
Rhydycar West, Merthyr Tydfil

Access Roundabout Design Audit

784-B023905

For Information

Marvel Ltd

December 2023

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Appendix B: Geometry and Visibility Plan Drawing

1.0 INTRODUCTION

BRIEF

- 1.1 Tetra Tech has been commissioned by Marvel Ltd to act as the transport and highways consultant in support of a planning application for land west of the A470 and to the south of the village of Heolgerrig in Merthyr Tydfil County Borough Council (MTCBC). The land represents an urban extension to the town of Merthyr Tydfil.
- 1.2 Planning Application P/23/0065 proposes the development of:
 - 39,200 sqm Indoor Snowdome.
 - 7,500 sqm Water Park.
 - 27,400 sqm Hotel (418 beds).
 - Indoor / Outdoor Activity Centre; and,
 - 30 Forest Lodges (up to 2,000 sqm).
- 1.3 Welsh Government's Transport Network Management Division provide a response to the highways materials submitted under Planning Application P/23/0065, citing that the developer should ensure that the junction improvement **Drawing 784-B023905-TTE-00-ZZ-DR-CH-SK001-P03** dated October 2021 is compliant with trunk road standards (DMRB), in particular CD116.
- 1.4 This report forms a Design Audit, prepared to provide confidence that the proposed works as illustrated in **Drawing 784-B023905-TTE-00-ZZ-DR-CH-SK001-P03** are compliant with the DMRB. The drawing is provided at **Appendix A**.
- 1.5 Welsh Government's Transport Network Management Division also requested that a Walking, cycling and horse-riding assessment and review (WCHAR) is undertaken, to the principals of GG 142. This is being undertaken and is submitted as a standalone document.

2.0 RELEVANT DESIGN STANDARDS

INTRODUCTION

- 2.1 This section provides a summary of the standards and geometric criteria applied to the proposed access.

RELEVANT DESIGN STANDARDS

- 2.2 The provision of the proposed site access does not materially affect the geometry of the existing northbound and southbound arms of the Rhyd-y-Car Roundabout, and the existing roundabout geometry has therefore not been considered as part of this assessment.
- 2.3 The preliminary design is in 2D, and the assessment of the proposed improvement has been undertaken on that basis. It is anticipated that the site levels are such that there will be no detrimental impact on the 3D design to be undertaken during the detailed design stage.
- 2.4 The proposed site access has been designed in accordance with the following standards:
- Design Manual for Roads and Bridges (DMRB) - CD116 Geometric Design of Roundabouts.
 - Manual for Streets (MfS).
 - Manual for Streets 2 (MfS2).
- 2.5 The proposed site access road will not be adopted and as such has been designed assuming a 30-mph design speed in accordance with MfS and MfS2.
- 2.6 The tie-in with the Rhyd-y-Car Roundabout will be designed in accordance with DMRB CD116.

3.0 DESIGN PARAMETERS

- 3.1 The geometric criteria and visibility splays for the proposed site access are detailed on **Drawing 784-B023905-TTE-00-ZZ-DR-CH-SK006**, provided at **Appendix B**.
- 3.2 The largest vehicle anticipated to use the proposed access is a large coach.
- 3.3 The carriageway consists of two 3.65m wide lanes with curve widening as required and verge widening to provide adequate Stopping Sight Distance (SSD).
- 3.4 The entry width is 9.00m, consisting of two lanes, and is compliant with DMRB CD116 Cl. 3.11 and Cl. 3.12.
- 3.5 The lane widths at the give way line are 4.50m and are compliant with DMRB CD116 Cl. 3.14. Although DMRB CD116 Cl. 3.14.2 suggests that lane widths for multilane entries should be between 3.00m and 3.50m, DMRB CD116 Cl. 3.14.4 states that vehicle swept paths should be assessed on multi-lane entries to ensure that sufficient width is provided for each entry lane. The provision of 4.50m entry lanes accommodates the swept paths of the large coaches anticipated to use the proposed access and is therefore considered to comply with the entry width requirements contained in CD116.
- 3.6 The average effective flare length is 34.78m and is compliant with DMRB CD116 Cl. 3.17 and Cl. 3.17.1. The flare length is dictated by the swept paths of the large coaches that will use the proposed access.
- 3.7 The entry angle is 24.02° and is compliant with DMRB CD116 Cl. 3.18 and Cl. 3.18.1.
- 3.8 The entry radius is 20.00m and is compliant with DMRB CD116 Cl. 3.19, Cl. 3.19.1, 3.19.2 and Cl. 3.19.3.
- 3.9 The entry path radius (deflection) is 24.40m and is compliant with DMRB CD116 Cl. 3.20 and Cl. 3.36.
- 3.10 The exit width is 7.27m reducing to 6.30m at the end of the splitter island and is compliant with DMRB CD116 Cl. 3.28 and Cl. 3.28.2.
- 3.11 The exit taper has not been assessed, as the curve widening required on the downstream link supersedes the exit taper criteria.
- 3.12 The exit radius is 68.80m and is compliant with DMRB CD116 Cl. 3.29, Cl. 3.29.3, and Cl. 3.6.8.
- 3.13 A Stopping Sight Distance (SSD) of 43m has been provided on the site access in accordance with MfS and MfS2.
- 3.14 Visibility on the approach to the give way line has been assessed in accordance with CD116 Figure 3.45. SSD of 43m, appropriate for a design speed of 30mph in accordance with MfS and MfS2, is provided.
- 3.15 Visibility at entry has been assessed in accordance with CD116 Figure 3.49N. Visibility of 50m around the circulatory carriageway, appropriate for a roundabout Inscribed Circle Diameter (ICD) of 70m, is provided. It is noted that an existing traffic sign within the central island encroaches on the visibility at entry and it is assumed that this will be relocated during the detailed design stage.
- 3.16 Visibility to the right measured at the give way line has been assessed in accordance with CD116 Figure 3.51. Visibility of 50m around the circulatory carriageway, appropriate for a roundabout ICD of 70m, is provided.

- 3.17 Visibility to the right measured at 15m in advance of the give way line has been assessed in accordance with CD116 Figure 3.52. Visibility of 50m around the circulatory carriageway, appropriate for a roundabout ICD of 70m, is provided.
- 3.18 **Table 1** provides a summary of the design illustrated at **Drawing 784-B023905-TTE-00-ZZ-DR-CH-SK006**, which is the site access proposal for this application.

Table 1 – Roundabout Geometry

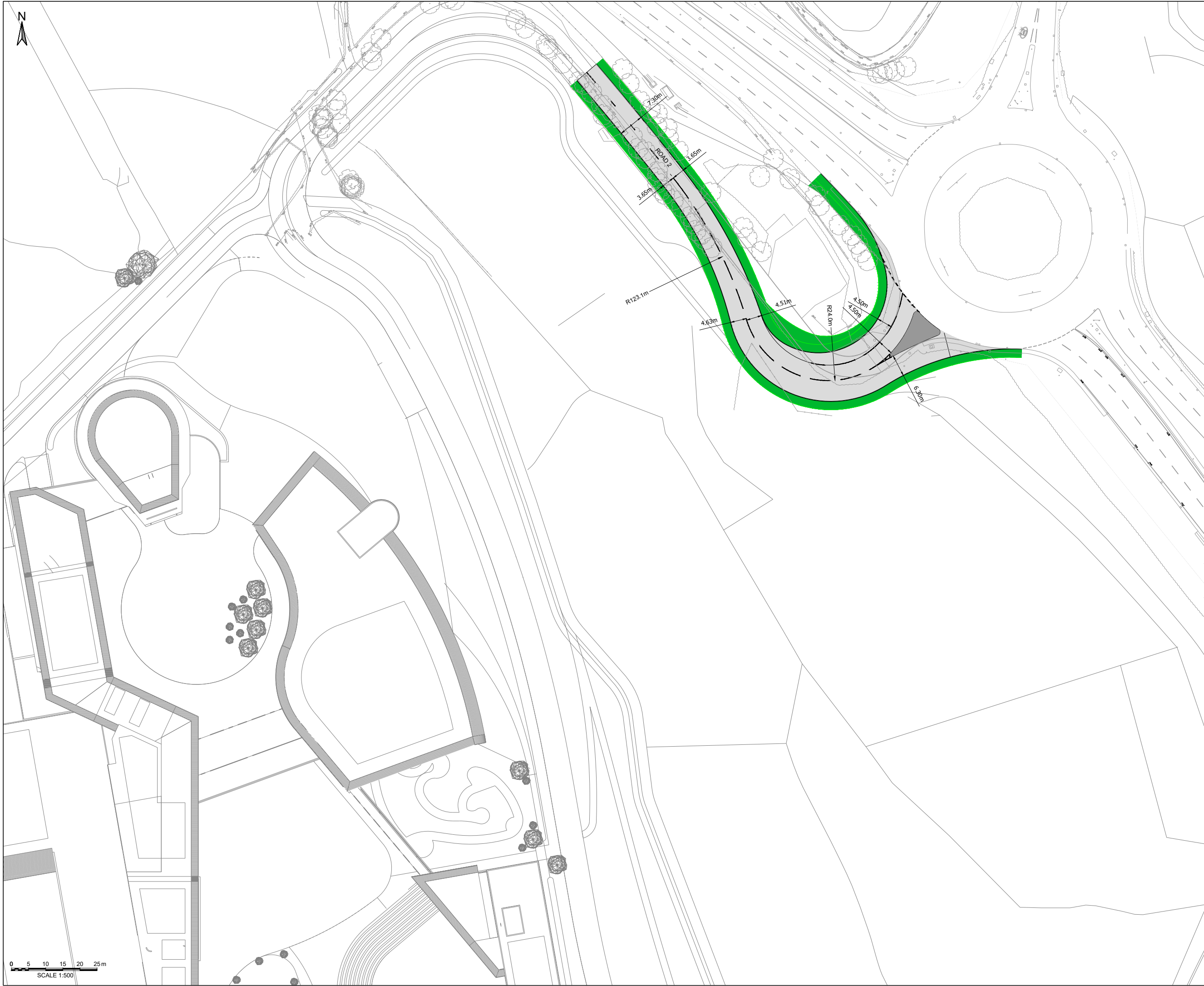
Criteria	Road 1 (A470 NB Approach)	Road 2 (Site Access)	Road 3 (A470 NB Exit)
Approach Half Width	9.41m	4.50m	n/a
No. of Entry Lanes	2	2	n/a
Entry Width	10.06m	9.00m	n/a
Entry Radius	22.11m	20m	n/a
Effective Flare	n/a	34.78m	n/a
Entry Angle	17.88°	24.02°	n/a
Entry Deflection	111.3m	24.4m	n/a
Exit Radius	n/a	68.80m	40.00m
No. of Exit Lanes	n/a	1	2
Exit Width	n/a	7.27m	10.69
Exit Width at End of Splitter	n/a	6.30m	n/a
Exit Taper	n/a	n/a	n/a
General			
ICD	70m		
Circulatory Width	11.20m		
Over-run Width	n/a		
Central Island Diameter	49.00m		

- 3.19 It is assumed that any existing vegetation or street furniture that may affect the visibility requirements will be identified during the detailed design stage and the impact designed out. It is not anticipated that site levels will have a detrimental impact on the visibility assessment.

4.0 SUMMARY

- 4.1 A design audit has been completed that evidences that the modifications proposed to the eastern arm of the A470 / A4102 roundabout are compliant with the geometric and visibility requirements contained in DMRB CD116, MfS and MfS2.
- 4.2 The access scheme outlined at **Drawing 784-B023905-TTE-00-ZZ-DR-CH-SK001-P03** is policy compliant, and as is demonstrated by the Transport Assessment to facilitate the safe and suitable movement of transport users to and from the site.

APPENDIX A: DRAWING 784-B023905-TTE-00-ZZ-DR-CH-SK001-P03



- KEY
- Carriageway
 - Footway/Cycleway-Footway
 - Verge

PRELIMINARY ISSUE

P03	DESIGN UPDATED TO TOPOGRAPHIC SURVEY	04.08.2022	AT	BM	AP				
P02	REVISED MASTERPLAN	19.04.2022	BM	AP	AP				
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Client

MARVEL LTD

Project Name

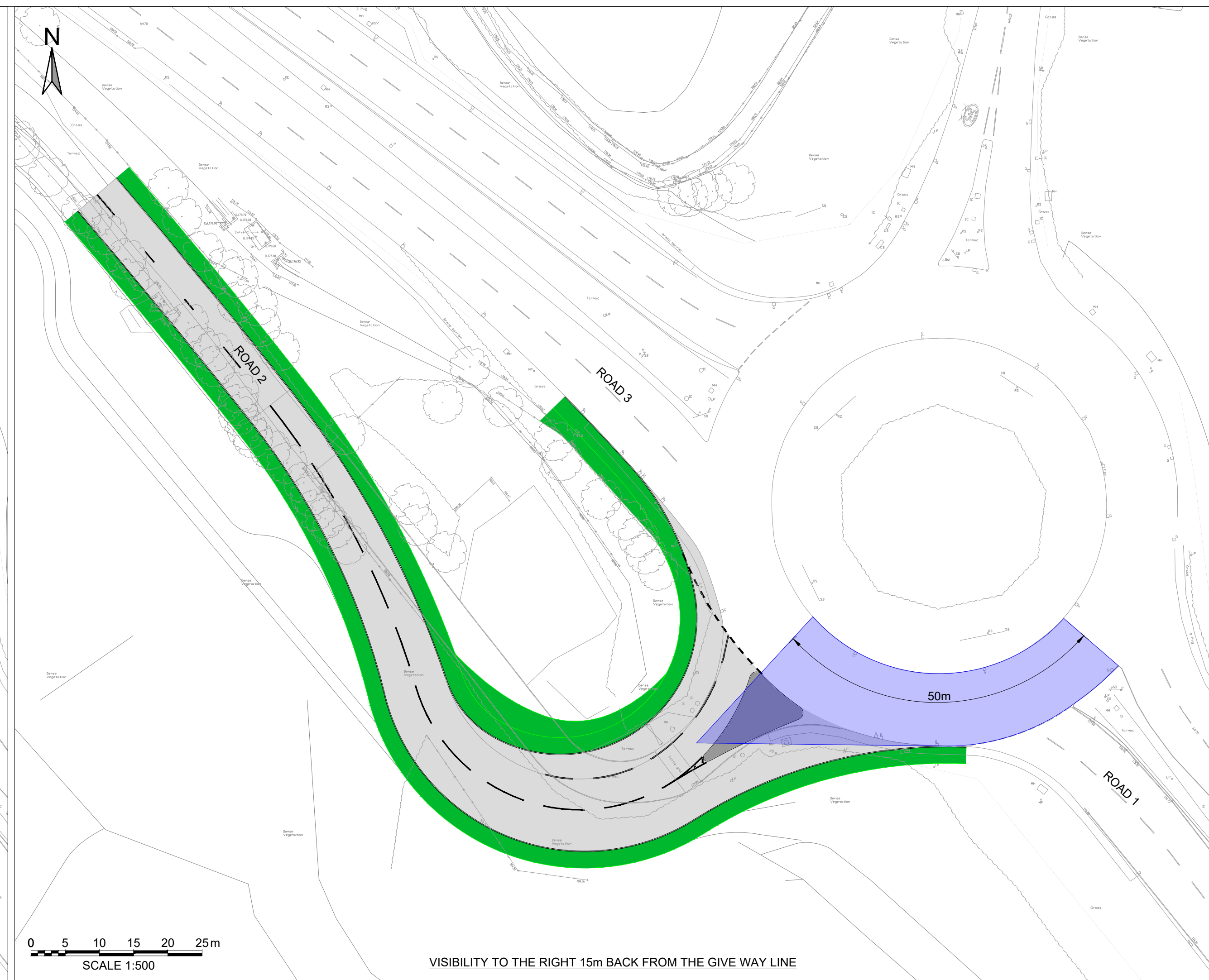
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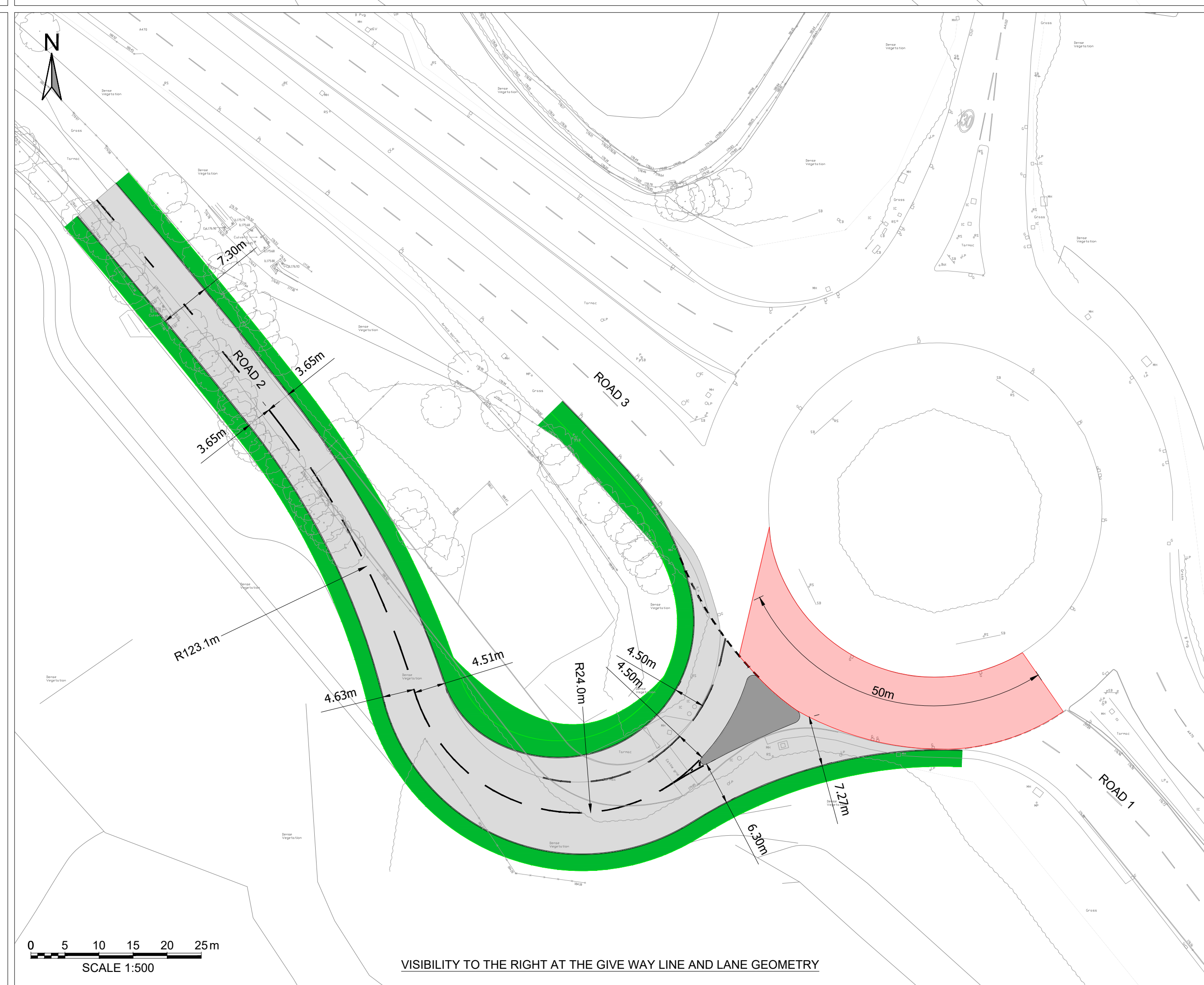
GENERAL ARRANGEMENT

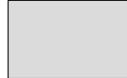
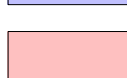
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B023905	- TTE	- 00	- ZZ	- DR	- CH	- SK001	P03	

APPENDIX B: GEOMETRY AND VISIBILITY PLAN DRAWING



ROUNDBOUT GEOMETRY			
CRITERIA	ROAD 1 (A407 (NB APPROACH))	ROAD 2 (SITE ACCESS)	ROAD 3 (A470 (NB EXIT))
APPROACH HALF WIDTH	9.41m	4.50m	N/A
NO. OF ENTRY LANES	2	2	N/A
ENTRY WIDTH	10.06m	9.00m	N/A
ENTRY RADIUS	22.11m	20m	N/A
EFFECTIVE FLARE	N/A	34.78m	N/A
ENTRY ANGLE	17.88°	24.02°	N/A
ENTRY DEFLECTION	111.3m	24.4m	N/A
EXIT RADIUS	N/A	68.80m	40.00m
NO. OF EXIT LANES	N/A	1	2
EXIT WIDTH	N/A	7.27m	10.69m
EXIT WIDTH AT END OF SPLITTER	N/A	6.30m	N/A
EXIT TAPER	N/A	N/A	N/A
GENERAL			
ICD	70m		
CIRCULATORY WIDTH	11.20m		
OVER-RUN WIDTH	N/A		
CENTRAL ISLAND DIA.	49.00m		



- | KEY | |
|---|---|
|  | Carriageway |
|  | Footway/Cycleway-Footway |
|  | Verge |
|  | Visibility at entry |
|  | Visibility to the right 15m back from give way line |
|  | Visibility to the right at the give way line |
|  | Visibility on approach |

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Project Name
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PROPOSED ACCESS
GEOMETRY AND VISIBILITY

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