
Appendix E Road Safety Audit



Land to the south of HSDC, Waterloooville

Stage 1 Road Safety Audit : Designer's Response

Project No.	1017
Revision	Initial Issue
Date	21 st March 2022
Client	Places for People
Prepared	B Fenton
Checked	C Grindle
Authorised	A Wozniczko
File Ref.	P:\1017 South Downs College\C Documents\Reports\RSA Designer's Response

1 Introduction

- 1.1 This document provides the Designer's Response to a Stage 1 Road Safety Audit (RSA) undertaken by David A Graham Associates Limited in respect of the proposed access arrangements (drawing no. 1017-SK-101-A) for a development of 102 residential units, replacing part of the car park for South Downs College, College Road, Havant.
- 1.2 The RSA was conducted to identify any safety issues associated with the preliminary design of Option 1, a proposed four-armed mini-roundabout to serve College Road (north and south), Apollo way as its western arm, and the proposed site access as its eastern arm. Although the audit also considered two further access options, those are not currently being pursued further and therefore not addressed in this Designer's Response.
- 1.3 The RSA (attached as Appendix B) presented a number of recommendations associated with the proposed mini-roundabout design, each of which will be dealt with in turn in **Section 2**.

- 1.4 A revised junction layout, taking account of the RSA recommendations is included as Drawing 1017-01-PHL-101 in Appendix A.

2 Problems and Solutions

Problem 1

PROBLEM

Location A – College Road at its junction with Apollo Drive

Summary: Capacity of proposed four arm mini roundabout junction

Whilst the Audit team note the content of the Pre-Application Scoping Note – (Access & Transport) with regard to traffic capacity at the proposed new four arm mini roundabout they remain concerned that when considering the proposed new traffic signal junction at the nearby Camptown development immediately southwest of the proposed mini roundabout that this could result in significant traffic congestion. In particular, four arm mini roundabouts will have four crossovers giving significant opportunity for collisions to take place during a busy peak hour period. Additionally, mini roundabouts are of particular concern to riders of two wheeled vehicles who are over represented in collisions at mini roundabouts and normal roundabouts alike.

RECOMMENDATION

If the four-arm mini roundabout option proceeds then the Audit team would recommend that the design as presented is revisited to look at the potential for two lane approaches in order to separate ahead and right turning traffic. Additionally, if feasible a separate access to the development should be provided for cyclists and pedestrians.

Response:

ARCADY analysis has been undertaken under very robust conditions which demonstrates that the greatest estimated queue on the southern arm of the proposed mini-roundabout would be one vehicle in the 2027 Baseline + Development scenario. A summary of the ARCADY results is seen below in Table 2.1, and included in full at Appendix C. The traffic flows upon which ARCADY analysis is based are included as Appendix within Appendix A as Figure 2.1.

Table 2.1 – ARCADY Results – 2027 Baseline + Development Scenario:

Approach/ Movement	AM Peak			PM Peak		
	RFC	Queue (Veh)	Delay (secs)	RFC	Queue (Veh)	Delay (secs)
2027 Baseline + Development:						
College Rd (N)	0.31	0.5	5.48	0.39	0.6	6.13
Site Access	0.04	0.0	5.79	0.02	0.0	6.01
College Rd (S)	0.28	0.4	5.39	0.12	0.1	4.48
Apollo Drive	0.11	0.1	4.93	0.08	0.1	4.30

- 2.1 The mini-roundabout is expected to operate well within capacity in the 2027 Baseline + Development scenario, with a maximum RFC value of 0.39 found on the College Road (N) arm of the roundabout during the PM Peak.

Problem 2

Summary: Lack of adequate entry deflection

The Audit team are concerned that the proposed four arm mini roundabout design lacks adequate entry deflection, particularly on the northeast and southwest approaches on College Road. Inadequate entry deflection on the approach to a mini roundabout could lead to an inappropriate approach speeds, overshoots and side impact type collisions.

RECOMMENDATION

Notwithstanding recommendation 3.1 above the design as presented should be revisited to allow for adequate entry deflection on all approaches to the mini roundabout, but in particular for those on College Road.

Response: Agreed.

Adequate entry deflection has been provided on the north- and southbound approaches. This has been achieved by moving the mini-roundabout towards the west and widening the splitter islands on each arm. This has provided at least 0.8m deflection on each arm in accordance with advice contained within DMRB CD-116.

Problem 3

Summary: Lack of swept path analysis

The Audit team are concerned that the drawing provided for the proposed four arm mini roundabout does not provide for the swept path analysis of the largest vehicle likely to need to negotiate the junction from all arms. Insufficient road space for the largest vehicle required to negotiate the proposed new mini roundabout junction could lead to sideswipe type collisions, injudicious reversing, shunts and the potential for over running of the footway and collisions with pedestrians and passing cyclists.

RECOMMENDATION

The design of the proposed four arm mini roundabout should provide for sufficient road space to accommodate the largest vehicle required to use the junction from all directions.

Response: Agreed.

Swept path analysis has been undertaken which demonstrates that a 16.5m articulated lorry can pass through the junction between the College Road arms without encroaching onto the footway or opposite carriageway, nor the central roundel, included as drawing 1017-01-ATR-103 in Appendix A. Swept path analysis has also demonstrated that the largest type of refuse vehicle can turn into and out of the site or Apollo Drive without encroaching on footways or the opposite carriageway. These are included as drawings 1017-01-ATR-102 and 1017-01-ATR-104 in Appendix A.

Problem 4

Summary: *Location of existing 30/40 mph speed limit interface*

The Audit team are concerned that the current location of the start of the 30mph speed limit on College Road is too close to the proposed new four arm mini roundabout junction. This could lead to inappropriate approach speeds on College Road which in turn could lead to heavy braking, shunts, overshoots and side impact type collisions on the proposed new mini roundabout.

RECOMMENDATION

The existing 30/40 mph speed limit interface should be relocated an appropriate distance, south-westwards on College Road to allow drivers approaching the new four arm mini roundabout to reduce their speed sufficiently in anticipation of the potential need to give way.

Response: Agreed.

It is proposed that the 30mph limit will be extended to 120m south of its present position. This would be expected to reduce the approach speed of traffic in both directions. Northbound traffic will therefore be required to reduce speed ahead of the 30mph zone, and southbound drivers will not yet be increasing speeds in anticipation of the speed limit transition. The mini-roundabout itself will also function as a traffic calming feature.

Problem 5

Summary: Lack of pedestrian crossing facilities

It is not clear from the drawing what if any facilities for pedestrians will be provided to cross College Road and Apollo Drive at the proposed new four arm mini roundabout junction. Inadequate facilities for pedestrians to cross College Road and Apollo Drive to and from the new development could lead to potential slips and trips, particularly involving pedestrians with visual or physical impairments and parents with buggies.

RECOMMENDATION

The proposed four arm mini roundabout junction should provide adequate provision for crossing pedestrians.

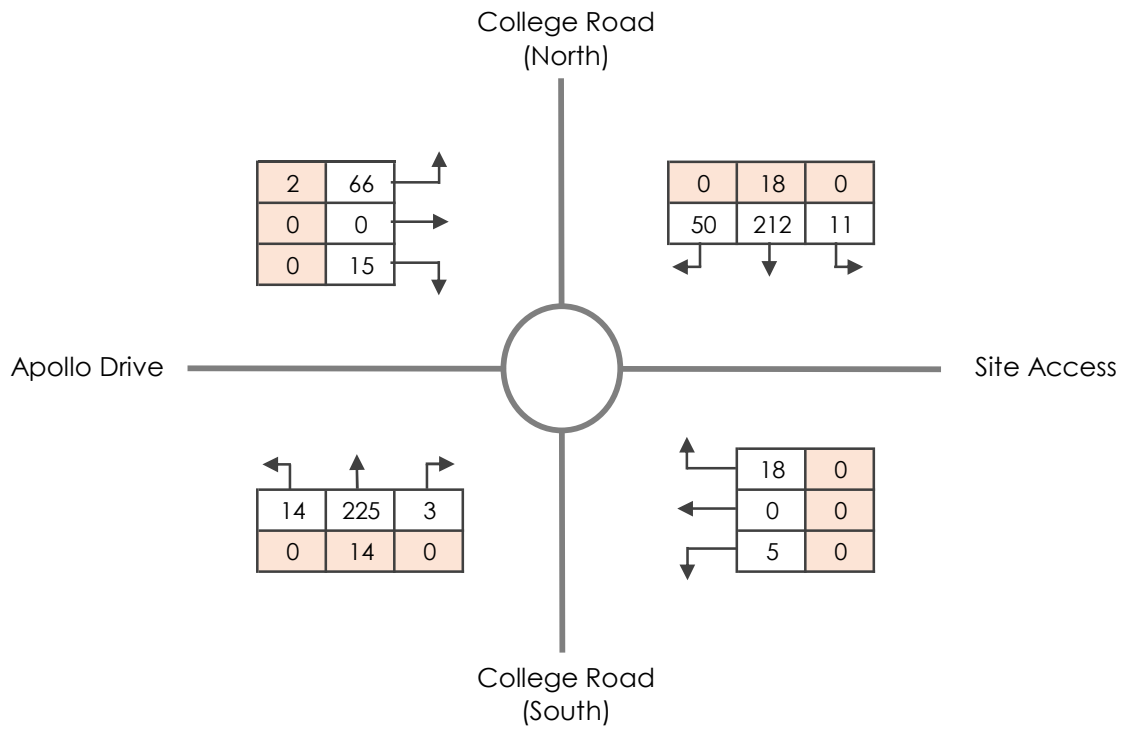
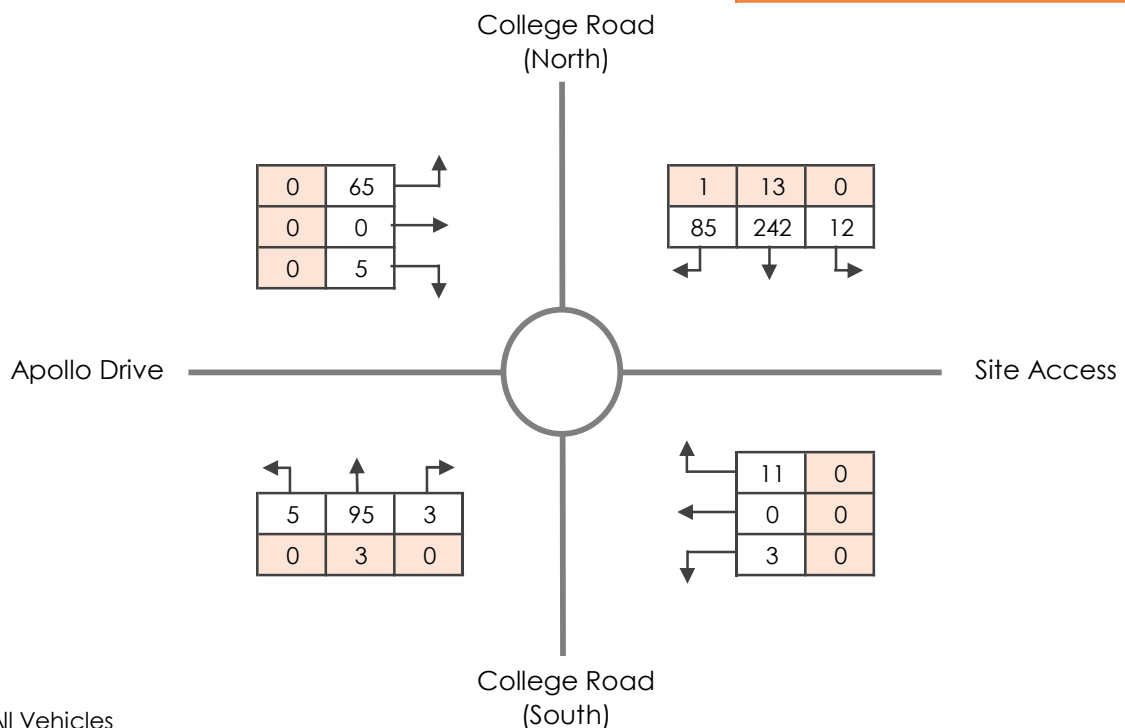
Response:

There is an existing pedestrian refuge approximately 30m to the north of the proposed access junction, which will remain in place, and drawing 1017-SK-101-B has been updated to provide uncontrolled crossing facilities for pedestrians on the site access arm.

3 Conclusions

- 3.1 It is concluded that the RSA raised no issues with the fundamental principle of providing a mini-roundabout in this location.
- 3.2 Drawing no. 1017-PHL-01-C contained in Appendix A shows an updated version of the Audit drawing that reflects the audit recommendations and scheme amendments set out in the Designer's Response summarised above.

Appendix A Drawings

**Site Access - Mini Roundabout****AM****Site Access - Mini Roundabout****PM****Key**

	All Vehicles
	HGV

TITLE

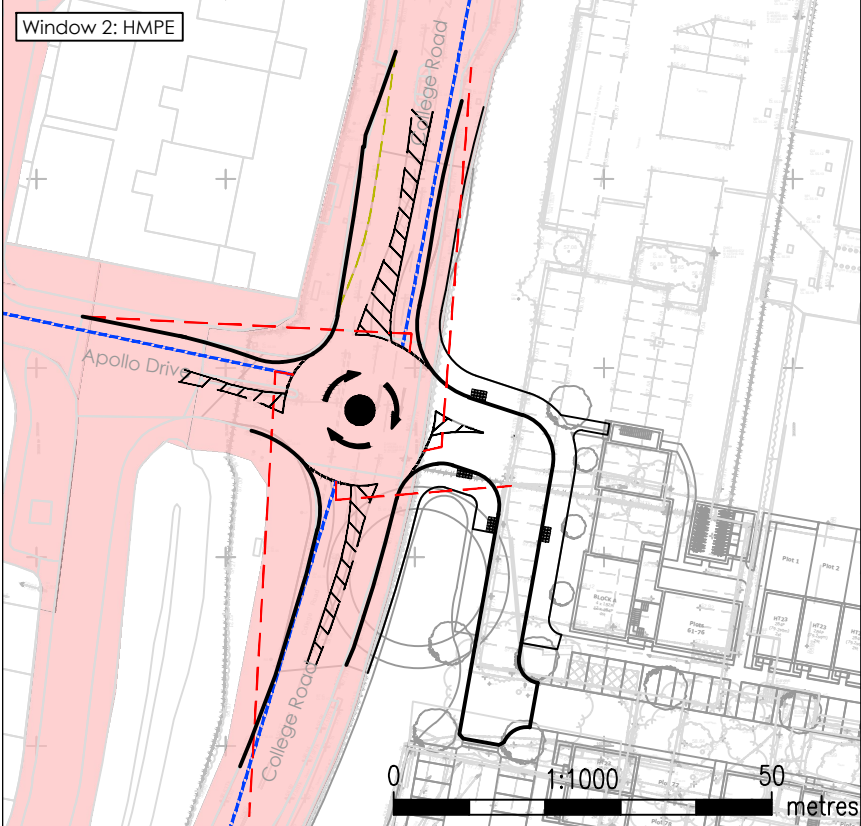
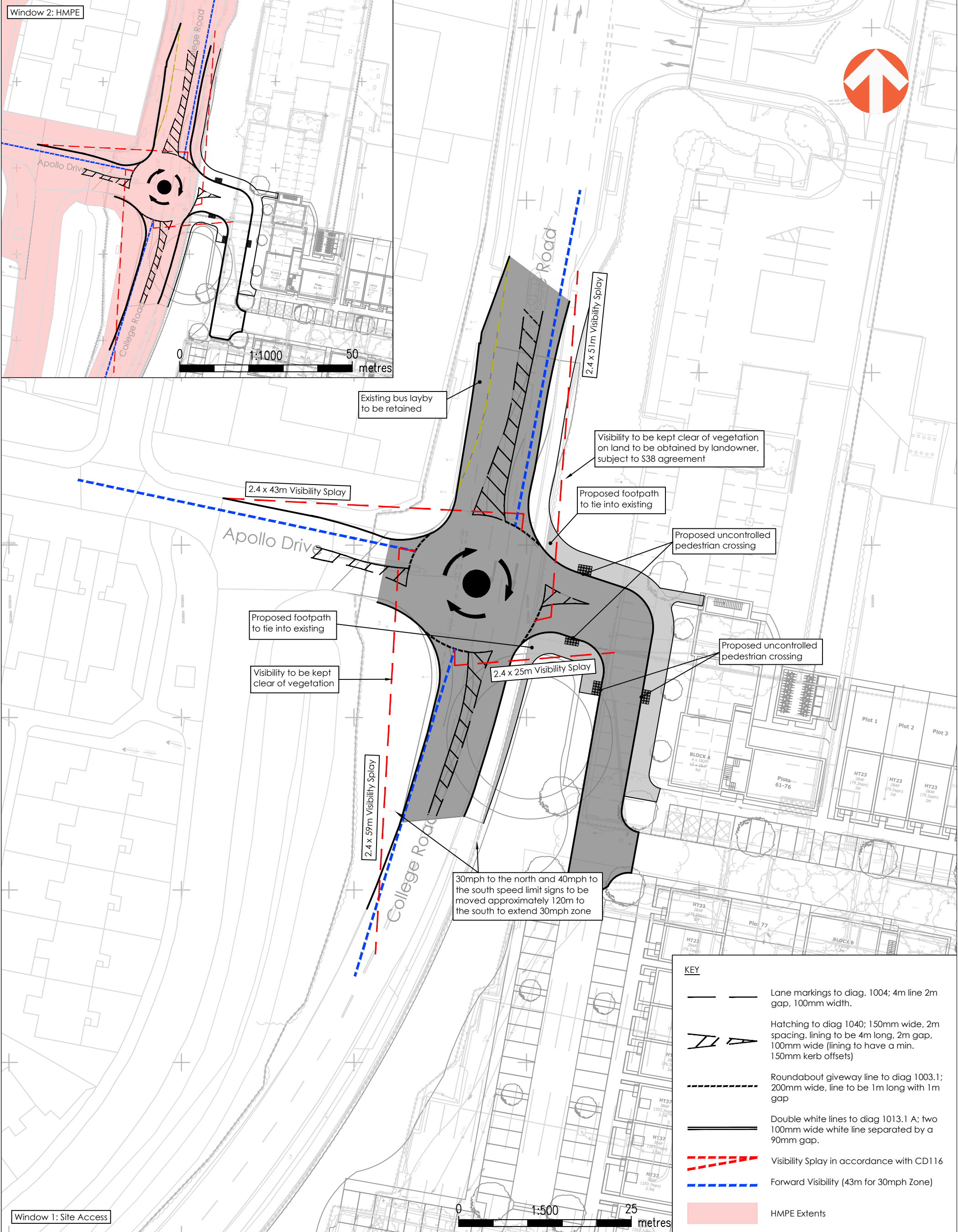
2027 BASE + DEVELOPMENT

PROJECT

1017

South Downs College

FIGURE**2.1**



Window 1: Site Access

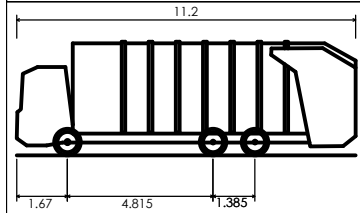
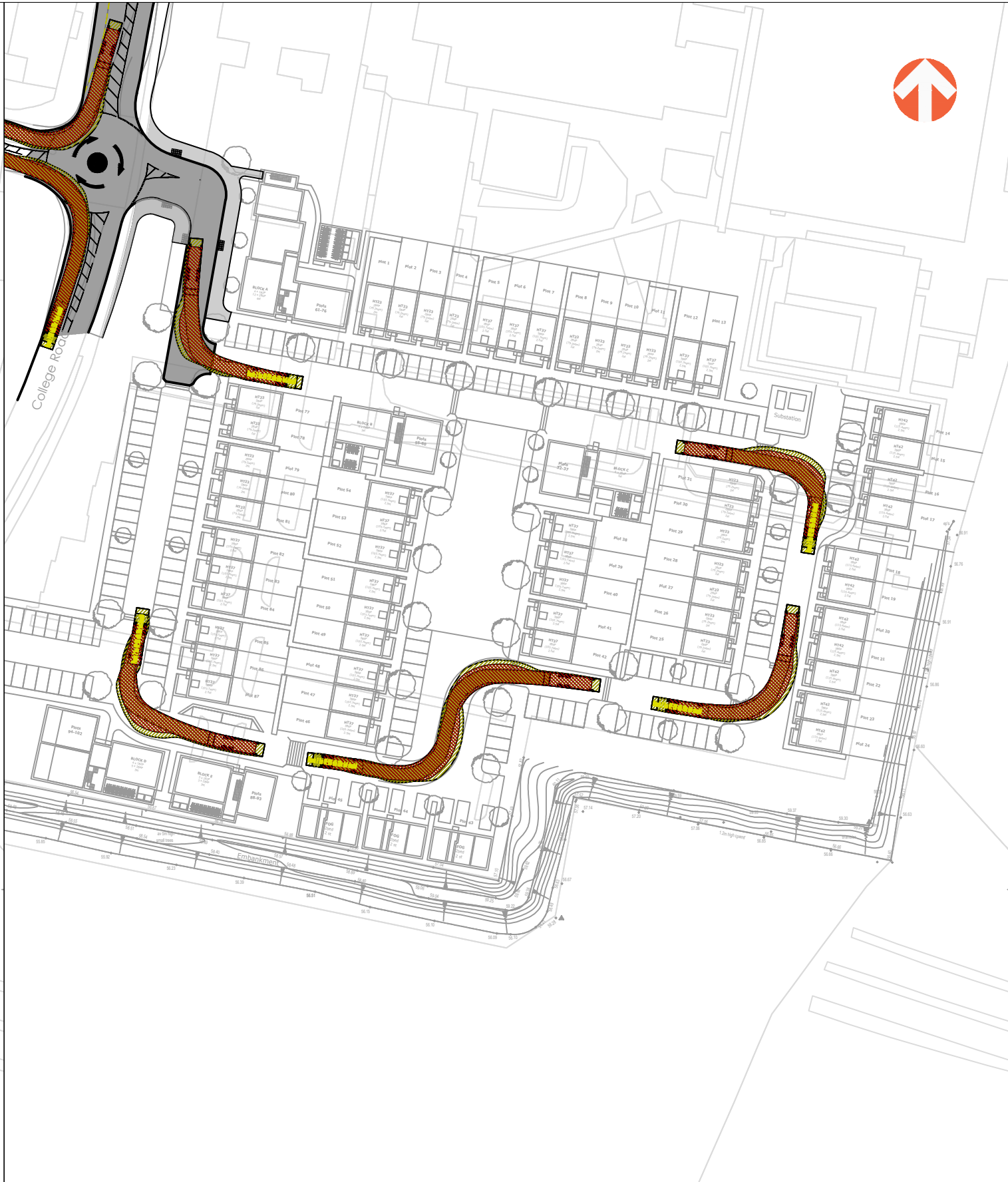
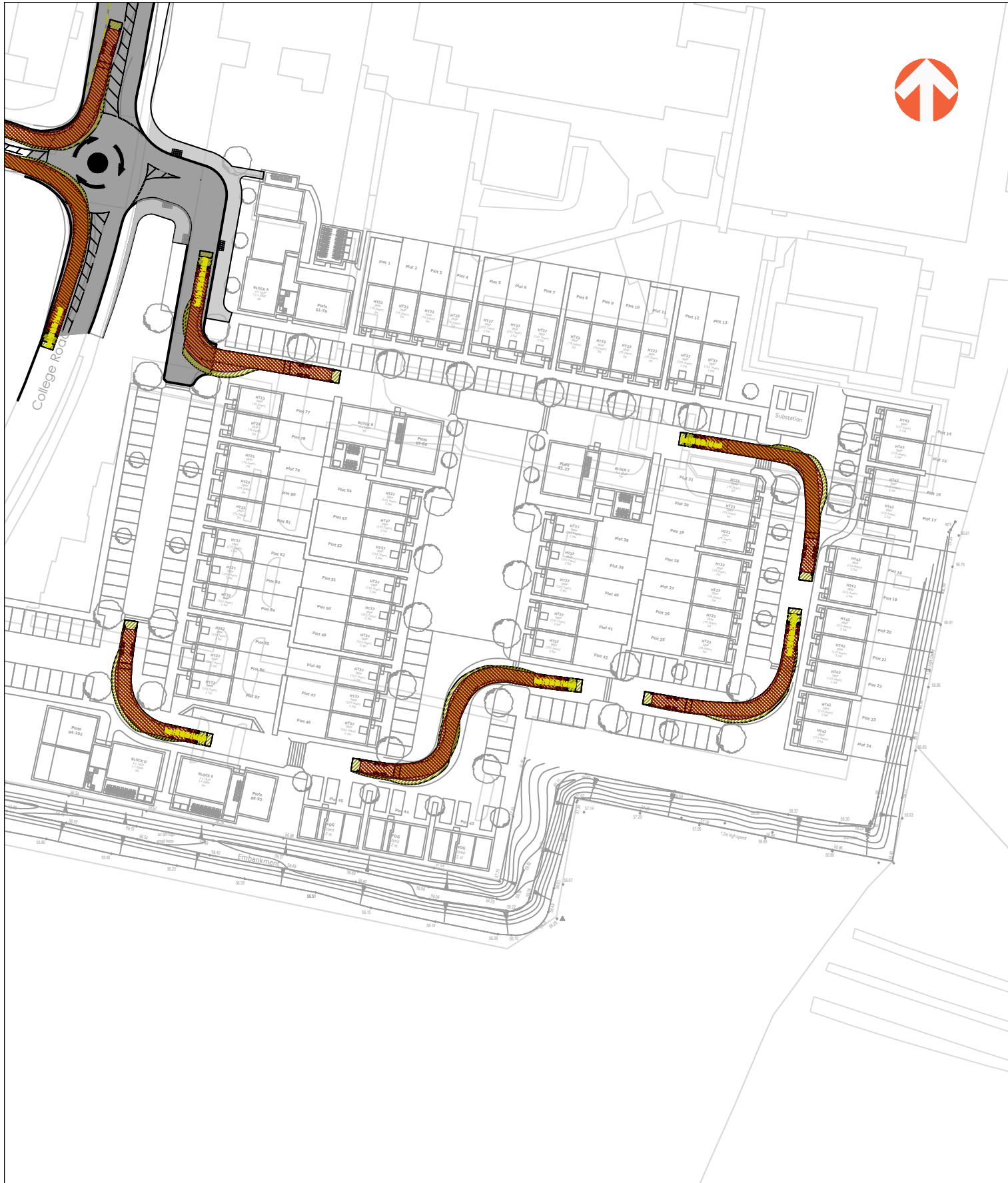
KEY	
	Lane markings to diag. 1004; 4m line 2m gap, 100mm width.
	Hatching to diag 1040; 150mm wide, 2m spacing. lining to be 4m long, 2m gap, 100mm wide (lining to have a min. 150mm kerb offsets)
	Roundabout giveaway line to diag 1003.1; 200mm wide, line to be 1m long with 1m gap
	Double white lines to diag 1013.1 A; two 100mm wide white line separated by a 90mm gap.
	Visibility Splay in accordance with CD116
	Forward Visibility (43m for 30mph Zone)
	HMPE Extents

C	24.03.2022	REVISED LAYOUT	BF	CG	AJW
B	14.03.2022	REVISED LAYOUT	BF	MR	AJW
A	11.01.2021	INITIAL ISSUE	MR	AJW	AJW
REV	DATE	DESCRIPTION	BY	CHK	APD
CLIENT:					
PLACES FOR PEOPLE					
DRAWING STATUS:					
FOR INFORMATION ONLY					

PROJECT:			SOUTH DOWNS COLLEGE		
TITLE:					
PRELIMINARY HIGHWAY LAYOUT					
PROJECT No:		DRAWING No:		REV:	
1017		PHL-101		C	
SCALE @ A3:					
AS SHOWN					



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Phoenix 2 Duo (P2-15W with Elite 6x4 chassis)
Overall Length 11.200m
Overall Width 2.530m
Overall Body Height 3.751m
Min Body Ground Clearance 0.304m
Track Width 2.500m
Lock to lock time 4.00s
Kerb to Kerb Turning Radius 9.500m

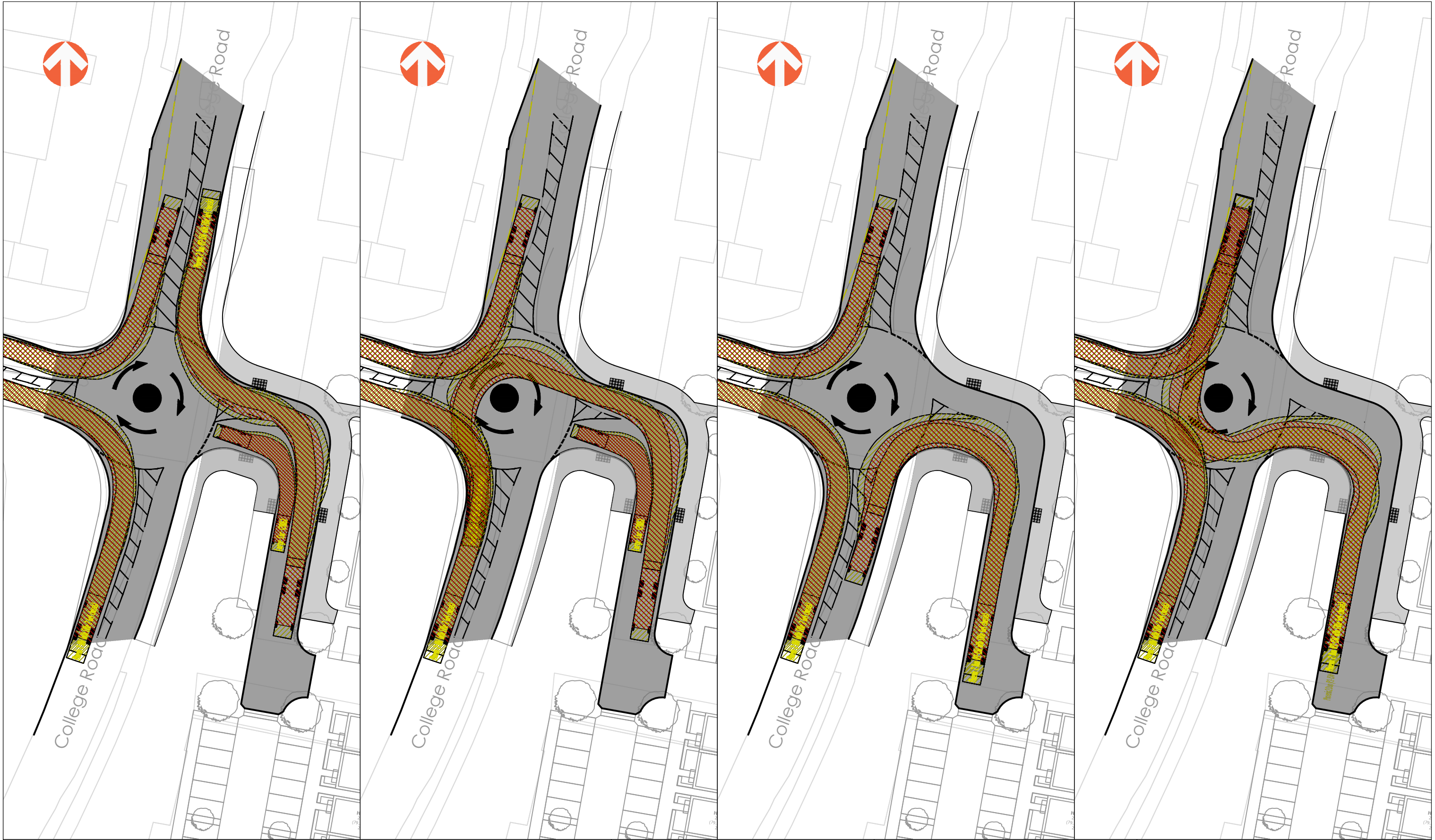
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A	10.09.2021	INITIAL ISSUE	MR	SD	AJW
REV	DATE	DESCRIPTION	BY	CHK	APD
CLIENT:					
PLACES FOR PEOPLE					
DRAWING STATUS:					
FOR INFORMATION ONLY					

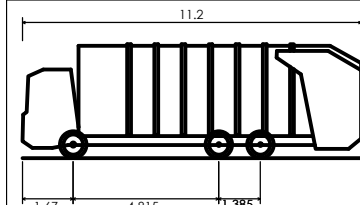
PROJECT:			SOUTH DOWNS COLLEGE		
TITLE:					
REFUSE VEHICLE SWEPT PATH ANALYSIS					
PROJECT No:		DRAWING No:		REV:	
1017		01-ATR-101		B	
SCALE @ A3:		0		1:1000	
metres				50	



awcockward
partnership

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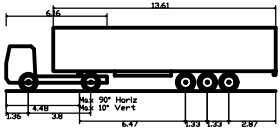
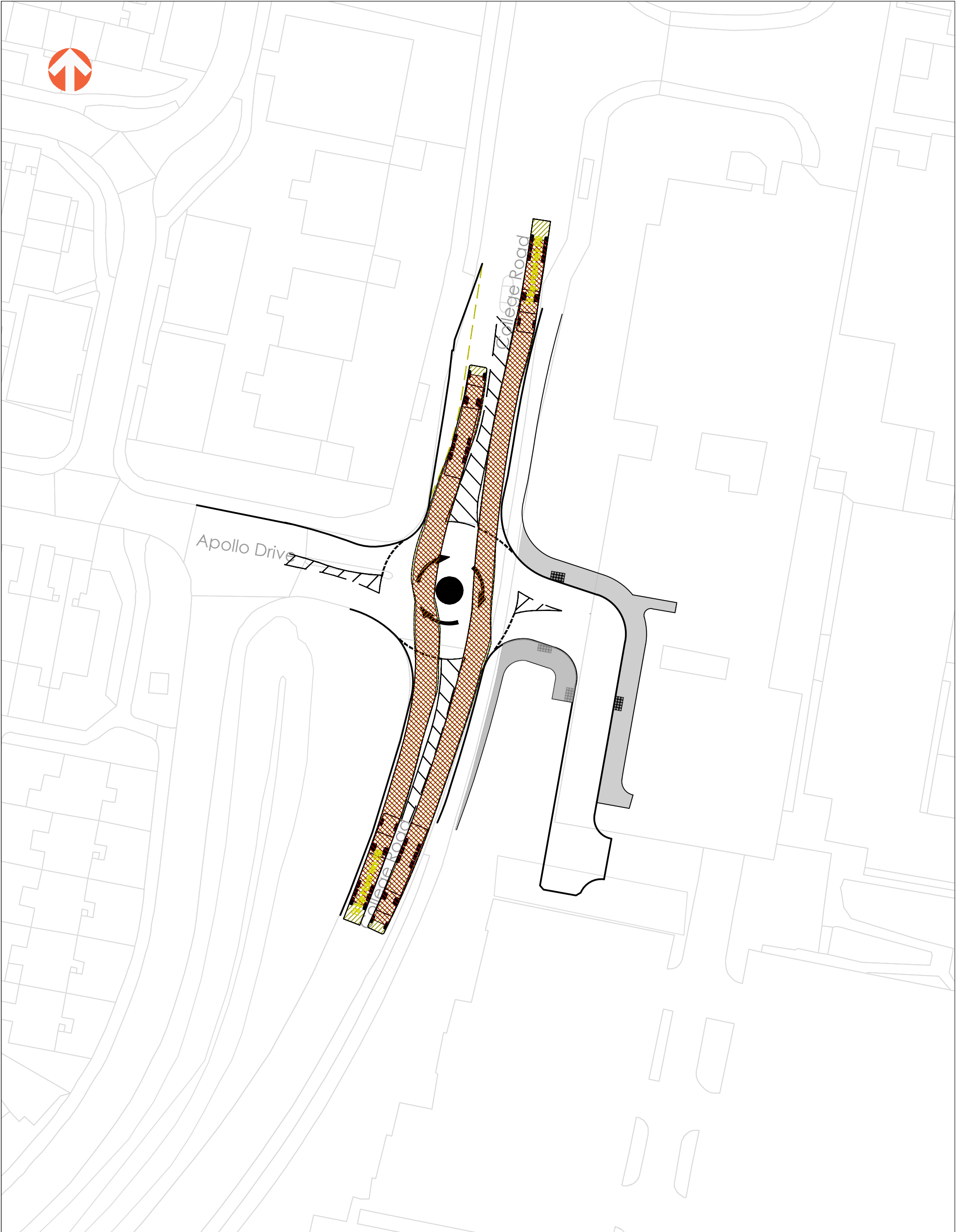
Phoenix 2 Duo (P2-15W with Elite 6x4 chassis)

Overall Length	11.200m
Overall Width	2.530m
Overall Body Height	3.751m
Min Body Ground Clearance	0.304m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	9.500m

PROJECT: SOUTH DOWNS COLLEGE					
TITLE: REFUSE VEHICLE SWEPT PATH ANALYSIS					
PROJECT No: 1017			DRAWING No: 01-ATR-102		REV: B
SCALE @ A0 1:500 25 metres					
CLIENT: PLACES FOR PEOPLE					
DRAWING STATUS: FOR INFORMATION ONLY					
B	25.03.2022	REVISED LAYOUT	BF	CG	AJW
A	14.03.2022	INITIAL ISSUE	BF	CG	AJW
REV	DATE	DESCRIPTION	BY	CHK	APD



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FTA Design Articulated Vehicle (1998)
Overall Length 13.61m
Overall Width 2.55m
Overall Body Height 3.87m
Min Body Ground Clearance 0.31m
Max Track Width 2.47m
Lock to lock time 3.00s
Kerb to kerb Turning Radius 6.55m

B	25.03.2022	REVISED LAYOUT	BF	CG	AJW
A	21.03.2022	INITIAL ISSUE	BF	CG	AJW
REV	DATE	DESCRIPTION	BY	CHK	APD

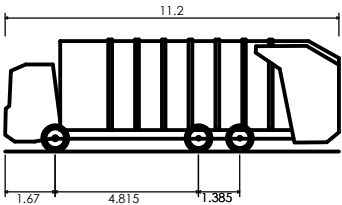
CLIENT: PLACES FOR PEOPLE

DRAWING STATUS: FOR INFORMATION ONLY

PROJECT: SOUTH DOWNS COLLEGE		
TITLE: ARTICULATED VEHICLE SWEEP PATH ANALYSIS		
PROJECT No: 1017	DRAWING No: 01-ATR-103	REV: B
SCALE @ A3: AS SHOWN		



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Phoenix 2 Duo (P2-15W with Elite 6x4 chassis)
Overall Length 11.200m
Overall Width 2.530m
Overall Body Height 3.751m
Min Body Ground Clearance 0.304m
Track Width 2.500m
Lock to lock time 4.00s
Kerb to Kerb Turning Radius 9.500m

A	25.03.2022	INITIAL ISSUE	BF	CG	AJW
REV	DATE	DESCRIPTION	BY	CHK	APD
CLIENT: PLACES FOR PEOPLE					
DRAWING STATUS: FOR INFORMATION ONLY					

PROJECT: SOUTH DOWNS COLLEGE		
TITLE: REFUSE VEHICLE SWEEP PATH ANALYSIS		
PROJECT No: 1017	DRAWING No: 01-ATR-104	REV: A
SCALE @ A0 1:500 25 metres		



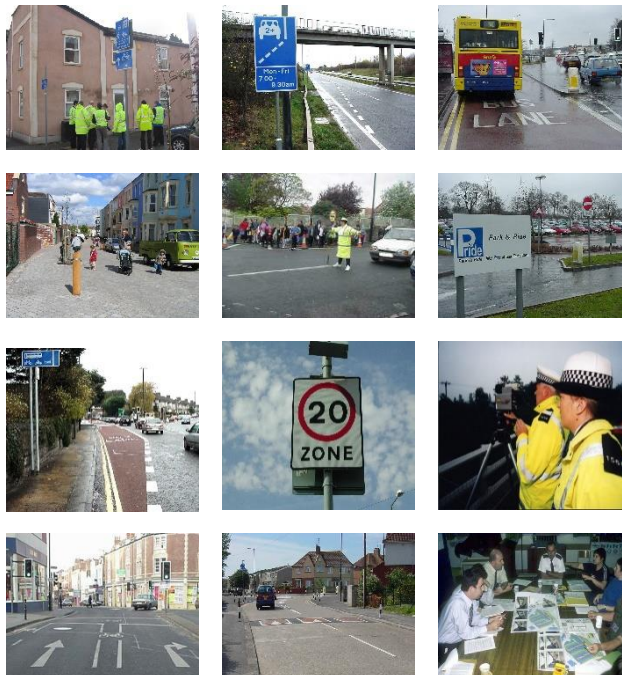
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Appendix B Stage 1 Road Safety Audit

**Section 278 Highway Works
Options for Proposed Residential
Development at
South Downs College,
College Road,
Waterlooville, Hampshire PO7 8AA**

**Stage 1 Road Safety Audit for
Awcock Ward Partnership
Consulting Limited**

18th September 2020



David A Graham Associates Limited

**SECTION 278 HIGHWAY WORKS OPTIONS FOR
PROPOSED RESIDENTIAL DEVELOPMENT,
SOUTH DOWNS COLLEGE, COLLEGE ROAD,
WATERLOOVILLE
HAMPSHIRE PO7 8AA**

STAGE 1 ROAD SAFETY AUDIT

**FOR AWCOCK WARD PARTNERSHIP CONSULTING
LIMITED**

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Our ref:

DAGA/AWP/SouthDownsCollege/Waterlloville/Hampshire/RSA1/03/2020

Date created: 18092020



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**SECTION 278 HIGHWAY WORKS OPTIONS FOR
PROPOSED RESIDENTIAL DEVELOPMENT,
SOUTH DOWNS COLLEGE
COLLEGE ROAD, WATERLOOVILLE
HAMPSHIRE PO7 8AA**

STAGE 1 ROAD SAFETY AUDIT

1. INTRODUCTION

1.1 This report describes a Stage 1 Road Safety Audit carried out on three options for Section 278 highway works associated with a proposed residential development of 117 dwellings at an existing brownfield site at South Downs College, College Road, Waterlooville, Hampshire PO7 8AA. The Audit was carried out on behalf of Awcock Ward Partnership Consulting Limited Kensington Court, Woodwater Park, Pynes Hill, Exeter EX2 5TY (referred to here as AWP).

1.2 The Audit team members were as follows:-

David Graham (Team Leader)
Managing Director
David A Graham Associates Ltd
(Certificate of Competency in Road Safety Audit gained in July 2013)

Veronica Graham (Team Member)
Director
David A Graham Associates Ltd

1.3 The Audit took place in the offices of D.A.G.A. Limited and on site at 1.30pm on Friday 18th September 2020. The Audit was undertaken in accordance with email instructions, documentation and Audit Brief received from Mr Alex Wozniczko, Development Planning Director and from Mr Michael Rose, Assistant Technician of AWP on 26th August and 14th September. The Audit comprised an examination of the drawings and supporting information supplied by Mr Wozniczko and Mr Rose listed in **Appendix A** and a site visit by the Audit Team. Photographs taken during this site visit are included in **Appendix B**. The weather was fine and the road surface was dry. The traffic conditions were medium on College Road.

- 1.4 The terms of reference of the Audit are as described in GG 119 of the Design Manual for Roads and Bridges (DMRB). The Road Safety Audit team has examined and reported only on the road safety implications of the scheme as presented and has not examined or verified the compliance of the design to any other criteria.
- 1.5 All of the problems described in this report arise from the design drawings supplied to the Audit Team and observations made during the site visit. Their locations have been indicated on the A4 drawing in **Appendix C**.
- 1.6 The proposed development is on an existing area of brownfield site and will consists of 117 residential dwellings. Access will be from College Road to the south of Apollo Drive. College Road is subject to a 30mph speed limit where access for vehicles and pedestrians will be considered. An additional pedestrian link at the eastern extents of the development into another development is also proposed by the designers. The Audit team have been asked to consider three potential options for the access into this proposed development as follows:-
- Option 1 – Mini roundabout, connecting the site access, College Road and Apollo Drive chosen to act as a gateway feature at the access to the proposed development (ref Drawing No. 1017-SK-101-B)
 - Option 2 – Cross roads, located at Apollo Drive. Hampshire County Council asked for us (i.e. AWP) to look at this as another potential option to the mini roundabout (ref Drawing No. 1017-PHL-102-A)
 - Option 3 – Staggered crossroads, the client (of AWP) requested this looked in to as a third option this option is constrained and cannot be taken any further south due to site ownership (ref Drawing No. 1017-PHL-102-B)
- 1.7 There was a system of street lighting present on the College Road in the vicinity of the proposals where a 30mph speed limit was in force.
- 1.8 The Audit team have been advised in the Audit Brief of the following potential departure from standard having been considered at feasibility stage with the local Highway Authority:-

College Road does not form part of the Strategic Highway Network and therefore DMRB standards are not mandatory. However, the Local Highway Authority has suggested that DMRB should be referred to for the design of mini-roundabouts and priority junctions on this section of the Local Highway Network. No formal applications for departures or relaxation of standards has been made to date as the project is at

feasibility/options stage. However, the pre-app report attached to this brief discusses the elements of the design for the mini-roundabout option that are not in strict accordance with DMRB standards and sets out the justification for a departure/relaxation as appropriate.

2. ITEMS RESULTING FROM PREVIOUS AUDITS

- 2.1 The Audit team are unaware of any previous Road Safety Audits having been carried out on the proposals.

3. ITEMS RESULTING FROM THIS STAGE 1 ROAD SAFETY AUDIT

OPTION 1 MINI ROUNDABOUT

Drawing N0. SK-101 Rev B

3.1 PROBLEM

Location A – College Road at its junction with Apollo Drive

Summary: Capacity of proposed four arm mini roundabout junction

Whilst the Audit team note the content of the Pre-Application Scoping Note – (Access & Transport) with regard to traffic capacity at the proposed new four arm mini roundabout they remain concerned that when considering the proposed new traffic signal junction at the nearby Camptown development immediately southwest of the proposed mini roundabout that this could result in significant traffic congestion. In particular, four arm mini roundabouts will have four crossovers giving significant opportunity for collisions to take place during a busy peak hour period. Additionally, mini roundabouts are of particular concern to riders of two wheeled vehicles who are over represented in collisions at mini roundabouts and normal roundabouts alike.

RECOMMENDATION

If the four-arm mini roundabout option proceeds then the Audit team would recommend that the design as presented is revisited to look at the potential for two lane approaches in order to separate ahead and right turning traffic. Additionally, if feasible a separate access to the development should be provided for cyclists and pedestrians.

3.2 PROBLEM

Location B – College Road at its junction with Apollo Drive

Summary: Lack of adequate entry deflection

The Audit team are concerned that the proposed four arm mini roundabout design lacks adequate entry deflection, particularly on the northeast and southwest approaches on College Road. Inadequate entry deflection on the approach to a mini roundabout could lead to an inappropriate approach speeds, overshoots and side impact type collisions.

RECOMMENDATION

Notwithstanding recommendation 3.1 above the design as presented should be revisited to allow for adequate entry deflection on all approaches to the mini roundabout, but in particular for those on College Road.

3.3 PROBLEM

Location C – College Road at its junction with Apollo Drive

Summary: Lack of swept path analysis

The Audit team are concerned that the drawing provided for the proposed four arm mini roundabout does not provide for the swept path analysis of the largest vehicle likely to need to negotiate the junction from all arms. Insufficient road space for the largest vehicle required to negotiate the proposed new mini roundabout junction could lead to sideswipe type collisions, injudicious reversing, shunts and the potential for over running of the footway and collisions with pedestrians and passing cyclists.

RECOMMENDATION

The design of the proposed four arm mini roundabout should provide for sufficient road space to accommodate the largest vehicle required to use the junction from all directions.

3.4 PROBLEM

Location D – College Road southwest of its junction with Apollo Drive

Summary: Location of existing 30/40 mph speed limit interface

The Audit team are concerned that the current location of the start of the 30mph speed limit on College Road is too close to the proposed new four arm mini roundabout junction. This could lead to inappropriate approach speeds on College Road which in turn could lead to heavy braking, shunts, overshoots and side impact type collisions on the proposed new mini roundabout.

RECOMMENDATION

The existing 30/40 mph speed limit interface should be relocated an appropriate distance, south-westwards on College Road to allow drivers approaching the new four arm mini roundabout to reduce their speed sufficiently in anticipation of the potential need to give way.

3.5 PROBLEM

Location E – College Road at its junction with Apollo Drive

Summary: Lack of pedestrian crossing facilities

It is not clear from the drawing what if any facilities for pedestrians will be provided to cross College Road and Apollo Drive at the proposed new four arm mini roundabout junction. Inadequate facilities for pedestrians to cross College Road and Apollo Drive to and from the new development could lead to potential slips and trips, particularly involving pedestrians with visual or physical impairments and parents with buggies.

RECOMMENDATION

The proposed four arm mini roundabout junction should provide adequate provision for crossing pedestrians.

OPTION 2 CROSS ROADS

Drawing N0. PHL-102 Rev A

3.6 PROBLEM

Location F – College Road at its junction with Apollo Drive

Summary: Confusing and inadequate junction layout

The drawing indicates a confusing road layout for drivers and riders wishing to turn right into the new development or into Apollo Drive as it requires right turning drivers / riders to pass one another before they turn right which is unlikely to take place. This could lead to drivers attempting to turn right in the opposing right turn pocket which in turn could lead to side impact and head on type collisions. Additionally, at peak periods it is unlikely that the design as presented would have adequate stacking capacity to accommodate right turning drivers and riders into either Apollo Drive or the new development. As such, this could lead to tailbacks, shunts, side impact and sideswipe type collisions with following vehicles. Furthermore, the right turn pocket into the proposed development will lead drivers and riders into a full height kerb where they could mount the pavement with the potential to collide with passing pedestrians.

RECOMMENDATION

The design as presented should be revisited with a view to investigating the potential for a ghost island right turn lane for right turning traffic in both directions on College Road.

3.7 PROBLEM

Location G – College Road at its junction with Apollo Drive

Summary: Lack of swept path analysis

The Audit team are concerned that the drawing provided for the proposed cross roads does not provide for the swept path analysis of the largest vehicle likely to need to negotiate the junction from all arms. Insufficient road space for the largest vehicle required to negotiate the proposed new crossroads layout could lead to sideswipe type collisions, injudicious reversing, shunts and the potential for over running of the footway and collisions with pedestrians and passing cyclists.

RECOMMENDATION

The design of the proposed new cross roads layout should provide for sufficient road space to accommodate the largest vehicle required to use the junction from all directions.

3.8 PROBLEM

Location H – College Road southwest of its junction with Apollo Drive

Summary: Location of existing 30/40 mph speed limit interface

The Audit team are concerned that the current location of the start of the 30mph speed limit on College Road is too close to the proposed new cross roads layout, particularly considering right turning drivers and riders will need to slow down to turn right into the right turn pocket for the new development. This could lead to inappropriate approach speeds on College Road which in turn could lead to heavy braking, shunts, injudicious reversing and side impact type collisions.

RECOMMENDATION

The existing 30/40 mph speed limit interface should be relocated an appropriate distance, south-westwards on College Road to allow drivers approaching the new right turn bay to reduce their speed sufficiently in order to turn right.

3.9 PROBLEM

Location I – College Road at its junction with Apollo Drive

Summary: Lack of pedestrian crossing facilities

It is not clear from the drawing what if any facilities for pedestrians will be provided to cross College Road and Apollo Drive at the proposed new cross roads layout. Inadequate facilities for pedestrians to cross College Road and Apollo Drive to and from the new development could lead to potential slips and trips, particularly involving pedestrians with visual or physical impairments and parents with buggies.

RECOMMENDATION

The proposed new cross roads layout should provide adequate provision for crossing pedestrians.

OPTION 3 STAGGERED JUNCTION

Drawing N0. PHL-102 Rev B

3.10 PROBLEM

Location J – College Road at its junction with Apollo Drive

Summary: Lack of full swept path analysis and potential for collisions between opposing large right turning vehicles

The drawing shows the swept path of a standard refuse collection vehicle turning left into Apollo Drive and right from the proposed new site access road. However, there is no swept path indicated for the other manoeuvres into and out of the remaining arms of the staggered junction, in particular a large right turning vehicle from Apollo Drive into College Road. As such, the Audit team are concerned that such a manoeuvre could lead to a head on collision with a similar vehicle turning right from the new site access simultaneously. Additionally, injudicious manoeuvres could be caused including reversing, mounting of the verge and mounting of the footway with the potential for collisions with passing pedestrians.

RECOMMENDATION

The design of the proposed new staggered junction layout should provide for sufficient road space to accommodate the largest vehicle required to use the junction from all directions.

3.11 PROBLEM

Location K – College Road at its junction with Apollo Drive

Summary: Lack of stacking capacity for right turning drivers and riders

The Audit team are concerned that the proposed staggered junction layout as presented on the drawing does not provide for any stacking capacity during peak periods. This could lead to tailbacks, driver frustration and injudicious manoeuvres including mounting of the footway which in turn could lead to collisions with passing pedestrians.

RECOMMENDATION

The design as presented should be revisited with a view to investigating the potential for a ghost island right turn lane for right turning traffic in both directions on College Road.

3.12 PROBLEM

Location L – College Road southwest of its junction with Apollo Drive

Summary: Location of existing 30/40 mph speed limit interface

The Audit team are concerned that the current location of the start of the 30mph speed limit on College Road is too close to the proposed new staggered junction layout, particularly considering right turning drivers and riders will need to slow down to turn right into the new development. This could lead to inappropriate approach speeds on College Road which in turn could lead to heavy braking, shunts, injudicious reversing and side impact type collisions.

RECOMMENDATION

The existing 30/40 mph speed limit interface should be relocated an appropriate distance, south-westwards on College Road to allow drivers approaching the new staggered junction to reduce their speed sufficiently in order to turn right.

3.13 PROBLEM

Location M – College Road at its junction with Apollo Drive

Summary: Lack of pedestrian crossing facilities

It is not clear from the drawing what if any facilities for pedestrians will be provided to cross College Road and Apollo Drive at the proposed new staggered junction layout. Inadequate facilities for pedestrians to cross College Road and Apollo drive to and from the new development could lead to potential slips and trips, particularly involving pedestrians with visual or physical impairments and parents with buggies.

RECOMMENDATION

The proposed new staggered junction layout should provide adequate provision for crossing pedestrians.

4. AUDIT TEAM STATEMENT

We certify that this Audit has been carried out generally in accordance with GG 119 of the Design Manual for Roads and Bridges (DMRB). No one on the Audit Team has been involved in the design of this scheme.

AUDIT TEAM LEADER

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Signed: 

Date: 18th September 2020

AUDIT TEAM MEMBER

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Signed: 

Date: 18th September 2020

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APPENDIX A

DOCUMENTS PROVIDED TO THE AUDIT TEAM

The Audit was undertaken in accordance with an email instructions, drawings, documentation and Audit Brief received from Mr Alex Wozniczko, Development Planning Director and from Mr Michael Rose, Assistant Technician both of AWP on 26th August and 14th September 2020.

DOCUMENTS

- 1/ Road Safety Audit Brief dated 10/09/2020 by AWP
- 2/ Pre-Application Scoping Note – Access & Transport dated 18/05/2020 by AWP
- 3/ Online PIA record 14/09/2020 from crashmap.co.uk

DRAWINGS

- Drawing No. 1017 – PHL – 102A Preliminary Site Access Arrangements
- Drawing No. 1017 – PHL – 102B Proposed Site Access, Staggered Junction Option
- Drawing No. 1017 – SK – 101B Proposed Mini Roundabout Access Option
- Drawing No. PBA 048.0010.004 Rev B Proposed Signal Junction Site Access
- Drawing No. A-02-200-MP Masterplan Layout

Accident Statistics:

See online PIA records 14/09/2020

Traffic Generation Data:

As included in Transportation Scoping Note 18/05/20

Traffic Flow Data:

As included in Transportation Scoping Note 18/05/20

APPENDIX B – PHOTOGRAPHS



Pic 1: College Road looking southwest towards Apollo Drive and proposed location of new site access road.



Pic 2: Apollo Drive looking northeast along College Road.



Pic 3: Apollo Drive looking southwest along College Road.



Pic 4: College Road looking northwest into Apollo Drive.



Pic 5: Location of proposed new staggered junction looking northeast along College Road.



Pic 6: Location of proposed new staggered junction looking southwest along College Road.



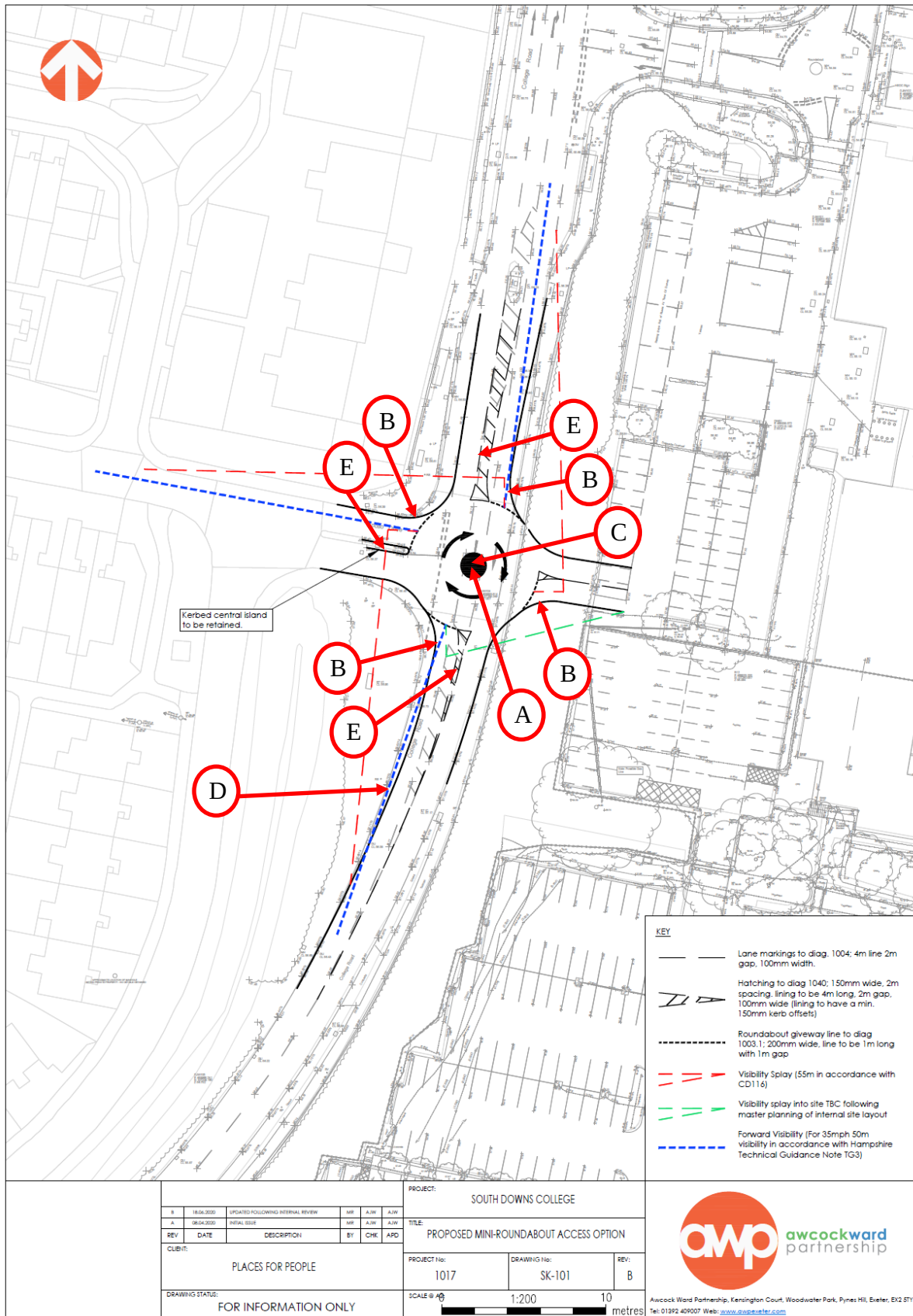
Pic 7: College Road looking northeast towards Apollo Drive and proposed location of new site access road.

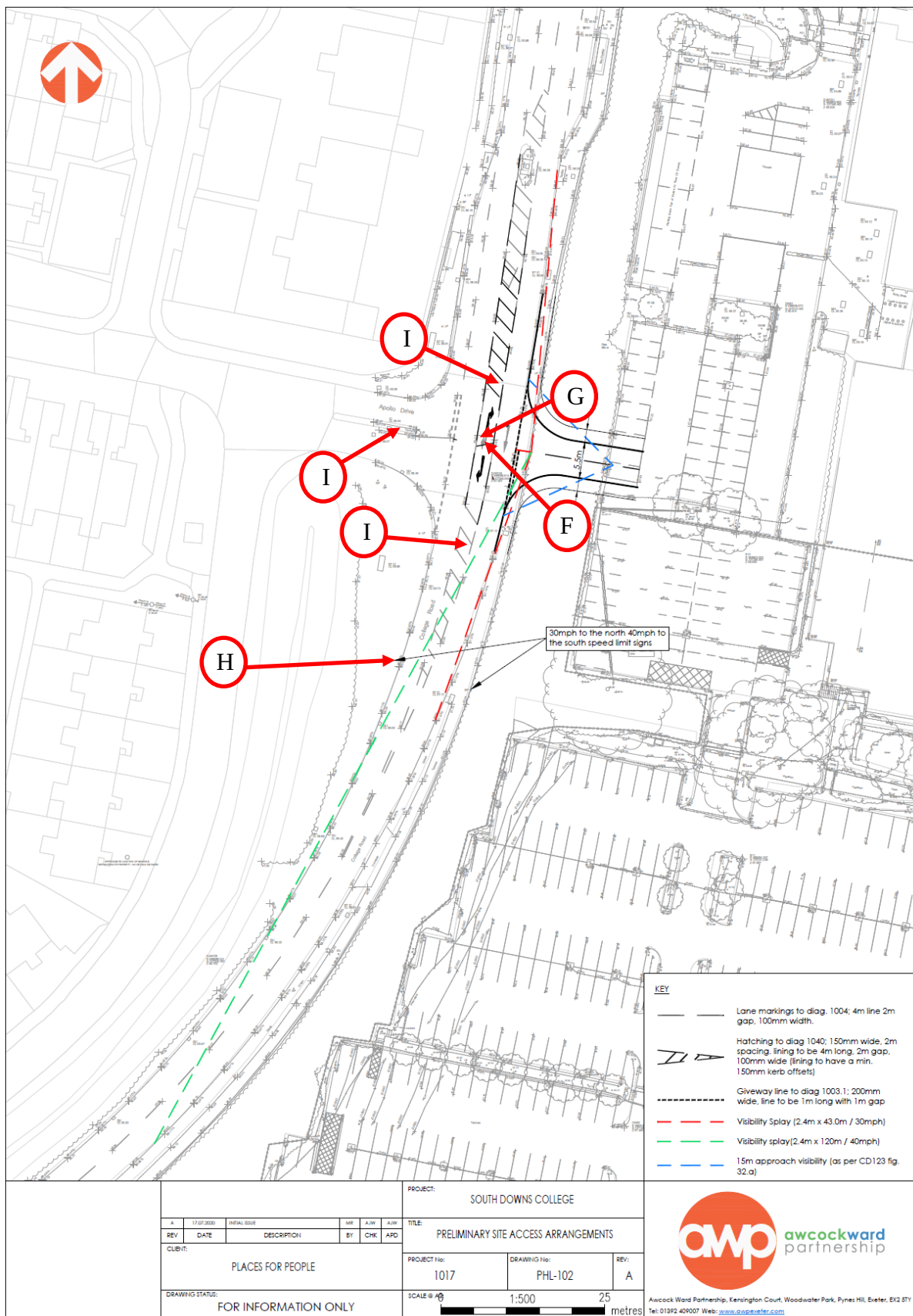


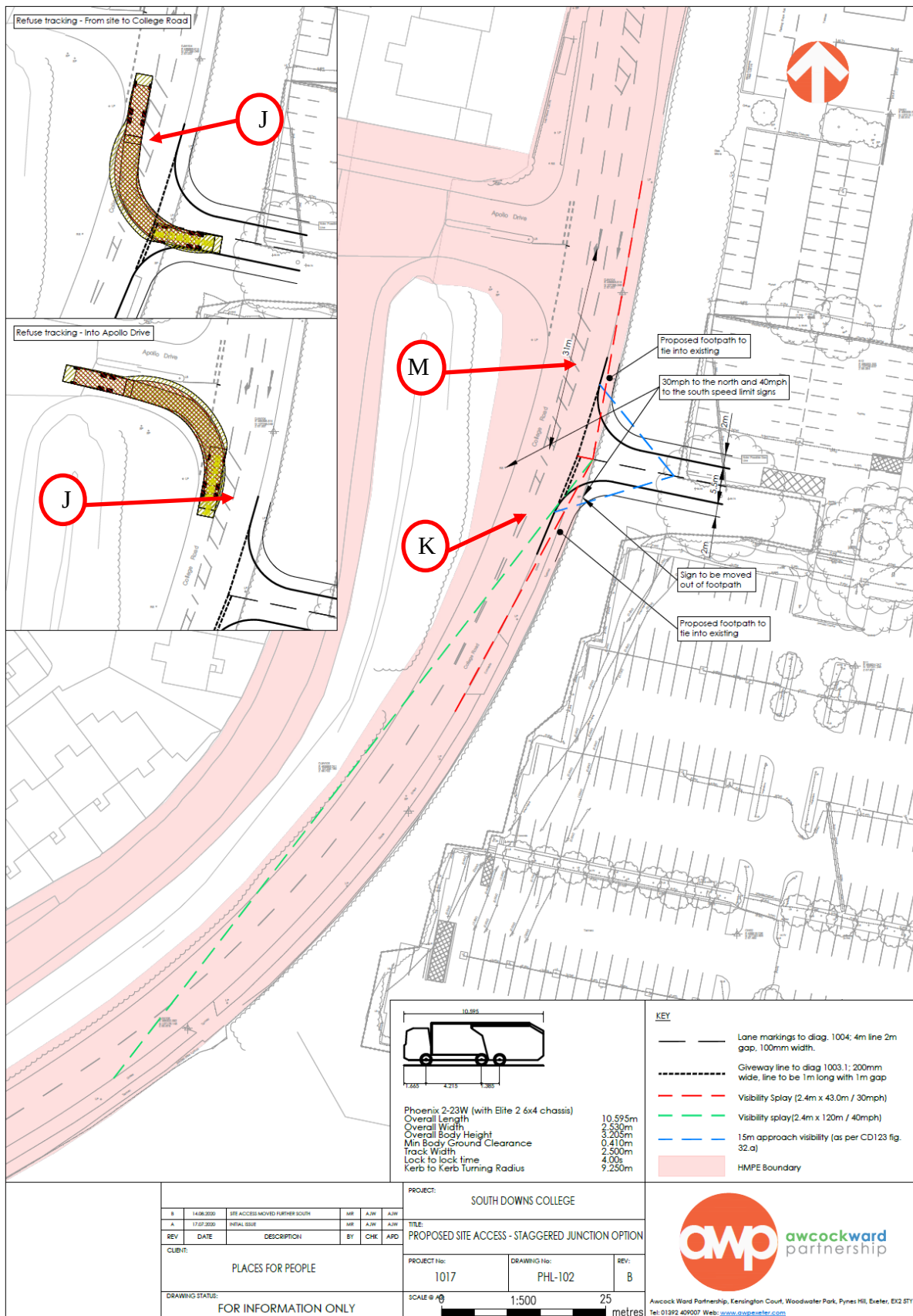
Pic 7: College Road looking northeast towards Apollo Drive and proposed location of new site access road at 30mph speed limit interface.

APPENDIX C

DRAWINGS SHOWING LOCATIONS OF PROBLEMS IDENTIFIED







Appendix C ARCADY Output

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.1.7462
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: J1-Site Access.j9

Path: P:\1017 South Downs College\ID Design and Analysis\ARCADY\Mini Roundabout Site Access

Report generation date: 24/03/2022 14:11:07

»2022 BASE, AM
»2022 BASE, PM
»2022 BASE+DEV, AM
»2022 BASE+DEV, PM
»2027 BASE, AM
»2027 BASE, PM
»2027 BASE+DEV, AM
»2027 BASE+DEV, PM

Summary of junction performance

	AM				PM			
	Set ID	Queue (Veh)	Delay (s)	RFC	Set ID	Queue (Veh)	Delay (s)	RFC
	2022 BASE							
1 - College Road North	D1	0.4	5.26	0.29	D2	0.6	5.80	0.36
2 - Site Access		0.0	0.00	0.00		0.0	0.00	0.00
3 - College Road South		0.4	5.16	0.26		0.1	4.39	0.11
4 - Apollo Drive		0.1	4.77	0.10		0.1	4.24	0.08
	2022 BASE+DEV							
1 - College Road North	D3	0.4	5.37	0.30	D4	0.6	5.97	0.37
2 - Site Access		0.0	5.72	0.04		0.0	5.92	0.02
3 - College Road South		0.4	5.28	0.27		0.1	4.44	0.12
4 - Apollo Drive		0.1	4.86	0.10		0.1	4.27	0.08
	2027 BASE							
1 - College Road North	D5	0.4	5.37	0.30	D6	0.6	5.95	0.37
2 - Site Access		0.0	0.00	0.00		0.0	0.00	0.00
3 - College Road South		0.4	5.26	0.28		0.1	4.43	0.12
4 - Apollo Drive		0.1	4.83	0.11		0.1	4.27	0.08
	2027 BASE+DEV							
1 - College Road North	D7	0.5	5.48	0.31	D8	0.6	6.13	0.39
2 - Site Access		0.0	5.79	0.04		0.0	6.01	0.02
3 - College Road South		0.4	5.39	0.28		0.1	4.48	0.12
4 - Apollo Drive		0.1	4.93	0.11		0.1	4.30	0.08

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

File summary

File Description

Title	
Location	
Site number	
Date	10/06/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	AD\annabel.harris
Description	

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

Analysis Options

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9	5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 BASE	AM	ONE HOUR	07:45	09:15	15	✓
D2	2022 BASE	PM	ONE HOUR	16:45	18:15	15	✓
D3	2022 BASE+DEV	AM	ONE HOUR	07:45	09:15	15	✓
D4	2022 BASE+DEV	PM	ONE HOUR	16:45	18:15	15	✓
D5	2027 BASE	AM	ONE HOUR	07:45	09:15	15	✓
D6	2027 BASE	PM	ONE HOUR	16:45	18:15	15	✓
D7	2027 BASE+DEV	AM	ONE HOUR	07:45	09:15	15	✓
D8	2027 BASE+DEV	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2022 BASE, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 86% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.15	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
1	College Road North	
2	Site Access	
3	College Road South	
4	Apollo Drive	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
1 - College Road North	3.59	3.59	3.98	1.1	11.28	8.05	1.7	
2 - Site Access	2.83	2.83	3.77	0.2	9.55	6.38	-2.9	
3 - College Road South	3.51	3.51	4.52	2.5	13.17	10.30	-0.2	
4 - Apollo Drive	4.02	2.97	4.89	12.4	12.16	7.60	2.3	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - College Road North	0.600	968
2 - Site Access	0.621	836
3 - College Road South	0.631	981
4 - Apollo Drive	0.611	985

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	2022 BASE	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	250	100.000
2 - Site Access		ONE HOUR	✓	0	100.000
3 - College Road South		ONE HOUR	✓	228	100.000
4 - Apollo Drive		ONE HOUR	✓	77	100.000

Origin-Destination Data

Demand (Veh/hr)

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	202	48
	2 - Site Access	0	0	0	0
	3 - College Road South	215	0	0	13
	4 - Apollo Drive	63	0	14	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.29	5.26	0.4	A	229	344
2 - Site Access	0.00	0.00	0.0	A	0	0
3 - College Road South	0.26	5.16	0.4	A	209	314
4 - Apollo Drive	0.10	4.77	0.1	A	71	106

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	188	47	10	962	0.196	187	208	0.0	0.2	4.641	A
2 - Site Access	0	0	198	713	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	172	43	36	959	0.179	171	162	0.0	0.2	4.564	A
4 - Apollo Drive	58	14	161	886	0.065	58	46	0.0	0.1	4.344	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	225	56	13	961	0.234	224	250	0.2	0.3	4.889	A
2 - Site Access	0	0	237	689	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	205	51	43	954	0.215	205	194	0.2	0.3	4.802	A
4 - Apollo Drive	69	17	193	867	0.080	69	55	0.1	0.1	4.513	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	275	69	15	959	0.287	275	306	0.3	0.4	5.260	A
2 - Site Access	0	0	290	656	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	251	63	53	948	0.265	251	237	0.3	0.4	5.159	A
4 - Apollo Drive	85	21	236	840	0.101	85	67	0.1	0.1	4.764	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	275	69	15	959	0.287	275	306	0.4	0.4	5.264	A
2 - Site Access	0	0	291	655	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	251	63	53	948	0.265	251	238	0.4	0.4	5.163	A
4 - Apollo Drive	85	21	237	840	0.101	85	67	0.1	0.1	4.766	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	225	56	13	961	0.234	225	250	0.4	0.3	4.898	A
2 - Site Access	0	0	238	688	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	205	51	43	954	0.215	205	194	0.4	0.3	4.808	A
4 - Apollo Drive	69	17	194	866	0.080	69	55	0.1	0.1	4.516	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	188	47	11	962	0.196	188	210	0.3	0.2	4.657	A
2 - Site Access	0	0	199	712	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	172	43	36	959	0.179	172	163	0.3	0.2	4.576	A
4 - Apollo Drive	58	14	162	886	0.065	58	46	0.1	0.1	4.350	A

2022 BASE, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 85% of the total flow for the roundabout for one or more time segments][Arms 1 and 4 have 79% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.30	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	2022 BASE	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	313	100.000
2 - Site Access		ONE HOUR	✓	0	100.000
3 - College Road South		ONE HOUR	✓	96	100.000
4 - Apollo Drive		ONE HOUR	✓	67	100.000

Origin-Destination Data

Demand (Veh/hr)

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	232	81
	2 - Site Access	0	0	0	0
	3 - College Road South	91	0	0	5
	4 - Apollo Drive	62	0	5	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.36	5.80	0.6	A	287	431
2 - Site Access	0.00	0.00	0.0	A	0	0
3 - College Road South	0.11	4.39	0.1	A	88	132
4 - Apollo Drive	0.08	4.24	0.1	A	61	92

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	236	59	4	966	0.244	234	115	0.0	0.3	4.913	A
2 - Site Access	0	0	238	688	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	72	18	61	943	0.077	72	177	0.0	0.1	4.131	A
4 - Apollo Drive	50	13	68	943	0.053	50	64	0.0	0.1	4.031	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	281	70	4	966	0.291	281	137	0.3	0.4	5.257	A
2 - Site Access	0	0	286	659	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	86	22	73	936	0.092	86	213	0.1	0.1	4.238	A
4 - Apollo Drive	60	15	82	935	0.064	60	77	0.1	0.1	4.116	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	345	86	5	965	0.357	344	168	0.4	0.6	5.794	A
2 - Site Access	0	0	350	619	0.000	0	0	0.0	0.0	0.000	A

3 - College Road South	106	26	89	925	0.114	106	261	0.1	0.1	4.392	A
4 - Apollo Drive	74	18	100	923	0.080	74	95	0.1	0.1	4.236	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	345	86	6	965	0.357	345	168	0.6	0.6	5.803	A
2 - Site Access	0	0	350	618	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	106	26	89	925	0.114	106	261	0.1	0.1	4.392	A
4 - Apollo Drive	74	18	100	923	0.080	74	95	0.1	0.1	4.236	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	281	70	5	966	0.291	282	138	0.6	0.4	5.272	A
2 - Site Access	0	0	286	658	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	86	22	73	935	0.092	86	213	0.1	0.1	4.242	A
4 - Apollo Drive	60	15	82	935	0.064	60	77	0.1	0.1	4.119	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	236	59	4	966	0.244	236	115	0.4	0.3	4.935	A
2 - Site Access	0	0	240	687	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	72	18	61	943	0.077	72	179	0.1	0.1	4.135	A
4 - Apollo Drive	50	13	69	943	0.054	50	65	0.1	0.1	4.034	A

2022 BASE+DEV, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 83% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.28	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	2022 BASE+DEV	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	261	100.000
2 - Site Access		ONE HOUR	✓	23	100.000
3 - College Road South		ONE HOUR	✓	231	100.000
4 - Apollo Drive		ONE HOUR	✓	77	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	11	202	48
	2 - Site Access	18	0	5	0
	3 - College Road South	215	3	0	13
	4 - Apollo Drive	63	0	14	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.30	5.37	0.4	A	239	359
2 - Site Access	0.04	5.72	0.0	A	21	32
3 - College Road South	0.27	5.28	0.4	A	212	318
4 - Apollo Drive	0.10	4.86	0.1	A	71	106

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	196	49	13	961	0.204	195	222	0.0	0.3	4.698	A
2 - Site Access	18	4	198	713	0.025	17	10	0.0	0.0	5.174	A
3 - College Road South	174	43	50	950	0.183	173	166	0.0	0.2	4.627	A
4 - Apollo Drive	58	14	177	877	0.066	58	46	0.0	0.1	4.395	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	234	59	15	959	0.244	234	266	0.3	0.3	4.965	A

2 - Site Access	21	5	237	689	0.030	21	12	0.0	0.0	5.390	A
3 - College Road South	208	52	60	944	0.220	207	198	0.2	0.3	4.886	A
4 - Apollo Drive	69	17	212	855	0.081	69	55	0.1	0.1	4.580	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	287	72	19	957	0.300	287	326	0.3	0.4	5.366	A
2 - Site Access	26	6	290	656	0.039	26	15	0.0	0.0	5.713	A
3 - College Road South	254	64	73	935	0.272	254	243	0.3	0.4	5.280	A
4 - Apollo Drive	85	21	260	826	0.103	85	67	0.1	0.1	4.856	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	287	72	19	957	0.300	287	326	0.4	0.4	5.372	A
2 - Site Access	26	6	291	655	0.039	26	15	0.0	0.0	5.715	A
3 - College Road South	254	64	73	935	0.272	254	243	0.4	0.4	5.284	A
4 - Apollo Drive	85	21	260	826	0.103	85	67	0.1	0.1	4.857	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	234	59	15	959	0.244	235	267	0.4	0.3	4.974	A
2 - Site Access	21	5	238	688	0.030	21	12	0.0	0.0	5.396	A
3 - College Road South	208	52	60	944	0.220	208	199	0.4	0.3	4.896	A
4 - Apollo Drive	69	17	213	855	0.081	69	55	0.1	0.1	4.585	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	196	49	13	961	0.204	197	223	0.3	0.3	4.715	A
2 - Site Access	18	4	199	712	0.025	18	10	0.0	0.0	5.181	A
3 - College Road South	174	43	50	950	0.183	174	167	0.3	0.2	4.642	A
4 - Apollo Drive	58	14	178	876	0.066	58	46	0.1	0.1	4.403	A

2022 BASE+DEV, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 84% of the total flow for the roundabout for one or more time segments][Arms 1 and 4 have 78% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.44	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	2022 BASE+DEV	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	327	100.000
2 - Site Access		ONE HOUR	✓	9	100.000
3 - College Road South		ONE HOUR	✓	100	100.000
4 - Apollo Drive		ONE HOUR	✓	67	100.000

Origin-Destination Data

Demand (Veh/hr)

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	14	232	81
	2 - Site Access	7	0	2	0
	3 - College Road South	91	4	0	5
	4 - Apollo Drive	62	0	5	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.37	5.97	0.6	A	300	450
2 - Site Access	0.02	5.92	0.0	A	8	12
3 - College Road South	0.12	4.44	0.1	A	92	137
4 - Apollo Drive	0.08	4.27	0.1	A	61	92

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	246	62	7	964	0.255	245	120	0.0	0.3	4.994	A
2 - Site Access	7	2	238	688	0.010	7	13	0.0	0.0	5.284	A
3 - College Road South	75	19	66	940	0.080	75	179	0.0	0.1	4.158	A
4 - Apollo Drive	50	13	76	938	0.054	50	64	0.0	0.1	4.054	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	294	73	8	963	0.305	293	144	0.3	0.4	5.371	A
2 - Site Access	8	2	286	659	0.012	8	16	0.0	0.0	5.534	A
3 - College Road South	90	22	79	932	0.096	90	215	0.1	0.1	4.276	A
4 - Apollo Drive	60	15	92	929	0.065	60	77	0.1	0.1	4.144	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	360	90	10	962	0.374	359	176	0.4	0.6	5.962	A
2 - Site Access	10	2	350	619	0.016	10	19	0.0	0.0	5.912	A
3 - College Road South	110	27	97	920	0.119	110	263	0.1	0.1	4.441	A
4 - Apollo Drive	74	18	112	916	0.081	74	95	0.1	0.1	4.273	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	360	90	10	962	0.374	360	176	0.6	0.6	5.974	A
2 - Site Access	10	2	350	618	0.016	10	19	0.0	0.0	5.915	A
3 - College Road South	110	27	97	920	0.119	110	263	0.1	0.1	4.442	A
4 - Apollo Drive	74	18	112	916	0.081	74	95	0.1	0.1	4.273	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	294	73	8	963	0.305	294	144	0.6	0.4	5.385	A
2 - Site Access	8	2	286	658	0.012	8	16	0.0	0.0	5.541	A
3 - College Road South	90	22	79	931	0.096	90	215	0.1	0.1	4.279	A
4 - Apollo Drive	60	15	92	929	0.065	60	77	0.1	0.1	4.147	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	246	62	7	964	0.255	246	121	0.4	0.3	5.017	A
2 - Site Access	7	2	240	687	0.010	7	13	0.0	0.0	5.292	A
3 - College Road South	75	19	66	940	0.080	75	180	0.1	0.1	4.165	A
4 - Apollo Drive	50	13	77	938	0.054	50	65	0.1	0.1	4.059	A

2027 BASE, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 86% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.25	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	2027 BASE	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	262	100.000
2 - Site Access		ONE HOUR	✓	0	100.000
3 - College Road South		ONE HOUR	✓	239	100.000
4 - Apollo Drive		ONE HOUR	✓	81	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	0	212	50
	2 - Site Access	0	0	0	0
	3 - College Road South	225	0	0	14
	4 - Apollo Drive	66	0	15	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.30	5.37	0.4	A	240	360
2 - Site Access	0.00	0.00	0.0	A	0	0

3 - College Road South	0.28	5.26	0.4	A	219	329
4 - Apollo Drive	0.11	4.83	0.1	A	74	111

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	197	49	11	962	0.205	196	218	0.0	0.3	4.697	A
2 - Site Access	0	0	207	707	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	180	45	38	958	0.188	179	169	0.0	0.2	4.618	A
4 - Apollo Drive	61	15	169	882	0.069	60	48	0.0	0.1	4.383	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	235	59	13	960	0.245	235	261	0.3	0.3	4.963	A
2 - Site Access	0	0	248	682	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	215	54	45	953	0.225	214	203	0.2	0.3	4.873	A
4 - Apollo Drive	72	18	202	861	0.084	72	57	0.1	0.1	4.564	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	288	72	16	959	0.301	288	320	0.3	0.4	5.363	A
2 - Site Access	0	0	304	647	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	263	66	55	947	0.278	262	249	0.3	0.4	5.260	A
4 - Apollo Drive	89	22	248	833	0.107	89	70	0.1	0.1	4.833	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	288	72	16	959	0.301	288	320	0.4	0.4	5.370	A
2 - Site Access	0	0	304	647	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	263	66	55	947	0.278	263	249	0.4	0.4	5.265	A
4 - Apollo Drive	89	22	248	833	0.107	89	70	0.1	0.1	4.835	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	235	59	13	960	0.245	236	262	0.4	0.3	4.972	A
2 - Site Access	0	0	249	681	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	215	54	45	953	0.225	215	204	0.4	0.3	4.880	A
4 - Apollo Drive	72	18	203	861	0.084	73	58	0.1	0.1	4.567	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	197	49	11	962	0.205	197	219	0.3	0.3	4.713	A
2 - Site Access	0	0	208	706	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	180	45	38	958	0.188	180	171	0.3	0.2	4.630	A
4 - Apollo Drive	61	15	170	881	0.069	61	48	0.1	0.1	4.389	A

2027 BASE, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 85% of the total flow for the roundabout for one or more time segments][Arms 1 and 4 have 79% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.41	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	2027 BASE	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	327	100.000
2 - Site Access		ONE HOUR	✓	0	100.000
3 - College Road South		ONE HOUR	✓	100	100.000
4 - Apollo Drive		ONE HOUR	✓	70	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	0	242	85
	2 - Site Access	0	0	0	0
	3 - College Road South	95	0	0	5
	4 - Apollo Drive	65	0	5	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.37	5.95	0.6	A	300	450
2 - Site Access	0.00	0.00	0.0	A	0	0
3 - College Road South	0.12	4.43	0.1	A	92	138
4 - Apollo Drive	0.08	4.27	0.1	A	64	96

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	246	62	4	966	0.255	245	120	0.0	0.3	4.984	A
2 - Site Access	0	0	249	681	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	76	19	63	941	0.080	75	185	0.0	0.1	4.153	A
4 - Apollo Drive	53	13	71	941	0.056	52	67	0.0	0.1	4.050	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	294	74	5	965	0.305	294	144	0.3	0.4	5.358	A
2 - Site Access	0	0	298	651	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	90	23	76	933	0.097	90	222	0.1	0.1	4.268	A
4 - Apollo Drive	63	16	85	932	0.068	63	81	0.1	0.1	4.140	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	360	90	6	965	0.373	360	176	0.4	0.6	5.942	A
2 - Site Access	0	0	365	609	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	110	28	93	923	0.120	110	272	0.1	0.1	4.431	A
4 - Apollo Drive	77	19	105	921	0.084	77	99	0.1	0.1	4.267	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	360	90	6	965	0.373	360	176	0.6	0.6	5.954	A
2 - Site Access	0	0	366	609	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	110	28	93	923	0.120	110	273	0.1	0.1	4.432	A
4 - Apollo Drive	77	19	105	921	0.084	77	99	0.1	0.1	4.267	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	294	74	5	965	0.305	295	144	0.6	0.4	5.372	A
2 - Site Access	0	0	299	650	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	90	23	76	933	0.097	90	223	0.1	0.1	4.270	A
4 - Apollo Drive	63	16	86	932	0.068	63	81	0.1	0.1	4.142	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	246	62	4	966	0.255	247	121	0.4	0.3	5.010	A
2 - Site Access	0	0	251	680	0.000	0	0	0.0	0.0	0.000	A
3 - College Road South	76	19	64	941	0.080	76	187	0.1	0.1	4.160	A
4 - Apollo Drive	53	13	72	941	0.056	53	68	0.1	0.1	4.053	A

2027 BASE+DEV, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 83% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.39	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D7	2027 BASE+DEV	AM	ONE HOUR	07:45	09:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	273	100.000
2 - Site Access		ONE HOUR	✓	23	100.000
3 - College Road South		ONE HOUR	✓	242	100.000
4 - Apollo Drive		ONE HOUR	✓	81	100.000

Origin-Destination Data

Demand (Veh/hr)

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	11	212	50
	2 - Site Access	18	0	5	0
	3 - College Road South	225	3	0	14
	4 - Apollo Drive	66	0	15	0

Vehicle Mix

Heavy Vehicle Percentages

From	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.31	5.48	0.5	A	250	375
2 - Site Access	0.04	5.79	0.0	A	21	32
3 - College Road South	0.28	5.39	0.4	A	222	333
4 - Apollo Drive	0.11	4.93	0.1	A	74	111

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	205	51	13	960	0.214	204	232	0.0	0.3	4.753	A
2 - Site Access	18	4	207	707	0.025	17	10	0.0	0.0	5.218	A
3 - College Road South	182	45	51	949	0.192	181	173	0.0	0.2	4.681	A
4 - Apollo Drive	61	15	184	872	0.070	60	48	0.0	0.1	4.435	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	245	61	16	959	0.256	245	278	0.3	0.3	5.039	A
2 - Site Access	21	5	248	682	0.031	21	12	0.0	0.0	5.447	A
3 - College Road South	217	54	62	943	0.230	217	208	0.2	0.3	4.960	A
4 - Apollo Drive	72	18	221	850	0.085	72	57	0.1	0.1	4.632	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	300	75	19	957	0.314	300	340	0.3	0.5	5.476	A
2 - Site Access	26	6	304	647	0.040	26	15	0.0	0.0	5.791	A

3 - College Road South	266	67	75	934	0.285	266	254	0.3	0.4	5.383	A
4 - Apollo Drive	89	22	271	819	0.108	89	70	0.1	0.1	4.927	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	300	75	19	957	0.314	300	341	0.5	0.5	5.482	A
2 - Site Access	26	6	304	647	0.040	26	15	0.0	0.0	5.793	A
3 - College Road South	266	67	75	934	0.285	266	255	0.4	0.4	5.390	A
4 - Apollo Drive	89	22	271	819	0.108	89	70	0.1	0.1	4.929	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	245	61	16	959	0.256	245	279	0.5	0.3	5.051	A
2 - Site Access	21	5	249	681	0.031	21	12	0.0	0.0	5.451	A
3 - College Road South	217	54	62	943	0.231	218	208	0.4	0.3	4.970	A
4 - Apollo Drive	72	18	222	849	0.085	73	58	0.1	0.1	4.636	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	205	51	13	960	0.214	205	233	0.3	0.3	4.770	A
2 - Site Access	18	4	208	706	0.025	18	10	0.0	0.0	5.225	A
3 - College Road South	182	45	52	949	0.192	182	174	0.3	0.2	4.698	A
4 - Apollo Drive	61	15	186	871	0.070	61	48	0.1	0.1	4.443	A

2027 BASE+DEV, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Mini-roundabout		Mini-roundabout appears to have unbalanced flows and may behave like a priority junction; treat results with caution. See User Guide for details.[Arms 1 and 3 have 84% of the total flow for the roundabout for one or more time segments][Arms 1 and 4 have 78% of the total flow for the roundabout for one or more time segments]
Warning	Vehicle Mix		HV% is zero for all movements / time segments. Vehicle Mix matrix should be completed whether working in PCUs or Vehs. If HV% at the junction is genuinely zero, please ignore this warning.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	untitled	Mini-roundabout		1, 2, 3, 4	5.56	A

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D8	2027 BASE+DEV	PM	ONE HOUR	16:45	18:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - College Road North		ONE HOUR	✓	341	100.000
2 - Site Access		ONE HOUR	✓	9	100.000
3 - College Road South		ONE HOUR	✓	104	100.000
4 - Apollo Drive		ONE HOUR	✓	70	100.000

Origin-Destination Data

Demand (Veh/hr)

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	14	242	85
	2 - Site Access	7	0	2	0
	3 - College Road South	95	4	0	5
	4 - Apollo Drive	65	0	5	0

Vehicle Mix

Heavy Vehicle Percentages

	To				
		1 - College Road North	2 - Site Access	3 - College Road South	4 - Apollo Drive
From	1 - College Road North	0	0	0	0
	2 - Site Access	0	0	0	0
	3 - College Road South	0	0	0	0
	4 - Apollo Drive	0	0	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
1 - College Road North	0.39	6.13	0.6	A	313	469
2 - Site Access	0.02	6.01	0.0	A	8	12
3 - College Road South	0.12	4.48	0.1	A	96	143
4 - Apollo Drive	0.08	4.30	0.1	A	64	96

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	257	64	7	964	0.266	255	125	0.0	0.4	5.068	A
2 - Site Access	7	2	249	681	0.010	7	13	0.0	0.0	5.336	A
3 - College Road South	78	20	69	938	0.084	78	187	0.0	0.1	4.183	A
4 - Apollo Drive	53	13	79	936	0.056	52	67	0.0	0.1	4.073	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	307	77	8	963	0.318	306	150	0.4	0.5	5.474	A

2 - Site Access	8	2	298	651	0.013	8	16	0.0	0.0	5.603	A
3 - College Road South	94	23	82	929	0.101	94	224	0.1	0.1	4.306	A
4 - Apollo Drive	63	16	95	926	0.068	63	81	0.1	0.1	4.168	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	375	94	10	962	0.390	375	184	0.5	0.6	6.118	A
2 - Site Access	10	2	365	609	0.016	10	19	0.0	0.0	6.008	A
3 - College Road South	115	29	101	918	0.125	115	274	0.1	0.1	4.482	A
4 - Apollo Drive	77	19	117	913	0.084	77	99	0.1	0.1	4.304	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	375	94	10	962	0.390	375	184	0.6	0.6	6.134	A
2 - Site Access	10	2	366	609	0.016	10	19	0.0	0.0	6.012	A
3 - College Road South	115	29	101	918	0.125	115	275	0.1	0.1	4.482	A
4 - Apollo Drive	77	19	117	913	0.084	77	99	0.1	0.1	4.304	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	307	77	8	963	0.318	307	150	0.6	0.5	5.493	A
2 - Site Access	8	2	299	650	0.013	8	16	0.0	0.0	5.611	A
3 - College Road South	94	23	83	929	0.101	94	225	0.1	0.1	4.308	A
4 - Apollo Drive	63	16	95	926	0.068	63	81	0.1	0.1	4.170	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - College Road North	257	64	7	964	0.266	257	126	0.5	0.4	5.096	A
2 - Site Access	7	2	251	680	0.010	7	13	0.0	0.0	5.345	A
3 - College Road South	78	20	69	938	0.084	78	188	0.1	0.1	4.189	A
4 - Apollo Drive	53	13	80	936	0.056	53	68	0.1	0.1	4.076	A