

# M25 junction 10/A3 Wisley interchange

## Requirement 12 Stratford Brook



## Notice

This document and its contents have been prepared and are intended solely for Highways England's information and use in relation to M25 Junction 10 Improvement. Atkins Limited assumes no responsibility to any other party in respect of or arising out of or in connection with this document and/or its contents.

## Document control

The Project Manager is responsible for production of this document, based on the contributions made by his/her team existing at each Stage

## Revision History

Revision	Suitability	Purpose/ Description	Originated	Checked	Reviewed	Authorised	Date
P03	S4	For submission to Secretary of State	EL	MH	NDW	DS	09/06/22
P02	S3	Updated for Req 12 document	EL	MH	NDW	DS	14/04/22
P01	S3	First Draft	EL	MH	NDW	AEM	21/09/21

The original format of this document is copyright to Highways England

# Table of contents

Chapter	Pages
<b>1. Introduction</b>	<b>4</b>
<b>2. Details of mitigation measures</b>	<b>5</b>
2.2 Stratford Brook habitat improvement	7
2.3 Reinstatement of riparian trees	7
2.4 Mammal passage on Stratford Brook underbridge	8
2.5 Fish easement	8
<b>3. Timetable</b>	<b>9</b>
3.1 Stratford Brook habitat improvement	9
3.2 Reinstatement of riparian trees	9
3.3 Mammal passage on Stratford Brook underbridge	10
3.4 Fish easement	10
<b>4. Management, monitoring and maintenance etc</b>	<b>11</b>
4.1 Stratford Brook habitat improvement	11
4.2 Reinstatement of riparian trees	11
4.3 Fish easement	12
<b>5. Consultation</b>	<b>12</b>
<b>Appendices</b>	<b>14</b>

## Tables

Table 2-1: Index of appendices for mitigation measures	6
Table 2-2: Mixed woodland planting mix	7
Table 3-1: timetable for the implementation of mitigation	9
Table 4-1: Programme of maintenance	11
Table 4-2: Frequency of monitoring	11
Table 5-1: Record of consultation on Stratford Brook	13

# 1. Introduction

- 1.1.1 Requirement 12 in Schedule 2 of the draft Development Consent Order deals with works to mitigate the effect of the Scheme on Stratford Brook. This document has been prepared to provide the details of the mitigation works. This is to enable the consultation with parties specified in the Requirement to take place and for the Secretary of State to approve the measures, after consideration of the consultation feedback, in due course.

The full text of the Requirement is set out below:

*(1) No part of the authorised development comprising Work No.33(b) (the new Stratford Brook underbridge) or Work No.54 (environmental mitigation works on land adjoining Stratford Brook) is to commence until details of the mitigation measures to be undertaken have been submitted to and approved in writing by the Secretary of State, following consultation with the Environment Agency and the relevant planning authority.*

*(2) Details to be approved under sub-paragraph (1) must be substantially in accordance with the measures described in the Environmental Statement, the REAC and the Water Framework Directive Assessment certified under article 45 (certification of documents, etc.) of this Order. The details must include—*

*(a) a timetable for the completion of the mitigation works; and*

*(b) a scheme for the maintenance, management and monitoring of the mitigation measures.*

*(3) The authorised development must be carried out, maintained, managed and monitored in accordance with the details approved under sub-paragraph (1) unless otherwise agreed by the Secretary of State following consultation with the Environment Agency, and under any necessary licences.*

- 1.1.2 This document provides the information needed for the discharge of this requirement. It provides an overview of the mitigation measures, a timetable for these to be implemented and details of the maintenance, management and monitoring of these measures. It also provides a record of consultation on these measures.

## 2. Details of mitigation measures

- 2.1.1 “Mitigation measures to address the impacts of the new Stratford Brook underbridge on the water environment were outlined in the Water Framework Directive Assessment and Biodiversity Chapter of Environmental Statement for the Scheme, which were submitted as part of the DCO application. These outlines were developed into designs as part of the detailed design of the Scheme.
- 2.1.2 Table 2-1 provides an index of relevant design documentation and where to locate it within this document for each of the mitigation measures.



**Table 2-1: Index of appendices for mitigation measures**

Title	Location in report	Document type	Document name	Document number
Stratford Brook habitat improvement	Appendix A.1	Report	Stratford Brook Habitat Improvements Design Note	HE551522-BBA-EWE-SCC_LR_STRATBR-RP-LW-000002
	Appendix A.2	Drawing	General Arrangement Plan, Stratford Brook	HE551522-BBA-ELS-SCC_LR_STRATBR-DR-LE-000001
	Appendix A.3	Drawing	Tree fall & Tree Deflector, Stratford Brook	HE551522-BBA-ELS-SCC_LR_STRATBR-DE-LE-000001
	Appendix A.4	Drawing	Securing Method, Stratford Brook	HE551522-BBA-ELS-SCC_LR_STRATBR-DE-LE-000002
	Appendix A.5	Drawing	Backwater, Stratford Brook	HE551522-BBA-ELS-SCC_LR_STRATBR-DE-LE-000003
	Appendix A.6	Report	Stratford Brook upstream mitigation area management plan	HE551522-BBA-EGN-SCC_LR_WISLEY-RP-LM-000011
Reinstatement of riparian trees	Appendix B.1	Drawing	Landscape and ecology design drawings	HE551522-BBA-ELS-WHL_AL_SCHME-DR-LL-000001
Mammal passage on Stratford Brook underbridge	Appendix C.1	Report	Provision of mammal passage beneath Stratford Brook Underbridge	HE551522-BBA-EEC-SCC_LR_STRATBR-RP-LE-000001
Investigation into feasibility of additional measures	Appendix D.1	Report	Stratford Brook Environmental Mitigation Feasibility Assessment	HE551522-BBA-EWE-SCC_LR_STRATBR-RP-LW-000001
	Appendix D.2	Report	Stratford Brook culvert (south) design note	HE551522-BBA-EWE-SCC_LR_STRATBR-RP-LW-000009
	Appendix D.3	Drawing	Stratford Brook fish easement general arrangement	HE551522-BBA-EWE-SCC_LR_STRATBR-DR-LW-000001
	Appendix D.4	Drawing	Stratford Brook fish easement details	HE551522-BBA-EWE-SCC_LR_STRATBR-DR-LW-000031

## 2.2 Stratford Brook habitat improvement

- 2.2.1 Stratford Brook is a narrow watercourse (approximately 1.5 m wide), which flows underneath the current A3 and A3 slip roads approximately east to west. Mitigation works to improve the habitat of the brook to mitigate for the effect of the proposed Stratford Brook underbridge are to be implemented along a 200m section of the watercourse upstream of the existing A3.
- 2.2.2 Although the Stratford Brook underbridge has been designed to minimise adverse effect on the brook it will increase shading of aquatic and riparian habitats, reducing the level of habitat complexity in this area. As a result, mitigation measures will be implemented. Details of the measures including the designs and the reasoning for them can be found in Appendix A.1 to A.5 and are briefly described below.
- 2.2.3 A backwater area will be created by lowering the bed level of part of an existing ditch. It will increase watercourse habitat complexity and provide a site of refuge from high flow for aquatic species and will provide additional wetted channel habitat connected to the main watercourse (Appendix A.2 and A.5).
- 2.2.4 Shading by riparian trees is a constraining factor which can limit the distribution of aquatic macrophytes within the Stratford Brook and by association in-channel and riparian habitat complexity. Selective tree/shrub works that will include clearance (including root mass) and felling and/or coppicing (depending on species) will be undertaken to improve the watercourse habitat and generate a more varied age structure along the riparian zone. Five daylighting areas along the watercourse will be created, along both the right and left bank (Appendix A.2).
- 2.2.5 Large wood features using logs and branches will be installed in five locations within the watercourse to add habitat complexity and improve local hydromorphological condition in keeping with the character of the watercourse. (Appendix A.2 to A.4).

## 2.3 Reinstatement of riparian trees

- 2.3.1 Vegetation clearance works are required to construct the new Stratford Brook underbridge, and in order to mitigate these losses riparian habitats (trees and shrubs) will be replaced in this location as shown in Appendix B.1.
- 2.3.2 **Table 2-2** sets out the species mix and percentages for each of the proposed planting mixes.

**Table 2-2: Mixed woodland planting mix**

%	Species	Common Name	Size	Form	Root Condition
25%	<i>Alnus glutinosa</i>	Alder	900-1200	Feathered	Bare Root
10%	<i>Salix cinerea</i>	Grey Willow	600-800	1+1 transplant	Bare Root
20%	<i>Salix caprea</i>	Goat Willow	600-800	1+1 transplant	Bare Root
10%	<i>Salix viminalis</i>	Violet Willow	600-800	1+1 transplant	Bare Root
25%	<i>Crateagus monogyna</i>	Hawthorn	400-600	1+1 transplant	Bare Root

%	Species	Common Name	Size	Form	Root Condition
5%	Betula pubescens	Downy Birch	400-600	1+1 transplant	Bare Root
2.5%	Corylus avellana	Hazel	400-600	1+1 transplant	Bare Root
2.5%	Prunus spinosa	Blackthorn	400-600	1+1 transplant	Bare Root

## 2.4 Mammal passage on Stratford Brook underbridge

- 2.4.1 The new Stratford Brook underbridge will allow mammal passage beneath the bridge during flood conditions. It was agreed through discussion with the Environment Agency that the 2 m clearance during the 100-year event provided by the bridge design would be acceptable, combined with the planting of hedges to guide mammal towards and beneath the underbridge. Details can be found in Appendix B.1 and C.1.

## 2.5 Fish easement

- 2.5.1 As part of the design work for the Stratford Brook underbridge an investigation into the feasibility of additional measures was undertaken (Appendix D.1) and, after consultation with the Environment Agency, it was agreed to provide a fish easement through Stratford Brook South culvert.
- 2.5.2 A fish easement will be installed through the Stratford Brook South culvert and this will involve the creation of a low flow channel through the existing concrete base of the culvert, and the addition of baffles to a concrete apron downstream. Details can be found in Appendix D.2 to D.4.



## 3. Timetable

### 3.1 Stratford Brook habitat improvement

3.1.1 The timetable for the implementation of the mitigation associated with the Stratford Brook habitat improvements is outlined in Table 3-1.

**Table 3-1: timetable for the implementation of mitigation**

Task	Timing
Backwater creation	
Survey riparian corridor and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	Complete
Mechanical excavation of the banks and bed of the ditch to provide additional wetted channel habitat connected to the main watercourse. Spoil will be removed from site.	May to July 2023
Create 'daylighting areas'	
Survey riparian corridor and identify trees with bat roost potential, veteran features, or significant value for saprophytic invertebrates (e.g. standing dead wood) and mark trees for retention.	Complete
Design a 'removals plan' which details where tree/scrub clearance / coppicing is required in consultation with the Environment Agency and adjacent landowner Taylor Wimpey. To include strategy for retaining arisings.	December 2022
Selective tree/shrub works that will include clearance (including root mass) and felling and/or coppicing (depending on species) will be undertaken. Five daylighting areas along the watercourse will be created, each nominally 100m <sup>2</sup> in area. At each daylighting area, nominally 10m of bank length, extending 5m into the riparian zone, will be daylighted along both the right and left bank. Trees will be checked for nesting birds before works are undertaken	January to March 2023
Introduce 'large wood features'	
Five large wood features will be installed in the watercourse in keeping with the character of the watercourse (wooded headwater). Appropriately sized large wood (typically 300mm to 500mm in diameter, 2m to 3m long) will be yielded from the local daylighting works and secured within the channel to prevent mobilisation during high flows.	May to July 2023

### 3.2 Reinstatement of riparian trees

3.2.1 These works will be undertaken in the planting season for bare-root plants from 1 November 2023 to 31 March 2024 inclusive subject to favourable weather conditions.

- 3.2.2 No planting or preparatory operations shall take place when the ground is frost bound, covered by snow, excessively wet or waterlogged or in excessively dry or windy conditions.

### **3.3 Mammal passage on Stratford Brook underbridge**

- 3.3.1 These works will be undertaken between September 2022 to May 2023

### **3.4 Fish easement**

- 3.4.1 These works will be undertaken between September 2022 to May 2023

## 4. Management, monitoring and maintenance etc

### 4.1 Stratford Brook habitat improvement

- 4.1.1 A management plan has been produced to cover the habitat improvement area (Appendix A.6). This covers a 15 year period from completion of the habitat improvement works. Management and monitoring frequencies are provided in Table 4-1 and Table 4-2.

**Table 4-1: Programme of maintenance**

Action					
Task	Responsibility	Season	5	10	15
Carry out selective tree removals/coppicing in daylighting areas.	Taylor Wimpey	Winter	Y	Y	Y

**Table 4-2: Frequency of monitoring**

Action			Years 1-15		
Task	Responsibility	Season	Year 1, 2, 3, 4 and 5	10	15
Fixed point photography	Taylor Wimpey	Late summer	Y (annually)	Y	Y
Habitat surveys (River corridor surveys or MORPH surveys)	Taylor Wimpey	Late summer	Y (annually)	Y	Y

### 4.2 Reinstatement of riparian trees

- 4.2.1 The objective of the mitigation is to reinstate riparian habitat (trees and shrubs) that was removed to facilitate construction of the underbridge. Maintenance will be undertaken for 60 months from the time of completion of planting works.
- 4.2.2 Used tree stakes, tubes, guards and ties deemed by the engineer to be no longer required shall be removed and disposed of off-site.
- 4.2.3 All planting areas will have weed control to a 1000mm diameter circle by non-residual herbicide carried out to each planting station 4 times per year in March, May, July and September. Where herbicide is used within 1 metre of the Stratford Brook or other water body, then a herbicide agreement will be obtained from the Environment Agency.
- 4.2.4 Residual herbicide application shall be applied to all planted areas once per year in January using a herbicide effective in cold weather.

#### Mammal passage on Stratford Brook underbridge

- 4.2.5 The objectives of the mitigation are to allow continued passage of mammal under the bridge. Management of the hedging provide may be required. This will be undertaken for 60 months after completion of the planting and will include the inspection of and re-securing and /or replacement of continuous mulch matting to hedgerows and the removal of weeds from the mulch matting. Hedging is being planted as part of the mammal passage to discourage mammals, particularly otters and badgers, from accessing the road when the Stratford Brook is in spate. Management of the hedging must ensure that it remains dense, without gaps that otters could force their way through. Rabbit proof fencing will be built on one side of the hedge, to act as a deterrent until the hedgerow shrubs are dense and tall enough to prevent access through.

### 4.3 Fish easement

- 4.3.1 The objective of this mitigation measure is to improve fish passage in Stratford Brook.
- 4.3.2 The fish easement has been designed to minimise management and maintenance through the design of the low flow channel and high quality baffles on the apron will be installed. There will be a visual inspection undertaken every 2 years as part of the general inspection of the Stratford brook underbridge. Every 6 years a visual inspection will be undertaken from the channel as part of the Principal inspection of the structure.

## 5. Consultation

A table of consultations undertaken during the development of the design of the mitigation work is provided in Table 5-1.

**Table 5-1: Record of consultation on Stratford Brook**

Meeting Title	Date	Group present							Meeting Reference (BBA)	Part of Scheme discussed and location of record in the minutes						
		Environment Agency	Surrey County Council	Surrey Wildlife Trust	Natural England	Guidford BC	Elmbridge BC	Taylor Wimpey		SB_a Habitat improvement	SB_b Riparian trees	SB_c Mammal passage on underbridge	SB_d- Investigation into feasibility of additional measures	SB_d fish easement	Management Plan	Flood risk
Water Matters Consultation 1	23/09/2020	Y	Y	Y		Y	Y		<a href="#">HE551522-BBA-EWE-WHL_AL_SCHME-MI-LW-000001</a>	Item 5						Item 3
Stratford Brook	03/11/2020	Y							<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000001</a>	Item 1			Item 1			
Stratford Brook - flood risk	04/12/2020	Y							<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000002</a>							Item 1 and 2
Water Matters Consultation 4	15/01/2021	Y	Y						<a href="#">HE551522-BBA-EWE-WHL_AL_SCHME-MI-LW-000008</a>	Item 5	Item 5		Item 5	Item 5		
Stratford Brook	25/03/2021	Y							<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000008</a>	Item 2 and Item 7		Item 4	Item 6	Item 3 and 5		Item 1
Stratford Brook, HE/TW Mitigation No.1	20/10/2020							Y	<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000003</a>	Item 1			Item 1	Item 1	Item 2	
Stratford Brook, HE/TW Mitigation No.2	10/02/2021							Y	<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000004</a> , <a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000005</a>	Item 1						Item 1
Stratford Brook, HE/TW Mitigation No.3	03/03/2021							Y	<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000006</a>	Item 1				Item 2	Item 3	Item 1
Email from J. Southgate to E. Lewin	16/03/2021							Y	<a href="#">HE551522-BBA-EWE-SCC_LR_STRATBR-MI-LW-000007</a>	Item 1						Item 3

# Appendices



# **Appendix A. Stratford Brook habitat improvement**

- A.1     Stratford Brook Habitat Improvements Design Note**
- A.2     General Arrangement Plan, Stratford Brook**
- A.3     Tree fall & Tree Deflector, Stratford Brook**
- A.4     Securing Method, Stratford Brook**
- A.5     Backwater, Stratford Brook**
- A.6     Stratford Brook upstream mitigation area management plan**

# Appendix B. Reinstatement of riparian trees

## B.1 Landscape and ecology design drawings

## **Appendix C. Mammal passage on Stratford Brook underbridge**

### **C.1 Provision of mammal passage beneath Stratford Brook Underbridge**

## **Appendix D. Investigation into feasibility of additional measures**

- D.1 Stratford Brook Environmental Mitigation Feasibility Assessment**
- D.2 Stratford Brook culvert (south) design note**
- D.3 Stratford Brook fish easement general arrangement**
- D.4 Stratford Brook fish easement details**

© Crown copyright (2017).

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit [www.nationalarchives.gov.uk/doc/open-government-licence/](http://www.nationalarchives.gov.uk/doc/open-government-licence/)

write to the Information Policy Team, **The National Archives**, Kew, London TW9 4DU,  
or email [psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

Printed on paper from well-managed forests and other controlled sources.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ  
Highways England Company Limited registered in England and Wales number 09346363

