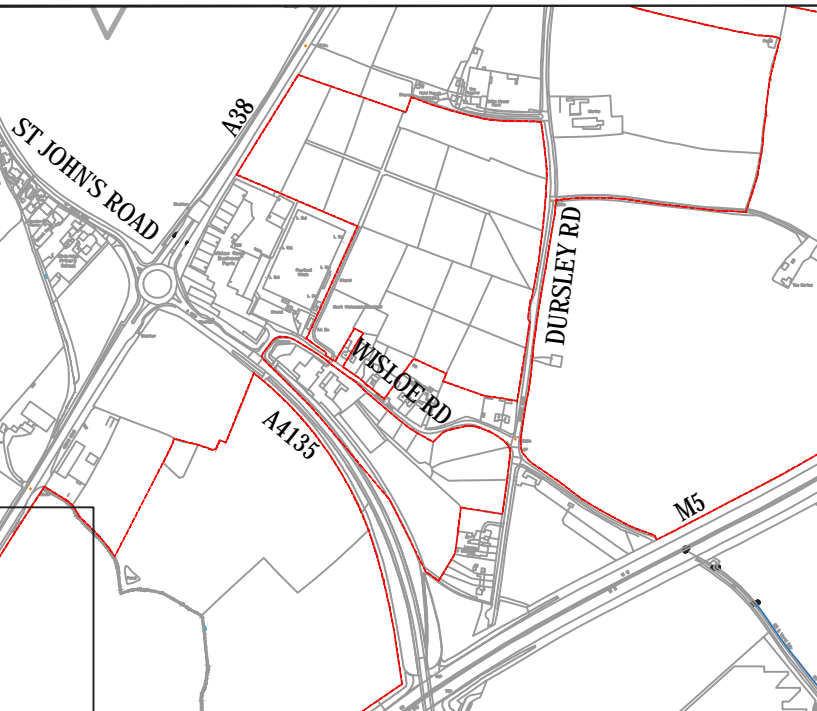


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Drawing Issue Status
CONCEPT

**WISLOE NEW SETTLEMENT
 PROPOSED ACCESS STRATEGY
 RIGHT TURN LANE AT SOUTHERN A38
 FRONTAGE**

Client
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EXISTING FOOTWAY

UNCONTROLLED CROSSING TO BE UPGRADED
TO TOUCAN CROSSING FOR ROUTE TO
NATIONAL CYCLE NETWORK ROUTE



ST JOHN'S ROAD

EXISTING
UNCONTROLLED
CROSSING

EXISTING UNCONTROLLED
CROSSING TO BE RETAINED BUT
POTENTIAL TO UPGRADE TO
SIGNALISED FACILITIES IF REQUIRED

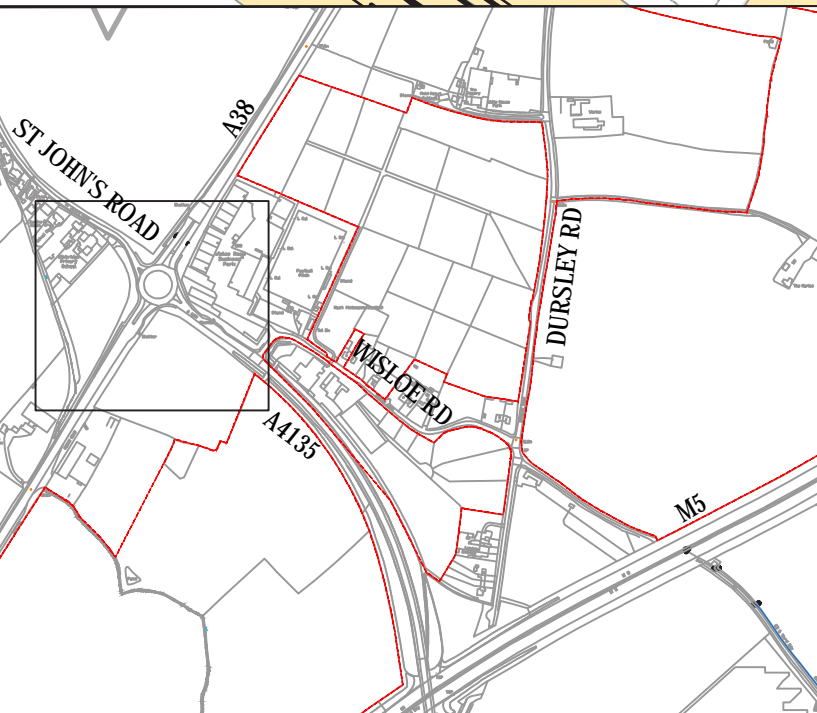
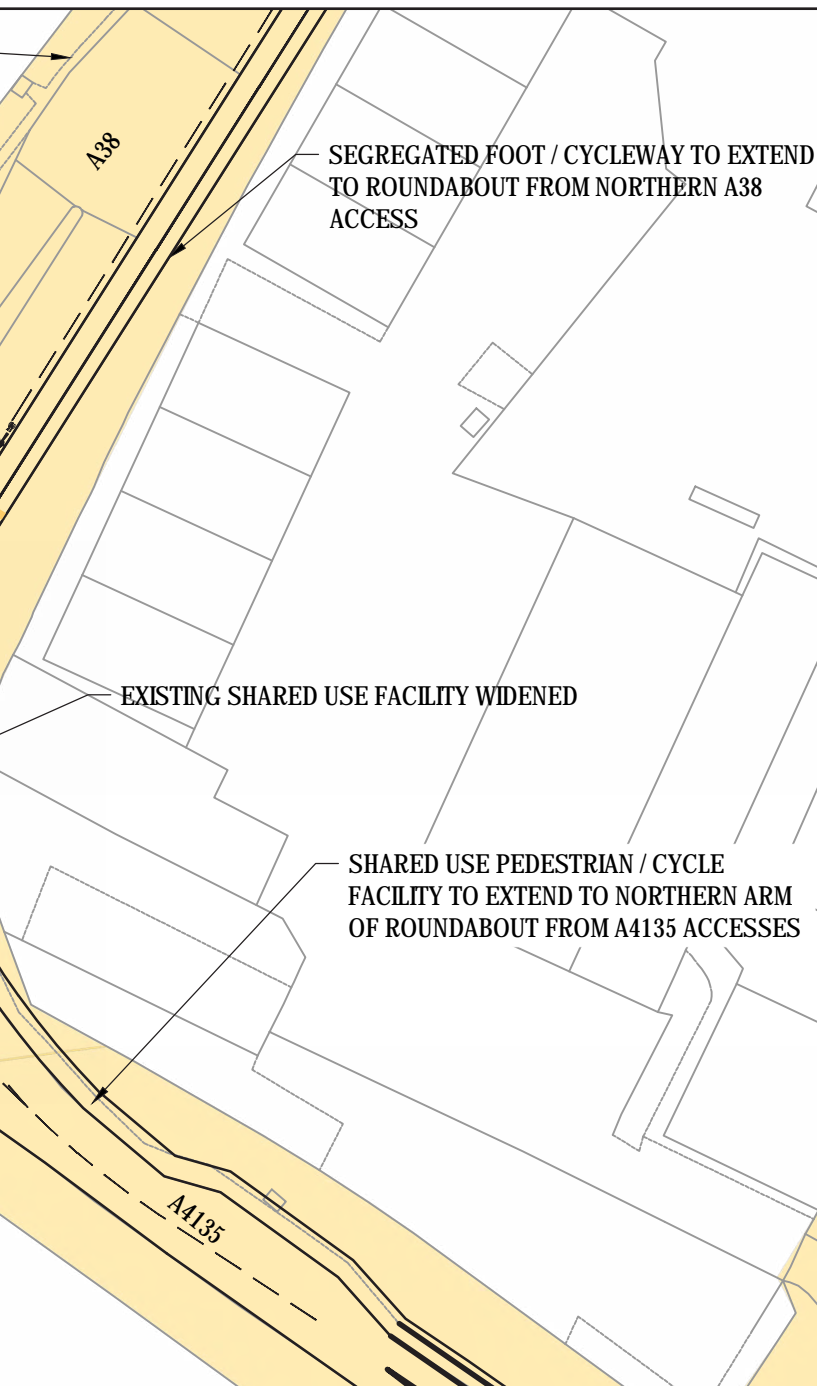
POTENTIAL TO INCREASE FLARE
SUBJECT TO CAPACITY
REQUIREMENTS

A38

SHARED USE FOOT / CYCLEWAY TO
EXTEND TO ROUNDABOUT FROM
SOUTHERN A38 ACCESS

CONTEXT PLAN
SCALE 1:10000

A38



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Drawing Issue Status
CONCEPT

**WISLOE NEW SETTLEMENT
 PROPOSED ACCESS STRATEGY
 IMPROVEMENTS AT A38 ROUNDABOUT**

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SLIP TO BE PROVIDED FOR CYCLISTS TO
RETURN TO NORTHBOUND CARRIAGEWAY
THROUGH CAMBRIDGE

TOUCAN CROSSING TO PROVIDE CONNECTION
TOWARDS CAMBRIDGE

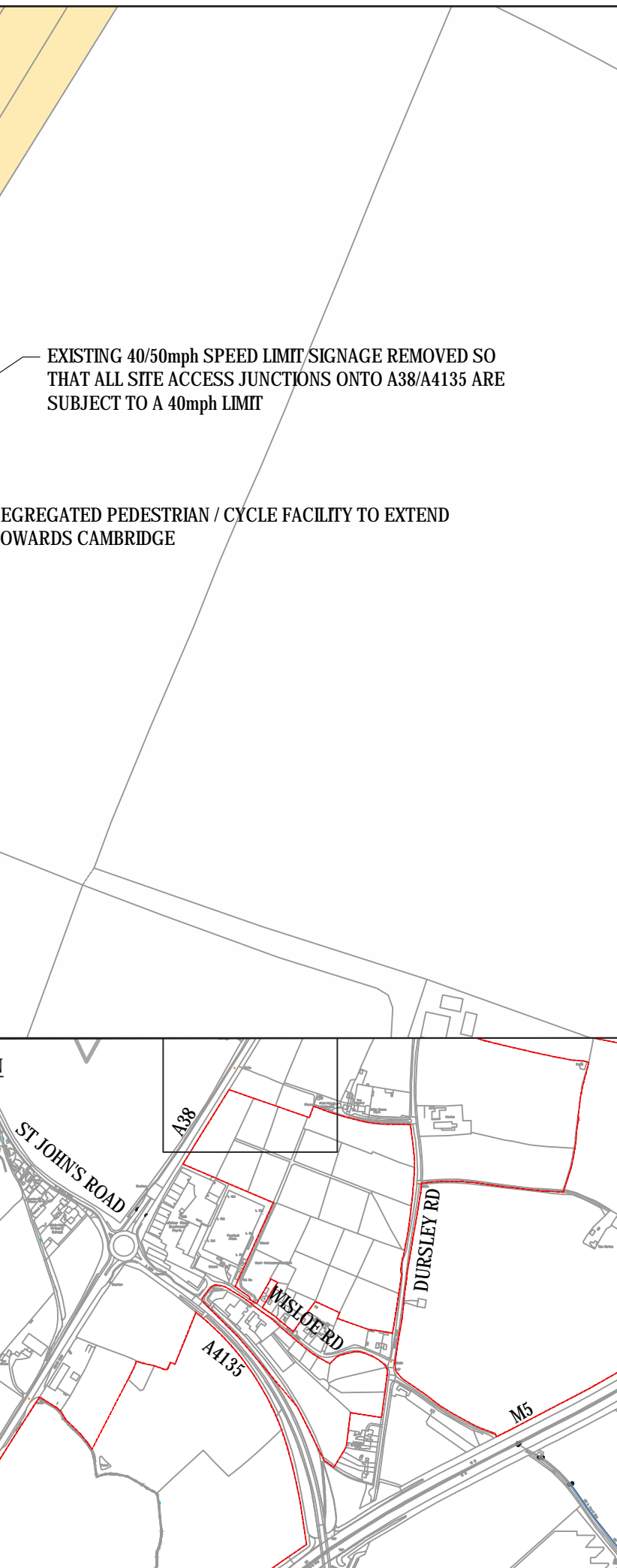
EXISTING FOOTWAY

ADVANCED STOP LINES TO
ALLOW COMMUTER
CYCLISTS TO CONTINUE TO
MAKE USE OF ON ROAD
FACILITIES

RIGHT TURN MOVEMENT
POTENTIAL TO RESTRICT AT
JUNCTION TO MAXIMISE
CAPACITY ON A38

SEGREGATED PEDESTRIAN/CYCLE
FACILITY TO EXTEND TO A38 ROUNDABOUT
TO PROVIDE CONNECTION TO NATIONAL
CYCLE NETWORK ROUTE IN SLIMBRIDGE

CONTEXT PLAN
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Drawing Issue Status
CONCEPT

**WISLOE NEW SETTLEMENT
 PROPOSED ACCESS STRATEGY
 SIGNALISED JUNCTION AT NORTHERN A38
 FRONTAGE: OPTION 1**

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SLIP TO BE PROVIDED FOR CYCLISTS TO RETURN TO NORTHBOUND CARRIAGEWAY THROUGH CAMBRIDGE

TOUCAN CROSSING TO PROVIDE CONNECTION TOWARDS CAMBRIDGE

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TOWA

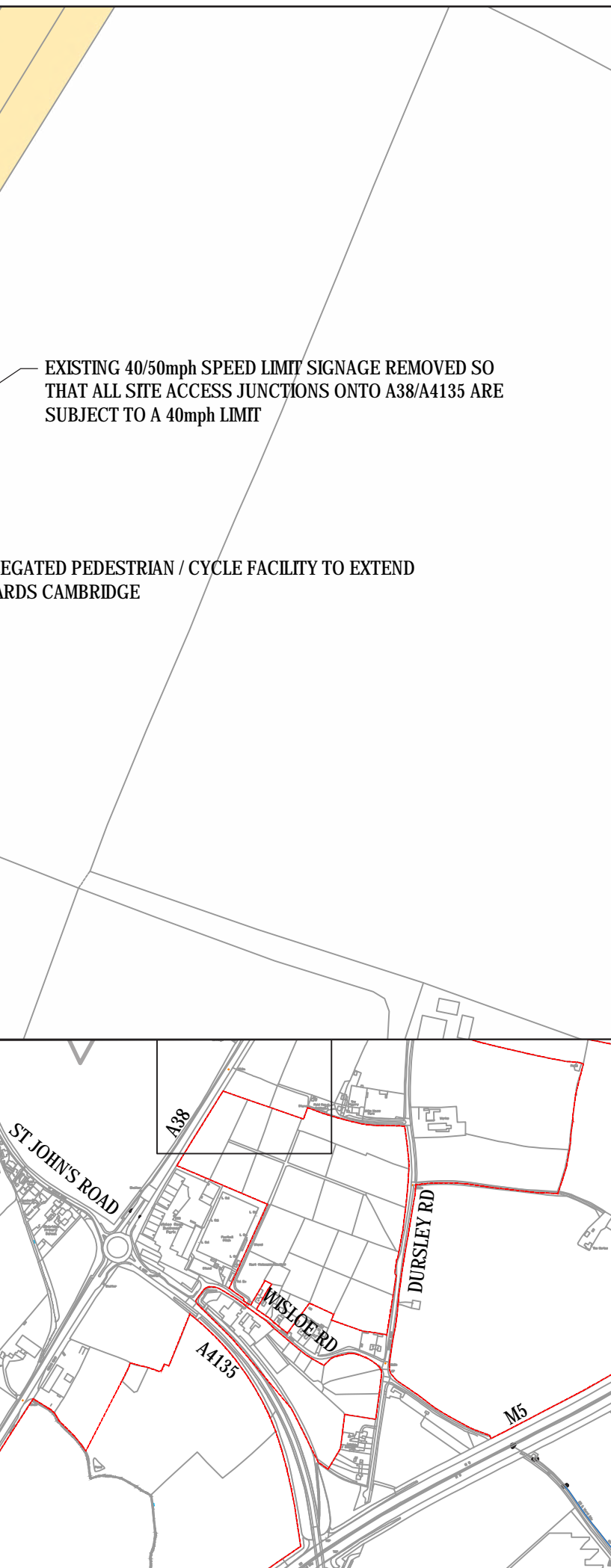
A38

EXISTING FOOTWAY

ADVANCED STOP LINES TO ALLOW COMMUTER CYCLISTS TO CONTINUE TO MAKE USE OF ON ROAD FACILITIES

CONTEXT PLAN
SCALE 1:10000

SEGREGATED PEDESTRIAN/CYCLE FACILITY TO EXTEND TO A38 ROUNDABOUT TO PROVIDE CONNECTION TO NATIONAL CYCLE NETWORK ROUTE IN SLIMBRIDGE



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Drawing Issue Status
CONCEPT

**WISLOE NEW SETTLEMENT
 PROPOSED ACCESS STRATEGY
 SIGNALISED JUNCTION AT NORTHERN A38
 FRONTAGE: OPTION 2**

Client
**GCC & ERNEST
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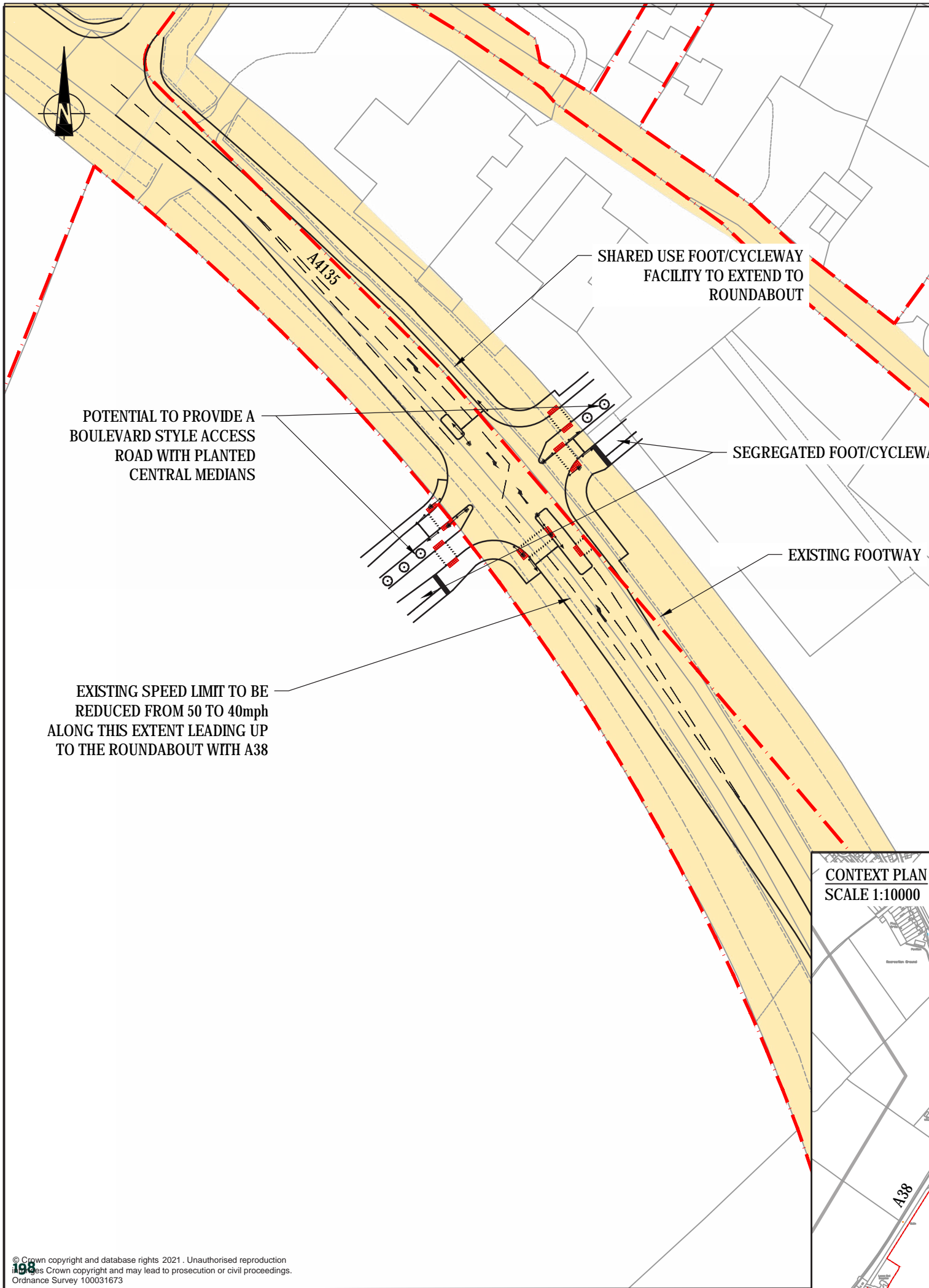


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POTENTIAL TO PROVIDE A BOULEVARD STYLE ACCESS ROAD WITH PLANTED CENTRAL MEDIANS

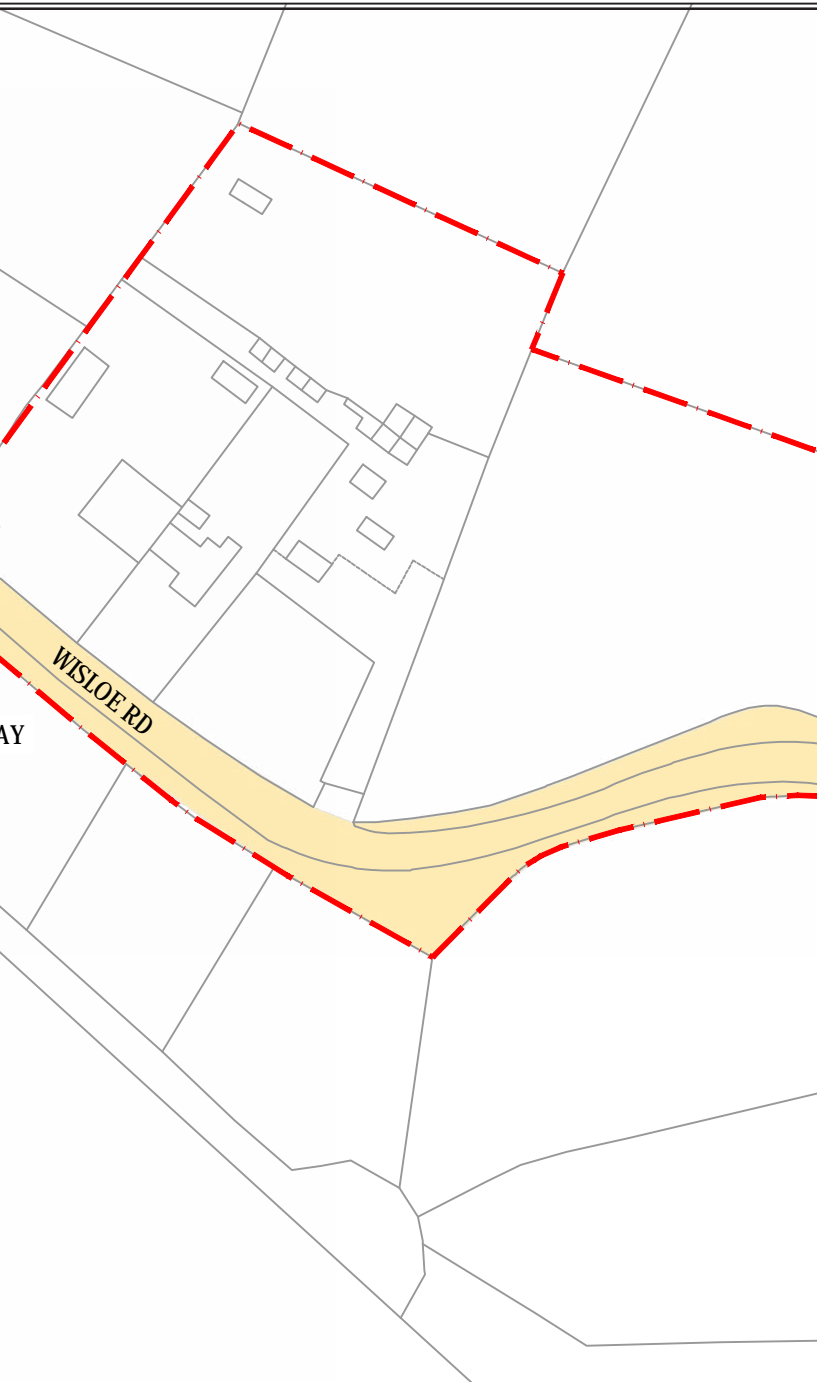
SHARED USE FOOT/CYCLEWAY FACILITY TO EXTEND TO ROUNDABOUT

SEGREGATED FOOT/CYCLEWAY

EXISTING FOOTWAY

EXISTING SPEED LIMIT TO BE REDUCED FROM 50 TO 40mph ALONG THIS EXTENT LEADING UP TO THE ROUNDABOUT WITH A38

CONTEXT PLAN
SCALE 1:10000

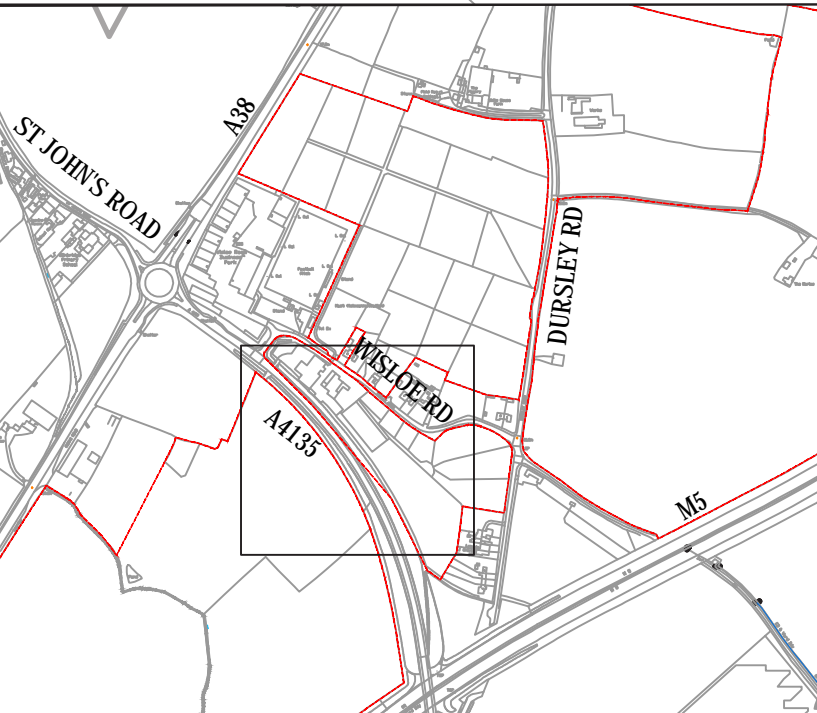


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Drawing Issue Status
CONCEPT

**WISLOE NEW SETTLEMENT
 PROPOSED ACCESS STRATEGY
 SIGNALISED JUNCTION AT CENTRE OF
 SITE ON A4135**

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Appendix C Non Motorised User M5 Bridge Feasibility Report

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Wisloe New Settlement

Non-Motorised User Route Over M5 - Feasibility Report

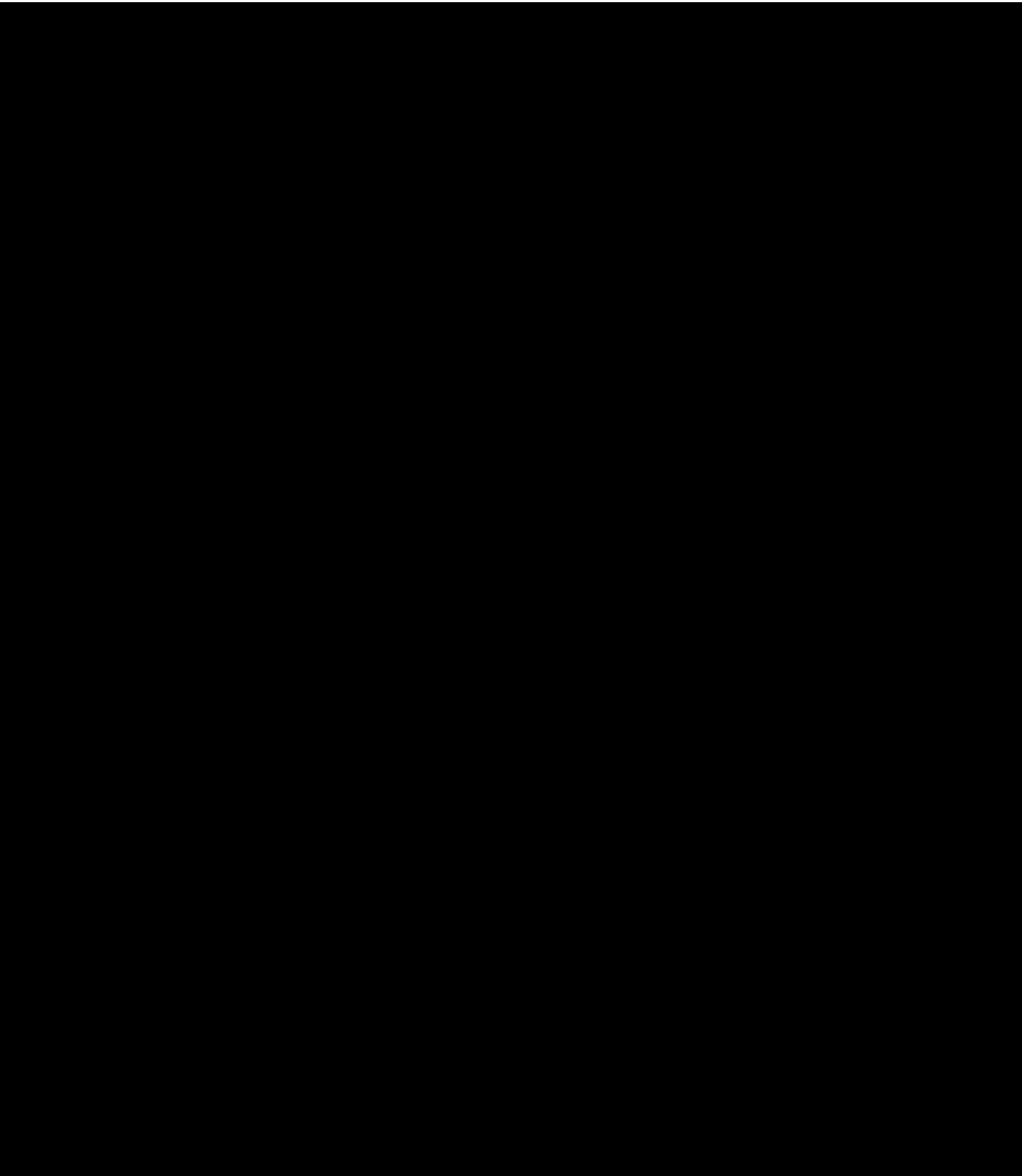
On behalf of **Ernest Cook Trust & Gloucestershire County Council**



Gloucestershire
COUNTY COUNCIL



Project Ref: 332310150 | Rev: P01 | Date: May 2021



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1.2 Consultations and requirements..... 1

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Appendices

Appendix A Option Drawings

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1 Introduction

1.1 Overview

- 1.1.1 Stantec was instructed by Gloucestershire County Council and the Ernest Cook Trust as the landowners of the site to consider the potential to provide a non-motorised user (NMU) link by way of a bridge between their proposed mixed use residential led scheme known as Wisloe New Settlement and Cam & Dursley Railway Station. To connect the two this link would therefore need to cross the M5 which falls within the control of Highways England.
- 1.1.2 This report considers two options:
- Option 1 – Foot/cycle bridge fully spanning M5 and Highways England land located either side
 - Option 2 – Foot/cycle bridge with minimum span over existing M5 carriageway.
- 1.1.3 Discounted options and reasons include:
- Underpass – discounted due to topography, NMU experience and disruption to the travelling public on the M5
 - 3 span bridge, adding backspans over adjacent land to create a more open structure and reduce the volume of earthworks.
- 1.1.4 A location plan is included in the option drawings in **Appendix A**.
- 1.1.5 Headings in this report follow the heading requirements and guidance for a structures option report in line with current Highways England requirements, as laid out in Appendix O of standard CG 300 in the Design Manual for Roads and Bridges (DMRB). Although the current feasibility study does not form a full structures options report, the structure is provided to allow for further development work.

1.2 Consultations and requirements

- 1.2.1 The main technical requirements are set out in the DMRB published by Highways England. This includes requirements to design to standards published by the British Standards Institution including the Eurocodes.
- 1.2.2 Stantec's transport planning team consulted both Highways England and Gloucestershire County Council in their role as the strategic highway and local highway authority respectively. This led the former to confirm their in principle support for a foot/cycle bridge with the only proviso being that the structure would need to have a clear span across the motorway. Similarly, the local highway was also supportive particularly given it emerged at the time that they were planning to submit a funding bid for a foot/cycle bridge across the M5 at more or less the same location.
- 1.2.3 Stantec in their role as the transport planning consultant for the site requested that the bridge have compliance with Local Transport Note (LTN) 1/20 Cycle Infrastructure Design, the key impact of which is requiring a clear width of 5.5m. This is significantly wider than the DMRB minimum requirement in CD 353 for a width of 3.5m and results in the introduction of a site splice joint along the centre of the bridge.

1.3 Geology

- 1.3.1 British Geological Survey (BGS) Geology of Bridge viewer indicates that the geology consists of Cheltenham Sand and Gravel superficial deposits overlying Blue Lias Formation and Charmouth Mudstone Formation (undifferentiated) – Mudstone.
- 1.3.2 There are three nearby historical borehole scans available on the BGS website.

1.4 Loading

- 1.4.1 The feasibility report is based on achieving a standard footbridge headroom of 5.7m over the M5. The Department for Transport (DfT) Heavy and High Routes map does not show the M5 at this location as a high load route.
- 1.4.2 Foot/cycle bridge structural loading will be in accordance with the Eurocodes and the DMRB.

1.5 Environment

- 1.5.1 No environmental requirements or constraints are known at this time.

1.6 Land and Property

- 1.6.1 The land considered either side of the M5 to accommodate a bridge is within the control of the landowners.

2 Bridge Feasibility

2.1 Description of proposed structure options

2.1.1 Proposed options are:

- Option 1 - Single 58m square span over M5 bow arch truss bridge
- Option 2 - Single 42.6m square span over M5 bow warren truss bridge.

2.2 Capital cost and whole life cost

2.2.1 Exclusions:

- Land costs
- Survey costs – topographical and ground investigation
- Legal and professional costs
- Highway Authority adoption costs (commuted sums)
- Contract administration and works examination costs
- Enabling works
- Contractor's preliminaries, overhead and profit
- Traffic Management
- Deep foundation if required
- Earthworks
- Drainage
- Streetlighting
- Hard and soft landscaping
- Parapets and fencing on approach to bridge
- Vehicle Restraint Systems (VRS) on the motorway
- Other aspects of approaches to bridge.

2.2.2 The costing is indicative and has been based on engineering experience of similar highway structures where Stantec have been involved. It should be noted that Stantec are not cost consultants. No bridge scheme is identical to another, bridges are often bespoke to the constraints they address. Constraints discovered during further design stages may have a significant effect on the costs. It should also be noted that steel and other construction material prices are highly volatile.

Option 1 - Single 58m square span over M5 bow arch truss bridge

Element	Quantity	Unit	Rate (£)	Budget Cost (£)
Superstructure Steelwork Deck Plan Area	5.5 x 58 = 319	m ²	3,500	1,116,500
Substructure – Abutment Elevation Area	2 x 190 = 380	m ²	200	76,000
Substructure - Bankseats	2 x 7 x 1 x 1 = 14	m ³	400	5,600
Total				1,198,100 round to: 1,200,000

Table 2.1 – Option 1 Costs

Option 2 - Single 42.6m square span over M5 bow warren truss bridge.

Element	Quantity	Unit	Rate (£)	Budget Cost (£)
Superstructure Steelwork Deck Plan Area	5.5 x 42.6 = 234	m ²	3,500	819,000
Substructure – Abutment Elevation Area	(52+196x2) + (52+150x2) = 796	m ²	200	159,200
Substructure - Bankseats	2 x 7 x 1 x 1 = 14	m ³	400	5,600
Total				983,800 round to: 1,000,000

Table 2.2 – Option 2 Costs

2.2.3 Whole life cost to be considered at a future design stage.

2.3 Appearance

2.3.1 The appearance will be considered by the landscape architect, the broader client team and the Local Planning Authority.

2.4 Sustainability and use of natural resources

2.4.1 Most steel is recycled at its end of life and the bridge steelwork will contain the standard proportion of recycled steel in line with the current supply of steel. At the end of its service life the steel will be recycled.

2.4.2 Concrete elements such as the substructure will be able to use cement replacements such as ground granulated blast furnace slag. At the end of its service life the concrete can be crushed and used as an engineered fill.

2.4.3 Where reinforced soil is used, this reduces the use of natural earthworks fill material.

2.5 Durability / design life

2.5.1 The structure will be designed with a 120 year design life.

2.5.2 The structure will be designed to be low maintenance and will consider options of emerging paint coating technology which may be able to increase the interval between repainting.

2.5.3 Water will be managed by collecting the run-off from the bridge into positive drainage system located off the bridge deck.

2.6 Health and safety, and potential risks and constraints to the project

2.6.1 No unusual hazards and risks identified to date.

2.7 Proposed design method

2.7.1 To be confirmed at future stage of design.

2.8 Departures from standards

2.8.1 If piled foundations are required a Departure from Standard is required to use the latest ICE Specification for Piling and Embedded Retaining Walls, as this has been updated for use with Eurocodes whereas the Specification for Highway Works has not yet been updated.

2.8.2 Foot/cycle bridge deck waterproofing is an aspect not covered by standards and would require consideration via the departures from standards system.

2.8.3 Consideration may be given to the use of a more durable paint coating system than the standard systems currently in the Specification for Highway Works.

2.8.4 No other departures are anticipated.

2.9 Construction issues

2.9.1 A full closure of the M5 will be required for installation of the superstructure bridge deck. The standard diversionary route via the A38 will be required between Junctions 13 and 14 of the M5.

2.10 Operation and maintenance

2.10.1 No unusual methods or facilities required for carrying inspections and maintenance.

2.11 Preferred option

2.11.1 To be confirmed in consultation with the client and highway authorities prior to next stage of work.

2.12 Proposed category of check

2.12.1 Check to be undertaken:

- Option 1 – Category 3 due to span
- Option 2 – Category 2

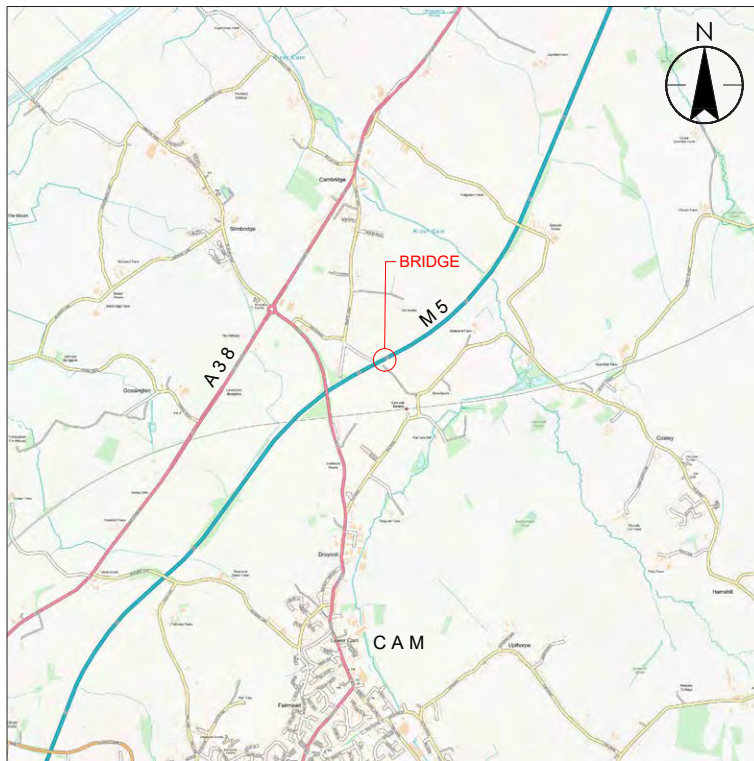
2.13 Role of the works examiner supervising the works

2.13.1 To be confirmed at future stage of design.

2.13.2 The CG 300 template includes text for submission by the designer to Highways England as Technical Approval Authority and agreement by the same. This has been omitted at this stage of the design development.

Appendix A Option Drawings

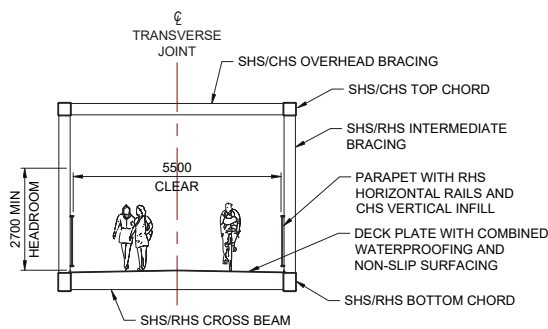
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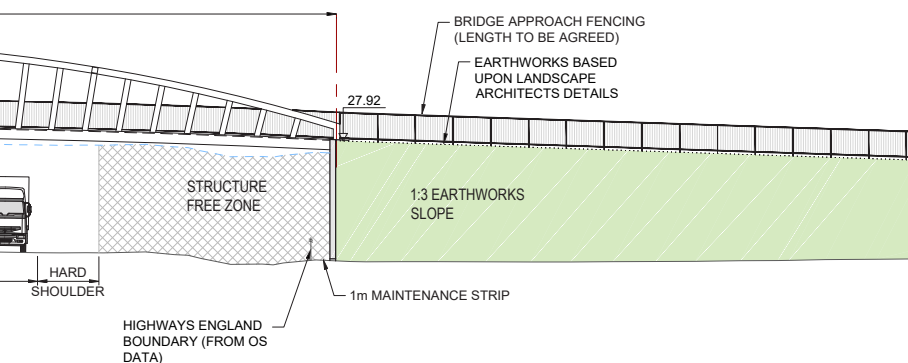
LOCATION PLAN

BRIDGE CO-ORDINATES
E: 375169.064m
N: 202507.654m



SECTION 02
1:100

LOW ARCH TRUSS BRIDGE



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 - LANDSCAPE ARCHITECTS PLAN: Drg. REFERENCE: M5 bridge sketch options.dwg
- 0100.5 THE GEOMETRY DEPICTED IN THIS DRAWING HAS BEEN DETERMINED FROM THE FOLLOWING:
 - THE DEPARTMENT FOR TRANSPORTATION / HIGHWAYS ENGLAND DESIGN MANUAL FOR ROADS AND BRIDGES
 - DEPARTMENT FOR TRANSPORT: CYCLE INFRASTRUCTURE DESIGN DOCUMENT LTN1/20.

P01 FIRST ISSUE	GCP	SCW	2021.05.12
Issued/Revision	By	Appd	YYYY.MM.DD
	GCP	SCW	2021.05.12
	Dwn.	Dsgn.	Chkd. YYYY.MM.DD

Issue Status

INFORMATION

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Client/Project Logo

Client/Project

GCC & ERNEST COOK TRUST

WISLOE NEW SETTLEMENT

NMU ROUTE OVER M5

Title

BRIDGE FEASIBILITY OPTION 1

Project No.

332310150 (50753)

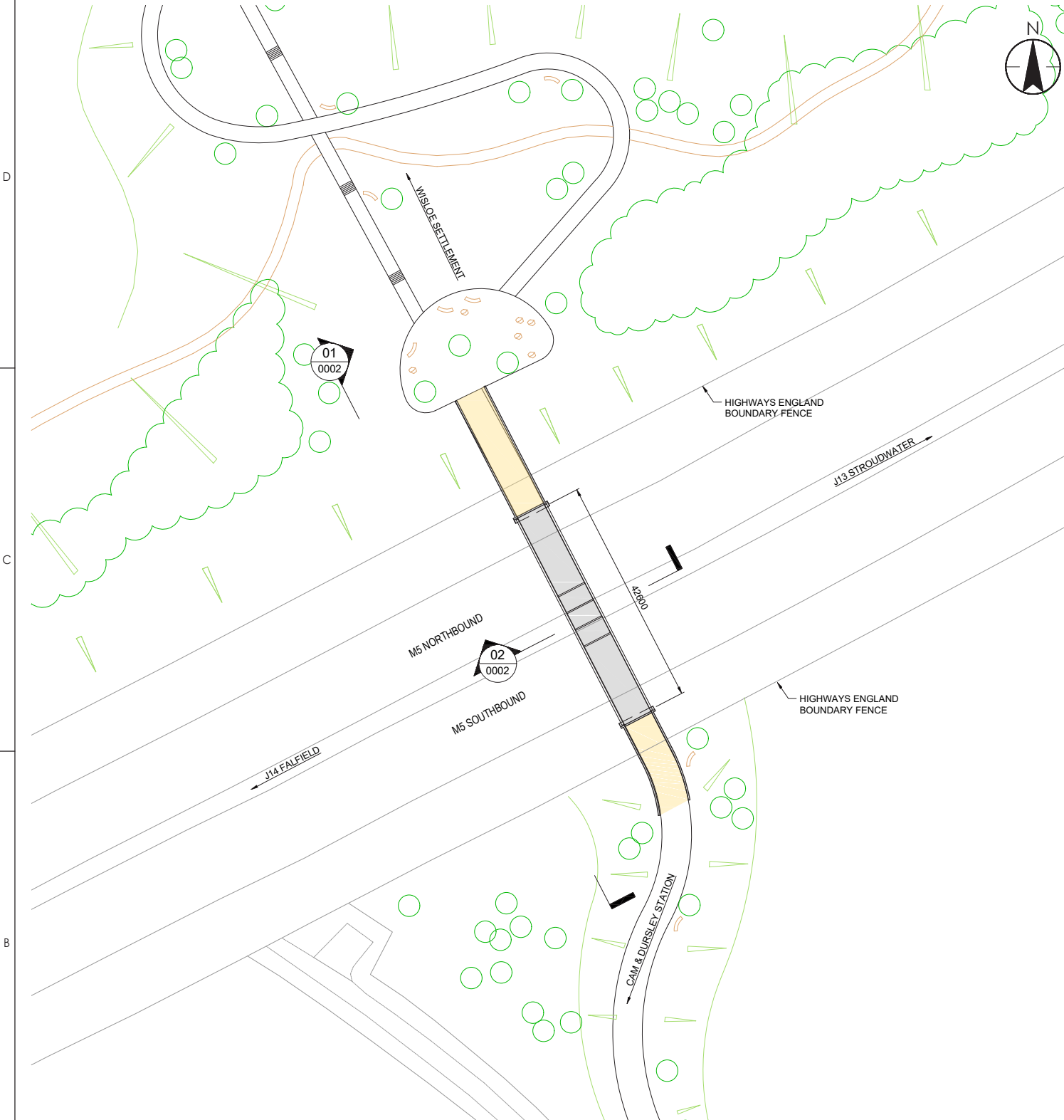
Scale **215**
As Indicated

Revision

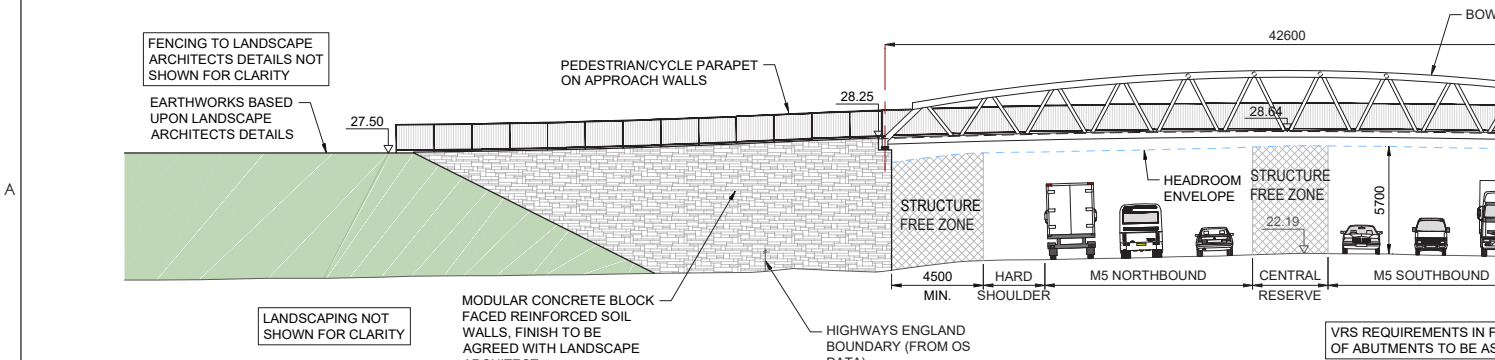
P01

Drawing No.

332310150-STN-SBR-NMU-DR-CB-0001



PLAN
1:500



SECTION 01
1:200

216
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