



Technical Note

East Hill, Medway

22-079-003 Rev A

Condition 35 – Transport Summary Note

March 2023

Rev	Issue Purpose	Author	Checked	Reviewed	Approved	Date
-	Draft	SW	CG	AT	JW	29/03/2023
A	Issue	SW	CG	AT	JW	30/03/2023

1 Introduction

- 1.1.1 This note has been produced by C&A Consulting Engineers Ltd (C&A), as instructed jointly by F D Attwood and Partners and Taylor Wimpey, in relation to the consented development at Land at East Hill, Medway.
- 1.1.2 The proposed development at East Hill comprises of up to 800 residential dwellings with a primary school, supporting retail space of up to 150sqm and a community or nursery facility with an associated road link between North Dane Way and Pear Tree Lane. The scheme was granted outline planning consent (app ref: MC/19/0765) at appeal in February 2022.
- 1.1.3 The consented development incorporates new highway infrastructure in the form of a link road between North Dane Way and Pear Tree Lane. Following approval of a non-material amendment application ((NMA) ref: MC/22/2346) in November 2022, the condition relating to access (Condition 35) states the following:

“No development above slab level shall take place within any phase or sub-phase until final details of the following highway works that provide access to that phase or sub-phase have been submitted to and approved in writing by the Local Planning Authority:

Received 13 November 2020

Drawing Numbers

17-035-013 Rev A

17-035-016 Rev B Southern Roundabout Access

The development shall be implemented in accordance with the approved details prior to the first occupation of the relevant phase or sub-phase of the {sic} development that they serve or in accordance with a timetable that has previously been submitted to and approved in writing by the Local Planning Authority.”

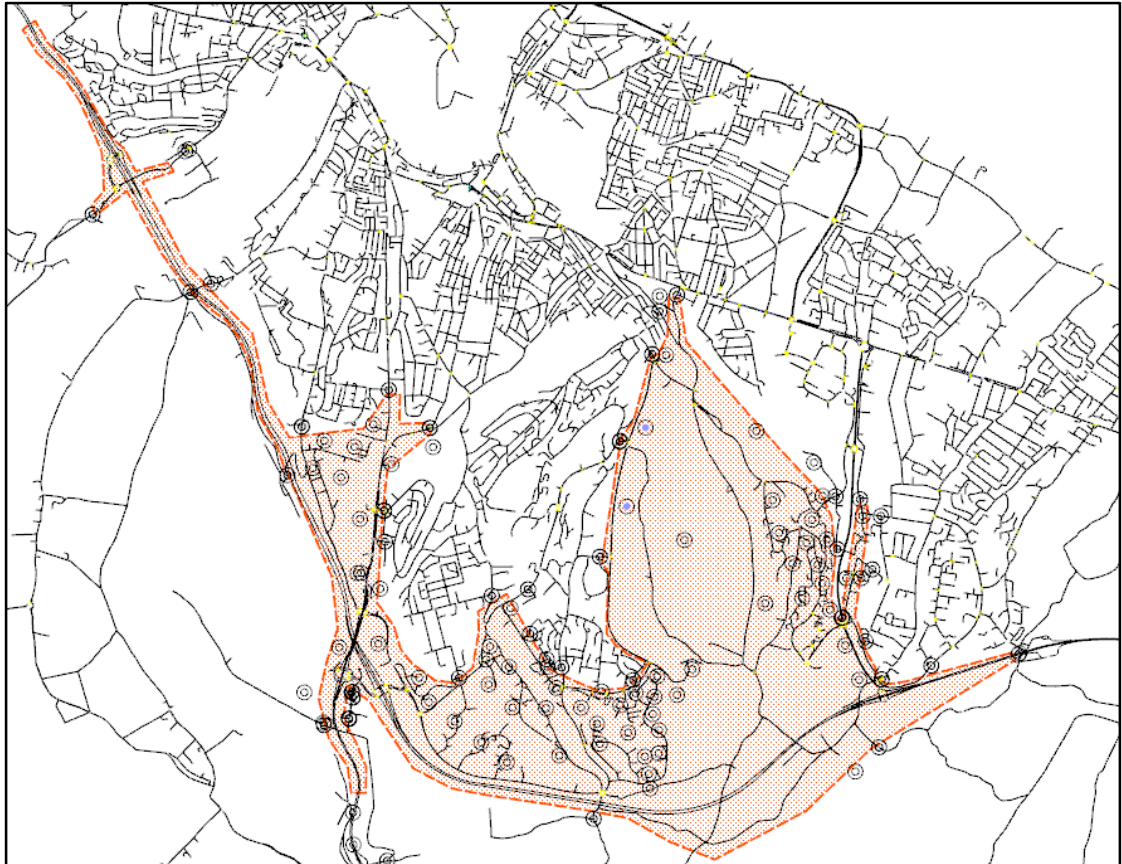
- 1.1.4 It is noted that no evidence has been provided to date to inform the occupation trigger for delivery of the link road, which has been incorporated into the planning condition relating to site access. The consented NMA wording of Condition 35 indicates some flexibility regarding this trigger subject to agreement with the LPA, which this note seeks to evidence and support.
- 1.1.5 In this context, the purpose of this note is to provide an evidence base to support a later delivery of the full link road connection between North Dane Way and Pear Tree Lane. For clarity, this does not relate to the delivery of the access junctions from Pear Tree Lane, as shown in **Drawing 17-035-013 Rev A**, but rather the northern access via North Dane Way and connection of the proposed internal link road.
- 1.1.6 This evidence is based upon a transport modelling assessment using Medway Council’s (MC’s) own transport model. The following note provides a summary of the modelling assessment undertaken and outlines the conclusions that can be drawn from it with respect to the timing of delivery of the proposed link road.

2 Modelling of Future Year Scenarios

2.1 Introduction

- 2.1.1 The Medway Aimsun Model (MAM) covers the whole of the borough at strategic level, while a number of subnetworks are defined that can be run at a more detailed microsimulation level. As the East Hill development and the study network sit within Subnetwork 5, shown below, this was also the subnetwork used for the microsimulation assessment.

Figure 2.1: Subnetwork 5



2.1.2 The future year scenarios that were tested within the MAM are as follows:

- 2025 Reference Case – Committed developments and emerging Medway Local Plan allocation sites.
- 2025 With Development Scenario 1 – 2025 Reference Case (as above) plus 90 units in the southern parcel; and
- 2025 With Development Scenario 2 – 2025 Reference Case (as above) plus 90 units in the southern parcel plus 210 units in the northern parcel plus all off-site mitigation.

2.1.3 It should be noted that 2025 With Development Scenario 1 was developed for the purposes of supporting a separate reserved matters application (ref: MC/23/0187) and is summarised in detail in a separate report (C&A ref: 22-079-002). As such, the assessment is not wholly relevant to this current application and is only mentioned forthwith where it is appropriate to do so in the context of the modelling assessment of 2025 With Development Scenario 2.

2.2 Traffic Demand

2025 Reference Case

- 2.2.2 A 2016 base model was used for calibration and validation purposes of the MAM, while the proposed allocation sites within the emerging Medway Local Plan were incorporated into a 2037 future year horizon.
- 2.2.3 In order to build the 2025 Reference Case demand matrix, the 2016 demand flows were factored up to an estimated level for 2025 assuming a linear growth rate from the 2016 and 2032 demand matrices.
- 2.2.4 No other changes were required for the 2025 Reference Case.

Development Scenarios

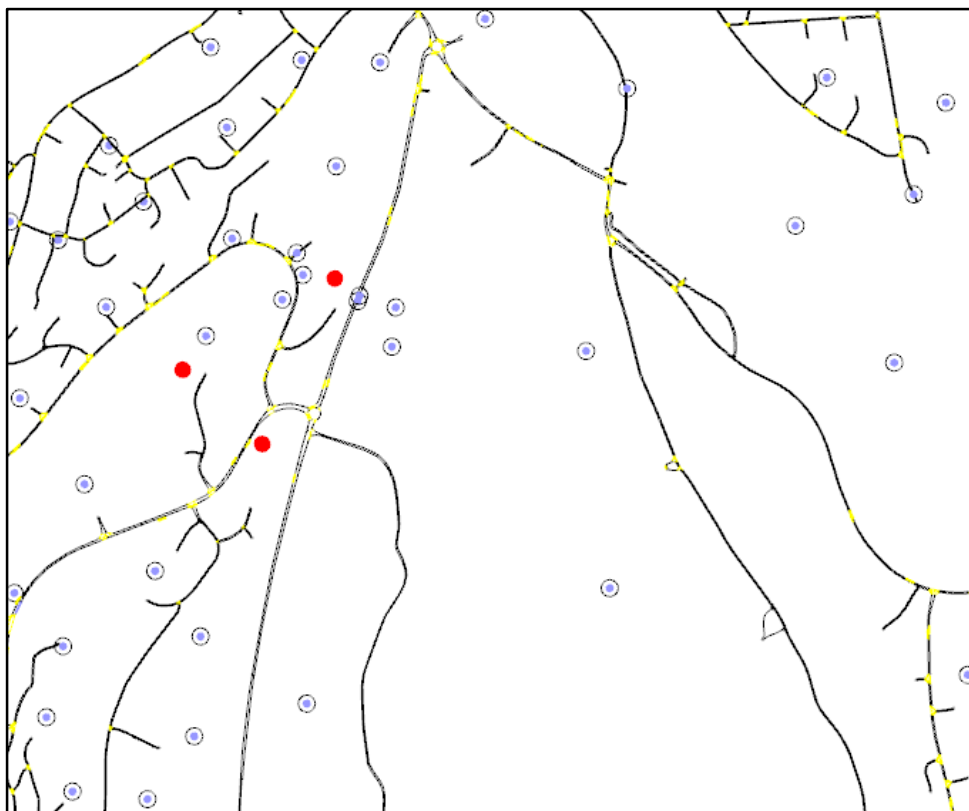
- 2.2.5 For With Development Scenario 1, 90 units have been added in the zone representing the southern parcel of the development, gaining access from a new proposed roundabout on North Dane Way. For With Development Scenario 2, an additional 210 units have been added to the zone relating to the northern parcel of the development with access onto the proposed junction at Pear Tree Lane, as shown in **Drawing 17-035-013 Rev B**, in line with the original consent.
- 2.2.6 The vehicle trip generation was carried out based on the residential trip rates outlined in the East Hill Transport Assessment. Both trip rates and associated trips are provided in **Table 2.1** below.

Table 2.1: Vehicle Trip Rates and Trip Generation

Vehicle Trip Rates and Trip Generation	AM Peak		PM Peak	
	Arrivals	Departures	Arrivals	Departures
Trip Rates	0.132	0.376	0.318	0.154
Southern Parcel Trips (90 units)	12	34	29	14
Northern Parcel Trips (210 units)	28	79	67	32

- 2.2.7 All development traffic has been distributed based on the distribution of nearby and similar zones, namely zones 442422, 442402 and 442435 as shown in **Figure 2.2** below.

Figure 2.2: Centroids for zones 442422, 442402 and 442435



2.2.8 A split between the six vehicle classes used within Aimsun was also established based on those three zones as below:

Table 2.2: Vehicle Class Split

Vehicle Class	Vehicle Type	Split %
Class 1	Micro 1 Car - HBW	33%
Class 2	Micro 2 LGV - HBW	4%
Class 3	Micro 3 Car - NHBW	14%
Class 4	Micro 4 LGV - NHBW	4%
Class 5	Micro 5 HGV - NHBW	4%
Class 6	Micro 6 Car - HBO + NHBO	36%
Class 7	Micro 7 LGV - HBO + NHBO	4%
All classes		100%

2.3 Network Coding

Reference Case

2.3.2 All geometry configurations as well as attribute overrides adopted for the 2037 Local Plan scenario were also applied to the 2025 Reference Case, and subsequently to the With Development scenarios, as there was not sufficient information for the interim 2025 year to inform those parameters.

2.3.3 Nevertheless, most of those parameters involve parts of the network that are further away from subnetwork 5 and the study area for the East Hill development, so these are not expected to affect the findings of this modelling exercise. This is even more so as this is a comparative test between the Reference Case and the 2025 With Development Scenario 2, where those parameters are kept consistent throughout.

2.3.4 Overall, no network changes were introduced into the 2025 Reference Case Scenario.

Development Scenarios

2.3.5 For Scenario 1, the North Dane Way Southern Roundabout (**Drawing 17-035-016 Rev C**) was introduced to serve as a site access for the southern parcel of the development. The rest of the network remained unchanged.

2.3.6 Scenario 2 introduced all of the proposed mitigation on the surrounding network as presented in the East Hill Transport Assessment and summarised as follows:

- Proposed mini roundabout at Princes Avenue/Prince Charles Avenue (**Drawing 17-035-029**)
- Street End Road/Luton High Street proposed mitigation (**Drawing 17-035-022 Rev A**)
- Walderslade Road/Princes Avenue proposed mitigation (**Drawing 17-035-021 Rev A**); and
- Hempstead Road proposed signalised junction (**Drawing 17-035-020 Rev A**).

2.3.7 With respect to site accesses, Scenario 2 incorporates the proposed access junction at Pear Tree Lane, as shown in **Drawing 17-035-013 Rev B**; however, this only includes part of the proposed link road. Fundamentally, access to the northern parcel via Pear Tree Lane is included within the model in line with the original consent. However, the model excludes the proposed access via North Dane Way and as such there is no ‘through road’ function from the proposed link road at this stage.

2.4 Scenario Runs

- 2.4.1 All scenarios were run at three different levels of modelling within Aimsun: Strategic Runs of the whole network (Strategic level 1), Strategic Runs at the subnetwork level (Strategic level 2) and microsimulation runs at subnetwork level.
- 2.4.2 During the strategic runs at the subnetwork level, an irregular vehicle behaviour was observed at the Lord Lees Roundabout. This involved undesirable route choice around the junction that resulted in the network locking up. This behaviour was inconsistent between the different scenarios, with more pronounced effects on the Reference Case and Scenario 1 runs, while no changes to this part of the network had been made for any of the scenarios discussed in this report.
- 2.4.3 To correct this behaviour, the Junction Delay Function (JDF) on the turn from the A229 westbound into the circulatory carriageway was adjusted to a more suitable alternative. It is worth noting that the JDF of a turn affects the calculated cost of the route and therefore its attractiveness.
- 2.4.4 This was done only for the strategic runs of the subnetwork that affects 85% to 95% (depending on the vehicle type) of the paths chosen through the network, while for the microsimulation runs that affect the remaining 5% to 15% the original JDF used to calibrate the MAM was re-established.
- 2.4.5 This allowed the network to perform more consistently and produce results without being affected by the unrealistic locking up of the Lord Less Roundabout.

3 Modelling Outputs

3.1 Overview

- 3.1.1 Three tiers of output results have been used for assessing the performance of each scenario:
1. Wider Network Strategic level outputs
 2. Subnetwork 5 overall microsimulation outputs; and
 3. Junction level outputs.
- 3.1.2 Wider network demand flows were used in order to establish the junctions that required further assessment for each scenario. The criterion used for this exercise was an increase of 30+ vehicles through a junction and/or on any one entry arm between the Reference Case scenario and the With Development scenarios.

3.1.3 Once the junctions have been identified, the model was then run at subnetwork level, first at strategic and then at microsimulation level. Overall network performance results as well as junction results from the microsimulation runs are provided below as appropriate. It is worth noting that each scenario was run in 10 iterations in microsimulation, with a degree of dynamic assignment involved, and that the microsimulation results presented below relate to the average output values resulting from those 10 runs.

3.2 Wider Network Strategic Level Outputs

3.2.1 While the wider network strategic model runs are necessary in order to run the model at the subnetwork level, it is also a suitable stage to identify those parts of the network that are expected to be impacted by the development in each scenario.

3.2.2 By applying the 30 vehicles increase threshold on the wider network, the effects on each subnetwork can be readily demonstrated, and as such, the most suitable subnetwork(s) for the next stages of modelling can be selected. The development sits within Subnetwork 5 (SN5) and thus SN5 is expected to experience most of the impact of the additional traffic.

3.2.3 **Figures 3.1-3.4** show the relative increase in flows between the Reference Case and 2025 With Development Scenario 2 for the area around Capstone Valley North and Capstone Valley South, both in the AM and PM peak periods.

3.2.4 This shows that impact of the development in Scenario 2 results in a higher increase in vehicles to the east of the Capstone Valley – something to be expected as the northern part of the development gains access to the existing network through the proposed roundabout of the Link Road (not yet complete) with Pear Tree Lane and Capstone Road.

3.2.5 In total there were 12 off-site junctions an equal or higher than 30 vehicles increase in either or both peak periods, as listed below:

1. North Dane Way/ Princes Avenue roundabout
2. North Dane Way/ Capstone Road roundabout
3. Capstone Road/ Ash Tree Lane mini-roundabout
4. Pear Tree Lane/ Dukes Meadow Drive priority junction
5. Chapel Lane/ Almond Grove priority junction
6. Chapel Lane/ Hempstead Valley Drive priority junction
7. Sharsted Way/ The Rise/ Hempstead Valley Drive roundabout
8. Wigmore Road/ Hoath Way/ Sharsted Way roundabout
9. Westfield Sole Road/ Lidsing Road/ Blind Lane priority junction
10. Walderslade Woods / Boxley Road / Lordswood Lane / Westfield Sole Rd roundabout
11. Jct3 of M2 (Taddington Rndbt); and

12. Lord Lees Roundabout.

3.2.6 As such, these junctions have been assessed in further detail later in this report to determine whether the flow increases will have a material impact on the operation of the junction. It should be noted that while an absolute threshold of 30+ vehicles has been applied, this may have a negligible impact if the junction is operating below capacity, or the proportional impact is minor.

3.3 Subnetwork 5 Overall Microsimulation Results

3.3.1 Network performance indicators from the microsimulation assessment of Subnetwork 5 for the Reference Case and Scenario 2 runs have been extracted to provide a picture of the overall performance of the network surrounding the application site. These outputs are provided in the table below.

Table 3.1: Overall Microsimulation Outputs – Reference Case vs With Dev Scenario 2

Output Metric		AM Peak			PM Peak		
		Ref	Sc2	Diff.	Ref	Sc2	Diff.
Delay Time - All	sec/km	28.27	27.43	-0.84	27.82	32.04	4.22
Flow - All	veh/h	16430.5	16588.1	157.6	17008.45	17180.3	171.85
Mean Queue - All	veh	385.02	392.6	7.58	728.66	1117.58	388.92
Mean Virtual Queue - All	veh	12.2	14.85	2.65	147.86	320.26	172.4
Speed - All	km/h	53.63	54.01	0.38	53.1	52.21	-0.89
Travel Time - All	sec/km	86.77	86.1	-0.67	85.14	89.09	3.95

3.3.2 The results indicate that the subnetwork area in the With Development Scenario 2 is forecast to operate slightly worse than in the Reference Case scenario, as would be expected; however, the relative differences between the two scenarios are minor in nature. Furthermore, in some cases the With Development Scenario 2 outputs are more positive, such as a reduction in delay time and travel time across the subnetwork in the AM peak.

3.3.3 The overall flow outputs indicate an increase in both peaks within Scenario 2 which is appropriate given the increased development on the application site when compared to the reference case. The comparative outputs for the AM peak as a whole indicate a negligible impact across the subnetwork area from the occupation of 300 units at East Hill. The outputs in the PM are slightly more pronounced with minor increases in delays and queues, however, the proportional impacts of these are still minor.

3.4 Junction Level Results

- 3.4.1 Comparative junction level outputs have been extracted for the 12 junctions identified at the wider network strategic stage, as well as for the three proposed access junctions, to determine any localised impacts arising from the delivery of 300 units on the site. The proposed access junctions are listed below:
13. Proposed Pear Tree Lane/ Capstone Road roundabout
 14. Proposed Link Road/ Capstone Road priority junction; and
 15. Proposed North Dane Way/ Princes Avenue roundabout.
- 3.4.2 Results are provided in **Tables 3.2** and **3.3** for the Scenario 2 AM and PM peaks respectively provided in **Appendix A**. The results are provided in the form of turn volume/capacity, delay and demand flows.
- 3.4.3 It should be noted that, although delay and flow outputs are taken from the microsimulation runs, the Turn volume/capacity (V/C) output is taken from the strategic level 2 runs, as it is not a metric calculated at microsimulation level within Aimsun.
- 3.4.4 The junction level micro-simulation outputs indicate that in the AM peak there are only a small number of junction approaches that are forecast to operate near to full capacity in 2025, with only arm 2 of M2 J3 (Taddington roundabout) forecast to operate just over capacity. The relative differences in volume/capacity between the reference case and With Development Scenario 2 on these movements is minor, being typically 2% or less. Furthermore, the delay outputs from the microsimulation model indicate negligible differences (less than 2 seconds) on nearly all assessed junction approaches.
- 3.4.5 In the PM peak (**Table 3.3**), again there are only a limited number of junction approaches that are forecast to operate at or near to full capacity in 2025. These largely occur, as with the AM peak, at M2 J3, but also at the Hoath Way/Sharsted Way junction. However, looking at the relative impact between the reference case and With Development Scenario 2, these are again typically minor in terms of volume/capacity and delays.
- 3.4.6 Furthermore, it should be noted that the two junctions identified above to be operating approaching or over full capacity on some approaches would be further mitigated by a current application site at Gibraltar Farm, Medway. The MAM incorporates a planning consent at this site, however, the current application scheme proposes an alternative access strategy via Ham Lane that would reduce the traffic impacts at M2 J3 compared to the consented scheme which is accessed via North Dane Way. In addition, the current application at Gibraltar farm also proposes an improvement scheme at the Hoath Way/Sharsted Way junction which would reduce the potential impacts at this junction when implemented.

- 3.4.7 The three proposed access junctions are forecast to operate comfortably within capacity in the 2025 With Development Scenario 2.
- 3.4.8 From a holistic view of network operation in the interim scenario, it is considered that the impact of 300 occupations on Land at East Hill in advance of the completion of the link road would range from minor to negligible. As such the impact would not be severe in the context of prevailing policy in the National Planning Policy Framework (NPPF).

4 Summary and Conclusions

- 4.1.1 This note has been prepared in relation to the consented development at Land at East Hill, Medway. The proposed development at East Hill comprises of up to 800 residential dwellings with a primary school, supporting retail space of up to 150sqm and a community or nursery facility with an associated road link between North Dane Way and Pear Tree Lane.
- 4.1.2 The purpose of this note is to provide an evidence base to support a later delivery of the full link road connection between North Dane Way and Pear Tree Lane.
- 4.1.3 A modelling exercise has been undertaken, with the use of the Medway Aimsun Model (MAM) to evidence the traffic impacts of 300 occupations on the site in advance of the committed link road but including all off-site highway mitigation. The MAM was run at both strategic and microsimulation levels in order to assess the 2025 With Development Scenario 2 against a 2025 Reference Case Scenario.
- 4.1.4 The 2016 Base model Demand was factored up to form a 2025 Reference Case. The With Development Scenario 2 introduced 90 units to the south parcel of the development and 210 units in the northern parcel, together with the proposed site access junctions from Pear Tree Lane.
- 4.1.5 Flow difference plots between the Reference Case and the With Development Scenario 2 have been provided at strategic level for the wider network so as to identify the junctions that are expected to experience an increase of 30+ vehicles on any one arm and/or through the junction as a whole. This exercise established that there were 12 junctions on the surrounding network would observe an increase in flows of 30+ vehicles, which have been reviewed in more detail at the microsimulation level of the model to determine whether these increases will result in a material impact locally.

- 4.1.6 Network performance indicators were extracted from the microsimulation level of the model for Subnetwork 5, which encompasses the development site and the surrounding network. These show only marginal changes in flow, travel time, delays and queueing across the subnetwork 5 area as a whole, indicating the occupation of 300 units at the site in advance of the link road would have only a minor impact.
- 4.1.7 Junction level outputs indicate that the vast majority of junctions impacted by the occupation of 300 units on the site would continue to operate within capacity in 2025 during highway peak periods. Only a limited number of junction approaches are forecast to operate at or near to full capacity in 2025 – in particular at M2 J3 and the Hoath Way/Sharsted Way roundabout. However, it should be noted that the relative impact of the 300 units at East Hill are typically minor in terms of increase in volume/capacity and delays.
- 4.1.8 In conclusion, it is considered that the modelling undertaken in Medway Council's MAM demonstrates that the occupation of 300 units at the application site in advance of the completion of the link road would, at worst, have a minor and therefore non-severe impact on the surrounding highway network.

Drawings



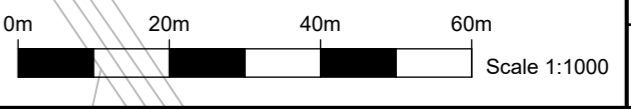
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A	Footway continued to North of Capstone Road	DN	SR	SW	Nov 20
Rev	Amendments	DN	SR	SW	Date

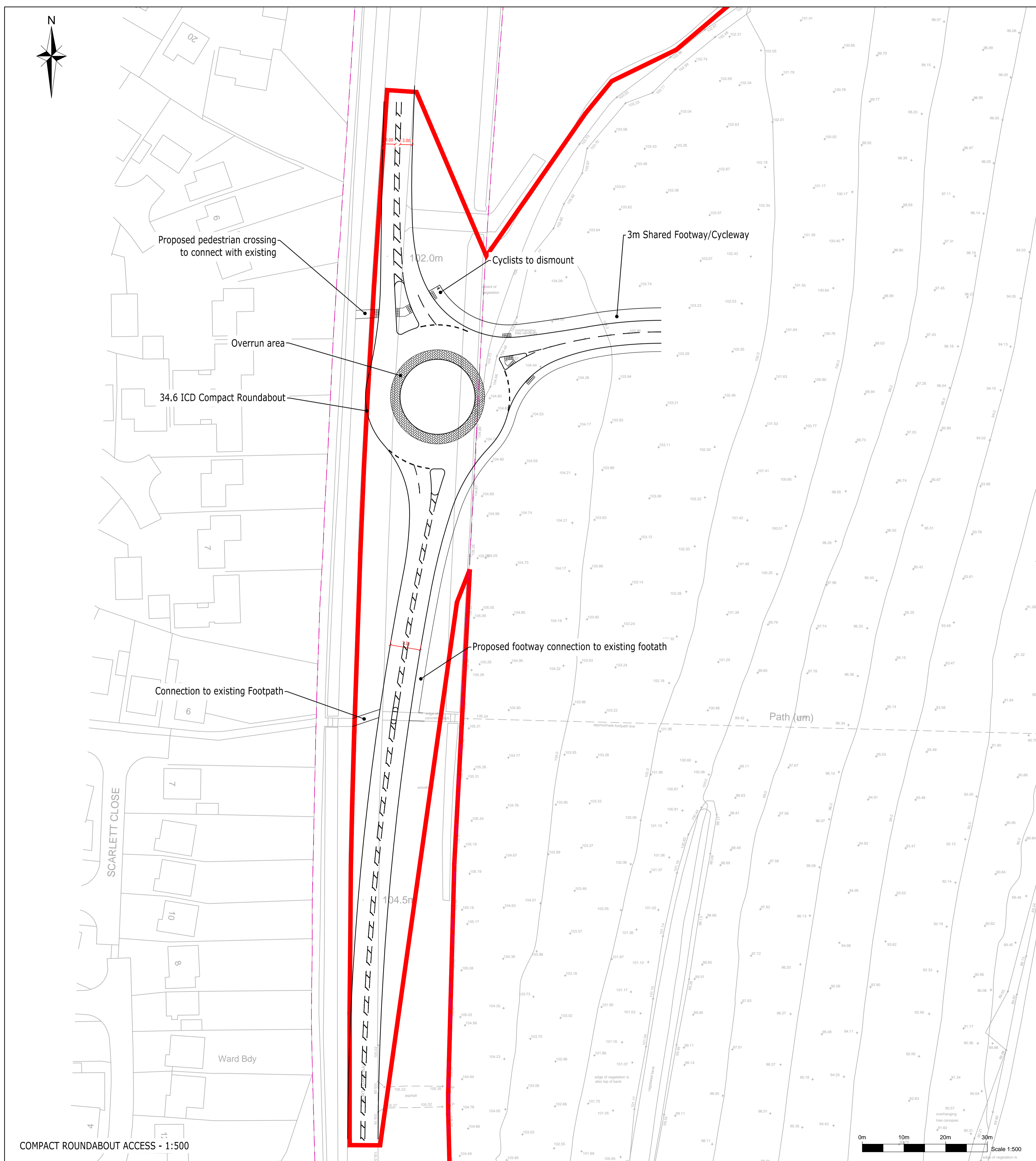
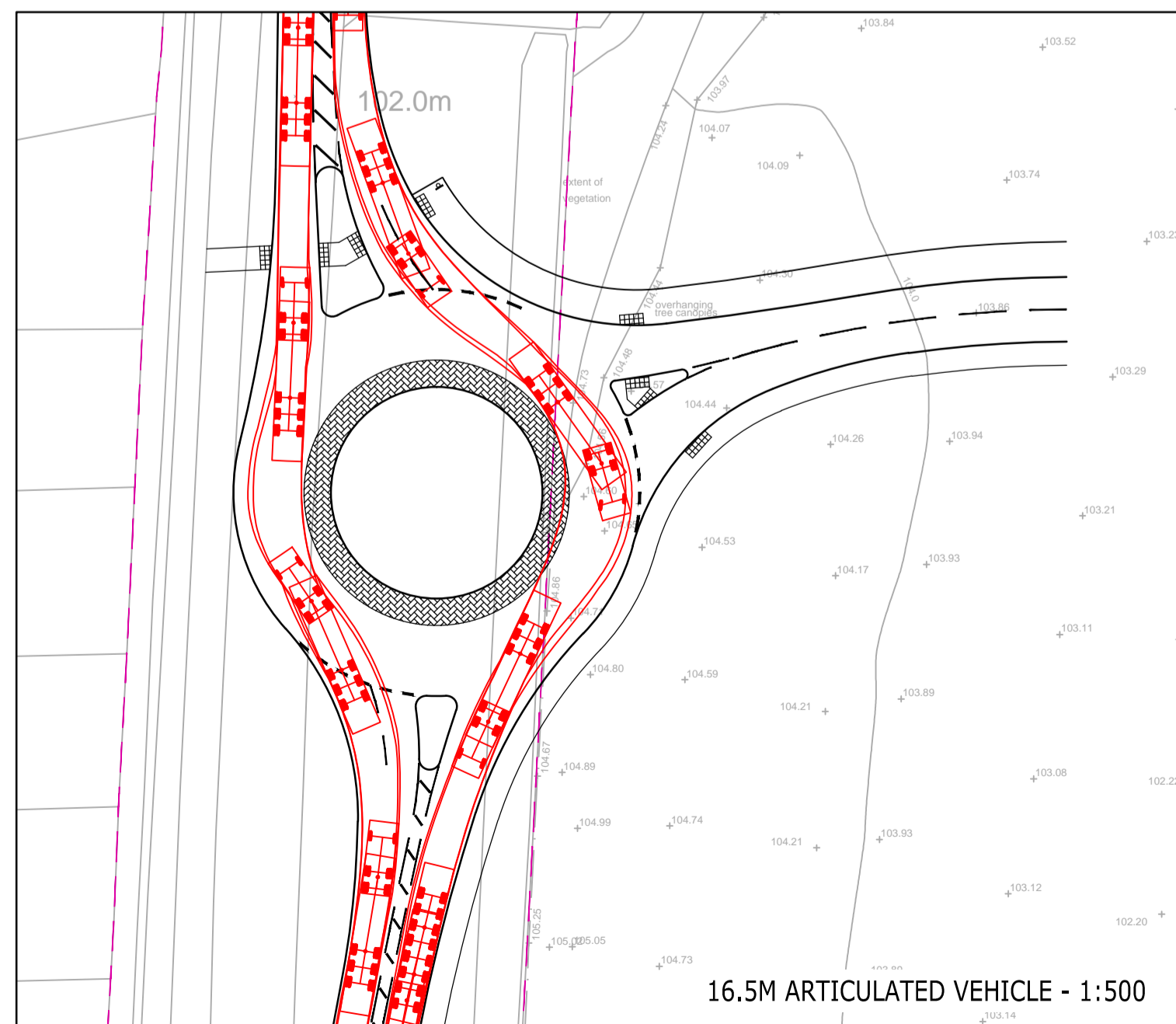
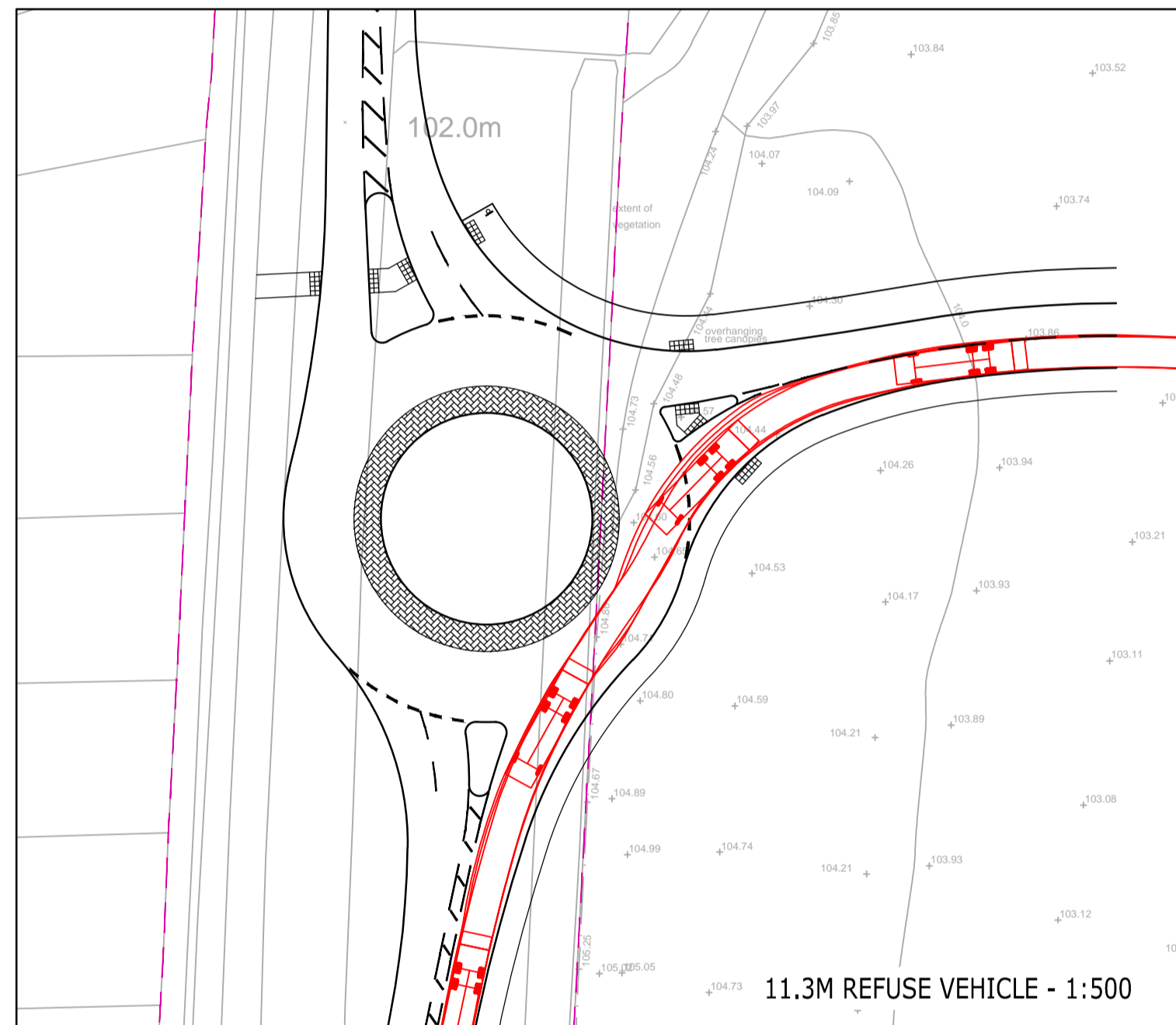
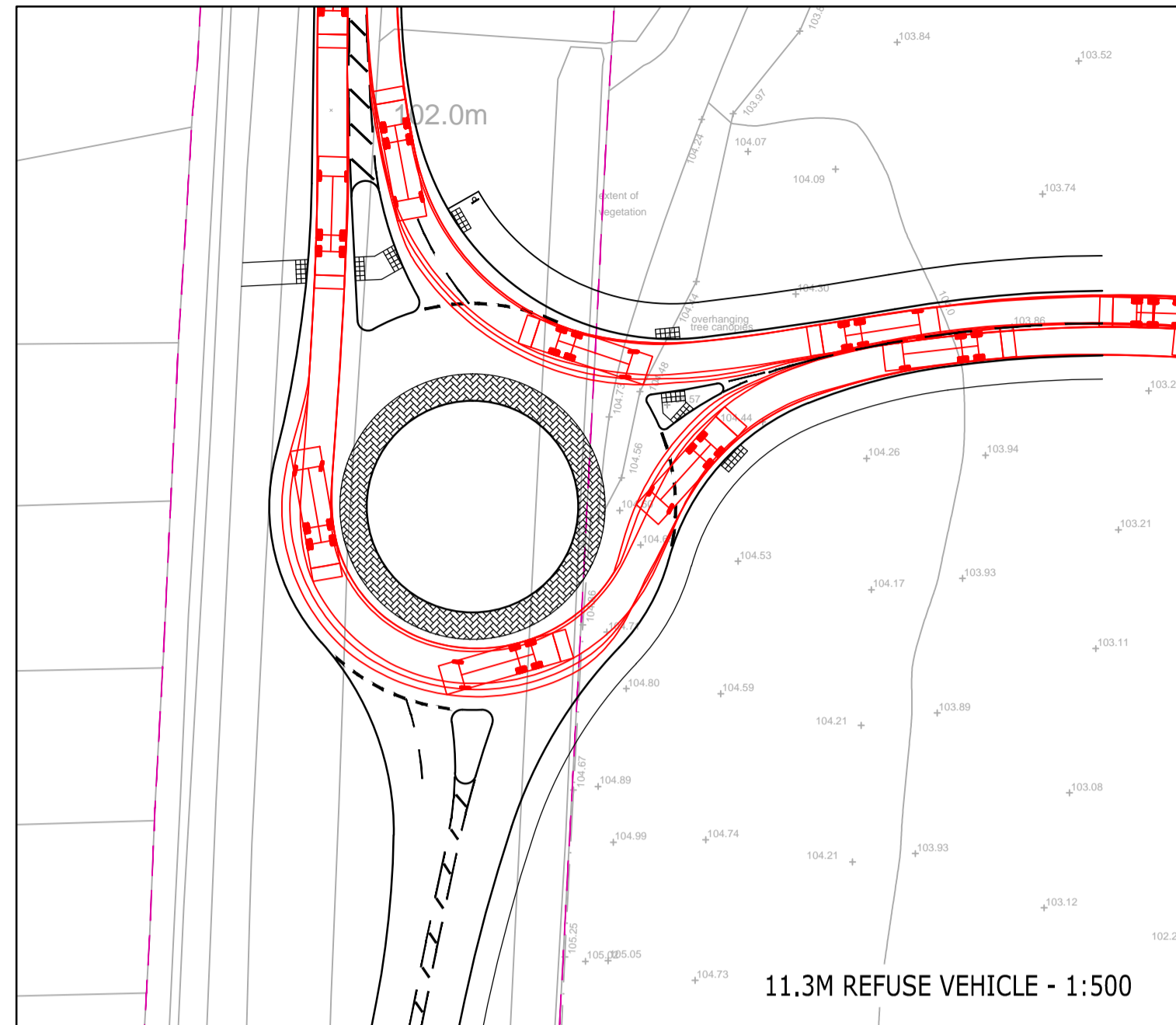
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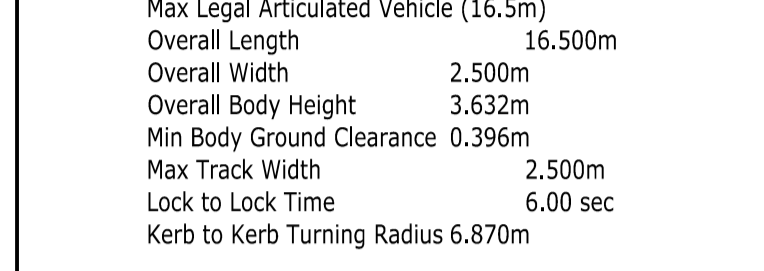
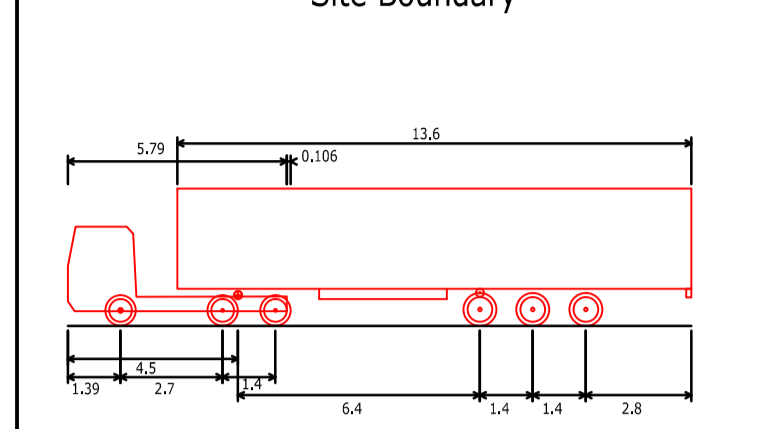
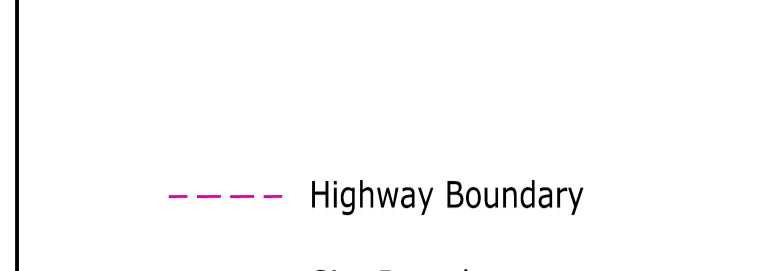
2, Andrew Street
 Hove, Brighton
 BN1 1UG
 Tel: 01323 686000
 Email: info@ca.co.uk
 www.ca.co.uk

Job Title		
Hempstead Valley, Medway		
Drawing Title		
Link road and site roundabouts		
Client		
Hume Planning Consultancy		
Scale	Date	Designed
1:1,000	Nov 19	GPW
Drawn	Checked	Approved
GPW	JW	JW
Job No	Drawing No	Rev
17-035	17-035/013	B

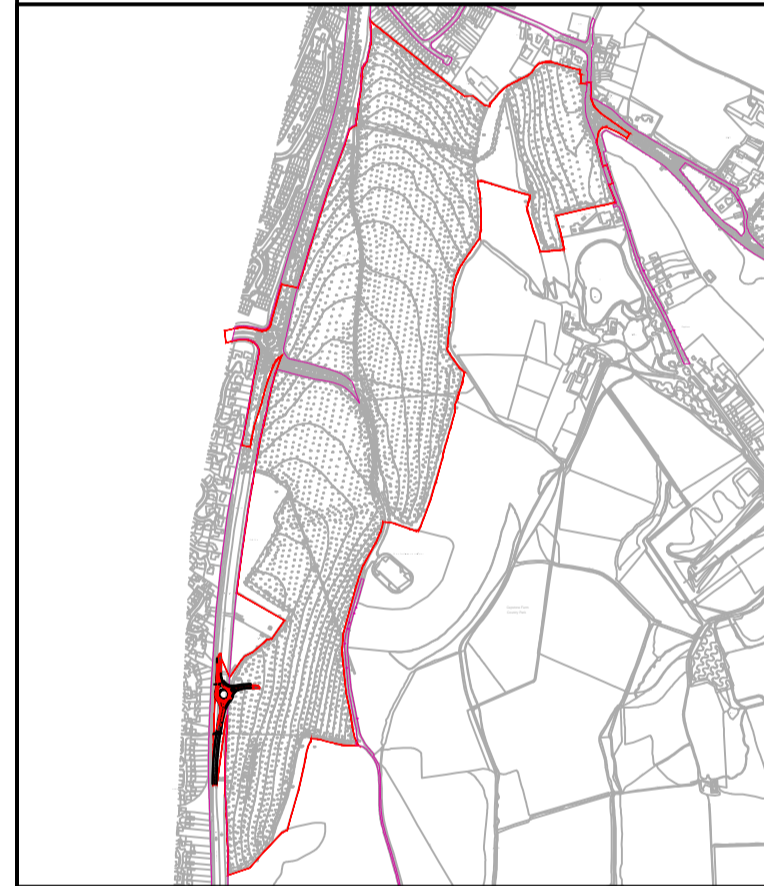




NOTES



Key Plan - 1:15k



C	Draft stamp removed & Scale Bar added	DH	SW	Jun 21	
B	Footways & Cycleways added	DH	SW	Oct 20	
A	Eastern arm amended to tie into masterplan	DH	SW	Mar 19	
Rev	Amendments	Dm	Chk	App	Date

Charles & Associates

Issued by

Landmark Home Station Road
Book Hampshire RG27 9HA
01256 63620

Park House Park Farm
East Milling Trust Estate
Bridport Lane
Aylesford Kent
ME20 6SN
01752 448120

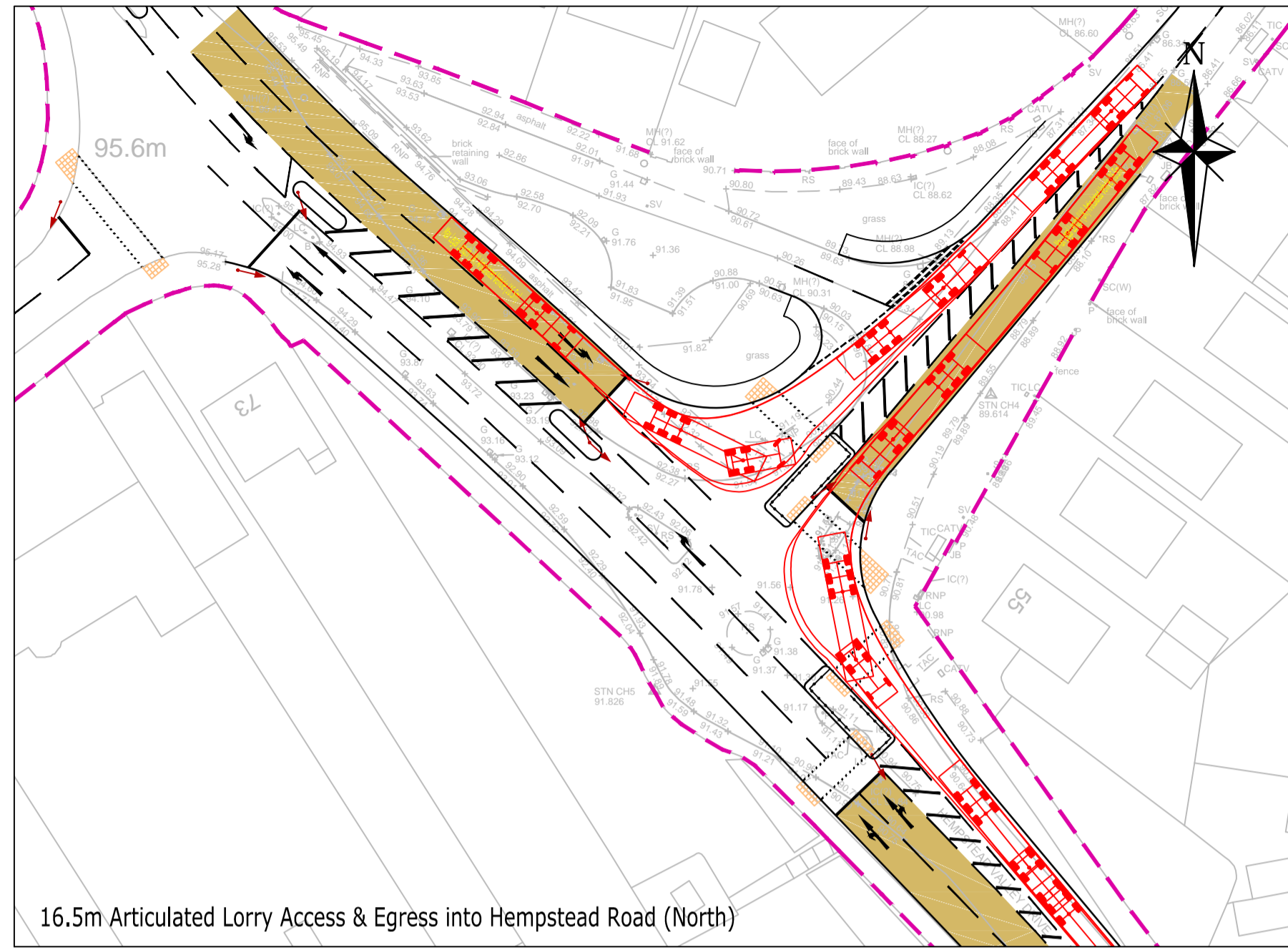
enquiries@c-a.uk.com
www.c-a.uk.com

Hempstead Valley, Medway

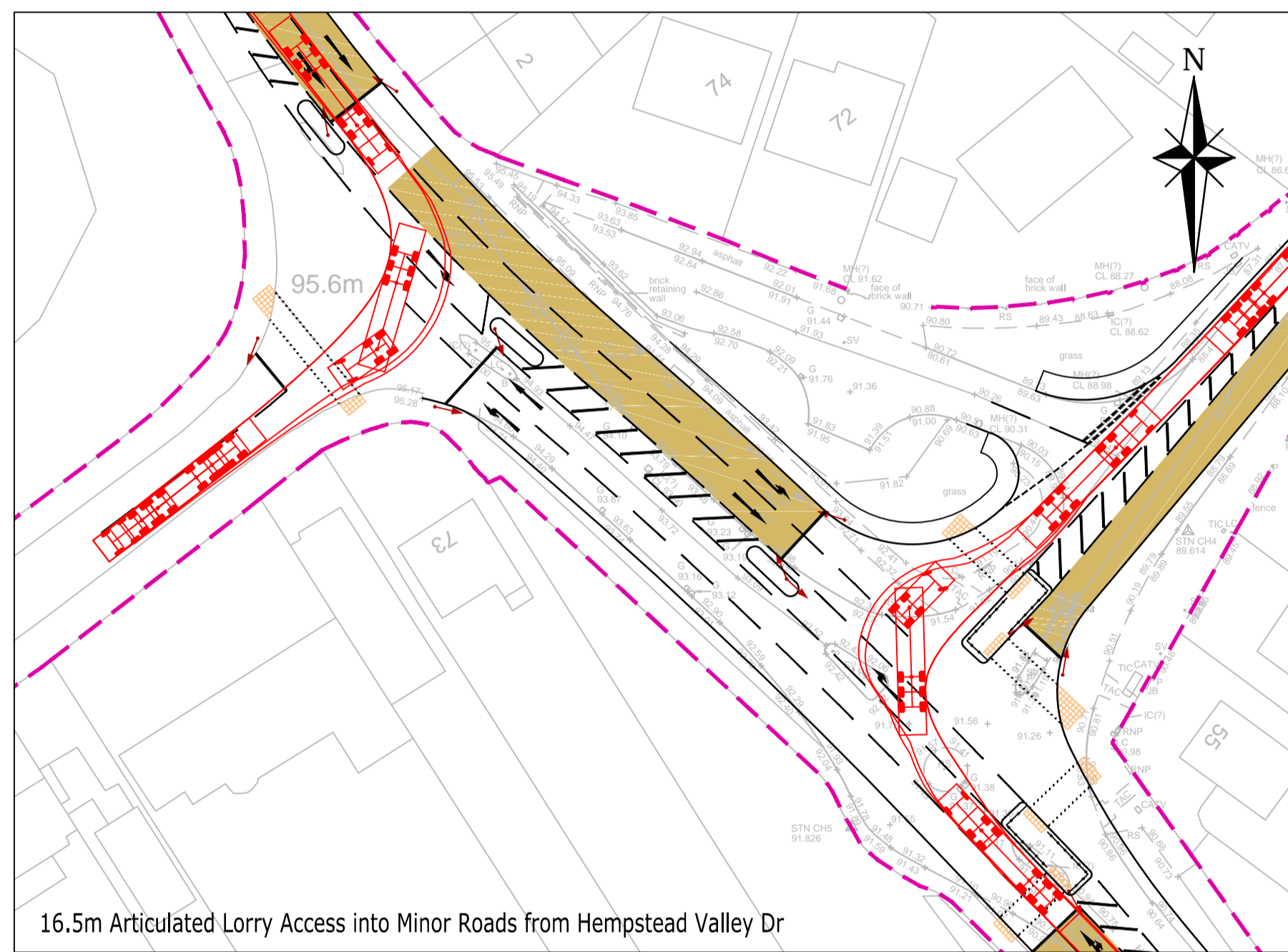
Southern Roundabout Access

Hume Planning Consultancy

Scale	1:500	Date	Feb 19	Designed	DH
Drawn	DH	Checked	SW	Approved	JW
Job No	17-035	Drawing No	17-035-016	Rev	C



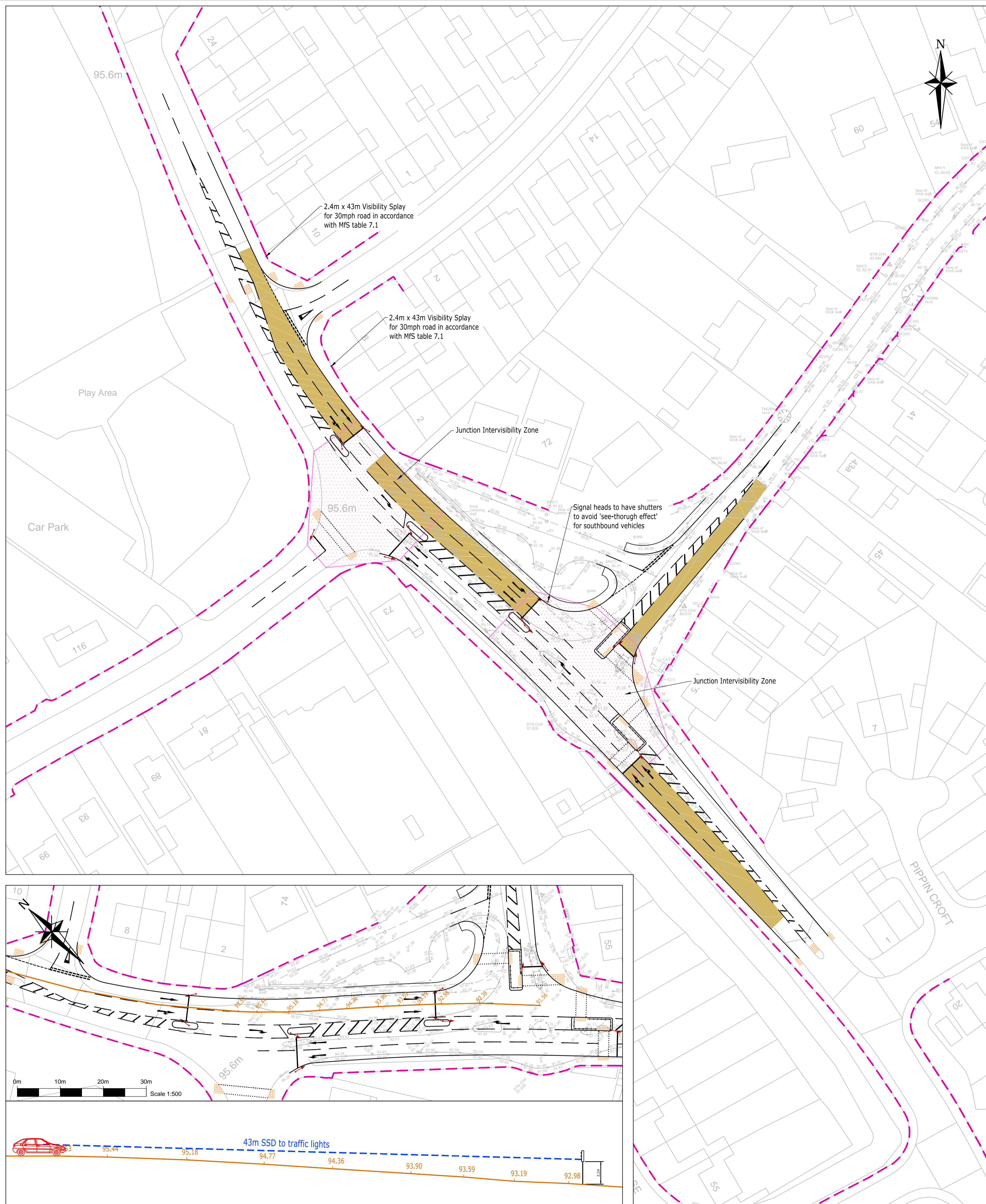
16.5m Articulated Lorry Access & Egress into Hempstead Road (North)



16.5m Articulated Lorry Access into Minor Roads from Hempstead Valley Dr

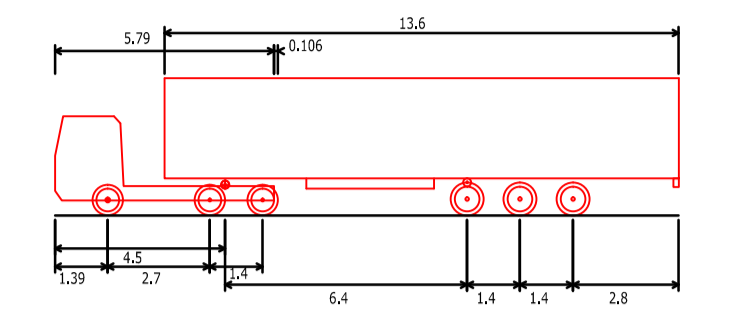


16.5m Articulated Lorry Access & Egress using Minor Roads



NOTES

- - - Highway Boundary
- High Friction Surfacing



- Max Legal Articulated Vehicle (16.5m)
- Overall Length 16.500m
- Overall Width 2.500m
- Overall Body Height 3.632m
- Min Body Ground Clearance 0.396m
- Max Track Width 2.500m
- Lock to Lock Time 6.00 sec
- Kerb to Kerb Turning Radius 6.870m

DRAFT

A	SSD check & anti skid surfacing added	DH	SW	Nov 20
Rev	Amendments	Dm	Chk	App
				Date

Charles & Associates

Issued by: Park House, Park Farm, East Malling Trust Estate, Bowdrene Lane, Aylesford, Kent ME20 6SN, 01732 448120

Landmark House, Station Road, Hampshire, RG27 9HA, 01256 436428, www.c-a.co.uk, enquiries@c-a.co.uk

Hempstead Valley, Medway			
Drawing Title Hempstead Road, Proposed Signalised Junction			
Client K.Attwood			
Scale 1:500 @ A1	Date Mar 19	Designed DH	
Drawn DH	Checked SW	Approved JW	
Job No 17-035	Drawing No 17-035-020	Rev A	