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Prepared on behalf of

Farnley Estates

Farnley Masterplan
Huddersfield

Access Appraisal

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Acknowledgements:

The TRICS database has been used in this report to calculate traffic generation rates.

Traffic Data has been supplied by RDS Ltd.

Census data has been obtained from ONS.

Disclaimer

The methodology adopted and the sources of information used by Sanderson Associates (Consulting Engineers) Ltd in providing its services are outlined within this Report.

Any information provided by third parties and referred to herein has not been checked or verified by Sanderson Associates (Consulting Engineers) Ltd, unless otherwise expressly stated within this report.

This report was checked and approved on the 13th December 2016 and the Report is therefore valid on this date, circumstances, regulations and professional standards do change which could subsequently affect the validity of this Report.

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Report Ref:	9058/AND/002/01		December 2016
Author:	Adam Darwin		
Checked & Approved:	Tracy Hargreaves	**Date:**	13th December 2016

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Drawing 9058/005

Drawing 9058/007

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1 Introduction

1.1 This report has been prepared to support the Farnley Estates Masterplan proposals. This report provides an updated access appraisal (original report produced in January 2016) of the Farnley Estates sites that are accessed from the A629 Penistone Road corridor, which have been included as a Draft Site Allocation.

1.2 The following Farnley Estates sites located along the A629 Penistone Road corridor have been included as Draft Site Allocations and are considered in this report:

- Site H31 allocated for 68 dwellings (Our teams previous site reference no. 2).
- Site H2684a allocated for 286 dwellings (Our teams previous site references no. 3 & 6), which is separated into eastern and western parcels bisected by a former railway line. This site also provides access to Dartmouth Estates site H2730a (312 dwellings).

1.3 Previous assessment work undertaken by Sanderson Associates assessed the potential site access arrangements for the sites, which included a new priority junction access to service site H31; and a new roundabout junction to serve site H2684a, together with realignment of Rowley Lane. Further detail was also provided as requested by Kirklees Council to confirm that a road link was achievable across the former railway line that bisects site H2684a. Details contained within the Site Appraisal reports prepared by Kirklees Council confirm that these access arrangements are achievable and that there are no physical constraints within the sites that cannot be mitigated against.

1.4 The Kirklees Council Site Appraisal report for the adjacent Dartmouth Estates site (H2730a) also states that only a limited number of units should be served by the existing Hermitage Park access road. Therefore, the majority of that site allocation may need to be accessed via the H2684a site. As such, this report included an assessment of traffic from this site, to confirm that the proposed roundabout access could also accommodate this development site.

2 Access Appraisal

2.1 Site H31 - Land northwest of Woodsome Drive, Fenay Bridge

2.1.1 The draft Site Allocation includes for 63 no. dwellings. However, the illustrative plans prepared by the Farnley Estates Team indicate that this site could accommodate approximately 81 no. dwellings. Therefore, for robustness, the larger scale of development has been included in our assessment. Based on this scale of development, the site could be served by a simple priority junction as shown on drawing 9058/007 included in **Appendix B**.

2.1.2 For a site of this scale, a priority junction with a single lane exit would be appropriate, with right turn lane provision on Penistone Road. The junction would also require radii of 10m due to the current 40mph speed limit; and have visibility splays of 2.4 x 90-120m, although these splays may be reduced should the speed limit be reduced on Penistone Road (or if actual speeds are lower), which may be considered appropriate by the Local Highway Authority (LHA). Due to the long site frontage on to Penistone Road, there is considerable scope to locate the site access, which achieves adequate junction spacing and visibility.

2.2 Site H2684 (western parcel) - Land south of Woodsome Drive, Lepton

2.2.1 The illustrative plans indicate that this site could accommodate approximately 63 no. dwellings. Based on this scale of development, the site could be served by a simple priority junction on to Rowley Lane, as shown on drawing 9058/003 included in **Appendix B**. As can be seen from the plan, the junction could be provided as a crossroads with Woodsome Drive.

2.2.2 For a development of this scale, a priority junction with a single lane exit would be appropriate. No right turn lane provision on Rowley Lane is considered to be required. The junction would also require radii of 6m due to the current 30mph speed limit; and have visibility splays of 2.4 x 43m that can be achieved in the suggested location.

2.2.3 As discussed with the Local Highway Authority, capacity problems are experienced at peak times at the Rowley Lane/Penistone Road priority junction. Therefore, to accommodate additional development traffic on Rowley Lane, improvements to this junction may be required. As such, consideration has been given to the feasibility of utilising site 3 to provide a new roundabout on Penistone Road, which would replace the existing Rowley Lane and Woodsome Road junctions, as shown on drawing 9058/007 included in **Appendix B**.

2.2.4 The provision of a new roundabout would address existing problems at the Rowley Lane junction and accommodate development traffic from Site H2684a (both western and eastern parcel, with the full allocation of 286 dwellings); and also the Dartmouth Estates site H2730a.

2.2.5 Preliminary capacity analysis has been undertaken of the roundabout (outlined in Section 3), which indicates that single lane approaches on both the Woodsome Road and Rowley Lane/H2684a site arms are adequate, with two lane flared approaches on both of the Penistone Road arms. The realignment of Rowley Lane would require the existing bus stops to be relocated, with indicative stop locations shown on drawing 9058/007.

2.3 Site H2684 (western parcel) - Land southeast of Hermitage Park, Lepton

2.3.1 There are currently no main public highways within the immediate vicinity of the western parcel of site H2584a. Therefore, to provide access to this site, some land acquisition is likely to be required.

2.3.2 To provide access via Hermitage Park, it would be necessary to purchase land from some of the existing properties to allow a suitable means of access to be created. Based on access via the existing Hermitage Park junction on to Rowley Lane, the illustrative masterplans indicate that the site could accommodate approximately 45 no. dwellings, which could be adequately served by the existing junction, which benefits from adequate visibilities splays.

2.3.3 As with the western parcel of Site H2684a, to accommodate additional development traffic on Rowley Lane, improvements to the Rowley Lane/Penistone Road junction may be required. Therefore, the viability of providing an access across the dismantled railway and gaining access via the western parcel of Site H2684a has been considered, which would enable the full site allocation (286 dwellings) to be delivered.

2.3.4 As requested by Kirklees Council, a cross section was provided to confirm that an access road link can be provided across the former railway, which is shown on drawing 9058/005 included in **Appendix B**. This drawing shows that there is adequate width to provide a highway corridor of sufficient width to accommodate a 6.5m wide carriageway, with footways, verges and embankments of appropriate width and gradient on both sides. It has also been confirmed to Kirklees Council that a legal agreement is now in place between Farnley Estates and the railway embankment land owner that mean this road link is achievable.

3 Traffic generations and assessment

3.1 Scope of assessment

3.1.1 A preliminary assessment has been undertaken of the peak hour traffic that could be generated by sites H31 and H2684a onto the Penistone Road corridor, to enable Kirklees Council to consider the wider implications of the Local Plan sites.

3.1.2 The traffic generation information has also be utilised to model the proposed roundabout junction on to Penistone Road to confirm that it could operate adequately in capacity terms. In addition to this, a further assessment scenario has been undertaken that assumes that all of the traffic from site Dartmouth Estates site (H2730a) is also served via site H2684a and gains access to Penistone Road via the proposed roundabout.

3.2 Based traffic data and growth

3.2.1 Traffic count data has been obtained at the Rowley Lane/Penistone Road and Woodsome Road/Penistone Road junctions on Thursday 3rd December, with the surveys recording cross movements between the Rowley Lane and Penistone Road arms. This data has been analysed, with the network peak hour flows (in PCU's) shown on Figure 2 in **Appendix A**.

3.2.2 For feasibility assessment purposes, 11 years traffic growth (10 years from current year) has been applied to the above survey data to ensure a robust assessment is undertaken, with the following traffic growth factors obtained from the TEMPRO 7 database (All routes in Kirklees uses, as they provide higher rates than the Urban Principal rates in the local area (MSOA Kirklees 051)):

	TEMPRO Growth Factors 2015-2026
AM Peak	1.1560
PM Peak	1.1585

3.2.3 The 2015 base traffic data has been growthed to 2026, with the flows shown on Figure 3 in **Appendix A**.

3.3 Traffic generations and distribution

3.3.1 The TRICS database has been utilised to calculate potential traffic generations for the sites. As the type of housing that may be proposed on each site is not currently known, detailed interrogation of the TRICS database has not been undertaken. Instead, average rates has been derived for sites in England (excluding London) from the 'Houses Privately Owned' dataset, which are considered to give a reasonable indication of the likely vehicles trips that would be generated by the sites, with further detailed assessment required in due course.

3.3.2 The TRICS output data is included in **Appendix C**, with the weekday network peak hour trip rates shown in the following table:

	AM Peak Hour	PM Peak Hour
IN	0.151	0.353
OUT	0.399	0.203

3.3.3 To determine the potential traffic distribution from the sites, a simple gravity model has been produced using method of travel to work data from the 2011 census for the Kirklees 51 Middle Super Output Layer (MSOA), with a summary of the trip distribution and route allocation included in **Appendix D**. Based on this assessment, site traffic has been distributed as follows:

Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West
58.6%	29.5%	5.5%	6.9%

3.3.4 Based on the higher number of dwellings either identified on the illustrative masterplan drawings, or the Draft Site Allocations report, the sites could accommodate the following units:

Site No.	Max. Units
H31	81
H2684a	286
H2730a	312

3.3.5 Based on the aforementioned dwelling numbers, the trip rates identified in paragraph 3.3.2 and the traffic distribution identified in paragraph 3.3.3, the peak hour trip distribution for each site have been calculated and are shown on Figures 4-6 in **Appendix A.**

3.4 Traffic modelling

3.4.1 The proposed roundabout that could serve sites H2684a and replace the existing Rowley Lane and Woodsome Road junctions on to Penistone Road has been assessed using ARCADY modelling software, with the output data included in **Appendix E**. As can be seen from the modelling results, the roundabout would be able to operate within capacity (RFC of below 0.850) utilising the ODTab flow profile in 2026. Even with the addition of the traffic from the Dartmouth Estates site (Site H2730a) the junction would still operate within capacity (RFC remains below 1.000).

3.4.2 Therefore, it is considered that a roundabout junction of this scale would be appropriate to serve these sites and would address the existing capacity issues at the Rowley Lane and Woodsome Road junctions.

3.5 Waterloo Junction

3.5.1 During discussions with Kirklees Council, the traffic impact of the Farnley Estates sites on the Waterloo traffic signal control junction have been queried.

3.5.2 An assessment of this junction is considered to be outside of the scope of this access appraisal, as the impact at this junction is a matter for Kirklees Council to consider on a strategic basis as part of the Local Plan process.

3.5.3 However, this report does identify the network peak traffic flows that have been predicted to utilise the Penistone Road corridor and that could head north towards the Waterloo junction, which will allow Kirklees Council to undertake this strategic traffic assessment in conjunction with other Site Allocations.

3.5.4 Based on the traffic assessment work included in this report, this shows that as a worst case (assuming all traffic heading north utilise the Waterloo junction) up to 117 and 119 trips in the weekday AM and PM peaks respectively could utilise the junction, which would equate to 2 trips per minute. When these flows are compared to the 2026 base traffic flows on Penistone Road, this would equate to increases of between 7% and 6% in the AM and PM peaks respectively. Therefore, whilst these traffic increases would have some effect on this junction, the increases would be within existing daily traffic fluctuations that can be around 10%.

3.5.5 Should the Farnley Estates Site Allocations be confirmed, planning applications would be submitted in due course. Therefore, at that time, detailed Transport Assessments will be required to support these applications, which will assess the development traffic impact at the Waterloo junction.

3.5.6 It is noted that the Waterloo junction is referred to in the Draft Local Plan as a junction of concern; and as such, is included on the Draft CIL 123 List, with a funding gap for improvement identified of £1.5-2.0 million (100% of required funding). Therefore, as CIL contributions will be applicable to the Farnley Estates site, these contributions can be used to fund improvement works at this junction, should they be deemed necessary and of sufficiently high priority at that time.

4 Accessibility

4.1 Introduction

4.1.1 As part of the Site Allocation process, Kirklees Council have reviewed the accessibility of the sites by non-car modes of transport. This assessment has been based on the accessibility criteria set out in DfT guidance, which includes 'lower' and 'upper' thresholds to a range of services based on journey time by non-car modes, with the thresholds shown in the following table:

Criteria from DfT Accessibility Statistics Guidance 2014		
Service	**Lower threshold (mins.)**	**Upper threshold (mins.)**
Employment	20	40
Primary School	15	30
Secondary School	20	40
Further Education	30	60
GP	15	30
Hospital	30	60
Food store	15	30
Town Centre	15	30

4.1.2 The Site Allocation process then uses the above criteria to assess the sites against 19 Objectives, 6 of which relate to accessibility. The scores for these 6 questions for each site are shown in the following table, which include both the Kirklees Council score included in the Site Appraisal report, together with our own score that we have checked based on the DfT criteria:

Site H31			
SA Objective No.	**Site Allocation Objective Type**	**Kirklees Assessment**	**Sandersons Assessment**
1	Employment	++	++
3	Education	++?	++?
4	Health	+	+
6	Local Services	+	++
10	Sustainable Transport	++	++
19	Climate change	++	++

Site 2684a			
SA Objective No.	**Site Allocation Objective Type**	**Kirklees Assessment**	**Sandersons Assessment**
1	Employment	++	++
3	Education	++?/0?	++?
4	Health	+/-	+
6	Local Services	++/-	++
10	Sustainable Transport	++	++
19	Climate change	++	++

4.1.3 Generally the Kirklees scores are identical to those we have determined. However, the only differences are the scores for the SA Objective 6, which Kirklees state as + for site H31 and ++/- for site H2684a. Due to both sites being within close proximity to Lepton Village Centre and Kirkburton/Almondbury District Centres it is considered that a score of ++ is applicable. This assessment is backed up by the Local Plan Settlement Appraisal data that gives Lepton a maximum of 3 for it's 'Local Centre Accessibility Score'.

4.1.4 Further details of the services that are accessible by non-car modes are provided in Section 4.3 to confirm the above findings.

4.2 Access by non-car modes

4.2.1 New access roads and pedestrian/cycle links will be provide for both sites. This will include routes with a maximum gradient of 1:14, which will enable them to be accessible on foot to all people.

4.2.2 Public Rights of Way (PROW) that lie within or adjacent to the site, will be improved as necessary to ensure that they are protected and enhanced.

4.2.3 Bus stops are currently available of Rowley Lane adjacent to site H2684a and on Penistone Road either adjacent to or in close proximity to both site H31 and H2684a. As part of the proposals for site H2684a could include a realignment of Rowley Lane and a new roundabout on Penistone Road, this would require alterations to the existing bus stops on Rowley Lane. This would allow for the stops to be improved to reduce the walking distance to the Farnley Estates sites and the main urban area in Lepton.

4.2.4 The possible location of the relocated bus stops, together with the location of other existing bus stops are shown on Figure 7 in **Appendix A** and drawing 9058/007 in **Appendix B**.

4.2.5 From the centre of the sites H31 and the western parcel of site H2684a, the existing bus stops on Penistone Road are within 200m (2 ½ minute walk). This increase to around 400m (5 minute walk) to the centre of the eastern parcel of site H2684a, with the furthest part of the site around 600m (7 ½ minute walk).

4.2.6 From the centre of site H31 the existing bus stops (and the suggested relocated stops) on Rowley Lane are within 400m (5 minute walk). The stops are immediately adjacent to the western parcel of site H2684a and are within 400m (5 minute walk) of the centre of the eastern parcel of site H2684a, with the furthest part of the site around 600m (7 ½ minute walk).

4.2.7 It is concluded that the existing/proposed bus stop locations will be easily accessible to future residents.

4.2.8 The bus stops on Rowley Lane are currently served by 2 public services (80 & 83A/84A) that operate between Huddersfield and Clayton West/Denby Dale. The only regular service is the service no. 80, which operates hourly during weekdays and Saturdays and could be used by future residents to gain access to the local services provided in Lepton Village Centre. In addition to the public services, school buses services are available on Rowley Lane to King James School (K77/K79) and Kirkburton Middle School (K89), which take approximately 5 minutes and 15 minutes respectively.

4.2.9 The bus stops on Penistone Road are currently served by 4 further public services (81, 82, 83 & 84, together with 80 & 83A/84A from Rowley Lane) that operate between Huddersfield and Clayton West/Denby Dale. These services operate with an average frequency of approximately 3 per hour during weekdays and Saturdays, with a reduced service on Sunday (1 per hour) and could be used by future residents to gain access to Huddersfield Town Centre, which take approximately 21 minutes. In addition to the public services, a school bus service

is available on Penistone Road to Shelley College (K88), which takes approximately 15 minutes.

4.2.10 It is concluded that the bus services currently available provide a range of frequent services to local/district centres, the Town Centre and to Secondary Schools/Further Education, which will allow future residents to travel by bus.

4.3 Location of services

4.3.1 Figure 7 in **Appendix A** includes plans that show the location of some of the key services that are available within walking and cycling distance of the site. The figure indicate walking zones of 800m and 2km, which are the generally accepted thresholds for walking, with the 800m distance being a 5 minute comfortable walk (as set out in Manual for Streets) and 2km being the preferred maximum walking distance for commuting journeys to work or school (from CIHT document ' Providing for Journeys on Foot). The figure also indicate a nominal cycle zone of 5km. It is noted that both the walking and cycling thresholds are not upper limits and some more able residents are likely to be able to walk and cycle significantly further than these thresholds. It is also noted that the zones shown are not accurate isochrones, but are instead provided to give an indication of the services available within walking and cycling distance only.

4.3.2 Based on the range of services used within the DfT/Kirklees assessment criteria, a summary of the nearest services to the site are as follows:

- **Primary Education** - The nearest Primary School to the sites is located on Rowley Lane, which is approximately 900m from the centre of site H31, 650m from the centre of the western parcel of H2684a and 550m from the centre of the eastern parcel of H2684a. Further Primary Schools are available nearby on Station Road, Lepton, in Highburton, Kirkburton and Almondbury.
- **Secondary Education** - The nearest Secondary Education School is King James in Almondbury. This school is accessible by cycle or bus. Other nearby secondary schools that accessible by cycle or bus are Kirkburton Middle School and Shelley College.

- **Further Education** - The nearest further education facilities are provided at Shelley College; and Kirklees College and Huddersfield University located in Huddersfield Town Centre. These facilities are slightly above the upper threshold for cycling, but would still be accessible for more able cyclists and are accessible by bus.
- **Doctors/Pharmacy** - The nearest Doctors and Pharmacy to the sites are located in Lepton Village Centre. These facilities are located towards the upper threshold for walking; and are also accessible by cycle and bus. A further Doctors/Pharmacy is located in Kirkburton and a Pharmacy in Waterloo, which are accessible by cycle and bus.
- **Hospital** - The nearest Hospital is located to the north of Huddersfield Town Centre, which is accessed by buses interchanging at Huddersfield Bus Station.
- **Local Facilities** - The nearest local facilities, including shops, post office, pub and take-aways are located within Lepton Village Centre. These facilities are located towards the upper threshold for walking; and are also accessible by cycle and bus. Further facilities are provided nearby in Kirkburton, Fenay Bridge and Waterloo, which are accessible by cycle and bus.
- **Employment** - There are existing employment sites immediately south of the sites on Penistone Road, which are easily accessible on foot (within 800m). Further employment opportunities exist nearby in Lepton, Fenay Bridge, Kirkburton and Waterloo, which are also accessible of foot, by cycle and by bus.
- **Town Centre** - Huddersfield Town centre is located approximately 5km from the site and is accessible by cycle and bus.

4.3.3 To review the accessibility of the sites based on the DfT Criteria, the journey time to all of the nearest service types has been assessed for walking, cycling and bus trips; which are shown in the following tables:

	Site H31			
	Walk	**Cycle**	**Bus (service no.)**	**DfT Theshold**
Primary Education	11min. (900m)	N/A	N/A	Lower
Secondary Education	N/A	9 min. (2.3km)	10min. (K77)	Lower
Further Education	N/A	21min. (5.6km)	20min. (K88)	Lower
University	N/A	18min. (4.8km)	23min. (81)	Lower
Doctor/Pharmacy	21min. (1.7km)	6min. (1.7km)	10min.(80)*	Lower
Hospital	N/A	N/A	43min.**	Upper
Local Facilities	10 min. (800m)	3 min. (800m)	10min.(80)*	Lower
Employment	8 min. (600m)	2min. (600m)	N/A	Lower
Town Centre	N/A	19min. (5.0km)	23min. (81)	Upper

	Site H2684a (western parcel)			
	Walk	**Cycle**	**Bus (service no.)**	**DfT Theshold**
Primary Education	8min. (650m)	N/A	N/A	Lower
Secondary Education	24min. (1.9km)	7min. (1.9km)	10min. (K77)	Lower
Further Education	N/A	19min. (5.2km)	20min. (K88)	Lower
University	N/A	19min. (5.2km)	23min. (81)	Lower
Doctor/Pharmacy	19min. (1.5km)	6min.(1.5km)	10min.(80)*	Lower
Hospital	N/A	N/A	43min.**	Upper
Local Facilities	14min. (1.1km)	4min. (1.1km)	10min.(80)*	Lower
Employment	3min. (200m)	1 min. (200m)	N/A	Lower
Town Centre	N/A	20min. (5.4km)	23min. (81)	Upper

	Site H2684a (eastern parcel)			
	Walk	**Cycle**	**Bus (service no.)**	**DfT Theshold**
Primary Education	7min. (550m)	N/A	N/A	Lower
Secondary Education	N/A	9 min. (2.3km)	13min. (K77)	Lower
Further Education	N/A	21min. (5.6km)	23min. (K88)	Lower
University	N/A	21min. (5.6km)	26min. (81)	Lower
Doctor/Pharmacy	18min. (1.4km)	5min. (1.4km)	10min.(80)*	Lower
Hospital	N/A	N/A	46min.(81)**	Upper
Local Facilities	13min. (1.0m)	4min. (1.0m)	10min.(80)*	Lower
Employment	5min. (400m)	2 min.(400m)	N/A	Lower
Town Centre	N/A	22min. (5.8km)	26min. (81)	Upper

All measurements and times are from centre of sites

Based on walking speed of 3mph/4.8kph

Based on cycling speed of 10mph/16kph

Cycling time has not been included for primary school or hospital trips in accordance with DfT guidance

*Min. bus travel time of 10min has been used.

**5 min. interchange time at Huddersfield Bus Station is included in accordance with Kirklees methodology.

4.3.4 As can be seen from the previous tables, the sites are accessible to all services outlined in the DfT/Kirklees criteria, with all except the location of a Hospital or Town Centre being within the lower threshold.

APPENDIX A

Figure 1 - Site Location Plan

Figure 2 - 2015 Base Traffic Flows

Figure 3 - 2026 Base Traffic Flows

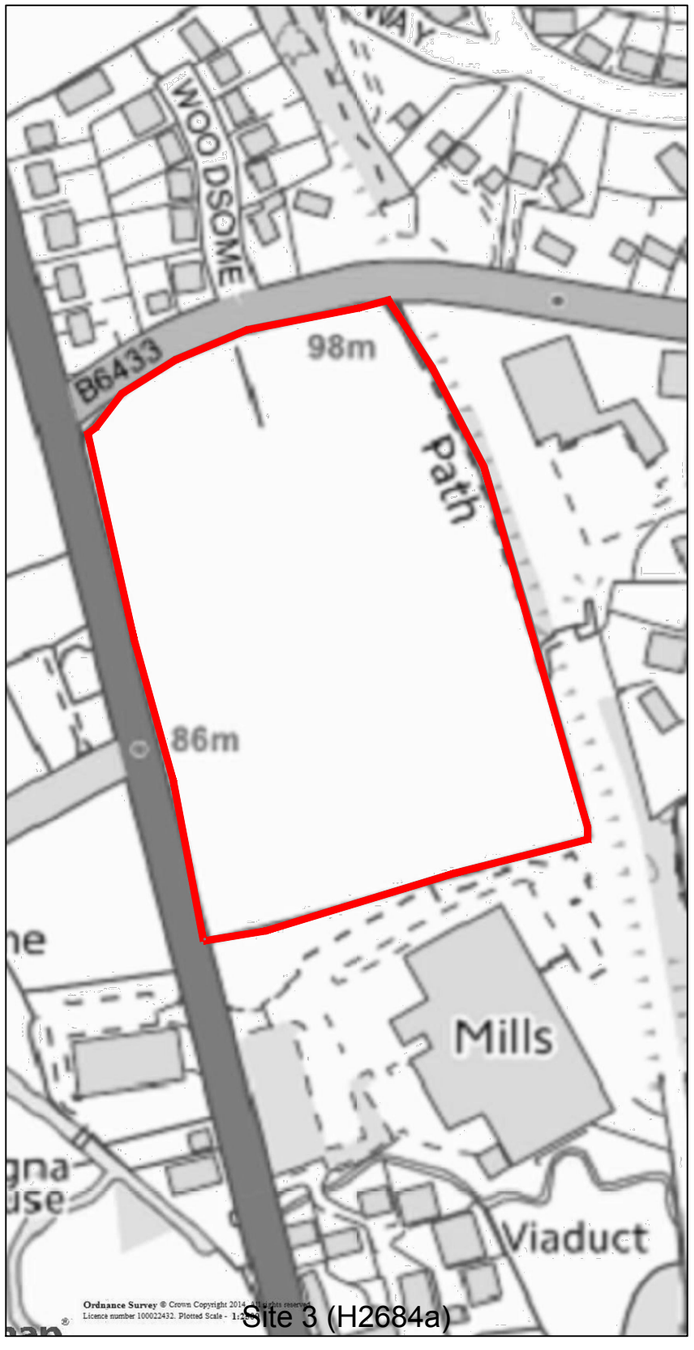
Figure 4 - Site H31 Flows

Figure 5 - Site H2684a Flows

Figure 6 - Site H2730a Flows

Figure 7 - Accessibility Plan

Site 2 (H31)



Site 3 (H2684a)

Site 6 (H2684a)

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Farnley Masterplan

Site Location Plan

Rev	Amendment	Drawn	Date	Checked

Scale NTS		Drawn By AND	
Drawing Size A3		Checked By AND	
Date Dec. 2016		Approved By AND	
QIMS ISO 9001 REGISTERED FIRM	Drawing Number Figure 1		Rev

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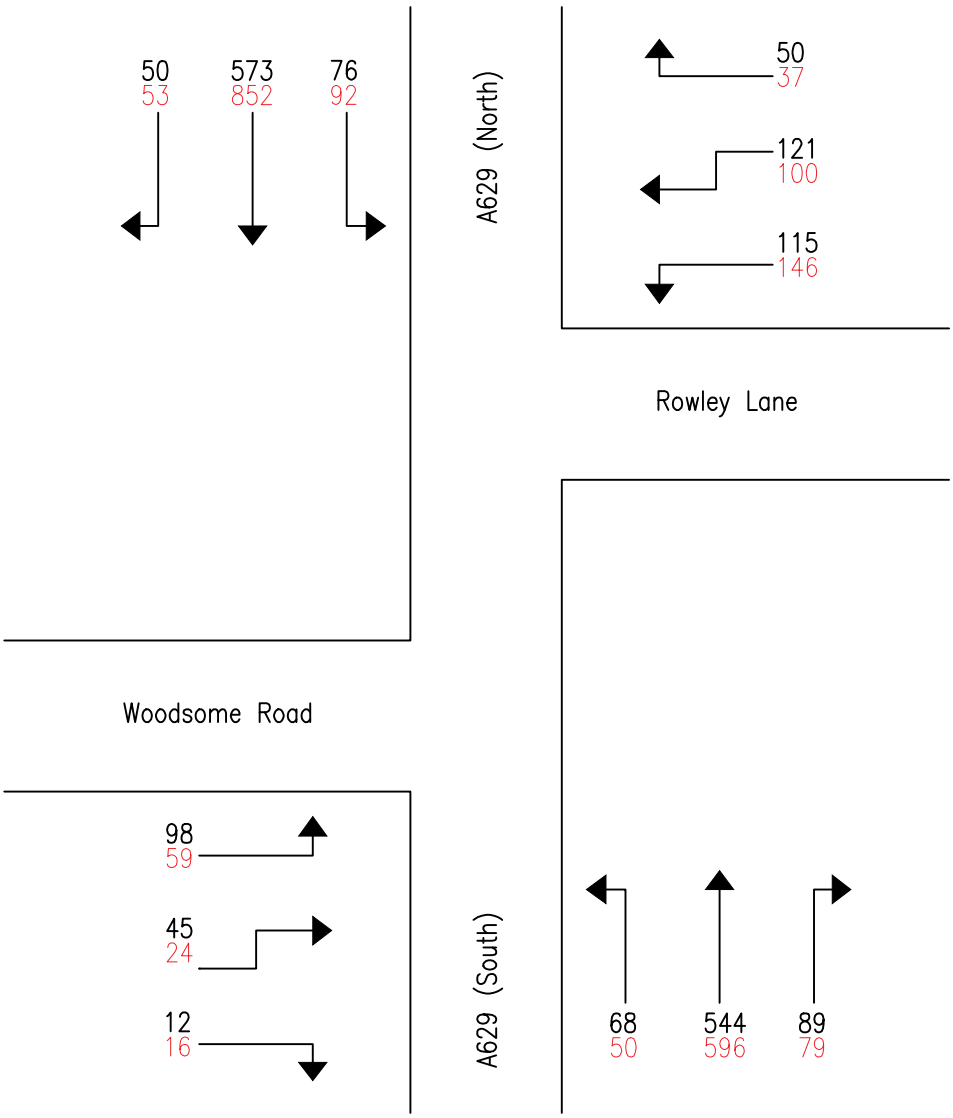

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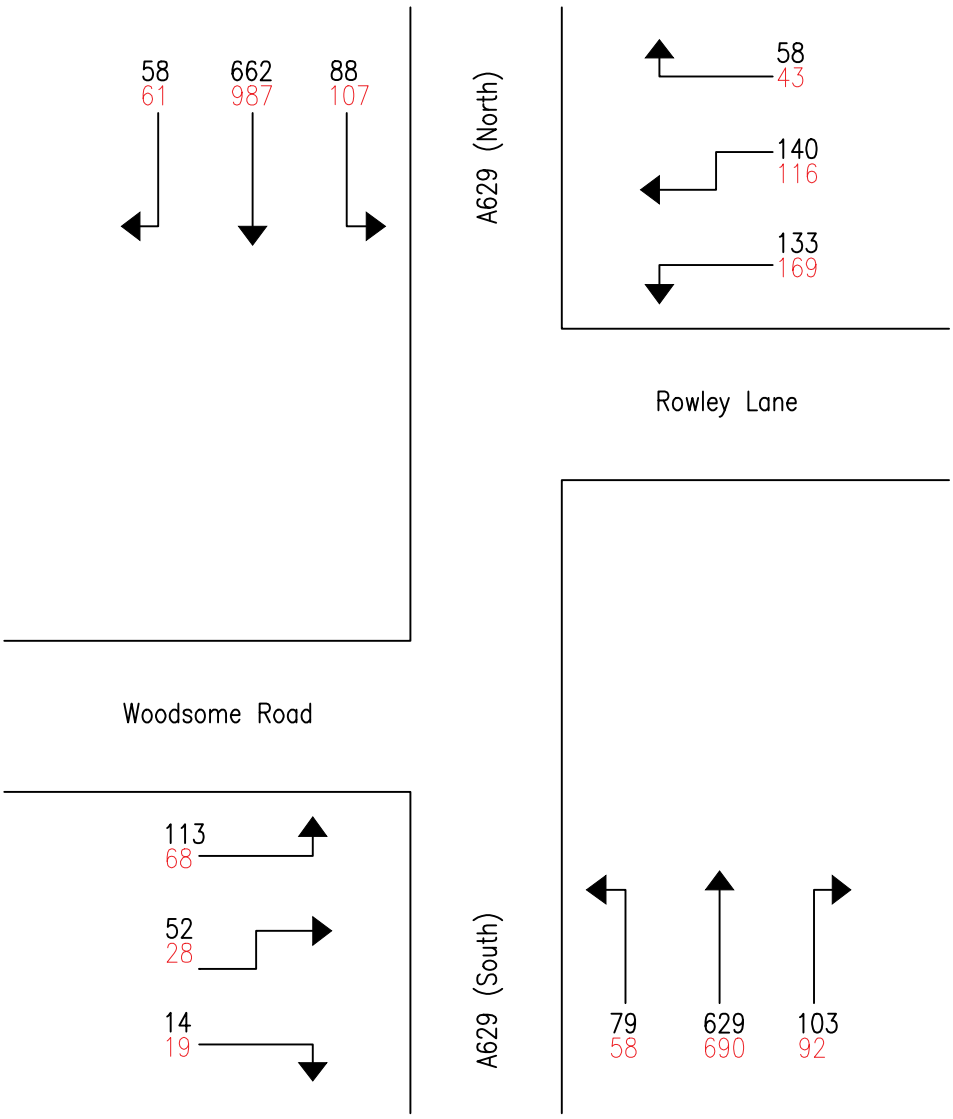
		Checked AD	Date Dec. 2016
		Approved AD	Drawing Number Figure 2 / Size A4

ISO 9001 REGISTERED FIRM

Key

AM (15.60% Growth)
PM (15.85% Growth)



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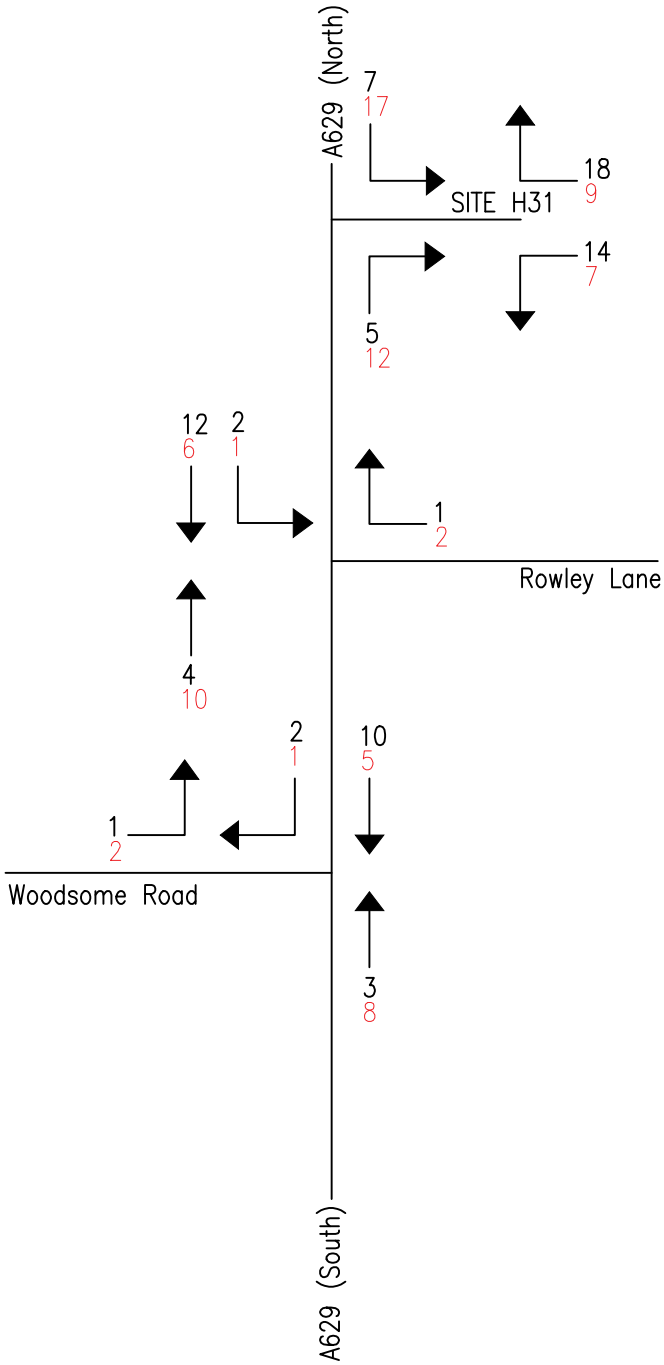

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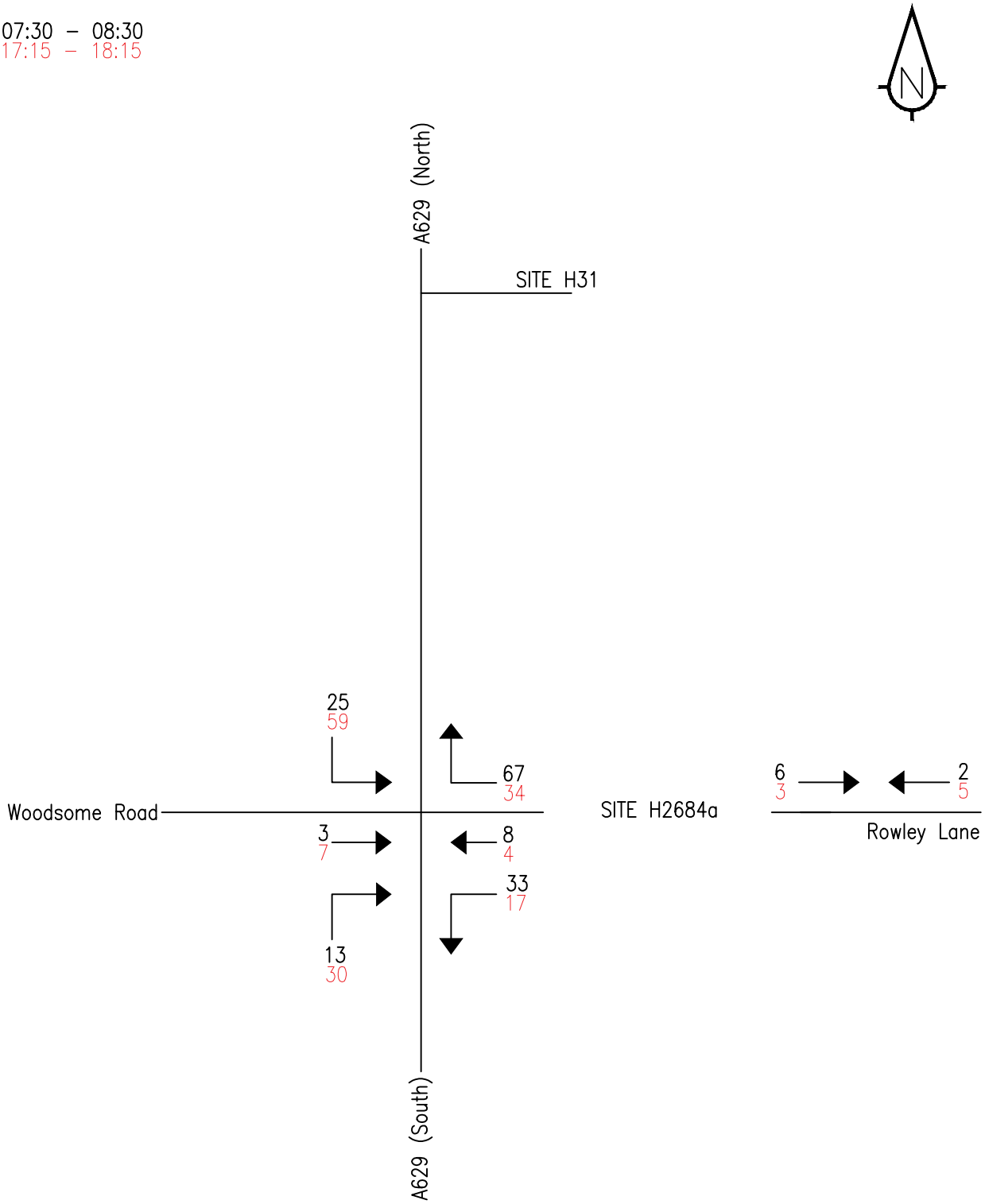

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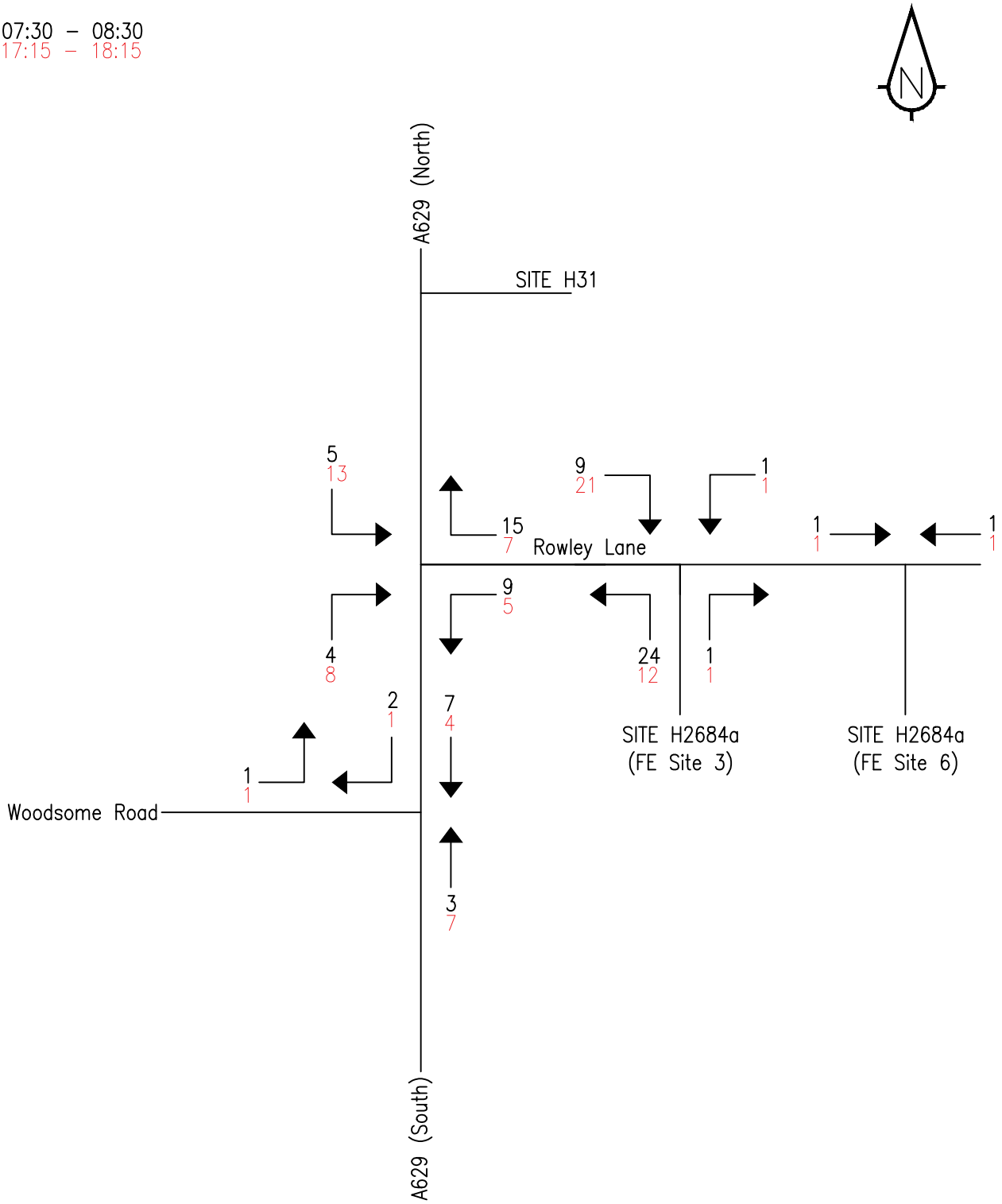
H2684a Site Flows (FE Sites 3 & 6)

Farnley Masterplan

Drawn AD	Scale NTS	QIM ISO 9001 REGISTERED FIRM
Checked AD	Date Dec. 2016	
Approved AD	Drawing Number Figure 5	Size A4

Key

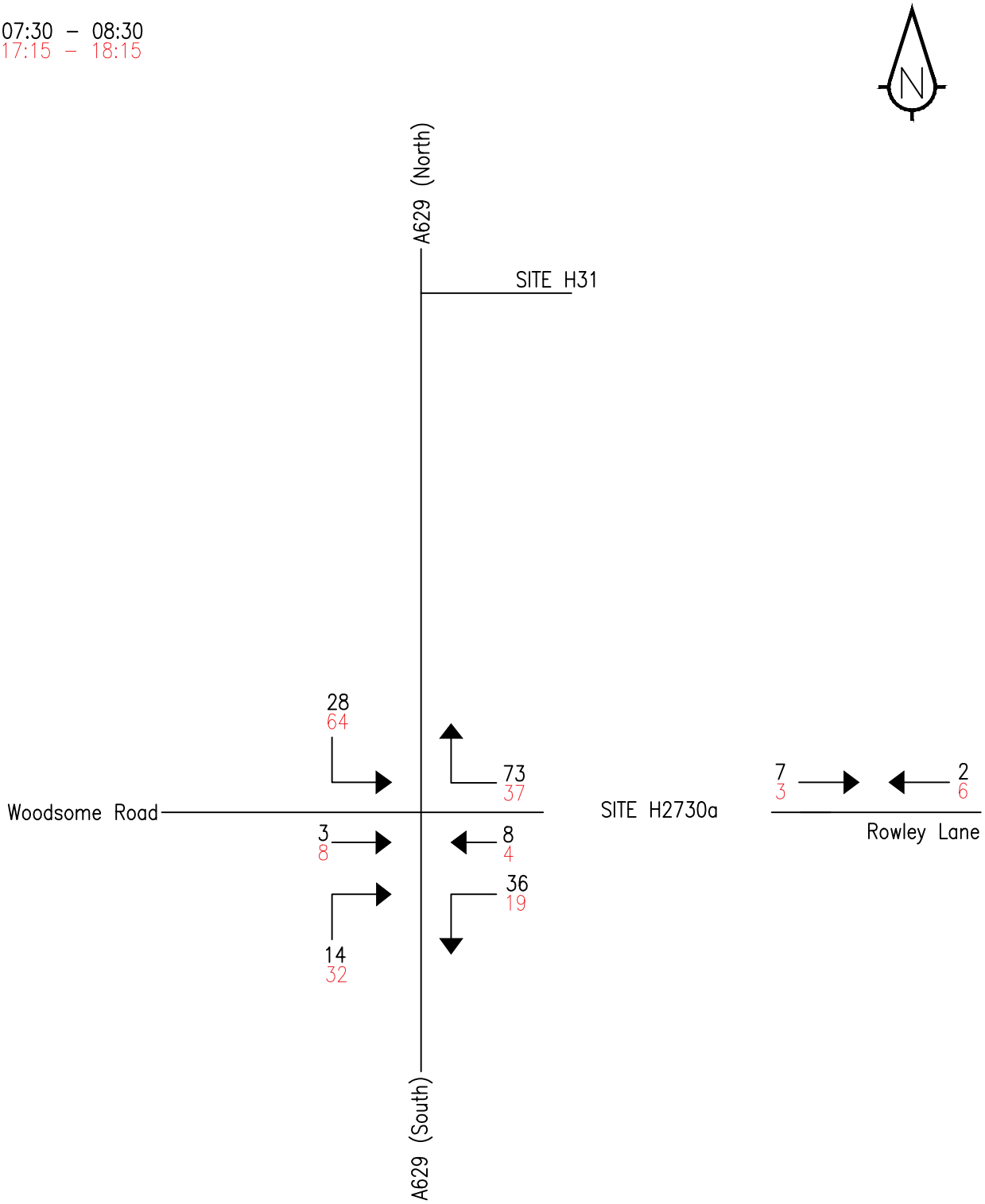
AM 07:30 – 08:30
PM 17:15 – 18:15



sanderson associates (consulting engineers) ltd Highways | Traffic | Transportation | Water T 01924 844080 mail@sandersonassociates.co.uk F 01924 844081 www.sandersonassociates.co.uk	H2684a Site Flows (FE Site 3)	Drawn AD	Scale NTS
		Checked AD	Date Dec. 2016
	Farnley Masterplan	Approved AD	Drawing Number Figure 5 / Size A4

Key

AM 07:30 – 08:30
PM 17:15 – 18:15



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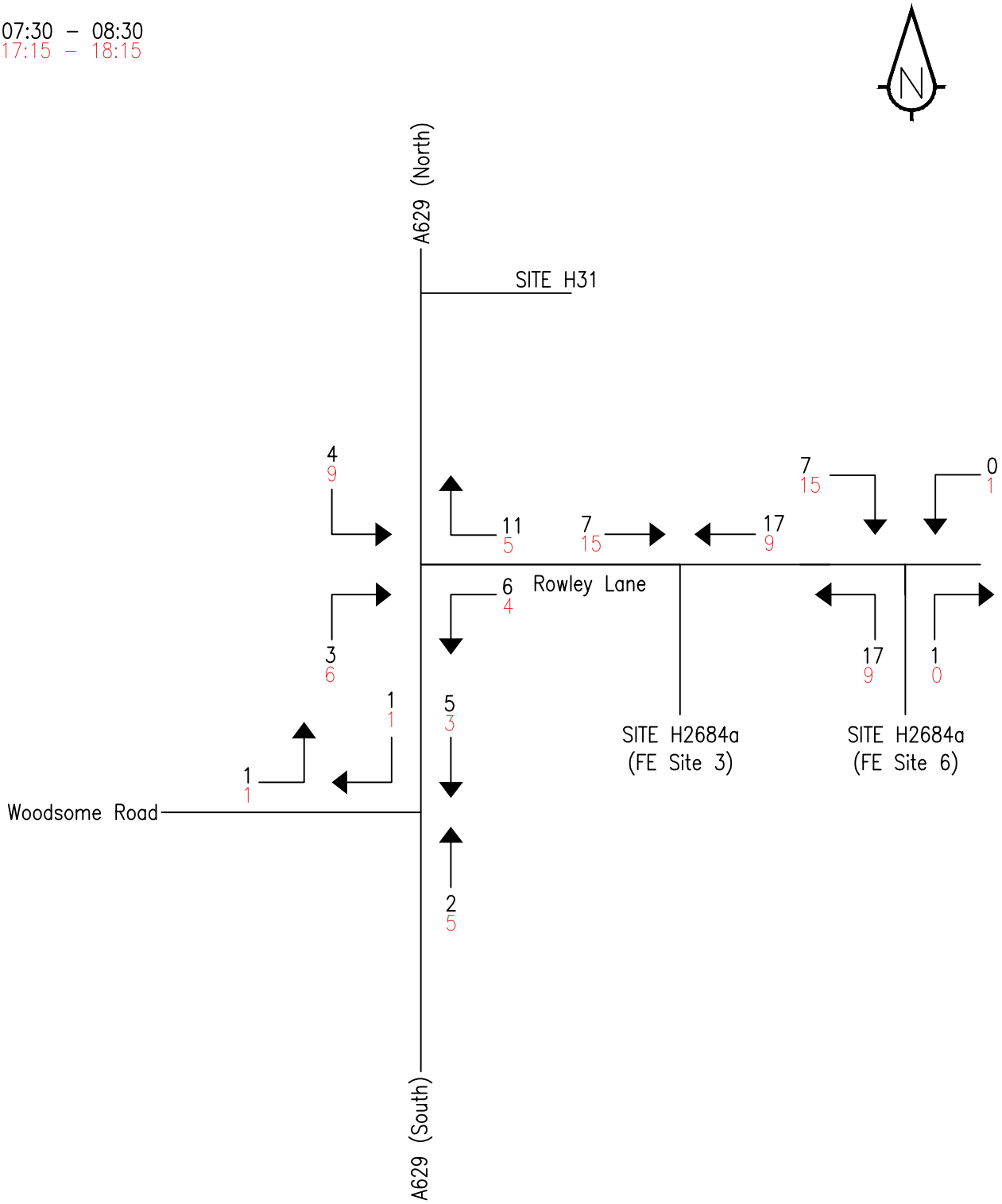
H2730a Site Flows (DE Site)

Farnley Masterplan

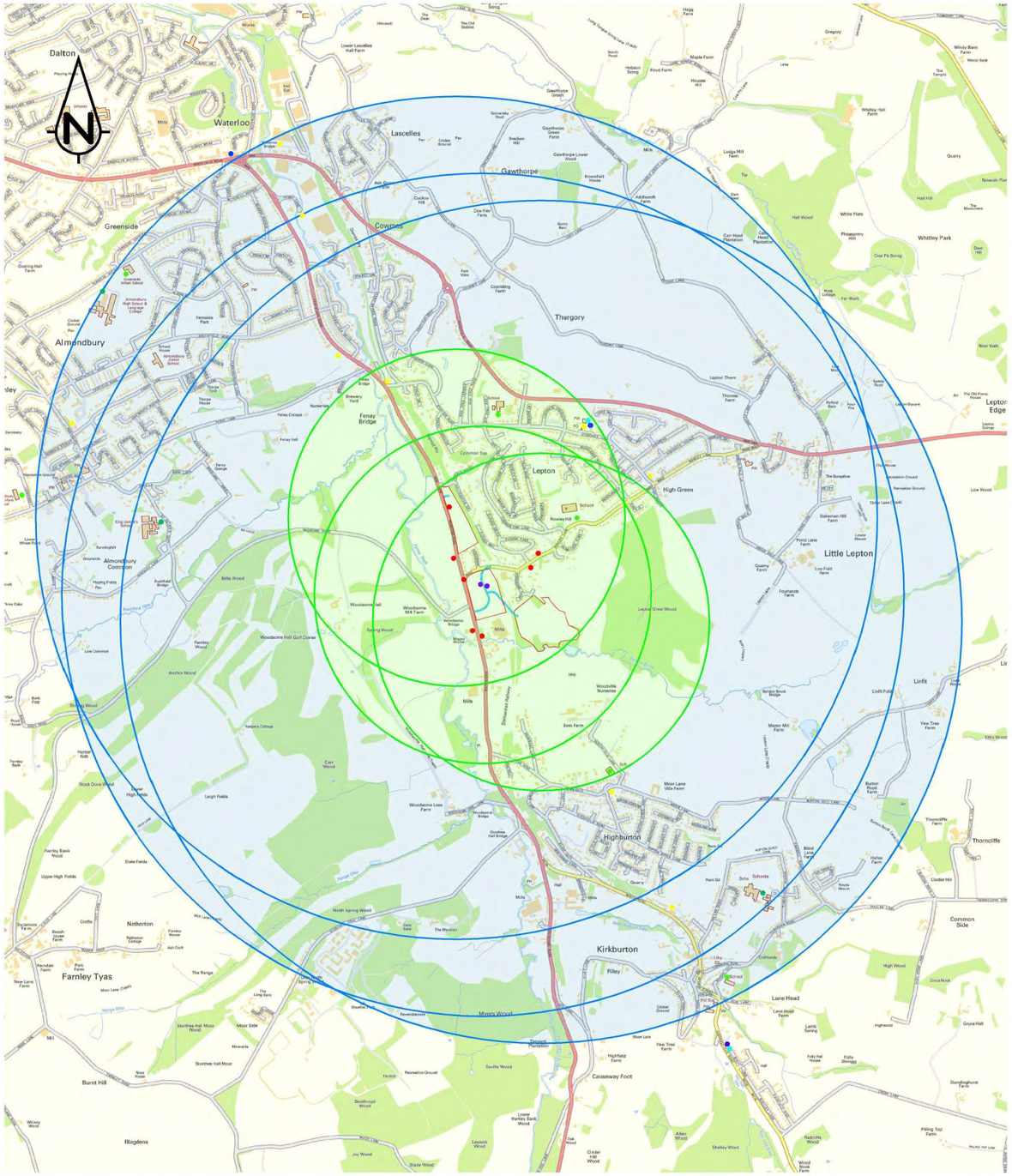
Drawn	Scale	
AD	NTS	QIM ISO 9001 REGISTERED FIRM
Checked	Date	
AD	Dec. 2016	
Approved	Drawing Number	Size
AD	Figure 6	A4

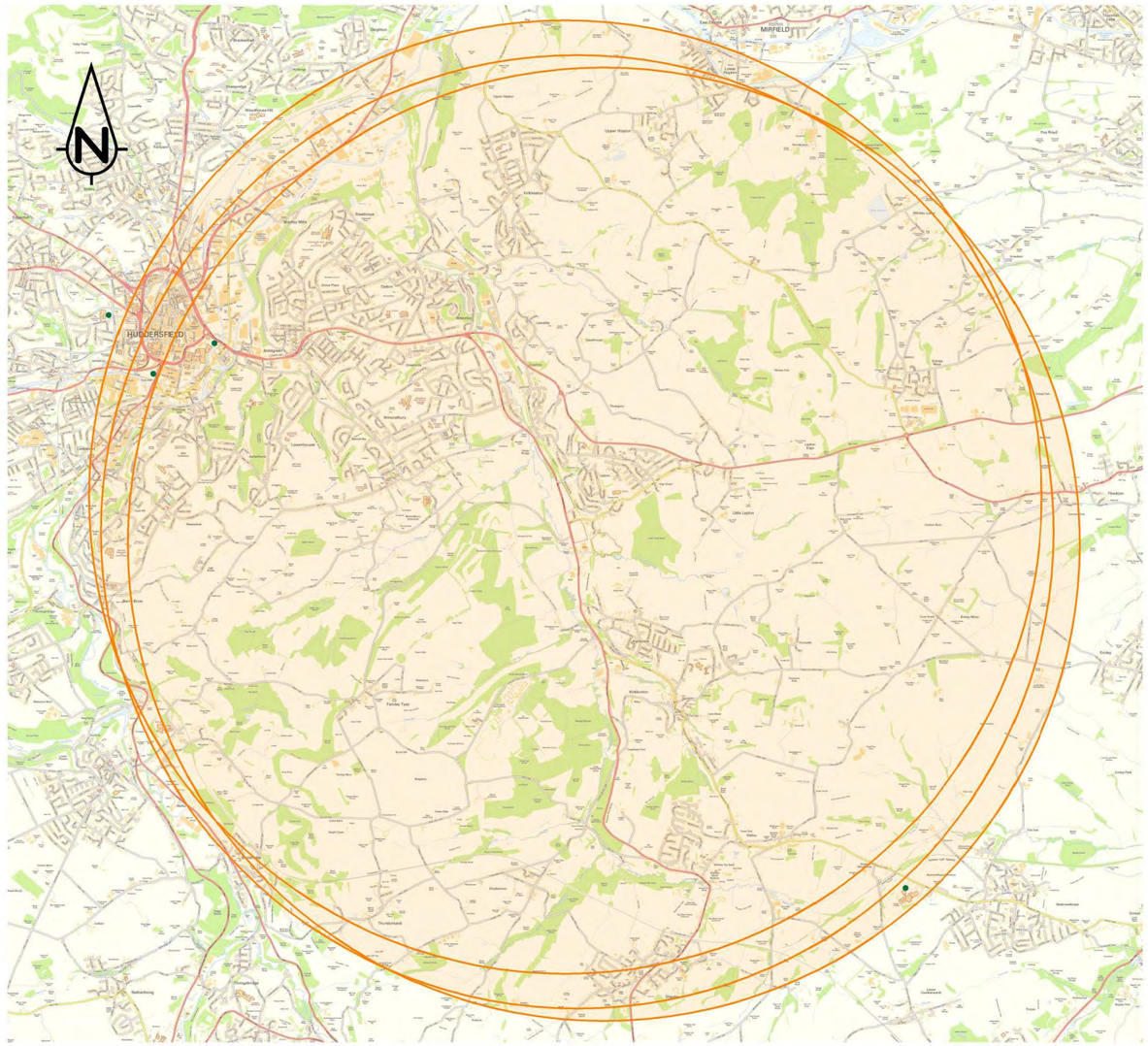
Key

AM 07:30 – 08:30
PM 17:15 – 18:15



sanderson associates (consulting engineers) ltd Highways | Traffic | Transportation | Water T 01924 844080 mail@sandersonassociates.co.uk F 01924 844081 www.sandersonassociates.co.uk	H2684a Site Flows (FE Site 6)	Drawn AD	Scale NTS
		Checked AD	Date Dec. 2016
	Farnley Masterplan	Approved AD	Drawing Number Figure 6 / Size A4





Key

- Existing bus stop
- Proposed bus stop
- Primary Education
- Secondary Education
- Further Education
- GP
- Pharmacy
- Local Facilities
- Access Roads
- 800m Comfortable Walking Zone
- 2km Preferred Maximum Walking Zone
- 5km Cycle Zone

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FARNLEY MASTERPLAN

ACCESSIBILITY PLAN

Rev	Amendment	Drawn	Date	Checked

Scale NTS	Drawn By AND
Drawing Size A3	Checked By AND
Date 12.12.16	Approved By AND
ISO 9001 REGISTERED FIRM	Drawing Number FIGURE 7 / Rev

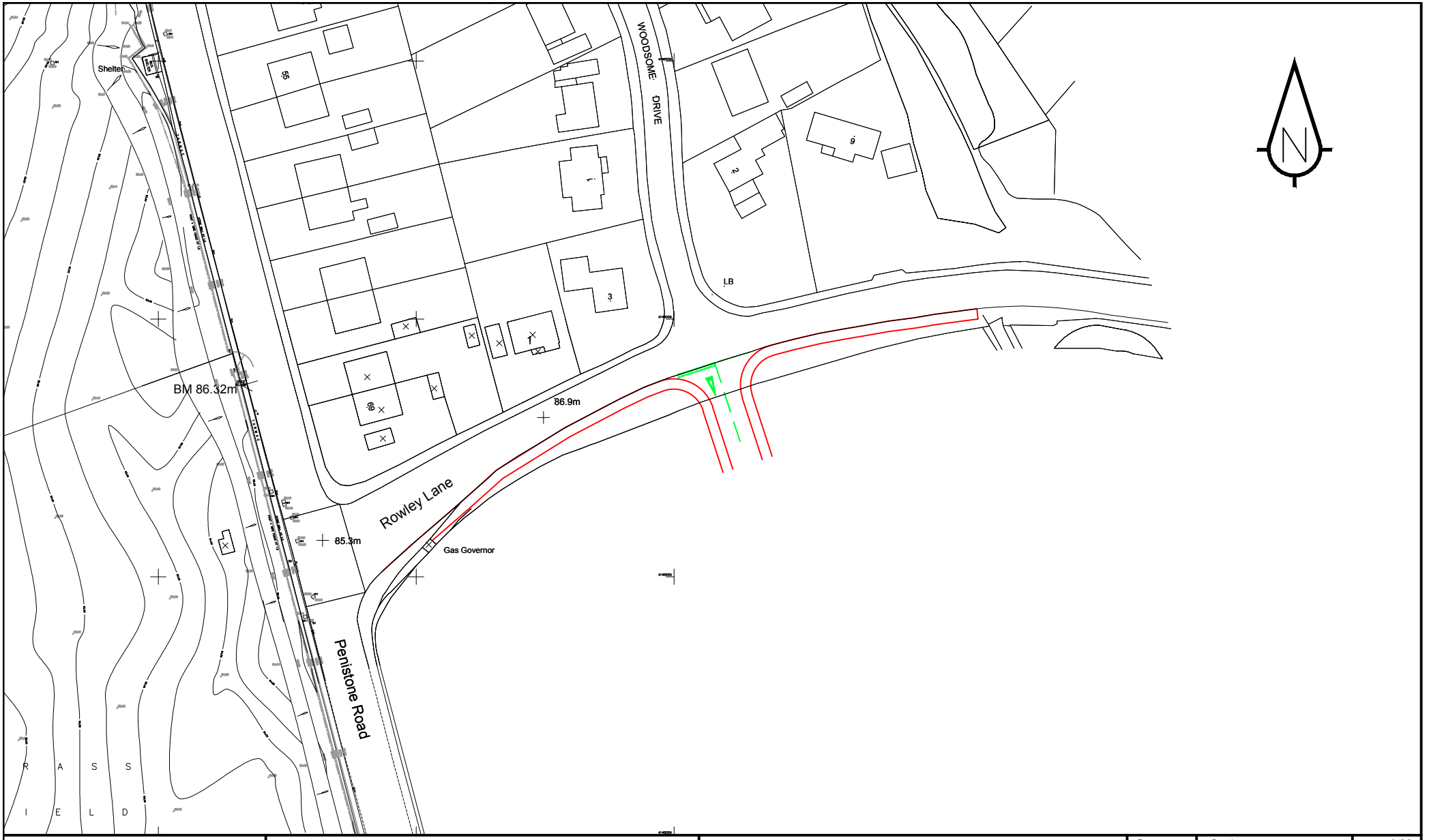
FILE REF:

APPENDIX B

Drawing 9058/003

Drawing 9058/005

Drawing 9058/007



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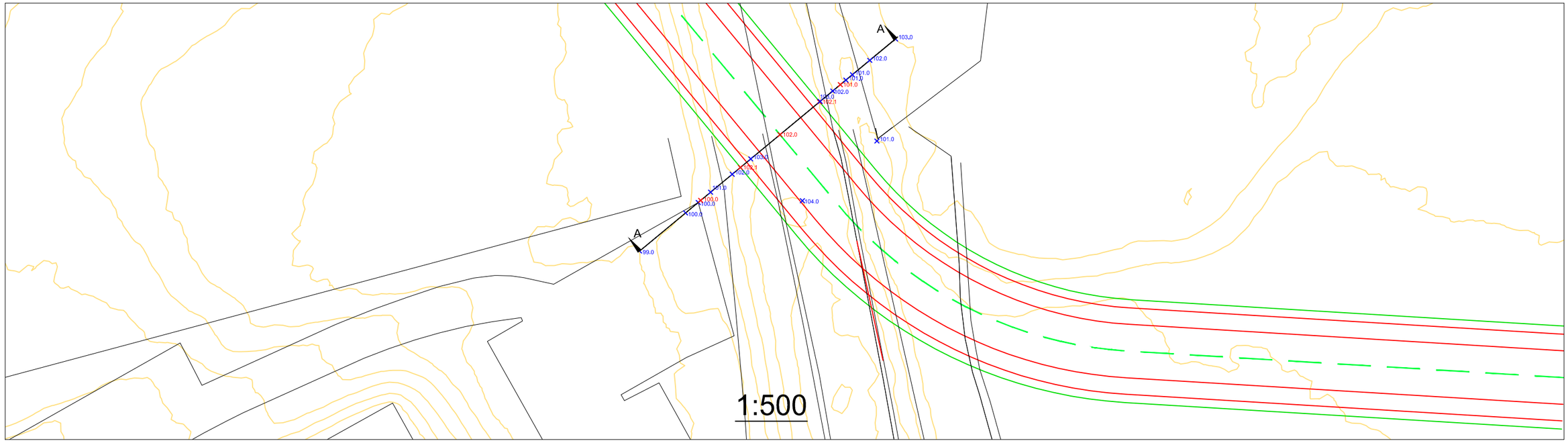
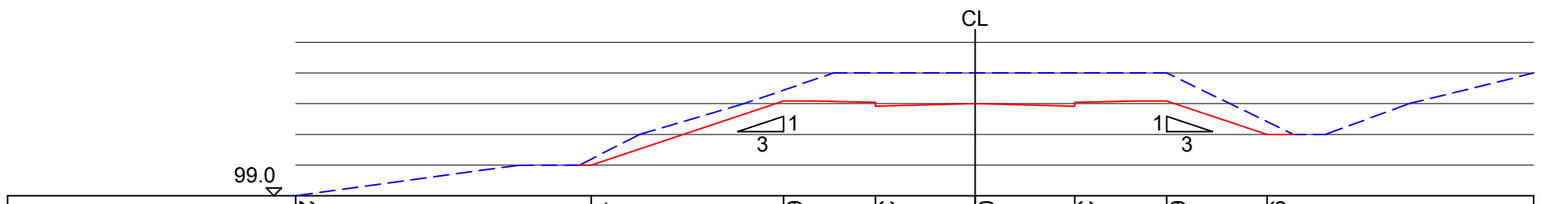
FARNLEY MASTERPLAN

PRELIMINARY ACCESS OPTION SITE NO. 3

Drawn	Scale	
KB	1:1000	QIM S ISO 9001 REGISTERED FIRM
Checked	Date	
AND	Jan. 2016	
Approved	Drawing Number	Size
AND	9058/003	A4





OFFSET	22.16	12.52	6.25	3.25	0.0	3.25	6.25	9.52	18.21
EX. LEVEL	99.00	100.20	102.44	103.00	103.00	103.00	103.00	101.42	103.00
PR. LEVEL		100.00	102.09	101.92	102.00	101.92	102.09	101.00	

SECTION A-A 1:200

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FARNLEY MASTERPLAN

POTENTIAL ALIGNMENT OF ACCESS ROAD TO SITE 6 CROSSING DISUSED RAILWAY EMBANKMENT

Rev	Amendment	Drawn	Date	Checked

Scale As Shown	Drawn By AND
Drawing Size A3	Checked By AND
Date 25.05.16	Approved By AND
QIM S ISO 9001 REGISTERED FIRM	Drawing Number 9058/005 Rev

FILE REF:

sanderson associates (consulting engineers) ltd Highways | Traffic | Transportation | Water T 01924 844080 mail@sandersonassociates.co.uk F 01924 844081 www.sandersonassociates.co.uk	Client FARNLEY ESTATES	Project Title FARNLEY MASTERPLAN	Drawing Title PRELIMINARY ACCESS OPTIONS	Scale 1:1000 Drawing Size A1 Date 12.12.16 Drawn By AND Checked By AND Approved By AND Drawing Number 9058/007 Rev

Rev	Amendment	Drawn	Date	Checked

QIM ISO 9001 REGISTERED FIRM

FILE REF:

APPENDIX C

TRICS Output Data

Calculation Reference: AUDIT-311901-160105-0139

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
	EX	ESSEX	1 days
	HC	HAMPSHIRE	1 days
	SC	SURREY	1 days
	WS	WEST SUSSEX	1 days
03	SOUTH WEST		
	CW	CORNWALL	1 days
	DC	DORSET	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
	NF	NORFOLK	2 days
	SF	SUFFOLK	3 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	3 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	4 days
	ST	STAFFORDSHIRE	1 days
	WK	WARWICKSHIRE	2 days
	WM	WEST MIDLANDS	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NE	NORTH EAST LINCOLNSHIRE	1 days
	NY	NORTH YORKSHIRE	6 days
	SY	SOUTH YORKSHIRE	1 days
08	NORTH WEST		
	CH	CHESHIRE	4 days
	GM	GREATER MANCHESTER	1 days
	MS	MERSEYSIDE	1 days
09	NORTH		
	CB	CUMBRIA	2 days
	TW	TYNE & WEAR	1 days

Filtering Stage 2 selection:

Parameter:	Number of dwellings
Actual Range:	6 to 432 (units:)
Range Selected by User:	6 to 4334 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/07 to 12/11/15

Selected survey days:

Monday	7 days
Tuesday	13 days
Wednesday	6 days
Thursday	9 days
Friday	6 days

Selected survey types:

Manual count	41 days
Directional ATC Count	0 days

Selected Locations:

Suburban Area (PPS6 Out of Centre)	21
Edge of Town	20

Selected Location Sub Categories:

Residential Zone	34
No Sub Category	7

Filtering Stage 3 selection:

Use Class:

C3	40 days

Population within 1 mile:

1,001 to 5,000	6 days
5,001 to 10,000	12 days
10,001 to 15,000	6 days
15,001 to 20,000	9 days
20,001 to 25,000	5 days
25,001 to 50,000	3 days

Population within 5 miles:

5,001 to 25,000	3 days
25,001 to 50,000	5 days
50,001 to 75,000	2 days
75,001 to 100,000	10 days
100,001 to 125,000	7 days
125,001 to 250,000	7 days
250,001 to 500,000	6 days
500,001 or More	1 days

Car ownership within 5 miles:

0.6 to 1.0	13 days
1.1 to 1.5	28 days

Travel Plan:

Yes	2 days
No	39 days

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	41	75	0.078	41	75	0.277	41	75	0.355
08:00 - 09:00	41	75	0.151	41	75	0.399	41	75	0.550
09:00 - 10:00	41	75	0.150	41	75	0.187	41	75	0.337
10:00 - 11:00	41	75	0.141	41	75	0.172	41	75	0.313
11:00 - 12:00	41	75	0.169	41	75	0.160	41	75	0.329
12:00 - 13:00	41	75	0.181	41	75	0.164	41	75	0.345
13:00 - 14:00	41	75	0.163	41	75	0.156	41	75	0.319
14:00 - 15:00	41	75	0.175	41	75	0.188	41	75	0.363
15:00 - 16:00	41	75	0.284	41	75	0.207	41	75	0.491
16:00 - 17:00	41	75	0.297	41	75	0.180	41	75	0.477
17:00 - 18:00	41	75	0.353	41	75	0.203	41	75	0.556
18:00 - 19:00	41	75	0.257	41	75	0.188	41	75	0.445
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.399			2.481			4.880

Parameter summary

Trip rate parameter range selected:	6 - 432 (units:)
Survey date date range:	01/01/07 - 12/11/15
Number of weekdays (Monday-Friday):	41
Number of Saturdays:	0
Number of Sundays:	0
Surveys manually removed from selection:	2

Calculation Reference: AUDIT-311901-160105-0102

TRIP RATE CALCULATION SELECTION PARAMETERS:

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

Selected regions and areas:

02	SOUTH EAST		
	HF	HERTFORDSHIRE	1 days
04	EAST ANGLIA		
	CA	CAMBRIDGESHIRE	1 days
05	EAST MIDLANDS		
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	SH	SHROPSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	NY	NORTH YORKSHIRE	2 days
08	NORTH WEST		
	CH	CHESHIRE	2 days
	MS	MERSEYSIDE	1 days

Filtering Stage 2 selection:

Parameter: Number of dwellings
Actual Range: 22 to 195 (units:)
Range Selected by User: 6 to 4334 (units:)

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/07 to 12/11/15

Selected survey days:

Saturday	1 days
Sunday	8 days

Selected survey types:

Manual count	9 days
Directional ATC Count	0 days

Selected Locations:

Suburban Area (PPS6 Out of Centre)	5
Edge of Town	4

Selected Location Sub Categories:

Residential Zone	9

Filtering Stage 3 selection:

Use Class:

C3	9 days

Population within 1 mile:

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

Filtering Stage 3 selection (Cont.):

Population within 5 miles:

5,001 to 25,000	2 days
100,001 to 125,000	3 days
125,001 to 250,000	3 days
500,001 or More	1 days

Car ownership within 5 miles:

0.6 to 1.0	2 days
1.1 to 1.5	5 days
1.6 to 2.0	2 days

Travel Plan:

No	9 days

TRIP RATE for Land Use 03 - RESIDENTIAL/A - HOUSES PRIVATELY OWNED
VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	9	63	0.032	9	63	0.043	9	63	0.075
08:00 - 09:00	9	63	0.050	9	63	0.080	9	63	0.130
09:00 - 10:00	9	63	0.075	9	63	0.179	9	63	0.254
10:00 - 11:00	9	63	0.155	9	63	0.211	9	63	0.366
11:00 - 12:00	9	63	0.165	9	63	0.263	9	63	0.428
12:00 - 13:00	9	63	0.226	9	63	0.206	9	63	0.432
13:00 - 14:00	9	63	0.201	9	63	0.155	9	63	0.356
14:00 - 15:00	9	63	0.202	9	63	0.188	9	63	0.390
15:00 - 16:00	9	63	0.204	9	63	0.160	9	63	0.364
16:00 - 17:00	9	63	0.190	9	63	0.124	9	63	0.314
17:00 - 18:00	9	63	0.181	9	63	0.147	9	63	0.328
18:00 - 19:00	9	63	0.153	9	63	0.117	9	63	0.270
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.834			1.873			3.707

Parameter summary

Trip rate parameter range selected:	22 - 195 (units:)
Survey date date range:	01/01/07 - 12/11/15
Number of weekdays (Monday-Friday):	0
Number of Saturdays:	1
Number of Sundays:	8
Surveys manually removed from selection:	0

APPENDIX D

Gravity Model Data

Employment Distribution Gravity Model -Sheet 1				
Location	**Penistone Road North**	**Penistone Road South**	**Rowley Lane East**	**Woodsome Road West**
Barnsley		100%		
Bradford	100%			
Calderdale	100%			
Doncaster		100%		
Kirklees 001	100%			
Kirklees 002	100%			
Kirklees 003	100%			
Kirklees 004	100%			
Kirklees 005	100%			
Kirklees 006	100%			
Kirklees 007	100%			
Kirklees 008	100%			
Kirklees 009	100%			
Kirklees 010	100%			
Kirklees 011	100%			
Kirklees 012	100%			
Kirklees 013	100%			
Kirklees 014	100%			
Kirklees 015	100%			
Kirklees 016	100%			
Kirklees 017	100%			
Kirklees 018			100%	
Kirklees 019	100%			
Kirklees 020	100%			
Kirklees 021	100%			
Kirklees 022	100%			
Kirklees 023	100%			
Kirklees 024			100%	
Kirklees 025	100%			
Kirklees 026	100%			
Kirklees 027	100%			
Kirklees 028			100%	
Kirklees 029	100%			
Kirklees 030	100%			
Kirklees 031	100%			
Kirklees 032	100%			
Kirklees 033	100%			
Kirklees 034	100%			
Kirklees 035	100%			
Kirklees 036	100%			
Kirklees 037	100%			
Kirklees 038	100%			
Kirklees 039	100%			
Kirklees 040	100%			
Kirklees 041	100%			
Kirklees 042	100%			
Kirklees 043	100%			
Kirklees 044	100%			
Kirklees 045	100%			
Kirklees 046			100%	
Kirklees 047	100%			
Kirklees 048	50%			50%
Kirklees 049	100%			
Kirklees 050	100%			100%
Kirklees 051		100%		
Kirklees 052	100%			
Kirklees 053				100%
Kirklees 054		100%		
Kirklees 055				100%
Kirklees 056		100%		
Kirklees 057		100%		
Kirklees 058				100%
Kirklees 059				100%
Leeds	50%	50%		
Manchester	100%			
Oldham	100%			
Rochdale	100%			
Rotherham		100%		
Selby	50%	50%		
Sheffield		100%		
Tameside	100%			
Trafford	100%			
Wakefield		50%	50%	
Other	50%	50%		

Employment Distribution Gravity Model -Sheet 2					
Location	**No.**	**Penistone Road North**	**Penistone Road South**	**Rowley Lane East**	**Woodsome Road West**
Barnsley	64	0.0%	3.0%	0.0%	0.0%
Bradford	73	3.4%	0.0%	0.0%	0.0%
Calderdale	128	6.0%	0.0%	0.0%	0.0%
Doncaster	13	0.0%	0.6%	0.0%	0.0%
Kirklees 001	1	0.0%	0.0%	0.0%	0.0%
Kirklees 002	3	0.1%	0.0%	0.0%	0.0%
Kirklees 003	5	0.2%	0.0%	0.0%	0.0%
Kirklees 004	1	0.0%	0.0%	0.0%	0.0%
Kirklees 005	5	0.2%	0.0%	0.0%	0.0%
Kirklees 006	2	0.1%	0.0%	0.0%	0.0%
Kirklees 007	1	0.0%	0.0%	0.0%	0.0%
Kirklees 008	2	0.1%	0.0%	0.0%	0.0%
Kirklees 009	2	0.1%	0.0%	0.0%	0.0%
Kirklees 010	8	0.4%	0.0%	0.0%	0.0%
Kirklees 011	5	0.2%	0.0%	0.0%	0.0%
Kirklees 012	1	0.0%	0.0%	0.0%	0.0%
Kirklees 013	7	0.3%	0.0%	0.0%	0.0%
Kirklees 014	2	0.1%	0.0%	0.0%	0.0%
Kirklees 015	11	0.5%	0.0%	0.0%	0.0%
Kirklees 016	11	0.5%	0.0%	0.0%	0.0%
Kirklees 017	15	0.7%	0.0%	0.0%	0.0%
Kirklees 018	1	0.0%	0.0%	0.0%	0.0%
Kirklees 019	5	0.2%	0.0%	0.0%	0.0%
Kirklees 020	1	0.0%	0.0%	0.0%	0.0%
Kirklees 021	7	0.3%	0.0%	0.0%	0.0%
Kirklees 022	18	0.8%	0.0%	0.0%	0.0%
Kirklees 023	8	0.4%	0.0%	0.0%	0.0%
Kirklees 024	10	0.0%	0.0%	0.5%	0.0%
Kirklees 025	36	1.7%	0.0%	0.0%	0.0%
Kirklees 026	25	1.2%	0.0%	0.0%	0.0%
Kirklees 027	5	0.2%	0.0%	0.0%	0.0%
Kirklees 028	4	0.0%	0.0%	0.2%	0.0%
Kirklees 029	205	9.7%	0.0%	0.0%	0.0%
Kirklees 030	9	0.4%	0.0%	0.0%	0.0%
Kirklees 031	19	0.9%	0.0%	0.0%	0.0%
Kirklees 032	25	1.2%	0.0%	0.0%	0.0%
Kirklees 033	54	2.5%	0.0%	0.0%	0.0%
Kirklees 034	34	1.6%	0.0%	0.0%	0.0%
Kirklees 035	10	0.5%	0.0%	0.0%	0.0%
Kirklees 036	4	0.2%	0.0%	0.0%	0.0%
Kirklees 037	20	0.9%	0.0%	0.0%	0.0%
Kirklees 038	9	0.4%	0.0%	0.0%	0.0%
Kirklees 039	22	1.0%	0.0%	0.0%	0.0%
Kirklees 040	19	0.9%	0.0%	0.0%	0.0%
Kirklees 041	7	0.3%	0.0%	0.0%	0.0%
Kirklees 042	110	5.2%	0.0%	0.0%	0.0%
Kirklees 043	21	1.0%	0.0%	0.0%	0.0%
Kirklees 044	24	1.1%	0.0%	0.0%	0.0%
Kirklees 045	22	1.0%	0.0%	0.0%	0.0%
Kirklees 046	24	0.0%	0.0%	1.1%	0.0%
Kirklees 047	7	0.3%	0.0%	0.0%	0.0%
Kirklees 048	22	0.5%	0.0%	0.0%	0.5%
Kirklees 049	17	0.8%	0.0%	0.0%	0.0%
Kirklees 050	14	0.7%	0.0%	0.0%	0.7%
Kirklees 051	116	0.0%	5.5%	0.0%	0.0%
Kirklees 052	6	0.3%	0.0%	0.0%	0.0%
Kirklees 053	37	0.0%	0.0%	0.0%	1.7%
Kirklees 054	51	0.0%	2.4%	0.0%	0.0%
Kirklees 055	13	0.0%	0.0%	0.0%	0.6%
Kirklees 056	56	0.0%	2.6%	0.0%	0.0%
Kirklees 057	55	0.0%	2.6%	0.0%	0.0%
Kirklees 058	17	0.0%	0.0%	0.0%	0.8%
Kirklees 059	55	0.0%	0.0%	0.0%	2.6%
Leeds	187	4.4%	4.4%	0.0%	0.0%
Manchester	8	0.4%	0.0%	0.0%	0.0%
Oldham	11	0.5%	0.0%	0.0%	0.0%
Rochdale	7	0.3%	0.0%	0.0%	0.0%
Rotherham	14	0.0%	0.7%	0.0%	0.0%
Selby	15	0.4%	0.4%	0.0%	0.0%
Sheffield	30	0.0%	1.4%	0.0%	0.0%
Tameside	6	0.3%	0.0%	0.0%	0.0%
Trafford	5	0.2%	0.0%	0.0%	0.0%
Wakefield	157	0.0%	3.7%	3.7%	0.0%
Other	94	2.2%	2.2%	0.0%	0.0%
Total	**2,118**	**58.6%**	**29.5%**	**5.5%**	**6.9%**

		Site 2 (81 units)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	7	3	1	1	12
	OUT	18	10	2	2	32
PM PEAK	IN	17	8	2	2	29
	OUT	9	5	1	1	16
WEEKEND PEAK	IN	11	5	1	1	18
	OUT	10	5	1	1	17

		Site 3 (63 units)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	5	3	1	1	10
	OUT	15	7	1	2	25
PM PEAK	IN	13	7	1	1	22
	OUT	7	4	1	1	13
WEEKEND PEAK	IN	8	4	1	1	14
	OUT	7	4	1	1	13

		Site 4 (Hub Uses)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	29	15	3	3	50
	OUT	29	15	3	3	50
PM PEAK	IN	29	15	3	3	50
	OUT	29	15	3	3	50
WEEKEND PEAK	IN	59	29	5	7	100
	OUT	59	29	5	7	100

		Site 6 (45 units)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	4	2	0	1	7
	OUT	11	5	1	1	18
PM PEAK	IN	9	5	1	1	16
	OUT	5	3	0	1	9
WEEKEND PEAK	IN	6	3	0	1	10
	OUT	5	3	0	1	9

		Site 16A (285 units)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	25	13	2	3	43
	OUT	67	33	6	8	114
PM PEAK	IN	59	30	5	7	101
	OUT	34	17	3	4	58
WEEKEND PEAK	IN	38	19	3	4	64
	OUT	35	17	3	4	59

		Site 17 (405 units)				
		Penistone Road North	Penistone Road South	Rowley Lane East	Woodsome Road West	Total
AM PEAK	IN	36	18	3	4	61
	OUT	95	47	9	11	162
PM PEAK	IN	83	42	8	10	143
	OUT	48	24	4	6	82
WEEKEND PEAK	IN	54	27	5	6	92
	OUT	49	24	4	6	83

APPENDIX E

ARCADY Output

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

For sales and distribution information,
program advice and maintenance, contact:

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Run with file:-
"j:\9000\9000\9058_FarnleyTyas\engineering\Traffic_Programs\Arcady\Rowley Lane Roundabout AM.vai"
(drive-on-the-left) at 17:14:15 on Thursday, 8 December 2016

FILE PROPERTIES

RUN TITLE: Farnley Estates Masterplan Proposals
LOCATION: Penistone Road
DATE: 09/12/16
CLIENT: Farnley Estates
ENUMERATOR: adam.darwin [PC115]
JOB NUMBER: 9058
STATUS: TIA
DESCRIPTION:

INPUT DATA

ARM A - Penistone Road (s)
ARM B - Woodsome Road
ARM C - Penistone Road (n)
ARM D - Rowley Lane

GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.00	6.80	15.00	20.00	40.00	39.0	0.592	24.944
ARM B	3.00	6.00	2.00	12.00	40.00	46.0	0.470	16.197
ARM C	3.00	6.90	30.00	20.00	40.00	33.0	0.644	28.756
ARM D	3.00	6.00	6.00	20.00	40.00	34.0	0.546	20.686

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -(90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2026 Base

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS	TO TOP OF PEAK	FLOW STOPS IS REACHED	FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00		10.14	15.21	10.14
ARM B	15.00	45.00	75.00		2.24	3.36	2.24
ARM C	15.00	45.00	75.00		10.10	15.15	10.10
ARM D	15.00	45.00	75.00		4.14	6.21	4.14

DEMAND SET TITLE: Site H31 + H2684a

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS	TO TOP OF PEAK	FLOW STOPS IS REACHED	FALLING	RATE OF FLOW (VEH/MIN) BEFORE PEAK	AT TOP OF PEAK	AFTER PEAK
ARM A	15.00	45.00	75.00		0.20	0.30	0.20
ARM B	15.00	45.00	75.00		0.05	0.08	0.05
ARM C	15.00	45.00	75.00		0.46	0.69	0.46
ARM D	15.00	45.00	75.00		1.35	2.03	1.35

DEMAND SET TITLE: 2026 Base

T33

TIME	FROM/T	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) ARM A	ARM B	ARM C	ARM D
07.15 - 08.45	ARM A	0.000	0.097	0.776	0.127
		0.0	79.0	629.0	103.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.078	0.000	0.631	0.291
		14.0	0.0	113.0	52.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.819	0.072	0.000	0.109
		662.0	58.0	0.0	88.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.402	0.423	0.175	0.000
		133.0	140.0	58.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

DEMAND SET TITLE: Site H31 + H2684a

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
07.15 - 08.45	ARM A	0.000	0.000	0.188	0.813
		0.0	0.0	3.0	13.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.000	0.000	0.250	0.750
		0.0	0.0	1.0	3.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.270	0.054	0.000	0.676
		10.0	2.0	0.0	25.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.306	0.074	0.620	0.000
		33.0	8.0	67.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.15-07.30									
ARM A	10.38	22.49	0.461	- - -	0.0	0.8	12.3	-	0.082
ARM B	2.30	11.08	0.207	- - -	0.0	0.3	3.8	-	0.113
ARM C	10.60	27.27	0.389	- - -	0.0	0.6	9.2	-	0.060
ARM D	5.51	15.59	0.353	- - -	0.0	0.5	7.8	-	0.098
07.30-07.45									
ARM A	12.39	22.00	0.563	- - -	0.8	1.3	18.4	-	0.103
ARM B	2.74	10.07	0.272	- - -	0.3	0.4	5.4	-	0.136
ARM C	12.66	26.98	0.469	- - -	0.6	0.9	12.9	-	0.070
ARM D	6.58	14.59	0.451	- - -	0.5	0.8	11.7	-	0.124
07.45-08.00									
ARM A	15.18	21.35	0.711	- - -	1.3	2.4	33.4	-	0.158
ARM B	3.36	8.71	0.386	- - -	0.4	0.6	8.8	-	0.186
ARM C	15.51	26.58	0.583	- - -	0.9	1.4	20.0	-	0.090
ARM D	8.06	13.23	0.609	- - -	0.8	1.5	21.3	-	0.190
08.00-08.15									
ARM A	15.18	21.33	0.712	- - -	2.4	2.4	36.0	-	0.163
ARM B	3.36	8.67	0.387	- - -	0.6	0.6	9.3	-	0.188
ARM C	15.51	26.57	0.584	- - -	1.4	1.4	20.8	-	0.090
ARM D	8.06	13.21	0.610	- - -	1.5	1.5	22.9	-	0.194

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	12.39	21.97	0.564	- - -	2.4	1.3	20.6	-	0.106
ARM B	2.74	10.01	0.274	- - -	0.6	0.4	5.9	-	0.138
ARM C	12.66	26.96	0.470	- - -	1.4	0.9	13.8	-	0.070
ARM D	6.58	14.57	0.452	- - -	1.5	0.8	13.1	-	0.127

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	10.38	22.46	0.462	- - -	1.3	0.9	13.4	-	0.083
ARM B	2.30	11.03	0.208	- - -	0.4	0.3	4.1	-	0.115
ARM C	10.60	27.26	0.389	- - -	0.9	0.6	9.8	-	0.060
ARM D	5.51	15.57	0.354	- - -	0.8	0.6	8.5	-	0.100

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.8	*
07.45	1.3	*
08.00	2.4	**
08.15	2.4	**
08.30	1.3	*
08.45	0.9	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.3	
07.45	0.4	
08.00	0.6	*
08.15	0.6	*
08.30	0.4	
08.45	0.3	

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.6	*
07.45	0.9	*
08.00	1.4	*
08.15	1.4	*
08.30	0.9	*
08.45	0.6	*

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.5	*
07.45	0.8	*
08.00	1.5	**
08.15	1.5	**
08.30	0.8	*
08.45	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1138.3	758.9	134.0	0.12	134.1	0.12
B	251.9	167.9	37.3	0.15	37.3	0.15
C	1163.1	775.4	86.5	0.07	86.5	0.07
D	604.3	402.8	85.4	0.14	85.4	0.14
ALL	3157.5	2105.0	343.2	0.11	343.3	0.11

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 17:14:24 on 08/12/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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RG40 3GA,UK

Run with file:-
"j:\9000\9000\9058_FarnleyTyas\engineering\Traffic_Programs\Arcady\Rowley Lane Roundabout AM.vai"
(drive-on-the-left) at 17:21:57 on Thursday, 8 December 2016

FILE PROPERTIES

RUN TITLE: Farnley Estates Masterplan Proposals
LOCATION: Penistone Road
DATE: 09/12/16
CLIENT: Farnley Estates
ENUMERATOR: adam.darwin [PC115]
JOB NUMBER: 9058
STATUS: TIA
DESCRIPTION:

INPUT DATA

ARM A - Penistone Road (s)
ARM B - Woodsome Road
ARM C - Penistone Road (n)
ARM D - Rowley Lane

GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.00	6.80	15.00	20.00	40.00	39.0	0.592	24.944
ARM B	3.00	6.00	2.00	12.00	40.00	46.0	0.470	16.197
ARM C	3.00	6.90	30.00	20.00	40.00	33.0	0.644	28.756
ARM D	3.00	6.00	6.00	20.00	40.00	34.0	0.546	20.686

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(07.15)AND ENDS(08.45)

LENGTH OF TIME PERIOD -(90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2026 Base

T15

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN): BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	10.14	15.21	10.14
ARM B	15.00	45.00	75.00	2.24	3.36	2.24
ARM C	15.00	45.00	75.00	10.10	15.15	10.10
ARM D	15.00	45.00	75.00	4.14	6.21	4.14

DEMAND SET TITLE: Site H31 + H2684a + H2730a

T15

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN): BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	0.38	0.56	0.38
ARM B	15.00	45.00	75.00	0.09	0.13	0.09
ARM C	15.00	45.00	75.00	0.81	1.22	0.81
ARM D	15.00	45.00	75.00	2.81	4.22	2.81

DEMAND SET TITLE: 2026 Base

T33

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
07.15 - 08.45	ARM A	0.000	0.097	0.776	0.127
		0.0	79.0	629.0	103.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.078	0.000	0.631	0.291
		14.0	0.0	113.0	52.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.819	0.072	0.000	0.109
		662.0	58.0	0.0	88.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.402	0.423	0.175	0.000
		133.0	140.0	58.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

DEMAND SET TITLE: Site H31 + H2684a + H2730a

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
07.15 - 08.45	ARM A	0.000	0.000	0.100	0.900
		0.0	0.0	3.0	27.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.000	0.000	0.143	0.857
		0.0	0.0	1.0	6.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.154	0.031	0.000	0.815
		10.0	2.0	0.0	53.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.307	0.071	0.622	0.000
		69.0	16.0	140.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
07.15-07.30									
ARM A	10.55	21.89	0.482	- - -	0.0	0.9	13.3	-	0.087
ARM B	2.33	10.57	0.221	- - -	0.0	0.3	4.1	-	0.121
ARM C	10.95	27.14	0.404	- - -	0.0	0.7	9.8	-	0.061
ARM D	6.98	15.60	0.447	- - -	0.0	0.8	11.5	-	0.115
07.30-07.45									
ARM A	12.60	21.29	0.592	- - -	0.9	1.4	20.5	-	0.114
ARM B	2.79	9.46	0.295	- - -	0.3	0.4	6.0	-	0.150
ARM C	13.08	26.81	0.488	- - -	0.7	0.9	13.8	-	0.073
ARM D	8.33	14.59	0.571	- - -	0.8	1.3	18.6	-	0.158
07.45-08.00									
ARM A	15.43	20.50	0.753	- - -	1.4	2.9	40.1	-	0.190
ARM B	3.41	7.98	0.428	- - -	0.4	0.7	10.4	-	0.217
ARM C	16.02	26.39	0.607	- - -	0.9	1.5	22.0	-	0.096
ARM D	10.20	13.23	0.771	- - -	1.3	3.1	41.4	-	0.306
08.00-08.15									
ARM A	15.43	20.45	0.755	- - -	2.9	3.0	44.3	-	0.199
ARM B	3.41	7.93	0.431	- - -	0.7	0.7	11.1	-	0.221
ARM C	16.02	26.37	0.607	- - -	1.5	1.5	22.9	-	0.096
ARM D	10.20	13.21	0.772	- - -	3.1	3.2	47.7	-	0.329

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.15-08.30									
ARM A	12.60	21.22	0.594	- - -	3.0	1.5	23.5	-	0.119
ARM B	2.79	9.38	0.297	- - -	0.7	0.4	6.7	-	0.152
ARM C	13.08	26.79	0.488	- - -	1.5	1.0	14.9	-	0.073
ARM D	8.33	14.56	0.572	- - -	3.2	1.4	22.1	-	0.167

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
ARM A	10.55	21.86	0.483	- - -	1.5	0.9	14.6	-	0.089
ARM B	2.33	10.52	0.222	- - -	0.4	0.3	4.5	-	0.122
ARM C	10.95	27.12	0.404	- - -	1.0	0.7	10.5	-	0.062
ARM D	6.98	15.57	0.448	- - -	1.4	0.8	12.8	-	0.117

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.9	*
07.45	1.4	*
08.00	2.9	***
08.15	3.0	***
08.30	1.5	*
08.45	0.9	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.3	
07.45	0.4	
08.00	0.7	*
08.15	0.7	*
08.30	0.4	
08.45	0.3	

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.7	*
07.45	0.9	*
08.00	1.5	**
08.15	1.5	**
08.30	1.0	*
08.45	0.7	*

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
07.30	0.8	*
07.45	1.3	*
08.00	3.1	***
08.15	3.2	***
08.30	1.4	*
08.45	0.8	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1157.6	771.7	156.4	0.14	156.4	0.14
B	256.0	170.7	42.7	0.17	42.7	0.17
C	1201.6	801.1	93.9	0.08	93.9	0.08
D	765.3	510.2	154.1	0.20	154.1	0.20
ALL	3380.5	2253.7	447.0	0.13	447.0	0.13

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 17:22:07 on 08/12/2016]

A R C A D Y 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

For sales and distribution information,
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Run with file:-
"j:\9000\9000\9058_FarnleyTyas\engineering\Traffic_Programs\Arcady\Rowley Lane Roundabout PM.vai"
(drive-on-the-left) at 17:34:02 on Thursday, 8 December 2016

FILE PROPERTIES

RUN TITLE: Farnley Estates Masterplan Proposals
LOCATION: Penistone Road
DATE: 09/12/16
CLIENT: Farnley Estates
ENUMERATOR: adam.darwin [PC115]
JOB NUMBER: 9058
STATUS: TIA
DESCRIPTION:

INPUT DATA

ARM A - Penistone Road (s)
ARM B - Woodsome Road
ARM C - Penistone Road (n)
ARM D - Rowley Lane

GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.00	6.80	15.00	20.00	40.00	39.0	0.592	24.944
ARM B	3.00	6.00	2.00	12.00	40.00	46.0	0.470	16.197
ARM C	3.00	6.90	30.00	20.00	40.00	33.0	0.644	28.756
ARM D	3.00	6.00	6.00	20.00	40.00	34.0	0.546	20.686

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.30)

LENGTH OF TIME PERIOD -(90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2026 Base

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN) BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	10.50	15.75	10.50
ARM B	15.00	45.00	75.00	1.44	2.16	1.44
ARM C	15.00	45.00	75.00	14.44	21.66	14.44
ARM D	15.00	45.00	75.00	4.10	6.15	4.10

DEMAND SET TITLE: Site H31 + H2684a

T15

ARM	NUMBER OF MINUTES FROM START WHEN FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN) BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	0.47	0.71	0.47
ARM B	15.00	45.00	75.00	0.11	0.17	0.11
ARM C	15.00	45.00	75.00	0.81	1.22	0.81
ARM D	15.00	45.00	75.00	0.69	1.03	0.69

DEMAND SET TITLE: 2026 Base

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.30	TURNING PROPORTIONS				
	TURNING COUNTS				
	(PERCENTAGE OF H.V.S)				
	ARM A	0.000	0.069	0.821	0.110
		0.0	58.0	690.0	92.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.165	0.000	0.591	0.243
		19.0	0.0	68.0	28.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.855	0.053	0.000	0.093
		987.0	61.0	0.0	107.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.515	0.354	0.131	0.000
		169.0	116.0	43.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

DEMAND SET TITLE: Site H31 + H2684a

T33

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.30	ARM A	0.000	0.000	0.211	0.789
		0.0	0.0	8.0	30.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.000	0.000	0.222	0.778
		0.0	0.0	2.0	7.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.077	0.015	0.000	0.908
		5.0	1.0	0.0	59.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.309	0.073	0.618	0.000
		17.0	4.0	34.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	11.02	23.03	0.478	- - -	0.0	0.9	13.1	-	0.082
ARM B	1.56	10.94	0.142	- - -	0.0	0.2	2.4	-	0.106
ARM C	15.31	27.34	0.560	- - -	0.0	1.3	18.1	-	0.082
ARM D	4.81	13.37	0.359	- - -	0.0	0.6	8.0	-	0.116
17.15-17.30									
ARM A	13.16	22.66	0.581	- - -	0.9	1.4	19.7	-	0.105
ARM B	1.86	9.90	0.188	- - -	0.2	0.2	3.3	-	0.124
ARM C	18.28	27.06	0.675	- - -	1.3	2.0	29.1	-	0.112
ARM D	5.74	11.93	0.481	- - -	0.6	0.9	13.0	-	0.160
17.30-17.45									
ARM A	16.11	22.17	0.727	- - -	1.4	2.6	35.9	-	0.161
ARM B	2.28	8.51	0.267	- - -	0.2	0.4	5.2	-	0.160
ARM C	22.39	26.69	0.839	- - -	2.0	4.8	64.0	-	0.215
ARM D	7.03	10.02	0.701	- - -	0.9	2.2	29.7	-	0.316
17.45-18.00									
ARM A	16.11	22.14	0.728	- - -	2.6	2.6	39.0	-	0.166
ARM B	2.28	8.47	0.269	- - -	0.4	0.4	5.4	-	0.162
ARM C	22.39	26.68	0.839	- - -	4.8	5.0	73.6	-	0.230
ARM D	7.03	9.94	0.707	- - -	2.2	2.3	34.0	-	0.340

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
ARM A	13.16	22.61	0.582	- - -	2.6	1.4	22.2	-	0.108
ARM B	1.86	9.84	0.189	- - -	0.4	0.2	3.6	-	0.126
ARM C	18.28	27.05	0.676	- - -	5.0	2.1	34.3	-	0.119
ARM D	5.74	11.82	0.486	- - -	2.3	1.0	15.5	-	0.169

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
ARM A	11.02	23.01	0.479	- - -	1.4	0.9	14.3	-	0.084
ARM B	1.56	10.89	0.143	- - -	0.2	0.2	2.6	-	0.107
ARM C	15.31	27.33	0.560	- - -	2.1	1.3	20.0	-	0.084
ARM D	4.81	13.31	0.361	- - -	1.0	0.6	8.9	-	0.118

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.9	*
17.30	1.4	*
17.45	2.6	***
18.00	2.6	***
18.15	1.4	*
18.30	0.9	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
17.15	0.2
17.30	0.2
17.45	0.4
18.00	0.4
18.15	0.2
18.30	0.2

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.3	*
17.30	2.0	**
17.45	4.8	*****
18.00	5.0	*****
18.15	2.1	**
18.30	1.3	*

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.6	*
17.30	0.9	*
17.45	2.2	**
18.00	2.3	**
18.15	1.0	*
18.30	0.6	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1208.5	805.7	144.2	0.12	144.2	0.12
B	170.7	113.8	22.6	0.13	22.6	0.13
C	1679.2	1119.5	239.2	0.14	239.2	0.14
D	527.2	351.4	109.1	0.21	109.1	0.21
ALL	3585.6	2390.4	515.1	0.14	515.1	0.14

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

Printed at 17:34:20 on 08/12/2016]

ARCADY 6

ASSESSMENT OF ROUNDABOUT CAPACITY AND DELAY

Analysis Program: Release 7.0 (FEBRUARY 2010)

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Run with file:-
"j:\9000\9000\9058_FarnleyTyas\engineering\Traffic_Programs\Arcady\Rowley Lane Roundabout PM.vai"
(drive-on-the-left) at 17:33:11 on Thursday, 8 December 2016

FILE PROPERTIES

RUN TITLE: Farnley Estates Masterplan Proposals
LOCATION: Penistone Road
DATE: 09/12/16
CLIENT: Farnley Estates
ENUMERATOR: adam.darwin [PC115]
JOB NUMBER: 9058
STATUS: TIA
DESCRIPTION:

INPUT DATA

ARM A - Penistone Road (s)
ARM B - Woodsome Road
ARM C - Penistone Road (n)
ARM D - Rowley Lane

GEOMETRIC DATA

T5

ARM	V (M)	E (M)	L (M)	R (M)	D (M)	PHI (DEG)	SLOPE	INTERCEPT (PCU/MIN)
ARM A	3.00	6.80	15.00	20.00	40.00	39.0	0.592	24.944
ARM B	3.00	6.00	2.00	12.00	40.00	46.0	0.470	16.197
ARM C	3.00	6.90	30.00	20.00	40.00	33.0	0.644	28.756
ARM D	3.00	6.00	6.00	20.00	40.00	34.0	0.546	20.686

V = approach half-width L = effective flare length D = inscribed circle diameter
E = entry width R = entry radius PHI = entry angle

TRAFFIC DEMAND DATA

Only sets included in the current run are shown

SCALING FACTORS

T13

IARM	FLOW SCALE(%)
A	100
B	100
C	100
D	100

TIME PERIOD BEGINS(17.00)AND ENDS(18.30)

LENGTH OF TIME PERIOD -(90) MINUTES

LENGTH OF TIME SEGMENT - (15) MINUTES

DEMAND FLOW PROFILES ARE SYNTHESISED FROM THE TURNING COUNT DATA

DEMAND SET TITLE: 2026 Base

T15

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN): BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	10.50	15.75	10.50
ARM B	15.00	45.00	75.00	1.44	2.16	1.44
ARM C	15.00	45.00	75.00	14.44	21.66	14.44
ARM D	15.00	45.00	75.00	4.10	6.15	4.10

DEMAND SET TITLE: Site H31 + H2684a + H2730a

T15

ARM	NUMBER OF MINUTES FROM START WHEN: FLOW STARTS	TOP OF PEAK	FLOW STOPS	RATE OF FLOW (VEH/MIN): BEFORE	AT TOP	AFTER
	TO RISE	IS REACHED	FALLING	PEAK	OF PEAK	PEAK
ARM A	15.00	45.00	75.00	0.88	1.31	0.88
ARM B	15.00	45.00	75.00	0.21	0.32	0.21
ARM C	15.00	45.00	75.00	1.61	2.42	1.61
ARM D	15.00	45.00	75.00	1.44	2.16	1.44

DEMAND SET TITLE: 2026 Base

T33

TIME	TURNING PROPORTIONS / TURNING COUNTS (PERCENTAGE OF H.V.S) FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.30	ARM A	0.000	0.069	0.821	0.110
		0.0	58.0	690.0	92.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.165	0.000	0.591	0.243
		19.0	0.0	68.0	28.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.855	0.053	0.000	0.093
		987.0	61.0	0.0	107.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.515	0.354	0.131	0.000
		169.0	116.0	43.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

DEMAND SET TITLE: Site H31 + H2684a + H2730a

T33

TURNING PROPORTIONS
TURNING COUNTS
(PERCENTAGE OF H.V.S)

TIME	FROM/T	ARM A	ARM B	ARM C	ARM D
17.00 - 18.30	ARM A	0.000	0.000	0.114	0.886
		0.0	0.0	8.0	62.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.000	0.000	0.118	0.882
		0.0	0.0	2.0	15.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.039	0.008	0.000	0.953
		5.0	1.0	0.0	123.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.313	0.070	0.617	0.000
		36.0	8.0	71.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

T70

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
ARM A	11.42	22.73	0.502	- - -	0.0	1.0	14.4	-	0.087
ARM B	1.66	10.54	0.157	- - -	0.0	0.2	2.7	-	0.112
ARM C	16.11	27.02	0.596	- - -	0.0	1.5	20.8	-	0.090
ARM D	5.56	13.38	0.416	- - -	0.0	0.7	10.0	-	0.126
17.15-17.30									
ARM A	13.63	22.30	0.611	- - -	1.0	1.5	22.2	-	0.114
ARM B	1.98	9.42	0.210	- - -	0.2	0.3	3.8	-	0.134
ARM C	19.24	26.68	0.721	- - -	1.5	2.5	35.5	-	0.132
ARM D	6.64	11.94	0.556	- - -	0.7	1.2	17.3	-	0.186
17.30-17.45									
ARM A	16.70	21.75	0.768	- - -	1.5	3.1	43.3	-	0.190
ARM B	2.42	7.93	0.305	- - -	0.3	0.4	6.2	-	0.181
ARM C	23.56	26.22	0.899	- - -	2.5	7.4	92.5	-	0.307
ARM D	8.13	10.08	0.807	- - -	1.2	3.6	46.2	-	0.445
17.45-18.00									
ARM A	16.70	21.70	0.770	- - -	3.1	3.2	48.1	-	0.199
ARM B	2.42	7.87	0.308	- - -	0.4	0.4	6.6	-	0.183
ARM C	23.56	26.21	0.899	- - -	7.4	8.0	116.2	-	0.359
ARM D	8.13	9.95	0.817	- - -	3.6	4.0	58.0	-	0.525

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.00-18.15									
ARM A	13.63	22.22	0.614	- - -	3.2	1.6	25.6	-	0.119
ARM B	1.98	9.33	0.212	- - -	0.4	0.3	4.2	-	0.136
ARM C	19.24	26.66	0.722	- - -	8.0	2.7	45.3	-	0.148
ARM D	6.64	11.75	0.565	- - -	4.0	1.3	22.4	-	0.210

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
18.15-18.30									
ARM A	11.42	22.70	0.503	- - -	1.6	1.0	15.9	-	0.089
ARM B	1.66	10.48	0.158	- - -	0.3	0.2	2.9	-	0.114
ARM C	16.11	27.01	0.597	- - -	2.7	1.5	23.5	-	0.093
ARM D	5.56	13.30	0.418	- - -	1.3	0.7	11.4	-	0.130

QUEUE AT ARM A

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.0	*
17.30	1.5	**
17.45	3.1	***
18.00	3.2	***
18.15	1.6	**
18.30	1.0	*

QUEUE AT ARM B

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.2	
17.30	0.3	
17.45	0.4	
18.00	0.4	
18.15	0.3	
18.30	0.2	

QUEUE AT ARM C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	1.5	*
17.30	2.5	***
17.45	7.4	*******
18.00	8.0	********
18.15	2.7	***
18.30	1.5	**

QUEUE AT ARM D

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE	
17.15	0.7	*
17.30	1.2	*
17.45	3.6	****
18.00	4.0	****
18.15	1.3	*
18.30	0.7	*

QUEUEING DELAY INFORMATION OVER WHOLE PERIOD

T75

ARM	TOTAL DEMAND		* QUEUEING * DELAY *		* INCLUSIVE QUEUEING * DELAY *	
	(VEH)	(VEH/H)	(MIN)	(MIN/VEH)	(MIN)	(MIN/VEH)
A	1252.5	835.0	169.4	0.14	169.5	0.14
B	181.7	121.1	26.4	0.15	26.4	0.15
C	1767.3	1178.2	333.8	0.19	333.9	0.19
D	609.8	406.5	165.4	0.27	165.4	0.27
ALL	3811.3	2540.9	695.1	0.18	695.2	0.18

* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD.
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD.
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

END OF JOB

========== end of file ==========

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