



## **E702 – Proposed District Centre Roundabout, Derby**

### **Stage 1 Road Safety Audit Response**

**For JCS Farming and Central Land Holdings Ltd**

**November 2021**

#### **1.0 Introduction**

1.1 Road Safety Auditors RSC have been commissioned by Cannon Consulting Engineers (CCE) to carry out a Stage 1 Road Safety Audit (RSA) of the access being proposed to access a mixed retail district centre. It is proposed to service the development from a four arm roundabout on Chellaston Lane at the existing junction with Woods Meadow. A separate infrastructure application has been submitted to secure the delivery of the roundabout and this Designer Response and associated Stage 1 Road Safety Audit has been requested by the Local Authority.

1.2 The overseeing highway authority is Derbyshire County Council, however the site is located on the boundary with Derby City Council.

1.3 RSC were asked to consider the following information:

| Information            | Rev | Title                                                                                      |
|------------------------|-----|--------------------------------------------------------------------------------------------|
| Dwg E702_PL_SK_246     | B   | Proposed 4 arm roundabout (Tie into existing)                                              |
| Dwg E702_PL_SK_247     | B   | Proposed 4 arm roundabout (Tie into committed Shardlow Road / Chellaston Lane improvement) |
| Dwg E702_PL_SK_252-255 | -   | Swept path analysis of proposed roundabout                                                 |
| Dwg E702-DD-DR-030     | -   | General Arrangement                                                                        |
| Dwg E702-DD-DR-630-631 | P01 | Proposed roundabout long sections                                                          |
| Dwg E702_DD-DR-632-633 | P01 | Proposed roundabout cross section                                                          |
| Dwg E702-DD-DR-230-231 | -   | Proposed surface contours                                                                  |
| Capacity Model Output  | -   | ARCADY model of junction                                                                   |
| Traffic flow forecasts | -   | Proposed traffic flow forecasts                                                            |

1.4 The Stage 1 RSA prepared by RSC is contained at **Appendix A**.



1.5 This report draws together the following documents and information:

a. The Designer's Comments to the Stage 1 RSA, set out as follows:

- Column 1 – identifies the item number (or paragraph number) in the Stage 1 RSA and summarises the problems identified within the Audit;
- Column 2 – sets out the Auditor's Recommendations;
- Column 3 – sets out the Designer's Comments to these problems and recommendations; and
- Column 4 – allows for comments from the Highway Authority.

1.6 The responses to the RSA queries do not require an update to the drawing at this stage. All matters are to be dealt with at detailed design. However for information purposes the proposed footway / cycleway network plan, prepared as part of the outline planning application for the District Centre has been appended, see **Appendix B**.



## DESIGNERS RESPONSE:- DEVELOPMENT ACCESS

| Items Raised by Stage 1 Road Safety Audit        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Item                                             | Problem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Auditor's Recommendation                                                                                                                                                                                                                                                                                                                                                               | Designer's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Highway Authority Response |
| <b>4.1 – Walking, Cycling &amp; Horse Riding</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |
| 4.1.1                                            | <p><b>Location</b> – General to the Development</p> <p><b>Summary</b> – Unmet pedestrian desire routes may lead to pedestrian to vehicle collisions, or hazards for vulnerable users</p> <p>The development is likely to attract diverse pedestrian movements and desire routes. At present there is evidence of pedestrian movements along verge areas and the development is likely to increase such use, to and from other facilities such as the adjacent bus stops. Unmet pedestrian routes may lead to unexpected pedestrian crossing on the highway network. Mobility impaired users, such as those using wheelchairs may experience difficulty negotiating routes where upstand kerbs are provided, or where there is a lack of footway provision and this may result in vulnerable user falls and injury.</p> <p>At the roundabout, the lack of crossing facilities across the development arm and southern arm of the junction may lead to unexpected crossing movements and the splitter islands may be used by pedestrians as crossing points which appear to be narrow and may not safely accommodate users.</p> | It is recommended that likely pedestrian desire routes are assessed and appropriate provision is made, at the roundabout, splitter islands may be located for crossing opportunities and dropped kerb facilities may be appropriate, splitter islands may be require to be widened to safely accommodate likely users. Any footway provision should link with the existing facilities. | <p>The proposed roundabout will ultimately serve a district centre, however a separate infrastructure application has been submitted to secure access to the site. This application makes provision for uncontrolled crossings to be provided on the western and northern arms, which will link to the existing Woods Meadow development. However no onward footway / cycleway connections have been provided at this stage. These are addressed as part of the District Centre planning application</p> <p>There is no current or future footway link on the western side of Chellaston Lane and therefore an uncontrolled crossing on the southern arm is not proposed. Notwithstanding the above the splitter island could accommodate a 2.4m wide uncontrolled crossing with a minimum 2.3m crossing depth.</p> <p>The proposed district centre application identifies internal crossing locations of the spine road at key desire lines and a potential crossing of the eastern arm.. The splitter island has been designed to be able to accommodate a 2.4m wide uncontrolled crossing with a minimum 2.3m crossing depth.</p> <p>The proposed district centre planning application provided a review the proposed desire lines and shared footway / cycleway connections are proposed on these links. These are illustrated on the sustainable access plan contained at Appendix B.</p> |                            |
| 4.1.2                                            | <p><b>Location</b> – General to the Development</p> <p><b>Summary</b> – Unmet cycle desire routes may lead to pedestrian to vehicle collisions, or hazards for vulnerable users</p> <p>The development may attract diverse cycle movements and desire routes. There is an existing dual use footway / cycleway on the northern side of Shardlow Road and cyclists may be attracted to / from this facility. It is unclear whether there are connecting cycle facilities between the development and adjacent cycle facilities and a lack of facilities may lead to unexpected cycle crossing movements at the existing and proposed roundabouts, with consequent risk of cycle to vehicle collisions.</p> <p>At the roundabout the lack of crossing facilities for cyclists across the development arm of the junction (connecting two apparent 3m wide footway / cycleways) may lead to unexpected crossing movements and the splitter island may not safely accommodate users.</p>                                                                                                                                          | It is recommended that likely cycle desire routes are assessed and appropriate provision made; at the roundabout, splitter islands may be locations for crossing opportunities and dropped kerb facilities may be appropriate; splitter islands may require to be widened to safely accommodate users. Any off-road cycle provision should link with existing facilities.              | See, comment above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                            |



| Items Raised by Stage 1 Road Safety Audit |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Item                                      | Problem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Auditor's Recommendation                                                                                                                                                                                                                                                                                                                                                                                                                                         | Designer's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Highway Authority Response |
| <b>4.2 Junctions</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |
| 4.2.1                                     | <p><b>Location:</b> At the proposed roundabout</p> <p><b>Summary:</b> Unbalanced lane usage may lead to lane change side-swipe collisions</p> <p>The traffic flow information indicates that approximately 1,000 vehicles per hour will be entering the roundabout from the northern arm and be proceeding southbound along Chellaston Lane during the AM peak hour. Unbalanced lane usage at the main road southbound entry may encourage drivers to use both lanes to proceed along Chellaston Lane. This may lead to late lane change or forced merge collisions on the circulatory carriageway or roundabout exit.</p>                                                                         | <p>It is recommended that an assessment of the need for both entry lanes on the northern arm for the straight across movement should be carried out. If two lanes are required for capacity purposes then the exit should be widened to two lanes. The length of merge lane, if required, should be adequate to ensure safe merging at the exit. If a single lane is sufficient it may be appropriate to provide lane destination markings to clarify usage.</p> | <p>Lane destination markings will be reviewed and provided on the northbound and southbound approaches, which will be agreed during detailed design.</p> <p>In addition the exit taper will be reviewed at detailed design and agreed as part of the S.278 process.</p>                                                                                                                                                                                                                                                                                                                                                                                  |                            |
| 4.2.2                                     | <p><b>Location:</b> On Chellaston Lane</p> <p><b>Summary:</b> Change in horizontal alignment may lead to loss of control type collisions.</p> <p>The right hand horizontal curve for northbound users 'tightens' on the approach to the proposed roundabout. The existing superelevation appears to be severe (and may have been introduced due to the previous design speed for the road). The change in horizontal alignment and application of superelevation may lead to an increased risk of loss of control type collisions. Motorcyclists may be particularly vulnerable to loss of control where the bend tightens.</p>                                                                    | <p>It is recommended that the horizontal curve is made a constant radius and that any superelevation applied is consistent with the reduced design speed and limit.</p>                                                                                                                                                                                                                                                                                          | <p>The centre line has been designed with a constant radius, however the radius/alignment used will be reviewed and agreed at detailed design</p> <p>The proposed levels including superelevation will be reviewed and agreed as part of the detailed design process.</p>                                                                                                                                                                                                                                                                                                                                                                                |                            |
| <b>4.3 Alignment</b>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                            |
| 4.3.1                                     | <p><b>Location:</b> On Chellaston Lane</p> <p><b>Summary:</b> Reduced forward visibility may lead to late braking loss of control or overshoot type collisions</p> <p>The northbound approach is on a right hand horizontal curve. The offset roundabout construction may lead to poor forward visibility to the junction and 'see through' issues for northbound drivers, which may lead to late braking loss of control or overshoot type collisions.</p> <p>The forward visibility along Chellaston Lane for southbound users may be reduced by the horizontal curve and landscaping alongside the carriageway. This may also contribute to late braking or loss of control type collisions</p> | <p>It is recommended that adequate stopping sight distance is provided along this section of Chellaston Lane, consistent with likely vehicle speeds. Measures should be introduced to minimise the likely hood of 'see through' issues along Chellaston Lane; measures may include strategic landscaping on the kerbed build out area.</p>                                                                                                                       | <p>Although it is noted that Chellaston Lane is not a trunk road, forward visibility on the southern approach to the junction has been provided in accordance with Figure 3.39 of DMRB CD116 Revision 2. Stopping sight distance can be accommodated up to 120m (40mph design speed) however it is considered that when the roundabout is implemented vehicles will be travelling slower given the proximity of the existing 30mph/40mph gateway on this approach. Therefore 90m is considered to be more appropriate.</p> <p>In addition to the above appropriate signage will be provided at the junction which will be agreed at detailed design.</p> |                            |



| Items Raised by Stage 1 Road Safety Audit |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| Item                                      | Problem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Auditor's Recommendation                                                                                                                                                                                                                    | Designer's Response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Highway Authority Response |
| <b>4.4 – Surface Water Drainage</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |
| 4.4.1                                     | <p><b>Location:</b> On Chellaston Lane</p> <p><b>Summary:</b> Roadside ditch and headwall may be a hazard for the occupants of errant vehicles.</p> <p>Along the western edge of Chellaston Lane, there is a ditch and proposed headwall. These drainage features may be a hazard for the occupants of errant vehicles and lead to increased severity of injury where vehicles leave the carriageway – see also observation 5.2</p>                                                                                                                                | It is recommended that the need for an appropriate VRS systems to protect against the drop should be assessed and provision made, as appropriate. It may be appropriate to pipe-in the ditch to remove the need for a headwall arrangement. | The proposed ditch and headwall arrangement is temporary until the district centre development is implemented. The temporary drainage strategy will be reviewed and potentially extend towards the existing gated access. In addition the need for a VRS will be agreed as necessary.                                                                                                                                                                                                                                           |                            |
| <b>Observations</b>                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                            |
| 5.1                                       | <p><b>Location: - On Chellaston Lane</b></p> <p>Between Woods Meadow and Shardlow Road, there is an existing equestrian route, which is signed to cross the road. It is unlikely that the proposed development will attract equestrian activity and it is unclear whether equestrians actually use the facility, however, it is unclear how the existing facilities will be incorporated within the highway proposals. It is recommended that an assessment of use of the facility is carried out and appropriate provision is incorporated within the scheme.</p> | N/A – Not RSA comment                                                                                                                                                                                                                       | <p>The facility for equestrians is located to the north of the proposed roundabout and runs east, crossing the A1, and continues down the B1159. The proposed roundabout does not affect this crossing location and therefore no alterations are considered necessary.</p> <p>Improvement works to the Shardlow Road / Chellaston Lane junction have been secured as part of neighbouring developments. It is considered that this crossing will be incorporated as necessary, which will be agreed during detailed design.</p> |                            |
| 5.2                                       | <p><b>Location: - On Chellaston Lane</b></p> <p>Between Woods Meadow and the proposed roundabout to the south, there is a deep water filled ditch. It is unclear how this ditch and culvert will be incorporated within the realignment. At detailed design, the need for an appropriate VRS system to protect against the drop should be assessed and provision made as appropriate.</p>                                                                                                                                                                          | N/A – Not RSA comment                                                                                                                                                                                                                       | To confirm the culvert is proposed to be extended east. The extent of this and need for a VRS system will be reviewed and agreed at detailed design                                                                                                                                                                                                                                                                                                                                                                             |                            |
| 5.3                                       | <p><b>Location: - Woods Meadow</b></p> <p>There is a severe transition in levels between Woods Meadow and the superelevated section of Snelsmoor Lane. At detailed design, the transition between gradients of both roads should be suitable designed to minimise the likelihood of vehicle grounding or vehicle instability</p>                                                                                                                                                                                                                                   | N/A – Not RSA comment                                                                                                                                                                                                                       | As referred to in response to Audit point 4.2.2. the proposed surface levels will be agreed at detailed design                                                                                                                                                                                                                                                                                                                                                                                                                  |                            |
| 5.4                                       | <p><b>Location: - Chellaston Lane, north of the Roundabout</b></p> <p>From information provided, the northbound exit appears to be two lanes wide and appears to be wide enough to provide two marked lanes, linking the existing layout and the proposed signalled layout of the Shardlow Road junction. At detailed design, it is recommended that the exit is marked with two lanes.</p>                                                                                                                                                                        | N/A – Not RSA comment                                                                                                                                                                                                                       | <p>Noted this appears to be an omission within CAD.</p> <p>It is considered that the due to phasing the proposed roundabout will be implemented and will tie into the existing roundabout, where the layout provides two lanes. Drawing 247 illustrates how the committed Shardlow Road improvements tie in with the proposed roundabout. As such the tie in detail will be confirmed as part of the Shardlow Road detailed design, unless phasing changes.</p>                                                                 |                            |

## Appendix A

**Stage 1 Road Safety Audit**

**Boulton Moor, Derby**

**Chellaston Lane Roundabout**

**Date:** 15/11/2021

**Report produced for:** JSC Farms & Central Land Holdings

**Report requested by:** Cannon Consulting Engineers

**On behalf of:** Derby City Council

**Report prepared by:** Kevin Seymour, Road Safety Consulting Ltd

**Reference:** RSC/KS/EB/21024

## Document Control Sheet

Project Title            Boulton Moor, Derby  
Chellaston Lane Roundabout

Report Title            Stage 1 Road Safety Audit  
Reference: RSC/KS/EB/21024

Revision                -

Status                    Final

Control Date           15/11/2021

### Record of Issue

| Issue | Author | Date     | Check | Date     | Authorised | Date     |
|-------|--------|----------|-------|----------|------------|----------|
| Final | KS     | 11/11/21 | EB    | 12/11/21 | EB         | 15/11/21 |
|       |        |          |       |          |            |          |
|       |        |          |       |          |            |          |

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Registered in England and Wales  
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## 1. Introduction

- 1.1. This report results from a Stage 1 Road Safety Audit carried out on the proposed Chellaston Lane Roundabout, Boulton Moor, Derby. The Audit was carried out during November 2021.
- 1.2. This Road Safety Audit was produced for (client): JSC Farms & Central Land Holdings, requested by (design organisation): Cannon Consulting Engineers, on behalf of (overseeing organisation): Derby City Council.
- 1.3. The Audit Team membership was as follows:  
  
Audit Team Leader  
Kevin Seymour  
B Sc, PG Dip TS, MCIHT, MSoRSA  
Highways England Certificate of Competence (Road Safety Audit)  
Road Safety Consulting Ltd  
  
Audit Team Member  
Elaine Bingham  
B Eng (Hons), MCIHT, MSoRSA  
Highways England Certificate of Competence (Road Safety Audit)  
Road Safety Consulting Ltd
- 1.4. The audit took place at the offices of Road Safety Consulting Ltd between 10<sup>h</sup> and 12<sup>th</sup> November 2021. The audit was undertaken in accordance with the email instruction provided and the report has been prepared with reference to the Design Manual for Roads and Bridges (DMRB) GG 119, with exceptions set out in paragraph 2.4.
- 1.5. The Audit Team visited the site together on the 11<sup>th</sup> November 2021 between 1:00pm and 2:00pm. Weather conditions at the time of the audit were cloudy and dry. The road surface was dry. Traffic flows were low. No pedestrians or cyclists were observed.
- 1.6. The audit comprised an examination of the information provided by the Design Organisation and listed in Appendix 1.
- 1.7. 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.
- 1.8. All comments and recommendations are referenced to the design drawing and the locations have been indicated on plans in Appendix 2.

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## **2. Items Considered**

### **2.1. Scheme Proposals**

- 2.1.1. The proposal consists of a large retail development, south of Shardlow Road.
- 2.1.2. The highway scheme consists of a four armed 38m diameter roundabout junction on Chellaston Lane, south of the junction with Shardlow Road, at the junction with Woods Meadow.
- 2.1.3. Two design drawing options have been provided to the Audit Team, with one indicating the retention of the Shardlow Road Roundabout and one showing a new signal controlled junction on Shardlow Road at the junction with Chellaston Lane. Whilst these two junctions appear to be outside the red line boundary of the scheme, there are potential tie-in issues that may influence road safety for users. These issues are highlighted within the report and are relevant to both layouts

### **2.2. Information Provided to the Audit Team**

- 2.2.1. Information that has been provided to the Audit Team, for the purpose of this audit, is as outlined within Appendix 1 of this report.

### **2.3. Departures from Standards (Design)**

- 2.3.1. The Audit Team has not been advised of any design departures from standards.

### **2.4. Departures from Standards (Road Safety Audit)**

- 2.4.1. This Road Safety Audit has been produced, with reference to DMRB – GG 119 – Road Safety Audit with the following exceptions.
  - A formal Road Safety Audit brief approved by Derby City Council has not been provided to the Audit Team, however the Audit Team received a supporting email with relevant background data and information and therefore did not consider that the lack of a formal brief would compromise the production of a Road Safety Audit for these proposals.
  - Section 5 of this report provides additional Observations that are outside of the scope of GG119 (which specifically excludes the provision of additional comments within Road Safety Audit report). These comments, whilst considered outside the scope of the audit, have been produced to assist the designer in providing a safe design where any safety comment may be conditional on receiving more detailed information.

## **3. Items Raised at Previous Road Safety Audits**

- 3.1. The Audit Team is unaware of any previous audits related to this proposal.
-

## 4. Items Raised by this Stage 1 Road Safety Audit

### 4.1. Walking, Cycling & Horse Riding

#### 4.1.1. Problem

Location: General to the development

Summary: Unmet pedestrian desire routes may lead to pedestrian to vehicle collisions, or hazards for vulnerable users



The development is likely to attract diverse pedestrian movements and desire routes. At present, there is evidence of pedestrian movements along verge areas and the development is likely to increase such use, to and from other facilities such as adjacent bus stops. Unmet pedestrian desire routes may lead to unexpected pedestrian crossing on the highway network. Mobility impaired users, such as those using wheelchairs may experience difficulty negotiating routes where upstand kerbs are provided, or where there is a lack of footway provision and this may result in vulnerable user falls and injury.

At the roundabout, the lack of crossing facilities across the development arm and southern Chellaston Lane arm of the junction may lead to unexpected crossing movements and the splitter islands may be used by pedestrians as crossing points which appear to be narrow and may not safely accommodate users.

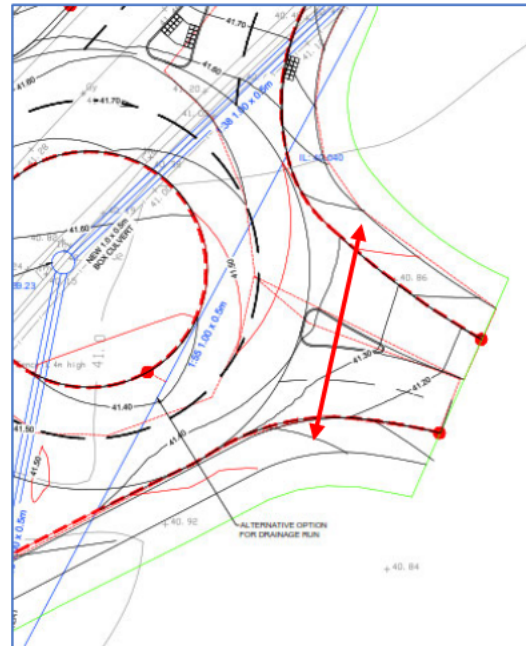
#### Recommendation:

It is recommended that likely pedestrian desire routes are assessed and appropriate provision made; at the roundabout, splitter islands may be locations for crossing opportunities and dropped kerb facilities may be appropriate; splitter islands may require to be widened to safely accommodate likely users. Any footway provision should link with existing facilities.

#### 4.1.2. Problem

Location: General to the development

Summary: Unmet cycle desire routes may lead to cycle to vehicle collisions, or hazards for cyclists



The development may attract diverse cycle movements and desire routes. There is an existing dual use footway / cycleway on the northern side of Shardlow Road and cyclists may be attracted to /from this facility. It is unclear whether there are connecting cycle facilities between the development and adjacent cycle facilities and a lack of facilities may lead to unexpected cycle crossing movements at the existing and proposed roundabouts, with consequent risk of cycle to vehicle collisions.

At the roundabout, the lack of crossing facilities for cyclists across the development arm of the junction (connecting two apparent 3m wide footway / cycleways) may lead to unexpected crossing movements and the splitter island may be used by cyclists as a crossing point which appears to be narrow and may not safely accommodate users.

#### Recommendation:

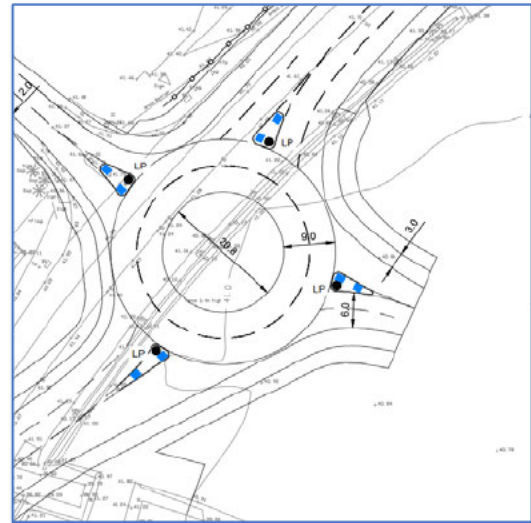
It is recommended that likely cycle desire routes are assessed and appropriate provision made; at the roundabout, splitter islands may be locations for crossing opportunities and dropped kerb facilities may be appropriate; splitter islands may require to be widened to safely accommodate likely users. Any off-road cycle provision should link with existing facilities.

## 4.2. Junctions

### 4.2.1. Problem

**Location:** At the proposed roundabout

**Summary:** Unbalanced lane usage may lead to lane change side-swipe type collisions



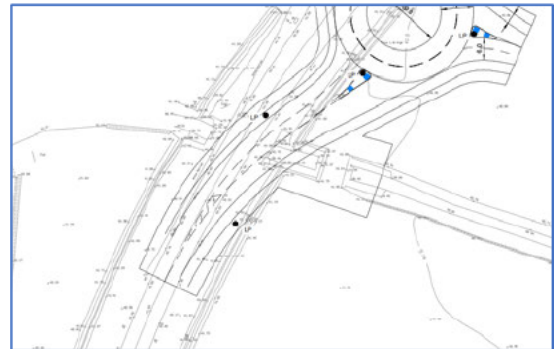
The traffic flow information indicates that approximately 1,000 vehicles per hour will be entering the roundabout from the northern arm and be proceeding southbound along Chellaston Lane during the AM peak hour. Unbalanced lane usage at the main road southbound entry may encourage drivers to use both lanes to proceed along Chellaston Lane. This may lead to late lane change or forced merge collisions on the circulatory carriageway or roundabout exit.

#### **Recommendation:**

It is recommended that an assessment of the need for both entry lanes on the northern arm for the straight across movement should be carried out. If two lanes are required for capacity purposes then the exit should be widened to two lanes. The length of merge lane, if required, should be adequate to ensure safe merging at the exit. If a single lane is sufficient it may be appropriate to provide lane destination signing and markings to clarify lane usage.

#### 4.2.2. Problem

**Location:** On Chellaston Lane  
**Summary:** Change in horizontal alignment may lead to loss of control type collisions



The right hand horizontal curve for northbound users 'tightens' on the approach to the proposed roundabout. The existing superelevation appears to be severe (and may have been introduced due to the previous design speed for the road). The change in horizontal alignment and application of superelevation may lead to an increased risk of loss of control type collisions. Motorcyclists may be particularly vulnerable to loss of control where the bend tightens.

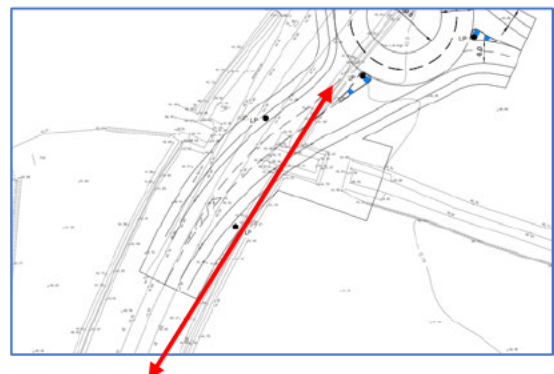
#### **Recommendation:**

It is recommended that the horizontal curve is made a constant radius and that any superelevation applied is consistent with the reduced design speed and limit.

### 4.3. Alignment

#### 4.3.1. Problem

**Location:** On Chellaston Lane  
**Summary:** Reduced forward visibility may lead to late braking loss of control or overshoot type collisions



The northbound approach is on a right hand horizontal curve. The offset roundabout construction may lead to poor forward visibility to the junction and 'see through' issues for northbound drivers, which may lead to late braking loss of control or overshoot type collisions.

The forward visibility along Chellaston Lane for southbound users may be reduced by the horizontal curve and landscaping alongside the carriageway. This may also contribute to late braking or loss of control type collisions.

#### **Recommendation:**

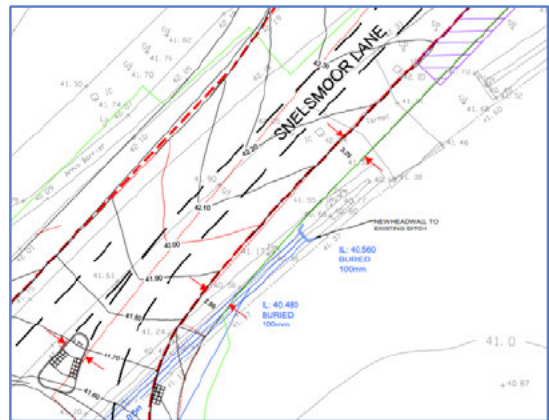
It is recommended that adequate stopping sight distance is provided along this section of Chellaston Lane, consistent with likely vehicle speeds. Measures should be introduced to minimise the likelihood of 'see through' issues along Chellaston Lane; measures may include strategic landscaping on the kerbed build-out area.

#### 4.4. Surface Water Drainage

##### 4.4.1. Problem

Location: On Chellaston Lane

Summary: Roadside ditch and headwall may be a hazard for the occupants of errant vehicles



Along the western edge of Chellaston Lane, there is a ditch and proposed headwall. These drainage feature may be a hazard for the occupants of errant vehicles and lead to increased severity of injury where vehicles leave the carriageway – see also Observation 5.2 below.

##### Recommendation:

It is recommended that the need for an appropriate VRS systems to protect against the drop should be assessed and provision made, as appropriate. It may be appropriate to pipe-in the ditch to remove the need for a headwall arrangement.

*End of Safety Comments*

## 5. Other Observations

### 5.1. Observation

Location: On Chellaston Lane



Between Woods Meadow and Shardlow Road, there is an existing equestrian route, which is signed to cross the road. It is unlikely that the proposed development will attract equestrian activity and it is unclear whether equestrians actually use the facility, however, it is unclear how the existing facilities will be incorporated within the highway proposals. It is recommended that an assessment of use of the facility is carried out and appropriate provision incorporated within the scheme proposals.

### 5.2. Observation

Location: On Chellaston Lane



Between Woods Meadow and the new roundabout to the south, there is a deep water filled ditch. It is unclear how this ditch and culvert will be incorporated within the realignment. At detailed design, the need for an appropriate VRS systems to protect against the drop should be assessed and provision made, as appropriate.

### 5.3. Observation

Location: Woods Meadow arm of the roundabout



There is a severe transition in levels between Woods Meadow and the superelevated section of Chellaston Lane. At detailed design, the transitions between gradients of both roads should be suitably designed to minimise the likelihood of vehicle grounding or vehicle instability.

### 5.4. Observation

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Location: Chellaston lane, north of the  
roundabout

From information provided, the northbound exit appears to be two lanes wide and appears to be wide enough to provide two marked lanes, linking with the existing layout and proposed signalled layout of the Shardlow Road junction. At detailed design, it is recommended that the exit is marked with two lanes.

## 6. Audit Team Statement

We certify that this Stage 1 Road Safety Audit has been carried with reference to GG 119.

### Audit Team Leader

Kevin Seymour  
B Sc, PG Dip TS, MCIHT, MSoRSA  
Highways England Certificate of Competence (Road Safety Audit)

Signed: ...  Dated 11<sup>th</sup> November 2021

Director of Road Safety Consulting Ltd

### Audit Team Member

Elaine Bingham,  
B Eng (Hons), MCIHT, MSoRSA  
Highways England Certificate of Competence (Road Safety Audit)  
Director of Road Safety Consulting Ltd

Signed: ...  Dated 12<sup>th</sup> November 2021

Director of Road Safety Consulting Ltd

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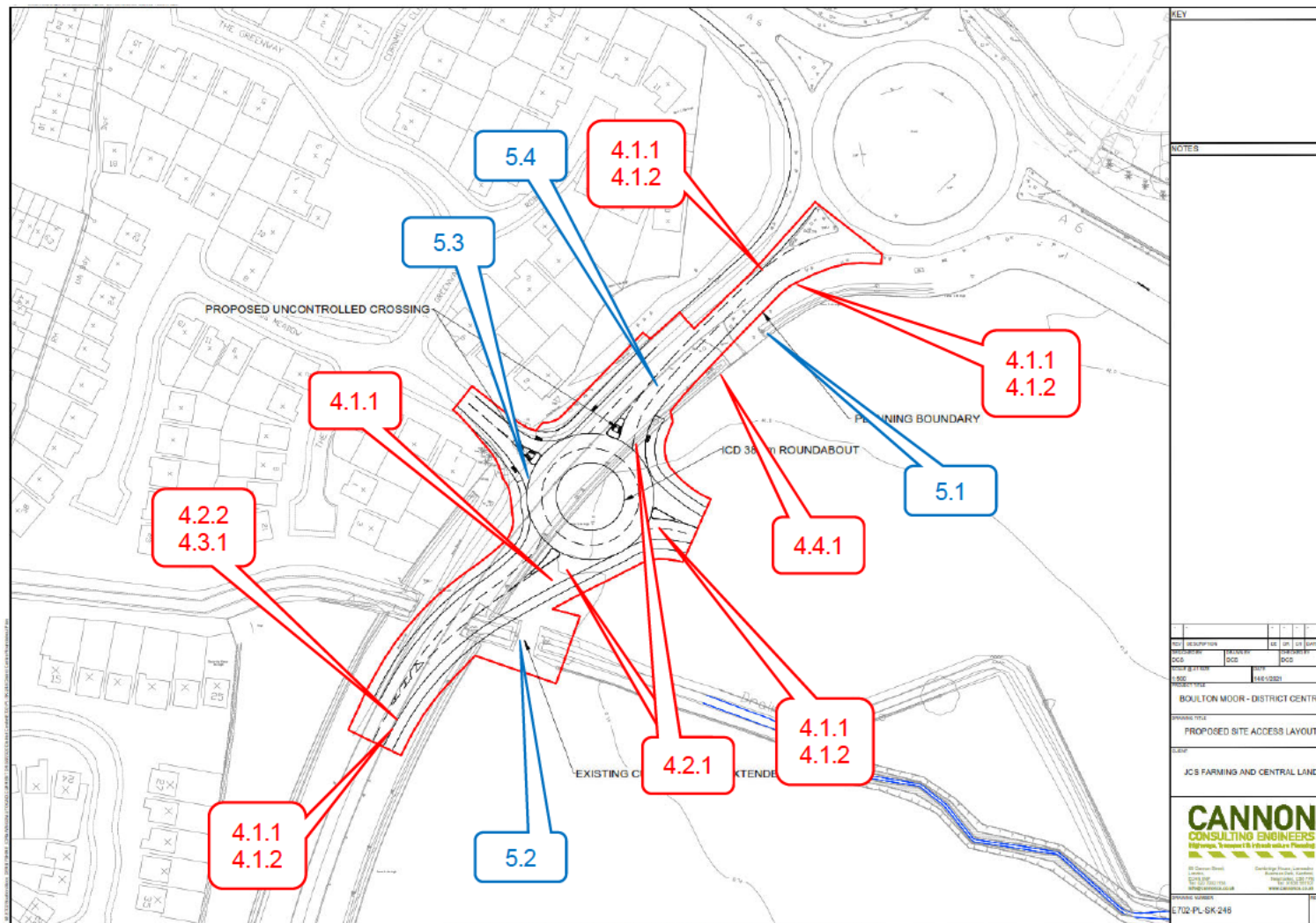
## APPENDIX 1: Information Provided

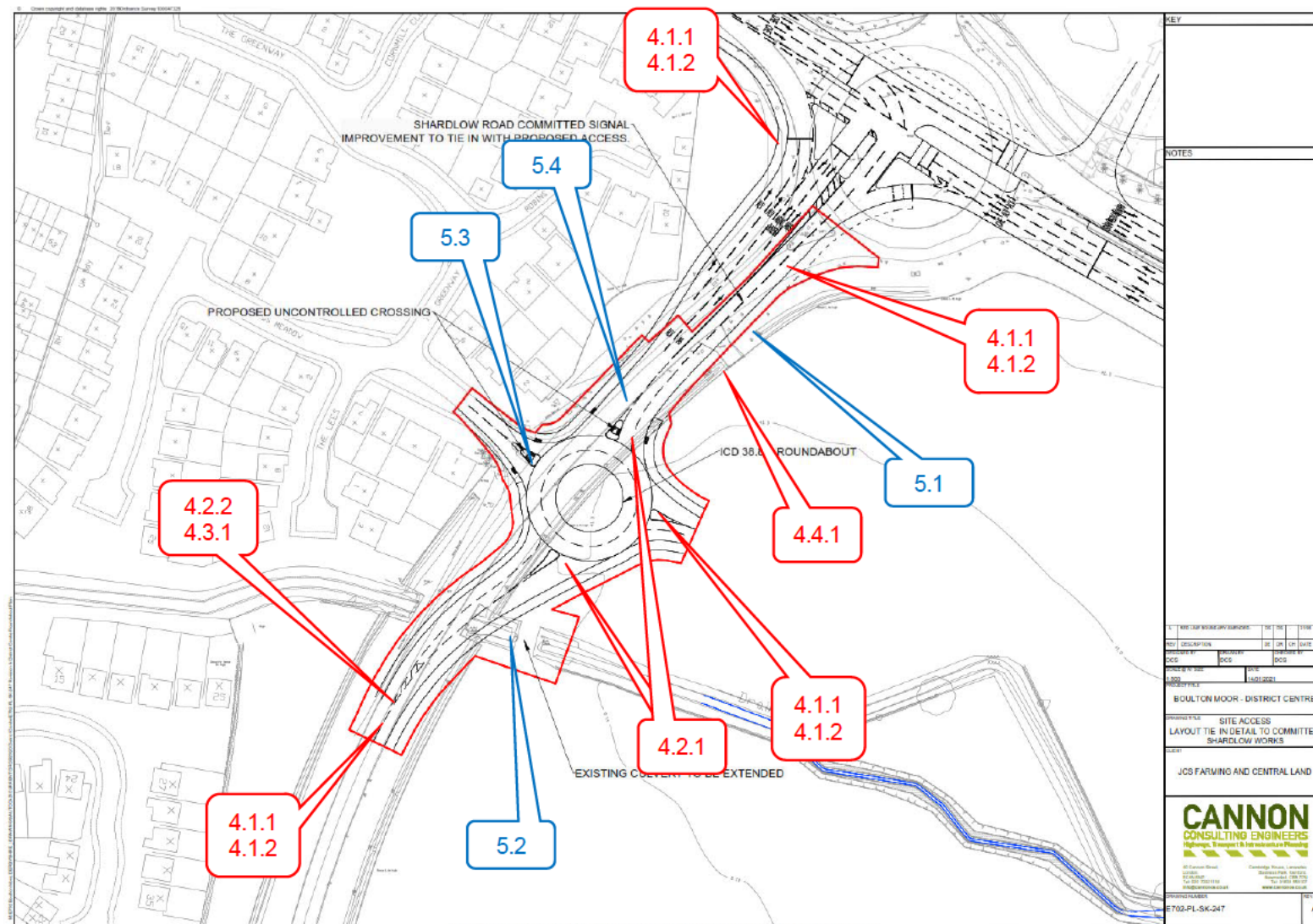
### List of Information Provided

- Drawing E702\_PL\_SK\_246 Revision B – Proposed 4-arm District Centre Roundabout (Tie in with existing)
- Drawing E702\_PL\_SK\_247 Revision B – Proposed 4-arm District Centre Roundabout (tie in with committed improvements)
- Drawing E702\_PL\_SK\_252 – District Centre Roundabout (Swept Path 16.5m Artic)
- Drawing E702\_PL\_SK\_253 – District Centre Roundabout (Swept Path 11.2 Refuse Vehicle)
- Drawing E702\_PL\_SK\_254 – District Centre Roundabout (Swept Path Fire Tender)
- Drawing E702\_PL\_SK\_255 – District Centre Roundabout (Swept Path Bus Tracking)
- Drawing E702-DD-DR-030 – General Arrangement (District Centre Roundabout)
- Drawing E702-DD-DR-630 P01 – District Centre Roundabout – Chellaston Lane (N) Long Section
- Drawing E702-DD-DR-631 P01 – District Centre Roundabout – Chellaston Lane (S) Long Section
- Drawing E702-DD-DR-632 P01 – District Centre Roundabout – Chellaston Lane (N) Cross Section
- Drawing E702-DD-DR-633 P01 – District Centre Roundabout – Chellaston Lane (S) Cross Section
- Drawing E702-DD-DR-230/231 – District Centre Roundabout – Surface Contours
  
- Arcady Model Printouts
- Traffic Flow Forecasts

## APPENDIX 2: Drawing Showing Problem Locations

Problem numbers shown on the attached drawing refer to Problem numbers within the report.





## Appendix B

