**From:** [redacted]
[redacted] M42 Junction 6
**Cc:** [redacted]
**Subject:** RE: TR010027: M42 Junction 6 Improvement - Applegreen plc Deadline 3 Submissions
**Date:** 15 July 2019 17:16:35
**Attachments:** Applegreen DL3 submissions - final.pdf
Technical Note on Free Flow Junction Alternative for M42 J5a - final.pdf
Appendices A-E to Applegreens D3 Submissions.zip

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Dear Case Team

We write on behalf of Applegreen plc pursuant to Deadline 3 for the examination of the above project. Our registration identification number is 20022311.

Our Deadline 3 submissions comprise:

- A document titled Applegreen DL 3 Submissions. This comprises 3 tables (in a single file) as follows:
    - Table 1: Comments on the Applicant's responses (Document 8.6) to the Panel's first written questions
    - Table 2: Comments on the Applicant's Document 8.24: Junction 5A Operational Assessment
    - Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions
- A ZIP folder containing 5 Appendices (A-E) to the above submissions.
- A Technical Note on the Free Flow Junction Alternative for J5A.

We trust that is all in order.

Finally, we would be grateful for confirmation of receipt of this email.

Regards,

**Nick Roberts**
**Director**

axis

**nickroberts@axisped.co.uk**
T: 0844 8700 007* | [redacted] | F: 01244 661 432
Camellia House, 76 Water Lane, Wilmslow, Cheshire, SK9 5BB
**www.axisped.co.uk**

# APPLEGREEN PLC

**DEADLINE 3 SUBMISSIONS**

**relating to**

**M42 Junction 6**
**Development Consent Order Application**

## Comprising:

- **Table 1: Comments on the Applicant's responses (Document 8.6) to the Panel's first written questions**
- **Table 2: Comments on the Applicant's Document 8.24: Junction 5A Operational Assessment**
- **Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions**

**15th July 2019**

| Table 1: Comments on the Applicant's responses (Document 8.6) to the Panel's first written questions | | | |
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| **Question number** | **Question** | **Highways England response** | **Applegreen comment** |
| 1.0.4 | MSA<br>Paragraph 4.3.5 of the ES explains that north facing slip roads were removed from the proposed new Junction 5a as it was considered that the junction is too close to Junction 6 and providing them would cause safety and operational issues. Paragraph 3.1.9 of the ES states that "*Although the MSA currently does not benefit from planning consent, Highways England has engaged with the applicant for the MSA and has sought to ensure that, where practicable, the design of Junction 5A would not preclude delivery of the MSA, should the MSA be authorised by SMBC following the implementation of the Scheme."* However, the proposed MSA for Junction 5a includes northern slip roads. Could the Applicant, SMBC and Extra MSA Solihull Ltd and | Answer:<br>The Scheme has been developed as a stand-alone proposal. The Scheme originally evaluated north facing slip roads during early option development stage, however, north facing slip roads were removed from the Scheme proposals at Preferred Route Announcement Stage (August 2017). This was because of the operational proximity to Junction 6 and limited traffic demand, as set out in paragraph of 4.3.5 of the Environmental Statement [APP-049/Volume 6.1]. The Applicant has engaged with the promotors of the Motorway Service Area (MSA) at Junction 5A and recognises that the MSA proposal includes north facing slip roads. The Applicant, as the strategic highways company, has agreed a number of measures which would be incorporated into the MSA scheme to provide mitigation against the operational impacts of the north facing slip roads. These mitigation measures include: the conversion of the M42 motorway to smart motorway with all lanes running, an upgrade from the dynamic hard shoulder running regime currently in place. The Applicant therefore does not consider there to be any contradiction. | Comment:<br><br>Highways England has confirmed that the north facing slips were removed from the DCO proposals because of the operational proximity to Junction 6, and the associated safety risks, and the limited traffic demand for the slips.<br><br>Notwithstanding this confirmation, Highways England's response demonstrates that the DCO scheme has been designed so as to accommodate the north facing slips, as required for the Extra MSA proposal , such that the DCO Junction 5A and the north facing slips have become inextricably linked. In facilitating the provision of the north facing slips the Applicant has compromised its Junction 5A solution.<br><br>By seeking to address the operational impacts through additional mitigation measures Highways England is acknowledging that the north facing slip roads are a sub-standard solution. The starting point in designing schemes is always to avoid any impacts if possible. Therefore, if there is a viable alternative site for an MSA which avoids compromising DCO Junction 5A and gives rise to none of the safety concerns that arise from the north facing slips then that alternative should be pursued. |

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| | Applegreen plc comment on this potential contradiction. | | Accordingly, there is a clear conflict in the Applicant's position in that it is facilitating an MSA which requires mitigation to address safety risks when there is an alternative MSA solution which avoids such risks. . |
| 1.0.5 | Has the positioning of the proposed MSA influenced the proposed siting and design of Junction 5a? If it has, should this be determinative given that the planning application remains undetermined and there is an alternative site at Junction 4 being considered under a separate planning application? | The positioning of the proposed MSA influenced the siting and design of the Junction but did not determine it. The design rationale for Junction 5A is included in Sections 3-6 of Appendix 4 to the Planning Statement [APP-173/Volume 7.1], which sets the range of factors that were considered. One of the objectives was not to preclude the MSA where practicable but there were a number of other factors that were also taken into account. | Applegreen notes that the Applicant explicitly confirms that the positioning of the MSA has influenced the siting and design of the junction. However, the Applicant does not set out a detailed response justifying the "other factors" which were taken into account. Applegreen's analysis of the design evolution is set out in its response to response to this question at REP2-041).<br><br>It is clear that the Applicant would not have proposed a dumb bell junction form if they had not been trying to accommodate the north facing slip roads required by the MSA proposals.<br><br>The overriding objectives of the DCO scheme should not be compromised by an MSA proposal that does not have planning permission, particularly as there is an alternative site at Junction 4. The Applicant's response reinforces the fact that the MSA was indeed determinative in its approach to the DCO scheme design. |
| 1.0.6 | DRMB (4.35) indicates that for Rural Motorways (as the M42 nominally is) the desirable minimum weaving length must be 2km. However, the distance likely to be available between | The DCO Scheme before the Examining Authority (ExA) does not include north facing slip roads at the proposed<br>Junction 5A. As set out in Paragraph 4.3.5 of Environmental Statement Chapter 4 [APP-049/Volume 6.1], there is no identified need nor | Applegreen welcomes the Applicant's comments that "there is no identified need nor requirement to provide north facing slip roads". However, this only serves to highlight the contradictory approach taken by it seeking to accommodate the future MSA at Junction 5a which requires north facing slip roads. |

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| | any north facing slip roads at junction 5a and the south facing slip roads at junction 6 is roughly 1.7km. In view of the high traffic flows on the M42 (nearly 7,000 vph northbound by 2041 in the AM peak and over 6,000vph southbound, APP-174, Figure 7.2) a longer weaving section might be warranted or desirable. What is the justification for countenancing the potentially sub-standard arrangement envisaged? | requirement to provide north facing slip roads and therefore there is no reduction in weaving length between Junctions 5A and 6 within the DCO Scheme Should it be deemed necessary or appropriate to provide north-facing slip roads to Junction 5A at a time in the future, the Applicant considers that this could only be delivered with a material amendment to the DCO or such other consenting means as appropriate. | Applegreen also notes that the Applicant considers that proposals to include the north facing slip roads would be a "material amendment" to the DCO. |
| 1.0.8 | Sensitivity tests have been undertaken entailing provision at junction 5A for the proposed motorway service area (MSA) [APP-174, 3.9].<br>What are the results of those tests? | The results are summarised in the M42/J6 Technical Note 13 Junction 5A Operational Assessment dated June 2019 which has been submitted for Deadline 2 [Volume 8.28].<br><br>This should have read [Volume 8.24] | Refer to our Table 2 (below) for comments on Junction 5A Operational Assessment |
| 1.0.9 | Do the tests referred to in ExQ1.0.8 entail ARCADY outputs for the roundabouts at junction 5A? If so, what are the results and what do they | Yes, ARCADY modelling was conducted and the outputs are summarised in M42/J6 Technical Note 13 Junction 5A Operational Assessment, dated June 2019 which has been submitted for Deadline 2 [Volume 8.24]. | Refer to our Table 2 (below) for comments on Junction 5A Operational Assessment |

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| | demonstrate? If there is no ARCADY output, please justify its absence. | | |
| 1.0.10 | In the absence of an MSA at junction 5a, would a junction designed along the lines indicated by Mr David Cuthbert [AS-018] be more efficient and represent something close to the optimum arrangement? | The proposed published dDCO layout for Junction 5A is a layout which largely follows similar layouts for Junctions across the motorway network, this is also recognised a standard arrangement in the DMRB TD 22/06, figure 5/2. This junction has been assessed to ensure it facilitates traffic movements without incurring significant congestion, this is demonstrated in the Transport Assessment Report [APP-174/Volume 7.2].<br>Since the Scheme inception in 2014 the Applicant has worked closely with SMBC, as described in detail in the Environmental Statement Chapter 4 Scheme History and Alternatives [APP-049/Volume 6.1], to develop and assess design solutions to best meet the Scheme objectives.<br><br>As a result of this development process the Applicant is satisfied that the Scheme layout published in the dDCO provides the required traffic capacity to cater for future forecast growth and is the most efficient and optimal arrangement for delivering the Scheme objectives with or without the MSA development. | As set out in Applegreen's response to this question at ExQ1 [REP2-041], the DCO layout for Junction 5A does not accord with any layouts for junctions across the motorway network that serve a similar function (i.e. accommodate single direction facing slips and link to a single link road).<br><br>In short, all other junctions where one directional slips connect to a single link are constructed as free flow. While the Applicant has directed the ExA to DMRB TD22/06 figure 5.2, they have chosen not to make reference to figure 5/4.2e, which better represents the arrangement that will occur at Junction 5A.<br><br>The Applicant states that the DCO scheme is the most efficient and optimal arrangement for delivering the scheme objectives with or without the MSA development. Applegreen disagrees with this statement and believes that the proposed form of Junction 5A is dictated by the objective not to preclude the MSA. We do not believe that this should be one of the DCO scheme objectives.<br><br>The Applicant states that it has produced a DMRB compliant design of a free-flow junction similar to the one proposed by Mr Cuthbert. They have not provided a plan of this and while |

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| | | The Applicant has reviewed the outline concept design provided by Mr David Cuthbert and has carried out a high level review of similar free-flow Junction design, to DMRB standards, at this location. This is generally comparable to the published dDCO junction layout.<br>The Applicant has carried out a qualitative comparison of this alternative layout with the published dDCO junction in the context of the wider Scheme objectives. This assessment recognises that a free-flow junction arrangement would provide additional traffic capacity to the road network. This additional capacity, however, is not required by the Scheme, nor would it bring the same benefits as the dumb-bell junction arrangement as set out below:<br>1. The overall footprint and associated land-take is smaller;<br>2. Has less impact on sensitive environmental features such as Ancient Woodland;<br>3. Would require less diversion of statutory undertakers apparatus;<br>4. Safer conditions for maintenance workers.<br>5. The published dDCO layout provides inherent flexibility to allow improved access to the road network for future local and regional growth.<br><br>Based on this high level review the Applicant is satisfied that the published layout in the dDCO provides the optimum junction arrangement and | they say it is generally comparable to the DCO scheme they do not explain in what way it is comparable.<br><br>To assist the Examining Authority's consideration of this issue, Applegreen's consultants have produced a variant of the free-flow junction attached as Appendix A.<br><br>Applegreen has also submitted (at Deadline 3) a Technical Note more fully describing its variant free flow option and the benefits of such a scheme.<br><br>The relevant DMRB standards for the free flow junction are TD22/06 (Layout of Grade separated Junctions) and TD9/93 (Highway Link Design). The road between the M42 northbound and the new link road is defined in 1.16 of TD22 as an Interchange Link. Table 4/1 of TD22 defines the design speed for this type of road as 85 kph. Table 3 of TD9 provides guidance on the horizontal curvature and stopping sight distance. In a situation such as that proposed in the free flow alternative, where there is potential environmental impact, it is appropriate to provide one step below desirable minimum for horizontal curvature and forward visibility. For this reason a horizontal radius of 360m is proposed with a stopping sight distance of 120m.<br><br>The connection between the new link road and the M42 southbound is defined as a Hook Merge in 4.11 of TD22. A minimum radius of 75m is specified in 4.9 of TD22 for this type of road where it connects to a motorway. |

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| | | meets the scheme objectives as defined in the Planning Statement [APP-173/Volume 7.1]. | In its response the Applicant compared the free-flow layout with their dumb-bell proposals and concluded that the dumb bell was superior for the following reasons:<br><br>1. The overall footprint and associate land take is smaller.<br><br>Applegreen response:<br><br>It is true that the outer limits of the free-flow arrangement may cover a slightly larger area than the dumb bell arrangement but the area of paved highway would be materially lower and the area contained within the connector roads of the free flow alternative could be retained as green landscaped area. Overall, the extent of unappropriated development within the Green Belt arising from a free flow solution would be less than from the proposed dumb bell arrangement.<br><br>2. Has less impact on the sensitive environmental features such as Ancient Woodland.<br><br>Applegreen response:<br><br>While the connector road from the M42 northbound may have marginally greater impact on the ancient woodland to the west of the DCO off-slip, the ability to provide an alternative horizontal and vertical alignment for Solihull Road afforded by the free flow option significantly reduces the potential impact |

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| | | | on the ancient woodland. Applegreen's consultants have undertaken an assessment of the relative impact of the two options on the ancient woodland to the west of the motorway and this is detailed in Appendix B. The relative areas taken from these sketches show that the free flow alternative would have 23% less impact on the area of ancient woodland to the west of the motorway than the DCO scheme.<br><br>3. Would require less diversion of statutory undertakers apparatus.<br><br>Applegreen response:<br><br>The Applicant has not identified the statutory undertakers apparatus they are referring to but the free flow scheme could be constructed without impacting on the overhead power lines. We are not aware of any other utilities' constraints.<br><br>4. Safer conditions for maintenance workers.<br><br>Applegreen response:<br><br>It is not clear why the Applicant considers this to be the case .<br><br>5. The published dDCO layout provides inherent flexibility to allow improved access to the road network for future local and regional growth. |

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| | | | Applegreen response:<br><br>It is assumed that the Applicant is referring to the ability to provide north facing slip roads with the dumb bell arrangement that could not be provided with the free flow arrangement. However, the Applicant has made it clear that the north facing slip roads were not included in the DCO scheme because of the safety risks associated with the close proximity to Junction 6 and the lack of traffic demand. It is therefore paradoxical to compromise the layout of an improvement scheme in order to retain the option to introduce slip roads that have already been determined by the Applicant to be unsafe. It is simply not the case that the draft DCO provides the "optimum junction arrangement" as the Applicant claims. It has been demonstrated through the design at Appendix A that more preferable improvement options exist. |
| 1.7.28 | Ancient Woodland<br>It is noted that Chapter 4 (alternatives) of the ES states that a southern junction option is considered to represent the only viable solution to improve Junction 6. It is also noted that paragraphs 4.4.19 to 4.4.21 of the ES state that the proposed layout of M42 Junction 5a was developed to reduce the impact of the scheme on ancient | The Applicant has evaluated a number of options as demonstrated in Chapter 4 of the ES. Furthermore, the siting of the preferred dumb-bell arrangement was assessed and explained in a Technical Note in Appendix<br>4 to the Planning Statement [APP-173/Volume 7.1], which sets out a range of factors that were also taken into account to determine the optimum location of the new Junction 5A design without north facing slip roads.<br>The Technical Note highlights that to achieve a significant reduction on the impact to the Ancient | The Applicant states in its response that a number of options were evaluated against the criterion of minimising effects on the ancient woodland. It should be noted that all options were of a dumb bell form and assumed that north facing slips would need to be accommodated. A free flow form for the junction, and the benefits this would have for Solihull Road, were not considered. In Appendix 4 to the Planning Statement the Applicant suggests the moving the dumb bell north would have impacts on the following:<br><br>• Residents of Brickhill village |

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| | woodland at Aspbury's Copse. However, can the Applicant explain why the dumb-bell layout for Junction 5a cannot be moved further north to avoid or further minimise the encroachment of the southern slip roads and associated works into or immediately adjoining Aspbury's Copse, particularly as the scheme is not constrained by providing slip roads to the north? | Woodland at Aspbury's Copse, Junction 5A would have to be moved 50m north, this will result in a 55% reduction on the Ancient Woodland as noted in Appendix 4 to the Planning Statement. This however, would preclude the MSA planning application from installing north facing slip roads which was one of the factors considered when siting the Junction in the proposed location. As noted in paragraph 3.7 of Appendix 4, moving Junction 5A beyond 50m north of its current location would have several other impacts including on:<br>a. residents of Bickenhill village;<br>b. land take within the Green Belt;<br>c. Bickenhill Meadows SSSI; and<br>d. the 132kV overhead powerline. | • Land take within the green belt<br>• Brickhill Meadows SSSI<br>• The 132kV overhead powerline<br>The impacts were assessed on the basis of a relocated dumb bell. If a free flow layout were provided in line with Appendix A, the following would arise::<br>i) the layout would tie back into the DCO scheme alignment before there is any impact on Brickhill village or the Brickhill Meadows SSSI;<br>ii) there would be no impact on the 132kV overhead powerline as it does not have to rise up to the level of the western roundabout of the DCO dumb bell arrangement; and<br>The extent of unappropriated development within the Green Belt arising from a free flow solution would be less than from the proposed dumb bell arrangement.<br>In summary a free flow layout would give rise to less environmental and Green Belt impact than the DCO dumb bell scheme. |
| 1.7.29 | Ancient Woodland<br>It is noted that the horizontal alignment of Solihull Road would remain largely the same | The Applicant has considered a number of options to position Solihull Road Overbridge further north up to 10m in order to reduce the impact on the ancient woodland. This would | As shown in Appendix A, a free flow junction form would allow the proposed horizontal and vertical alignment of Solihull Road to be revised to reduce the impact on the ancient woodland. The reason for this is the vertical level of the |

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| | as the existing to minimise land-take, although the new alignment would move off-line slightly to the north by 10m on the approaches to the overbridge, where the embankment height would be at its peak of 7.5m. Paragraph 3.5.21 of the ES explains that this offset would contribute towards reducing the amount of land-take required within Aspbury's Copse ancient woodland, and mitigating adverse impacts on properties to the south of the existing Solihull Road. However, if a new Solihull Road overbridge is to be built, can the Applicant explain why can't it, and the raised vertical alignment of its approaches, be positioned further to the north so as to avoid or further minimise encroachment into the Aspbury's Copse? Although the general arrangement drawings show relatively steep embankments to the raised sections of Solihull Road, they appear to take a considerable | require increasing the vertical height of the overbridge to accommodate the rising slip road levels and subsequently the increased embankment heights on approach to the overbridge on Solihull Road, which will have the following impacts:<br>• The increased embankment heights would have a visual impact on the adjacent properties to Solihull Road, east of the M42 motorway,<br>• To achieve a safe horizontal and vertical alignment of Solihull Road Overbridge, greater land take would be required on both the east and west of the M42 Motorway,<br>• Moving the overbridge further north would require increasing the span of the Solihull Road overbridge and incurring greater costs associated with the construction of the bridge, it would also require two additional structures to span over the slip roads as Solihull Road is located closer to the Junction 5A overbridge, and<br>• A safe horizontal alignment connecting with the Solihull Road Overbridge on the eastern approach will impact upon the existing 400kV assets owned by National Grid leading to increased costs associated with utility diversions.<br><br>The Applicant has included greater vertical and horizontal limits of deviation for Solihull Road overbridge in order to provide flexibility for this. This will be subject to further evaluation during the construction phase where the Applicant can | proposed slip roads, where they pass under Solihull Road, can be much lower with the free flow form of junction that with the proposed dumb bell. This is because the slip roads under the free flow form do not have to rise up to the level of the dumb bell roundabout which would need to be at the same height as the bridge over the motorway linking the two roundabouts together.<br><br>While with the free flow layout the on slip connector road would still need to cross the motorway, the distance between this crossing and Solihull Road would be much longer than the distance between the eastern dumb bell roundabout and Solihull Road, allowing the level of the slip road under Solihull Road to be much lower. This is shown on the sketches in Appendix C. With the free flow layout the slip roads could be at the same level as the motorway as they pass under Solihull Road. Given that the proposed off slip of the DCO scheme would be 4.7m higher than the motorway were it would pass under Solihull Road, it can be seen that a free flow arrangement would allow the Solihull Road Bridge to be 4.7m lower than currently proposed in the DCO scheme.<br><br>This is best highlighted by looking at the elevation of the proposed Solihull Road Bridge submitted with the DCO application. This is reproduced in Appendix D of this response. The elevation shows three clearance envelopes which have been highlighted in the Appendix. It can be seen that the height of the Solihull Road Bridge proposed in the DCO is determined by the clearance envelope for the northbound off slip. If, with a free flow arrangement, the slip roads could be at the same level as the M42 mainline, the |

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| | amount of land around the edges of the Aspbury's Copse. How would such earthworks be constructed without causing additional harm? | assess the implications of risks associated with Health and Safety and quality due to constructing an offline overbridge parallel to the demolition works associated with the existing Solihull Road Overbridge.<br><br>Based upon these factors, the Applicant considers that the limits of deviation prescribed in the Development Consent Order enable the maximum shift in the alignment of Solihull Road overbridge without introducing additional adverse impacts.<br>In order to prevent damage to existing vegetation from the earthworks, commitment G11 in the REAC requires the CEMP to include measures for the protection and retention of trees in proximity to construction working areas. | bridge height would only need to accommodate clearance envelopes as high as that shown for the mainline on the section in Appendix D. The sketch in Appendix E shows an indicative comparison of the elevation of this lower bridge superimposed on the DCO scheme bridge.<br><br>If Solihull Road were aligned as shown in Appendix A the highway would extend no further south than the existing Solihull Road with no impact on the ancient woodland.<br><br>If Solihull Road were aligned as shown in Appendix A it should be possible to keep the existing Solihull Road Bridge open during construction of the new bridge. This would not be possible with the alignment proposed in the DCO and Solihull Road would be closed for many months at the inconvenience of local traffic movement. |

| Table 2: Comments on the Applicant's Document 8.24: Junction 5A Operational Assessment | | |
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| **Paragraph** | **Issue** | **Applegreen comment** |
| Table 3 & 5.1.9, 5.1.10 | Table 3 presents the results of the ARCADY analysis at the western roundabout at Junction 5A in the AM peak with both north and south facing slip roads. The north facing slip roads are required to accommodate the MSA development. The | The results of the modelling at the western roundabout indicate that in the scenario with the MSA, the northbound off-slip would be operating well above capacity. A queue of 159 vehicles is predicted and there is a risk that a queue of this magnitude would extend to affect the M42 mainline. This would have operational and safety consequences both for traffic |

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| | Assessment is based on a 6% turn-in rate to the MSA. The analysis indicates that the western roundabout is forecast to experience traffic demands in excess of its capacity on the M42 northbound off-slip approach arm where a ratio of flow to capacity (RFC) of 1.11 is predicted with a corresponding queue of 159 vehicles. The Level of Service (LOS) is rated as F which indicates that the flow has broken down and congestion will occur. | leaving the motorway at Junction 5A and for traffic continuing northbound on the M42 towards Junction 6. |
| Table 5 & 5.1.12, 5.1.13 | To improve the performance of the western roundabout, a further test is undertaken on the basis that a segregated left-turn lane from the northbound off-slip directly into the MSA is provided. This is shown to improve the performance of the western roundabout where a maximum RFC of 0.87 and corresponding queue of six vehicles is predicted on the northbound off-slip during the AM peak. | At roundabouts, a maximum desirable RFC value of 0.85 is preferred as this minimises the chance of queues forming at the junction and therefore builds in some resilience to the design. The RFC on the northbound off-slip even with the left-turn lane to the MSA, exceeds the 0.85 RFC threshold and is an indication that the northbound off-slip is beginning to show signs of stress with an increasing likelihood of queues forming. |
| Table 6 & 5.1.14, 5.1.15, 5.1.16 | The above exercise was repeated with an 8% turn-in rate which was undertaken by the Applicant for the MSA development as a sensitivity test. | The results of the ARCADY assessment indicate that even with the segregated left turn lane into the MSA, the western roundabout would operate above capacity. The critical arm is the exit from the MSA where a RFC of 1.05 and a queue of 48 vehicles is predicted during the AM peak. On the northbound off-slip a RFC of 0.91 and a queue of 10 vehicles is predicted also during the AM peak. As noted above this exceeds the 0.85 RFC threshold and is an indication that the northbound off-slip is beginning to show signs of stress with an increasing likelihood of queues forming. |
| Table 7 & 5.1.17 to 5.1.25 | Acknowledging the capacity issues at the western roundabout, Highways England has proposed a further capacity improvement involving widening and partial signalisation. The proposal is to provide traffic signals on the northbound off slip and the MSA exit arm and to widen on the northbound off-slip and on the western circulatory section of the | The modelling results presented in Table 7 indicate that the western junction would operate within capacity with a maximum DoS of 85% and queue of 14 passenger car units (pcu's) on the MSA exit arm during the AM peak. The corresponding values for the northbound off-slip are 81% and 12 pcu's. No modelling output has been provided by the Applicant.<br><br>An observation of the proposed design is that there is a very short stacking length on the circulatory approach carriageway to the MSA exit. If a HGV was to be stopped at a red |

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| | roundabout. The exit onto the new dual carriageway link would also be widened to 3 lanes allowing traffic to merge from three to two lanes downstream of the junction. The segregated left turn lane into the MSA would be retained.<br><br>The proposed layout has been modelled on the basis of an 8% turn-in rate using LinSig. The critical outputs from LinSig are the degree of saturation (DoS) for each individual link and the practical reserve capacity (PRC) for the junction as a whole. The maximum desirable DoS/PRC is 90% and if this is exceeded the junction begins to become unstable with an increasing likelihood of queues forming. | signal on the circulatory carriageway, there is a risk that it would block the entry to the MSA which would have implications for the operation and safety of the junction. Highways England has not provided the output from the LinSig analysis and therefore it is not possible to establish whether queues would form on the short section of circulatory carriageway at the access to the MSA.<br><br>A further observation is that for consistency it is considered that the junction should be modelled using microsimulation rather than a static traffic model such as LinSig. In its response to the planning application for an alternative MSA at Junction 4 of the MSA, Highways England rejected the use of a TRANSYT traffic model (which is similar to LinSig) in favour of microsimulation, as the former "is not capable of considering the complex interaction of traffic flows with the M42 mainline". Highways England's response identified further limitations of TRANSYT stating that "a matter of particular concern at this junction is further to the interaction of this traffic flow with the M42 Smart Motorway system". Another limitation that was highlighted was that TRANSYT "is not capable of modelling impacts between individual highway links where congestion may cause queuing traffic to 'block back' from one link to the next".<br><br>Many of the comments regarding the limitations of the TRANSYT model developed at Junction 4 of the M42 equally apply to LinSig; and on this basis it is considered that microsimulation should have been used to assess the impact of the MSA at Junction 5A. The justification for this is enhanced by the fact that with all the modifications proposed to accommodate the MSA, the junction is becoming more complex with multiple entry lanes, short sections of circulatory carriageway and a short merging section downstream of the junction on the new dual carriageway link road. |
| 6.1.1 & 6.1.2 | So as not to preclude the MSA should it receive planning permission at a later date, Highways England is proposing to make a change to the design of Junction 5A. The change is required to accommodate the segregated left turn lane into the MSA which would extending the span of the Solihull Road overbridge by approximately 6m. | Extending the Solihull Road bridge span by approximately 6m would have a detrimental impact on the ancient woodland on the west side of the motorway. |
| General | The Junction 5A Proposed Design – With MSA as shown in Figure 6 of the Applicants Document | As part of Applegreen's proposal for an alternative MSA at Junction 4 of the M42, the highway scheme that is proposed to accommodate the MSA has been subject to a rigorous |

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| | 8.24: Junction 5A Operational Assessment has not been subject to a Stage One Safety Audit. | Stage 1 Road Safety Audit in accordance with GG 119. For consistency and to ensure that the scheme shown in Figure 6 provides a safe solution, it should be subject to the same rigorous process. |
| General | The Junction 5A Proposed Design – The proposed dumb bell layout introduces unnecessary delays to the majority of the vehicles using the junction. | The dumb bell arrangement will require vehicles travelling from the M42 northbound to the new link road to slow down for the give-way line at the western roundabout and to negotiate the roundabout before proceeding along the link road. The free flow arrangement would allow them to make this movement without these delays.<br><br>The dumb bell arrangement will require vehicles travelling from the new link road to the M42 southbound to slow down for the give-way line at the western roundabout and to negotiate the roundabout before proceeding to the eastern roundabout to negotiate the give-way line and the roundabout before joining the motorway. The free flow arrangement would allow them to make this movement without these delays.<br><br>Every vehicle making these movements would incur these delays. Over the course of a year this would add up to significant unnecessary additional delay.<br><br>If the MSA were constructed these delays would be significantly greater. As the Applicant has not provided copies of the junction modelling it is not possible to quantify these delays. |

## Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions

| Question number | Question | Extra MSA Group response | Applegreen comment |
|---|---|---|---|
| 1.0.4 | MSA<br>Paragraph 4.3.5 of the ES explains that north facing slip roads were removed from the proposed new Junction 5a as it was considered that the junction is too close to Junction | The provision of the north facing slip roads are required for the Motorway Service Area (MSA) but not for the DCO scheme. The slip roads require a departure from DMRB Standards due to the short weaving length between the proposed M42 J5A and existing M42 J6 however, this departure from DMRB Standards has already | The suggested additional economic benefits identified by Birmingham Airport, the NEC, UK Growth Company and the Chambers of Commerce were referenced by the aforementioned organisations at a point in time where they were completely unaware of the detrimental effects of the MSA (and its associated north facing slip roads) on the future |

| Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions | | | |
|---|---|---|---|
| **Question number** | **Question** | **Extra MSA Group response** | **Applegreen comment** |
| | 6 and providing them would cause safety and operational issues. Paragraph 3.1.9 of the ES states that "*Although the MSA currently does not benefit from planning consent, Highways England has engaged with the applicant for the MSA and has sought to ensure that, where practicable, the design of Junction 5A would not preclude delivery of the MSA, should the MSA be authorised by SMBC following the implementation of the Scheme."* However, the proposed MSA for Junction 5a includes northern slip roads. Could the Applicant, SMBC and Extra MSA Solihull Ltd and Applegreen plc comment on this potential contradiction. | been agreed in principle by Highways England's National Safety Division.<br>The benefit of the north facing slip roads are as follows:<br>1. Most importantly they are essential for the operation of an on-line MSA. They enable the Extra MSA to be provided in the only location on the M42 that can provide the maximum road safety benefit for users of the motorway network in enabling them to have a break within the prescribed 28 mile maximum recommended travel distance between MSAs set out in paragraph B6 of DfT Circular 02/2013. The location of the Extra MSA ensures that this is the case in respect of the existing gaps on this part of the Motorway Network, save for the gap between Warwick Services and Telford Services, which cannot be resolved by a single MSA.<br>2. There are additional economic benefits identified by Birmingham Airport, the NEC, UK Growth Company and the Chambers of Commerce due to the added resilience that they would deliver to the Strategic Road Network in the event of an incident or congestion at M42 Junction 6 at which time the north facing slip roads would act as a safety valve for the A45.<br>There will be an increased road safety risk as a result of the provision of the north facing slip roads but given the important benefits outlined above, particularly the significant improvement in road safety that would be provided by an MSA in this | operating capacity of J5a, as now identified within HE's Junction 5a Operational Assessment (June 2019).<br><br>The supposed benefits (i.e. that north facing slip roads at J5a would provide an alternative to north facing slip roads at J6 in the event of an incident or congestion at M42 J6) need to be properly considered against the disbenefits of the north facing slips and the likely frequency of an event the completely blocks J6. It is unlikely that this would happen apart from on a rare occasion, but the safety hazard of the north facing slips would be present 365 days of the year. In addition J5a is remote from J6 and it would be difficult to provide signing in appropriate locations to direct drivers to J5A rather than J6, particularly as this would be sending them in the opposite direction to that which they want to go. Applegreen repeat that there is an alternative MSA site at J4 that does not impact on the DCO proposals. |

| Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions | | | |
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| **Question number** | **Question** | **Extra MSA Group response** | **Applegreen comment** |
| | | location, the applicant considers that these benefits outweigh the additional risk of providing the north facing slips in this location. Highways England's specialists have agreed with this position by confirming approval in principle to the requested departures from DMRB Standards by the issue of its HEPR-16-01 responses dated 21st August 2017 and 14th March 2019. In the absence of a road safety benefits associated with delivery of an MSA in this location, the standalone DCO scheme is unable to justify the additional risk posed by the north facing slip roads | |
| 1.0.5 | Has the positioning of the proposed MSA influenced the proposed siting and design of Junction 5a? If it has, should this be determinative given that the planning application remains undetermined and there is an alternative site at Junction 4 being considered under a separate planning application? | The application for the MSA was, of course, submitted sometime before the DCO scheme emerged into the public domain. Highways England will address this in detail but it is clear that Highways England undertook an extensive option selection process and there were several different proposals on the table, which were all subject to public consultation. The DCO scheme was chosen because it was, when considering all alternatives, the best location for the Junction and the best location to provide the link road.<br><br>The Extra MSA was not a determining factor with regard to the location of the DCO Junction. The co-location of the DCO and the proposed MSA Junction was however unsurprising, since the work undertaken by Extra in conjunction with | Applegreen refer to their comments on the Applicant's response to 1.0.5 and in REP 2-041. |

| Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions | | | |
|---|---|---|---|
| **Question number** | **Question** | **Extra MSA Group response** | **Applegreen comment** |
| | | its consultants ARUP prior to submission of its planning application in 2015, had followed a similar process, considered similar factors and reached substantially the same overall conclusions. | |
| 1.0.6 | DRMB (4.35) indicates that for Rural Motorways (as the M42 nominally is) the desirable minimum weaving length must be 2km. However, the distance likely to be available between any north facing slip roads at junction 5a and the south facing slip roads at junction 6 is roughly 1.7km. In view of the high traffic flows on the M42 (nearly 7,000 vph northbound by 2041 in the AM peak and over 6,000vph southbound, APP-174, Figure 7.2) a longer weaving section might be warranted or desirable. What is the justification for countenancing the potentially sub-standard arrangement envisaged? | The consideration of the weaving length must be undertaken in the context of the overall benefits provided by the MSA in significantly improving safety on this stretch of the M42 Motorway given the large distances involved between existing adjacent MSAs on the Motorway Network at this point. The Extra MSA is the only location which satisfies the prescribed 28-mile maximum gap and therefore fully provides this improvement in safety. Furthermore, there is a need to consider the additional economic resilience benefits associated with the provision of north-facing slip roads as recognised by Birmingham Airport, NEC, UK Growth Company and the Chamber of Commerce.<br><br>It should be noted that the desirable minimum standards set out in the DMRB are not absolute limits and a Departure process exists within the DMRB to consider proposals for designs which do not meet the desirable minimum standards. This enables each project situation to be considered on its own merits and determined by expert engineers.<br>The north facing slip roads provided by Extra's MSA proposal require departures from standard | As stated in Applegreen's response to this question at REP2-041, the weaving length would be 1.15km not 1.7km.<br><br>The Applegreen MSA (at J4) would resolve the same 11 gaps (of more than 28 miles) between existing MSAs on the West Midlands motorway network as the Extra MSA. The Extra MSA also reduces 2 further gaps to just below 28 miles, whereas the Applegreen MSA reduces these to 30 miles. One of these 30 gaps does not form part of a route that a motorist is ever likely to use. Consequently, there is no material difference between the schemes in terms of the 'need' they would meet. However, the Applegreen scheme would resolve MSA 'need' whilst:<br>• Not requiring any new departures from DMRB standards<br>• Avoiding any direct impacts on ancient woodland<br>• Minimising harm to the Green Belt<br>• Not having any adverse impact on the DCO scheme and the new junction capacity it is seeking to create.<br><br>Extra's Departures submission to Highways England referred to in this response looked at other locations where MSA slip roads are close to adjacent junctions. While the response looks at the motorway flows at these locations and |

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|---|---|---|---|
| **Question number** | **Question** | **Extra MSA Group response** | **Applegreen comment** |
| | | due to the short weaving length between proposed M42 J5a and the existing M42 J6. These Departures were considered and approved in principle by Highways England based on a standalone planning application for the MSA. The MSA access Junction did not include the link road to Clock Interchange.<br><br>The introduction of the link to Clock Interchange as part of the M42 J5a scheme reduces traffic flows between proposed M42 J5a and existing M42 J6 [APP-174, Figure 7.5] and this will therefore reduce the risk presented by the short weaving length as there will be more road space available to merging traffic. In the northbound direction, most of the weaving flow is expected to use the proposed M42 J5a and this will significantly reduce the opportunities for conflict within the weaving length compared to the scenario previously approved by Highways England for the MSA application.<br><br>Within Extra's Departures submission to Highways England, in relation to the northbound weaving length, it was specifically noted that the proposed layout is like others currently operating on the Strategic Road Network. This is supported by research which has considered situations on the Motorway Network where Motorway Service Areas are located in close proximity to a Motorway Junction. The Motorway Service Areas | compares them with the M42 flows, it does not look at the level of weaving traffic. The proportion of M42 traffic that enters and leaves at J6 is exceptionally high, in the order of 30%. The traffic entering or leaving the motorway at the other junctions considered is likely to be considerably lower. Toddington services are close to M1 J12 which connects to the B5120 where the traffic entering and leaving the motorway is significantly lower than J6 of M42. |

## Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions

| Question number | Question | Extra MSA Group response | Applegreen comment |
|---|---|---|---|
| | | and Junctions considered were:<br>• M1 Toddington services to M1 Junction 12;<br>• M1 Leicester Forest East services to M1 Junction 21;<br>• M62 Hartshead Moor services to M62 Junction 25. | |

| | M42 Solihull MSA to M42 Junction 6 | M1 Toddington services to M1 Junction 12 | M1 Leicester Forest East services to M1 Junction 21 | M62 Hartshead Moor services to M62 Junction 25 |
|---|---|---|---|---|
| Operational regime | All Lane Running | All Lane Running | D4M motorway | All Lane Running |
| MSA merge/diverge layout | Taper Merge/Taper Diverge | Parallel Merge/Parallel Diverge | Parallel Merge/Parallel Diverge | Taper Merge/Taper Diverge |
| Adjacent junction merge/diverge layout | Ghost island with lane gain merge/Ghost island with lane drop diverge | Taper Merge/Taper Diverge | Ghost island with lane gain merge/Ghost island with lane drop diverge | Ghost island with lane gain merge/Lane drop diverge |
| Weaving length | 1,175m | 800m | 900m | 800m |
| Two-way AADT traffic flow on link | 142,053 | 135,227 | 135,525 | 111,501 |
| HGV% | 15.1% | 19% | 15.3% | 17.1% |

The M42 Solihull MSA has a longer weaving length than any of these examples. Based on discussions with Highways England during consideration of these Departures, and amended direction signage strategy was developed for the M42 northbound approach to

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|---|---|---|---|
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| | | M42 Junction 6, which included lane designation slips mounted on gantries above the traffic lanes at 1m and ½ mile distances in advance of M42 J6 and this mitigation forms part of the MSA application.<br>Extra consider that the proposed signing for M42 Solihull MSA is an improvement over the existing situation and should further reduce the risk of conflict between weaving vehicles. | |
| 1.0.10 | In the absence of an MSA at junction 5a, would a junction designed along the lines indicated by Mr David Cuthbert [AS-018] be more efficient and represent something close to the optimum arrangement? | The arrangement presented by Mr David Cuthbert would, in Extra's view, require approval of significant Departures for the southbound merge slip road due to the geometry proposed where the link crosses the M42 and this is likely to require the introduction of speed restrictions to ensure the design can operate safely. This would, in turn, compromise the capacity of the scheme, and lead to safety problems if drivers fail to observe the speed restrictions.<br><br>It is also likely that the visibility splays required for the northbound diverge slip road would have a significant impact on the design of Solihull Road overbridge.<br><br>An examination of the land take required to deliver this arrangement appears to indicate that it would have a much greater impact on environmental concerns and to the integrity of the | Applegreen consider that a single Departure would be required to implement a free flow junction arrangement. This would be the same Departure on forward visibility on the diverge as is required for the DCO scheme to minimise impact on the ancient woodland. In their response to 1.0.10 the Applicant states that they have prepared a DMRB compliant free flow junction design in this location.<br><br>As a matter of fact the DCO dumb bell layout with and without north facing slip roads requires a number of Departures. |

| Table 3: Comments on the Extra MSA Group's responses to the Panel's first written questions | | | |
|---|---|---|---|
| **Question number** | **Question** | **Extra MSA Group response** | **Applegreen comment** |
| | | areas of purported Ancient Woodland around the Junction.<br>It is Extra's view therefore that there would be an increased impact on important environmental considerations which would negate any potential benefit that may arise from the simpler arrangement put forward by Mr Cuthbert. | |

# APPLEGREEN PLC

## DEADLINE 3 SUBMISSION

### Technical Note on Free Flow Junction Alternative for M42 J5a

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**Introduction**

1. The DCO proposals for the improvement of M42 J6 include the construction of a new junction to the south of J6 to be known as J5a. The proposed junction would connect the M42, to the south of the junction, with a new link road connecting the M42 to the A45 west of J6. The purpose of the new junction is to take traffic to and from the motorway, south of the junction, to the A45 without passing through J6.

2. A review of all existing motorway junctions in England that connect a single link road with a motorway from one side only, reveals that all these junctions are of a free flow form[1]. Traffic can pass from the motorway to the link road, and visa versa, without coming into conflict with other traffic or passing through any roundabouts or stop lines. This is the most efficient way of travelling from one road to the other.

3. The DCO scheme proposes the provision of a dumb-bell junction. This type of junction takes the form of two roundabouts, either side of the motorway, with a bridge connecting the two together. In this arrangement four slip roads would normally be provided. The DCO scheme is only proposing two, south facing, slip roads although the form of junction and its location mean that it could be adapted to provide north facing slip roads for a motorway service area (MSA).

4. This note describes how an alternative, free flow, junction form would be more efficient and have less impact on the environment.

**Relevant Design Standards**

5. The primary design standards to be considered when looking at the layout of grade separated junctions are the DMRB standards TD 22/06 Layout of Grade Separated Junctions and TD 9/93 Highway Link Design.

6. For northbound traffic, the free flow alternative design would have a road connecting the M42 northbound directly to the new link road, to be constructed around Brickhill village, connecting to the A45. This type of road is defined in TD22 as an “Interchange Link”. The definition is given as “A connector road, one or two way, carrying free flowing traffic within an interchange between one level and or direction and another.” Table 4/1 of TD22 specifies that the design speed for this type of road should be 85 kph. TD9 provides guidance on the appropriate horizontal curvature and stopping sight distance for road links. TD9 specifies in Table 3, that for 85 kph design speed, the desirable minimum stopping sight distance is 160m and the desirable minimum horizontal radius with superelevation of 7% is 510m. TD9 also states in 1.15-1.26 that relaxations from

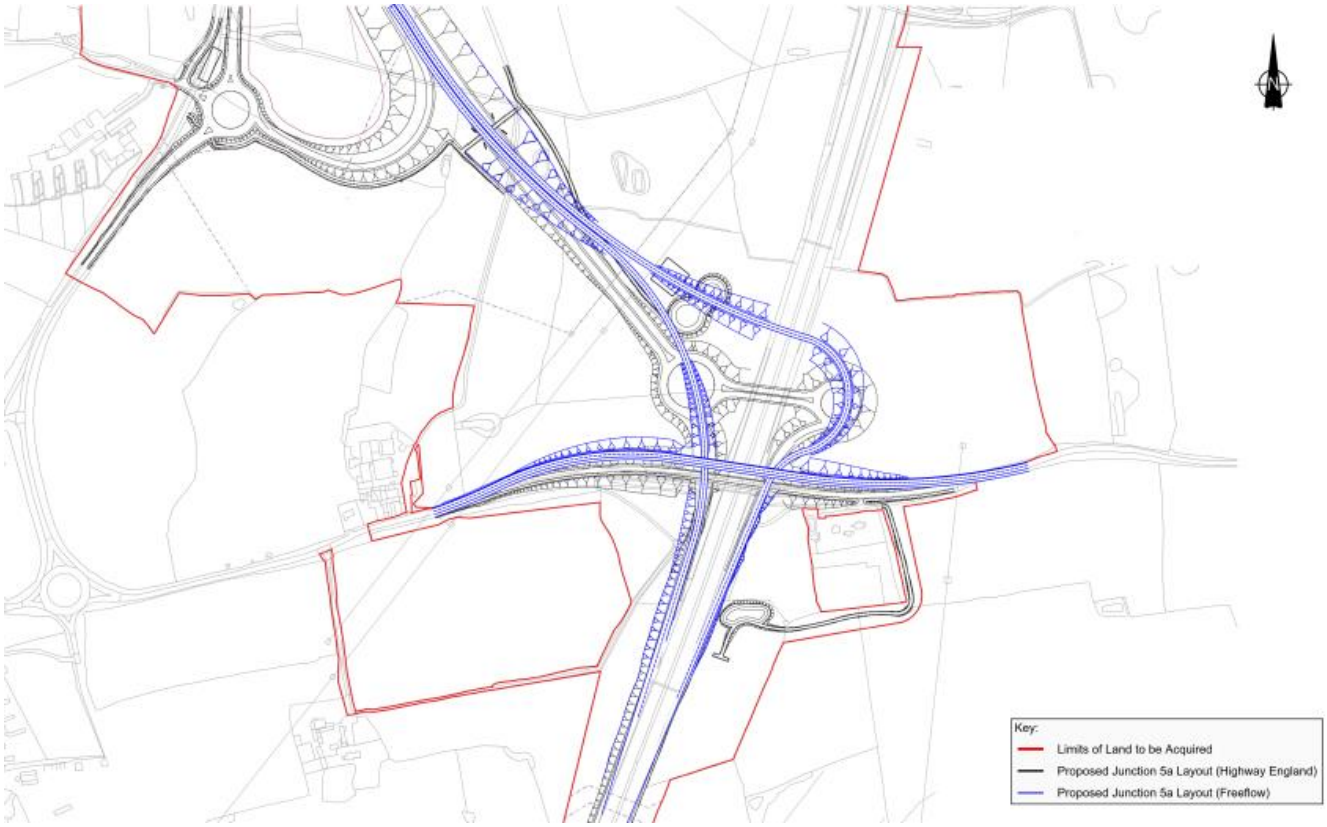
[1] See Table 1 contained in Applegreen's response to question 1.0.10 of the Examining Authority's first written questions

this guidance are acceptable, particularly where this would reduce environmental impact. A one step relaxation has therefore been applied to the horizontal radius and the stopping sight distance. A radius of 360m and a stopping sight distance of 120m has been adopted in the design of this link.

7. For southbound traffic, the free flow alternative design would provide a road connecting the new A45 link road to the M42 southbound. This road would have to cross over the M42 mainline. This type of link is defined in TD22 4.11 as a ”Hook Merge”. Table 4/2 of TD22 defines the minimum radius for this category of road as 75m.

8. The above design criteria have been used to produce an indicative layout for a Free Flow alternative for junction 5a which is shown in Figure 1 of this note.

***Figure 1: Junction 5a Free Flow Alternative Layout***




**Description of Free Flow Junction Alternative**

*Northbound Connection*

9. The road connecting the M42 northbound with the link to the A45 would follow the horizontal and vertical alignment of the DCO scheme up to the end of the diverge from the motorway. At this point the DCO scheme starts to climb up to get to the level of the western dumbbell roundabout. In the free flow alternative the connecting road would stay at the same level as the motorway mainline until it has passed under Solihull Road. This would have two impacts on Solihull Road. It would allow the new bridge to be lower and to be located further north.

10. Having passed under Solihull Road, the connecting road would climb up to existing ground level in a location close to where the DCO western roundabout would be. The road would then continue north west, tying in with the DCO alignment before the Catherine de Barnes junction. The road would remain at existing ground level as it passes under the overhead cables then drop down into cutting in a similar arrangement to the DCO scheme.

*Southbound Connection*

11. The road connecting the link from the A45 with the M42 southbound would start to deviate from the DCO scheme to the south east of the Catherine de Barnes junction. The road would rise up to existing ground level before passing under the overhead cables in the same way the DCO scheme would. The road would then climb up to cross the M42 68 metres north of the proposed DCO crossing of the motorway. The road would then turn right, dropping down to pass under Solihull Road at the same level as the existing motorway mainline. The merge with the motorway will be identical to that proposed by the DCO scheme.

12. All the works for the free flow alternative could be constructed within the existing DCO boundary.

**Impacts of Free Flow Alternative compared to DCO Scheme.**

*Traffic Movement*

13. The DCO scheme proposals would require all northbound traffic leaving the M42 to slow down and possibly stop at the give-way line on the western roundabout before negotiating the roundabout and accelerating to join the link to the A45. The delay at the roundabout would be much greater if a MSA were also accessed off the roundabout due to higher circulating flows passing the northbound off-slip. With the free flow alternative traffic would progress through the junction without the need to stop or negotiate roundabouts. There are obviously environmental benefits of vehicles not having to slow down, stop and accelerate away from the junction, including in respect of aerial emissions and noise.

14. With the DCO scheme proposal, traffic heading from the A45 link towards the M42 southbound would have to slow and possibly stop at the give-way line on the western roundabout, negotiate the roundabout and the bridge link to the eastern roundabout, slow to the stop line at the eastern roundabout, negotiate the eastern roundabout before accelerating down the slip road to join the M42. The delays on this movement would be higher if a MSA was located at the junction. With the free flow alternative traffic would progress through the junction without the need to stop or negotiate roundabouts.

15. The savings in traffic delay associated with the free flow alternative would have significant environmental and economic benefits when taken in the context of the number of vehicles expected to use this route i.e. 28,436 AADT in 2041 (Figure 7.6 of DCO Transport Assessment).

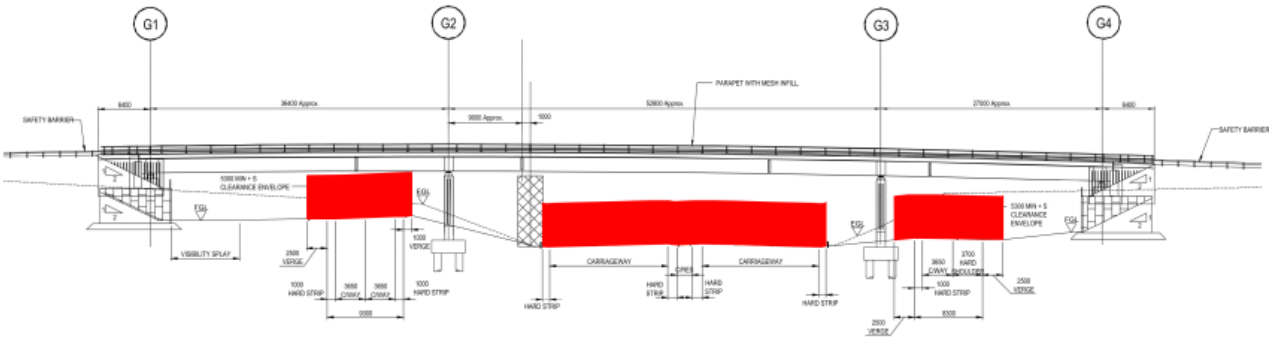
*Solihull Road*

16. The construction of Junction 5a will require the replacement of the existing bridge that carries Solihull Road over the M42. This is to allow for the additional width required to accommodate the new slip roads. Solihull Road is a key link between the areas to the north east of Solihull and areas to east of the M42.

17. The design of the revised bridge and its alignment has the potential to have a significant impact on adjacent areas of ancient woodland. In the DCO proposal the height of the new bridge and the alignment of Solihull Road is constrained by the level of the proposed slip roads where they pass under Solihull Road. This is because the slip roads have to climb up from the level of the motorway mainline to connect to the roundabouts of the dumbbell junction which have to be set at a level that allows them to be connected by a bridge over the motorway.

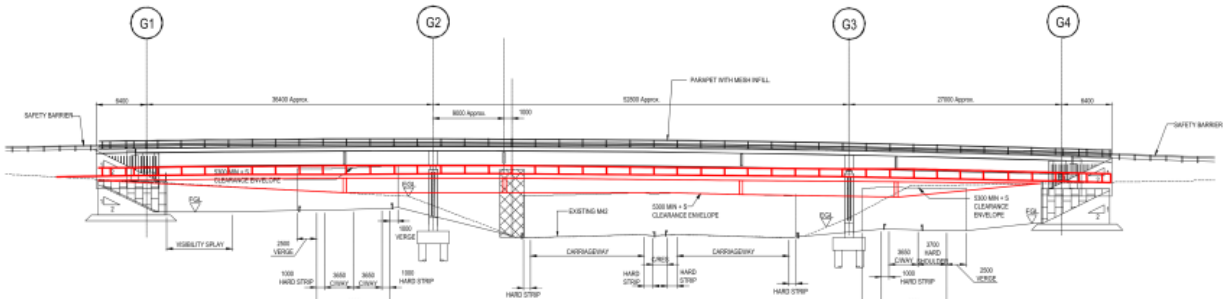
18. The fact that the slip roads will be higher than the motorway mainline where they pass under Solihull Road means that the new bridge will have to be significantly higher than it would have to be just to cross the motorway. At the point where it would pass under Solihull Road, the northbound off-slip would be over 4 metres higher than the adjacent motorway. This is shown in Figure 2 of this note where the clearance envelopes for the mainline and the two slip roads are highlighted and it can be seen how much higher the envelope for the northbound off-slip is compared to the one for the motorway mainline. These rising slip roads also constrain the ability to align Solihull Road further north as the further north Solihull Road is located the higher it would need to be. The height and location of Solihull Road has an impact on the ancient woodland to the south.

***Figure 2: Solihull Road Bridge DCO Scheme Clearances***




19. With the free flow alternative the proposed slip roads would be kept at the same level as the motorway mainline meaning that the clearance from the mainline would determine the height of the bridge. This also allows Solihull Road to be aligned further north without needing to be higher. The relative heights of the proposed DCO Solihull Road Bridge and what could be achieved with the free flow alternative are shown in Figure 3 of this note. As noted above, the height and location of Solihull Road has an impact on the ancient woodland to the south.

***Figure 3: Solihull Road Bridge Indicative Alternative with Free Flow Arrangement***




20. The height and alignment of Solihull Road proposed in the DCO scheme would require the closure of Solihull Road during construction requiring the traffic that currently uses the road to divert onto alternative routes which will include junctions 5 and 6 of the M42, which are already congested at peak times. The lower height and location further north that could be achieved with the free flow alternative would allow Solihull Road to remain open during construction of the new bridge.

*Brickhill Village*

21. It can be seen from Figure 1 of this note that the alignment of the link to the A45 would be identical with the free flow alternative as with the DCO scheme where they would pass Brickhill village so there would be no difference in the impact on Brickhill village.

*Brickhill Meadows SSSI*

22. It can be seen from Figure 1 of this note that the alignment of the link to the A45 would be identical with the free flow alternative as with the DCO scheme where they pass the Brickhill Meadows SSSI so there would be no difference in the impact on Brickhill Meadows SSSI.

*Overhead Powerlines*

23. Although the alignment of the free flow alternative scheme would differ slightly from the DCO scheme where they pass under the overhead powerlines, there is no constraint on the level of the free flow scheme that would preclude the necessary clearances being achieved.

*Ancient Woodland*

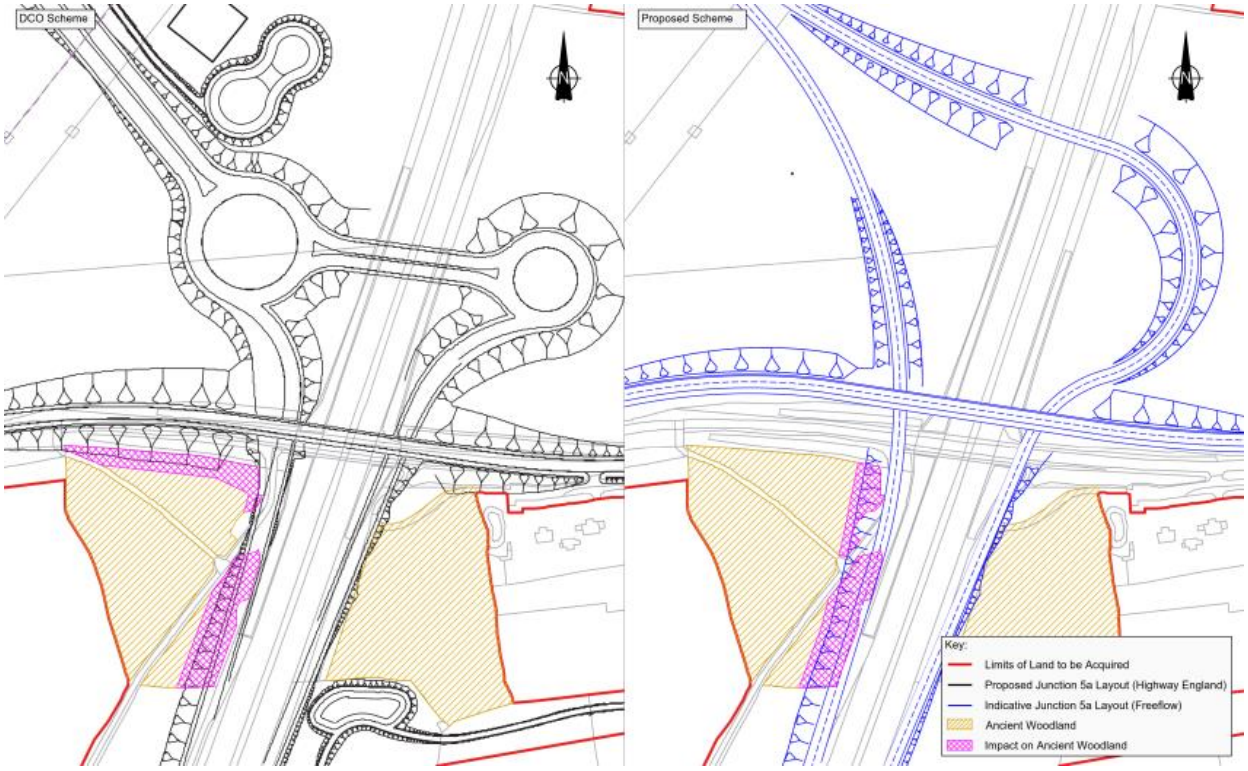
24. The DCO scheme has two impacts on the area of ancient woodland to the west of the M42 and the south of Solihull Road. The widening of the M42 corridor would impact on the eastern edge of the woodland. The extent of the encroachment would reduce as the off-slip heads north as the level of the slip road rises reducing the earthworks required. The significant height increase on Solihull Road would require earthworks that would encroach on the northern edge of the woodland.

25. The free flow option off-slip would have a similar encroachment on the ancient woodland at its southern end, but would have slightly more impact closer to Solihull Road as earthworks would be required to accommodate the level difference. The alignment and

level of Solihull Road that could be achieved with the free flow alternative would mean that no earthworks would be required to the south of the existing Solihull Road corridor and there would, therefore, be no impact on the northern edge of the ancient woodland.

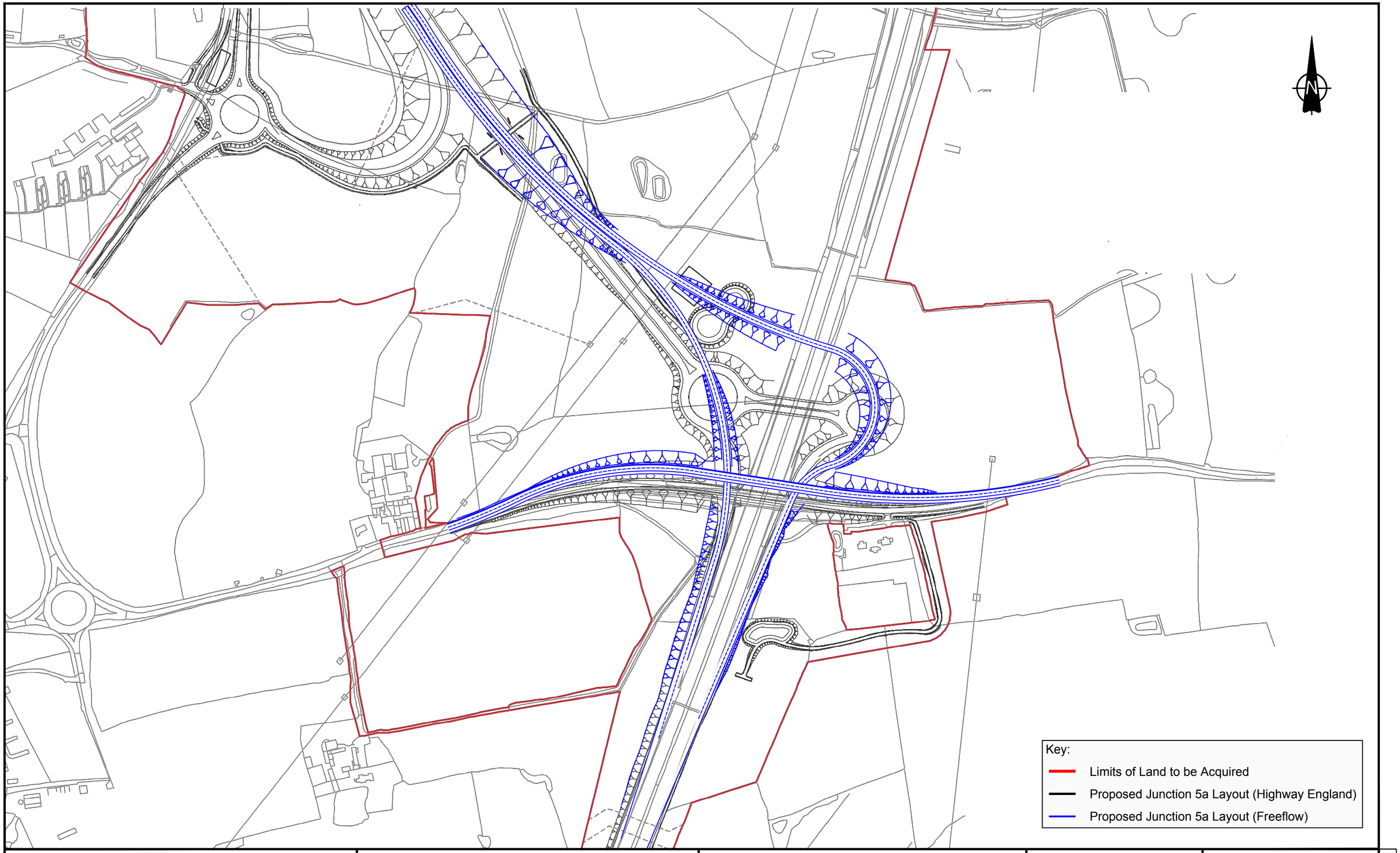
26. The relative impacts of the two schemes are shown on Figure 4 of this note, which demonstrates that the overall net impact of the free flow option on these areas of ancient woodland, would be material less than the DCO junction 5a scheme.

***Figure 4: Relative Impact on Ancient Woodland***




**Summary**

27. The free flow alternative would provide more efficient traffic operation, would have less impact on the ancient woodland, would allow Solihull Road to remain open during construction and would have no greater impact than the DCO scheme on Brickhill village, Brickhill Meadows SSSI or the overhead cables.




| | | | | |
|---|---|---|---|---|
| Client: Applegreen | Title: Junction 5a Free Flow Alternative Layout | applegreen plc | Design: DC | CAD: DC |
| Project: M42 Junction 6 Improvement | | | Chk'd: JA | App'd: NA |
| | | | Date: 15/07/2019 | Scale: NTS |
| | | | No. Appendix A | Rev: |

cm

A3

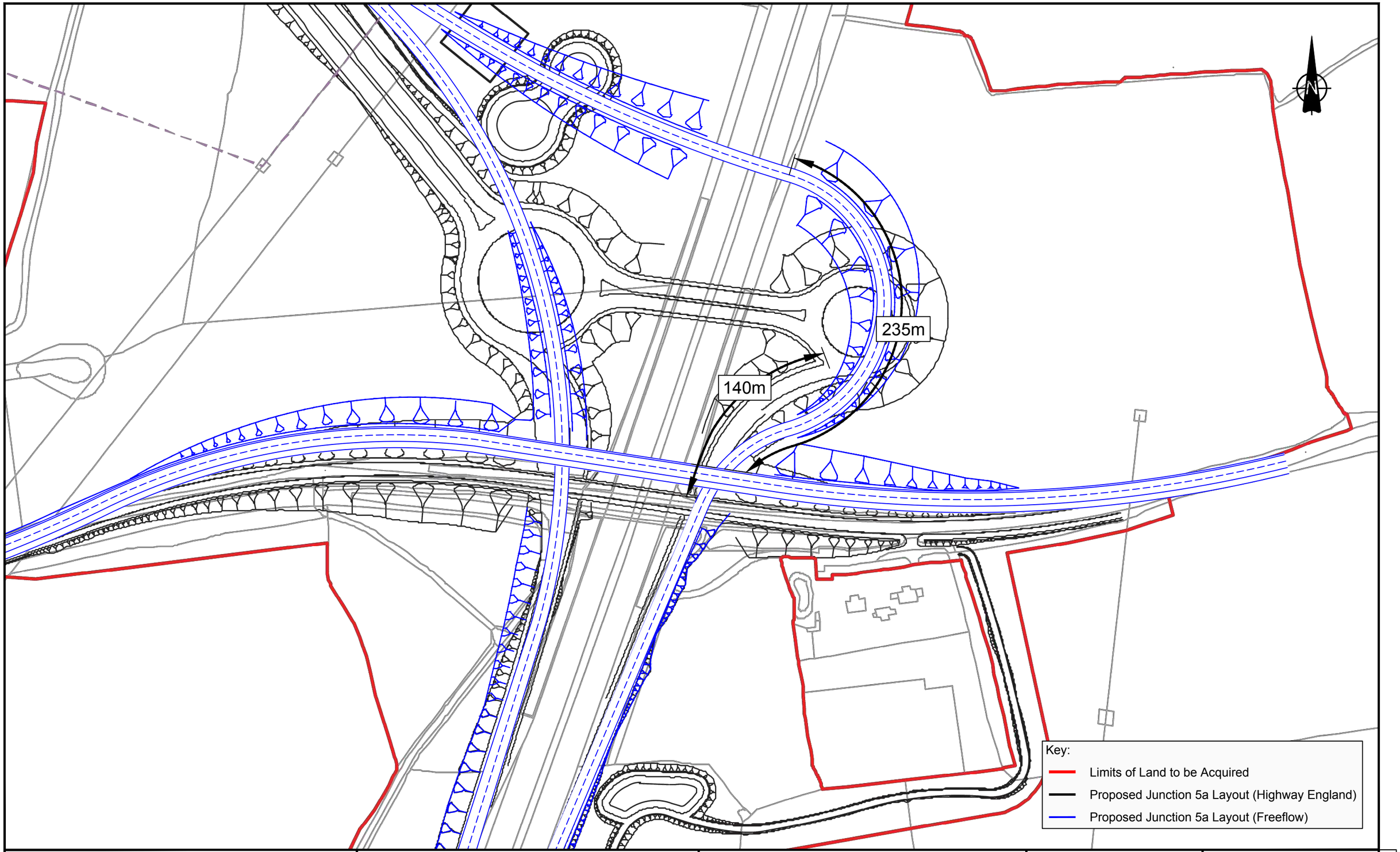
DCO Scheme

Proposed Scheme

Key:

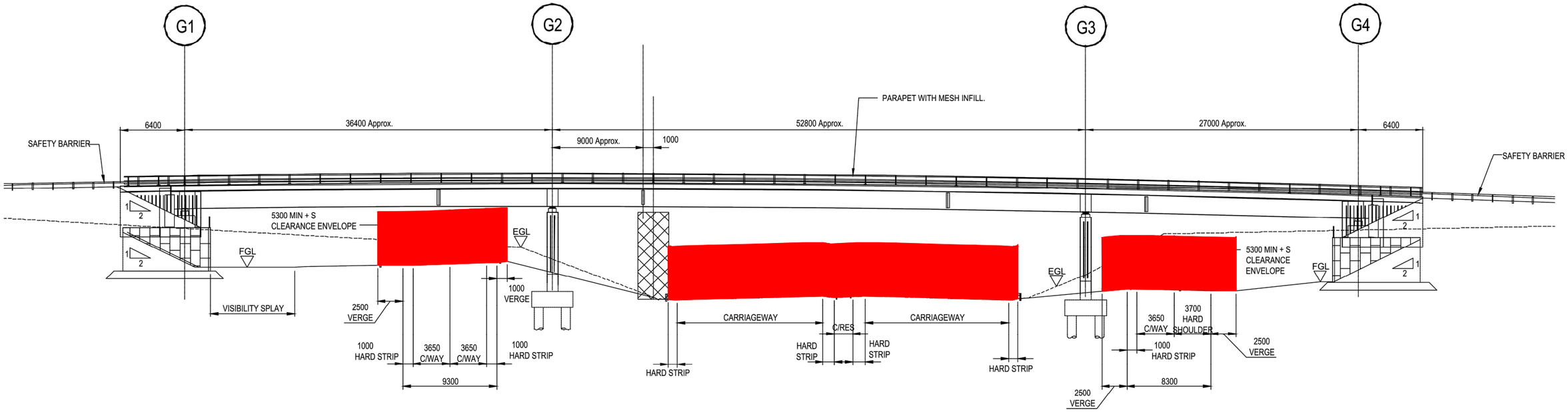
- Limits of Land to be Acquired
- Proposed Junction 5a Layout (Highway England)
- Indicative Junction 5a Layout (Freeflow)
- Ancient Woodland
- Impact on Ancient Woodland

| | | | |
|---|---|---|---|
| Client: Applegreen | Title: Relative Impact on Ancient Woodland | applegreen plc | Design: DC / CAD: DC / Chk'd: JA / App'd: NA / Date: 15/07/2019 / Scale: 1:2000@A3 / No. Appendix B / Rev: / A3 / cm |
| Project: M42 Junction 6 Improvement | | | |




| | | | |
|---|---|---|---|
| Client: Applegreen | Title: Relative Lengths of Southbound OnSlip | applegreen plc | Design: DC / CAD: DC / Chk'd: JA / App'd: NA / Date: 15/07/2019 / Scale: 1:2000@A3 / No. Appendix C / Rev: / A3 |
| Project: M42 Junction 6 Improvement | | | |

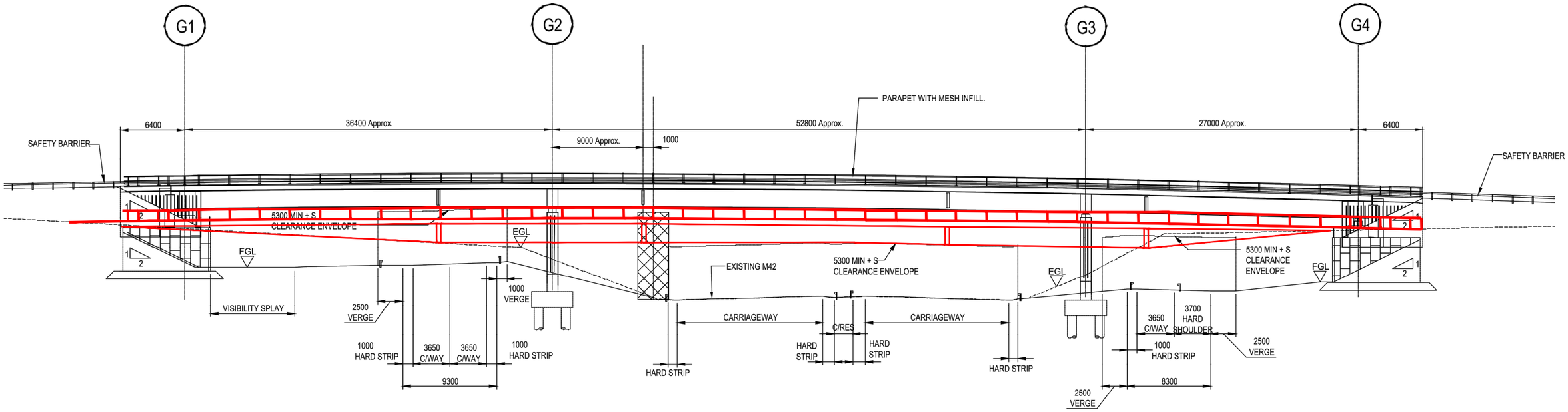
cm




Note:
Figure taken from M42 Junction 6 Improvement
Scheme Number TR010027 Volume 2
2.8 Engineering Drawings and Sections:
Structure Engineering Drawings and Sections Regulation 5(2) (o) Sheet 5 of 8

| | | | | |
|---|---|---|---|---|
| Client: Applegreen | Title: Solihull Road Bridge<br>DCO Scheme Clearances | applegreen plc | Design: DC | CAD: DC |
| Project: M42 Junction 6 Improvement | | | Chk'd: JA | App'd: NA |
| | | | Date: 15/07/2019 | Scale: 1:2000@A3 |
| | | | No. Appendix D | Rev: |
| | | | | A3 |

cm




Note:
Figure taken from M42 Junction 6 Improvement
Scheme Number TR010027 Volume 2
2.8 Engineering Drawings and Sections:
Structure Engineering Drawings and Sections Regulation 5(2) (o) Sheet 5 of 8

| | | | | |
|---|---|---|---|---|
| Client: Applegreen | Title: Solihull Road Bridge<br>Indicative Alternative with Free Flow Arrangement | applegreen plc | Design: DC | CAD: DC |
| Project: M42 Junction 6 Improvement | | | Chk'd: JA | App'd: NA |
| | | | Date: 15/07/2019 | Scale: 1:2000@A3 |
| | | | No. Appendix E | Rev: |
| | | | | A3 |