

**Bradley Villa, Huddersfield
A641 Bradford Road Site Access Junction and Shepherds
Thorn Lane Ped/Cycle Access**

Response Report to Road Safety Audit Stage 1

July 2022 (Final)

Prepared on behalf of

Redrow Homes (Yorkshire) Ltd, R Kershaw & S Gill

Quality Management

Bradley Villa, Farm – Response Report to Road Safety Audit Stage 1 Project No: 19154					
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Signature					
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Signature					

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1. Introduction

1.1 PROJECT DETAILS

Table 1.1 Project Details

Report title	Bradley Villa, Huddersfield A641 Bradford Road Site Access and Shepherds Thorn Lane Ped/Cycle Access Response Report to Road Safety Audit Stage 1
Date	12 th July 2022
Document reference and revision	220712 BVF Site Access Stage 1 RSA Response Report (Final)
Prepared by	Optima Highways and Transportation.
On behalf of	Kirklees Council

Table 1.2 Authorisation Sheet

Project:	Bradley Villa, Huddersfield A641 Bradford Road Site Access and Shepherds Thorn Lane Ped/Cycle Access
Report Title:	Response Report to Road Safety Audit Stage 1
Prepared by:	
Name:	Chloe Regan BSc (Hons) MTPS
Position:	Senior Transport Planner
Signed:	
Organisation:	Optima Highways & Transportation.
Date:	11 th July 2022.
Approved by:	
Name:	Adam Darwin
Position:	Group Engineer – Highway Development Management
Signed:	A Darwin
Organisation:	Kirklees Council
Date:	11 th July 2022.



1.2 OVERVIEW

1.2.1 This report provides a response to the items raised within the Road Safety Audit Stage 1 (RSA) dated June 2022 prepared by VIA Solutions which considers the proposed site access arrangements from the A641 Bradford Road and pedestrian/cycle access via Shepherds Thorn Lane.

1.2.2 The proposed works for which the Stage 1 RSA has been completed comprises:

- The proposed Bradley Villa Phase 1 site access onto the A641 Bradford Road; and
- Pedestrian/cycle access via Shepherds Thorn

1.2.3 The Stage 1 Road Safety Audit has been conducted at the request of, and on behalf of, Kirklees Council (Overseeing Organisation).

1.2.4 The Audit team was provided with the following drawings:

- **Drawing 18088/GA/01 Revision F:** shows the proposed access onto the A641 Bradford Road. It includes a 6.75m wide carriageway and 3.0m shared footway/cycleway to both sides; and
- **Drawing 18088/GA/04 Revision C:** shows the proposed pedestrian/cycle access via Shepherds Thorn Lane.

1.2.5 A copy of the Road Safety Audit Stage 1 is provided in Appendix A.

1.2.6 This RSA Response Report has been prepared by Chloe Regan BSc (Hons) who represents the Design Organisation, Optima Highways & Transportation.

1.3 KEY PERSONNEL

1.3.1 Table 1.3 below contains the details of the key personnel involved in this Stage 1 RSA; representing the Overseeing Organisation, the RSA Team and the Design Organisation.

Table 1.3 Key Personnel

Overseeing organisation	Kirklees Council
RSA Team	Lead Auditor: Eric Appleton, Via Solutions Team Member: Chris Yarrow, Via Solutions
Design Organisation	Chloe Regan BSc (Hons) MTPS Senior Transport Planner Optima Highways and Transportation

1.3.2 Chapter 2 contains the RSA decision log which references each road safety issue/problem, associated recommendation made in the Stage 1 RSA, design organisation response, overseeing organisation response and the agreed RSA action.



2. Road Safety Audit Decision Log

RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
1.7 Problem: Utility cabinet and underground services at the start of shared footway/cycleway warning paving Location – Western flank of Shepherds Thorn Lane adjacent to A6107 Bradley Road Summary – Public utilities/services apparatus at the commencement of a shared footway/cycleway where cyclists would be carrying out a sharp turn. Detail – The Audit team noted that a utility cabinet and underground services chamber is located at the start of the proposed shared footway/cycleway onto Shepherds Thorn Lane. Cyclists turning to use the lane have the potential to strike the cabinet in close proximity, especially if a pedestrian is walking at the same time. Accessing the adjacent underground services chamber may also result in cyclists utilising the proposed Shepherds Thorn Lane carriageway and conflicting with vehicles, albeit vehicular movements here would be minimal.	It is recommended that clarity is provided with regard to the existing position of both services and a detailed assessment carried out as to whether there is scope to move these services away from the start of the proposed shared use path, or the path is relocated to suit. Increase visibility/ prominence of utility cabinet (by ensuring proposed verge vegetation /grass is maintained at low level) so no blind spots are created which potentially lead to conflict points.	The RSA recommendation is accepted, and the indicative location of the utility cabinet has been shown on the drawing attached at Appendix B. A note has also been added to the drawing which confirms that the cabinet is to be moved circa 2.0m to the west at the detailed design stage.	It is agreed that the cabinet must be relocated, with the location to be determined at the detailed design stage.	The utility cabinet is to be relocated and the exact location will be determined at the detailed design stage.
2.1 Problem: Proposed Right Turn Visibility Obstructed Location – A641 Bradford Road proposed right-turn lane into Site access junction Summary – Sight line for right turning vehicles potentially obstructed by the crest of the hill and bend in the road. Detail – The vertical alignment and bend in the road towards the left obstruct visibility for drivers turning	A visibility splay assessment should be carried out (potentially including a speed survey) to establish if adequate visibility is provided. In addition, it is recommended that the orientation of the “Left Turn Only” sign be made clear on any design drawings.	The RSA recommendation is accepted and a long section drawing has been produced to confirm the level of visibility for right turning vehicles, as shown on the drawing attached at Appendix C. It was requested by the Council that an updated speed survey was undertaken along the A641	The long section drawing (19154/IN/05) indicates that a 120m sightline is available for right turning vehicles, when measured to an object height of 1.05m. However, based on further on-site observations by Kirklees HDM, it is clear that views to an approaching southbound vehicle	The drawing attached at Appendix C includes the following amendments: • Toucan crossing has been relocated to the south of the Site access out of the visibility envelope for right turning vehicles – The final



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
<i>right into the proposed site access junction. The proposed crossing facility, and pedestrians / cyclists using the same will add to the potential obstruction of vehicles approaching at high speed. This may encourage drivers to 'peep and creep' into the opposite side of the road where there is potential for collisions with southbound traffic travelling at speed. It is also noted that the proposed drawing states 'provide 'left turn only' sign' but the orientation of the sign is not clear (it would be assumed to face traffic leaving the site access.</i>		Bradford Road. The speed survey was undertaken on 17th November 2021 in wet weather conditions. The results of the survey are attached at Appendix D and the northbound (NB) and southbound (SB) 85th percentile speeds are summarised below: • NB – 35mph; • SB – 36mph; • NB adjusted – 40mph; and • SB adjusted – 41mph. Given that the speed survey was undertaken in wet weather conditions an additional 8kph has been added to the recorded 85th percentile speeds, in accordance with paragraph 3.1.1 of DMRB document CA 185 'Vehicle Speed Measurement' for dual carriageways. The survey demonstrates that vehicular speeds comply with the prevailing 40mph speed limit in place along the A641 Bradford Road (or very marginally above in the case of southbound movements), adjacent the Site access junction.	will be obscured due to the vertical alignment (crest) of the carriageway, which is exacerbated by the proposed toucan crossing (both the apparatus and waiting pedestrians/cyclists) and overgrown verge within the central reservation (on both sides of the Dorchester Road junction), with only the tops of cars/bikes being visible at the full 120m SSD. Therefore, improvements to forward visibility will need to be incorporated at the detail design stage. The toucan crossing will also need to be relocated as this is likely to have an unacceptable impact on visibility and make the waiting right turning vehicle inconspicuous to approaching southbound drivers. Measures to improve visibility and conspicuity associated with right turning vehicles must be incorporated at the detailed design stage. The following measures are suggested and should be shown indicatively on the preliminary layout as follows:	location of the crossing to be determined at the detailed design stage, with crossing located to maximise separation/stacking space from Bradley Bar Roundabout; • Verge in central reservation that is within the visibility envelope has been shown as hard surfacing; • A note has been added to the drawing setting out that street furniture/trees in central reservation either side of Dorchester Road junction, within the visibility envelope, are to be removed/relocated where possible; and • A note setting out that warning signage is to be provided and SLOW road



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
			- Toucan crossing relocated from sightline; - Verge in central reservation either side of Dorchester Road junction that is within the visibility envelope to be replaced by hard surfacing; - Street furniture/trees in central reservation either side of Dorchester Road junction that is within the visibility envelope to be removed/relocated where possible (e.g. excluding any statutory signage etc that may be necessary). - Warning signage and SLOW road markings to be provided on southbound approach (e.g. replacement of the bend ahead sign with junction on bend ahead sign). - Vertical alignment of right turn lane carriageway designed to maximum available visibility.	markings have been shown on the southbound approach. All of the above measures will assist in maximising the available visibility for right turning vehicles as part of the detailed design process.



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
3.1.1 Problem: Central Island at priority junction may encourage right turns Location – Centre of proposed site access / A641 priority junction. Summary – Proposed arrangement of give-way central island and central reservation may encourage vehicles to turn right through the right-turn lane. Detail – The proposed drawing shows the give-way central island and central reserve along A641 Bradford Road. The arrangement may encourage (and physically still allow) drivers exiting the site to illegally turn right through the adjacent right-turn lane in order to avoid having to route southbound towards the Bradley Bar Roundabout and back north again. This will result in vehicle conflict and collisions.	It is recommended that the designs of the proposed site access junction give-way central island and A641 Bradley Road central reservation are amended to make the aforementioned dangerous manoeuvre as difficult as possible.	The RSA recommendation is noted, and amendments have been made to the central reserve as shown on the drawing attached at Appendix C. The vehicle tracking drawing contained at Appendix E has also been updated to reflect the changes made.	The original layout already discourages right turn movements from the site access, through the provision of a deflection island on the minor arm, an extended central island adjacent to the right turn lane and the provision of the left turn only sign. Whilst the suggested extension of the central island would further discourage right turns from the site access, it also restricts the right turn movement into the access, which would be extremely constrained for large vehicles and this could result in overrunning of the islands. Therefore, the suggested alteration is not accepted. Due to vehicle swept path requirements on the minor arm, it does not appear possible to increase the size of the deflection island further as an alternative option. Therefore, it is instead suggested that additional left turn only text and arrow road markings are provided on the site access exit to reinforce the turning restriction at the junction.	Alterations to the design to make the right turn out of the Site access 'as difficult as possible' is not accepted. The layout already discourages right turning traffic out of the Site access and any extensions to kerb lines would be problematic for large vehicles manoeuvring into and out of the Site access. The agreed action is to provide additional left turn only text and arrow markings on the Site access to reinforce the turning restriction at the junction – as shown on the drawing attached at Appendix C.



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
3.1.2 Problem: Restricted access to adjacent property Location – No.686 Bradford Road, corner property adjacent to the proposed southern site access radius Summary – No vehicle tracking shown for driveway access and egress Detail – The drawings provided to the audit team do not show any swept paths in and out of the driveway to No.686, the property is in close proximity to the proposed give way markings and associated central island.	It is recommended that swept path analysis is carried out for access and egress into this particular driveway in order to rule out any access issues for the property.	The RSA recommendation is accepted and vehicle swept path analysis has been undertaken for a large car accessing and egressing no. 686 Bradford Road. As shown on the drawing attached at Appendix E the vehicle can enter and exit the private driveway satisfactorily.	The tracking provided does not show whether a car can access the drive from the site access road approach. Therefore, additional tracking should be provided to confirm this (either by entering in forward gear or reversing in safely).	Additional swept path analysis has been undertaken to show that a large car can safely and satisfactorily access the private driveway from the site access road approach, as shown on the drawing attached at Appendix E.
3.2.1 Problem: Visibility to the right restricted due to vertical alignment, traffic signs, bend in the road Location – Proposed site access junction give-way Summary – Visibility from the minor road is potentially restricted due to the crest of a hill, traffic signs and bend in the road Detail – The Audit team noted that the vertical alignment of the A641 Bradford Road north of the proposed site access junction could result in restricted visibility. No information is provided on Drawing No. 19154/GA/01 as to whether the 2.4m x 120m junction visibility splay can be achieved in the vertical plane due to the existing crest in the road. As a consequence of the above, there is the potential for vehicles exiting the site to be struck by oncoming vehicles travelling at speed if adequate visibility is not provided.	It is recommended that the design team assess whether the visibility to the north from the site access is achievable in the vertical plane or not. If not, then an alternative form of junction control may be necessary. A visibility splay assessment should be carried out (potentially including a speed survey) to establish if adequate visibility is provided.	The RSA recommendation is noted and it is advised that the long sections have already been completed and accepted by the Council after being included within TA Addendum 2 dated April 2022. A copy of the long sections are attached at Appendix F for completeness and show that appropriate visibility can be achieved in the vertical plane.	The long section drawing (19154/IN/03) indicates that a 120m visibility splay is available to the north from the site access, when measured to an object height of 1.05m. However, as with problem 2.1, due to the vertical alignment (crest) of the carriageway, only the tops of cars/bikes will be visible at the full 120m SSD. Therefore, careful siting of any signage or other features in the highway verge/footway to the north of the junction is required, to ensure that the visibility/ conspicuity of the junction is unaffected, with a full review of existing / proposed signage	Careful siting of any signage or other features in the highway verge/footway to the north of the junction is required, to ensure that the visibility/ conspicuity of the junction is unaffected, with a full review of existing / proposed signage required at the detailed design stage, and additional/ amended warning signage and road markings provided as necessary.



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
			required at the detailed design stage, and additional/amended warning signage and road markings provided as necessary.	
5.1.1 Problem: Blank speed limit roundels Location – Attached to lamp posts on central reserve north of proposed Toucan crossing location and on the grass verge upon entry to Bradley Bar Roundabout Summary – Blank roundels attached to lamp posts may confuse drivers and are unnecessary Detail – The Audit team observed 2no. blank roundels which appear to have previously been speed limit signs. No speed limit is given within these signs which may lead to driver confusion, attracting unwarranted attention and sudden slowing down or speeding up.	<i>It is recommended that both these repeater signs are removed to avoid confusion or speeds limits re-instated within them.</i>	The RSA recommendation is accepted and the existing blank roundels will be replaced with 40mph speed limit repeater roundels, as shown on the drawing attached at Appendix C.	Agreed. As with Problem 3.2.1, a full signage review is required at the detailed design stage, with signs replaced/ relocated/ amended as necessary.	The RSA recommendation is accepted. A full signage review is required at the detailed design stage, with signs replaced/ relocated/ amended as necessary.
5.1.2 Problem: Relocation of existing roundabout signs Location – North of the proposed site access Summary – Relocating of the existing roundabout signs further south may result in vehicles incoming at too high a speed Detail – The drawing provided does not specify the exact relocation of the 2no. roundabout warning signs, as shown in Photograph 5 below, as well as the new position of the existing directional roundabout sign currently located immediately south of the proposed access junction. The 2no. signs provide drivers with a warning to 'reduce speed now'.	<i>It is recommended that clarity is provided in regard to the exact relocation of all three signs, in particular the roundabout warning signs. A revised plan showing where the signs are to be relocated is recommended. An assessment of the distance the signs are located from the busy roundabout can then be made, particularly in light of vehicle speeds and driver anticipation.</i>	The directional signs have moved a nominal distance to the south and this sign provides clear information of the presence of Bradley Bar Roundabout ahead. The roundabout warning signs have been relocated to the south east at the location shown on the drawing attached at Appendix C. The signs have not been shown to the north of the Site access as this could cause driver confusion on approach to the proposed toucan crossing. Whilst the	Agreed. As with Problem 3.2.1/5.1.1, a full signage review is required at the detailed design stage, with signs replaced/ relocated/ amended as necessary.	The RSA recommendation is accepted. A full signage review is required at the detailed design stage, with signs replaced/ relocated/ amended as necessary.



RSA Problem	RSA Recommendation	Design Organisation Response	Overseeing Organisation Response	Agreed RSA Action
<i>The audit team noted that vehicles travelling southbound were travelling at speed and potentially more than 40mph, the relocation of these signs southeast of the site access may result in vehicles travelling at too high a speed upon approach to the proposed Toucan crossing and Bradley Bar Roundabout further south. This may result in loss of control, veering and collisions.</i>	<i>It is noted that these signs are quite large and so might obstruct the forward view of the new traffic signals but given warning signs are recommended for the latter above, it is recommended that these could be stacked and located further from the signals rather than closer to the roundabout.</i>	roundabout warning signs have been re-provided they are considered supplementary and it is noted within Traffic Signs Manual Chapter 4 that 'warning signs should not be used to indicate the approach to a roundabout where adequate warning is conveyed by a map-type advance direction sign or where the roundabout is clearly visible to approaching drivers.'		



3. Design Organisation and Overseeing Organisation Statements

3.1 DESIGN ORGANISATION STATEMENT

3.1.1 On Behalf of the design organisation, I certify that:

- 1) *the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the overseeing organisation.*

Name: Chloe Regan BSc (Hons) MTPS

Position: Senior Transport Planner

Organisation: Optima Highways & Transportation

Date: 11th July 2022.



Signed:

3.2 OVERSEEING ORGANISATION STATEMENT

3.2.1 On Behalf of the overseeing organisation, I certify that:

- 1) *the RSA actions identified in response to the road safety audit problems in this road safety audit have been discussed and agreed with the design organisation; and*
- 2) *the agreed RSA actions will be progressed.*

Name: Adam Darwin

Position: Group Engineer – Highway Development Management

Organisation: Kirklees Council

Date: 11th July 2022

A Darwin

Signed:



Appendices



Appendix A Road Safety Audit Stage 1



ROAD SAFETY AUDIT

STAGE 1



Bradley Villa, Huddersfield

ON BEHALF OF

Optima Highways and Transportation Consultancy Ltd

June 2022



Quality Management

Project Number	22086
Filename	22086 Stage 1 RSA Bradley Villa, Huddersfield
Issue No	1
Issue Date	23.06.2022
Author	Chris Yarrow
Reviewer	Eric Appleton

Signatures:

Two handwritten signatures in blue ink. The first signature is 'C. Yarrow' and the second is 'E. Appleton'.

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Appendices

Appendix A	Problem Location Plans
Appendix B	Audit Brief

1. Introduction

- 1.1.1. Via Solutions has been appointed to carry out a Stage 1 Road Safety Audit (RSA) of the proposed highway works to serve a residential-led development of 275 dwellings known as Bradley Villa Farm (BVF). The BVF phase forms part of the full 'HS11' site allocated for housing by Kirklees Council (KC) which includes up to 1,958 homes, a two-form entry primary school, a potential local centre incorporating community uses, retail and a health facility, public open space and leisure facilities.
- 1.1.2. The site is located on land to the north of the A6107 Bradley Road some 3.8km north of Huddersfield and 2.4km south of Brighouse. The BVF site includes the western portion of HS11 between Bradford Road and Shepherds Thorn Lane, extending over an area of some 9.8 hectares (approx. 14% of the HS11 allocation). Existing vehicular accesses are provided onto Bradford Road to the west of the site and via Shepherds Thorn Lane to the east.
- 1.1.3. The proposed Section 278 (S278) works to be considered in this report include:
- ✦ The proposed site access priority junction onto A641 Bradford Road; and
 - ✦ A pedestrian/cycle access onto Shepherds Thorn Lane.
- 1.1.4. The A641 Bradford Road is currently a lit dual carriageway subject to a 40mph speed limit adjacent the proposed site access location, which changes to 50mph north-west of the junction with Dorchester Road. South of the site, Bradley Road is a lit, single carriageway which runs east to west. The road is subject to a 40mph speed limit with the exception of a 30mph speed limit in the vicinity of All Saints School. Mandatory cycle lanes (07:30-09:00 and 16:30-18:00) are provided along both flanks of the road between Bradley Bar and the A62. Shepherds Thorn Lane runs on a north/south alignment from Bradley Road and provides access to a small number of dwellings.

- 1.1.5. The project sponsor is Kirklees Council (KC). The Audit Team Membership is given in Section 4 of this report. This Audit was undertaken in accordance with the guidance in GG 119 and that published by the CIHT. A site visit was carried out on 13th June 2022. The weather during the daytime site visit was dry and traffic conditions were moderate.
- 1.1.6. The scope of this Road Safety Audit is to consider the safety implications of the proposed highway works for the proposed site access onto A641 Bradford Road, including a toucan crossing located to the north, associated right turn lane and 3.0m wide shared footway/cycleway to either side of the road. This RSA will also consider the proposed 3.0m wide shared pedestrian/cycle access onto Shepherds Thorn Lane, all of the proposed highway works to be audited fall under a S278 agreement.
- 1.1.7. The proposed works are shown on the following drawings prepared by Optima Highways and Transportation Consultancy Ltd:
- 2
- 19154/GA/01 Rev F – A641 Bradford Road Proposed Site Access Arrangement
19154/ATR/06 Rev A – A641 Bradford Road Proposed Site Access – Swept Path Analysis
19154/GA/04 Rev C – Proposed pedestrian/cycle link to Bradley Road
19154/ATR/05 Rev B – Proposed pedestrian/cycle link to Bradley Road – Swept Path Analysis
- 1.1.8. The terms of reference of the audit are as described in GG 119 'Road Safety Audit' that forms part of Volume 5 of the Design Manual for Roads and Bridges. Whilst the advice given in the DMRB applies to trunk road and motorway highway improvement schemes, it has been used to inform the scope of this audit. The guidance published by the CIHT has also been followed.
- 1.1.9. The 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 designs

to any other criteria. Recommendations are made in this report regarding problems that are considered to be worthy of attention in respect of safety. The Audit Team has not been involved in the design of the works.

- 1.1.10. Any recommendations included within this report should not be regarded as being prescriptive design solutions to the problems identified. They are intended only to indicate a proportionate and viable means of eliminating or mitigating the identified problem. There may be alternative methods of addressing a problem which would be equally acceptable in achieving the desired elimination or mitigation and these should be considered when responding to this report.
- 1.1.11. 'Problem Location Plans' highlighting the problem references are attached at Appendix A.

2. Items Raised in Stage 1 Road Safety Audit

SUMMARY

2.1.1. The table below summarises the findings of the Stage 1 Road Safety Audit, which are described in more detail in the section below.

Summary of Items Considered / Raised in Stage 1 Road Safety Audit

Item	Problem
1 GENERAL	
1 Departure from Standards	No
2 Cross Sections / Variations	No
3 Landscaping	No
4 Climatic Conditions	No
5 Drainage	No
6 Lay-bys	No
7 Public Utilities Apparatus	Yes
8 Access	No
9 Skid Resistance	No
10 Emergency Vehicles	No
11 Future Widening	No
12 Agriculture	No
13 Fences and Road Restraint Systems	No
14 Adjacent Development	No
15 Basic Design Principles	No
16 Bridge Parapets	No
17 Network Management	No
18 Specific Road Users	No

ITEM	PROBLEM
2 LOCAL ALIGNMENT	
1 Visibility	Yes
2 New / Existing Interface	No
3 Vertical Alignment	No
3 JUNCTIONS	
1 Layout	Yes
2 Visibility	Yes
3 T X Y Junctions	No
4 All Roundabouts	No
5 Mini Roundabouts	No
6 Traffic Signals	No
4 NON-MOTORISED USER (NMU) PROVISION	
1 Adjacent Land	No
2 Pedestrians	No
3 Cyclists	No
4 Equestrians	No
5 TRAFFIC SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING	
1 Signs	Yes
2 Variable Message Sign	No
3 Lighting	No
4 Poles / Columns	No
5 Carriageway Markings	No

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1 GENERAL

1.7 Problem: Utility cabinet and underground services at the start of shared footway/cycleway warning paving

Location: Western flank of Shepherds Thorn Lane adjacent to A6107 Bradley Road

Summary: Public utilities/services apparatus at the commencement of a shared footway/cycleway where cyclists would be carrying out a sharp turn

The Audit team noted that a utility cabinet and underground services chamber is located at the start of the proposed shared footway/cycleway onto Shepherds Thorn Lane. Cyclists turning to use the lane have the potential to strike the cabinet in close proximity, especially if a pedestrian is walking at the same time. Accessing the adjacent underground services chamber may also result in cyclists utilising the proposed Shepherds Thorn Lane carriageway and conflicting with vehicles, albeit vehicular movements here would be minimal.



Photograph 1: Utility Cabinet and underground services chamber at the end of Shepherds Thorn Lane

Recommendation

It is recommended that clarity is provided with regard to the existing position of both services and a detailed assessment carried out as to whether there is scope to move these services away from the start of the proposed shared use path, or the path is relocated to suit.

Increase visibility / prominence of utility cabinet (by ensuring proposed verge vegetation / grass is maintained at low level) so no blind spots are created which potentially lead to conflict points.

2 LOCAL ALIGNMENT

2.1 Problem: Proposed right turn lane visibility obstructed

Location: A641 Bradford Road proposed right-turn lane into site access junction

Summary: *Sight line for right turning vehicles potentially obstructed by the crest of the hill and bend in the road*

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The vertical alignment and bend in the road towards the left obstruct visibility for drivers turning right into the proposed site access junction. The proposed crossing facility, and pedestrians / cyclists using the same will add to the potential obstruction of vehicles approaching at high speed.

This may encourage drivers to 'peep and creep' into the opposite side of the road where there is potential for collisions with southbound traffic travelling at speed. It is also noted that the proposed drawing states 'provide 'left turn only' sign' but the orientation of the sign is not clear (it would be assumed to face traffic leaving the site access.

Recommendation

A visibility splay assessment should be carried out (potentially including a speed survey) to establish if adequate visibility is provided.

In addition, it is recommended that the orientation of the "Left Turn Only" sign be made clear on any design drawings.

3 JUNCTIONS

3.1.1 Problem: Central Island at priority junction may encourage right turns

Location: Centre of proposed site access / A641 priority junction

Summary: *Proposed arrangement of give-way central island and central reservation may encourage vehicles to turn right through the right-turn lane*

The proposed drawing shows the give-way central island and central reserve along A641 Bradford Road. The arrangement may encourage (and physically still allow) drivers exiting the site to illegally turn right through the adjacent right-turn lane in order to avoid having to route southbound towards the Bradley Bar Roundabout and back north again. This will result in vehicle conflict and collisions.

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Recommendation

It is recommended that the designs of the proposed site access junction give-way central island and A641 Bradley Road central reservation are amended to make the aforementioned dangerous manoeuvre as difficult as possible.

3.1.2 Problem: Restricted access to adjacent property

Location: No.686 Bradford Road, corner property adjacent to the proposed southern site access radius

Summary: *No vehicle tracking shown for driveway access and egress*

The drawings provided to the audit team do not show any swept paths in and out of the driveway to No.686, the property is in close proximity to the proposed give way markings and associated central island.

Recommendation

It is recommended that swept path analysis is carried out for access and egress into this particular driveway in order to rule out any access issues for the property.

3.2.1 Problem: Visibility to the right restricted due to vertical alignment, traffic signs, bend in the road

Location: Proposed site access junction give-way

Summary: *Visibility from the minor road is potentially restricted due to the crest of a hill, traffic signs and bend in the road*

The Audit team noted that the vertical alignment of the A641 Bradford Road north of the proposed site access junction could result in restricted visibility. No information is provided on Drawing No. 19154/GA/01 as to whether the 2.4m x 120m junction visibility splay can be achieved in the vertical plane due the existing crest in the road.

As a consequence of the above, there is the potential for vehicles exiting the site to be struck by oncoming vehicles travelling at speed if adequate visibility is not provided.



Photograph 2: Proposed site access junction location - visibility looking right along
A641 Bradford Road

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Recommendation

It is recommended that the design team assess whether the visibility to the north from the site access is achievable in the vertical plane or not. If not, then an alternative form of junction control may be necessary.

A visibility splay assessment should be carried out (potentially including a speed survey) to establish if adequate visibility is provided.

5 TRAFFIC SIGNS, CARRIAGEWAY MARKINGS AND LIGHTING

5.1.1 Problem: Blank speed limit roundels

Location: Attached to lamp posts on central reserve north of proposed Toucan crossing location and on the grass verge upon entry to Bradley Bar Roundabout

Summary: *Blank roundels attached to lamp posts may confuse drivers and are unnecessary*

The Audit team observed 2no. blank roundels which appear to have previously been speed limit signs. No speed limit is given within these signs which may lead to driver confusion, attracting unwarranted attention and sudden slowing down or speeding up.



11

Photograph 3: Blank speed limit roundel along A641 Bradford Road adjacent to proposed site access

Recommendation

It is recommended that both these repeater signs are removed to avoid confusion or speeds limits re-instated within them.

5.1.2 Problem: Relocation of existing roundabout signs

Location: North of the proposed site access

Summary: *Relocating of the existing roundabout signs further south may result in vehicles incoming at too high a speed*

The drawing provided does not specify the exact relocation of the 2no. roundabout warning signs, as shown in Photograph 5 below, as well as the new position of the existing directional roundabout sign currently located immediately south of the proposed access junction. The 2no. signs provide drivers with a warning to 'reduce speed now'.

The audit team noted that vehicles travelling southbound were travelling at speed and potentially more than 40mph, the relocation of these signs south east of the site access may result in vehicles travelling at too high a speed upon approach to the proposed Toucan crossing and Bradley Bar Roundabout further south. This may result in loss of control, veering and collisions.

12



Photograph 4: Existing 2no. roundabout signs warning drivers to reduce speed

13

Recommendation

It is recommended that clarity is provided in regard to the exact relocation of all three signs, in particular the roundabout warning signs. A revised plan showing where the signs are to be relocated is recommended. An assessment of the distance the signs are located from the busy roundabout can then be made, particularly in light of vehicle speeds and driver anticipation. It is noted that these signs are quite large and so might obstruct the forward view of the new traffic signals but given warning signs are recommended for the latter above, it is recommended that these could be stacked and located further from the signals rather than closer to the roundabout.

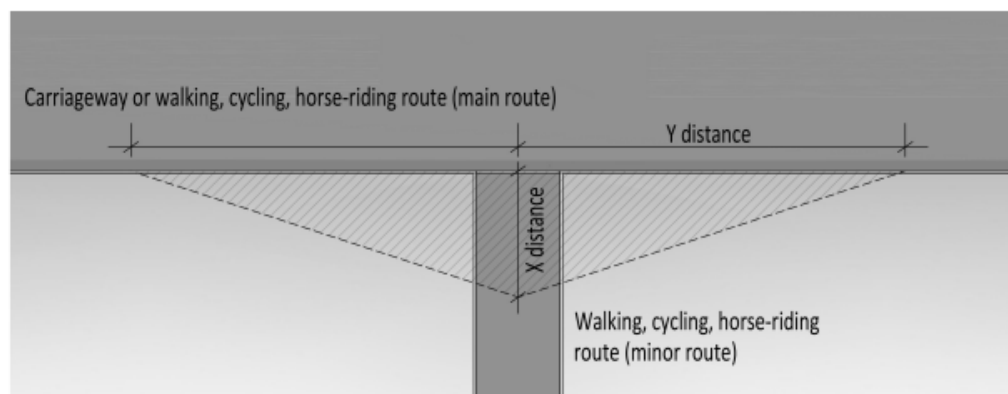
MATTERS OUTSIDE TERMS OF ROAD SAFETY AUDIT

Location: A641 Bradford Road toucan crossing from the western side

Summary: Set back (visibility 'x' distance) of 1.6m for cyclists waiting to cross the A641 is based on a perpendicular arrangement

The Audit Team notes that for cyclists at shared use crossings, the desirable minimum "x" distance is 2.5m as set out in table E/5.2 of DMRB CD 143. This is based on cyclists approaching a main route crossing perpendicularly, this is not the case at the proposed Toucan crossing point.

Figure E/5.1N Visibility splay 'x' and 'y' distances for walking, cycling and horse-riding routes



Visibility splay "x" distances for pedestrians, cyclists (on shared use facilities only) and equestrians at junctions and crossing points shall be provided in accordance with Table E/5.2.

Table E/5.2 Visibility "x" distance requirements at junctions

	Desirable minimum	Absolute minimum
Pedestrian	2.0 metres	1.5 metres
Shared use (pedestrians and cyclists)	4.0 metres	2.5 metres
Equestrians	5.0 metres	3.0 metres

Extract 1: DMRB CD 143 Figure E/5.1N and Table E/5.2

3. Audit Team Statement

- 3.1.1. We certify that this Audit has been carried out in accordance with GG 119 and the guidance from CIHT.

AUDIT TEAM LEADER

Eric Appleton BEng DMS CEng MICE
MCIHT
Technical Director
Via Solutions
The Old Coach House, 1 Campbell
Street, Pudsey LS28 6DP

Signed:



Date: 23 June 2022

AUDIT TEAM MEMBER

Chris Yarrow BEng MCIHT
Director
Via Solutions
The Old Coach House, 1 Campbell
Street, Pudsey LS28 6DP

Signed:

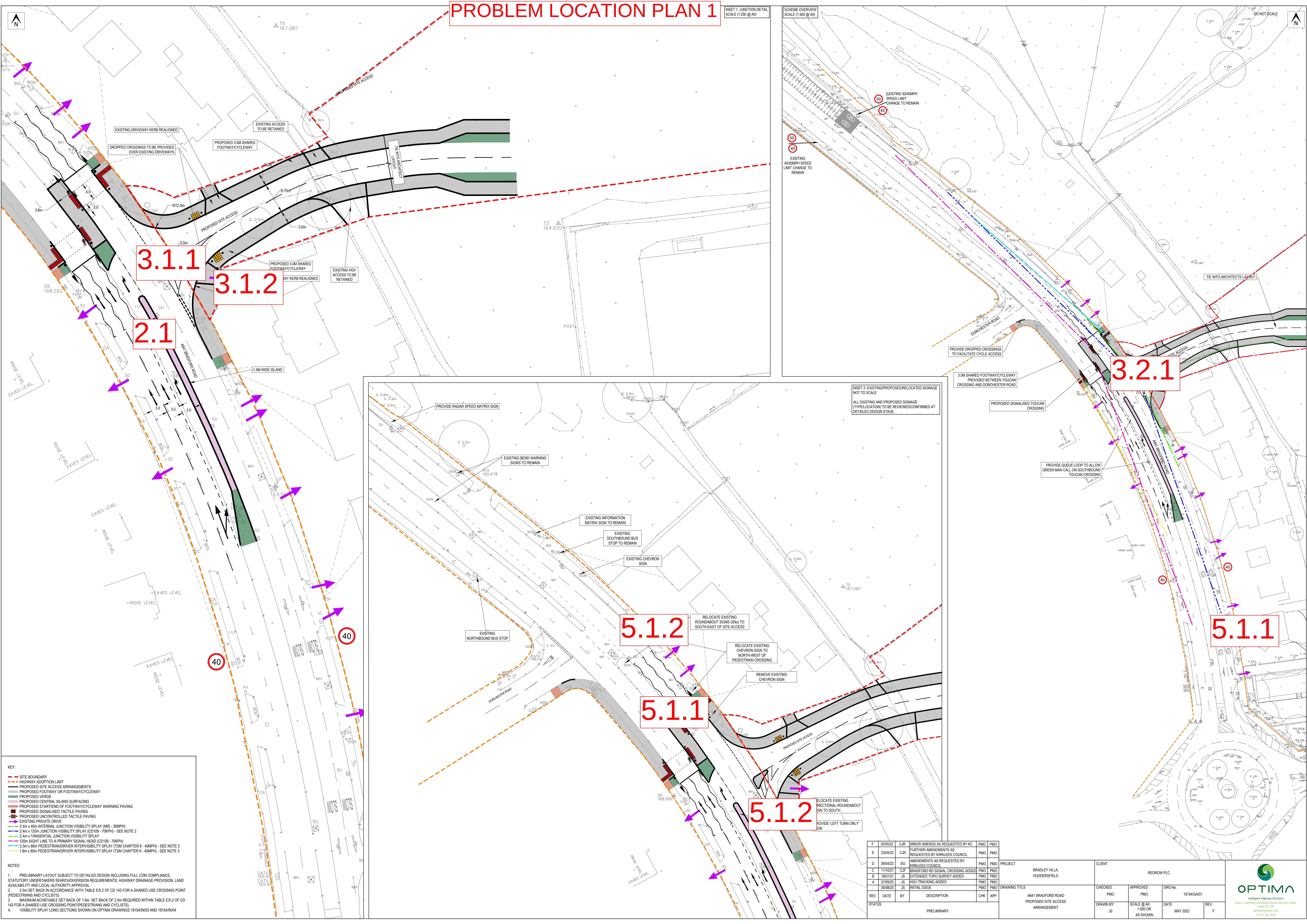


Date: 23 June 2022

15

APPENDICES

APPENDIX A: Problem Location Plans



KEY:

SITE BOUNDARY

HIGHWAY ADOPTION LIMIT

PROPOSED SITE ACCESS ARRANGEMENTS

PROPOSED FOOTWAY OR FOOTWAYCYCLEWAY

PROPOSED VERGE

PROPOSED CENTRAL ISLAND SURFACING

PROPOSED START/END OF FOOTWAYCYCLEWAY WARNING PAVING

PROPOSED SIGNALISED TACTILE PAVING

PROPOSED UNCONTROLLED TACTILE PAVING

EXISTING PRIVATE DRIVE

2.4m x 4.0m INTERNAL JUNCTION VISIBILITY SPLAY (MS - 30MPH)

2.4m x 120m JUNCTION VISIBILITY SPLAY (CD109 - 70KPH) - SEE NOTE 2

2.4m x 120m JUNCTION VISIBILITY SPLAY

120m SIGHT LINE TO A PRIMARY SIGNAL HEAD (CD109 - 70KPH)

2.5m x 80m PEDESTRIAN/DRIVER INTERVISIBILITY SPLAY (TSM CHAPTER 6 - 40MPH) - SEE NOTE 2

1.6m x 80m PEDESTRIAN/DRIVER INTERVISIBILITY SPLAY (TSM CHAPTER 6 - 40MPH) - SEE NOTE 3

NOTES

1. PRELIMINARY LAYOUT SUBJECT TO DETAILED DESIGN INCLUDING FULL CDM COMPLIANCE, STATUTORY UNDERTAKERS SEARCH/VERSION REQUIREMENTS, HIGHWAY DRAINAGE PROVISION, LAND AVAILABILITY AND LOCAL AUTHORITY APPROVAL.

2. 2.5m SET BACK IN ACCORDANCE WITH TABLE E/5.2 OF CD 143 FOR A SHARED USE CROSSING POINT (PEDESTRIANS AND CYCLISTS).

3. MAXIMUM ACHIEVABLE SET BACK OF 1.6m. SET BACK OF 2.5m REQUIRED WITHIN TABLE E/5.2 OF CD 143 FOR A SHARED USE CROSSING POINT (PEDESTRIANS AND CYCLISTS).

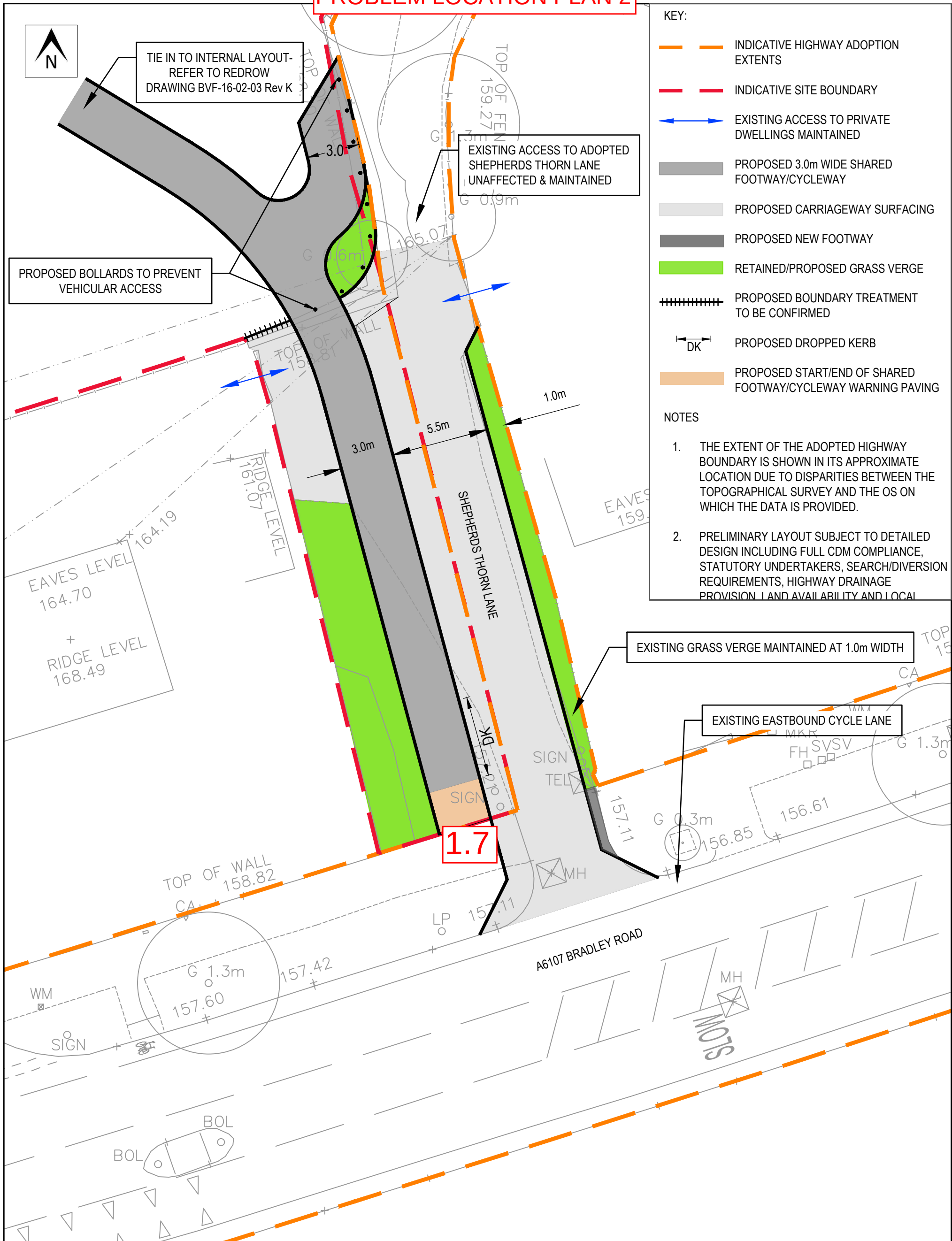
4. VISIBILITY SPLAY LONG SECTIONS SHOWN ON OPTIMA DRAWINGS 19154IN03 AND 19154IN04

F	30/05/22	CJR	MINOR AMENDS AS REQUESTED BY KC	PMO	PMO
E	23/05/22	CJR	FURTHER AMENDMENTS AS REQUESTED BY KIRKLEES COUNCIL	PMO	PMO
D	29/04/22	SG	AMENDMENTS AS REQUESTED BY KIRKLEES COUNCIL	PMO	PMO
C	11/10/21	CJR	BRADFORD RD SIGNAL CROSSING ADDED	PMO	PMO
B	19/01/21	JS	EXTENDED TOPO SURVEY ADDED	PMO	PMO
A	07/09/20	JS	HGV TRACKING ADDED	PMO	PMO
-	26/08/20	JS	INITIAL ISSUE	PMO	PMO
REV	DATE	BY	DESCRIPTION	CHK	APP
PRELIMINARY					

PROJECT		CLIENT	
BRADLEY VILLA, HUDDERSFIELD		REDROW PLC	
DRAWING TITLE		DRG No.	
A641 BRADFORD ROAD PROPOSED SITE ACCESS ARRANGEMENT		19154G/A01	
CHECKED	APPROVED	DATE	REV.
PMO	PMO	19154G/A01	F
DRAWN BY	SCALE @ A0	DATE	REV.
JS	1:500 OR AS SHOWN	MAY 2022	F

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PROBLEM LOCATION PLAN 2



C	30/05/2022	CJR	FURTHER KC AMENDS	PMO	PMO	PROJECT BRADLEY VILLA FARM, HUDDERSFIELD	CLIENT REDROW PLC				
B	23/05/2022	CJR	AMENDS AS REQUESTED BY KC	PMO	PMO						
A	26/04/2022	MSP	EMERGENCY ACCESS REMOVED - PED/CYCLE LINK ONLY	PMO	PMO						
-	01/12/2020	CJF	INITIAL ISSUE	PMO	PMO	DRAWING TITLE	CHECKED PMO	APPROVED PMO	DRG No. 19154/GA/04		
REV	DATE	BY	DESCRIPTION	CHK	APP	PROPOSED PEDESTRIAN/CYCLE LINK TO BRADLEY ROAD	DRAWN BY: MSP	SCALE @ A3 1:200	DATE MAY 2022	REV. C	
STATUS											
PRELIMINARY											



OPTIMA

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optimahighways.com T 0113 245 1679

APPENDIX B: Audit Brief

Table C.1 Project Summary

Date:	30 th May 2022
Document reference:	Site Accesses Stage 1 Road Safety Audit Brief (Initial Issue)
Prepared by:	Optima Highways and Transportation Consultancy Ltd
On behalf of:	Kirklees Council
AUTHORISATION SHEET	
Project:	Bradley Villa, Huddersfield
Report title:	Site Accesses Stage 1 Road Safety Audit Brief (Initial Issue)
PREPARED BY:	
Name:	Chloe Regan
Signed:	
Organisation:	Optima Highways and Transportation Consultancy Ltd
Date:	30 th May 2022
I APPROVE THE RSA BRIEF AND INSTRUCT THE RSA TO TAKE PLACE ON BEHALF OF THE OVERSEEING ORGANISATION:	
Name:	Adam Darwin
Signed:	
Organisation:	Kirklees Council
Date:	30 th May 2022

Table C.2 General Details

General details							
Highway scheme name and number:				Bradley Villa, Huddersfield			
Type of scheme:		Priority junction access onto the A641 Bradford Road and Pedestrian/Cycle access onto Shepherds Thorn Lane.					
RSA stage tick as appropriate		1	☒	2	☐	3	☐
		Interim				4	☐
Overseeing organisation details				Design organisation details			
Kirklees Council				Optima Highways and Transport Transportation			
Police contact details				Maintaining agent contact details			
N/A				Kirklees Council			
RSA team membership							
Lead Auditor: Eric Appleton, Via Solutions Team Member: Chris Yarrow, Via Solutions							
Terms of reference							
DMRB GG119 Road Safety Audit							

Table C.3 Scheme Details

Scheme description/objective
General
The extent of the works included within the audit are summarised as: • The proposed Site access onto the A641 Bradford Road; and • A pedestrian/cycle access onto Shepherds Thorn Lane. Drawing 19154/GA/01 Revision F shows the proposed vehicular Site access onto the A641 Bradford Road, including a toucan crossing located to the north. The access includes a 6.75m wide carriageway, 3.0m wide shared footway/cycleway to the north and south of the road. Drawing 19154/GA/04 Revision C shows the proposed 3.0m wide shared footway/cycleway onto Shepherds Thorn Lane.
Design standards applied to the scheme design
CD 123 Geometric design of at-grade priority and signal-controlled junctions, LTN 1/20 Cycle Infrastructure Design, Chapter 6 of the Traffic Signs Manual, CD 143 Designing for walking, cycling and horse-riding and Kirklees Highways Design Guide
Design speeds
A641 Bradford Road – 70kph (43.5mph)
Speed limits
A641 Bradford Road – 40mph Bradley Road – 30mph (see Table C.4)/40mph
Existing traffic flows/queues
See Traffic Flow Figures 120 to 133
Forecast traffic flows
See Traffic Flow Figures 310 to 321
Pedestrian, cyclist and equestrian desire lines
Pedestrian/cycle desire lines will predominantly be along the A641 Bradford Road south towards Bradley Bar Roundabout, Bradley Road and the Shepherds Thorn Lane towards All Saints School.
Environmental constraints
None known.

Table C.4 Locality

Description of locality
Nothing to note
General Description
The A641 Bradford Road is currently a lit dual carriageway subject to a 40mph speed limit adjacent the proposed Site access location which changes to 50mph to the north-west of the junction with Dorchester Road. Shepherds Thorn Lane runs on a north/south alignment from Bradley Road and provides access to a small number of dwellings. Bradley Road is a lit, single carriageway which runs east to west to the south of the Site. The road is subject to a 40mph speed limit with the exception of a 30mph speed limit in the vicinity of All Saints School. Mandatory cycle lanes (07:30-09:00 and 16:30-18:00) are provided along both flanks of the road between Bradley Bar and the A62.
Relevant factors which may affect road safety
None known.

Table C.5 Analysis

Collision data analysis
See full LCC collision data, attached.
Departures from standards
Maximum achievable set back of 1.6m for cyclists waiting to cross the proposed A641 Bradford Road toucan crossing from the western side - as shown on drawing 19154/GA/01 Revision F. A set back of 2.5m is required as set out within table E/5.2 of CD 143 for shared use crossing points (pedestrian and cyclist).
Previous road safety audit stage reports, road safety audit response reports and evidence of agreed actions
Strategic decisions
None
List of included documents and drawings
Documents
• LCC Accident Data • Traffic Flow Figures 120 to 321 • Optima March 2021 Transport Assessment – Revision 1
Drawings
• Optima Drawing 19154/GA/01 Revision F – A641 Bradford Road Proposed Site Access Arrangement • Optima Drawing 19154/GA/04 Revision C – Proposed Pedestrian/Cycle Link to Bradley Road • Optima Drawing 19154/ATR/05 Revision B – Proposed Pedestrian/Cycle Link to Bradley Road – Swept Path Analysis • Optima Drawing 19154/ATR/06 Revision A – A641 Bradford Road Proposed Site Access Arrangement – Swept Path Analysis

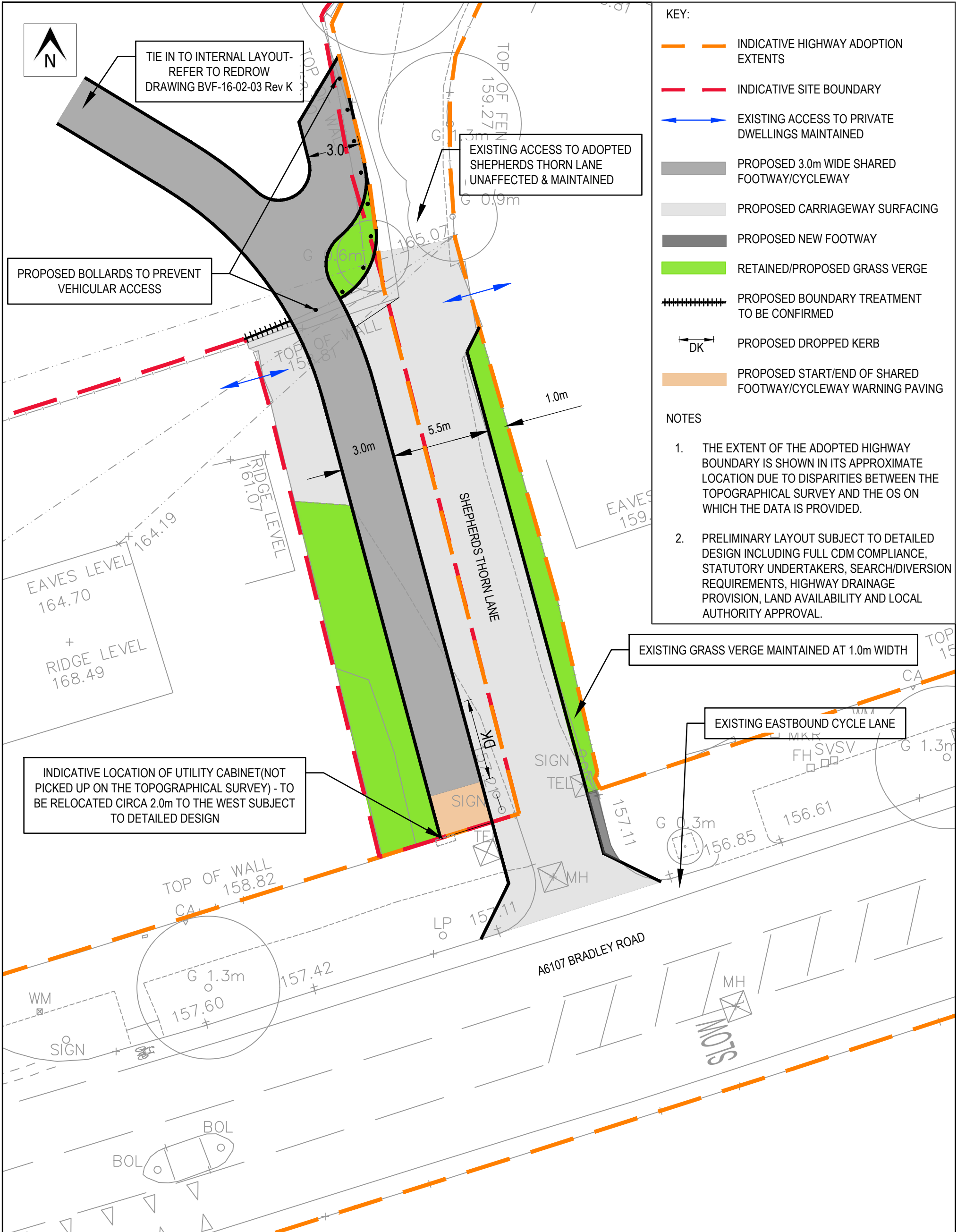
Table C.6 Checklist

Tick all that are included and provide reasons for those that are not included			
Site location plan	☒	Scale layout plans	☒
Departures and relaxations from standards	☒	Construction/typical details	☐
Previous RSA reports	☐	Previous RSA response reports and evidence of agreed actions	☐
Collision data and collision data analysis	☒	Road traffic collision plot	☒
Traffic signal staging	☐	Traffic counts	☒
Speed surveys	☐	Pedestrian, cyclist and horse-riding desire lines and volumes	☐
Walking, cycling and horse-riding assessment and reviews	☐	Items outside the scope of the RSA/strategic decisions Not applicable	☐
Other factors that may impact on road safety	☐	Design speeds/speed limits	☒
Design standards used	☒	Adjacent land uses	☐



Appendix B Optima drawing 19154/GA/04 Revision D

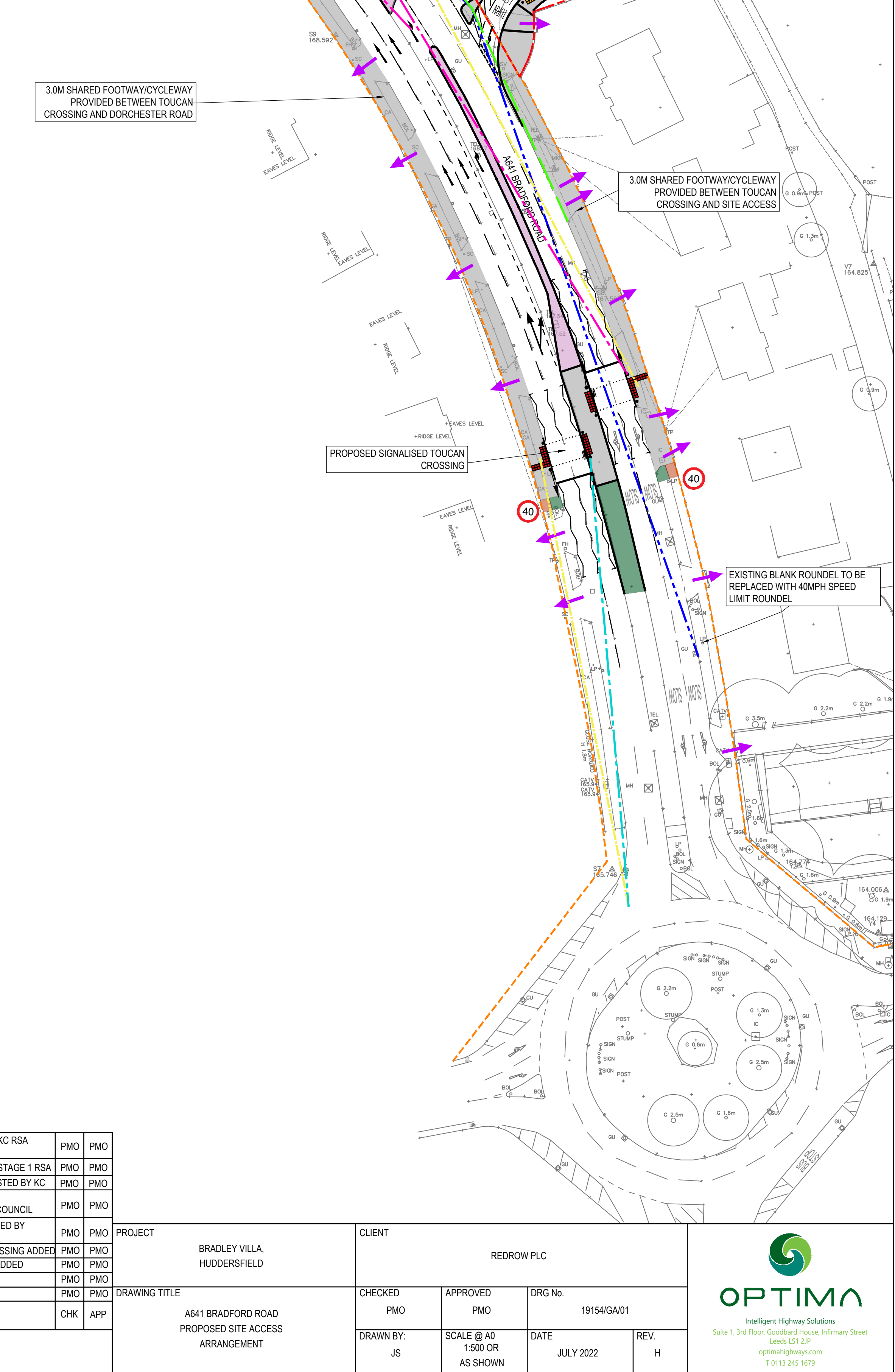
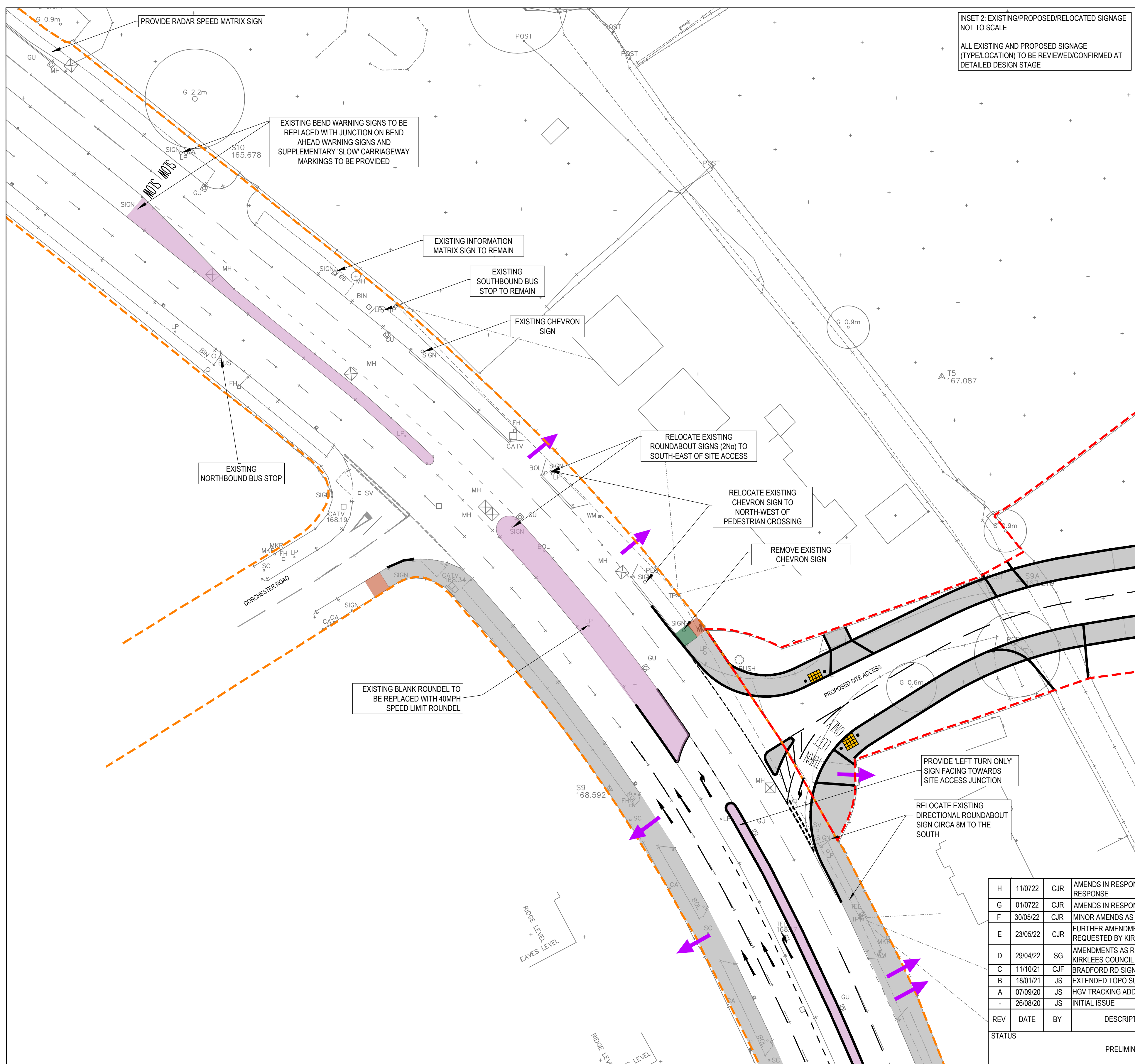
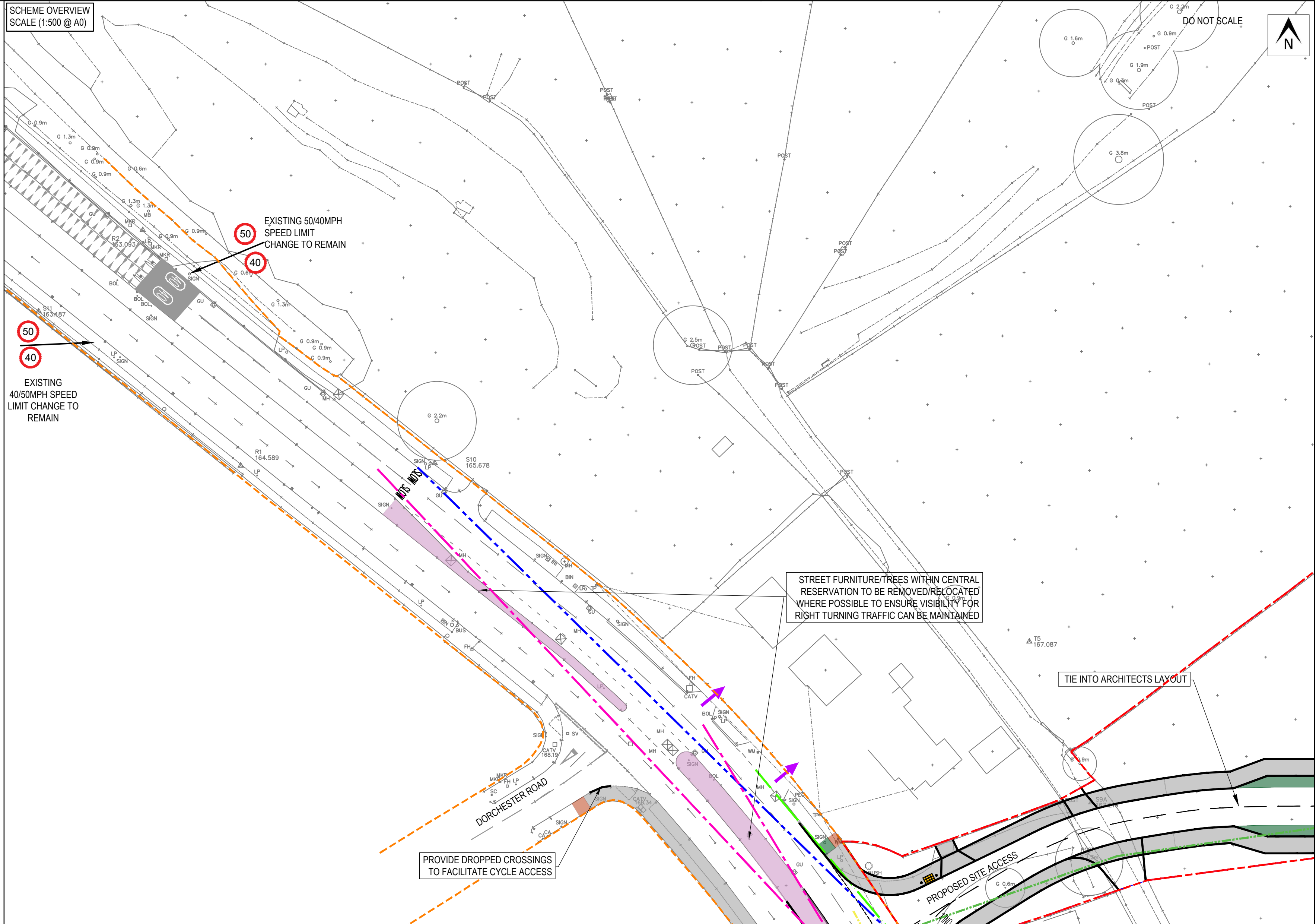
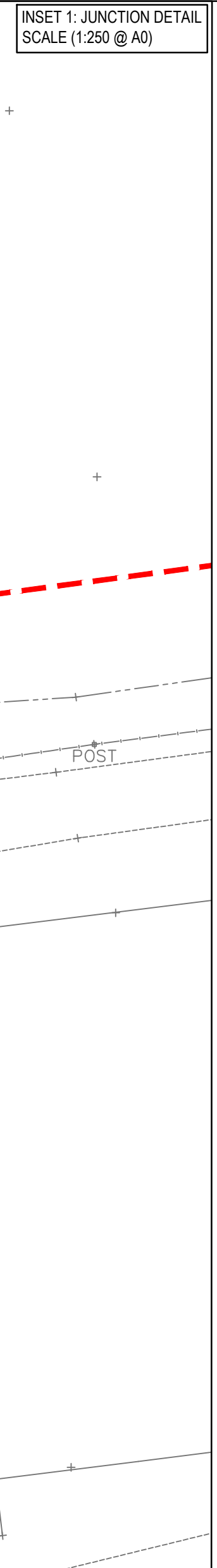
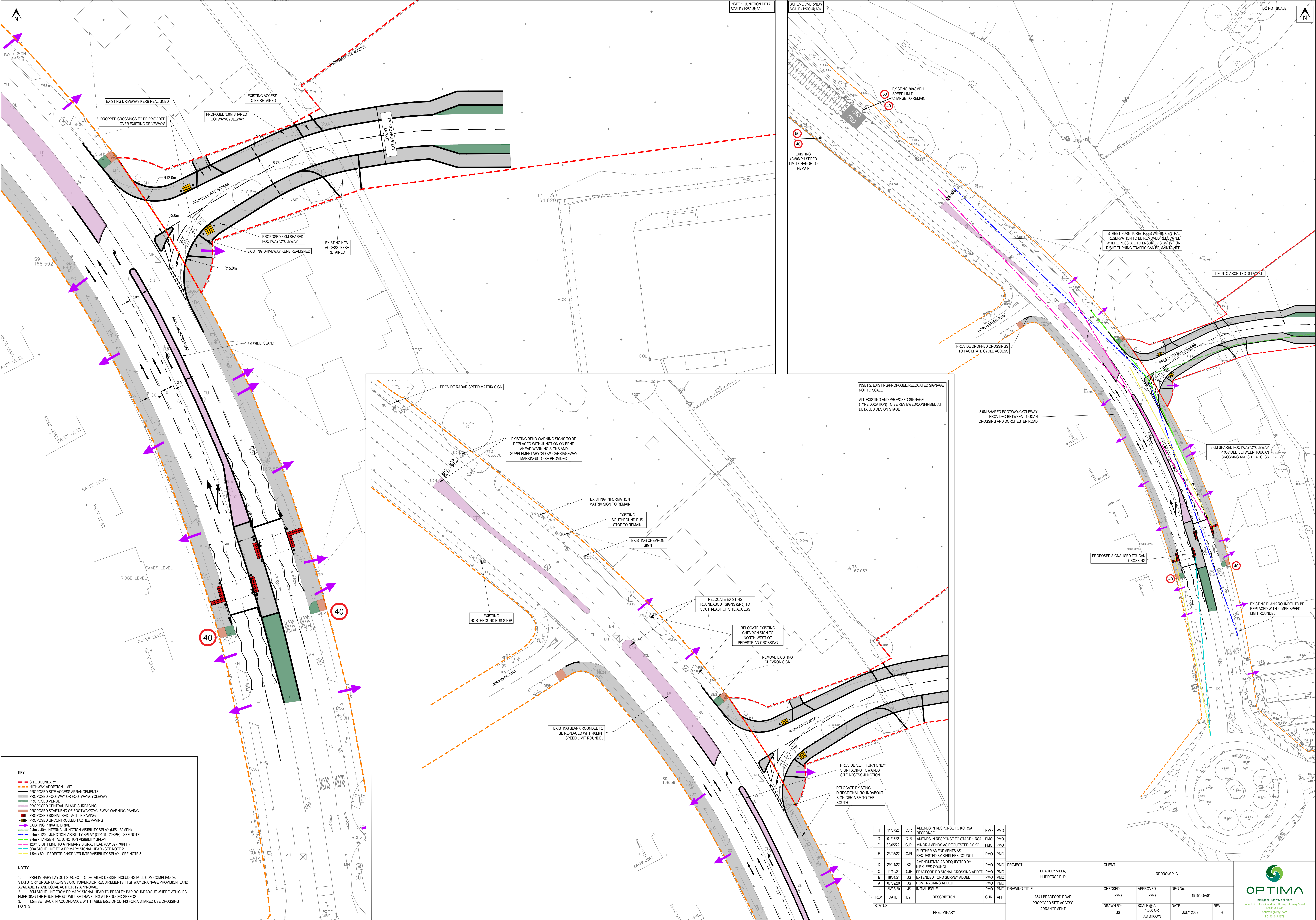




D	30/06/2022	CJR	RESPONSE TO STAGE 1 RSA	PMO	PMO	PROJECT BRADLEY VILLA FARM, HUDDERSFIELD	CLIENT REDROW PLC		 OPTIMA Intelligent Highway Solutions Suite 1, 3rd Floor, Goodbaird House, Infirmary Street Leeds LS1 2JP optimahighways.com T 0113 245 1679
C	30/05/2022	CJR	FURTHER KC AMENDS	PMO	PMO				
B	23/05/2022	CJR	AMENDS AS REQUESTED BY KC	PMO	PMO				
A	26/04/2022	MSP	EMERGENCY ACCESS REMOVED - PED/CYCLE LINK ONLY	PMO	PMO				
-	01/12/2020	CJF	INITIAL ISSUE	PMO	PMO	DRAWING TITLE	CHECKED	APPROVED	DRG No.
REV	DATE	BY	DESCRIPTION	CHK	APP	PROPOSED PEDESTRIAN/CYCLE LINK TO BRADLEY ROAD	PMO	PMO	19154/GA/04
STATUS						DRAWN BY:	SCALE @ A3	DATE	REV.
PRELIMINARY						MSP	1:200	JUNE 2022	D

Appendix C Optima drawing 19154/GA/01 Revision H





KEY:

- SITE BOUNDARY
- HIGHWAY ADOPTION LIMIT
- PROPOSED SITE ACCESS ARRANGEMENTS
- PROPOSED FOOTWAY OR FOOTWAY/CYCLEWAY
- PROPOSED VERGE
- PROPOSED CENTRAL ISLAND SURFACING
- PROPOSED START/END OF FOOTWAY/CYCLEWAY WARNING PAVING
- PROPOSED SIGNALISED TACTILE PAVING
- PROPOSED UNCONTROLLED TACTILE PAVING
- EXISTING PRIVATE DRIVE
- 2.4m x 40m INTERNAL JUNCTION VISIBILITY SPLAY (MS - 30MPH)
- 2.4m x 10m JUNCTION VISIBILITY SPLAY (CD109 - 70MPH) - SEE NOTE 2
- 2.4m x 10m TANGENTIAL JUNCTION VISIBILITY SPLAY
- 120m SIGHT LINE TO A PRIMARY SIGNAL HEAD (CD109 - 70MPH)
- 80m SIGHT LINE TO A PRIMARY SIGNAL HEAD - SEE NOTE 2
- 1.5m x 80m PEDESTRIAN/DRIVER INTERVISIBILITY SPLAY - SEE NOTE 3

NOTES

- PRELIMINARY LAYOUT SUBJECT TO DETAILED DESIGN INCLUDING FULL CDM COMPLIANCE, STATUTORY UNDERTAKERS SEARCH/VERSION REQUIREMENTS, HIGHWAY DRAINAGE PROVISION, LAND AVAILABILITY AND LOCAL AUTHORITY APPROVAL.
- 80m SIGHT LINE FROM PRIMARY SIGNAL HEAD TO BRADLEY BAR ROUNDABOUT WHERE VEHICLES EMERGING THE ROUNDABOUT WILL BE TRAVELLING AT REDUCED SPEEDS
- 1.5m SET BACK IN ACCORDANCE WITH TABLE E19.2 OF CD 143 FOR A SHARED USE CROSSING POINTS

H	11/07/22	CJR	AMENDS IN RESPONSE TO KC RSA RESPONSE	PMO	PMO
G	01/07/22	CJR	AMENDS IN RESPONSE TO STAGE 1 RSA	PMO	PMO
F	30/05/22	CJR	MINOR AMENDS AS REQUESTED BY KC	PMO	PMO
E	23/05/22	CJR	FURTHER AMENDMENTS AS REQUESTED BY KIRKLEES COUNCIL	PMO	PMO
D	29/04/22	SG	AMENDMENTS AS REQUESTED BY KIRKLEES COUNCIL	PMO	PMO
C	11/01/21	CJR	BRADFORD RD SIGNAL CROSSING ADDED	PMO	PMO
B	19/01/21	JS	EXTENDED TOPO SURVEY ADDED	PMO	PMO
A	07/09/20	JS	HGV TRACKING ADDED	PMO	PMO
-	26/08/20	JS	INITIAL ISSUE	PMO	PMO
REV	DATE	BY	DESCRIPTION	CHK	APP
STATUS					
PRELIMINARY					

PROJECT	BRADLEY VILLA, HUDDERSFIELD	CLIENT	REDROW PLC
DRAWING TITLE	A641 BRADFORD ROAD PROPOSED SITE ACCESS ARRANGEMENT	CHECKED	PMO
SCALE @ A0	1:500 OR AS SHOWN	APPROVED	PMO
DATE	JULY 2022	DRG No.	19154/GA01
REV.	H	DATE	

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Leeds LS2 9JF
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Appendix D Speed Survey Information



SPEED SURVEY

JOB NO 12277

LOCATION: Bradley

DATE: 17/11/2021

SPEED LIMIT AT SITE: 40

DAY: Wednesday

DIRECTION: Northbound

WEATHER: Wet

25	31	32	34	39	29	34	26	25	28
27	28	29	30	33	36	33	39	33	35
42	26	28	21	24	25	23	26	27	28
31	26	30	31	30	28	27	20	25	29
42	32	23	31	28	29	32	37	31	29
27	25	29	29	33	29	34	26	30	27
32	36	40	31	36	33	28	32	25	32
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27	29	33	38	26	30	31	32	35	35
33	38	26	35	37	23	54	24	28	30
31	32	34	26	34	38	32	40	47	32
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29	32	27	26	32	32	27	29	27	30
26	29	27	31	27	31	32	36	26	30
29	32	33	32	25	33	27	29	31	33

Total No. 200

Summary

	MPH	KPH
Average	30	49
85th %ile	35	56
Maximum	54	87
Minimum	20	32

Traffic speeds measured by hand held radar speed gun in accordance with advice given in Department of Transport Advice Note CA 185 - DMRB Volume 5 Part 2 - 'Vehicle Speed Measurements on All Purpose Roads'

SPEED SURVEY

JOB NO 12277

LOCATION: Bradley

DATE: 17/11/2021

SPEED LIMIT AT SITE: 40

DAY: Wednesday

DIRECTION: Southbound

WEATHER: Wet

31	32	34	25	27	17	33	40	39	43
45	24	23	26	30	33	44	28	29	31
27	24	26	31	26	24	30	28	26	25
26	25	35	23	32	31	29	45	31	36
26	34	36	39	23	31	30	27	32	31
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Total No. 200

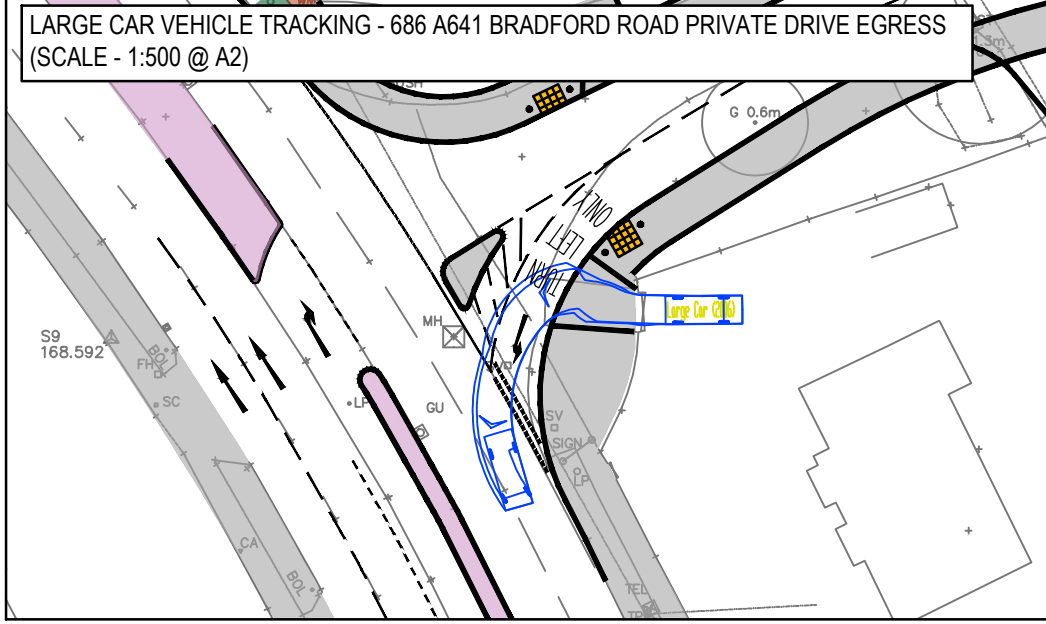
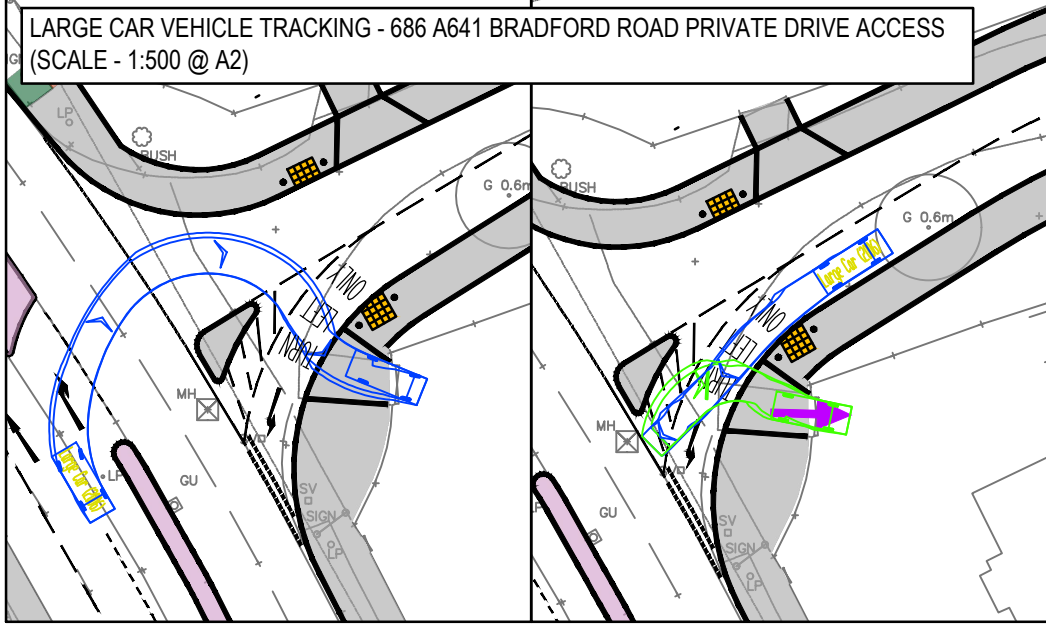
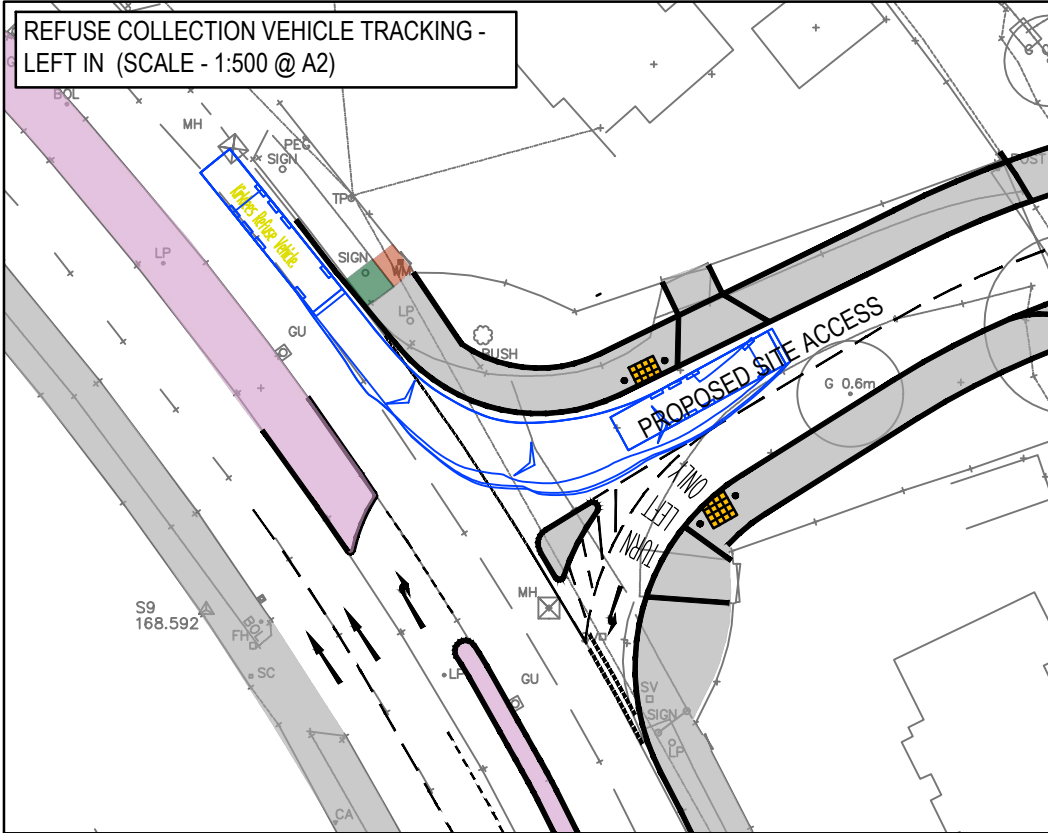
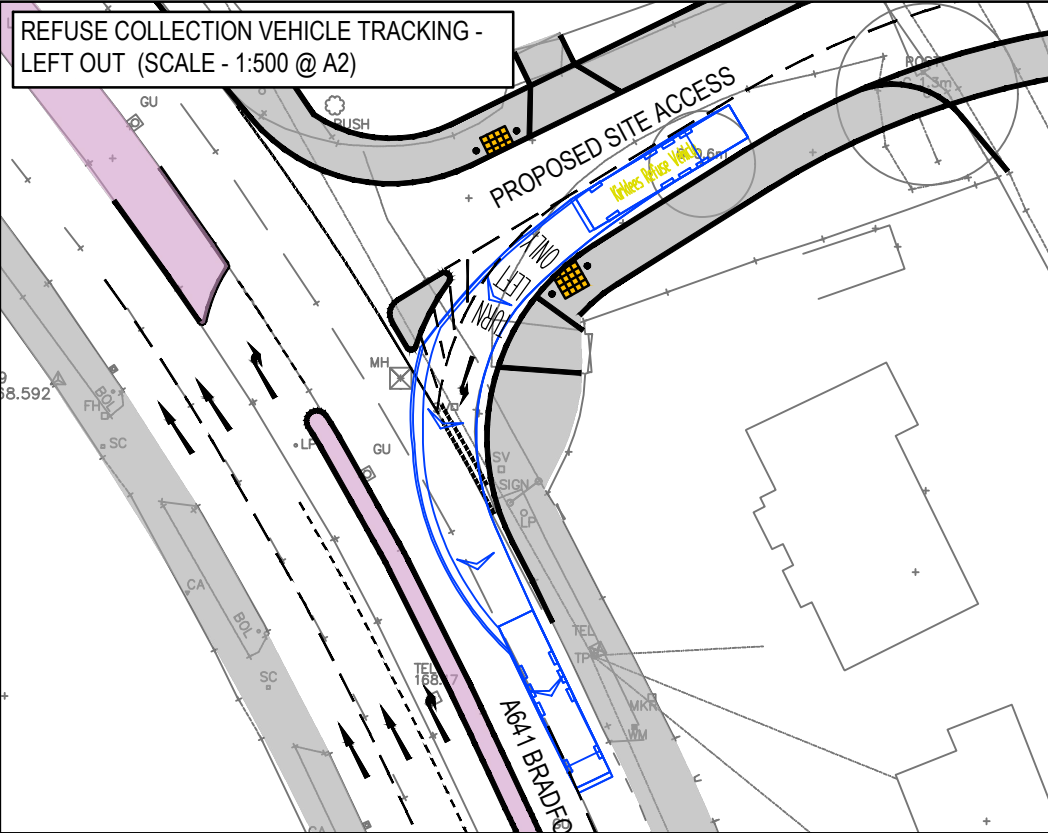
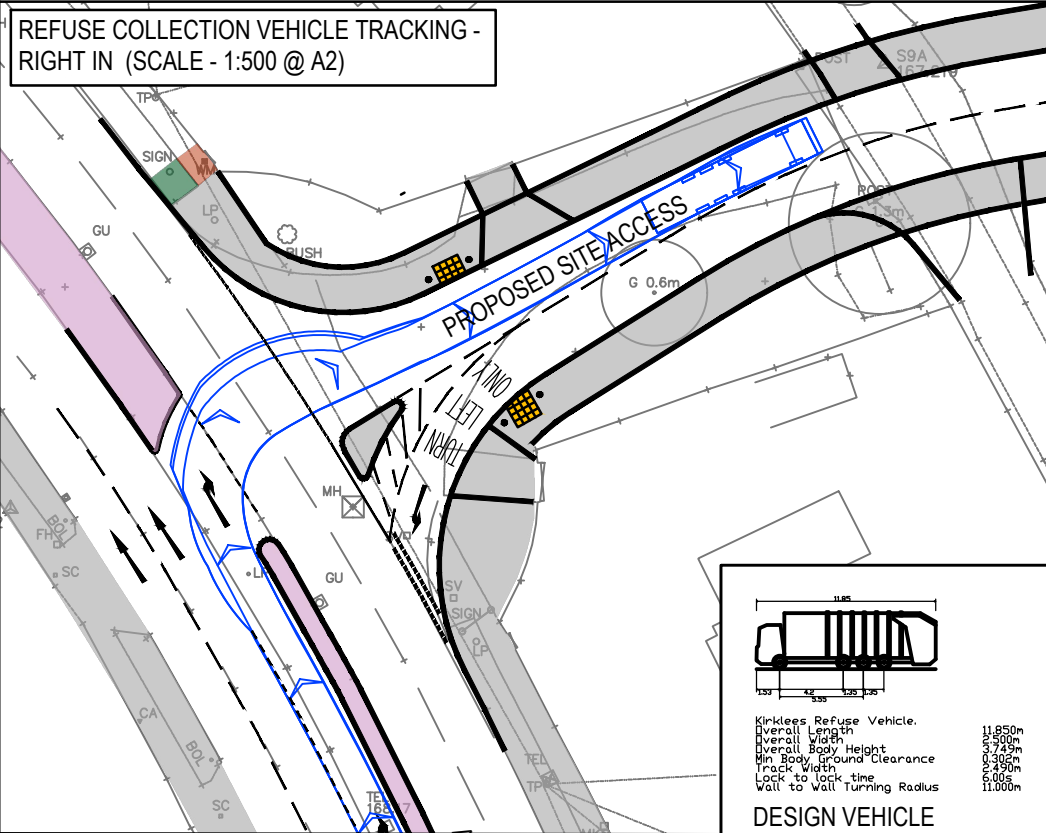
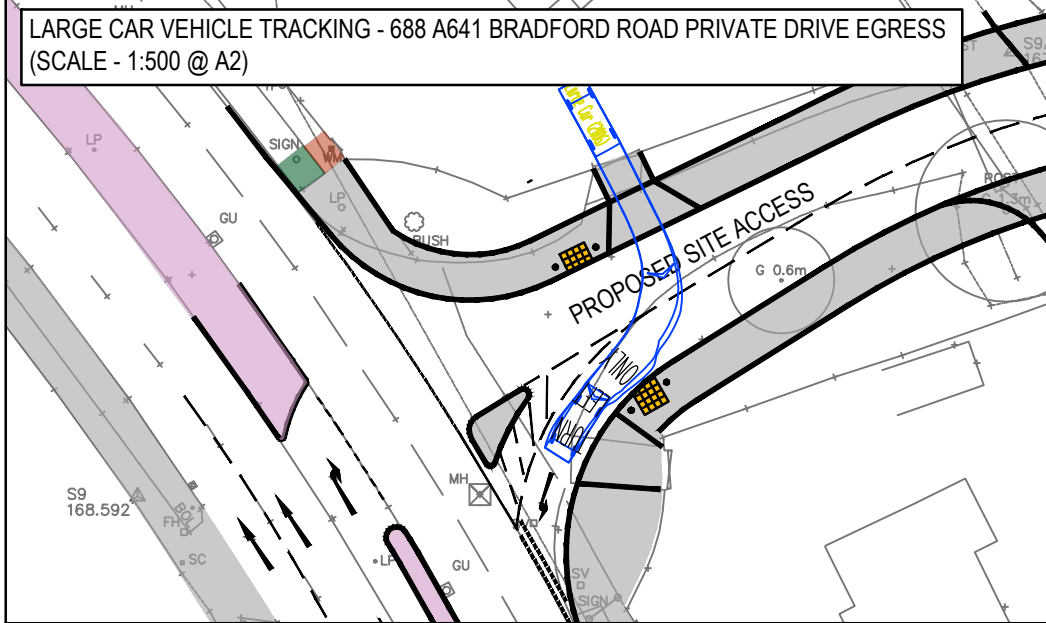
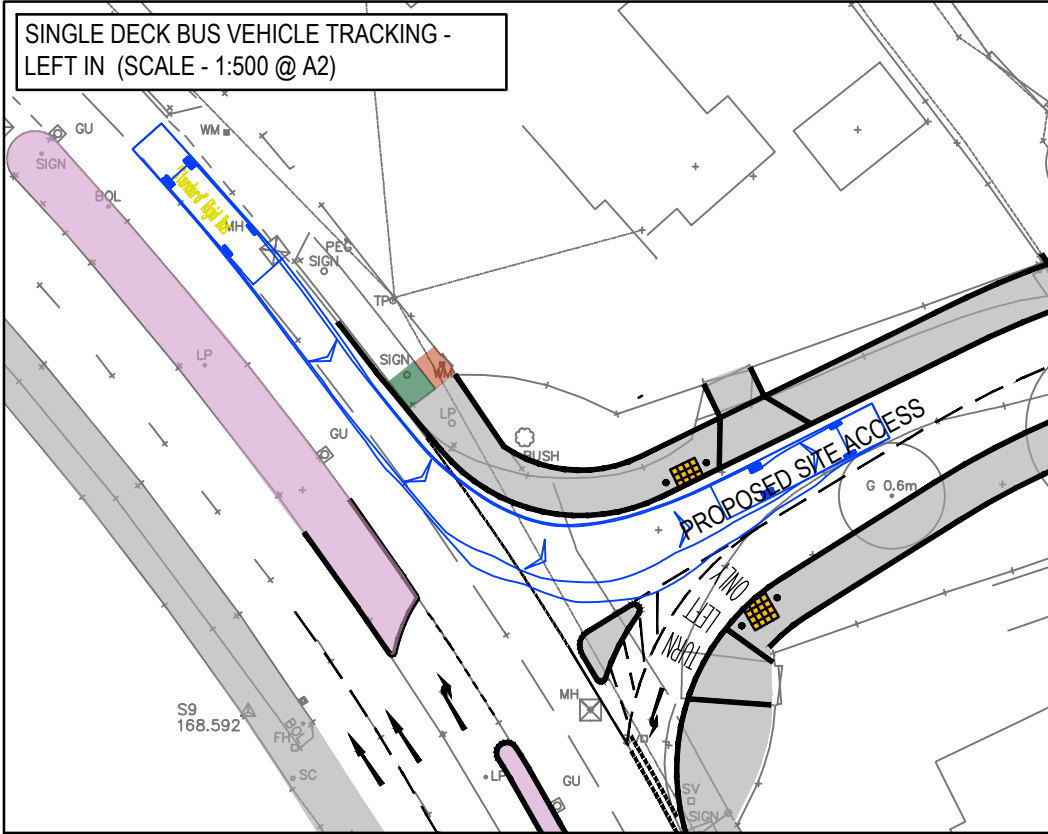
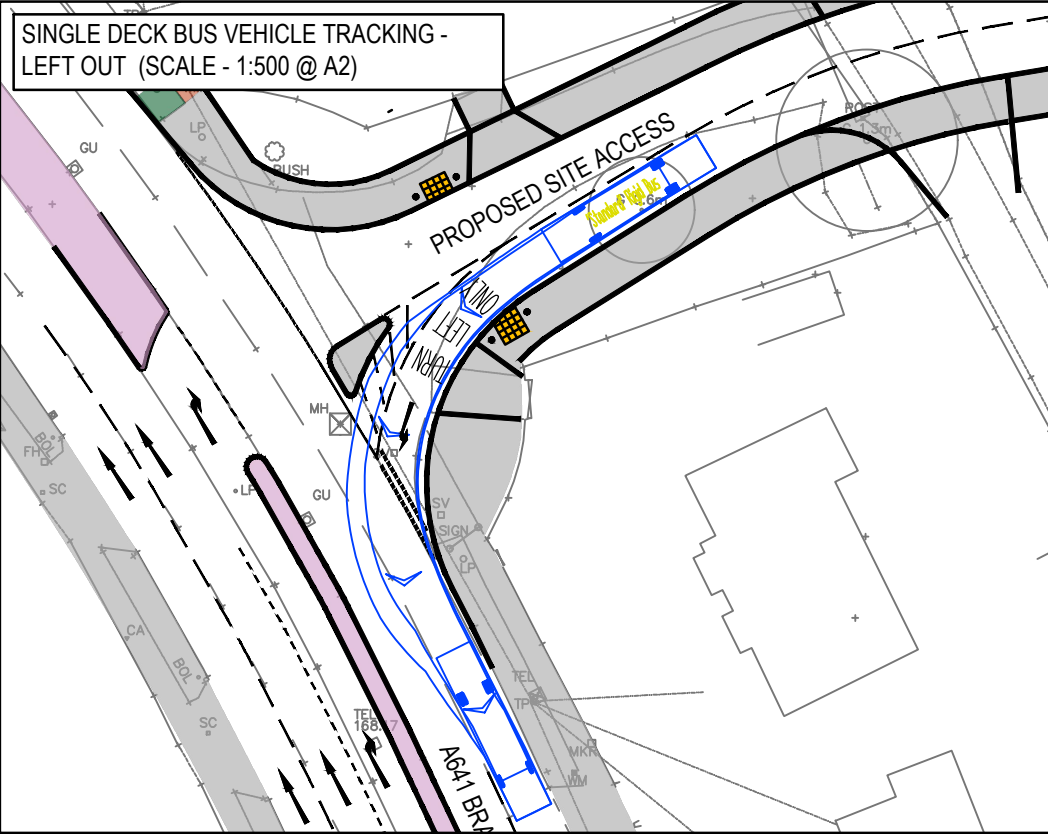
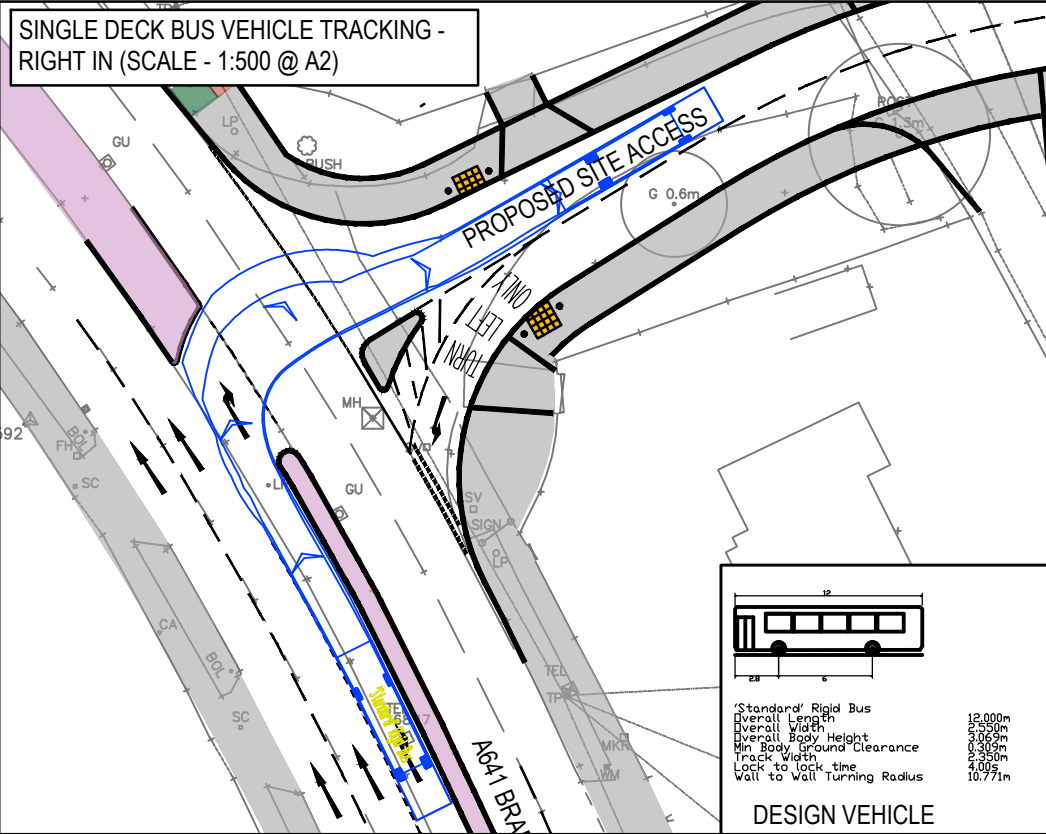
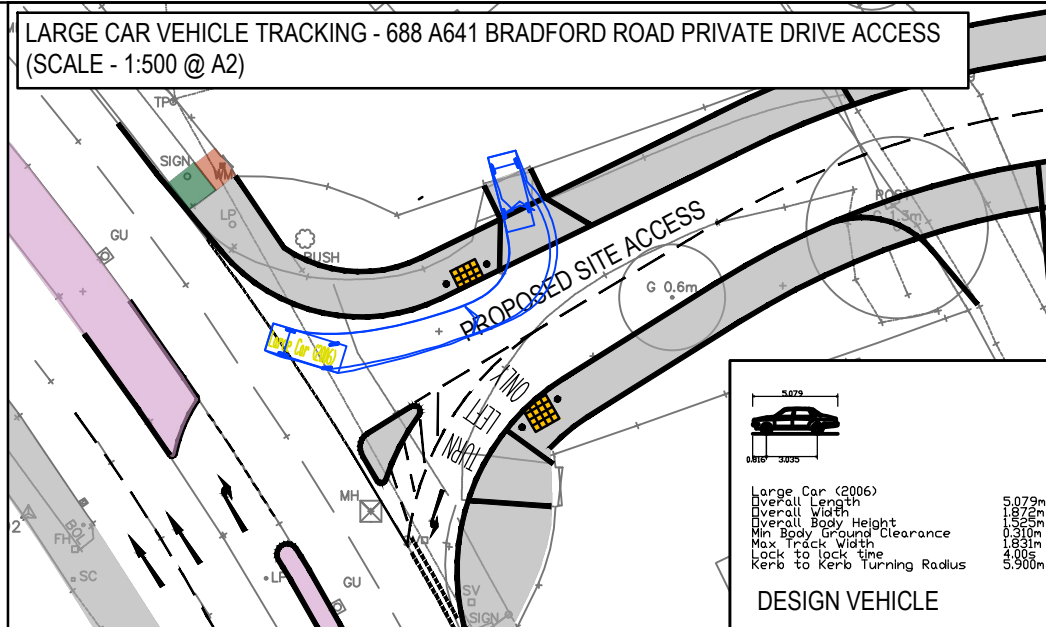
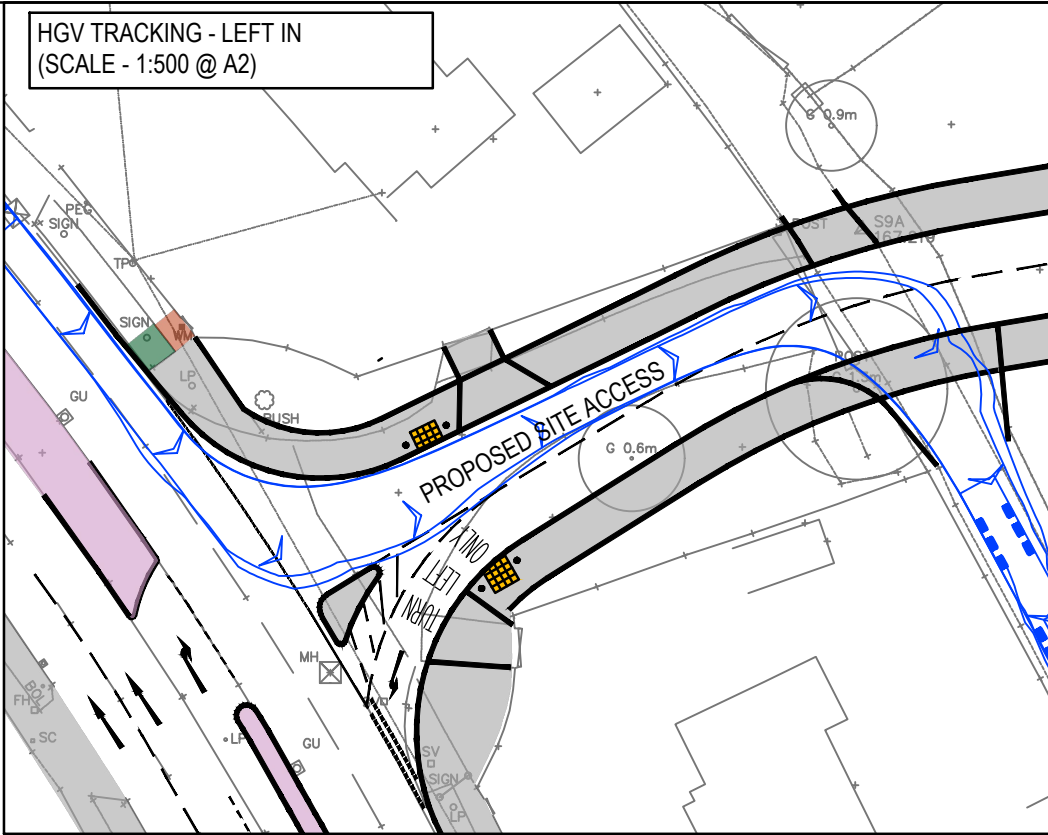
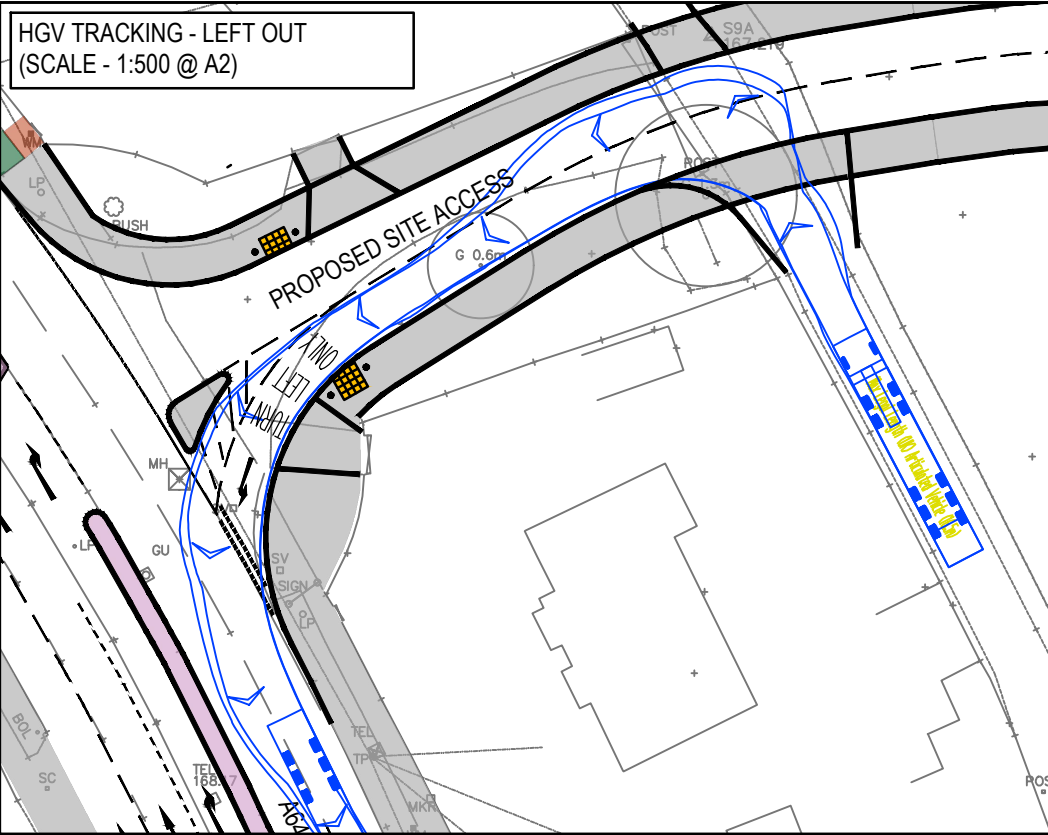
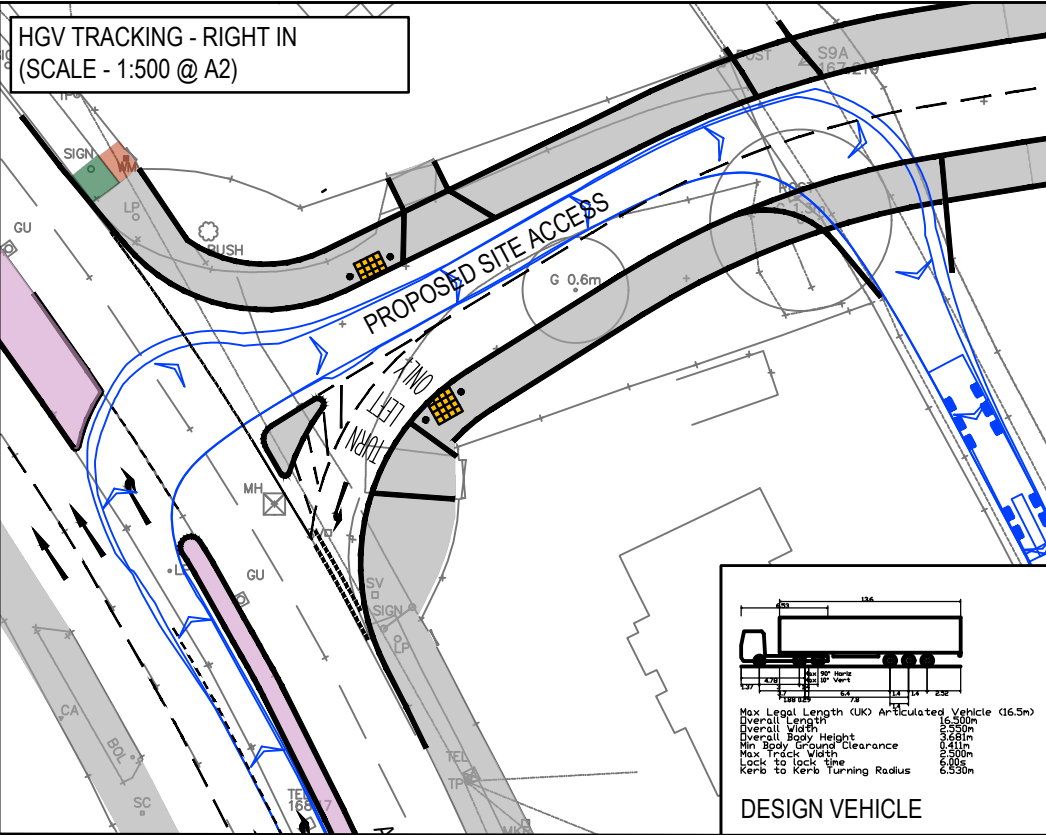
Summary

	MPH	KPH
Average	31	49
85th %ile	36	58
Maximum	79	127
Minimum	13	21

Traffic speeds measured by hand held radar speed gun in accordance with advice given in Department of Transport Advice Note CA 185 - DMRB Volume 5 Part 2 - 'Vehicle Speed Measurements on All Purpose Roads'

Appendix E Vehicle Swept Path Analysis (Optima Drawing 19154/ATR/06 Revision C)





	C	07/07/22	CJR	ADDITIONAL PRIVATE DRIVE TRACKING	PMO	PMO	PROJECT	BRADLEY VILLA, HUDDERSFIELD		CLIENT			 OPTIMA Intelligent Highway Solutions Suite 1, 3rd Floor, Goodbaird House, Infirmary Street Leeds LS1 2JP optimahighways.com T 0113 245 1679
	B	30/06/22	CJR	RESPONSE TO STAGE 1 RSA	PMO	PMO							
	A	30/05/22	CJR	UPDATED LAYOUT & PRIVATE DRIVE TRACKING	PMO	PMO							
	-	23/05/22	CJR	INITIAL ISSUE	PMO	PMO	DRAWING TITLE	A641 BRADFORD ROAD PROPOSED SITE ACCESS - SWEEP PATH ANALYSIS		CHECKED	APPROVED	DRG No.	
	REV	DATE	BY	DESCRIPTION	CHK	APP				PMO	PMO	19154/ATR/06	
STATUS					PRELIMINARY		DRAWN BY:		SCALE @ A2		DATE	REV.	
							CJR		1:500		JULY 2022	C	