

A46 Coventry Junctions (Walsgrave)

Scheme number: TR010066

6.1 Environmental Statement

Chapter 3 – Assessment of Alternatives

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A46 Coventry Junctions (Walsgrave)
Development Consent Order 202[x]

ENVIRONMENTAL ASSESSMENT
Chapter 3 - Assessment of Alternatives

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3. Assessment of alternatives

3.1. Introduction

- 3.1.1. Regulation 14(2) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) states that an Environmental Statement (ES) must provide *‘a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment’*.
- 3.1.2. In accordance with Regulation 14(2)(d) and Schedule 4 of the EIA Regulations, this Chapter outlines the alternative design options that were considered during the development of the Scheme.

3.2. Assessment methodology

- 3.2.1. The options appraisal process is summarised below with further Scheme specific detail provided in section 3.3:
- **Strategy, Shaping and Prioritisation stage:** at this stage, initial analysis and appraisal are conducted to assess the viability of transport scheme solutions to the problem, including road network and non-road network solutions
 - **Options Identification Stage:** at this stage, traffic modelling and economic and environmental assessment is undertaken on a number of options
 - **Option Selection Stage:** at this stage, the public are consulted on the recommended options from the options identification stage. Refinements are then made to the option designs, traffic modelling and economic and environmental assessments following feedback from the consultation. At the end of the option selection stage a Preferred Route Announcement (PRA) is made to announce the decision on which option will be progressed
 - **Preliminary Design Stage:** this is the stage that the Scheme is currently in and involves developing a design for the preferred option. An environmental impact assessment (EIA) is undertaken upon the Scheme at this stage which is reported in the ES to support the Development Consent Order (DCO).

3.3. Reasonable alternatives studied Strategy, Shaping and Prioritisation Stage

- 3.3.1. In July 2014, Highways England published the Route Strategic Options Report – A46 Coventry to M6 J2 Study (Highways England, 2014), which identified four potential options associated with the Binley and Walsgrave Junctions that could

address congestion and poor journey time reliability issues at Binley and Walsgrave Junctions along the A46. These included:

- Option A: Improvements to the Binley Junction by grade separation
- Option B: Improvements to Walsgrave Junction through relocation of the junction and grade separation
- Option C: Improvements to or upgrade of M6 Junction 2 and M6/M69, and consideration of whether the links can be improved, and if there is sufficient capacity to cope with the planned growth
- Option D: Improvements to both Binley and Walsgrave Junctions as stated in Options A and B above

- 3.3.2. A recommendation was made to take forward Option D and its associated sub-options as the improvement works to the two junctions would facilitate economic growth and alleviate delay and congestion along this section of the A46.
- 3.3.3. Due to the more urgent need to upgrade Binley Junction, plans to upgrade it were progressed ahead of the proposals to upgrade the Walsgrave junction. The Binley Junction Improvement Scheme was progressed using Highways Act 1980 powers and was open to traffic in 2022.
- 3.3.4. During the Strategy, Shaping and Prioritisation stage in 2015 the options for grade separation were developed without the benefit of traffic flow data and traffic modelling to inform the proposed layout configurations. At this stage it was proposed to remove the existing Walsgrave roundabout and provide a grade separated junction 1000m north of the existing junction. Under this option the A46 would be realigned through the existing location of the roundabout. There was some flexibility in the location of this junction along the route of the A46. There was also potential for a link into Coventry immediately to the south of the University Hospital Coventry.

Options Identification Stage Binley and Walsgrave Junctions (2015 - 2016)

- 3.3.5. During 2015-2016, the Option Identification stage for the Walsgrave and Binley junctions identified three options:
- Option A – Grade separation at the A46 Binley Junction + Do Nothing at the Walsgrave junction
 - Option B – Grade separation at the A46 Binley Junction + Do Minimum at Walsgrave junction (enhanced at-grade roundabout or signal solution)
 - Option C – Grade separation at the A46 Binley Junction + Do Something at the Walsgrave junction (Dumbbell Layout - A46 grade separated northwest of the roundabout)

- 3.3.6. No traffic data was available at the time to verify the suitability or otherwise of the layouts developed.
- 3.3.7. Option C was identified as unlikely to be delivered within the budget of the Scheme, however it met stakeholder expectations by opening up land for development opportunities. There was significant potential identified to secure developer contributions from sites that would be unlocked by the relocation of the Walsgrave junction, through the Coventry Local Plan which was being produced at the time.
- 3.3.8. Since mid-March 2016 the scheme had been directed to continue with the evaluation of a single solution (Option C) which aligned with the RIS1 strategy. Option C included the grade separation of Binley Junction and relocation and grade separation of Walsgrave junction. Whilst this was considered the most appropriate long-term solution for the A46, it exceeded the RIS1 funding allowance.
- 3.3.9. It was decided that Walsgrave junction would be considered for funding under proposed RIS2 submissions and would be put on hold until local authorities were in the position to unlock the surrounding development land within the project vicinity.
- 3.3.10. Following a decision by National Highways in February 2018 to progress both elements of the scheme at the same time, a revisit of the Walsgrave Options Identification Stage began in March 2018.

Options Identification Stage - Walsgrave Junction

- 3.3.11. In April 2018, design work for Walsgrave re-commenced and a review of the work completed as part of the early option assessment was undertaken. To ensure that identification of specific options was not biased by earlier work, or limited to a narrow interpretation of the layout, options were developed within six “design families”, as outlined in Table 3-1.

Table 3-1: Descriptions of the six design families considered as part of the assessment of alternatives

Design family	Description	Degree of change
1	Do nothing / Do minimum	None
Do something		
2	Southbound dedicated bypass lane	Minor
3	Signalised junction	Minor to moderate
4	Remodel for left-in and left-out to B4082	Moderate
5	Compact grade separated junction	Substantial
6	Full grade separation	Substantial

- 3.3.12. Through the option appraisal process, 30 options considered were grouped within the six family groups and assessed on their merits against a range of factors including safety, benefits to traffic, impact on the local network, environmental and geotechnical considerations, economic benefits, cost and effects on stakeholders. Through rationalisation and the Option sifting activities the options were shortlisted down to 10 for further consideration and assessment.
- 3.3.13. The following options shown in Table 3-2 of the Staged Overview of Assessment Report (SOAR) (Highways England, 2022) below were selected for further assessment in the options identification stage.

Table 3-2: Options assessed in the Options Identification Stage (Table 6-2 from the SOAR).

Option	Brief Description
1	One-way traffic system on Clifford Bridge Road (70mph)
2	Dedicated bypass southbound (free-flow link) with fly-over northbound (50mph)
3	Signalised T-junction (50mph)
4	Left-in / Left-out (LILO) connection to B4082 (50mph)
5	Compact Grade-separated Junction (fully compact junction) (50mph)
6	Fully Grade-separated Junction (70mph)
7	Left-in / Left-out (LILO) connection to B4082 (tight radii) (50mph)
8	Realignment of A46 Mainline with Left-in / Left-out (LILO) connection to B4082 (70mph)
9	Removal of A46 connection to B4082 (50mph)
10	Removal of A46 connection to B4082, with realignment of A46 Mainline (70mph)

- 3.3.14. The allowable geometries of the junction option alignments were severely constrained by the following existing key features:
- Coombe Pool Site of Special Scientific Interest (SSSI) and the Coombe Abbey Grade II* Registered Park and Garden (RPG), located east of the junction
 - Grade II listed buildings at Hungerley Hall Farm, located north-west of the junction
 - Overhead 132kV power line and associated pylons, located west of the junction
 - Floodplain associated with the River Sowe and Smite Brook

- 3.3.15. With respect to the consideration of potential environmental impacts, those options which would require the loss of large areas of Coombe Pool SSSI/ Coombe Abbey Grade II* listed Park and Garden were discounted and not progressed further, as were options which would require complex construction works within Coombe Pool itself.
- 3.3.16. Based on the assessment undertaken, it was concluded that of the 10 options taken forward for further consideration, the following should be discounted at the options identification stage:
- Option 1 was highly unlikely to be considered favourably by local road users and residents and provides no meaningful benefit to the A46.
 - Option 2 had insufficient capacity on the southbound free flow link. The Option also did not fit within the budget.
 - Option 3 was not considered practical given the need to have five lanes for A46 traffic at the stop line and the likely safety disbenefits of this traffic merging into two lanes exiting from the junction. It would also not meet the overall scheme objectives of having free flowing traffic on the A46, would severely penalise off-peak journey times and does not fit within the budget.
 - Option 4 impacted the existing National Grid electricity assets which would require relocation. This relocation cost is substantial and cannot be afforded within the available project budget.
 - Option 5 technically complied with the RIS2 requirement for “grade-separation”; however, compact arrangement is not suitable for traffic flows on A46 and alignments would encircle Hungerley Hall Farm. It was not affordable within the project budget.
 - Options 9 and 10 did not provide any connectivity with the B4082, plus would have likely resulted in significant negative stakeholder reaction due the combination of the removal of the connection to the local network. National Highways want to meet the RIS2 requirements as far as possible and Options 7 and 8 were superior in this respect.
- 3.3.17. Following on from the options identification stage, of the 10 options, three options (6 (Table 3-3), 7 (Table 3-4) and 8 (Table 3-5) were initially taken forward to the options selection stage, with seven options discounted.
- 3.3.18. Option 6, at the options identification stage, was ruled out as being beyond the anticipated budget however it was brought into consideration because it fulfils the Department for Transport requirements for the national speed limit use and is a fully grade separated junction, allowing exit and entry from the strategic road network.
- 3.3.19. Options 7 and 8 were recommended to be carried forward to the options selection stage because they would contribute to relieving the A46 of

congestion, maintain or better safety by reducing conflicting traffic movements and, based on the current estimates, could be delivered within the Scheme budget allowance. Option 8 allows the national speed limit to be met.

- 3.3.20. Option 7 provides a good balance between value for money and provision of local road connectivity. Option 8 provides the best balance between connectivity, safety and affordability.

Option Selection Stage

- 3.3.21. Option 6, 7 and 8 design solutions for Walsgrave junction were originally carried forward into the Options Selection Stage.
- 3.3.22. Following initial environmental assessment and traffic modelling of the three selected options, a further fourth option, Option 11 in Table 3-6, was subsequently developed based on previously discounted options re-examined. Option 11 is a grade separated junction approximately 0.8km to the north of the existing roundabout location, with a realigned B4082 connector road connecting back to Clifford Bridge Road. The geometry of which allows a 50mph speed limit on the mainline dual carriageway.
- 3.3.23. Refinements to the design, including bringing the alignment closer online to the existing A46 and realigning the connector road away from the River Sowe improved the viability of Option 11. A review was held in September 2021 and the viability confirmed of Option 11.
- 3.3.24. The four 'do something' options are described further below. Table 3-3, Table 3-4, Table 3-5 and Table 3-6 present a description of the key elements of each option and the option layout. For all options any sections of the existing highway no longer required would be landscaped.
- 3.3.25. At the options selection stage options progressed were considered against the do minimum scenario. The 'do minimum' option is the current baseline (that is, what would happen in future without the Scheme) and includes the completed improvements to Binley Junction. With this option there would be no capacity improvements to Walsgrave Junction and the Applicant would be required to put in place a long-term repair and maintenance strategy to maintain the serviceability of the existing network.

Table 3-3: Do something – Option 6 – Full grade separated junction

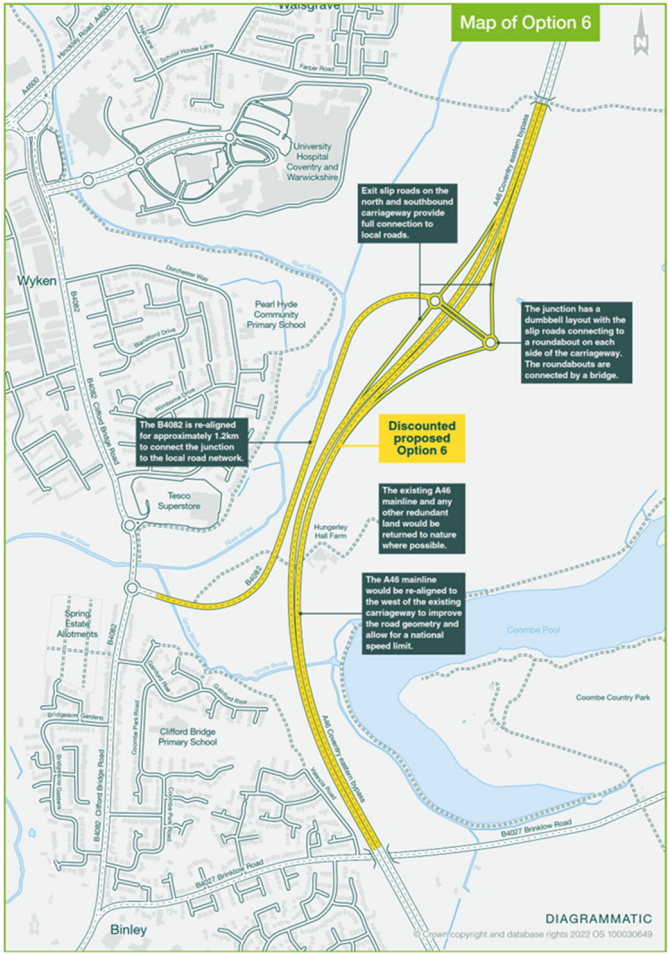
Option 6 layout	Description of key elements
 <p>Map of Option 6</p> <p>Exit slip roads on the north and southbound carriageway provide full connection to local roads.</p> <p>The junction has a dumbbell layout with the slip roads connecting to a roundabout on each side of the carriageway. The roundabouts are connected by a bridge.</p> <p>The B4082 is re-aligned for approximately 1.2km to connect the junction to the local road network.</p> <p>The existing A46 mainline and any other redundant land would be returned to nature where possible.</p> <p>The A46 mainline would be re-aligned to the west of the existing carriageway to improve the road geometry and allow for a national speed limit.</p> <p>Discounted proposed Option 6</p> <p>DIAGRAMMATIC</p>	<p>Grade separated junction approximately 1km to the north of the existing roundabout. The geometry allowed for a 70mph speed limit on the mainline dual carriageway.</p> <p>A46 mainline realigned through the existing Walsgrave roundabout for approximately 1.8km in length, approximately 225m west of the existing route, and approximately 1m above the existing ground level before re-joining the existing A46 approximately 1.1km north of the existing roundabout.</p> <p>The full grade separated dumbbell junction would consist of north and southbound diverge and merge slip roads connecting to an overbridge with roundabouts at each end. The overbridge would be provided across the realigned A46 between the two roundabouts and carry a two-lane single carriageway. The proposed height above the A46 mainline road level would be up to approximately 7m.</p> <p>A new B4082 link road, approximately 1km in length, would be provided between the western roundabout of the dumbbell junction and the existing roundabout on Clifford Bridge Road. This would be a two-lane single carriageway.</p> <p>One carriageway from the eastern dumbbell could have been re-used to the south to re-provide access to Hungerley Hall Farm.</p> <p>The drainage strategy comprised of three attenuation ponds to attenuate the increase in impermeable area, before discharging to the River Sowe to the west via new outfalls. A new culvert may have been required for this option to carry flow under the proposed mainline and connector road.</p> <p>An extension to the Smite Brook culvert under the B4082 would be required on both sides to support the proposed verge. Works would involve in-situ reinforced concrete extensions on both sides with new wingwalls and headwalls.</p> <p>The Scheme footprint for Option 6 would have been 333,138m². The permanent land take outside of the highway boundary would be 192,825m². The temporary land take would be 86,358m².</p>

Table 3-4: Do something – Option 7 – Left-in/ left-out junction

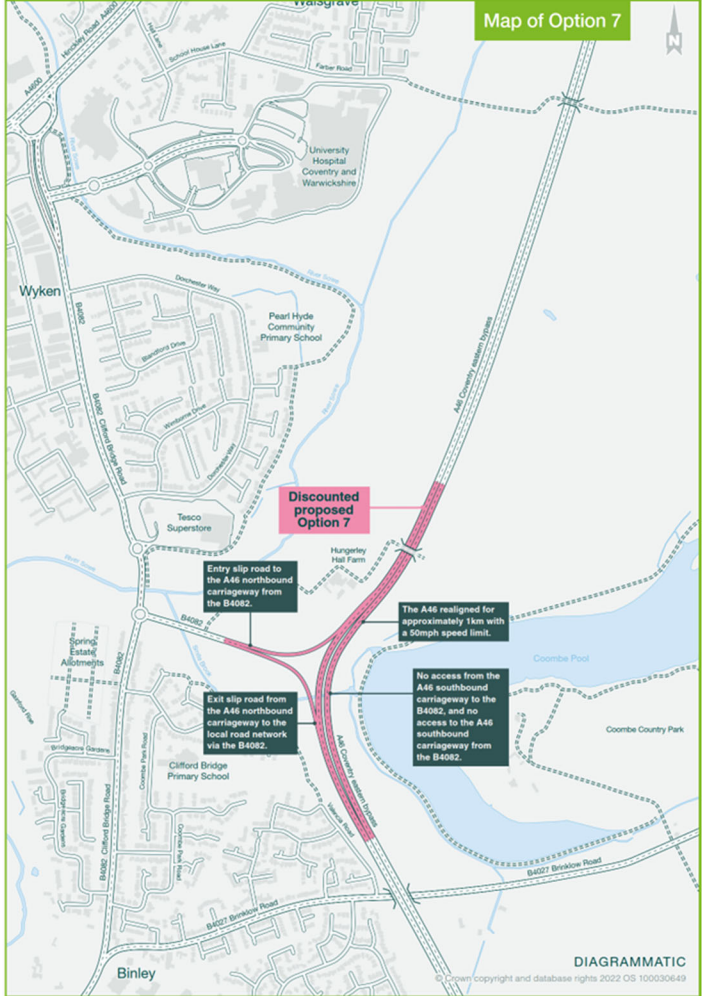
Option 7 layout	Description of key elements
 <p>The map shows the proposed A46 realignment (highlighted in pink) running north-south. Key features include:</p> <ul style="list-style-type: none"> Discounted proposed Option 7: Indicated by a pink line. Entry slip road: From the A46 northbound carriageway to the B4082. Exit slip road: From the A46 northbound carriageway to the local road network via the B4082. The A46 realigned: For approximately 1km with a 50mph speed limit. No access: From the A46 southbound carriageway to the B4082, and no access to the A46 southbound carriageway from the B4082. Local roads: B4082, B4027 Brooklow Road, B4027 Brooklow Road, B4027 Brooklow Road. Landmarks: University Hospital Coventry and Warwickshire, Pearl Hyde Community Primary School, Tesco Superstore, Wyken, Binley, Coombe Country Park. Diagrammatic: Indicated by a green box. 	<p>Left-in/ left-out arrangement, allowing merging or diverging from the proposed A46 northbound carriageway. Access/egress to the local road network from the southbound carriageway removed. The proposed A46 alignment would have a speed limit of 50mph.</p> <p>The existing roundabout would be removed and the A46 mainline dual carriageway would be realigned to provide a continuous link for two lanes of traffic in both the north and southbound directions. The realignment would occur at approximately the same level as the existing A46 and would be approximately 1km in length and approximately 40m to the east of the existing roundabout.</p> <p>Access to the northbound carriageway of the A46 would be maintained through the provision of a new northbound merge slip road from the B4082 to the A46 mainline. Similarly, egress would be maintained via a new northbound diverge slip road from the A46 mainline to the B4082. The northbound diverge and merge slip roads would be single lane and would require widening of the existing highway corridor north and south of the B4082 where it meets the existing Walsgrave roundabout. Access to and egress from the A46 southbound carriageway at this junction would no longer be possible.</p> <p>The diverge lane from the A46 would begin approximately 200m south of the existing junction and would join the B4082 approximately 230m to the west of the existing junction. The northbound diverge would be introduced at approximately the same level as the existing A46.</p> <p>The merge lane would join the B4082 approximately 230m west of the existing junction and join the A46 approximately 260m to the north. The northbound merge would be introduced at approximately the same level as the existing A46.</p> <p>The drainage strategy would require an extension to the Smite Brook culvert on the west side of the A46. This would require a new precast concrete retaining wall approximately 1.2m high and 6.2m long, to be installed in front of the existing headwall to retain fill. No extension would be required for the existing B4082 culvert.</p> <p>The Scheme footprint for Option 7 would have been 111,453m². The permanent land take outside of the highway boundary would be 7,177m². The temporary land take would be 28,006m².</p>

Table 3-5: Do something – Option 8 – Left-in/ left-out junction

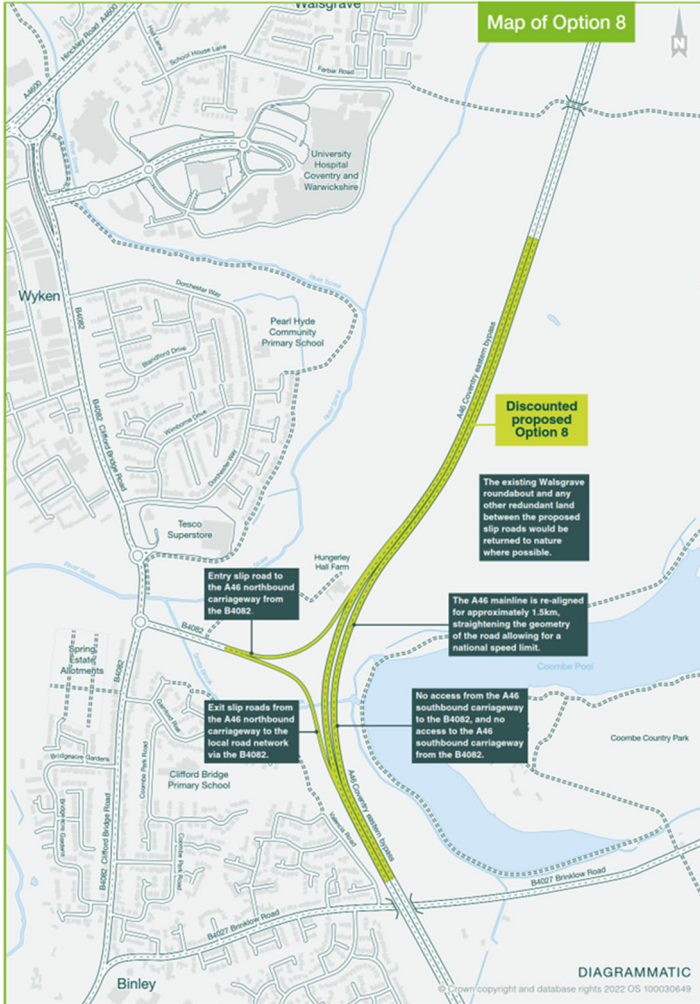
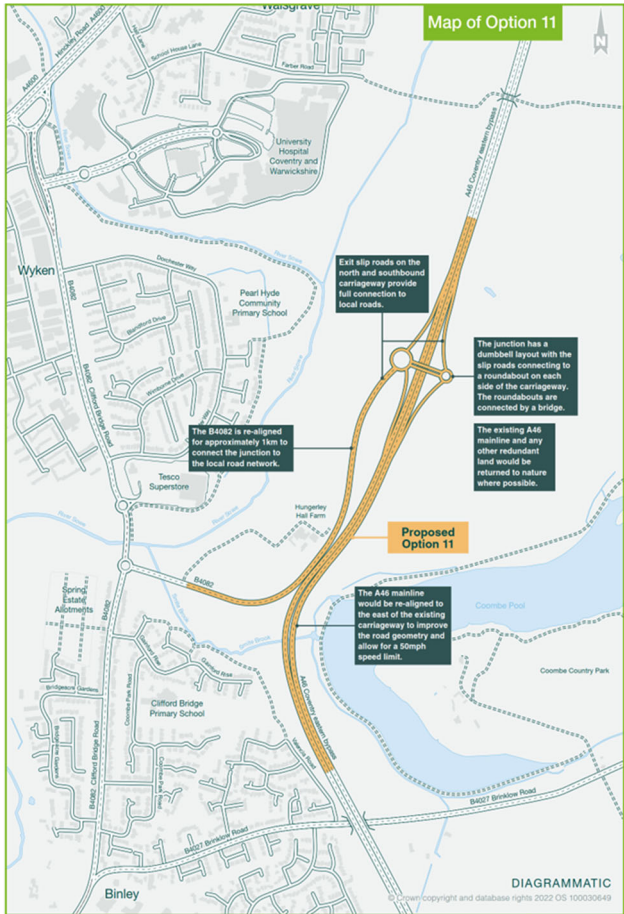
Option 8 layout	Description of key elements
 <p>Map of Option 8</p> <p>Discounted proposed Option 8</p> <p>The existing Walsgrave roundabout and any other redundant land between the proposed slip roads would be returned to nature where possible.</p> <p>The A46 mainline is re-aligned for approximately 1.5km, straightening the geometry of the road allowing for a national speed limit.</p> <p>Entry slip road to the A46 northbound carriageway from the B4082.</p> <p>Exit slip roads from the A46 northbound carriageway to the local road network via the B4082.</p> <p>No access from the A46 southbound carriageway to the B4082, and no access to the A46 southbound carriageway from the B4082.</p> <p>DIAGRAMMATIC</p> <p>© Crown copyright and database rights 2022 OS 100030649</p>	<p>Left-in/ left-out arrangement, allowing merging or diverging from the proposed A46 northbound carriageway. Access/ egress to the local road network from the southbound carriageway removed. A46 alignment allows for a 70mph speed limit.</p> <p>The existing roundabout would be removed and the A46 mainline dual carriageway would be realigned to provide a continuous link for two lanes in both the north and southbound directions. The realignment would be around the same level as the existing A46 and approximately 1.4km in length and 30m east of the existing roundabout.</p> <p>Access to the northbound carriageway of the A46 would be maintained by a new northbound merge slip road from the B4082 to the A46 mainline. Egress would be maintained via a northbound diverge slip road from the A46 mainline to the B4082. The northbound diverge and merge slip roads would be single lane and require widening of the existing highway north and south of the B4082 where it meets the existing Walsgrave roundabout. Access to and egress from the A46 southbound carriageway would no longer be possible.</p> <p>The diverge lane from the A46 would begin approximately 260m south of the existing junction and join the B4082 approximately 230m to the west of the existing junction. The northbound diverge would be at approximately the same level as the existing A46.</p> <p>The merge lane would diverge from the B4082 approximately 230m west of the existing junction and join the A46 approximately 570m to the north. The northbound merge would be at approximately the same level as the existing A46.</p> <p>The road realignment would impact the listed buildings at Hungerley Hall Farm and require the demolition of the farmhouse.</p> <p>The drainage strategy would require an attenuation pond located north-west of the existing junction to attenuate the runoff from an increase in impermeable area. This pond would discharge to the River Sowe via a new outfall.</p> <p>The Smite Brook culvert under the A46 would need to be extended either side of the A46, involving an in-situ reinforced concrete extension.</p> <p>The Scheme footprint for Option 8 would be 223,636m². The permanent land take required outside of the highway boundary would be 52,890m². The temporary land take would be 38,253m². Option 8 includes temporary and permanent land take within the Coombe Pool SSSI, with approximately 1,850m² permanent land take and approximately 2,850m² temporary land take.</p>

Table 3-6: Do something – Option 11 – Full grade separated junction

Option 11 layout	Description of key elements
 <p>The map illustrates the proposed Option 11 layout for the A46 Coventry Junctions. Key features include:</p> <ul style="list-style-type: none"> Map of Option 11: A diagrammatic map showing the proposed full grade separated junction, A46 realignment, and surrounding infrastructure. Exit slip roads: Exit slip roads on the north and southbound carriageway provide full connection to local roads. Junction layout: The junction has a dumbbell layout with the slip roads connecting to a roundabout on each side of the carriageway. The roundabouts are connected by a bridge. B4082 realignment: The B4082 is re-aligned for approximately 1km to connect the junction to the local road network. A46 realignment: The A46 mainline would be re-aligned to the east of the existing carriageway to improve the road geometry and allow for a 50mph speed limit. Existing A46 mainline: The existing A46 mainline and any other redundant land would be returned to nature where possible. Proposed Option 11: A new B4082 link road, approximately 1km in length, would be provided between the western roundabout of the dumbbell junction and the existing section of the B4082 that leads to the Clifford Bridge Road roundabout. This would be a two-lane single carriageway. Other features: The map also shows the existing Hungerley Hall Farm accommodation bridge over the A46, which would be demolished and replaced by a new dumbbell junction overbridge. The drainage strategy includes three attenuation ponds to attenuate the increase in impermeable area, before discharging to the River Sowe via new outfalls. A new culvert may have been required to carry flow under the proposed connector road to maintain an existing drainage ditch. 	<p>Full grade separated junction approximately 800m to the north of the existing roundabout location. The geometry of this option allows a 50mph speed limit on the mainline dual carriageway.</p> <p>The A46 mainline would be realigned through the existing Walsgrave roundabout for approximately 800m, before tying back into the current alignment at the existing Hungerley Hall Farm accommodation bridge. The mainline then continues on the current alignment for approximately 850m to allow for junction slip road tie ins.</p> <p>The full grade separated dumbbell junction would consist of north and southbound diverge and merge slip roads connecting to an overbridge with roundabouts at each end. The overbridge would be provided across the A46 between the two roundabouts and would carry a two-lane single carriageway. The proposed height above the A46 mainline road level would be up to approximately 8m.</p> <p>A new B4082 link road, approximately 1km in length, would be provided between the western roundabout of the dumbbell junction and the existing section of the B4082 that leads to the Clifford Bridge Road roundabout. This would be a two-lane single carriageway.</p> <p>The existing Hungerley Hall Farm accommodation bridge over the A46 would be demolished, with access re-provided via the B4082 and dumbbell junction overbridge, subject to consultation with the current landowner.</p> <p>The drainage strategy comprised of three attenuation ponds to attenuate the increase in impermeable area, before discharging to the River Sowe via new outfalls. A new culvert may have been required to carry flow under the proposed connector road to maintain an existing drainage ditch.</p> <p>The Scheme footprint for Option 11 would be 306,752m². The permanent land take required outside of the highway boundary would be 94,553m². In addition, an allowance was made for an environmental compensation area to the north of Coombe Pool SSSI of 37,020m². The temporary land take would be 23,678m².</p>

- 3.3.26. Options 6, 7 and 8 were concluded as non-viable. This was due to their impact on flooding and re-routing traffic, resulting in one remaining viable option (Option 11) being taken forward and presented at non-statutory Consultation between 11 January and the 14 February 2022. A full report on the options considered is included in Appendix D and Appendix E of the A46 Coventry Junctions Upgrade (Walsgrave) Stage Overview Assessment Report (Highways England, 2020).
- 3.3.27. At the options selection stage, an Environmental Assessment Report (National Highways, February 2022) was produced that documented the environmental assessment of the environmental effects for the four options to support the selection of the preferred option. The preferred option was selected after the EAR was completed and was informed by the conclusions of the EAR.
- 3.3.28. Table 3-7 provides a summary of the likely significant environmental effects of Options 6, 7, 8 and 11 that was detailed within the EAR (National Highways, February 2022).

Table 3-7: Comparison of potentially significant environmental effects identified for Options 6, 7, 8 and 11 (National Highways, 2022)

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
Air Quality	No significant effects.				No significant effects.			
Cultural Heritage	<p>Large permanent adverse effect on:</p> <p>Grade II listed barn at Hungerley Hall Farm (setting impact as closer to the new road alignment).</p> <p>Grade II listed Granary, cowshed and stable at Hungerley Hall Farm.</p> <p>Moderate temporary adverse effect on:</p> <p>Grade II Listed Granary, cowshed and stable at Hungerley Hall Farm.</p>	No significant effects.	<p>Very large permanent adverse effects on:</p> <p>Demolition of the listed Hungerley Hall Farmhouse</p> <p>Large permanent adverse effect on:</p> <p>Grade II listed barn at Hungerley Hall Farm (setting impact as closer to the new road alignment).</p> <p>Grade II listed Granary, cowshed and stable at Hungerley Hall Farm.</p>	<p>Moderate permanent adverse effect on:</p> <p>Hungerley Hall Farm-house due to loss of field adjacent to gardens.</p>	<p>Moderate adverse effect on Coombe Abbey Grade II* RPG due to lighting of 'dumbbell junction'.</p>	No significant effects.	No significant effects.	<p>Moderate adverse effect on Coombe Abbey Grade II RPG due to lighting of 'dumbbell junction'.</p>

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
Landscape and Visual Effects	<p>No significant landscape effects.</p> <p>Very large visual effects during construction on:</p> <p>Residential receptors at southern end of Fontmell Close/ Abbotsbury Close (very large in winter and large in summer)</p> <p>Residential receptors at Hungerley Hall Farm Grade II Listed Building</p> <p>Large visual effects during construction on:</p> <p>Residential receptors at northern end of Fontmell Close/ Abbotsbury Close</p>	<p>No significant landscape effects.</p> <p>Large visual effects during construction on:</p> <p>Residential receptors at Hungerley Hall Farm Grade II Listed Building</p> <p>Moderate visual effects during construction on:</p> <p>Recreational receptors at Gainford Rise Open Space, Binley</p> <p>Residential receptors at southern end of Fontmell Close/ Abbotsbury Close</p>	<p>No significant landscape effects.</p> <p>Large visual effects during construction on: Residential receptors at Hungerley Hall Farm Grade II Listed Building</p> <p>Moderate visual effects during construction on:</p> <p>Recreational receptors at Gainford Rise Open Space, Binley</p> <p>Residential receptors at southern end of Fontmell Close/ Abbotsbury Close</p>	<p>No significant landscape effects.</p> <p>Very large visual effects during construction on:</p> <p>Residential receptors at Hungerley Hall Farm Grade II Listed Building</p> <p>Large visual effects during construction on:</p> <p>Residential receptors at southern end of Fontmell Close/ Abbotsbury Close (winter)</p> <p>Moderate visual effects during construction on:</p> <p>Residential receptors at southern end of Fontmell Close/ Abbotsbury Close (summer)</p> <p>Residential receptors at northern end of</p>	<p>No significant landscape effects.</p> <p>Moderate permanent adverse visual effects on residential receptors at Hungerley Hall Farm Grade II Listed Building</p>	<p>No significant landscape effects.</p> <p>There are no permanent residual effects at year 15 (winter).</p>	<p>No significant landscape effects.</p> <p>There are no permanent residual effects at year 15 (winter).</p>	<p>No significant landscape effects.</p> <p>There are no permanent residual effects at year 15 (winter).</p>

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
	Moderate visual effects during construction on: Recreational receptors in the River Sowe open space			Fontmell Close/ Abbotsbury Close (winter)				
Biodiversity	Significant effects arising from: Slight adverse temporary effect on broad-leaved semi-natural woodland (County value) and potential for moderate adverse effect on Coombe Pool SSSI in the short term and reducing to not significant in the long term. Moderate adverse permanent effect on hedgerows	Significant effects arising from: Slight adverse temporary effect on broad-leaved semi-natural woodland (County value) and potential for moderate adverse effect on Coombe Pool SSSI in the short term and reducing to not significant in the long term.	Significant effects arising from: Moderate adverse permanent effect on Coombe Pool SSSI and broad-leaved semi-natural woodland (County value) Major adverse effects on bats (County value) due to habitat loss and severance.	Significant effects arising from: Slight adverse temporary effect on broad-leaved semi-natural woodland (County value) and potential for moderate adverse effect on Coombe Pool SSSI in the short term and reducing to not significant in the long term. Major adverse effects on bats (County value) due to habitat	Significant effects arising from: Major adverse effect on bats, barn owl and riparian mammals (County value) due to risk of species mortality from collision with operational traffic; and disturbance from lighting.	No significant effects.	No significant effects.	Significant effects arising from: Major adverse effect on bats, barn owl and riparian mammals (County value) due to risk of species mortality from collision with operational traffic; and disturbance from lighting.

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
	(County value) due to loss and severance; Major adverse effects on bats (County value) due to habitat loss and severance.			loss and severance.				
Noise and Vibration	Potential for significant construction noise and vibration effects on nearby residential properties and Hungerley Hall Farmhouse. Construction traffic noise was not assessed.	Potential for significant construction noise and vibration effects on nearby residential properties and Hungerley Hall Farmhouse. Construction traffic noise was not assessed.	Potential for significant construction noise and vibration effects on nearby residential properties. Construction traffic noise was not assessed.	Potential for significant construction noise and vibration effects on nearby residential properties and Hungerley Hall Farmhouse. Construction traffic noise was not assessed.	Large adverse effects on Hungerley Hall Farm. Moderate adverse effects at 66 Noise Sensitive Receptors in vicinity of Valencia Road. Moderate adverse effects at 157 NSRs in vicinity of Dorchester Way.	Moderate adverse effects at 29 NSRs in vicinity of Gainford Rise and Royston Close.	Large adverse effects at 53 NSRs in vicinity of Gainford Rise, Royston Close and Valencia Road.	Moderate adverse effects on Hungerley Hall Farm.
Geology and Soils	Large or very large adverse effect on soil quality and surrounding agricultural land. Moderate or large adverse effects on controlled surface waters.				No significant effects.			
Material Assets and Waste	No significant effects.				No significant effects.			

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
Population and Health	Large adverse permanent effects on: Hungerley Hall Farmhouse (severance to road network) Moderate adverse permanent effects on: Hungerley Hall Farmhouse (residential access) Potential for significant construction noise and vibration effects.	Potential for significant construction noise and vibration effects.	Large adverse permanent effects on: Hungerley Hall Farmhouse (severance of access to eastern field) Moderate adverse permanent effects on: Hungerley Hall Farmhouse (demolition) Potential for significant construction noise and vibration effects.	Potential for significant construction noise and vibration effects.	No significant effects.			
Road Drainage and the Water Environment	Moderate adverse temporary effects on water quality within the River Sowe.	No significant effects.	Moderate adverse temporary effect on Coombe Pool SSSI.	No significant effects.	Moderate or large adverse effect on hydromorphology.	No significant effects.		
Climate	No significant effects				No significant effects. In comparison to the Do-Minimum scenario, some options provide a net increase in carbon budget periods, however this net difference is never more than 0.001% of the budget.			

Chapter	Construction				Operation			
	Option 6	Option 7	Option 8	Option 11	Option 6	Option 7	Option 8	Option 11
Combined and Cumulative Effects	<p>Large adverse temporary residual combined effects on: Hungerley Hall Farm Grade II Listed Building</p> <p>Moderate adverse temporary residual combined effects on: Residential receptors at southern end of Fontmell Close/Abbotsbury Close</p> <p>Residential receptors at northern end of Fontmell Close/Abbotsbury Close</p> <p>No significant cumulative effects with other projects.</p>	<p>Large adverse temporary residual combined effects on: Hungerley Hall Farm Grade II Listed Building</p> <p>No significant cumulative effects with other projects.</p>	<p>Moderate adverse temporary residual combined effects on: Hungerley Hall Farm Grade II Listed Building</p> <p>No significant cumulative effects with other projects.</p>	<p>Large adverse temporary residual combined effects on: Hungerley Hall Farm Grade II Listed Building</p> <p>Moderate adverse temporary residual combined effects on: Residential receptors at southern end of Fontmell Close/Abbotsbury Close</p> <p>No significant cumulative effects with other projects</p>	<p>Moderate adverse residual combined effects on: Residential receptors at southern end of Fontmell Close/Abbotsbury Close, Hungerley Hall Farm Grade II Listed Building.</p> <p>No significant cumulative effects with other projects.</p>	<p>No significant residual combined effects.</p> <p>No significant cumulative effects with other projects.</p>	<p>No significant residual combined effects.</p> <p>No significant cumulative effects with other projects.</p>	<p>No significant residual combined effects.</p> <p>No significant cumulative effects with other projects.</p>

Consultation at Options Selection Stage

- 3.3.29. Consultation is an important part of the options selection process. The Applicant held a non-statutory consultation between 11 January and the 14 February 2022 as part of the option selection stage for the proposed upgrade to Walsgrave Junction. Consultation was undertaken with applicable statutory stakeholders including Historic England, Natural England, Environment Agency, Coventry City Council, Warwickshire County Council and Rugby Borough Council as well as the public.
- 3.3.30. Due to Covid-19 restrictions that were in place at the time, this was carried out remotely which included three online public information events. Members of the community could also request a call back from a specialist within the project team as well as request hard copies of consultation documents to be posted to them free of charge. Detail was shared during the public consultation on the discounted options and why these options were not viable. The purpose of the consultation was to provide the local community and stakeholders with the opportunity to have their say on the proposals and share ideas, concerns, and local knowledge.
- 3.3.31. The feedback received during the consultation showed support for improvements at Walsgrave Junction and support for Option 11. Option 11 would provide a fully grade separated junction approximately 800m north of the existing A46 Walsgrave junction. Exit and entry slip roads would be provided on both the north and southbound carriageway allowing full connection to the local road network. 80% of respondents agreed that improvements to the Walsgrave Junction are needed, and 66% supported Option 11.
- 3.3.32. The Applicant received 121 responses to the consultation. This feedback was important to understand how the local community currently uses the road and what people thought about the proposals for upgrading the A46 Walsgrave junction. Respondents were asked to share thoughts on the need for improvements at Walsgrave Junction and on Option 11, as presented in the consultation.
- 3.3.33. A number of comments were raised in response to the consultation, which included (but not limited to):
- Access to the hospital
 - Walking and cycling provision
 - Proposed 50mph speed limit
 - Impact on the local road network

Selection of the preferred option

- 3.3.34. When selecting the preferred route, several criteria, including the Scheme objectives, safety, benefits, costs, environmental effects, construction and feedback from the public consultation were considered.
- 3.3.35. Option 6 was deemed non-viable due to a change in the extent of floodplain based on new data and modelling results provided by the Environment Agency. This resulted in additional areas of the option being within the floodplain and therefore much increased the constraint to Scheme.
- 3.3.36. Refined traffic modelling determined that the left in/left out solution (Option 7 and 8) created congestion impacts and did not achieve the objectives of the Scheme, therefore making these two options not fit for purpose.
- 3.3.37. National Highways undertook a Formal Solution Review and Validation workshop which determined Option 11 was acceptable in performance (with a 50mph speed limit), deliverable and achieved the objectives of the Scheme.
- 3.3.38. The environmental assessment undertaken at the options selection stage concluded that there is potential for significant adverse effects due to Option 11. These are principally associated with:
- Noise and vibration effects at Hungerley Hall Farm
 - Landscape and townscape effects due to the elevated and lit junction affecting the setting of listed Coombe Abbey Registered Park and Gardens
 - Effects of new road alignment (and removal of the existing Hungerley Hall Farm accommodation overbridge) on the movement of bats, barn owls and riparian mammals.
- 3.3.39. The environmental assessment undertaken at the options selection stage found that in terms of noise, Option 6 would have had the most significant adverse effects on the adjacent residential areas. Comparatively, Option 7 and Option 8 exhibited fewer adverse effects in comparison to Option 6. However, it is worth noting that Option 11 has the least number of significant adverse effects in terms of noise and vibration.
- 3.3.40. In the context of the water environment, Options 6, 8, and 11 provide notable water quality benefits through the utilisation of attenuation ponds. However, appropriate flood mitigation measures would have been required for Options 6 and 8. It is important to consider that such measures would have incurred considerable costs and had led to other environmental impacts. On the other hand, Options 7 and 11 are expected to have a minimal impact on fluvial flood risk.

- 3.3.41. In relation to landscape and townscape, it became evident that Option 6 would have the most significant adverse effect due to its substantial footprint. Option 11 was found to be less intrusive compared to Option 6, while Options 7 and 8 would have had a minimal and minor adverse effect, respectively.
- 3.3.42. Following public consultation in early 2022, Option 11 was chosen as the preferred option which was supported by the consultation responses received. The Preferred Route Announcement (PRA) for Option 11 was made in June 2022 and Option 11 has been progressed to the preliminary Design Stage which commenced in February 2023.
- 3.3.43. Early engagement with statutory environmental bodies was undertaken after the PRA and prior to the start of the preliminary Design Stage to discuss the Scheme with:
- Natural England (September 2022)
 - Environment Agency (September 2022)
 - Historic England (September 2022)

3.4. Preliminary design

- 3.4.1. During the Preliminary Design Stage, the Option 11 design was further refined as a result of design development, public consultations and environmental assessments, as explained below. The Scheme Design Report (TR010066/APP/7.4) provides further details on design principles and the design development.

Design development following the Preferred Route Announcement

- 3.4.2. Table 3-8 lists the changes to the design since the publication of the PRA in June 2022 and up to the time of statutory consultation in October 2023.

Table 3-8: Design development to the design since PRA

Design element	Change since PRA	Changes to the design
A46 vertical alignment	The proposed vertical alignment of the A46 mainline has been adjusted to reduce the extents of works.	<ul style="list-style-type: none"> • Results in avoiding works to a significant amount of the existing A46. • Reduces traffic management and disruption to users. • Reduces the carbon impact. • Reduces disturbance to natural and human receptors through reduction in works required.

Design element	Change since PRA	Changes to the design
Dumbbell western roundabout	The proposed western dumbbell roundabout has been designed to accommodate a future link road to access the allocated development land to the west of the Scheme and to the hospital. As stated within Coventry City Council's Local Plan ¹ , the delivery of the link road will form part of the adjacent development.	<ul style="list-style-type: none"> • Results in avoiding additional construction work to the roundabout when the new link road is delivered. • Reduces future traffic management and disruption to users.
B4082 speed limit	The existing B4082 has a speed limit of 60mph. Through discussions with Coventry City Council, it has been agreed to reduce the speed limit of the B4082 to 40mph.	<ul style="list-style-type: none"> • A 40mph speed limit is deemed more appropriate for the B4082 and the adjacent future development land to the west of the Scheme. • Reduces noise impacts for human and ecological receptors.
Northern pond maintenance access track	A maintenance access track has been provided for the northern attenuation pond via the western dumbbell roundabout.	<ul style="list-style-type: none"> • Provides a safer off-road access for National Highways maintenance teams.
Lighting	An assessment of the lighting requirement of the Scheme has been undertaken. It concluded that the A46 mainline does not require lighting, but lighting would be provided on the junction, on the slip roads and along the B4082.	<ul style="list-style-type: none"> • Assists in mitigating the impact of lighting in the area, both on general light pollution and the impact on adjacent biodiversity receptors.
Walking, cycling, horse riding (WCH) provision (Across the A46)	Initial consultation with local walking, cycling and horse riding user groups and Coventry City Council, identified an aspiration for a WCH link across the A46 to Coombe Abbey Park. The Scheme provides enabling works, including the retention of Hungerley Hall Farm accommodation overbridge, for a potential future WCH route to be provided by others.	<ul style="list-style-type: none"> • Providing the space and alignment along the new B4082 link road for a potential future WCH link to Coombe Abbey Park.
Walking, cycling, horse riding (WCH) provision (Clifford Bridge Road)	WCH surveys of the local infrastructure identified a notable number of users crossing over the eastern arm of the Clifford Bridge Road roundabout at the uncontrolled crossing. Many of these movements were attributed to unaccompanied minors reflecting pupils making their way to and from school. To address the need for formalising this crossing, the Scheme provides a signalised pedestrian crossing at this location.	<ul style="list-style-type: none"> • Provides a safer crossing point on the B4082.

Statutory consultation

3.4.3. Statutory consultation was undertaken between 25 October and 22 December 2023. The Applicant consulted with prescribed consultees as per the requirements of Section 42 of the Planning Act 2008. The consultees included

¹

statutory consultees (Natural England, the Environment Agency, Historic England, relevant planning authorities, UK Health Security Agency and the Office for Health Improvement and Disparities, statutory undertakers and anyone who has an interest in the Scheme (for example landowners and tenants). The local community and wider public were consulted on the Scheme in line with Section 47 of the Planning Act 2008.


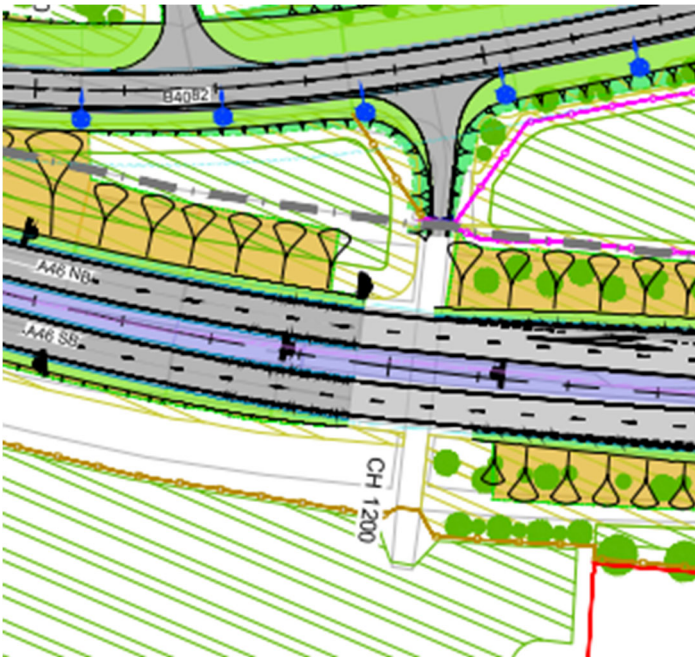
- 3.4.4. A Statement of Community Consultation (SoCC) was produced and published prior to the formal statutory consultation period. The SoCC outlined how the Applicant would formally consult with the local community about the Scheme.
- 3.4.5. The purpose of the consultation was to seek comments from the local community and statutory consultees on the Scheme. The Preliminary Environmental Information Report (PEIR) (National Highways, 2024) was produced to support the consultation. The PEIR included preliminary environmental information to enable consultees to understand the likely significant environmental effects of the Scheme, and measures identified to mitigate such effects, to help inform their consultation responses.
- 3.4.6. The statutory consultation included public events, a webinar (live online event where technical experts talked through the Scheme design and answered any questions), a mobile engagement van at multiple locations in the local area, and publication of brochures, reports and other information made available in local community facilities and online.
- 3.4.7. The Consultation Report (**TR010066/APP/5.1**) and Consultation Report Annexes (**TR010066/APP/5.2**), submitted as part of the DCO application, summarise the feedback received during the consultations as well as how the project team have considered this feedback in the Scheme design. The Consultation Report (**TR010066/APP/5.1**) demonstrates how the Applicant has complied with the consultation requirements of the Planning Act 2008.

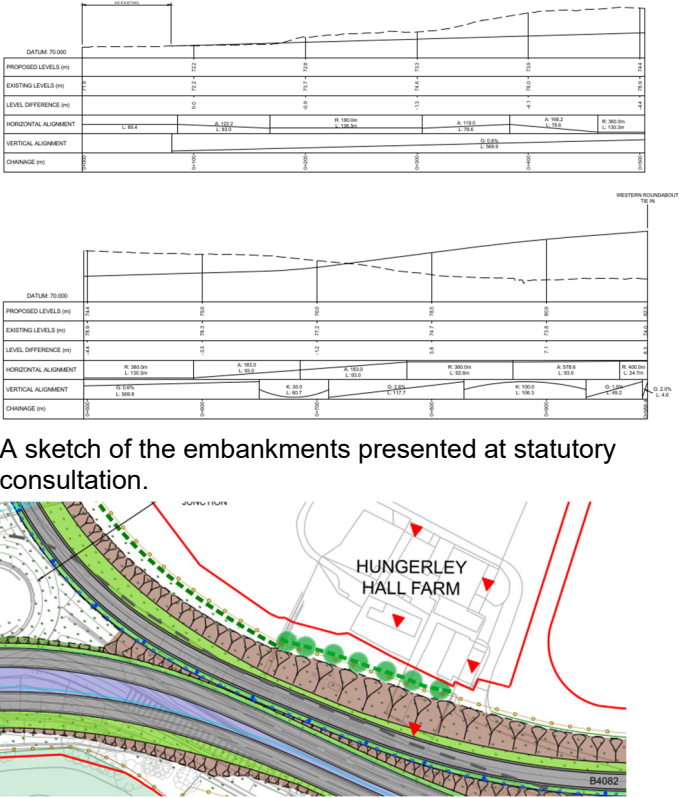
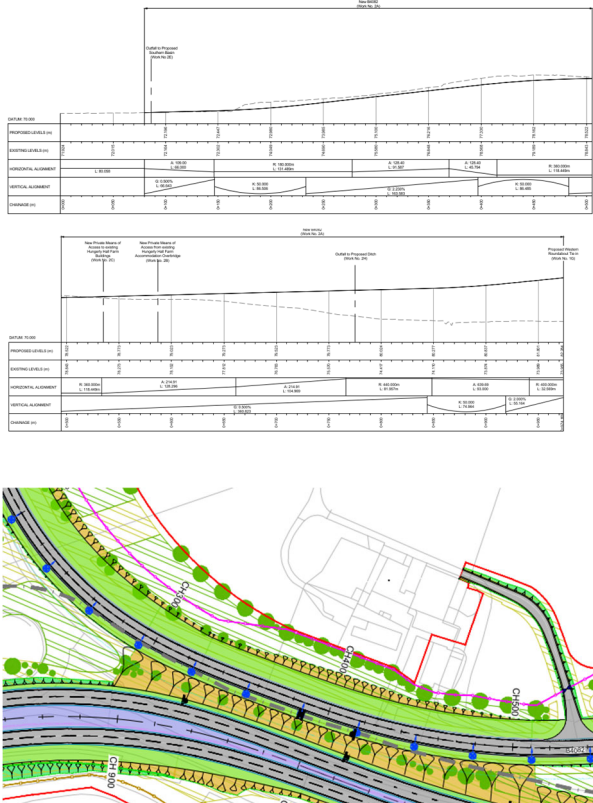
Design development following statutory consultation

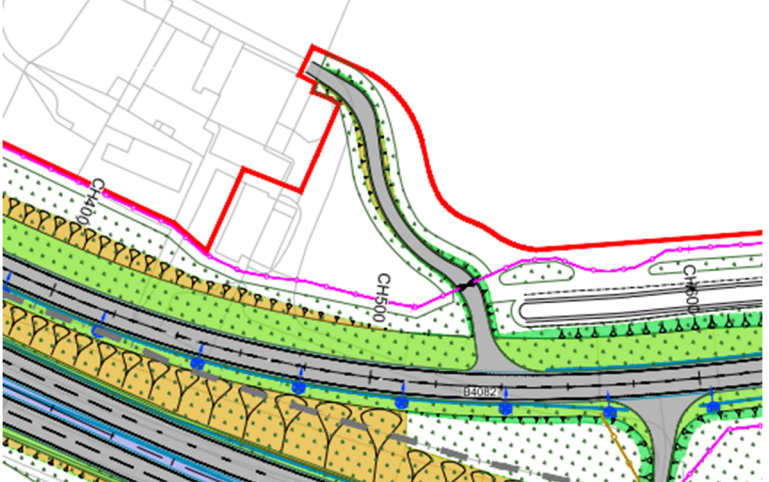
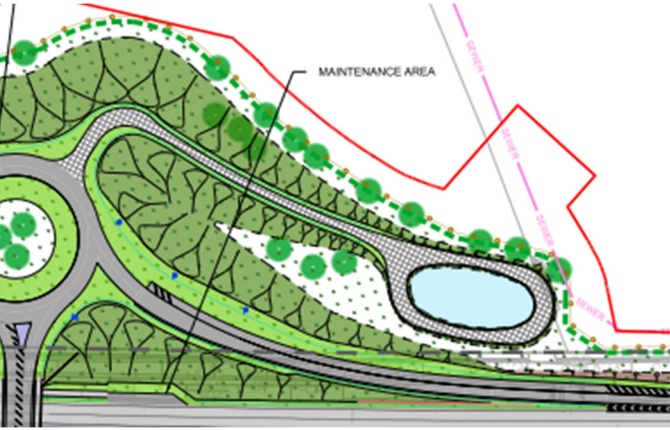
- 3.4.8. This section summarises the design developments that have taken place following the statutory consultation (October – December 2023) to produce the design which forms the application for development consent. These design developments have been integrated into the current Scheme presented and therefore the represent the design that has been assessed within this ES.
- 3.4.9. The design developments that have taken place between statutory consultation and the design submitted for development consent are detailed in Table 3-9 below. Further embedded mitigation is described in ES Chapter 2 (The Scheme) (**TR010066/APP/6.1**) and within the relevant aspect Chapters (ES Chapters 5-

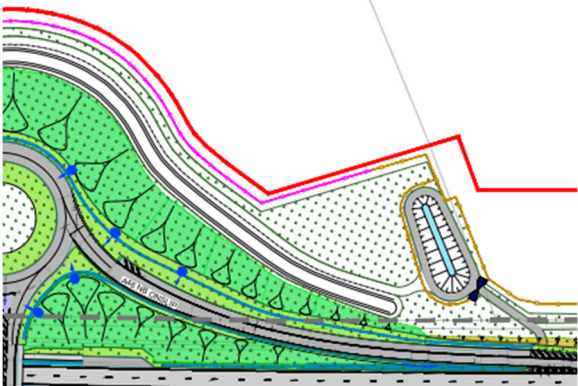
15) (**TR010066/APP/6.1**). Some changes have also been made to the Order Limits and these are details in Table 3-10.

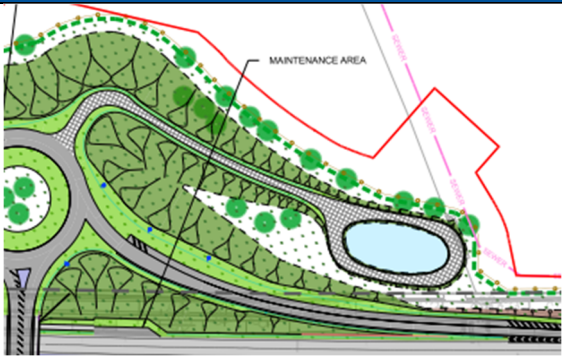
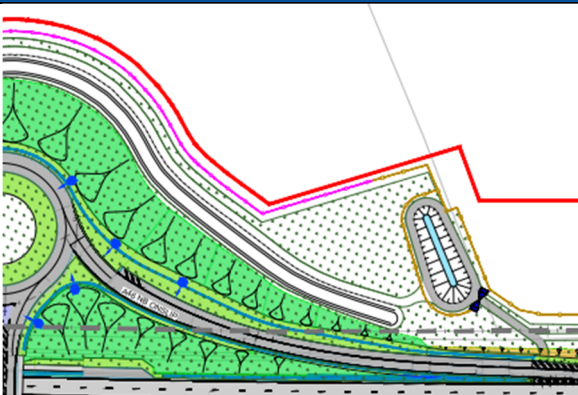
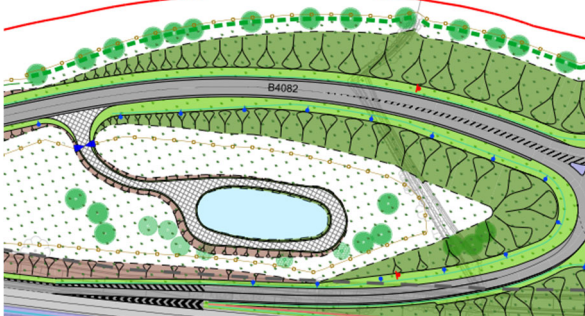
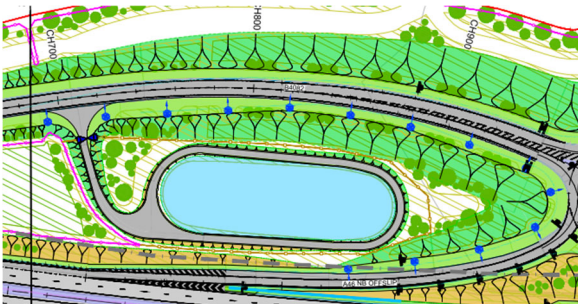
Table 3-9: Design development since statutory consultation


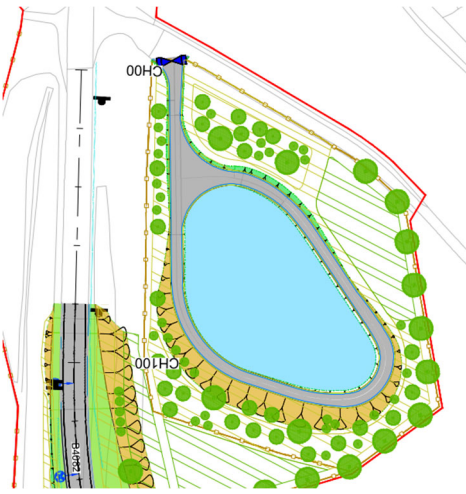
Design element	Change since statutory consultation	Changes to the design
Hungerley Hall Farm accommodation overbridge		
<p>A sketch of the statutory consultation design is contained below.</p> 	<p>The structural surveys undertaken on the accommodation overbridge have not raised any concerns in retaining the structure. It will therefore be retained in its current form as an accommodation overbridge for Hungerley Hall Farm to access their land east of the A46. A new access off the B4082 will be provided for farm vehicles to access the overbridge.</p> 	<ul style="list-style-type: none"> • Allows Hungerley Hall Farm to access land east of the A46 to avoid travelling on the B4082 and the dumbbell junction. • Avoids the need for a farm access off the eastern roundabout • Allows a future opportunity of converting it to a walking/cycling link over the A46 in conjunction with adjacent developments. • Reduces the impact on carbon by avoiding demolition. • Retains a route currently used by mammals, such as badgers, to cross the A46.
B4082 alignment design		
<p>A sketch of the vertical alignments presented at statutory consultation.</p>	<p>The vertical alignment of the B4082 has been raised to meet with the retained accommodation overbridge.</p>	<ul style="list-style-type: none"> • Allows Hungerley Hall Farm to access the accommodation

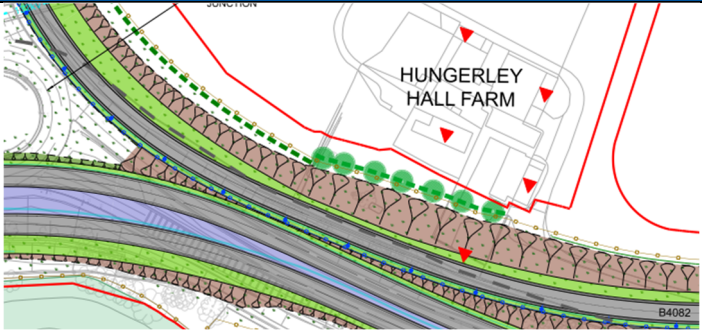

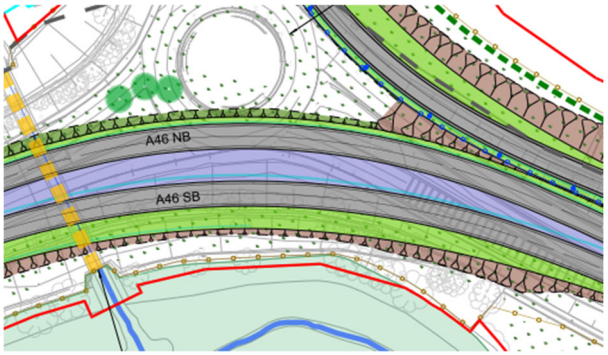
Design element	Change since statutory consultation	Changes to the design
 <p>A sketch of the embankments presented at statutory consultation.</p>	<p>The horizontal alignment has moved west to create an embankment to separate the new B4082 and the A46.</p> 	<p>overbridge from the B4082.</p> <ul style="list-style-type: none"> Allows a more direct link for a future walking/cycling link to connect to the overbridge. Requires less excavation but results in an increase in imported fill material required for the overall Scheme. Embankment between A46 and B4082 can be planted to assist in natural screening between the two roads. Results in the B4082 road alignment moving closer to Hungerley Hall Farm and results in a greater length of the listed wall being demolished.
<p>Hungerley Hall Farm access road</p> <p>A new farm access track was not provided at statutory consultation (with the assumption that farm vehicles would access the B4082 via the current access off the road, south of the farm).</p>	<p>A new access has been provided for Hungerley Hall Farm in order to reduce the distance travelled to/from the accommodation overbridge and farmland east of the A46. A staggered junction arrangement has been provided to allow access across the B4082.</p>	<ul style="list-style-type: none"> The existing Hungerley Hall Farm access road would result in farm vehicles travelling for circa 600m on the new B4082 to access the


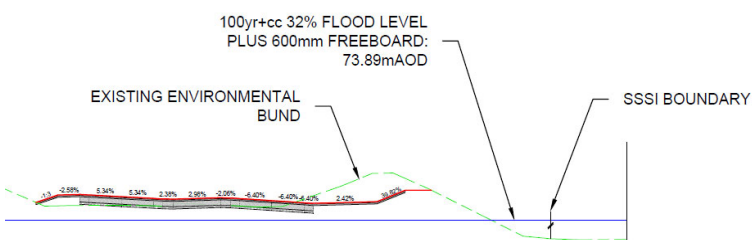
Design element	Change since statutory consultation	Changes to the design
		<p>accommodation overbridge. The new access road only requires farm vehicles to use the B4082 for approx. 50m, significantly reducing the impact on the B4082.</p> <ul style="list-style-type: none"> • Results in sterilisation of agricultural land. • Results in a gap in the landscape planting which also provides screening and a wildlife corridor.
Northern drainage attenuation pond		
<p>A sketch of the design presented at statutory consultation.</p> 	<p><u>Consolidation of drainage assets</u></p> <p>The northern attenuation pond has changed in size, position and use. The pond was originally designed to attenuate runoff from the Scheme before discharging to the existing drainage network. Further design development has determined that the two ponds can be consolidated into one large pond (south of the dumbbell) thus negating the need for the pond to the north for attenuation purposes.</p> <p><u>Water quality improvements</u></p> <p>Water quality assessments have determined that the existing drainage catchment to the north of the Scheme requires additional water quality treatment to meet National Highways discharge requirements. A new pond, designed to be permanently wet, has been introduced to the north-west of the dumbbell to provide this additional treatment.</p> <p>Other options considered for the location of the new pond included:</p>	<p><u>Consolidation of drainage assets</u></p> <ul style="list-style-type: none"> • Reduced permanent land take due to attenuation requirements diverted to the central pond. <p><u>Water quality improvements</u></p> <ul style="list-style-type: none"> • With the inclusion of the northern pond, designed to be permanently wet, this discharge now passes the water quality assessment for soluble pollutants and sediment bound pollutants.

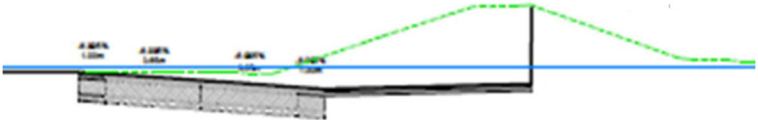
Design element	Change since statutory consultation	Changes to the design
	<p>To the east of the A46, north of the dumbbell – discounted due to the requirement to change a number of existing cross carriageway drains resulting in buildability issues (4m deep excavations), programme implications and traffic management requirements.</p> <p>To the north west of the dumbbell and north of the un-named ditch (within the satellite compound area) – discounted due to clashes with an existing foul sewer, which made this option un-viable due to cost and programme (to divert the sewer).</p> <p>Connecting into the proposed ditch which run along the toe of the B4082 embankment (on the western side) – discounted due levels not working to connect to the ditch.</p> <p>Proposed pond design:</p> 	<ul style="list-style-type: none"> • A permanently wet pond will provide additional ecological habitat.
Northern maintenance access track		
A sketch of the design presented at statutory consultation.	The separate access track off the dumbbell roundabout to the northern pond has been removed. Maintenance access will be via a maintenance strip along the bottom of the western embankment of the B4082 and dumbbell roundabout.	<ul style="list-style-type: none"> • Reduced permanent land take due to removal of additional embankments. • Reduction in associated imported material to form embankments.

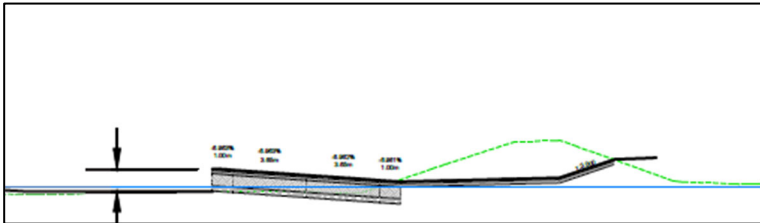
Design element	Change since statutory consultation	Changes to the design
		
<p>Central drainage pond</p> <p>A sketch of the design presented at statutory consultation.</p> 		
<p>The central pond has increased in size as the majority of the new National Highway drainage networks for the A46 and the new junction will discharge to the central pond.</p> <p>In order to meet water quality assessment requirements, this pond will be lined in order to protect groundwater from pollution associated with the road runoff.</p> <p>This pond will be designed to be permanently wet to provide water quality treatment.</p> <p>A maintenance access track has also been provided around the pond.</p> 		<ul style="list-style-type: none"> • Reduced permanent land take due to attenuation requirements diverted to the central pond. • With the creation of a wet pond, this outfall passes the water quality assessment for soluble pollutants and sediment bound pollutants. • Permanently wet ponds provide ecological benefits and landscape design opportunities (planting).

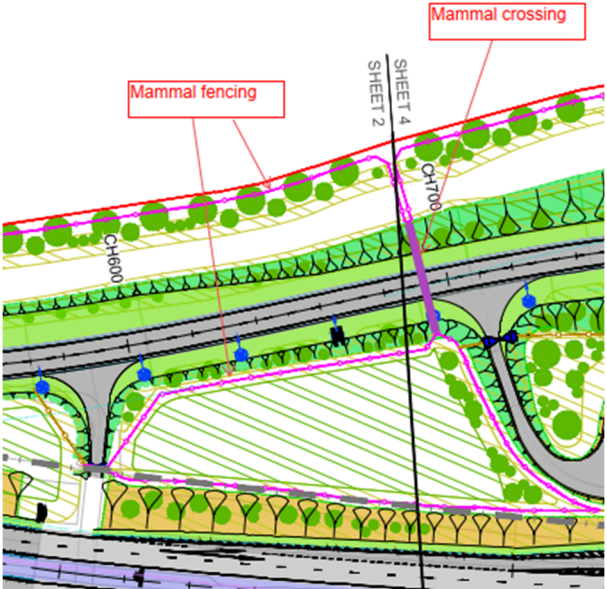
Design element	Change since statutory consultation	Changes to the design
Southern drainage detention basin		
<p>A sketch of the design presented at statutory consultation.</p> 	<p>The southern detention basin located off the B4082, has changed in orientation, to better reflect the topography of the existing ground and to allow for better integration of the proposed landscaping, extending the Order Limits to the east of the pond to accommodate additional planting.</p> <p>This basin will not be designed to be permanently wet and will remain dry unless being used for attenuation purposes.</p> 	<ul style="list-style-type: none"> Allows for an improved integration of the layout and landscape design with the wider Scheme and the existing landscape.
Embankments		
<p>A sketch of the design presented at statutory consultation.</p>	<p>Slopes have been increased to 1:3 across the Scheme to facilitate planting and to provide safer maintenance access. There may be short sections of 1:2.5 where constraints dictate a steeper slope.</p>	<ul style="list-style-type: none"> Planting on embankments allows the Scheme to provide more landscape planting and reduce land take.

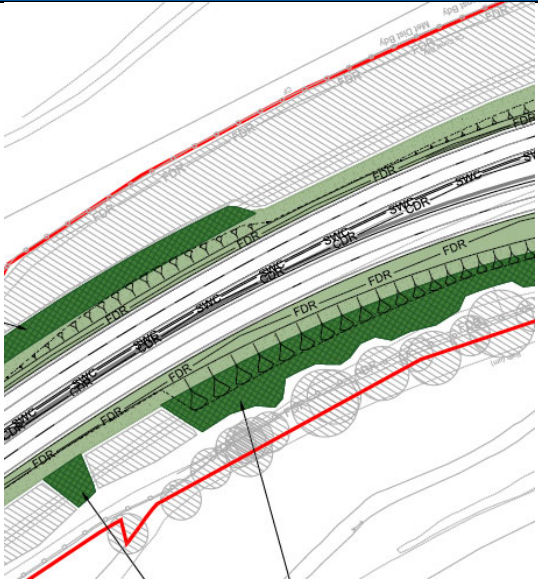
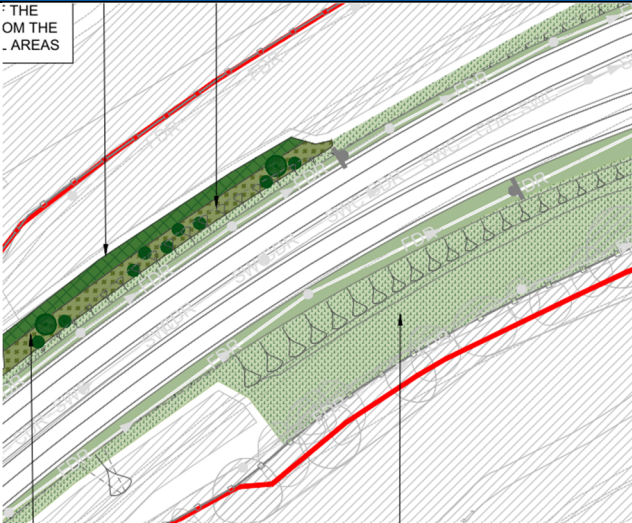
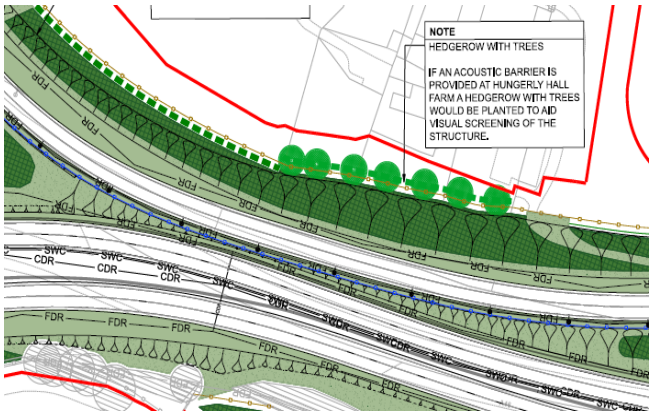

Design element	Change since statutory consultation	Changes to the design
		
Raised bund alongside Coombe Pool		
<p>A sketch of the design presented at statutory consultation.</p> 	<p>The existing environmental bund along the eastern side of the existing A46 is partially removed due to the realignment of the A46 for approximately 310m. The bund will be re-built over a distance of approximately 150m to a level of 74m AoD that protects the Scheme from flooding during the 1 in 100-year plus 32% Climate Change (CC) design event. This flood protection level has been determined through hydraulic modelling that has been agreed with the Environment Agency (as detailed in the ES Appendix 13.1 (Flood Risk Assessment) (TR010066/APP/6.3). The bund may be lined, if required, with an impermeable barrier to avoid seepage through the bund during a flood event.</p> <p>Reconstruction of the bund will require works, including tree removal, in Coombe Abbey Park which has a number of environmental designations including the SSSI and as a RPG.</p>	<ul style="list-style-type: none"> • Provides an efficient vertical alignment whilst providing flood defence in accordance with legislation and Government policy to the Scheme. • Impacts to trees within the Tree Preservation Order. • Loss of habitat for species due to tree removal and construction works areas.

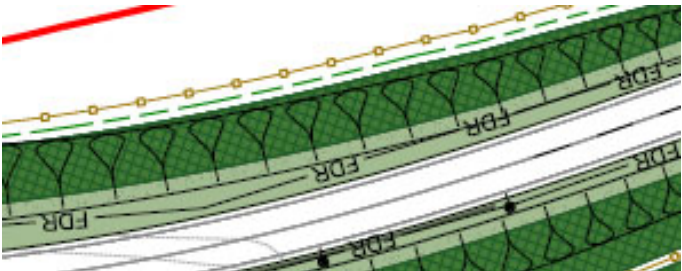
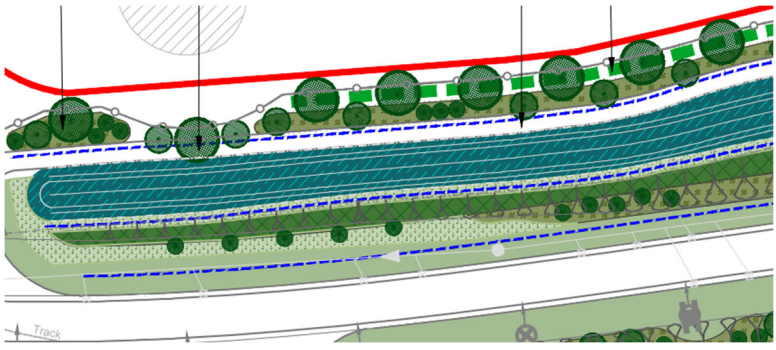
Design element	Change since statutory consultation	Changes to the design
	<p>The below plan shows the new bund in green. The remainder of works to the existing bund are shown yellow alongside Coombe Pool, which have not changed since statutory consultation.</p>  <p>The below cross section shows the existing and proposed details.</p>  <p>Two other options were considered, for flood protection, which were a retaining wall at the verge edge or raising the A46 southbound carriageway. The following provides further details on these options.</p> <p><u>Retaining wall at verge edge (reinforced earth or sheet piled)</u></p> <ul style="list-style-type: none"> • Retain current road alignment. • Eastern A46 verge adjusted to fall towards the carriageway to reduce retaining wall height slightly. 	

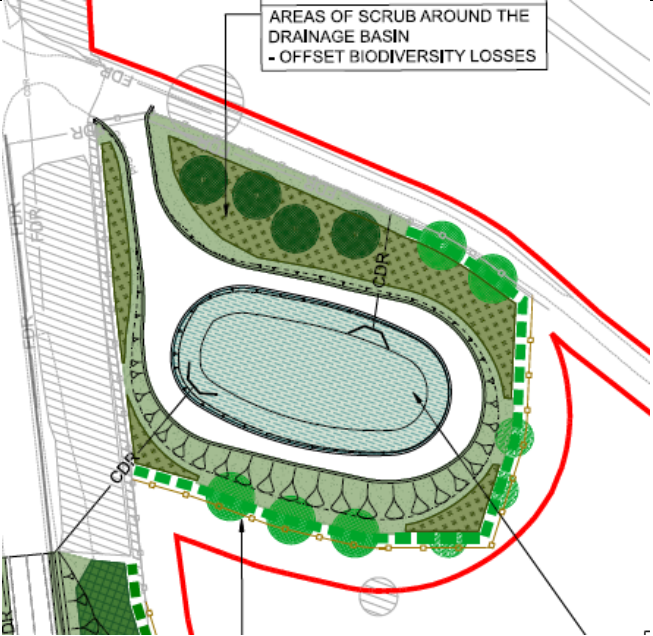
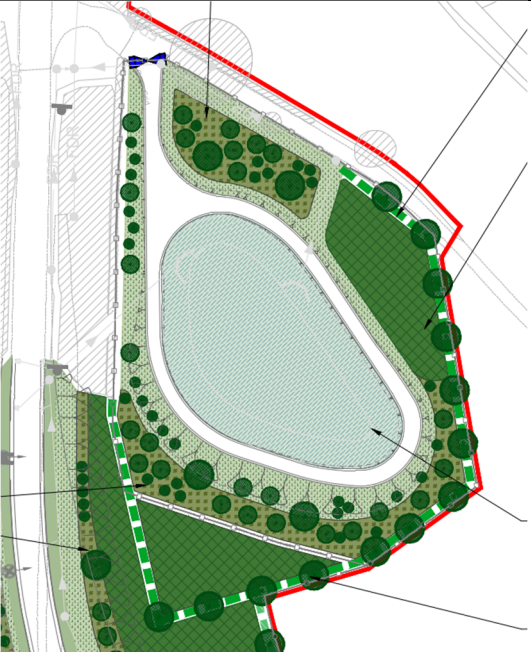
Design element	Change since statutory consultation	Changes to the design
	<ul style="list-style-type: none"> Retaining wall at the edge of the verge for approximately 135m to the existing bund height to minimise land take as much as possible. Discounted due to impact on adjacent SSSI (noise, vibration, and/or land take) <p>Retaining wall option sketch</p>  <p>The most suitable type of retaining wall would be a sheet piled wall:</p> <p>A sheet piled wall would not require extensive excavation of the back of the bund, therefore reducing the impact on the SSSI. Although noise impacts would be greater the duration of reconstruction could be less.</p> <p>Excavation would be carried out in front of the bund, to a maximum depth of around 3m.</p> <p>The inclusion of the sheet piles within the bund would prevent groundwater flow through the permeable granular sub-formation which may affect the carriageway and structural stability of the bund.</p> <p>This option was discounted as it would likely result in a sustainable use of materials but would also require an extensive amount of excavation on the back of the bund, which would encroach into the SSSI and therefore would likely be unfeasible.</p> <p><u>Raise southbound carriageway above 74m AoD with step in central reserve</u></p>	

Design element	Change since statutory consultation	Changes to the design
	<ul style="list-style-type: none"> Retain current northbound carriageway alignment. Raise southbound carriageway by 1.1m at the central reserve, in order for the road surface level to be above the flood level (of 74m AoD) to avoid the need for a bund for flood purposes. Requires a retaining wall structure in the central reserve beneath the central barrier. <p>Sketch of southbound carriageway raised 1.1m above central reserve. Blue line represents the flood level of 74mAoD.</p>  <p>This option was discounted due to construction and maintenance issues relating to a retaining wall in the central reserve and design implications due to the change in levels.</p>	
Fencing to Coombe Pool SSSI		
No change to the existing fencing was proposed at statutory consultation	Further to condition surveys undertaken, the fencing along the land ownership boundary of the Scheme adjacent to Coombe Pool will be replaced as it is in poor condition. This will require works in and around the existing woodland and within the SSSI.	<ul style="list-style-type: none"> Vegetation removal maybe required in some locations. Disturbance to ecology from machinery and works.
Mammal crossing		
A mammal crossing was not included in the design for statutory consultation	Following protected species surveys, a mammal crossing will be provided under the B4082 as part of the Scheme. Mammals are	<ul style="list-style-type: none"> Maintains commuting route for species,

Design element	Change since statutory consultation	Changes to the design
	<p>known to use the accommodation overbridge to cross the A46, and therefore mammal fencing will be provided to direct mammals from the accommodation overbridge to the new mammal crossing.</p> 	<p>particularly mammals and reduces the likelihood of casualties.</p>
Landscape design		
<p>Rationalisation of planting types (woodland) south of existing Walsgrave roundabout. Image below from statutory consultation</p>	<p>A variety of vegetation types have been provided including woodland, scrub, scattered trees and grassland</p>	<ul style="list-style-type: none"> • Creation of a variety of habitats in collaboration with ecology, arboricultural and highways teams. • Improves landscape character integration • Provides benefits for barn owl

Design element	Change since statutory consultation	Changes to the design
		
<p>Hungerley Hall Farm - landscape mitigation for visual screening. Image below from statutory consultation</p>  <p>NOTE HEDGEROW WITH TREES IF AN ACOUSTIC BARRIER IS PROVIDED AT HUNGERLEY HALL FARM A HEDGEROW WITH TREES WOULD BE PLANTED TO AID VISUAL SCREENING OF THE STRUCTURE.</p>	<p>Landscape amendments to reflect the new Hungerley Hall Farm access road and a widened verge (potential future WCH route provided by others). A variety of landscape planting types added, including woodland, scrub, scattered trees and grassland</p>  <p>NEARBY RESIDENTIAL AREAS AND HUNGERLEY HALL FARM - OFFSET BIODIVERSITY LOSSES</p>	<ul style="list-style-type: none"> • Improved habitat variety and biodiversity • Provides benefits for barn owl

Design element	Change since statutory consultation	Changes to the design
<p>Hedgerows (with/ without trees). Image below from statutory consultation</p> 	<p>Continuous hedgerow provided with trees on edge of Scheme providing height to encourage barn owl to fly up and over the B4082. Also the introduction of areas of scrub (rather than areas of long grassland) to reduce the likelihood of barn owl foraging adjacent to the B4082 which could increase the risk of casualties.</p> 	<ul style="list-style-type: none"> • Additional hedgerows with trees • Provides benefits for barn owl
<p>Drainage features. Image below from statutory consultation</p>	<p>Enhanced landscape design for integration screening and variety of habitats, adopting woodland, hedges, trees, grasslands, suds wetland planting and meadow mix)</p>	<ul style="list-style-type: none"> • Enhanced landscape and habitat creation and biodiversity

Design element	Change since statutory consultation	Changes to the design
 <p>AREAS OF SCRUB AROUND THE DRAINAGE BASIN - OFFSET BIODIVERSITY LOSSES</p>		
<p>Roundabouts. Image below from statutory consultation</p>	<p>Enhanced landscape design for integration, screening feature and sense of place for users adopting woodland, hedges, trees, grasslands, shrubs, bulbs</p>	<ul style="list-style-type: none"> Improved design, screening, integration and habitat creation

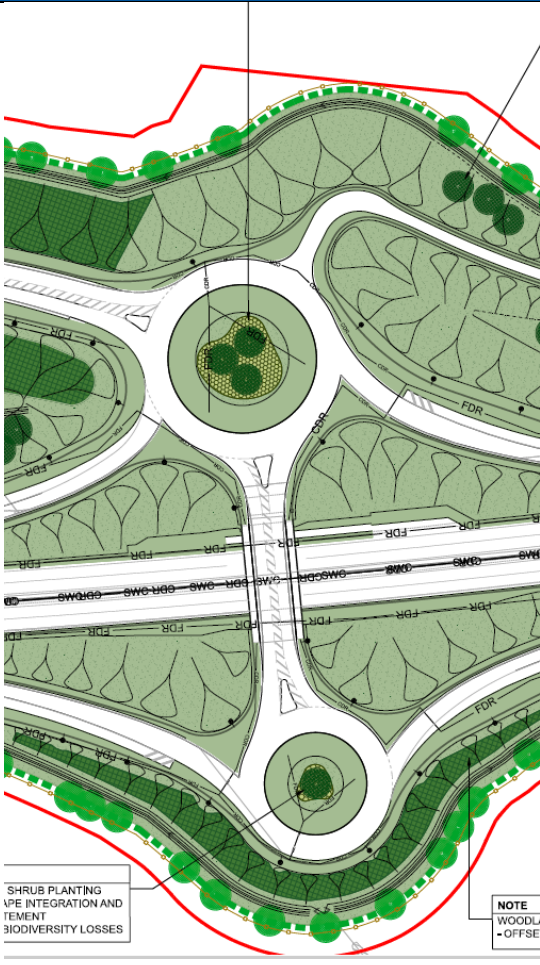
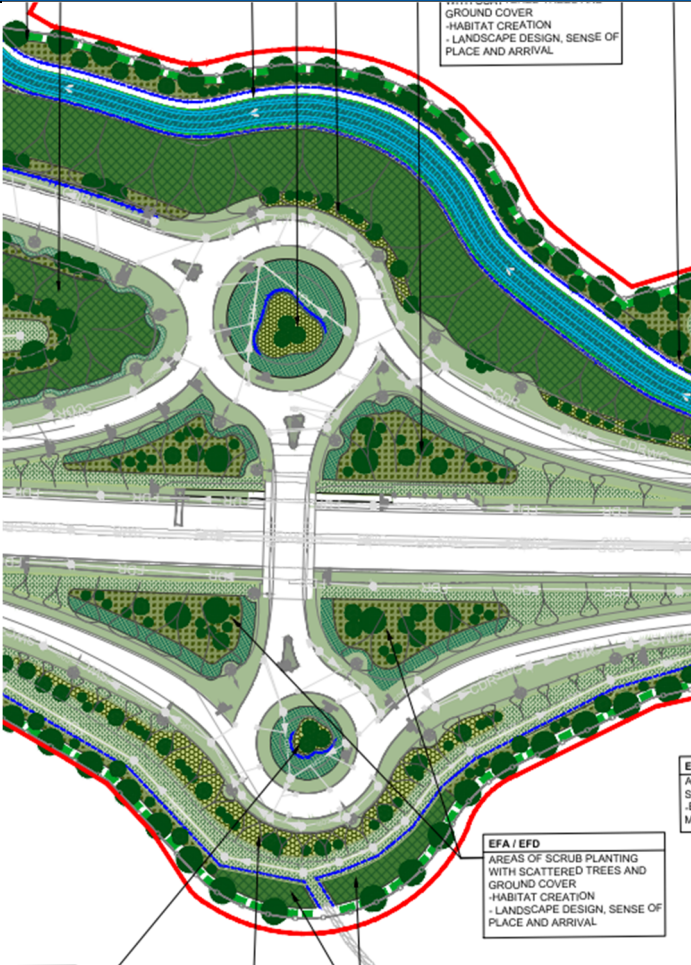

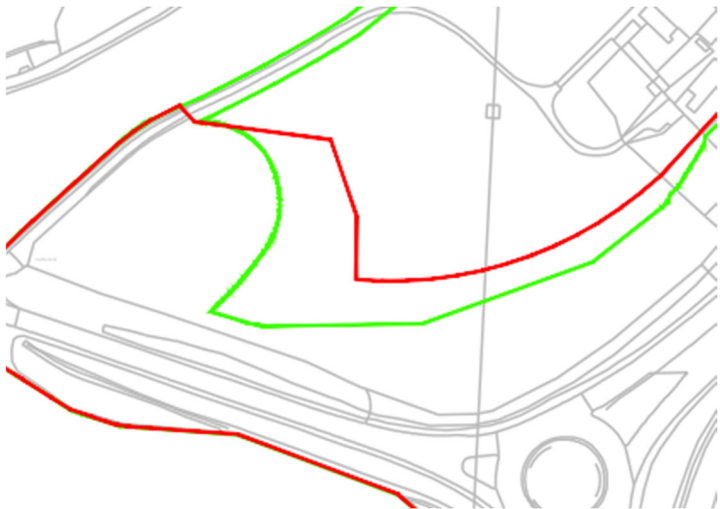



Design element	Change since statutory consultation	Changes to the design
		

Table 3-10: Changes to the Order Limits since statutory consultation

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)	
<p>1. Clifford Bridge Road roundabout</p> 	<p>Order Limits extended to accommodate works associated with the proposed pedestrian crossing on the B4082, if needed. This involves installing loops within the carriageway of the roundabout and extending the pedestrian guard rails around the south-east corner of the roundabout.</p>

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)	
<p>2. Southern detention basin</p> 	<p>To accommodate the change in orientation of the detention basin and to allow an increase in vegetation planting connecting the detention basin towards Hungerley Hall Farm.</p>
<p>3. Haul road behind Hungerley Hall Farm</p> 	<p>A change in construction methodology has resulted in the haul road behind Hungerley Hall Farm no longer being required. Construction traffic will now enter the satellite compound directly off the A46 mainline and the B4082 (new link road alignment) will be used as a haul road.</p>

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)	
<p>4. Hungerley Hall Farm buildings</p> 	<p>The barns at Hungerley Hall Farm have been included within the Order Limits due to their poor condition, in the event that mitigation is required to reduce any risk of collapse.</p>
<p>5. Hungerley Hall Farm access</p> 	<p>The requirement for a new access to Hungerley Hall Farm has resulted in a change to the Order Limits immediately north of the farm buildings.</p>

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)

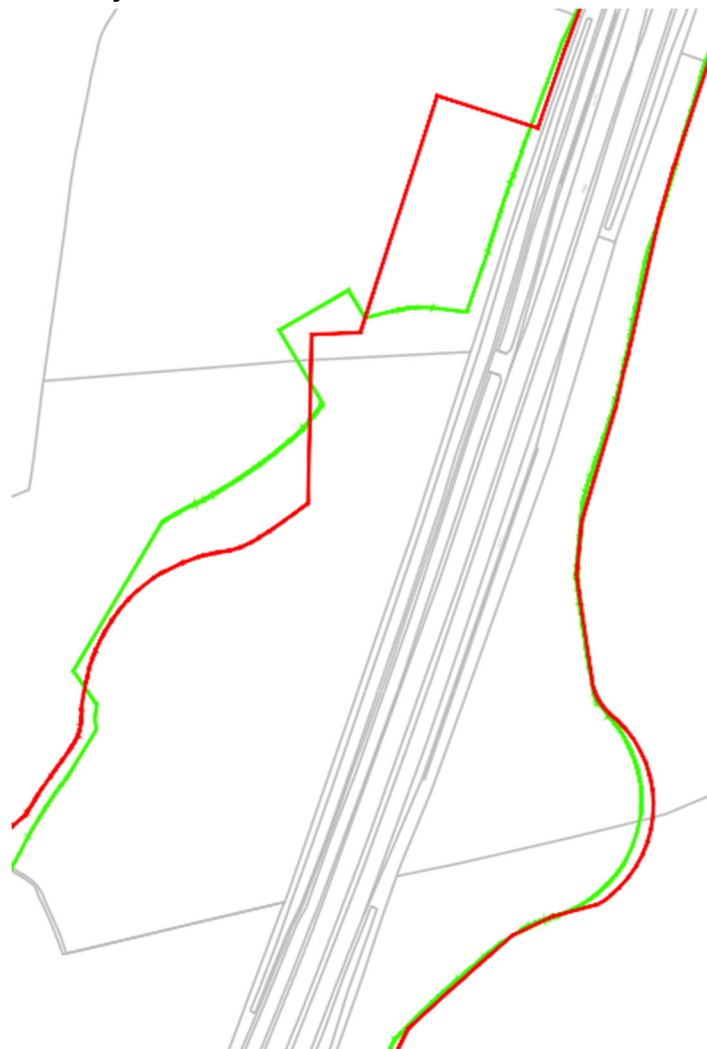
6. West of B4082



The Order Limit has been moved further west along this section of the new B4082 between Hungerley Hall Farm and the new dumbbell junction. This allows for more landscape planting to be provided, a maintenance access strip and a wider working width during construction. At the un-named ditch currently in the location of the dumbbell roundabout the Order Limits have been increased to accommodate this watercourse connection. The new highways drainage ditch along the western toe of the new B4082 link road embankment will discharge into the un-named ditch and so the Order Limit has been increased to accommodate working widths.

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)


7. New dumbbell junction



The removal of the maintenance access to the northern drainage pond has resulted in a reduction in the Order Limits in this location.

However, additional temporary land is required further north for the satellite construction compound which will now also be the laydown area for the bridge deck construction.

The change to the Order Limits at the eastern dumbbell is due to design development relating to landscape mitigation.

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)	
<p>8. Environmental mitigation area</p>  The map shows a section of a road with several lanes. A green line follows the outer edge of the road, while a red line follows a different path, generally parallel to the green line but shifted in some areas. The red line forms a large triangular shape on the right side of the road. The green line is more complex, with several turns and loops. The background shows some buildings and other roads.	<p>The Order Limits have been adjusted to reflect the Coombe Abbey Park boundary to accommodate temporary works.</p>

Changes to the Order Limits (Green – statutory consultation Order Limits, Red – DCO application Order Limits)

9. Raised bund near Coombe Pool



The Order Limits have been moved eastwards into the SSSI to accommodate works needed to specific trees in relation to the repairs/replacement of the existing land ownership boundary fence.

Acronyms

Acronym	Meaning
AoD	Above Ordnance Datum
DCO	Development Consent Order
EAR	Environmental Assessment Report
EIA	Environmental Impact Assessment
ES	Environmental Statement
PRA	Preferred Route Announcement
PEIR	Preliminary Environmental Information Report
RPG	Registered Park and Garden
SSSI	Site of Special Scientific Interest
SOAR	Staged Overview of Assessment Report
SoCC	Statement of Community Consultation

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