Highway Transportation and Infrastructure Consultants

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A259/CHURCH LANE CLIMPING
PROPOSED NEW JUNCTION

DESIGN AUDIT

MULGRAVE ESTATES

GDB/4724/DA.1

April 2017

Partners:
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IT Roberts MCIHT

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DOCUMENT CONTROL SHEET

	NAME	QUALIFICATIONS	DATE	SIGNED
Designer	Jason Brown	HND Civils, MIHIE	21 April 2017	[redacted]
Checker	Graham Bellamy	BSc CEng MICE	21 April 2017	
Technical Approval	Graham Bellamy	BSc CEng MICE PARTNER	21 April 2017	

1.0 INTRODUCTION

1.1 This document comprises a Design Audit of the proposals by Mulgrave Estates to construct a new roundabout junction with A259 and realignment of Church Lane, Climping. These works are to be off-site improvements under a S.278 Agreement related to planned housing development (planning application ref. CM/1/17/OUT refers).

1.2 The document comprises a Design Statement, in tabular format, which cross-checks elements of the design against the relevant DMRB Standards. There is then a Relaxation and Departures from Standards report, and an Appendix containing the relevant drawings, as listed below:

4724/002 Rev. C	General Arrangement
4724/004 Rev. A	Roundabout Details
4724/201-206	Swept Path Diagrams
4724/007	Location of Relaxations from Standards

1.3 It should be noted that as these proposals are associated with an outline planning application, yet to be determined, they are not at the detailed design stage, so detailed aspects such as vertical realignment, drainage, signs and road markings etc. have not yet been developed. However, the scheme layout has been drawn to accord with DMRB Standards and the extent of land available and the flat topography of the site mean that there will be no difficulties in meeting appropriate standards for those detailed elements.

2.0 DESIGN STATEMENT

See following tables

3.0 RELAXATIONS AND DEPARTURES REPORT

3.1 The following table sets out details and justifications for the RELAXATIONS incorporated into the design. There are no DEPARTURES from Standards.

3.2 Plan 4724/007 shows the locations of the Relaxations identified.

ARUN DISTRICT COUNCIL CM/1/17/OUT

ROUNDABOUT

TD16/07: Geometric Design of Roundabouts See drawing 4724/004 Rev. A

PARA	REQUIREMENT	PROVISION	COMMENT
7.8	Circular carriageway must be 1.0-1.2 x maximum entry width	8m circular and 7.3m entries (x 1.1)	Compliant
7.24	Entry lane widths 3m - 4.5m	Entry widths 3.65m	Compliant
7.25	Maximum entry width ≤ 10.5m	Maximum entry 7.3m	Compliant
7.56	Entry deflection ≤ 100m	All entry deflection < 100m as shown on dwg. 4724/004 Rev. A	Compliant
8.1	Visibility available from 1.05m x 2.0m to 0.26m – 2m.	No vertical obstructions or alignment issues.	Compliant
8.2	Mounting height of signs > 2.0m	Signage not yet designed but will be kept > 2.0m	Compliant
8.3	Approach visibility to conform to TD9 minimum requirements, as per Fig 8/1	Speed limit 40mph Design speed 70kph Minimum Stopping Sight Distance – 120m 4724/004 Rev. A	Compliant
8.4	Forward visibility around roundabout from give way line. For 50m ICD, visibility requirement is 40m	Flat site and flat central island so 40m is available (whole ICD visible)	Compliant
8.5 8.6 8.7	Visibility to right on entry should be 40m (and from 15m back).	Flat site and flat central island so 40m is available (whole ICD visible)	Compliant
8.9	Forward visibility around circular carriageway should be 40m (for 50m ICD)	Flat site and flat central island so 40m is available (whole ICD visible)	Compliant
8.11	Forward visibility on approach to a crossing point at an entry must be available to full width of crossing	Only applies on approach from north. Full 120m visibility available	Compliant

PARA	REQUIREMENT	PROVISION	COMMENT
8.12	From give way line drivers must see full width of a crossing point on next exit if within 20m and crossings not within 20-60m	Crossing point is 80m from give way	Compliant
8.24	Lighting must be considered	Lighting to be provided	Compliant
8.28	No right turn arrows on approaches	Road markings not yet fully detailed but no right turn arrows will be used	Compliant
8.36	Skidding resistance of road markings	Appropriate materials will be used	Compliant
8.37	Landscaping	Not designed at this stage but will be kept clear of all visibility splays	Compliant
8.50	Not applicable as refers to improvements at existing roundabouts	N/A	N/A

CHURCH LANE DIVERSION

TD42/95: See drawing 4724/004 Rev. A

TD9/93: Link Design

PARA	REQUIREMENT	PROVISION	COMMENT
1.8	Design Speed: 40mph speed limit proposed so Design Speed = 70kph	Design parameters based on 70kph	Compliant
2.1	Stopping sight distance for 70kph = 120m	120m SSD achieved	Compliant
3.3-3.4	Desirable minimum radius at centreline 70kph is 360m	305m radius	This is a RELAXATION of less than one full design speed step down (that would be 255mR). The curve is on the approach to exit from a roundabout where speeds will be moderated, and no other Relaxations or Departures are associated with it
4.4-4.17	Vertical alignment K values	Vertical alignment not yet designed but length of road is essentially flat so appropriate Desirable Minimum K values will be achieved	Compliant

TD42/95: Design of Major/Minor Junctions

PARA	REQUIREMENT	PROVISION	COMMENT
2.15	Simple junctions only to be used where minor road flow is <300 vehicles AADT and major road flow not expected to exceed 13,000 AADT	Minor road flow likely to be c.1500 AADT although major road flow c.12,000 AADT. So Ghost Island right turn lane provided, with refuge islands to prevent overtaking	Compliant
5.1-5.16	Road user specific requirements	Refuge islands in the hatching both sides of right turn lane. One links to off carriageway cycle paths and the other to pedestrian routes	Compliant
7.5-7.6	Junction approach visibility	Main road approaches have 120m clear stopping sight distance of junction (70kph design speed) and minor road approach is straight and will be designed to 20-25mph as a residential road.	Compliant
7.5-7.6	Minor road visibility	The design provides 4.5 x 120m visibility splays. The 120m y-distance is compliant with 70kph design speed	Compliant
7.8	Visibility x-distance	The 4.5m x-distance is arguably a Relaxation as it is not a Simple junction. 9m x-distance could be provided but would result in excessive verge widths, and the 4.5m x-distance reflects the approach taken in MfS.2 for residential accesses	RELAXATION?

PARA	REQUIREMENT	PROVISION	COMMENT
7.20	Through lane widths	Through lanes are 3.65m	Compliant
7.32	Turning length	10m provided	Compliant
7.34	Direct taper length	15m provided	Compliant
7.35	Turning lane width	3.5m provided	Compliant
7.40	Turning lane length	For 70kph design speed length = 40m. 45m provided (55m – 10m turning length)	Compliant
7.47	Pedestrian refuge island widths to be at least 1.5m	2.5m width provided	Compliant

A259 JUNCTION WITH CROOKTHORN LANE

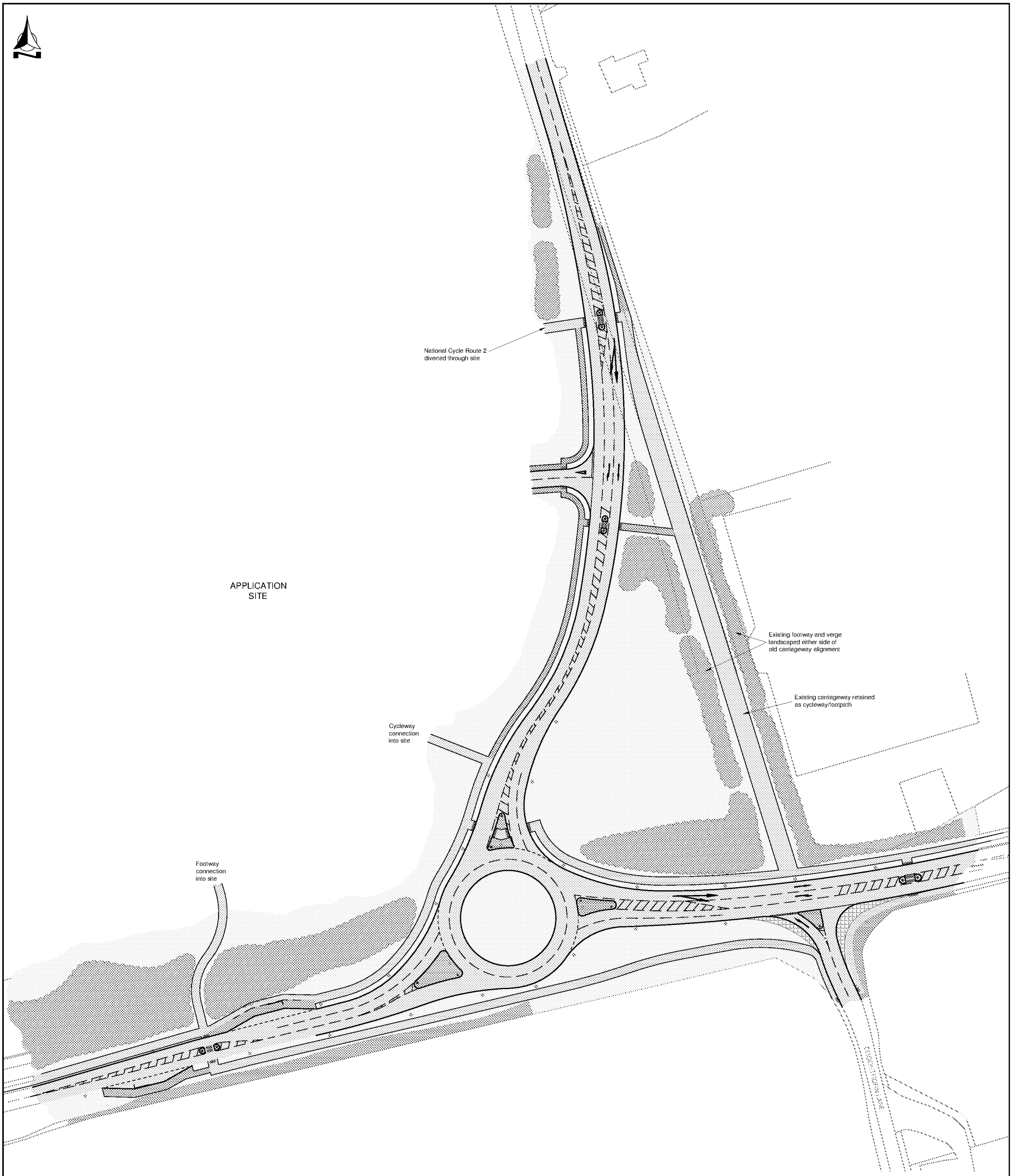
TD42/95: Design of Major/Minor Junctions See drawing 4724/004 Rev. A

PARA	REQUIREMENT	PROVISION	COMMENT
2.15	Simple junctions to be used only where minor road flows < 300 vehicles AADT and major road flow not expected to exceed 13,000 AADT	Minor road flow very low but major road flow well above 13,000 AADT. Ghost island right turn lane provided	Compliant
5.1-5.6	Road user specific requirements	Refuge island for pedestrians and cyclists to east of junction	Compliant
7.5-7.6	Junction approach visibility. Speed limit is 40mph (70kph design speed)	Main road visibility exceeds 120m from east. From west approach visibility is 100m but speeds lower as traffic is on or leaving the roundabout. Also, the junction prevents right turns out, so no conflicts with eastbound traffic on main road. Minor arm approach speed limit 30mph and straight approach with visibility > 90m	Compliant
7.5-7.6	Minor road visibility	Visibility only required to right as junction is no right turn out. 4.5m x 120m provided	Compliant

PARA	REQUIREMENT	PROVISION	COMMENT
7.8	Visibility x-distance	The 4.5m x-distance is arguably a Relaxation as it is not a simple junction. However, minor road flows are very low (approximately 500 vehicles AADT). A 9m x-distance could be provided with trimming of existing overhanging roadside vegetation, but that could encourage higher exit approach speeds which is undesirable in this location	RELAXATION?
7.14	Design vehicle	The RSA reported large agricultural vehicles stored in a barn on the minor road. The junction radii are therefore enlarged with cobbled over-run areas to allow for the turning requirements of such vehicles, whilst not providing a very large junction for the normal use which is very low flows. Attached swept path diagrams number 4724/201-206 refer.	Compliant
7.20	Through lane widths	Through lanes are 3.65m	Compliant
7.32	Turning length	10m provided. No additional queueing length required as peak hour flow only 27 vehicles per hour	Compliant

PARA	REQUIREMENT	PROVISION	COMMENT
7.34	Direct taper length	15m provided	Compliant
7.35	Turning lane width	3.5m provided	Compliant
7.40	Turning lane length	Approaching eastbound traffic on or leaving the adjacent roundabout so speeds < 70kph. 35m turning lane provided, (45m-10m turning length) which exceeds 60kph requirement (25m)	Compliant
7.47	Pedestrian refuge island widths to be at least 1.5m	2.5m width provided	Compliant

Ref. on Plan	DMRB Standard	Paragraph Ref.	Details of Relaxation	Justification
1.	TD9/93	3.3-3.4	The Desirable Minimum centreline radius for the 70kph design speed is 360m. The design radius is 305m.	The relaxation is less than one full design speed step down (that would be a 255m R for 60kph). The location is on the approach to the new roundabout and exit from it, so speeds will be moderated. Further influences likely to reduce speeds are the central refuge islands either side of the ghost island junction. A fully compliant radius of 360m would be wasteful of land.
2.	TD42/95	7.8	The minor road x-distance is 4.5m rather than the full 9.0m. This is arguably a relaxation because it is a ghost island right turn lane junction, not a Simple junction.	Capacity is not an issue, so the 9m x-distance would be of no benefit in that respect, which is the principal benefit of the longer x-distance. There is no safety benefit, and indeed research indicates that longer x-distances can increase shunt type accidents on the minor arm (ref. para 10.5.7 of MfS.2). The 4.5m x-distance on a 70kph design speed road reflects the approach advocated in MfS.2.
3.	TD42/95	7.8	The minor road x-distance is 4.5m rather than the full 9.0m. This is arguably a relaxation because it is a ghost island right turn lane junction, not a Simple junction.	Minor road flows are very low and therefore capacity is not an issue, so the 9m x-distance would be of no benefit in that respect, which is the principal benefit of the longer x-distance. There is no safety benefit, and indeed research indicates that longer x-distances can increase shunt type accidents on the minor arm (ref. para 10.5.7 of MfS.2). The 4.5m x-distance on a 70kph design speed road reflects the approach advocated in MfS.2.



Notes

Please do not scale this drawing

- Carriageway
- Footway
- Shared Footway/Cycleway
- Islands
- Tactiles
- Soft Landscaping
- Trees
- Street lighting columns - Illustrative only, subject to detailed design

REVISION	AMENDMENT	DRN	DATE	CHK
A	Design amended	JCB	31/08/16	GDB
B	Design amended, drawing size changed	JCB	25/11/16	GDB
C	Road layout amended	ARM	12/04/17	GDB

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CLIENT: Mulgrave Estates

PROJECT: Land at Climping, West Sussex

TITLE: Proposed Roundabout

DRAWN BY	DESIGN BY	CHK BY
JCB	GDB	GDB

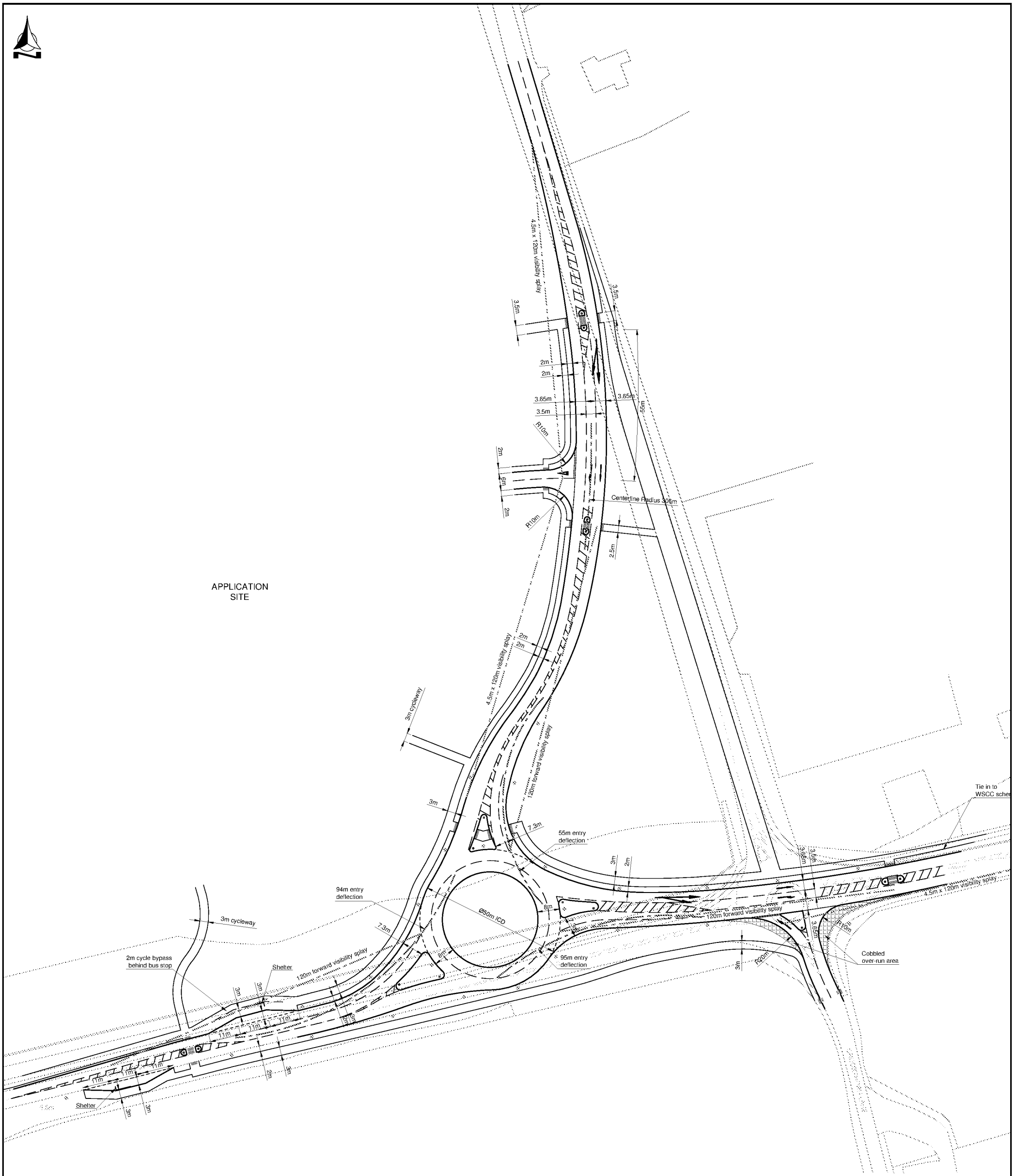
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DRAWING No.: 4724 / 002

REV No.: C

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Notes

Please do not scale this drawing

REVSION	AMENDMENT	DRN	DATE	CHK
A	Amended following RSA and WSCC comments	ARM	11/04/17	GDB

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PROJECT: Land at Climping, West Sussex

TITLE: Proposed Roundabout Details

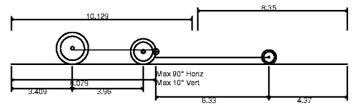
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24/11/16	4724 / 004	A

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Notes



Massey Fergusson 7278 combine harvester and trailer

Overall Length	18.779m
Overall Width	3.460m
Overall Body Height	0.805m
Min Body Ground Clearance	0.400m
Max Track Width	4.060m
Lock to Lock Time	5.00s
Kerb to Kerb Turning Radius	12.770m

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CLIENT
Mulgrave Estates

PROJECT
Land at Climping, West Sussex

TITLE
Swept Path Analysis
Combine Harvester
Sheet 1 of 3

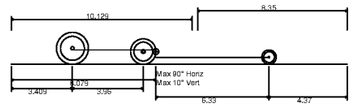
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Combine Harvester
Sheet 2 of 3

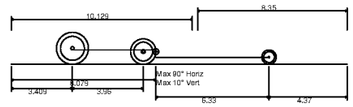
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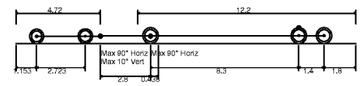
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Notes



Farm tractor & hay wagon

Overall Length	19.020m
Overall Width	2.500m
Overall Body Height	0.438m
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Max Track Width	2.500m
Lock to Lock Time	4.00s
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TITLE
Swept Path Analysis
Tractor and Wagon
Sheet 1 of 3

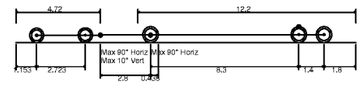
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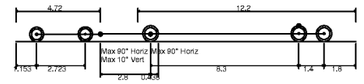
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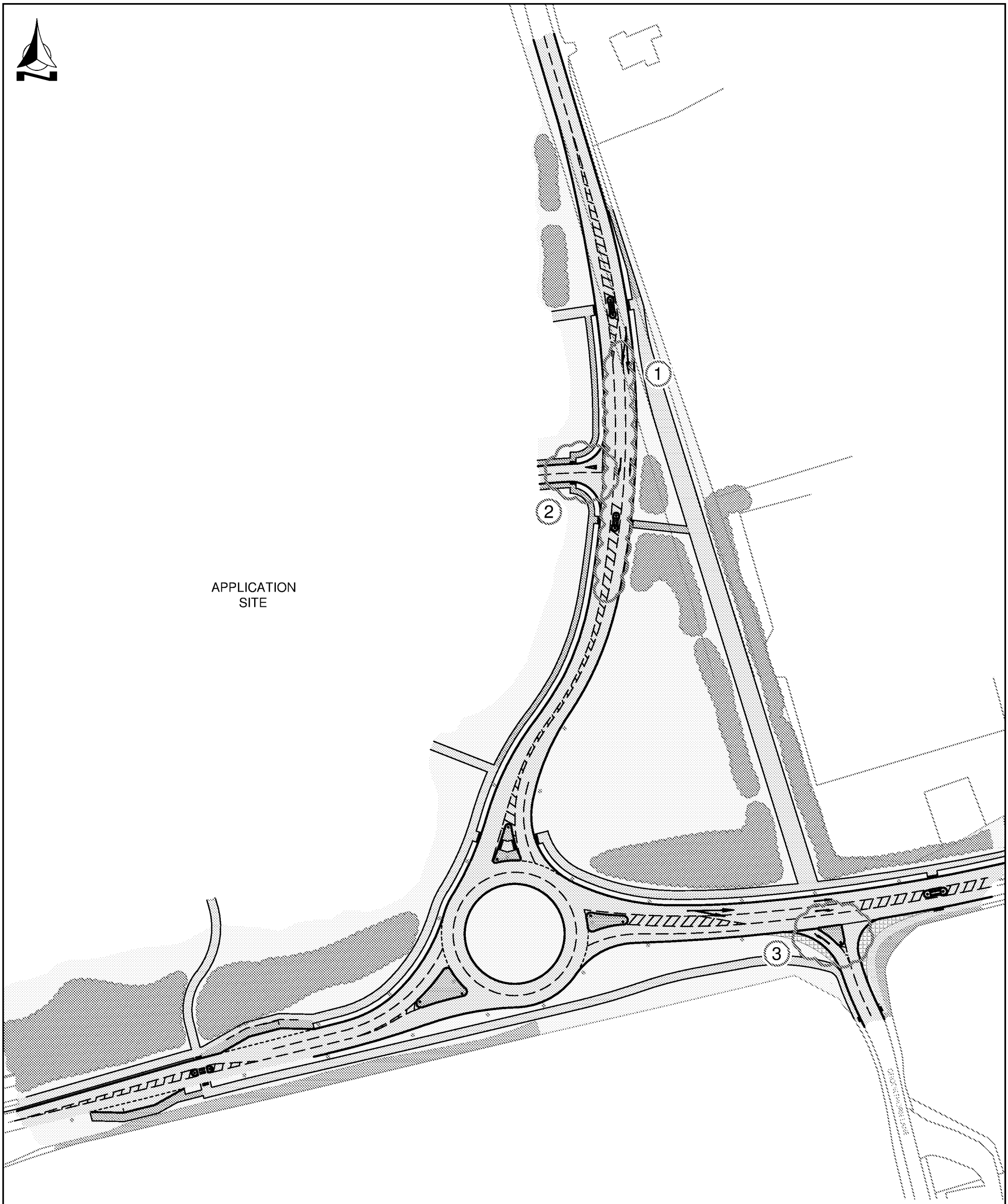
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Sheet 3 of 3

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CLIENT
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TITLE
Location of Relaxations from Standards

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JCB	GDB	GDB

DATE	DRAWING No.	REV No.
21/04/17	4724 / 007	

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