M42 Junction 6 Development Consent Order
Scheme Number TR010027

8.29 Environmental Mitigation Table

Planning Act 2008

Rule 8 (1)(k)

The Infrastructure Planning (Examination Procedure) Rules 2010

Volume 8

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M42 Junction 6 Development Consent Order
Development Consent Order 202[ ]

Environmental Mitigation Table

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ExQ 1.3.1

EIA Methodology and Consultation

Highways England can confirm that paragraph 5.2.55 in Chapter 5 within Volume 1 of the Environmental Statement **[APP-050]** contains an incorrect reference to the embedded mitigation measures being presented within the Register of Environmental Actions and Commitments in Appendix 3.1 within Volume 3 of the Environmental Statement **[APP-172]**.

This should state that all embedded mitigation measures are reported within the mitigation sub-sections of the individual assessments reported in Chapters 6 to 15 within Volume 1 of the Environmental Statement, and that certain key embedded measures are presented in the Register of Environmental Actions and Commitments in Appendix 3.1 within Volume 3 of the Environmental Statement **[APP-172]**.

All embedded mitigation measures relied upon in Volume 1 of the Environmental Statement have been consolidated and reproduced in the table below for clarity, accompanied by details of how these are to be secured. Where the table refers to a plan or numbered Work, this indicates that the embedded mitigation is secured by way of the obligations in the DCO to carry out the consented development in accordance with that plan, or within the limits of deviation shown on the plan for that Work.

AIR QUALITY			
Ref	**Environmental Statement Reference**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
AIR1	Volume 1 Chapter 6	The proposed locations of the main site compound and associated storage areas have been identified to reduce the potential for impacts to sensitive receptors.	Works Plans **[APP-007]** DCO Requirement 3 **[APP-015]** Work No. 69 within Schedule 1 of the DCO **[APP-015]**
AIR2	Volume 1 Chapter 6	To reduce the generation of dust, temporary haul roads shall form part of the construction works to reduce, as far as practicable, construction related traffic movements on the local road network.	Works Plans **[APP-007]** DCO Requirement 3 **[APP-015]** DCO Requirement 10 **[APP-015]**
AIR3	Volume 1 Chapter 6	The mainline link road route alignment has been designed to reduce its proximity to Bickenhill village to reduce the potential for changes to operational air quality emissions at identified sensitive receptors within the village.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
CULTURAL HERITAGE			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
CH1	Volume 1 Chapter 7	The alignment and permanent land take requirements of the mainline link road have been developed to minimise the extent of truncation of the Bickenhill Conservation Area to facilitate the Scheme.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]**

			DCO Requirement 3 **[APP-015]**
CH2	Volume 1 Chapter 7	The mainline link road has been designed to position the majority of its length within an earthwork cutting, the objective being to visually contain much of the new carriageway and traffic movements from existing views available within the western fringes of Bickenhill Conservation Area, and to contain traffic-sourced noise which can also influence the setting of the area.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
CH3	Volume 1 Chapter 7	Lighting of new and improved sections of road within the Scheme has been confined to locations where road safety is a priority, in order to reduce the potential for light spill in night time views across the landscape.	DCO Requirement 3 **[APP-015]** The Applicant has produced a Lighting Strategy, which is being formalised in a Technical Note and will be made available to the Examining Authority on completion.
LANDSCAPE			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
LS1	Volume 1 Chapter 8	The new mainline link road has been designed to position the majority of its length within an earthwork cutting, the objective being to visually contain much the new carriageway and associated infrastructure and traffic movements from existing views available from residential properties and some Public Rights of Way in proximity to the corridor.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
LS2	Volume 1 Chapter 8	The placement of the new mainline link road beneath the level of the surrounding topography was also undertaken to reduce the visual awareness of the road in more distant views available from a range of locations within the surrounding landscape. The cutting slopes have generally been designed to a gradient of 1 in 3 to soften their appearance in the local landscape. The extent of landtake associated with M42 Junction 5A and B4102 Solihull Road (Solihull Road) overbridge has been minimised, where possible, to reduce encroachment into Aspbury's Copse ancient woodland.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
LS3	Volume 1 Chapter 8	Lighting of new and improved sections of road within the Scheme has been confined to locations where road safety is a priority, in order to minimise the potential for light spill in night time views across the landscape.	DCO Requirement 3 **[APP-015]** The Applicant has produced a Lighting Strategy, which is being formalised in a Technical Note and will be made available to the Examining Authority on completion.
LS4	Volume 1 Chapter 8	Signage provision has been designed to minimise the potential for visual clutter along new and improved roads.	DCO Requirement 3 **[APP-015]** The Applicant is working in collaboration

			with Solihull Metropolitan Borough Council to develop a robust signage strategy catering to the demands of the strategic and local road network.
LS5	Volume 1 Chapter 8	The extent of landtake associated with M42 Junction 5A and B4102 Solihull Road (Solihull Road) overbridge has been minimised, where possible, to reduce encroachment into Aspbury's Copse ancient woodland.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
LS6	Volume 1 Chapter 8	A planting strategy has been developed and incorporated into the design of the Scheme. This has been developed in accordance with the landscape design guidance and principles contained in DMRB Volume 10, and has taken into account the restrictions on introducing woodland and tree planting within Birmingham Airport's safeguarding zone.	Figure 8.3 **[APP-090]** DCO Requirement 5 **[APP-015]**
LS7	Volume 1 Chapter 8	The appointed contractor would be responsible for undertaking landscape management within the contract period, after which the longer term maintenance and management responsibilities would transfer to Highways England.	Outline Environmental Management Plan **[APP-172]**, which would be secured through DCO Requirement 4 **[APP-015]**. The Principal Contractor would be required to prepare a Construction Environmental Management Plan and a Handover Environmental Management Plan in accordance with the framework of measures contained within this document. DCO Requirement 5 **[APP-015]**
LS8	Volume 1 Chapter 8	The appointed contractor would be responsible for the preparation of a Handover Environmental Management Plan (HEMP) during the contract period. The purpose of the HEMP is to provide information relating to existing and future environmental commitments that would need to be delivered by those responsible for the future management and operation of the Scheme. The HEMP would include specific requirements concerning the long term maintenance and management of all landscaping incorporated into the Scheme.	Outline Environmental Management Plan **[APP-172]**, which would be secured through DCO Requirement 4 **[APP-015]**. The Principal Contractor would be required to prepare a Handover Environmental Management Plan in accordance with the framework of measures contained within this document. Figure 8.3 **[APP-090]** DCO Requirement 5 **[APP-015]**
LS9	Volume 1 Chapter 8	The planting strategy for the Scheme has sought, where possible, to incorporate tree, shrub, scrub and grassland species that would not only provide an essential landscape mitigation (screening and integration) function, but also offer biodiversity benefits.	Figure 8.3 **[APP-090]** DCO Requirement 5 **[APP-015]**
BIODIVERSITY			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
BIO 1	Volume 1 Chapter 9	The Scheme has been designed so that impacts upon important habitats (comprising woodland, grassland, hedgerow and ponds) are avoided or reduced, where reasonably practicable, through the retention of existing habitat and the creation or replacement of habitat.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]**

		The development of planting measures as part of the landscape assessment has been informed by the outcomes of the biodiversity assessment, a key objective being to identify measures that, wherever possible, provide a combined function of landscape integration and/or screening, and habitat creation and replacement, to mitigate effects on biodiversity interests. Habitat creation and replacement measures incorporated into the Scheme have accordingly focused on: the use of planting along sections of the new mainline link road, to minimise the risk of mortality to barn owls from traffic collisions; the creation of grassland habitats on earthwork slopes and within severed or redundant land parcels within the Order Limits, to mitigate for the loss of habitat to the Scheme; and mitigating effects on existing ecological networks and habitats through the planting of hedgerows (12km), trees and scrub (8.09ha), woodland (3.30ha) and grassland (34.86ha) at locations across the Scheme, taking into account the restrictions on introducing woodland and tree planting within Birmingham Airport's safeguarding zone.	Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
BIO 2	Volume 1 Chapter 9	Much of the new mainline link road will be positioned within an earthwork cutting which will help to contain operational road noise and reduce indirect effects associated with the degradation of habitats adjacent to the road corridor.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
BIO 3	Volume 1 Chapter 9	The design of the Scheme includes earthwork slopes that are predominantly of 1 in 3 gradient. A narrower footprint has been created by steepening slopes to reduce the total area of permanent landtake required to minimise habitat loss.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
BIO 4	Volume 1 Chapter 9	The extent of landtake associated with M42 Junction 5A and Solihull Road overbridge has been minimised as far as possible within acceptable design and safety limits, to reduce encroachment into Aspbury's Copse ancient woodland.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
BIO 5	Volume 1 Chapter 9	Lighting of new and improved sections of roads within the Scheme have been confined to locations where road safety is a priority, in order to minimise the potential for light spill into adjacent habitats.	DCO Requirement 3 **[APP-015]** The Applicant has produced a Lighting Strategy, which is being formalised in a Technical Note and will be made available to

			the Examining Authority on completion.
BIO 6	Volume 1 Chapter 9	Impacts upon the most important habitats within the Order Limits will be addressed through translocation techniques, the strategies for which will be based on best practice and have been agreed through consultation with Natural England.	Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
BIO 7	Volume 1 Chapter 9	The following receptor areas for translocated habitats have been located such that they form an integral part of the green infrastructure, thereby maintaining connectivity with similar habitats and the wider landscape. A soil receptor site to mitigate the loss of grassland from Castle Hill Farm Meadows Local Wildlife Site has been identified to maintain connectivity with the retained habitats of the site. The receptor site will form part of a larger area of grassland creation that will lie adjacent to the notable grassland of Bickenhill Meadows Site of Special Scientific Interest and the highway soft estate. The strategy for grassland translocation at Castle Hill Farm Meadows Local Wildlife Site will be based on best practice. The key points of the approach are summarised below, the final details of which will be informed by a soil survey of donor and receptor sites prior to construction: a) the translocation will be completed under the supervision of an appropriately qualified Ecological Clerk of Works; b) every effort will be made to ensure the translocation will only take place during the autumn, but if this is not possible then it will be completed in early spring and will avoid periods when ground conditions are unsuitable, i.e. too wet and/or frosty and/ or during extreme weather conditions; c) the full extent of the donor grassland and receptor sites will be identified and marked out prior to the translocation of soils, with fencing and signage used to protect the area as appropriate; d) controlled access routes and low ground-pressure vehicles will be used to avoid unnecessary compaction of soils; e) the translocation will involve only the soil A-horizon from the donor site to a depth of up to 40cm as determined by the on-site conditions; f) there will be no storage of any soils prior to use; translocation of soils will be undertaken in the same 24 hour period; g) the laying of soils will be undertaken in strips the working width of an excavator; no machinery will run on the re-laid soils; and h) the laying of soils will be arranged as far as it practicable in a manner that replicates the existing topography and aspect of the donor site. The loss of hedgerows that are of County importance, and for which there is evidence that they have been established for a long period of time (hedgerows H35 and H42), will be mitigated through their translocation into the retained habitats within the Order Limits. Any sections of these hedgerows that cannot be retained and translocated as a consequence of construction will be replaced or gaps filled where necessary. The approach to hedgerow translocation has been developed to optimise connectivity with retained hedgerows or other	Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan). DCO Requirement 4 **[APP-015]** DCO Requirement 5 **[APP-015]**

		habitats, such as woodland and ponds. Soil translocation will also be implemented as part of measures to compensate the effects of the Scheme on the ancient woodland of Aspbury's Copse potential Local Wildlife Site.	
BIO 8	Volume 1 Chapter 9	The drainage strategy for the Scheme has been developed to manage surface water runoff in accordance with current highway design standards. The strategy includes treatment measures to mitigate pollution to likely higher standards than exist at present, which will assist in mitigating any effects on aquatic and riparian species and habitats. Due to the potential risk of large waterbodies attracting birds within Birmingham Airport's safeguarding zone, the drainage strategy for the Scheme has avoided introducing large bodies of open water close to the airport to minimise the potential for bird strike. Alternative measures comprising reed beds and swales have been incorporated into the design of the Scheme to match habitats found in the local area, for example the grassland habitats of Bickenhill Meadows Site of Special Scientific Interest and Castle Hill Farm Meadows Local Wildlife Site. The design of these wetland features has been developed with the objective of supporting a range of aquatic and inundation communities, in addition to their primary function of holding and treating road runoff.	Drainage Strategy Report **[APP-160]** DCO Requirement 4 **[APP-015]** DCO Requirement 6 **[APP-015]** DCO Requirement 8 **[APP-015]**
BIO 9	Volume 1 Chapter 9	The horizontal alignment of the new mainline link road has been moved as far to the east of Bickenhill Meadows Site of Special Scientific Interest (North Western unit) during the design-development process, to maximise the distance from this unit, which is 100m from the new mainline link road at its closest point.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
BIO 10	Volume 1 Chapter 9	A pumped mitigation solution has been developed to mitigate for the loss of surface water catchment at Shadowbrook Meadows South Eastern. The design principles of the pumped solution consist of a collection drain on the western slope of the new mainline link road cutting to intercept surface water flows that would otherwise have drained towards the Site of Special Scientific Interest. The collection drain would discharge to a sealed collection sump, from where water would be pumped and/or captured from an alternative water source(s) to an appropriate reed bed/ditch feature in the vicinity of Shadowbrook Meadows South Eastern. This feature would act as a recharge trench, from which water would drain through to the sand, gravel and clay deposits in the upper layers of the substrata within the Site of Special Scientific Interest. The above design principle has been developed in consultation with and agreed in principle with Natural England. Highways England will continue to refine the mitigation solution using: data obtained from ongoing dipwell monitoring; and information gathered from further analysis of the local topography and existing water sources. These refinements will seek to identify a sustainable drainage mechanism to mitigate the effects of the Scheme on Bickenhill Meadows Site of Special Scientific Interest. Highways England will seek to agree any refinements to the mitigation approach with Natural England prior to commencement of the Scheme.	Work No. 76 within Schedule 1 of the DCO **[APP-015]** Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**

		Further monitoring will be undertaken at both units of the Site of Special Scientific Interest during construction and the first five operational years of the Scheme. This will include hydrological and vegetation monitoring to determine the success of the mitigation solution, which will be evaluated by the flow of water to the Site of Special Scientific Interest and the extent of the dependent wet grassland habitats, the objective being to maintain the conservation status of the interest features of the Site of Special Scientific Interest.	
BIO 11	Volume 1 Chapter 9	Mammal tunnels (and associated guide fencing) will be installed at the northern and southern ends of the new mainline link road to aid the safe crossing of the road by badgers and other animals, and to mitigate the risks of increased mortality of wildlife once the road becomes operational and used by traffic.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]** Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
BIO 12	Volume 1 Chapter 9	Bat boxes will be sited on retained trees to provide alternative roosting opportunities for the local bat population, and if required (for confirmed high status roosts only), like-for-like roost replacement will be provided.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]** Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
BIO 13	Volume 1 Chapter 9	Two receptor sites have been identified for the translocation of GCN that are in close proximity to the GCN ponds, and within which planting, log piles and hibernacula will be used to mitigate for terrestrial habitat lost elsewhere to the Scheme.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]** Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
BIO 14	Volume 1 Chapter 9	Breeding and wintering habitat for birds, currently provided by hedgerows, scrub and grassland, will be lost to the Scheme. This loss will be mitigated through the habitat creation and replacement measures, which comprise hedgerows, woodland, scrub and grassland habitat that have been incorporated into the design of the Scheme.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]** Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).

BIO 15	Volume 1 Chapter 9	Mitigation for terrestrial invertebrates in relation to the loss of woodland comprises a combination of the establishment of new woodland and the retention of deadwood habitat.	Environmental Masterplan **[APP-095]** DCO Requirement 5 **[APP-015]** Biodiversity Management Plan, which will be secured through an amendment to the dDCO under Requirement 4 (this does not currently refer to the Biodiversity Management Plan).
GEOLOGY AND SOILS			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
GEO1	Volume 1 Chapter 10	The mainline link road has been designed to minimise the potential for interacting with known contaminated land, so thus reduce the likelihood for disturbance.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
GEO 2	Volume 1 Chapter 10	The extent of land take to construct the Scheme has been designed to minimise the overall footprint so as to reduce the loss of agricultural soils.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
GEO 3	Volume 1 Chapter 10	The possibility of cut/embankment slopes being susceptible to erosion have been reduced through design, by means of drainage and appropriate gradient of cutting slopes, primarily around the mainline link road where cutting would be at a gradient of 1:3 to 1:2.5.	Works Plans [APP-007] General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
GEO 4	Volume 1 Chapter 10	The long-term risk associated with corrosive chemical attack on infrastructure will be further considered during detailed design; however, the broad design principles of appropriate construction material use has been applied to the Scheme, for example, the construction of the new Solihull Road overbridge and the new pedestrian overbridge over the A45 at Church Lane.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
MATERIALS			
Ref	**Mitigation Type**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
MAT1	Volume 1 Chapter 11	The design of the Scheme, and the planned approach to its construction, have been developed to achieve efficiencies in materials and waste, the main objectives being to reuse and recycle site-won materials on-site wherever possible, to minimise the need to import construction materials to site, and to reduce the quantity of waste to be exported off-site.	DCO Requirement 3 **[APP-015]**
MAT	Volume 1 Chapter 11	The following principles have been considered when designing the Scheme and developing	DCO Requirement 3 **[APP-015]**

2		the approach to its construction: a. reuse of excavated materials and the recycling of demolition materials within the Scheme; b. managing waste in accordance with the waste hierarchy, with a focus on designing-out and preventing waste arising where possible, and diverting waste from landfill through off-site recycling and recovery; and c. using other recycled and secondary materials during construction, where practicable.	Materials Management Plan and Site Waste Management Plan, comprising secondary plans within the framework of the Outline Environmental Management Plan **[APP-172]** and Construction Environmental Management Plan which would be secured through DCO Requirement 4 **[APP-015]**.
MAT 3	Volume 1 Chapter 11	The retention of existing highways infrastructure within the design at the following locations formed a key consideration in the design-development process, which has accordingly avoided the need to demolish and remove components that would have contributed to the total materials and waste generated by the Scheme: a. East Way bridge structure – this structure was originally identified for demolition and replacement within the design presented at the Preferred Route Announcement stage; however, further design work concluded that this could be retained and accommodated within the Scheme design; b. Clock Interchange – by undertaking widening and junction modifications, the design has retained the existing form and layout of the interchange and has avoided the need to replace this with a new junction configuration; and c. M42 motorway – works required along the M42 motorway, north and south of M42 Junction 6, include the retention of several existing overhead gantries and emergency refuge areas.	DCO Requirement 3 **[APP-015]** Materials Management Plan and Site Waste Management Plan, comprising secondary plans within the framework of the Outline Environmental Management Plan **[APP-172]** and Construction Environmental Management Plan which would be secured through DCO Requirement 4 **[APP-015]**.
MAT 4	Volume 1 Chapter 11	The Scheme has been designed to facilitate the reuse, where possible, of acceptable material arisings from earthworks cuttings and other excavations. These include materials won from the earthworks to position the mainline link road in cutting, which would be utilised to form the earthwork embankments for M42 Junction 5A and Barber's Coppice Roundabout.	Works Plans **[APP-007]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]** Materials Management Plan and Site Waste Management Plan, comprising secondary plans within the framework of the Outline Environmental Management Plan **[APP-172]** and Construction Environmental Management Plan which would be secured through DCO Requirement 4 **[APP-015]**.
MAT 5	Volume 1 Chapter 11	The design of the Scheme includes earthworks that are predominantly of 1 in 2.5 and 1 in 3 gradient, the narrower footprint of which has reduced the volume of materials generated from cuttings and that required to form embankments. Earthworks comprising soil nailing have also been incorporated into the design at specific locations, further reducing the need for excavations.	Works Plans **[APP-007]** Engineering Drawings and Sections **[APP-013]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**

MAT 6	Volume 1 Chapter 11	Underpass structures incorporated into the design of the Scheme have been designed to be precast, in order to minimise waste generated on site.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
MAT 7	Volume 1 Chapter 11	In calculating the overall quantities of materials and waste for the Scheme, the approach to construction incorporates the on-site reuse or recycling of approximately 75% of the total hard demolition arisings, comprising concrete, brick and block and asphalt planings generated from the required demolition of an existing building, bridge and sections of road, and aggregates from temporary works. These materials would be used within the Scheme for ground improvements, within sub-bases, and for temporary works, and would be processed on-site. Approximately 25% of hard demolition arisings are expected to arise at the end of the construction programme and these materials are expected to be recycled on-site or off-site for subsequent use off-site on the open market. A small proportion (approximate 5%) of hard demolition arisings are expected to be unsuitable for recovery.	Materials Management Plan and Site Waste Management Plan, comprising secondary plans within the framework of the Outline Environmental Management Plan **[APP-172]** and Construction Environmental Management Plan which would be secured through DCO Requirement 4 **[APP-015]**.
NOISE AND VIBRATION			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
NOI 1	Volume 1 Chapter 12	To mitigate construction-related effects, the proposed locations of the main site compound and associated storage areas have been identified to reduce the potential for impacts to sensitive receptors.	Works Plans **[APP-007]** Engineering Drawings and Sections **[APP-013]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
NOI 2	Volume 1 Chapter 12	The appointed Contractor for the Scheme will be required to develop and implement a Traffic Management Plan for the construction phase. The Traffic Management Plan will present the haul routes and road management procedures used to manage traffic movements within the works, construction compounds and on the local road network in the vicinity of the closest noise sensitive receptors.	DCO Requirement 4 **[APP-015]** DCO Requirement 10 **[APP-015]**
NOI 3	Volume 1 Chapter 12	To mitigate operational phase effects, the following measures have been incorporated into the design of the Scheme: a. the mainline link road has been predominately positioned in cutting to minimise the noise impacts on the local environment; and b. M42 Junction 5A including slip roads and the mainline link road would be constructed with a thin surface course system, with the north facing slip roads and free flow links at Junction 6 also be constructed with a thin surface course system, which results in lower levels of noise generation than a standard hot rolled asphalt surface at speeds ≥75 km/hr, to reduce noise at source.	Works Plans **[APP-007]** Engineering Drawings and Sections **[APP-013]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
POPULATION AND HEALTH			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
PH 1	Volume 1 Chapter 13	Measures incorporated into the design of the Scheme to avoid or mitigate impacts and effects on agricultural land interests include:	Works Plans **[APP-007]**

		• designing earthworks along the new mainline link road and its junctions from to 1 in 3 with local steepening to 1 in 2.5 gradients, to reduce the extent of permanent land take within agricultural holdings and the loss of Best and Most Versatile land; • the incorporation of severed and/or inaccessible land parcels into the design of the Scheme, where appropriate and reasonably practicable, as part of environmental mitigation works; • reinstating boundaries with fencing and hedgerows where components of the Scheme, for example the new mainline link road, would sever established field boundaries; • the use of underground storage tanks as part of the treatment train for road runoff, which avoid permanent land take within agricultural fields; • providing a combined Non-Motorised User and farm access accommodation bridge over the new mainline link road, north west of M42 Junction 5A, to maintain access between fields on both sides of the road; and • provision of a new private means of access running parallel to the western edge of the northbound carriageway of the new mainline link road, commencing from just south of Shadowbrook Lane and continuing north to The Haven Caravan Park, which would be used by landowners to gain access to fields to the west of the new mainline link road.	Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
PH 2	Volume 1 Chapter 13	Measures incorporated into the design of the Scheme to avoid or mitigate adverse impacts associated with the severance or loss of routes used by Non-Motorised Users include: • a combined Non-Motorised User and farm access accommodation bridge over the new mainline link road, north west of M42 Junction 5A, to enable safe crossing over the road; • a grade separated pedestrian footway/cycle path (overbridge) over the A45 to replace the existing footway/cycle path at Clock Interchange and to ensure safe crossing over the A45; • upgrades to the combined footway/cycleway on the southern edge of the A45 to accommodate Non-Motorised Users redirected from the footpath/cycleway at M42 Junction 6; • construction of a pedestrian underpass beneath the free flow link between the new mainline link road and Airport Way to allow continued movement of Non-Motorised Users between the footbridge on A45 and footpaths to the west of the study area; • repurposing of redundant sections of the Catherine-de-Barnes Lane to footways and cycleways; • two new overbridges along the realigned Catherine-de-Barnes Lane with pedestrian and cycle facilities (Catherine-de-Barnes Lane south overbridge) and pedestrian facilities (Catherine-de-Barnes Lane north overbridge) connecting M42 Junction 5A and Clock Interchange, to enable users of the Public Rights of Way network to cross the new mainline link road, and a new pedestrian cycleway/footway constructed adjacent to the northbound carriageway between Bickenhill Roundabout and Catherine-de-Barnes Lane.	Works Plans **[APP-007]** Streets, Rights of Way and Access Plans **[APP-009]** DCO Requirement 3 **[APP-015]**
PH 3	Volume 1 Chapter 13	For motorised travellers, safety measures included in the design relate to the provision of signage and signalling, increased verge width to accommodate highway features such as	Works Plans **[APP-007]**

		signs, vehicle restraint systems, communication equipment and laybys, and central reserves providing appropriate visibility.	DCO Requirement 3 **[APP-015]** The Applicant is working in collaboration with Solihull Metropolitan Borough Council to develop a robust signage strategy catering to the demands of the strategic and local road network.
PH 4	Volume 1 Chapter 13	The Scheme includes land within the Order Limits to reconfigure the Warwickshire Gaelic Athletic Association sports facility adjacent to the existing sports facility in order to ensure its continued operation.	Works Plans **[APP-007]** DCO Requirement 3 **[APP-015]** Work No. 68 within Schedule 1 of the DCO **[APP-015]**
ROAD DRAINAGE AND THE WATER ENVIRONMENT			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
DW 1	Volume 1 Chapter 14	A number of tanks, reed beds and swales have been incorporated into the overall water management strategy. These have been designed to mimic natural drainage as far as practicable and to provide a number of other benefits to ecological habitat creation.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Environmental Masterplan **[APP-095]** DCO Requirement 3 **[APP-015]**
DW 2	Volume 1 Chapter 14	A drainage strategy (incorporating the use of SuDS) will be implemented as part of the Scheme to manage surface water runoff and accidental spillages that may drain to watercourses. SuDs are the preferred solution they provide a number of functions, including, a way to minimise the risk and impact of flooding in addition to potentially providing a degree of treatment for pollutants.	Drainage Strategy Report **[APP-160]** DCO Requirement 4 **[APP-015]** DCO Requirement 6 **[APP-015]** DCO Requirement 8 **[APP-015]**
DW 3	Volume 1 Chapter 14	Attenuation has been incorporated to control any increase in the rate of flow towards the impacted watercourses resulting from increased impermeable road areas. Without attenuation increased flows may result in bank erosion, increased sediment loading, greater flooding and increased pollution to the impacted watercourses. The specific treatment approach adopted for each road catchment has been designed to reflect the extent of flow attenuation and pollutant treatment required, as well as to reflect stakeholder concerns.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
DW 4	Volume 1 Chapter 14	Flow attenuation and water quality treatment measures are included variously in the form of filter drains, reed bed areas, proprietary storage tank systems, vortex grit separators and swales. The treatment train specifications for each road catchment are described in more detail within the Drainage Strategy Report.	Drainage Strategy Report **[APP-160]** Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Environmental Masterplan **[APP-095]**

			DCO Requirement 3 **[APP-015]**
DW 5	Volume 1 Chapter 14	The Drainage Strategy has been designed in accordance with HD33/16, ensuring no surcharge for a 1 in 1 year return period and no flooding in a 1 in 5 year return period. The network has been designed including a 20% increase in rainfall intensity to consider the effects of climate change. Peak discharge rates are to be controlled and SuDS that discharge to a watercourse would accommodate the 1 in 100 year return period +40%. For culverts that convey permanent watercourses beneath roads the flow rate has been assessed for return periods up to 100 years.	Drainage Strategy Report **[APP-160]** DCO Requirement 3 **[APP-015]**
DW 6	Volume 1 Chapter 14	The number of new surface water outfalls has been minimised where possible and the drainage strategy makes use of numerous existing outfalls from the M42 and surrounding network, in order to prevent construction of unnecessary structures along the river bank. For the new outfalls, pre-fabricated concrete headwalls would be used where possible to avoid the need for pouring wet concrete close to the watercourse as this represents a spillage risk.	Drainage Strategy Report **[APP-160]** DCO Requirement 3 **[APP-015]**
DW 7	Volume 1 Chapter 14	The attenuation reed beds have been located out of Flood Zones 2 and 3, with the exception of the northernmost tip of the reed bed discharging to Hollywell Brook to the northeast of M42 Junction 6. However, the majority of this reed bed is located in Flood Zone 1 and it has embanked edges thereby reducing the risk of receiving flood waters from Hollywell Brook.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
DW 8	Volume 1 Chapter 14	Pre-earthworks drainage would be installed to convey land runoff/intercepted existing land drainage. This would take the form of filter drains or ditches and would be particularly important at the top of cuttings and toe of embankments. Both approaches would provide a degree of treatment for pollutants, although land runoff would be unlikely to have a high pollutant load when compared to road runoff and does not require further treatment.	DCO Requirement 3 **[APP-015]**
DW 9	Volume 1 Chapter 14	Ditches are simpler to construct and maintain, fit in with the existing drainage philosophy and have higher capacities than typical filter drains but require more land so are not viable at constrained locations. They also tend to collect litter, although litter picking would be included in the requisite maintenance schedules for the Scheme. Filter drains use stone resources which typically need to be cleaned or replaced every ten to 15 years, as is standard practice for highway maintenance.	DCO Requirement 3 **[APP-015]**
DW 10	Volume 1 Chapter 14	In general, the pre-earthworks ditches tie in to the existing road outfalls that are being utilised by the Scheme or to those new outfalls that are included for drainage of the new link road.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]**
DW 11	Volume 1 Chapter 14	A pumped mitigation solution has been developed to mitigate for the loss of surface water catchment at Shadowbrook Meadows South Eastern unit. The design principles of the pumped solution consist of a collection drain on the western slope of the new link road cutting to intercept surface water flows that would otherwise have drained towards the Site of Special Scientific Interest. The collection drain would discharge to a sealed collection sump, from where water would be pumped and/or captured from an alternative water source(s) to an appropriate reed bed/ditch feature in the vicinity of Shadowbrook Meadows South Eastern unit. This feature would act as a recharge trench, from which water would drain through to the sand, gravel and clay deposits in the upper layers of the substrata within the Site of Special Scientific Interest. The above design principle has been developed in consultation with and agreed in principle with Natural England.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** DCO Requirement 3 **[APP-015]** Work No. 76 within Schedule 1 of the DCO **[APP-015]**

		Highways England will continue to refine the mitigation solution using: data obtained from the ongoing dipwell monitoring; and information gathered from further analysis of the local topography and existing water sources. These refinements will seek to identify a sustainable drainage mechanism to mitigate the effects of the Scheme on Bickenhill Meadows Site of Special Scientific Interest. Highways England will seek to agree any refinements to the mitigation approach with Natural England prior to commencement of the Scheme.	
DW 12	Volume 1 Chapter 14	Extension of any replacement of culverts have been designed in such a way as to minimise the potential adverse hydromorphological, water quality and biological impacts of the structure, while being large enough to convey flood flows.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
DW 13	Volume 1 Chapter 14	The base of each culvert would be sunken below the current bed level and backfilled with a suitable grade substrate to ensure a naturalised bed is provided through the extended culvert structure. With the exception of Hollywell Brook, there is limited evidence along these small watercourses of any functional flows and processes. However, the provision of a naturalised bed would help to maintain channel/process continuum. Culverts have been sized appropriately to carry the watercourse without constriction or narrowing, and would be no smaller than the size of existing culverts to ensure that they do not accumulate sediment upstream due to afflux caused by too narrow a culvert.	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
DW 14	Volume 1 Chapter 14	Realignment or regrading of minor drainage ditches would be required at the following locations: a. realignment and regrading of a minor ditch off Catherine-de-Barnes Lane, to the southwest of the proposed Barber's Coppice roundabout (SP 18361 81081); b. regrading of minor ditch off Catherine-de-Barnes Lane, to the northwest of the proposed Barber's Coppice roundabout (SP 18348 81187); c. diversion and realignment of a minor ditch to the southeast of Bickenhill roundabout (SP 18771 83175); and d. realignment of a minor ditch adjacent to the M42, immediately north of Hollywell Brook (SP 19917 83685).	Works Plans **[APP-007]** General Arrangement Plans **[APP-008]** Engineering Drawings and Sections **[APP-013]** DCO Requirement 3 **[APP-015]**
CLIMATE			
Ref	**Source Ref**	**Action / commitment**	**Reporting Criteria / DCO Requirement**
C1	Volume 1 Chapter 15	The incorporation of SuDS to handle road runoff and provide resilience against potential future flood events associated with climate change.	Works Plans **[APP-007]** DCO Requirement 3 **[APP-015]**
C2	Volume 1 Chapter 15	The use of energy efficient road lighting to reduce energy consumption during operation of the Scheme.	DCO Requirement 3 **[APP-015]** The Applicant has produced a Lighting Strategy, which is being formalised in a Technical Note and will be made available to the Examining Authority on completion.

C3	Volume 1 Chapter 15	The incorporation of variable messaging systems to provide resilience during severe weather events.	DCO Requirement 3 **[APP-015]** The Applicant is working in collaboration with Solihull Metropolitan Borough Council to develop a robust signage strategy catering to the demands of the strategic and local road network.
C4	Volume 1 Chapter 15	The specification and installation of highway equipment capable of withstanding high temperatures (including electrical equipment comprising information and communication systems, bridge joints and paved surfaces) arising from severe weather events,	DCO Requirement 3 **[APP-015]**
C5	Volume 1 Chapter 15	The retention of existing highways infrastructure (East Way bridge structure, Clock Interchange and M42 motorway overhead gantries and emergency refuge areas) within the Scheme design to reduce GHG emissions associated with demolition activities and the transportation of associated arisings off-site.	Works Plans **[APP-007]** DCO Requirement 3 **[APP-015]**
C6	Volume 1 Chapter 15	The reuse, where possible, of materials and arisings generated from construction works, to minimise GHG emissions associated with their transportation off-site and from the importation of materials to site.	DCO Requirement 3 **[APP-015]** Materials Management Plan and Site Waste Management Plan, comprising secondary plans within the framework of the Outline Environmental Management Plan **[APP-172]** and Construction Environmental Management Plan which would be secured through DCO Requirement 4 **[APP-015].**
C7	Volume 1 Chapter 15	The inclusion of new or diverted footpaths and cycleways at strategic points across the Scheme (including across A45 Coventry Road and across Green Man Trail) to preserve and improve non-motorised user connectivity and journeys, thereby promoting alternative non-motorised modes of transport to reduce GHG emissions.	Works Plans **[APP-007]** Streets, Rights of Way and Access Plans **[APP-009]** DCO Requirement 3 **[APP-015]**
C8	Volume 1 Chapter 15	The implementation of emergency systems and response plans, including the identification of suitable network redundancies and diversion routes, to respond to severe weather events.	DCO Requirement 3 **[APP-015]**
C9	Volume 1 Chapter 15	The implementation of management and inspection procedures for road systems, drainage systems and landscaping to maintain or lengthen lifetime of assets.	DCO Requirement 3 **[APP-015]**