

TECHNICAL NOTE

Job Name: BSIP Bus Rapid Transit (BRT), A33, Reading
Job No: 332110759
Note No: BRT-STN-HGN-RKLS-TN-CH-100001
Date: 28/07/022
Prepared By: Sachit Dahal
Subject: Rose Kiln Lane South Junction Geometric Compliance Review

Item	Subject
1.	Introduction Stantec have been commissioned by Reading Borough Council to complete the design of the Rose Kiln Lane North junction section of the A33 South Reading Bus Rapid Transit scheme. The purpose of this technical note is to review the concept design against the relevant design standards to identify potential safety risks or improvements to the scheme. The scheme involves the widening/realignment of the carriageway to accommodate the addition of a new southbound bus lane on the A33. The proposed changes include: • Widening and realignment of the carriageway on the A33 to fit a new southbound bus lane • Reduced lane widths and central reservation widths • Changes to footway and crossing alignments • Amendments to the kerb lines to accommodate new footway or carriageway • Changes to Rose Kiln Lane junction layout to accommodate the new bus lane • Improvements to RKLS Junction The proposals are shown in Figure 1

DOCUMENT ISSUE RECORD

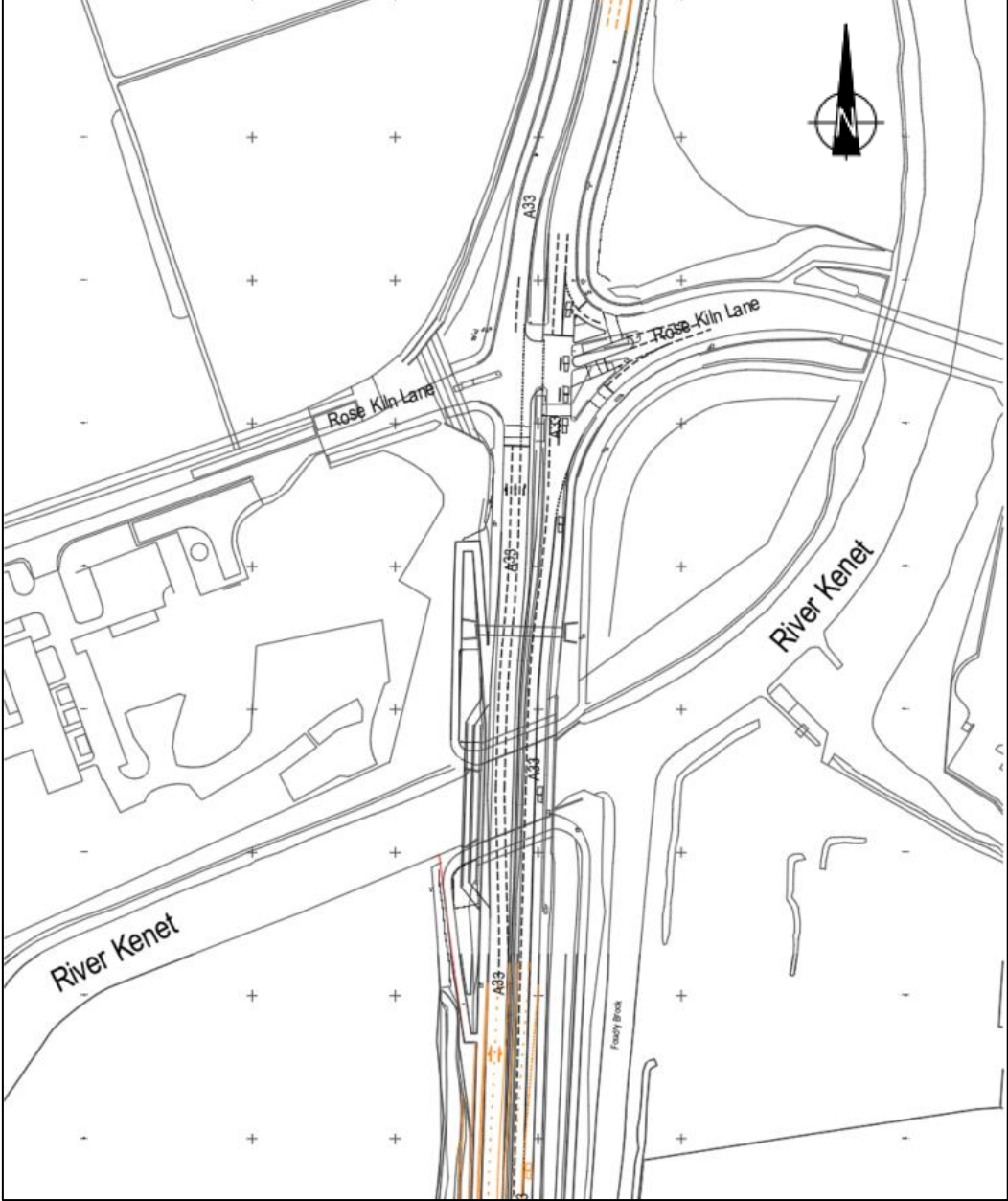
Technical Note No	Rev	Date	Prepared	Checked	Approved (Project Director)
BRT-STN-HGN-RKLS-TN-CH-100001	-	17.08.22	SD	RT	SE

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	 <i>Figure 1 RKLS junction proposed scheme</i>

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	The documents listed are the design standards referenced in this design compliance review: Design Manual for Roads and Bridges - CD 109 – <i>Highway Link Design</i> - CD 123 – <i>Geometric design of at grade priority and signal-controlled junctions</i> - CD 127 – <i>Cross section and headrooms</i>										
2.	General principles The scheme concept design is shown in the following documents, which are appended to this technical note: The tables to follow contain check lists of key sections of the DMRB standards, to enable quick confirmation that relaxations or departures are or/are not required. It should be noted that mandatory sections of the standards within the DMRB contain the words “shall” or “must”. Any noncompliance with these sections is deemed to be a departure. In some of the standards (i.e., CD 109) there are allowable relaxations that can be applied to desirable minimum standards and can be used at the discretion of the designer. The rest of the guidance (i.e., containing the words “should” or “may”) is advice and explanation commented for consideration - therefore any deviation from these sections does not constitute a departure. The following glossary has been devised to help assess the compliance to standards: Compliant – The design element complies with the relevant design guidance (mandatory and discretionary). No further consideration is deemed necessary. Non-Compliant – The design element does not comply with discretionary design guidance and may require further consideration Departure – The design element does not comply with mandatory design standards and requires further consideration For the elements of the design that require a relaxation or departure within DMRB standards, a table has been prepared to give justifications for these.										
3.	Summary of Key Findings: <table><tr><th>Ref</th><th>Subject</th><th>Design guidance doc-ref</th><th>Comment</th><th>Compliant</th></tr><tr><td>A3</td><td>Signal-controlled junction visibility</td><td>CD123, cl. 7.2</td><td><i>Each traffic lane shall have clear visibility of at least one primary signal associated with its particular movement, from a distance equivalent to a desirable</i></td><td>Departure (existing)</td></tr></table>	Ref	Subject	Design guidance doc-ref	Comment	Compliant	A3	Signal-controlled junction visibility	CD123, cl. 7.2	<i>Each traffic lane shall have clear visibility of at least one primary signal associated with its particular movement, from a distance equivalent to a desirable</i>	Departure (existing)
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A3	Signal-controlled junction visibility	CD123, cl. 7.2	<i>Each traffic lane shall have clear visibility of at least one primary signal associated with its particular movement, from a distance equivalent to a desirable</i>	Departure (existing)							

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				<i>minimum SSD of the approach road.</i> On the approach from Rose Kiln Lane towards southbound on the A33 the signals are not visible from the SSD. It is proposed this vegetation should be cut back to remove this existing Departure.	
	B3	Design speed related parameters and relaxations	CD 109 cl 2.9	<i>Designs shall provide at least the desirable minimum values for stopping sight distance, horizontal curvature, vertical crest curvature and sag curvature as shown in Table 2.10, except for the following situations: 1) where a relaxation is permitted by sections 2, 3, 4 or 5 of this document; 2) the design of a vertical crest curve on a 2 lane single carriageway road (see Section 9).</i> The desirable minimum stopping sight distance is 120m on the A33 and 90m on Rose Kiln Lane. The stopping sight distance is compliant on the A33 however on Rose Kiln Lane going westbound the SSD is not compliant. Horizontal curvature 1020m, and K value of 30. To the north of the junction there is a horizontal curvature of around 140m.	Departure (existing)
	B9	Design speed related parameters and relaxations	CD 109 cl 2.13	<i>The relaxations below desirable minimum in stopping sight distance, desirable minimum vertical curvature for crest curves and sag curves, described in Sections 3 and 5 of this document respectively, shall not be used on the immediate approaches to junctions</i>	Departure

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				There is a relaxations at an immediate approach to the junction from Rose Kiln Lane to the A33 going Southbound.	
	B12	Stopping sight distance	CD 109 cl 3.2	<i>Desirable minimum stopping sight distance shall be available between any two points in the centre of each lane within the horizontal and vertical extents of the visibility envelope (measured for each carriageway in the case of dual carriageways and motorways).</i> The minimum SSD is available horizontally except at Rose Kiln Lane going southbound on the A33 and vertically as there is very little obstruction within the visibility splay.	Departure (existing)
	B25	Application of superelevation	CD 109 cl 4.9	<i>For improvements to existing roads without transitions, between half and two thirds of the superelevation shall be introduced on the approach straight with the remainder provided at the beginning of the curve</i> There is no superelevation applied to the north of the junction where there is significant horizontal curvature	Departure (existing)
	B27	Widening on curves	CD 109 cl 4.11	<i>For carriageways less than the standard widths as defined in CD 127 [Ref 1.N], widening shall be: 1) 0.6 metres per lane where the radius is greater than 90 metres but below 150 metres subject to maximum carriageway widths of 7.9 metres, 11.9 metres and 15.8 metres (for 2, 3 and 4 lanes carriageways respectively); 2) 0.5 metres per lane where the radius is between</i>	Departure

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				150 metres and 300 metres, subject to a maximum width not being greater than the standard lane widths in CD 127 [Ref 1.N]; 3) 0.3 metres per lane, where the radius is between 300 metres and 400 metres subject to a maximum width not greater than the standard lane widths in CD 127 [Ref 1.N]. The carriageway widths do not coincide with the figures shown on CD127, the lane widths are mostly less than required. 3.0m going northbound on the A33 and 3.25 going southbound on the A33, the bus lane is 3.2m wide. There is no widening on curves.	
	C3	Traffic lane width	CD 127 cl 2.2	Traffic lane widths for horizontal curvature greater than 400 metres radii shall be in accordance with Figures 2.1.1N1a to 2.1.1N1h. The carriageway widths do not coincide with the figures shown on CD127, the lane widths are mostly less than required. 3.0m going northbound on the A33 and 3.25 going southbound on the A33, the bus lane is 3.2m wide.	Departure
	C5	Central reserves	CD 127 cl 2.9	Minimum central reserve widths shall be as shown in Figures 2.1.1N1a to Figure 2.1.1N1h except where the offside hard strip has been widened for drainage. Central reserve is proposed to be 1.2m wide for a long stretch of road	Departure
	C12	VRS set-back	CD 127 cl 2.24	The minimum dimensions for VRS set-back shall be as shown	Departure

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				<i>in Table 2.24 and are illustrated in Figures 2.25a to 2.25d.</i> South of the junction the stretch of VRS cannot have a 600mm set back as the central reserve itself is 1.2m	
	C14	VRS set-back	CD 127 cl 2.26	<i>On central reserves where there are no obstructions and there is only one double sided deformable safety barrier between carriageways, the minimum set-back on both sides of the safety barrier shall be as stipulated in Table 2.24 but also no less than the working width of the safety barrier minus the actual width of the safety barrier.</i> VRS will be installed south of the junction. However, due to the narrowing of the central reserve the set back of the central reserve cannot be in accordance to this clause	Departure