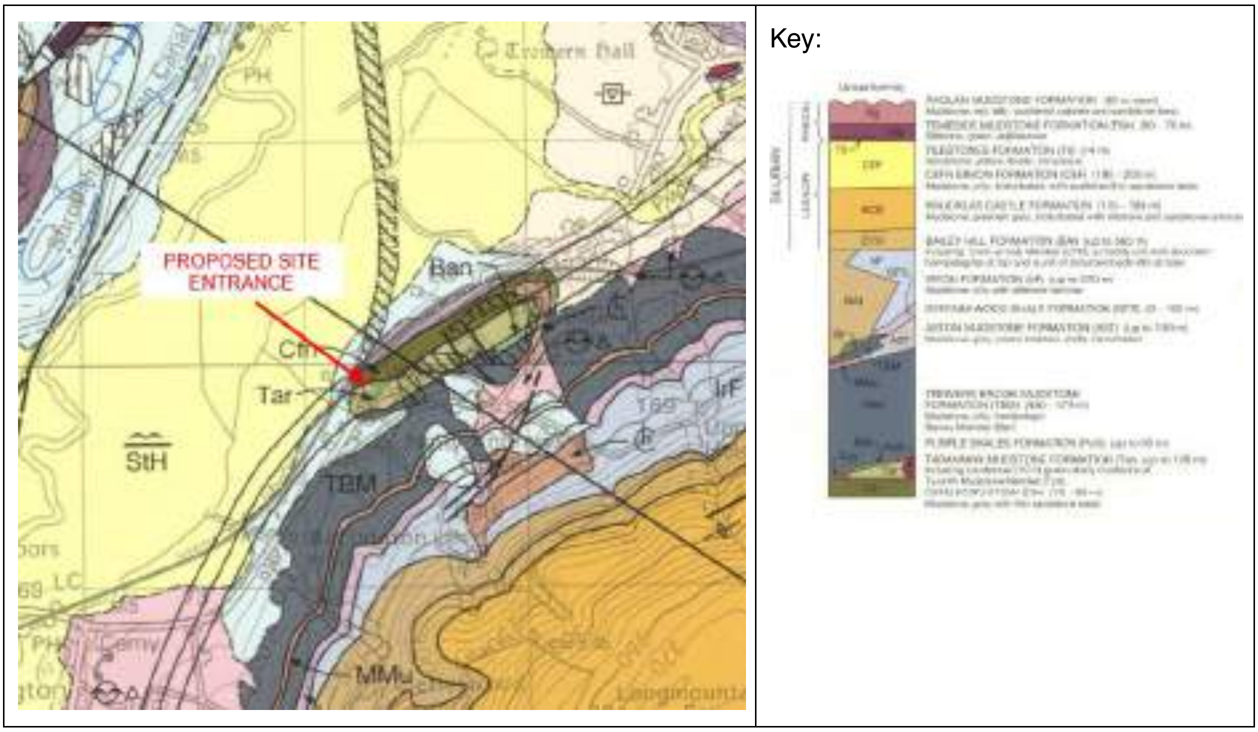


Figure 4.1 Extract from BGS 1:50,000 scale geological mapping sheet 151, Welshpool

No historical British Geological Survey held borehole records are available within the site or nearby surrounding area.

5 SITE WALKOVER AND INSPECTION

To enable assessment of the current condition of the site and to allow inspection of the proposed development area, a site inspection was undertaken by an experienced geotechnical engineer from Harrison Group Environmental Ltd on 29th October 2019. The walkover was undertaken during clear, dry weather conditions. A photographic record of the walkover is provided in the appendix, with individual areas discussed in more detail below.

The area of the proposed new access road and associated works lie towards the south-western end of the quarry site, approximately 50m north of the existing weighbridge office. The access road alignment will head east off the A428 for approximately 175m before turning northeast into the main quarry void. This area is currently being operated for the extraction of rock fill materials which has resulted in two excavation slopes, formed from individual faces and benches, between which is an open horizonal working area to allow access to delivery vehicles/trucks and associated plant.

5.1 North-Eastern Excavation

The north-eastern slope, as shown in Photograph 1 comprises a series of five faces and four benches. Access to the three lower benches is achieved from the southeast corner of the slope, with access to the upper bench from a separate haul road which approaches from the northeast, at the entrance to the main quarry.

Individual faces have been formed at heights of between 2-3m up to a maximum of 7m at gradients of generally between 1v:0.83h (50°) and 1v:0.73h (54°) but locally up to a maximum of approximately 1v:0.5h (63°).

As can be seen in Photograph 1, the Cefn Formation comprises light brown and grey thinly interbedded mudstones and sandstones. Bedding is generally at around 80°, dipping to the southeast and striking at 265° (W). Locally, bedding is affected by either faulting or localised folding which is most notable in the upper bench visible in Photograph 1 and more closely in Photograph 4, which has resulted in bedding being rotated to dip at approximately 45° to the southwest (out of the face). Photograph 3 also shows an area located close to the western end of the face where small scale faulting (slickensides observed on face) has resulted in a block of material sliding out of the face.

Overall the lower three faces of this slope have been formed at a gradient of 1v:1.66h (31°).

It was noted that a significant amount of fine grained, friable scree (silt to sand with occasional fine gravel) was present at the base of each of the faces, although this is considered likely to be the result of excavation activities, rather than weathering and spalling of material. Overall, the faces appeared to be in a stable condition with no indications of tension cracking, deformation or groundwater seepages.

5.2 Western Excavation

In contrast to the north-eastern excavation, the western area is of limited vertical extent due to topography rising up from the A458 to the west. In this area the excavation is formed from two faces with a maximum overall height of approximately 6m. Bedding was consistent with that observed to the northwest, and there were no obvious indications of faulting or folding disrupting the overall structure. The lower face is up to 2m high with the upper face at between 2m and 4m in height.

The lower portion of each face is covered by scree which was present at approximately 1v:1.2h (40°). The upper faces were excavated at an angle of 70-80° and generally appeared stable, although some localised small hanging blocks were observed. However, overall the excavation faces appeared stable with no indications of tension cracking, deformation or groundwater seepages.

The material appeared slightly less weathered and more competent in this area, particularly towards the southern end of the excavation as shown in Photographs 6 and 7. Spalled material was less friable and was present at the base of the lower slope up to 130mm in size, generally grading down to 2-5mm.

Photograph 8 shows the crest of the western excavation where vegetation has recently been cleared exposing residual soils formed the underlying material. The ground had recently been disturbed but there were no indications of tension cracking or ground movement along the entire western crest of the excavation.

5.3 A458 Existing Western Slope

Photographs 10 and 11 show the existing slope which falls to the west down to the A458. This area has recently been cleared of trees along the majority of the proposed works area. This slope is generally present at approximately 35-40° and could not be safely accessed during the walkover. Observations made from the crest of the slope indicated that it was in a stable condition with no visible tension cracking or deformation. The slope is likely to have been subject to minor soil creep as indicated by slight curvature in some tree trunks remaining on the slope, although this would not be considered to represent a significant risk.

As part of the proposed works, this slope will be cut back to form the new verge in order to improve visibility for the new junction.

Two historical workings are recorded in the western slope of the A458; a smaller excavation in the south and a larger one to the north, both located to the north of the proposed new access. Safe access into the former workings was not possible during the site walkover. However, when observed from the crest each appear to be heavily vegetated with shrubs and small trees with only limited areas of the underlying rock mass and scree visible.

The larger working in the north has slopes ranging from approximately 35° at the base up to subvertical at the crest of the excavation. Anecdotal evidence suggests both excavations have been present for a significant period of time (likely more than 20 years), and despite the steep slopes present, no evidence of instability or movement observed, apart from spalled material at the base of the slopes.

6 STABILITY OF NEW EXCAVATIONS

Although evidence suggests that slopes greater than 45° will stand unsupported for a significant period of time, as observed in the existing quarry and former excavations on the western side of the A458, westering and spalling will result in a shallower slope angle to form in the long term. The natural angle of repose of scree within the existing quarry appears to be at 35-40°, and as such the proposed cut angle of 45° is likely to generate a limited amount of scree, albeit to a much lesser degree than that observed from steeper slope.

Vegetation growing on the 45° cut slope will help to mitigate the effect of surface water runoff washing fine scree downslope. This may be achieved by planting of grass and shrubs or allowing the slope to vegetate naturally. Low lying shrubs and undergrowth have a stabilising effect on shallow soils as a result of root growth; large trees can have a much greater reinforcing effect while they stand, but should trees be blown down during storms or root balls rot once the trees die, this can result in localised oversteepening and instability. As such, it is recommended that trees are not allowed to grow to maturity and that vegetation is regularly controlled.

As previously recommended in the Veryards Ltd Geotechnical Report dated August 1999, the proposed design incorporates a 1m deep trench at the base of the slope with 1v:1h (45°) sides. This will act to retain any spalling material and prevent material falling onto the verge or adjacent carriageway. The ditch should be drained to prevent surface water build up.

7 CONCLUSIONS

It is considered that the proposed verge widening and slope cutting to be formed at a gradient of 1v:1h (45°) associated with the new site access will remain stable in the long term. It is recommended that the catch ditch will be required to ensure any spalled material is retained to the base of the cutting intrusive ground investigation is considered necessary, although it is recommended that the proposed works are overseen by a qualified person to ensure excavation is undertaken in a safe manner and that the final cut slopes are inspected to ensure the local conditions are as expected and are not impacted by unfavourable bedding, faulting, groundwater seepages or other factors which could detrimentally affect their long term stability.

Should any faulting or localised folding be encountered on the final excavation face, adjustment to the final gradient may be necessary to ensure planar surfaces to not exist at a potentially detrimental angle out of the face, as this could result in sliding failure. As such it would be prudent of a suitable qualified person to be present at the time of construction to verify the condition of the slope and the assumptions made based on outcrop within the quarry excavation immediately to the east.

To ensure loose material is stabilised on the surface of the slope, it is considered that hydro-seeding should be undertaken as soon as possible following excavation, as this would be beneficial in promoting rapid vegetation growth. As an alternative, conventional seeding could achieve a similar result in a slightly longer timespan. It is recommended that large tree species are not permitted to become established on the slope, although slow growing, small/dwarf tree species should not cause any issues with regard to stability in the long term.

We recommend that this report is submitted to Regulators as part of the planning process.

Harrison Group Environmental Limited would be pleased to offer further assistance with the recommended works if requested, and if the client or regulators have any comments or questions we would be glad to discuss them.

REFERENCES

BS EN 1997-1:2004 +A1:2013, ‘Eurocode 7: Geotechnical Design - Part 1: General rules”.

HD22/08: Managing Geotechnical Risk Implementation Guidance – Wales, DMRB 4.1.2, December 2009.

Design Manual for Roads and Bridges CD 622 Managing Geotechnical Risk (formerly HD 22/08, BD 10/97, HA 120/08) Revision 0

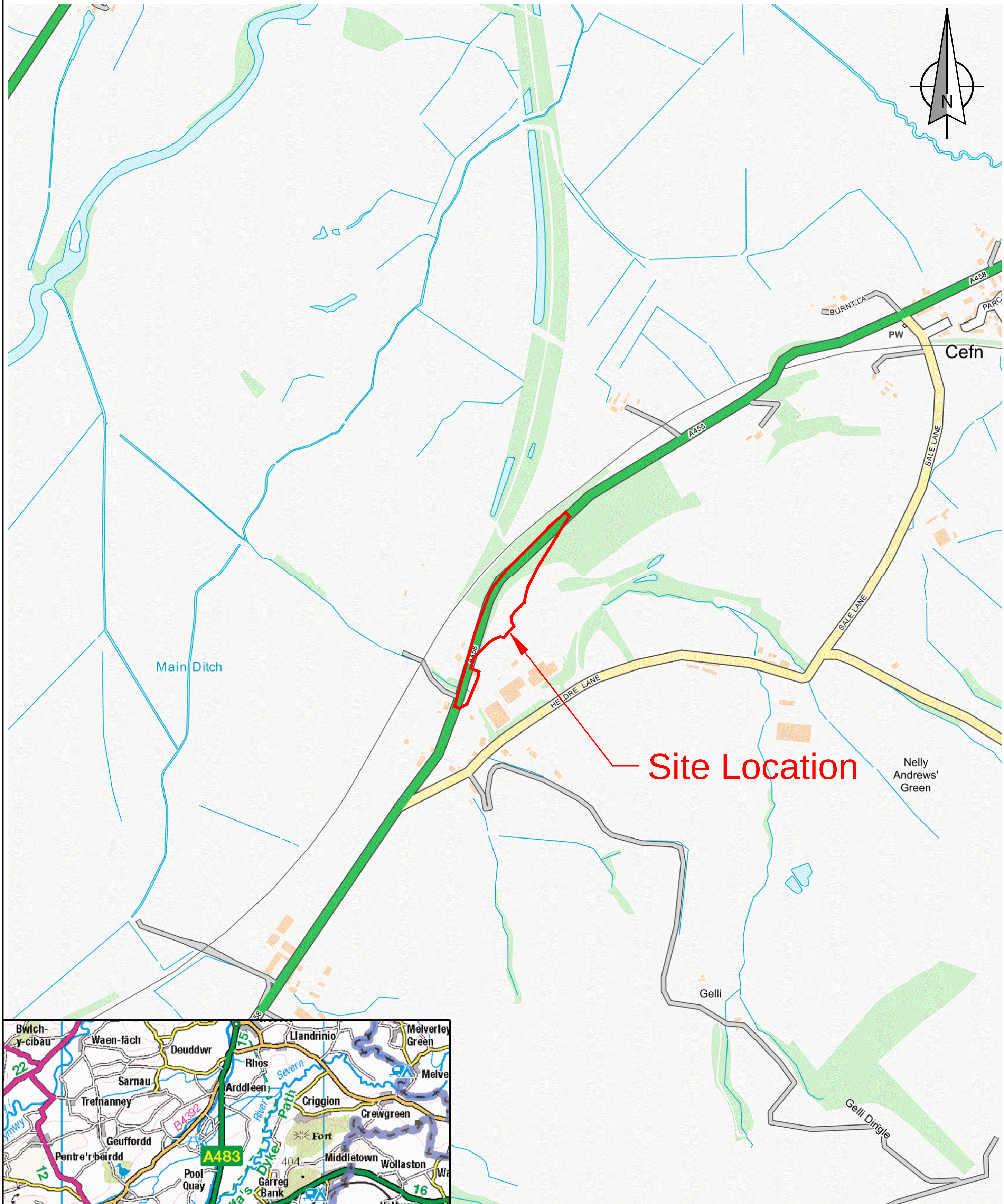
LIST OF DRAWINGS

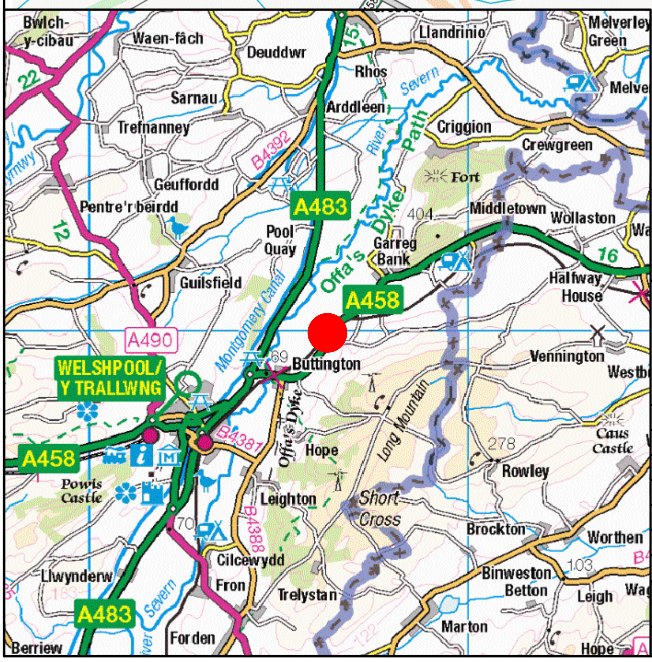
Site Location Plan	GC23128-DR001
Annotated Location Plan	GC23128-DR002
Photographic Record	GC23128-DR002a-c
Proposed Access	CC6532/SK20 Rev. C

APPENDICES

Appendix A	Geotechnical Certificate (DRAFT)

FM-Hn-D-104 Rev B N:\NorwichProjects\Jobs 23000s\23100\GC23128 Buttington Quarry\Drawings\CAD Files\GC23128 - DR001.dwg





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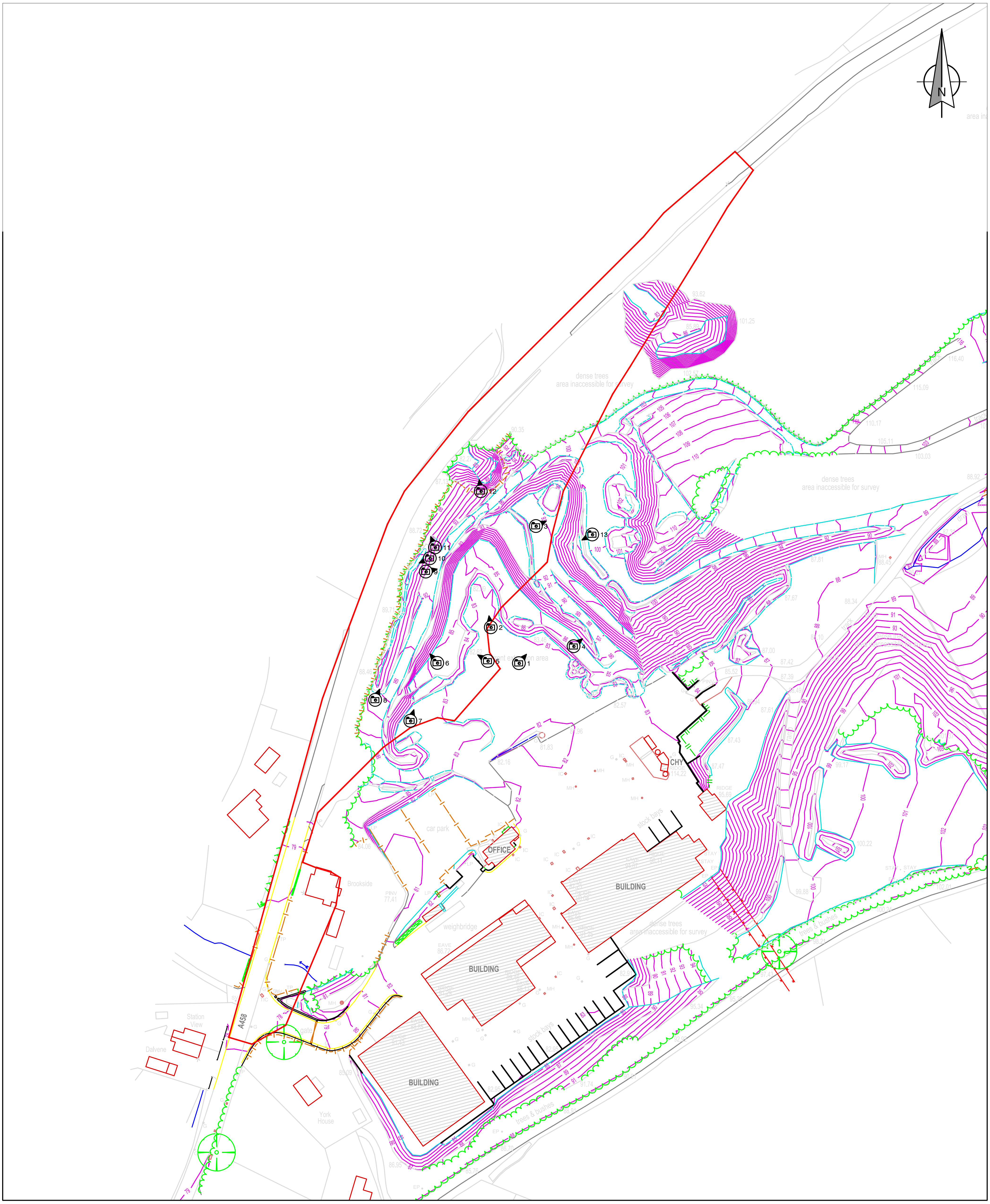
Cambridge: 01223 781585
Laboratory: 01603 416333
Email: [redacted]
Website: www.harrisongroupuk.com

Certificate Number 5933
ISO 9001, ISO 14001
4031

Client : Broad Environmental Ltd	
Project : Buttington Quarry	
Job No : GC23128	Date : November 2019
Drawing No : GC23128 - DR001	
Scale : 1:10000 @ A4	
Drawn by : CS	Checked by : JAu
Eastings : 326296	Northings : 309947



BROAD ENVIRONMENTAL

Client : Broad Environmental Ltd

Project : Buttington Quarry

Job No : GC23128 Date : December 2019

Drawing Title : Annotated Location Plan

Drawing No : GC23128 - DR002

Scale : 1:1500 @ A3

Drawn by : CS Checked by : JAu

Eastings : 326296 Northings : 309947

Revision history

Rev	Date	Revision Data

Key :

Site Boundary

1 Photo Number and Direction

Notes :

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Cambridge: 01223 781585 Laboratory: 01603 416333

Email: [redacted]
Website: www.harrisongroupuk.com

0026

Certificate Number 5933
ISO 9001, ISO 14001

4031

Photograph 1: Panoramic view looking northeast of existing excavation southwest facing benches located approximately 90m north of weighbridge office. Generally sub-vertically bedded interbedded shales and sandstones of the Cefn Formation. Note faulting in the upper slope which has resulted in planar surface dipping out of the slope at approximately 45°. Note presence of spalled material at base of each face which is fine grained; silt to coarse sand sized matrix with some gravel. Overall face is dry with no indications of groundwater seepage.

Photograph 2: View looking north into corner of existing excavation adjacent to new access road.

Photograph 3: Possible fault zone present in lower face or northern excavation.

Photograph 4: Faulting and deformation of beds in upper face resulting in planar surface dipping out of the face at approximately 45°.

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Cambridge: 01223 781585

London: 020 7537 9233
Laboratory: 01603 416333

Email: [redacted]
Website: www.harrisongroupuk.com

BUTTINGTON QUARRY

PHOTOGRAPHIC RECORD

Client:	Broad Environmental Limited		
Project No	GC23128		
Project Name:	Buttington Quarry		
Date:	30th November 2019		
Drawing No:	DR002a.		
Drawn By:	JAU	Checked By:	SW

Photograph 5: Panoramic view of western excavation face showing 1.5m high lower face and 2-4m high upper face. Some minor spalling present but no signs of significant instability. Angle of face is variable up to approximately 70-80°. Face is dry with no indications of groundwater seepage.

Photograph 6: Spalled material present at base of western excavation, naturally forming blocks of approximately 50-130mm in size.

Photograph 7: General view looking north along the western excavation. Some spalling at base of slope but excavation appears stable at 70-80°.

Photograph 8: View looking northern along crest of western excavation. Vegetation has been cleared with good exposure. No indications of tension cracking, deformation or signs of instability.

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Cambridge: 01223 781585

London: 020 7537 9233
Laboratory: 01603 416333

Email: [redacted]
Website: www.harrisongroupuk.com

BUTTINGTON QUARRY

PHOTOGRAPHIC RECORD

Client:	Broad Environmental Limited		
Project No	GC23128		
Project Name:	Buttington Quarry		
Date:	30th November 2019		
Drawing No:	DR002b.		
Drawn By:	JAU	Checked By:	SW

Photograph 9: View looking northeast of upper excavation faces.

Photograph 10: View looking southwest of slope leading down to A458 showing steep slopes partially cleared of trees.

Photograph 11: View looking northwest of slope leading down to A458 showing steep slopes partially cleared of trees.

Photograph 12: View looking down into former highways cutting with 50-60º vegetated slopes. No indications of tension cracking or instability although some historical spalling evident at base of slope.

Photograph 13: View looking southwest showing overview of western excavation face.

harrisongroup ENVIRONMENTAL

Norwich: 01603 613111
Cambridge: 01223 781585

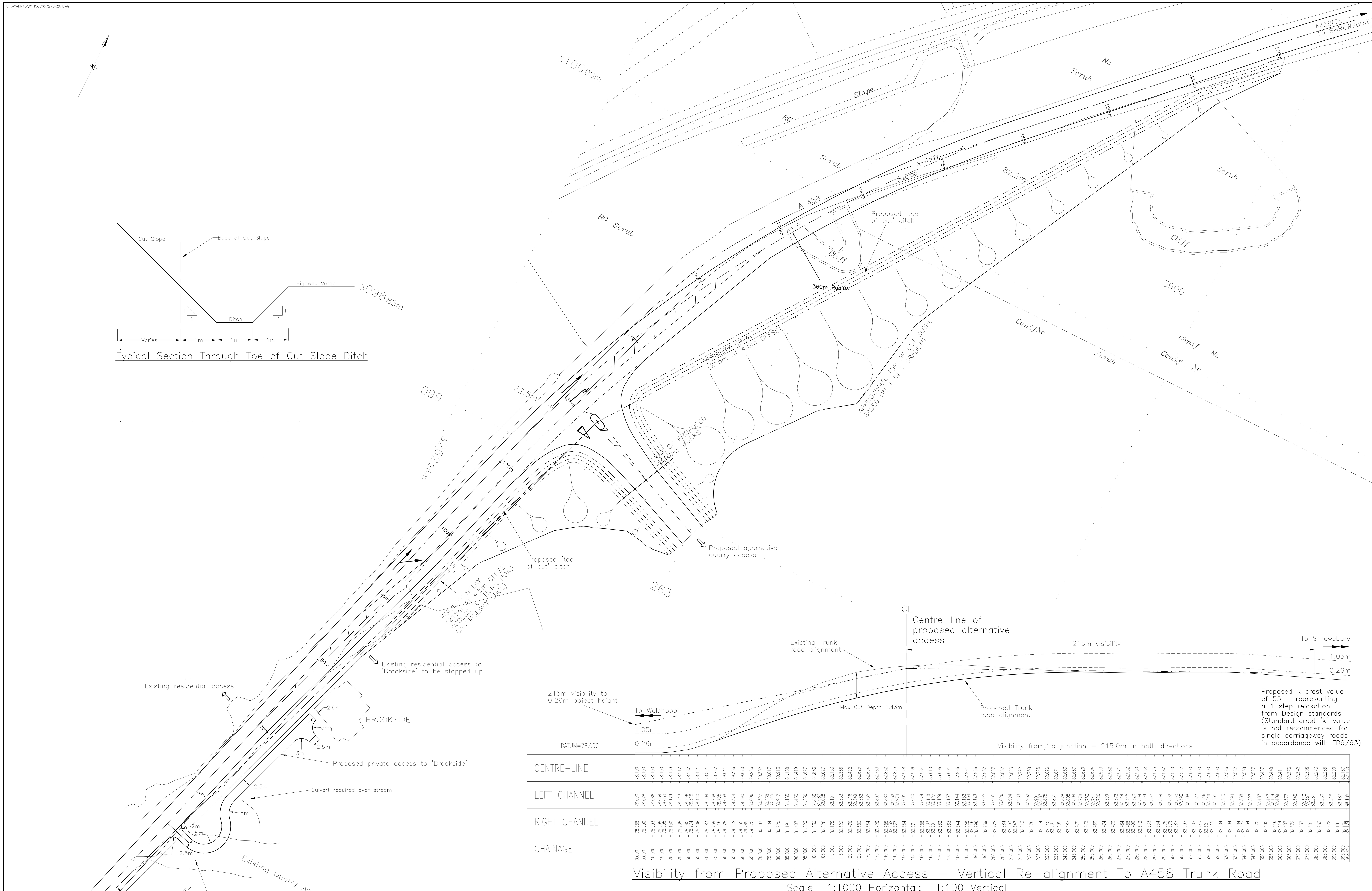
London: 020 7537 9233
Laboratory: 01603 416333

Email: [redacted]
Website: www.harrisongroupuk.com

BUTTINGTON QUARRY

PHOTOGRAPHIC RECORD

Client:	Broad Environmental Limited		
Project No	GC23128		
Project Name:	Buttington Quarry		
Date:	30th November 2019		
Drawing No:	DR002c.		
Drawn By:	JAU	Checked By:	SW



Visibility from Proposed Alternative Access – Vertical Re-alignment To A458 Trunk Road

Scale 1:1000 Horizontal; 1:100 Vertical

NOTE:

Proposed quarry access has been designed in accordance with TD42/95 – 'At-Grade' Ghost island junction.

Revisions

No	Date	By	Details	Chk
A	22.3.99	AW	Long section added	GW
B	14.4.99	AW	Brookside access added	GW
C	18.10.99	AW	Alternative brookside access removed	

Project: A458 BORDER STONE ALTERNATIVE ACCESS

Title: PROPOSED ACCESS 170m NORTH OF EXISTING ACCESS – HORIZONTAL ALIGNMENT OF TRUNK ROAD ALTERED – 360m RADIUS

Scale	Date	Drawn	Checked
1:500	13.3.99	AJW	G.Walker

VERYARDS Ltd
CONSULTING ENGINEERS
TEL. 01222 552444 FAX. 01222 554447

No CC6532 / SK20 Rev. C

Appendix A. Geotechnical Certificate (DRAFT)

Certificate to be used by the Designer for certifying the design of geotechnical works. Variations to be agreed by discussion between the DGA and the OOGA.

Geotechnical Certificate

OO Reference No.: TBC – Approach agreed with Casey Dunn with Iain McKenzie to act as OOGA.

1. We, the 'Design Organisation' (insert name) certifies that the submitted information for the geotechnical activities listed below have been prepared by us with reasonable professional skill and diligence, and that in our opinion:

i. constitutes and adequate and economic design for the project

ii. appropriate solutions to all the reasonably foreseeable geotechnical risks have been incorporated

iii. the work intended is accurately represented and conforms to OO's requirements

iv. with the exception of any item listed below or appended overleaf, the documentation has been prepared in accordance with the relevant documents from the Design Manual for Roads and Bridges and the Manual of Contract Documents for Highway Works.

and, where necessary,

v. The design elements covered in this certificate are not detrimental to the design elements previously certified and not amended by this certificate. [end Note 1]

LIST OF SUBMITTED INFORMATION

Statement of Intent (ref. GC23128_SoI dated March 2020)

Preliminary Sources Study Report (ref. GC23128_PSSR dated March 2020

DEPARTURES FROM DMRB DOCUMENTS (List or None)

None

INCORPORATION OF GEOTECHNICAL DATA INTO CONSTRUCTION DETAILS (where relevant)

The reports, design data, drawings or documents listed above have been accurately translated onto the construction drawings or other design documents bearing the unique numbers listed below/appended overleaf.

TBC on completion of design and construction documentation and drawings

....
Signed and dated by the DGA

Where necessary, also signed with date and organisation by the Contractor (agent or Contracts Director)

Countersignature by Overseeing Organisation (*delete or strike through as necessary)

This Certificate is:

(a) received*

(b) received with comments as follows.*

(c) returned marked 'comments' as follows:*

....
Signed and dated by the OOGA

Document: Statement of Intent

Project: Buttington Quarry, Welshpool

Reference No: GC23128_SoI

Date: March 2020

Prepared for: Broad Environmental Limited
c/o Environmental Compliance Limited

harrisongeotechnical
ENGINEERING

A division of Harrison Group Environmental Limited

HARRISON GROUP ENVIRONMENTAL LIMITED

Document: Statement of Intent

Project: Buttington Quarry, Welshpool

Reference No: GC23128_SoI

Date: March 2020

Prepared for: Broad Environmental Limited
c/o Environmental Compliance Limited

REPORT STATUS

Revision	Comments	Prepared By	Approved By	Issued By	Audited By
0	First Issue	INITIALS IH DATE 9/03/20	INITIALS JAU DATE 10/03/20	INITIALS JAU DATE 10/03/20	INITIALS JAU DATE 10/03/20
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE
		INITIALS DATE	INITIALS DATE	INITIALS DATE	INITIALS DATE

CONTENTS

FOREWORD

The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.

The opinions expressed in this report are based on the ground conditions revealed by the site works or inspection, together with an assessment of the site. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated or visible, for example between exploratory positions or outcrop exposure, these are only for guidance and no liability can be accepted for their accuracy.

Some information of the assessment has been provided by third parties and whilst Harrison Group have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.

This report is produced in accordance with the scope of Harrison Group's appointment and is subject to the terms of appointment. Harrison Group accepts no liability for any use of this document other than by its client and only for the purposes, for which it was designed and produced. No responsibility can be accepted for any consequences of this information being passed to a third party who may act upon its contents/recommendations.

Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.

STATEMENT OF INTENT

FOR LAND AT

BUTTINGTON QUARRY, WELSHPOOL

1 PROJECT

1.1 TERMS OF REFERENCE & INTRODUCTION

The work covered by this report was requested by Environmental Compliance Ltd. and was undertaken on behalf of Broad Environmental Ltd in accordance Harrison Group Environmental Limited's quotation (GC23128_Q_JAU) dated 10th October 2019.

This Statement of Intent should be read in conjunction with the Preliminary Sources Scoping Report (PSSR) (ref. GC23128_PSSR, dated January 2019) which provides details of the site walkover and assessment in relation to the proposed works. The purpose of the Statement of Intent is to provide a summary overview of the proposed development and an initial review in relation to potential geotechnical issues relating to such development.

The report was undertaken in order to address the requirements of the planning permission granted by Powys County Council (ref. P/2015/0439), Condition 3 which states:

> *Prior to the commencement of works the developer shall submit a scheme that includes detailed design drawings and calculations of the proposed new highway cutting, a catch ditch to prevent scree from obscuring highway visibility and exposure of rock formations of geological interest for the written approval of the Local Planning Authority. This submission must be prepared by a Geotechnical consultant in accordance with DMRB HD22/08- "Managing Geotechnical Risk" and be accompanied by a Geotechnical Certificate signed by the applicants Geotechnical Advisor. Upon written approval of the Local Planning Authority, the scheme shall be implemented in full.*

Since publication of the planning permission, HD22/08 has been superseded by CD 622 Managing Geotechnical Risk, Revision 1, dated August 2019.

1.2 Background

Butting Quarry lies to the northeast of Buttington village, immediately east of the A458 between Welshpool and Shrewsbury. The quarry has been historically worked since the late 1800's primarily as a brickworks but also for the extraction of bulk and screened rock fill.

The main quarry has not been operational for around 20 years, although rock fill extraction is currently being undertaken in the vicinity of the proposed new site access road, which lies in the west of the site. The base of the quarry in this area is present at an elevation of 82-83m AOD, which is approximately coincident with the elevation of the adjacent A428 at the location of the proposed new site entrance.

1.3 Site Setting and Proposed Development

The existing site comprises the western fringe of the existing Buttington Quarry, immediately east of the adjacent A458.

The proposed overall development is for the construction and operation of an Energy Recovery Facility (ERF) capable of generating around 13MWe of low carbon and renewable electrical energy (when operational in full condensing mode) through the thermal treatment of up to 167,000 tonnes per annum of residual MSW and MSW like waste ("the feedstock"). The feedstock would arise from industrial and commercial sources and would consist of material suitable for energy recovery.

The ERF would be capable of generating both electrical and heat energy from the thermal recovery of energy through the process and so would be classed as a Combined Heat and Power plant, often referred to by the acronym CHP plant.

The proposed development relating to the highway adjacent to Buttington Quarry will include formation of a new access route as indicated on Drawing Ref. GC23128_DR001. The new site entrance will access from the existing A458 at National Grid Reference 326262, 309914 directly onto the site which lies to the east. It is proposed that as part of the access construction, improvements will be made to the visibility splay by cutting back the existing slope to form an open verge extending a distance of approximately 170m to the north.

The slope will be formed at a gradient of 1v:1h (45°) to a maximum height of approximately 16m. The toe of the cutting will also incorporate a 1m deep catch trench to prevent any spalling material from impacting on the verge or adjacent highway. This will result in a verge of up to 15m wide between the outer edge of the catch trench and the adjacent A458.

2 OBJECTIVES

The objective of the proposed project is to provide improved, safe access into the existing quarry to to accommodate future industrial/commercial development.

3 EXISTING INFORMATION

Existing information relating to the proposed new junction and access road into Buttington Quarry comprise the following:

1. A458 Alternative Access Appraisal, Buttington Quarry, Geotechnical Report, Veryards Ltd. Ref. CC6532/GR/FD, dated August 1999.
2. Geotechnical report review letter by Opus International Consultants (UK) Ltd dated 12th April 2010.

A copy of the above documents is appended to this report.

4 GEOTECHNICAL RISK

The following table provides a preliminary summary of key geotechnical risks that are envisaged.

Hazard	Requires further consideration?	Comment
Mining	No	No coal mining is recorded within 1km of the site. The site is currently operated as a quarry for the extraction of general/rock fill and aggregate. No underground works are associated with the historical or current site operations.
Underground voids or cavities	No	The site is underlain bedrock comprising the Cefn Sandstone and Tarannon Mudstone Formation of Silurian age. The risk of natural cavities in these strata is considered to be very low and does not require further consideration.
High groundwater level/flooding	**Yes**	Groundwater is understood to be present at depth beneath the site and no groundwater seepages have been recorded in the existing quarry cuttings and exposure faces. Review of the magic.defra.gov.uk dataset indicates the site lies within an area designated as a 'High Priority - Flood Risk Management Priorities'. A west flowing watercourse lies approximately 140m to the east of the site. Further information is required to clarify the level risk on surface water flooding.
Slope Stability	**Yes**	The proposed access road is currently being quarries for the extraction of general rockfill. The existing exposure should be inspected to determine quality of the in-situ rock mass, orientation of bedding/structures and determine the need for further assessment or investigation.
Shrink/swell potential	No	Cohesive (potentially shrinkable) soils are not expected on the site. As such, further assessment is not required.
Uncontrolled backfill/Potential for unknown made/filled ground	No	The area of proposed development will be quarried and cut to provide new access road with proposed slopes formed within the in-situ bedrock. As such, this element does not require further assessment.
Relict foundations/ below ground structures.	No	The area of proposed development will be quarried and cut to provide new access road with proposed slopes formed within the in-situ bedrock. As such, this element does not require further assessment.

Table 4.1 Summary of Key Geotechnical Risks

Although the proposed works require the cutting of in-situ bedrock at a maximum angle of 1v:1h (45°), this will be setback from the existing highway and a 1m deep catch trench is proposed. A such, this will provide an improvement to safety of the existing highway. Given the scale and nature of the proposed works, this is considered to fall into **Geotechnical Category 1**.

5 PROPOSED STUDIES AND INVESTIGATIONS

Significant exposure of the underlying bedrock is present within the site adjacent to the proposed development area. As such, it is considered that intrusive investigation will not be required. It is proposed that a site walkover is completed by a competent geotechnical engineer to assess condition of the existing rock faces and provide recommendations in relation to the proposed development.

6 SPECIALIST CONSULTATION

None required.

7 PROGRAMME

Submission of Planning application is proposed for September 2020.

Construction anticipated Q1/Q2 2022.

We recommend that this report is submitted to Regulators as part of the planning process.

Harrison Group Environmental Limited would be pleased to offer further assistance with the recommended works if requested, and if the client or regulators have any comments or questions we would be glad to discuss them.

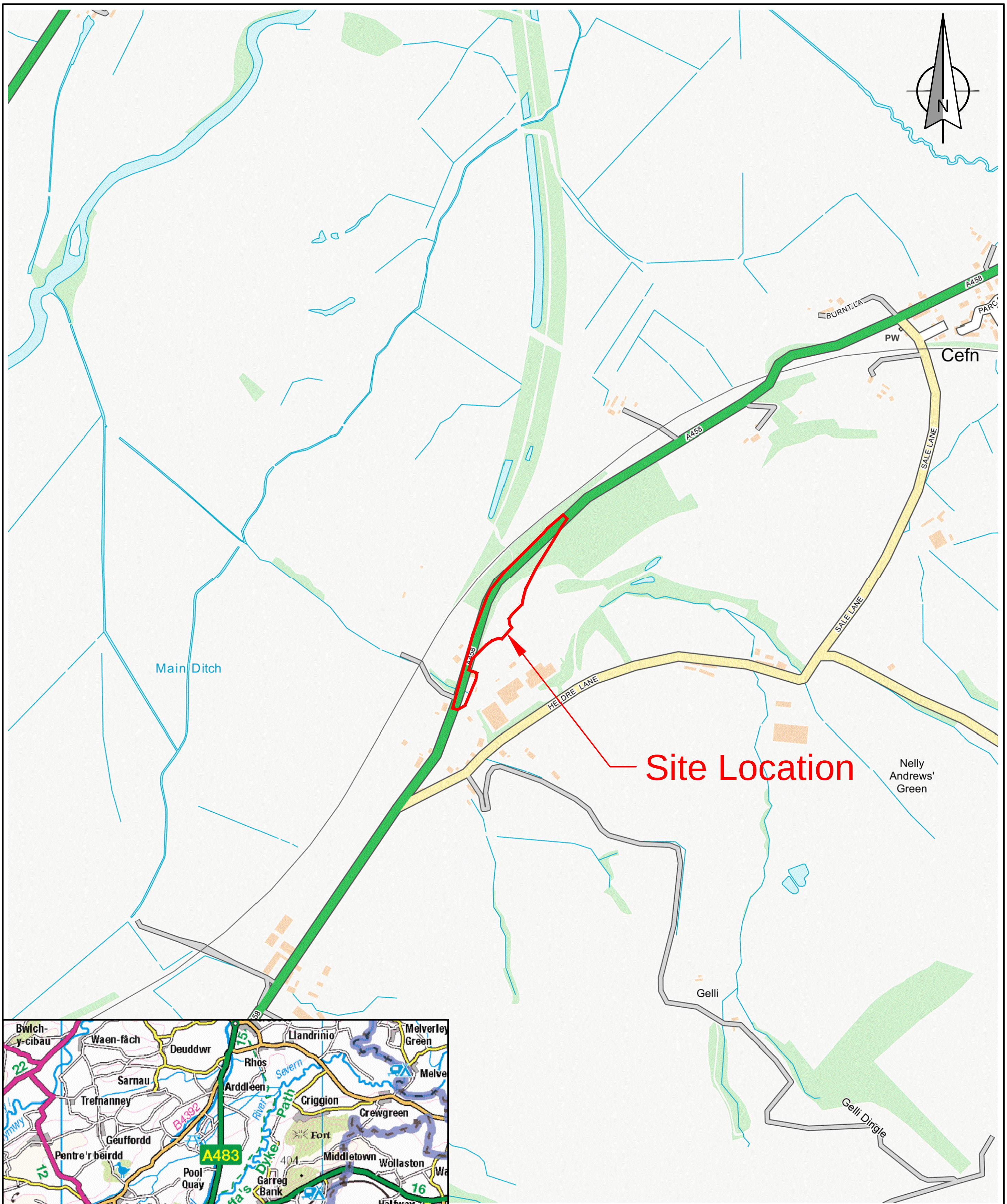
REFERENCES

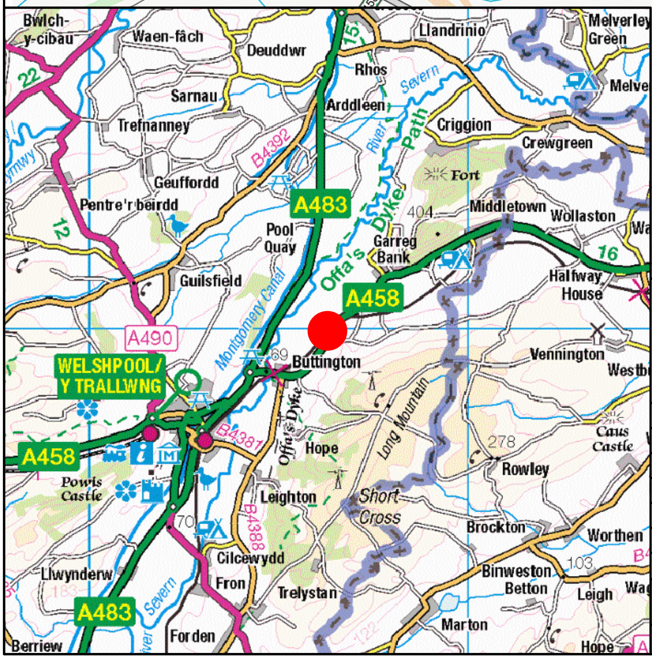
BS EN 1997-1:2004 +A1:2013, ‘Eurocode 7: Geotechnical Design - Part 1: General rules”.

HD22/08: Managing Geotechnical Risk Implementation Guidance – Wales, DMRB 4.1.2, December 2009.

Design Manual for Roads and Bridges CD 622 Managing Geotechnical Risk (formerly HD 22/08, BD 10/97, HA 120/08) Revision 0, 2019.

FM-Hn-D-104 Rev B N:\NorwichProjects\Jobs 23000s\23100\GC23128 Buttington Quarry\Drawings\CAD Files\GC23128 – DR001.dwg





BROAD ENVIRONMENTAL

harrisongroup ENVIRONMENTAL

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Cambridge: 01223 781585 Laboratory: 01603 416333
Email: [redacted]
Website: www.harrisongroupuk.com

Certificate Number 5933
ISO 9001, ISO 14001
4031

Client : Broad Environmental Ltd	
Project : Buttington Quarry	
Job No : GC23128	Date : November 2019
Drawing No : GC23128 - DR001	
Scale : 1:10000 @ A4	
Drawn by : CS	Checked by : JAu
Eastings : 326296	Northings : 309947

VERYARDS Ltd
CONSULTING ENGINEERS

BORDER HARDCORE & ROCKERY STONE CO. LTD.

A458 ALTERNATIVE ACCESS APPRAISAL

BUTTINGTON QUARRY

GEOTECHNICAL REPORT

Veryards Ltd, Consulting Engineers
18d High Street, Llandaff
CARDIFF
CF5 2DZ

Tel. : 01222 552444
Fax. : 01222 554447

CC6532/GR/FD

VERYARDS Ltd
CONSULTING ENGINEERS

QUALITY ASSURANCE COMPLIANCE STATEMENT

Project	:	A458 Alternative Access Appraisal
Job No.	:	CC6532
Report Title	:	Geotechnical Report
Report Ref.	:	CC6532/GR/FD
Report Status	:	Final Draft
Date	:	23 August 1999
Prepared by	:	[redacted]................ J. E. Peacock
Checked by	:	[redacted]............ G. Walker
Approved for issue	:	[redacted]............ G. Walker (Director)

A458 ALTERNATIVE ACCESS APPRAISAL, BUTTINGTON QUARRY

GEOTECHNICAL REPORT

1.0 Introduction

1.1 This report gives an assessment of the stability of surfaces likely to be exposed in excavations for an improved access to Buttington Quarry near Welshpool, Powys.

1.2 The assessment is made on an examination of existing exposed surfaces in Buttington Quarry and two small abandoned workings beside the A458 Trunk Road to the west of the quarry.

2.0 Geology

2.1 Buttington Quarry was developed to exploit a near vertically bedded band of eponymous shales outcropping on the west side of the Long Mountain syncline as a raw material for brick making.

2.2 Although the Buttington Shales are the upper stage of the Llandovery Series, the earlier stages are absent and in this locality these beds mark the boundary of the Silurian system with the older Ordovician system to the west.

2.3 East of the quarry the Silurian sequence continues with a broader band of Wenlock Shales and the Ludlow Beds.

2.4 Buttington Shales have characteristic bands of pale green and purple with much of the bedding displaying ripple marking. The coloured shales can be separated or blended and worked into attractive brick clays.

3.0 Existing Quarry Workings

3.1 The site takes the form of a ridge with a south-west to north-east axis, rising steeply on the east side of the River Severn flood plain and then falling away a little before rising again to the east.

3.2 The A458 Trunk Road is terraced onto the steep hillside with the Shrewsbury to Aberystwyth railway line some way below.

3.3 Buttington Quarry has been worked following the axis of the ridge, removing a band of the near vertically bedded shale.

3.4 The office car park on the west side of the stream exposes the greatest depths of sub-soil seen on the site - approximately 2 - 3 metres.

4.0 Ground Conditions

4.1 Very little topsoil was seen and sub-soil consisted of light brown residual clay soil from weathering of the shale, sometimes with purplish bands. The thickness of the soil and subsoil was generally less than half a metre but increased to over two metres in the office car park area.

4.2 Beneath the surface clay the shales become increasingly less weathered with depth, reducing in friability, fracturing and discolouration.

4.3 The shale generally dips at about 80° to the south-east, i.e. from the Trunk Road side into the quarry. Local folding leaves some areas with much shallower inclination, down to 30° - 40°, with the dip not always into the quarry.

4.4 The shale has the pale green and purple bedding with ripple marks previously described and is fractured into small irregular blocks a few centimetres across at the base of the quarry, but breaks down into particles the size of coarse sand where highly weathered further up. Degradation generally results in runs of scree at the foot of the sub-vertical beds.

4.5 The fine material generated by weathering is being produced at a fast enough rate for it to have been frequently seen to run while making observations.

4.6 On the east side of the quarry, loose shale material is standing in a slope at about 1 in 1 but it is not clear to what extent this is through natural weathering after original exposure.

5.0 Older Workings

5.1 The two small workings beside the Trunk Road show how exposed faces mature when natural weathering and revegetation is established.

5.2 In the larger working to the north, the dip towards the main quarry creates a slight overhang which shelters the face below, allowing it to stand apparently stably 5 to 10 metres high. Debris at the base of the rock face has become vegetated forming a short slope of about 1 in 1½ with further shallower falls towards the road.

5.3 The smaller working to the south has diverse bedding due to folding and a vertical face only a few metres high. The scree here is more extensive in proportion to the height of the rock face and has formed a mature slope of about 1 in 3.

6.0 Stability of New Excavations

6.1 Although the more resistant beds will stand vertically several metres high for many years in sheltered surroundings, any new exposure for road widening is likely to weather rapidly at first and it is the stability of the scree forming rather than the face itself which is the critical factor.

6.2 If vegetation is encouraged to grow, a cutting slope of 1 in 1 should remain stable in the long term. If the whole slope is cut back to this angle, there would not be the same amount of weathered material generated as there would be with a near vertical face above.

6.3 Fine scree material will tend to be washed down from the slope before vegetation takes hold and therefore it is recommended that a ditch be formed to catch this material at the base of the cutting slope to prevent it building up and affecting sight lines. A trench 1 metre deep and 2 - 3 metres across the top with 1 in 1 batter is suggested, which should be drained to stop it filling with water.

6.4 Although hydroseeding would provide an early growth of grass, it may be better to promote nature vegetation as shrubs and bushes are needed to help long term stability.

7.0 Conclusions

7.1 A cutting slope of 1 horizontal to 1 vertical should be safely achievable for any new excavation associated with the verge widening required for the alternative access. The slope will however need careful after-treatment to promote quick vegetation growth and aid stability. A catch ditch is recommended for the base of the cutting to prevent a build-up of scree impeding the highway sight lines.

. . . .

J. E. PEACOCK BSc CEng MICE MIHT

VERYARDS Ltd
CONSULTING ENGINEERS

QUALITY ASSURANCE COMPLIANCE STATEMENT

Project	:	A458 Alternative Access Appraisal
Job No.	:	CC6532
Report Title	:	Geotechnical Report
Report Ref.	:	CC6532/GR/FD
Report Status	:	Final Draft
Date	:	23 August 1999
Prepared by	:	[redacted] ....
Checked by	:	....
Approved for issue	:	.... r)

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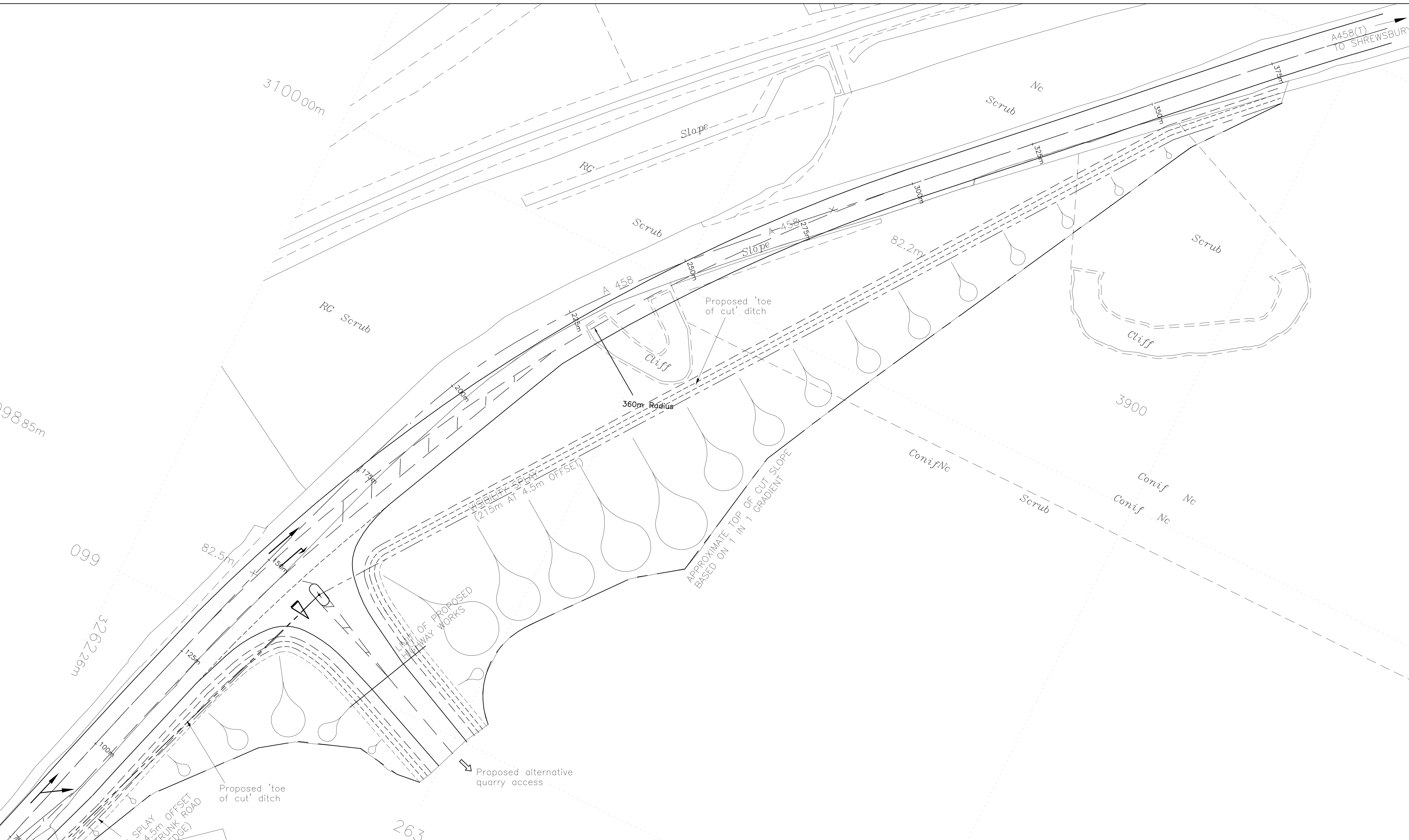
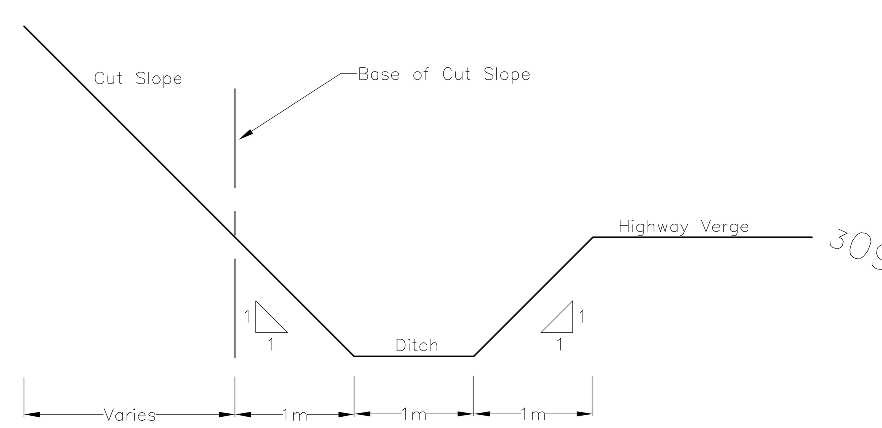
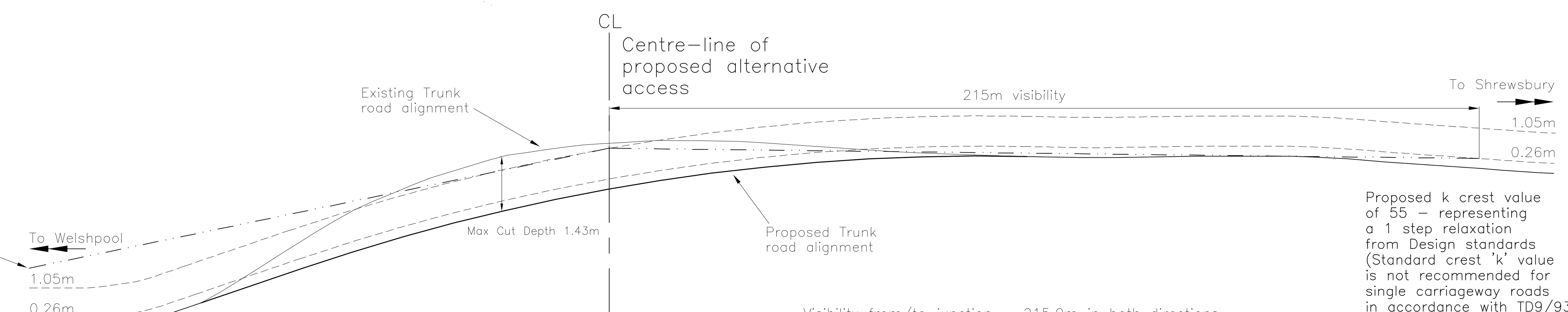




Typical Section Through Toe of Cut Slope Ditch

Existing quarry access modified to provide residential access to 'Brookside' only
Existing access to be closed to all site traffic upon completion of alternative access.



Proposed k crest value of 55 – representing a 1 step relaxation from Design standards (Standard crest 'k' value is not recommended for single carriageway roads in accordance with TD9/93)

CENTRE-LINE	78.100 78.100 78.100 78.100 78.139 78.212 78.282 78.421 78.591 78.762 79.041 79.356 79.670 79.986 80.302 80.617 80.913 81.188 81.419 81.627 81.836 82.027 82.183 82.338 82.492 82.625 82.694 82.763 82.832 82.895 82.928 82.956 82.984 83.010 83.006 83.001 82.996 82.991 82.966 82.932 82.897 82.862 82.825 82.792 82.758 82.725 82.696 82.671 82.653 82.637 82.620 82.604 82.593 82.582 82.571 82.562 82.560 82.568 82.575 82.582 82.590 82.597 82.600 82.600 82.600 82.600 82.596 82.582 82.558 82.527 82.487 82.448 82.411 82.376 82.342 82.308 82.273 82.238 82.200 82.167 82.150
LEFT CHANNEL	78.090 78.078 78.066 78.054 78.053 78.129 78.213 78.296 78.318 78.440 78.604 78.768 78.795 79.058 79.374 79.690 80.006 80.322 80.638 80.645 80.912 81.185 81.435 81.636 81.836 81.987 82.028 82.191 82.353 82.516 82.649 82.662 82.735 82.807 82.880 82.952 82.974 83.001 83.040 83.079 83.118 83.122 83.129 83.137 83.144 83.152 83.154 83.129 83.095 83.061 83.026 82.994 82.963 82.932 82.901 82.887 82.875 82.851 82.828 82.808 82.804 82.778 82.753 82.741 82.726 82.699 82.672 82.649 82.645 82.620 82.599 82.599 82.597 82.594 82.592 82.590 82.590 82.608 82.627 82.646 82.648 82.631 82.613 82.594 82.568 82.527 82.487 82.447 82.419 82.409 82.377 82.345 82.313 82.291 82.281 82.250 82.218 82.187 82.155 82.151
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CHAINAGE	0.000 5.000 10.000 15.000 20.000 25.000 30.000 35.000 40.000 45.000 50.000 55.000 60.000 65.000 70.000 75.000 80.000 85.000 90.000 95.000 100.000 105.000 110.000 115.000 120.000 125.000 130.000 135.000 140.000 145.000 150.000 155.000 160.000 165.000 170.000 175.000 180.000 185.000 190.000 195.000 200.000 205.000 210.000 215.000 220.000 225.000 230.000 235.000 240.000 245.000 250.000 255.000 260.000 265.000 270.000 275.000 280.000 285.000 290.000 295.000 300.000 305.000 310.000 315.000 320.000 325.000 330.000 335.000 340.000 345.000 350.000 355.000 360.000 365.000 370.000 375.000 380.000 385.000 390.000 395.000 398.822

Visibility from Proposed Alternative Access – Vertical Re-alignment To A458 Trunk Road

Scale 1:1000 Horizontal; 1:100 Vertical

NOTE:

Proposed quarry access has been designed in accordance with TD42/95 – 'At-Grade' Ghost island junction.

Revisions

No	Date	By	Details	Chk

Revisions

No	Date	By	Details	Chk
A	22.3.99	AW	Long section added	GW
B	14.4.99	AW	Brookside access added	GW
C	18.10.99	AW	Alternative brookside access removed	

Project
A458 BORDER STONE ALTERNATIVE ACCESS

Title
PROPOSED ACCESS 170m NORTH OF EXISTING ACCESS – HORIZONTAL ALIGNMENT OF TRUNK ROAD ALTERED – 360m RADIUS

Scale	Date	Drawn	Checked
1:500	13.3.99	AJW	G.Walker

VERYARDS Ltd
CONSULTING ENGINEERS
TEL. 01222 552444 FAX. 01222 554447

No CC6532 / SK20 Rev. C

12 April 2010

Border Hardcore & Rockery Stone Co. Ltd
Buttington Quarry
Welshpool
Powys
SY21 8SZ

C8039

Dear Sirs

C8039 – Buttington Quarry: Alternative Access
Geotechnical Report

With reference to the Geotechnical Report undertaken by Veryards Ltd, referenced CC6532/GR/FD dated August 1999, we confirm that the information contained within has been reviewed and found to still be current.

Should you require any further information please do not hesitate to contact me.

Yours faithfully,

[redacted]

Levi Major
Engineering Geologist

Opus International Consultants (UK) Ltd

Unit 2 Fountain Court
Fountain Lane, St Mellons
Cardiff CF3 0FB

[redacted]

Registered in England & Wales
Company Reg No: 2847568
Reg Office: Willow House, Brotherswood Court, Great Park Rd, Bristol BS32 4QW

Technical Appendix 8-2
PICADY Outputs – Decommissioning Phase

Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.6.541 [19821,26/11/2015]

Filename: A458 - Site Access (Decommisioning).arc8
Path: C:\ITL Jobs\IT1921 Buttington Quarry\PICADY\Junction 4
Report generation date: 06/08/2020 11:37:35

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - Base 2055 + Committed + Development							
Stream B-C	0.07	12.21	0.07	B	0.04	9.24	0.03	A
Stream B-A	0.21	22.55	0.18	C	0.09	12.92	0.09	B
Stream C-A	-	-	-	-	-	-	-	-
Stream C-B	0.24	9.23	0.20	A	0.06	9.95	0.05	A
Stream A-B	-	-	-	-	-	-	-	-
Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - Base 2055 + Committed + Development, AM " model duration: 07:45 - 09:15
"D2 - Base 2055 + Committed + Development, PM" model duration: 16:15 - 17:45

Run using Junctions 8.0.6.541 at 06/08/2020 11:37:34

File summary

Title	A458 - Site Access Junction
Location	Buttington, Wales
Site Number	Junction 4
Date	31/07/2020
Version	
Status	(new file)
Identifier	
Client	ECL
Jobnumber	
Enumerator	Dshrivastava
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - Base 2055 + Committed + Development, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2055 + Committed + Development, AM	Base 2055 + Committed + Development	AM		ONE HOUR	07:45	09:15	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	13.47	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A458 North		Major
B	B	Site Access		Minor
C	C	A458 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00	✓	3.50	165.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	7.47	5.00	4.13	4.00		1.00	160	160

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	685.457	0.125	0.316	0.199	0.451
1	B-C	747.824	0.115	0.290	-	-
1	C-B	764.243	0.296	0.296	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	628.00	100.000
B	ONE HOUR	✓	51.00	100.000
C	ONE HOUR	✓	573.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	77.000	551.000
	B	31.000	0.000	20.000
	C	487.000	86.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.12	0.88
	B	0.61	0.00	0.39
	C	0.85	0.15	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.246	1.032
	B	1.613	1.000	1.650
	C	1.061	1.130	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	24.6	3.2
	B	61.3	0.0	65.0
	C	6.1	13.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-C	0.07	12.21	0.07	B
B-A	0.18	22.55	0.21	C
C-A	-	-	-	-
C-B	0.20	9.23	0.24	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (07:45-08:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	15.06	14.89	0.00	364.23	0.041	0.04	10.301	B
B-A	23.34	22.96	0.00	267.14	0.087	0.09	14.721	B
C-A	366.64	366.64	0.00	-	-	-	-	-
C-B	64.75	64.21	0.00	545.21	0.119	0.13	7.477	A
A-B	57.97	57.97	0.00	-	-	-	-	-
A-C	414.82	414.82	0.00	-	-	-	-	-

Main results: (08:00-08:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	17.98	17.93	0.00	345.26	0.052	0.05	10.996	B
B-A	27.87	27.72	0.00	236.35	0.118	0.13	17.244	C
C-A	437.80	437.80	0.00	-	-	-	-	-
C-B	77.31	77.15	0.00	519.77	0.149	0.17	8.131	A
A-B	69.22	69.22	0.00	-	-	-	-	-
A-C	495.34	495.34	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	22.02	21.94	0.00	317.17	0.069	0.07	12.191	B
B-A	34.13	33.82	0.00	193.77	0.176	0.21	22.472	C
C-A	536.20	536.20	0.00	-	-	-	-	-
C-B	94.69	94.42	0.00	484.58	0.195	0.24	9.220	A
A-B	84.78	84.78	0.00	-	-	-	-	-
A-C	606.66	606.66	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	22.02	22.02	0.00	316.79	0.070	0.07	12.212	B
B-A	34.13	34.12	0.00	193.77	0.176	0.21	22.546	C
C-A	536.20	536.20	0.00	-	-	-	-	-
C-B	94.69	94.68	0.00	484.58	0.195	0.24	9.232	A
A-B	84.78	84.78	0.00	-	-	-	-	-
A-C	606.66	606.66	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	17.98	18.05	0.00	344.72	0.052	0.06	11.022	B
B-A	27.87	28.17	0.00	236.40	0.118	0.14	17.313	C
C-A	437.80	437.80	0.00	-	-	-	-	-
C-B	77.31	77.57	0.00	519.77	0.149	0.18	8.145	A
A-B	69.22	69.22	0.00	-	-	-	-	-
A-C	495.34	495.34	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	15.06	15.11	0.00	363.70	0.041	0.04	10.328	B
B-A	23.34	23.49	0.00	267.11	0.087	0.10	14.785	B
C-A	366.64	366.64	0.00	-	-	-	-	-
C-B	64.75	64.91	0.00	545.21	0.119	0.14	7.496	A
A-B	57.97	57.97	0.00	-	-	-	-	-
A-C	414.82	414.82	0.00	-	-	-	-	-

(Default Analysis Set) - Base 2055 + Committed + Development, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Base 2055 + Committed + Development, PM	Base 2055 + Committed + Development	PM		ONE HOUR	16:15	17:45	90	15		

Junction Network

Junctions

Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
1	(untitled)	T-Junction	Two-way	A,B,C	11.00	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Arm	Name	Description	Arm Type
A	A	A458 North		Major
B	B	Site Access		Minor
C	C	A458 South		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00	✓	3.50	165.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane plus flare				10.00	7.47	5.00	4.13	4.00		1.00	160	160

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	696.620	0.127	0.321	0.202	0.458
1	B-C	734.639	0.113	0.285	-	-
1	C-B	764.243	0.296	0.296	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	454.00	100.000
B	ONE HOUR	✓	36.50	100.000
C	ONE HOUR	✓	479.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	31.000	423.000
	B	24.000	0.000	12.500
	C	460.000	19.000	0.000

Turning Proportions (Veh) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.07	0.93
	B	0.66	0.00	0.34
	C	0.96	0.04	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.620	1.040
	B	1.360	1.000	1.430
	C	1.020	1.580	1.000

Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.0	62.0	4.0
	B	36.0	0.0	43.0
	C	2.0	58.0	0.0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
B-C	0.03	9.24	0.04	A
B-A	0.09	12.92	0.09	B
C-A	-	-	-	-
C-B	0.05	9.95	0.06	A
A-B	-	-	-	-
A-C	-	-	-	-

Main Results for each time segment

Main results: (16:15-16:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	9.41	9.32	0.00	439.29	0.021	0.02	8.370	A
B-A	18.07	17.87	0.00	370.55	0.049	0.05	10.202	B
C-A	346.31	346.31	0.00	-	-	-	-	-
C-B	14.30	14.16	0.00	414.54	0.035	0.04	8.988	A
A-B	23.34	23.34	0.00	-	-	-	-	-
A-C	318.46	318.46	0.00	-	-	-	-	-

Main results: (16:30-16:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	11.24	11.22	0.00	424.30	0.026	0.03	8.715	A
B-A	21.58	21.51	0.00	343.01	0.063	0.07	11.193	B
C-A	413.53	413.53	0.00	-	-	-	-	-
C-B	17.08	17.05	0.00	401.12	0.043	0.04	9.373	A
A-B	27.87	27.87	0.00	-	-	-	-	-
A-C	380.27	380.27	0.00	-	-	-	-	-

Main results: (16:45-17:00)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	13.76	13.73	0.00	403.30	0.034	0.03	9.241	A
B-A	26.42	26.32	0.00	304.95	0.087	0.09	12.910	B
C-A	506.47	506.47	0.00	-	-	-	-	-
C-B	20.92	20.87	0.00	382.56	0.055	0.06	9.952	A
A-B	34.13	34.13	0.00	-	-	-	-	-
A-C	465.73	465.73	0.00	-	-	-	-	-

Main results: (17:00-17:15)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	13.76	13.76	0.00	403.20	0.034	0.04	9.243	A
B-A	26.42	26.42	0.00	304.96	0.087	0.09	12.923	B
C-A	506.47	506.47	0.00	-	-	-	-	-
C-B	20.92	20.92	0.00	382.56	0.055	0.06	9.954	A
A-B	34.13	34.13	0.00	-	-	-	-	-
A-C	465.73	465.73	0.00	-	-	-	-	-

Main results: (17:15-17:30)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	11.24	11.27	0.00	424.11	0.027	0.03	8.720	A
B-A	21.58	21.68	0.00	343.05	0.063	0.07	11.207	B
C-A	413.53	413.53	0.00	-	-	-	-	-
C-B	17.08	17.13	0.00	401.12	0.043	0.04	9.376	A
A-B	27.87	27.87	0.00	-	-	-	-	-
A-C	380.27	380.27	0.00	-	-	-	-	-

Main results: (17:30-17:45)

Stream	Total Demand (Veh/hr)	Entry Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	RFC	End Queue (Veh)	Delay (s)	LOS
B-C	9.41	9.43	0.00	439.06	0.021	0.02	8.381	A
B-A	18.07	18.13	0.00	370.56	0.049	0.05	10.218	B
C-A	346.31	346.31	0.00	-	-	-	-	-
C-B	14.30	14.34	0.00	414.54	0.035	0.04	8.997	A
A-B	23.34	23.34	0.00	-	-	-	-	-
A-C	318.46	318.46	0.00	-	-	-	-	-

Technical Appendix 8-3
TRANSYT Outputs – Temporary Traffic Signals

ECL Ref: ECL.001.01.02/ES
DATE: February 2021
ISSUE: 1

TRANSYT 15

Filename: Temporary Lights Base 2025 + Committed + Existing AM.t15
Path: C:\ITL Jobs\IT1921 Buttington Quarry\Transyt
Report generation date: 06/08/2020 12:51:02

File summary

File description

File title	Base 2025 + Committed + Existing AM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	06/08/2020
Version	
Status	TRANSYT/11 import
Identifier	
Client	
Jobnumber	
Enumerator	INTER-MODAL\dshrivastava
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

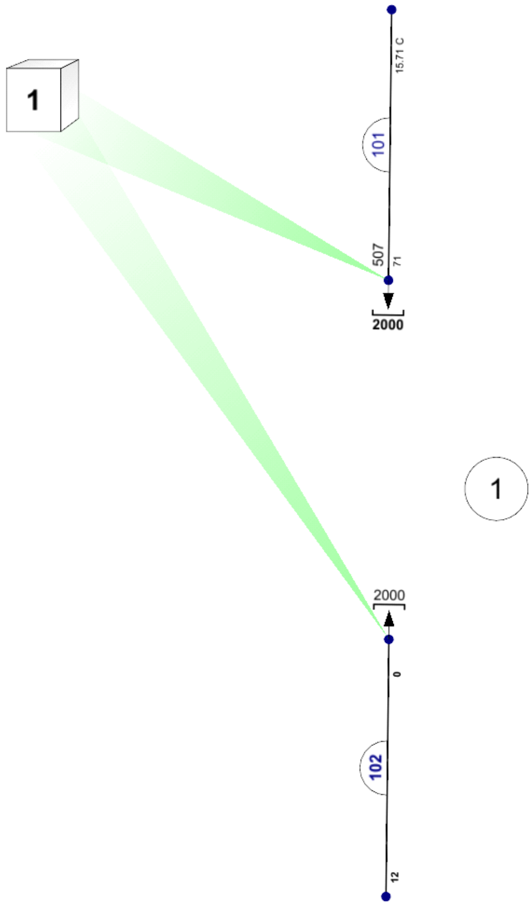
Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams



Base 2025 + Committed + Existing AM
Cycletime 0s / 120s , Timesteps 119 / 120
Diagram produced using TRANSYT 15.5.3.7

A1 - (untitled)
D1 - Base 2025 + Committed + Existing*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	06/08/2020 12:50:43	06/08/2020 12:50:43	08:00	120	157.75	11.45	70.74	101	0	0	101		10

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
(untitled)		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
Base 2025 + Committed + Existing				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
120		120	1	120

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓	✓	Simplified (TRANSYT 12)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
✓	✓	Offsets And Green Splits	✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
Hill Climb (Fast)	15, 40, -1, 15, 40, 1, -1, 1	50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05		✓	1			Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
12.90	2.35	12.90

Traffic Nodes

Traffic Nodes

Traffic node	Name	Description
1	(untitled)	

Links

Links

Link	Name	Description	Traffic node	Length (m)	Has Saturation Flow	Use RR67	Saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Is minor shared	Allow Nearside Turn On Red
(ALL)	(untitled)		1	300.00	✓		2000	✓		Normal		

Modelling

Link	Traffic model	Stop weighting (%)	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Has degree of saturation limit
(ALL)	NetworkDefault	100	100	100		0.00		

Modelling - Normal traffic - Advanced

Link	Dispersion type for Normal Traffic	Initial queue (PCU)	Auto cycle time	Cycle time
(ALL)	NetworkDefault	0.00	✓	120

Flows

Link	Total flow (PCU/hr)	PCU Factor
101	507	1.00
102	453	1.00

Flows - Advanced

Link	Detectors
(ALL)	

Signals

Link	Controller stream	Phase	Second phase enabled
101	1	101	
102	1	102	

Entry Sources

Link	Cruise time (seconds)	Cruise speed (kph)
(ALL)	36.00	30.00

Signal Timings

Network Default: 120s cycle time; 120 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	120

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Absolute

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type
1	**(ALL)**	(untitled)	1	300	0	0	Unknown

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	**1**	101	7
	2	102	7

Losing / Gaining Phase Delays

Controller Stream	Delay	Type	Phase	From stage	To stage	Relative delay	Absolute delay
1	**1**	Gaining	101	1	2	8	8
	2	Gaining	102	2	1	9	9

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	**1**	(untitled)	Single	1, 2	60, 118

Intergreen Matrix for Controller Stream 1

	To		
From		101	102
	101		20
	102	20	

Banned Stage transitions for Controller Stream 1

	To		
From		1	2
	1		
	2		

Interstage Matrix for Controller Stream 1

	To		
From		1	2
	1	0	20
	2	20	0

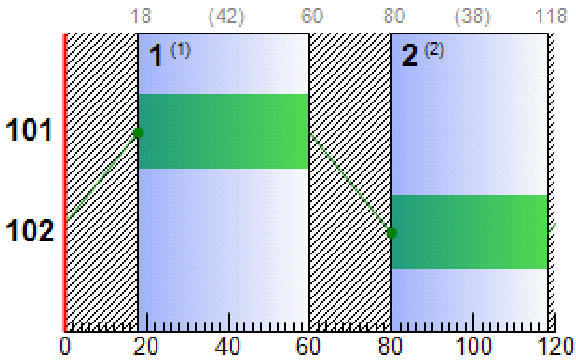
Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	101	18	60	42	7	7
	2	✓	2	102	80	118	38	7	7

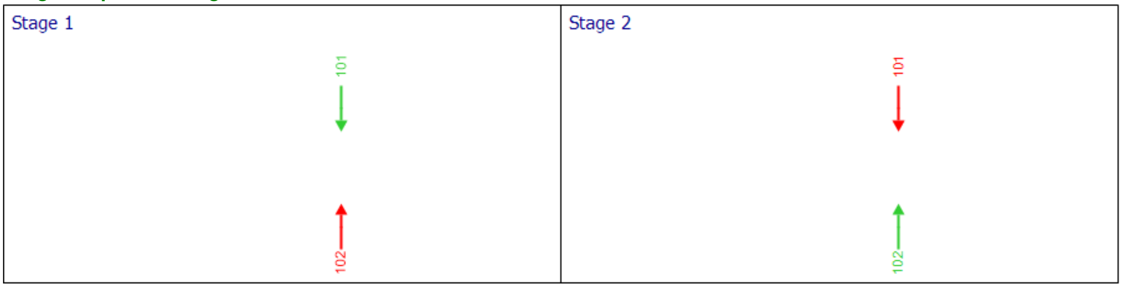
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	101	1	✓	18	60	42
	102	1	✓	80	118	38

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
08:00-10:00	1	0.00	0.00	0.00	0.00

Results - Link

Results - Link: Vehicle summary

Time Segment	Link	Name	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Calculated capacity (PCU/hr)	Degree of saturation (%)	Practical reserve capacity (%)	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	JourneyTime (s)
08:00-10:00	101	(untitled)	101	507	2000	42	717	71	27	41.63	15.71	27.85	77.63
	102	(untitled)	102	453	2000	38	650	70	29	44.43	14.23	25.23	80.43

Results - Traffic Stream

Data Entry - Stage Start and End

Resultant Stage

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	101	18	60	42	7	7
	2	✓	2	102	80	118	38	7	7

Data Entry - Phase

Phase

Controller Stream	Phase	Phase	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type
1	101	101	1	300	0	0	Unknown
	102	102	1	300	0	0	Unknown

Data Entry - Traffic Stream

Data entry - Link

Link

Link	Link	Length (m)	Is minor shared	Traffic model	Max queue storage (PCU)	Traffic type	Has Saturation Flow	Is signal controlled	Is give way	Use RR67	Saturation flow (PCU/hr)	Stop weighting (%)	Delay weighting (%)
101	101	300.00		NetworkDefault	0.00	Normal	✓	✓			2000	100	100
102	102	300.00		NetworkDefault	0.00	Normal	✓	✓			2000	100	100

Results - Pedestrian

Link Results

Link Results: Vehicle summary

Time Segment	Link	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-10:00	101	71	27	507	2000	42	41.63	15.71	27.85	75.63	5.23	80.86
	102	70	29	453	2000	38	44.43	14.23	25.23	72.12	4.77	76.89

Link Results: Flows and signals

Time Segment	Link	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Calculated sat flow (PCU/hr)	Calculated capacity (PCU/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-10:00	101	507	507	0		2000	717	71		27	0.00	42
	102	453	453	0		2000	650	70		29	0.00	38

Link Results: Stops and delays

Time Segment	Link	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-10:00	101	36.00	41.63	5.86	75.63	91.04	461.57	5.23
	102	36.00	44.43	5.59	72.12	92.87	420.71	4.77

Link Results: Queues and blocking

Time Segment	Link	Initial queue (PCU)	Mean max queue (PCU)	Max queue storage (PCU)	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))	Estimated blocking
08:00-10:00	101	0.00	15.71	56.40	27.85	0.00	0.00	
	102	0.00	14.23	56.40	25.23	0.00	0.00	

Link Results: Advanced

Time Segment	Link	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (PCU)	Max End of Green Queue EoTS (PCU)	Max End of Red Queue EoTS (PCU)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-10:00	101	0.00	0.00	✓	15.71	1.21	12.05	1.00	0.00	80.86
	102	0.00	0.00	✓	14.23	1.15	11.34	1.00	0.00	76.89

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	06/08/2020 12:50:43	06/08/2020 12:50:43	08:00	120	157.75	11.45	70.74	101	0	0	101		10

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-10:00	71	27	960	80	42.95	147.75	10.00	157.75

Network Results: Flows and signals

Time Segment	Calculated flow entering (PCU/hr)	Calculated flow out (PCU/hr)	Flow discrepancy (PCU/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:00-10:00	960	960	0		71		27	80

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Total stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-10:00	36.00	42.95	11.45	147.75	91.90	882.28	10.00

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time total (s (per cycle))
08:00-10:00	27.85	0.00	0.00

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
08:00-10:00	0.00	0.00	✓	1.00	0.00	0.00	157.75

Final Prediction Table

Link Results

			SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	WEIG
Link	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	Delay weighting (%)
101	(untitled)	1	1	101	507	2000	42	0.00	71	27	77.63	41.63	91.04	15.71	100
102	(untitled)	1	1	102	453	2000	38	0.00	70	29	80.43	44.43	92.87	14.23	100

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	288.00	21.05	13.68	11.45	147.75	10.00	0.00	157.75
Bus								
Tram								
Pedestrians								
TOTAL	288.00	21.05	13.68	11.45	147.75	10.00	0.00	157.75

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***