ARUP

South Yorkshire Passenger Transport Executive (SYPTE)

Old Mill Lane, A61 Phase 1

Biodiversity Enhancement Management Plan

Reference:

A | 5 January 2023

Job number 253511-00

Ove Arup & Partners Limited
Admiral House Rose Wharf
78 East Street
Leeds
LS9 8EE
United Kingdom
arup.com

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1. Introduction

Ove Arup and Partners Ltd. (Arup) was commissioned by South Yorkshire Passenger Transport Executive (SYPTE) to produce a Biodiversity Enhancement Management Plan (BEMP) to fulfill Condition 14 of planning permission 2021/1660. The BEMP is required to inform long-term management of the habitats reinstated on site, to ensure they meet the requirements of the Biodiversity Net Gain (BNG) assessment undertaken to inform the planning submission. [1]

1.1 Scheme Description

The Old Mill Lane site is located north of Barnsley town centre (national grid reference SE3504307232) and encompasses a section of the A61 where it crosses the River Dearne. Planning consent has been granted for widening of the A61 along the Old Mill Lane Bridge and re-decking of the existing road.

A suite of surveys and assessments were undertaken to inform ecological mitigation requirements and biodiversity enhancement measures, to ensure compliance with national legislation, planning policy and Local Planning Authority (LPA) recommendations. This included a BNG assessment to identify requirements to achieve "no net loss" of biodiversity on site.

1.2 Aims and Objectives

This document has been produced to discharge Condition 14 of planning permission 2021/1600. The requirements of Condition 14 are summarised in Table 1 which signposts the location of relevant information.

Table 1: Information required to fulfil Condition 14

Condition Requirement	
Plan of the areas to be maintained, enhanced and/or created.	Drawing 1 and 2.
A schedule of actions to create or enhance and maintain each habitat at the required quality for a period of 30 years. The schedules must include details of technique(s) to be used, equipment to be used, roles and relevant expertise of personnel and organisations involved and timing of actions including submission of monitoring report to the Council.	Section 4 contains habitat creation and management prescriptions.
Schedule of actions to be undertaken in case signs of failing are identified.	Habitat management measures are provided in Section 4.2 and a maintenance programme is provided in Section 4.3.
A schedule of ecological monitoring for the 30 year period identifying when key indicators of habitat maturity should be achieved. *Monitoring would be required within years 2, 5, 10, 20 and 30.*	The post-construction monitoring schedule is detailed in Section 5.
The BEMP will be supported by a Defra Metric and will include condition assessments of baseline habitats and condition assessments of habitats proposed for creation, with details of the condition assessment criteria anticipated to be passed/failed. Thereafter the approved scheme shall be carried out in accordance with the approved details and timescales.	The Biodiversity Metric is provided in Appendix A.

This report has been produced to inform those involved in the construction of the Old Mill Lane Phase 1 Scheme of the requirements in relation to Biodiversity Enhancement and Ecological Mitigation. It has also been written to inform long-term management of habitats created on site, in accordance with requirements of

[1] Arup (2022) A61 Old Mill Lane Phase 1 Biodiversity Net Gain Assessment. Issue 2.

the DEFRA Biodiversity Metric[2] undertaken to inform planning submission (Appendix A). The BEMP will be submitted to, and approved in writing by the Local Planning Authority in order to discharge Condition X.

It should be read in full by the Site Manager and all relevant information and requirements in relation to ecology should be incorporated into staff, contractor and site visitor induction packs.

This document should be read alongside the Balfour Beatty Sustainability Plan (Appendix C of the Construction Health and Safety Plan), which forms the scheme's Construction Environment Management Plan (CEMP). The Sustainability Plan contains further information on ecological mitigation measures to be adopted during the construction programme.

The BEMP should be considered a 'live' document that may be subject to change as construction activities take place and associated documents or licences are developed and approved. Any amendments to the BEMP should be submitted to the LPA for review and comment.

1.3 Report Structure

This report is structured as follows:

- Section 2: Biodiversity Baseline.
- Section 3: Ecological Mitigation Measures.
- Section 4: Habitat Creation and Management.
- Section 5: Post-Construction Monitoring.

[2] Available at http://publications.naturalengland.org.uk/publication/6049804846366720. Accessed March 2022.

2. Biodiversity Baseline

2.1 Ecological Surveys

The following surveys were undertaken to inform the planning submission:

- Preliminary Ecological Appraisal[3]: A field survey of the site was carried out in August 2020. Habitats were identified using the standard Phase 1 Habitat survey methodology (JNCC, 2010)[4]. As part of the field survey, the potential for the site to support any legally protected or notable faunal species was also assessed.
- Bat roost suitability assessment[3]: An external bat roost suitability assessment of trees and buildings within the site boundary (Drawing 1.1) was undertaken in August 2020 to determine their suitability to support roosting bats. The survey was conducted externally from the ground using binoculars. The survey followed standard methodology detailed within the Bat Conservation Trust (BCT) Good Practice Guidelines (Collins, 2016)[5].
- Biodiversity Net Gain (BNG) Assessment: A BNG assessment was undertaken for the site using the DEFRA and Natural England Biodiversity Metric 3.0 calculator tool.[2] The assessment was completed using the relevant technical guidance.[6]
- Otter *Lutra lutra,* survey[7]: An otter survey was undertaken in accordance with current guidance[8] in March 2021, during a period of typical flow for the River Dearne. The survey involved a thorough search for otter activity both on the banks of the watercourse and a minimum of 2m from the bank top, by a suitably experienced ecologist. Where optimal habitat was present at the top of the bank, the search area was extended to an appropriate distance. The river was surveyed 200m up and downstream of the site boundary, where accessible.
- Bat emergence/re-entry survey of Old Mill Lane Culvert[9]: Three surveys were undertaken in 2020, comprising two dusk emergence and one dawn re-entry survey during the appropriate bat survey period. Surveys were undertaken in accordance with BCT[5] during suitable weather conditions. Surveys were repeated in 2021 and 2022 to ensure up to date survey data was available to inform the bat licence application.

The results of these surveys are summarised below. Further information can be found in the individual survey reports.

2.1.1 Preliminary Ecological Appraisal

One statutory designated site was recorded within 2km of the site; Dearne Valley Park Local Nature Reserve (LNR). Three Local Wildlife Sites (LWS) are present within 2km of the site. Most notably, Old Mill Lane Culvert Bat Roost LWS is located within the site boundary. Since 1990, the culvert under the A61 bridge has been known to support an important maternity roost for Daubenton's bat *Myotis Daubentonii*. The River Dearne is tree-lined, both upstream and downstream of the A61 bridge and is used by foraging bats. Upstream of the A61, the landscape of the floodplain opens into recreation grounds and bodies of standing water.

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[3] Arup (2022) Old Mill Lane, A61 Phase 1 Ecological Assessment. Issue 2.

[4] Joint Nature Conservation Committee (JNCC) (2010) *Handbook for Phase 1 Habitat Survey: A technique for environmental audit*. Revised re-print. JNCC: Peterborough

[5] Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). London: The Bat Conservation Trust.

[6] Natural England (2021) *The Biodiversity Metric 3.0: Auditing and Accounting for Biodiversity Value: Technical Supplement* (July 2021).

[7] Arup (2021) *Old Mill Lane, A61. Otter Survey Report*. Issue.

[8] Chanin, P. (2003) Ecology of the European Otter. Conserving Natura 2000 Rivers Ecology Series No. 10. English Nature, Peterborough.

[9] Arup (2022) *Old Mill Lane, A61. Bat Survey Report.* Issue 4.

The habitats recorded within the site and 20m survey buffer included: broadleaved semi-natural woodland; scattered broadleaved trees and scrub; amenity grassland; introduced shrub; tall ruderal vegetation; running water (River Dearne); hardstanding and buildings.

The invasive species Himalayan balsam *Impatiens glandulifera*, is and giant hogweed *Heracleum mantegazzianum*, were recorded within the site boundary.

2.1.2 Bat Roost Suitability Assessment

All trees within the site boundary were assessed to provide negligible potential for roosting bats.

The culvert located within the site boundary adjacent to the Old Mill Lane bridge is known to support a maternity roost of Daubenton's bats. Bat emergence/re-entry surveys were subsequently recommended and undertaken in 2020, 2021 and 2022, confirming the presence of this roost (Section 2.1.5).

2.1.3 BNG Assessment

The proposed scheme will result in the permanent loss of 0.28ha of habitat comprising broadleaved woodland, introduced shrub and urban street trees. A further 0.05ha of woodland will be temporarily lost to facilitate site access and working area. The BNG metric has been undertaken including provision of replacement woodland planting within the areas of temporary loss, and factors in the reduction in River Units resulting from increased shading of the river due to bridge widening.

Overall, the proposed scheme results in the loss of 2.27 Habitat Units and 0.05 River Units. The deficit in Biodiversity Units will be compensated for via a payment to be agreed with BMBC and secured through a Section 106 agreement, in order to achieve no net loss of biodiversity.

2.1.4 Otter Survey

No evidence of otter such as spraints, feeding remains or prints, was recorded during the survey in March 2021. The River Dearne within the site boundary is highly modified, with vertical stone retaining walls and a weir present. This engineered section of the river provides limited suitability for otter holts or resting sites due to the absence of natural features and the noise/visual disturbance from Old Mill Lane bridge.

The section of river to the west of the site boundary provides natural earth banks with woodland and scrub vegetation. It is therefore considered likely that otter are present in the area, however the absence of fresh evidence indicates this section of the River Dearne is used infrequently. The possibility of encountering otter should be considered during the proposed works. It is recommended that a Reasonable Avoidance Measures Method Statement (RAMMS) is prepared for works on site.

2.1.5 Bat Emergence/Re-entry Surveys

The presence of a Daubenton's bat maternity roost in Old Mill Lane culvert was confirmed during the surveys in 2020, 2021 and 2022. Three species of bat were recorded foraging and/or commuting within the site during the surveys: Daubenton's bat; common pipistrelle *Pipistrellus pipistrellus*; and soprano pipistrelle *Pipistrellus pygmaeus*.

Daubenton's bat was the most frequently recorded species throughout all surveys and the only species observed roosting within Old Mill Lane culvert in group numbers. Additional individual soprano pipistrelle were observed roosting within the culvert in 2020. Common pipistrelle were observed socialising within the River Dearne corridor.

The peak count of Daubenton's bats was 24, recorded in August 2022.

3. Ecological Mitigation Measures

This section should be read alongside the Balfour Beatty Sustainability Plan/CEMP which provides further detail on the ecological mitigation measures to be adopted prior to and during construction.

3.1 Pre-Construction Surveys

Ecological surveys are limited by factors that affect the presence of plants and animals, such as the time of year, migration patterns and behaviour. Therefore, the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future. As a result, it is recommended that baseline conditions reported during the design and planning process of the project are checked in advance of construction commencing on site.

The following surveys should be undertaken prior to any works commencing on site, include site setup, vegetation clearance or compound establishment:

- Nesting bird survey: Based on the current scheme programme, vegetation clearance is likely to occur during the breeding bird season (March to August inclusive). A suitably qualified ecologist should therefore undertake a survey to establish the presence of active bird nests, prior to clearance work commencing. This includes tree felling in addition to clearance of shrubs and low-lying scrub.
- Otter survey: A pre-commencement survey for otter should be undertaken along the River Dearne, 200m up and downstream of the site boundary, where accessible.

3.2 Invasive Species Management Plan

For activities that break ground or have potential to cause disturbance/spread of invasive non-native species (INNS), no work is to be carried out until a site-specific Invasive Species Management Plan is in place. The location of INNS should be clearly demarcated and, where necessary, fenced off to create a buffer zone of the recommended width. Signage must be erected indicating what species are present, with protection and avoidance requirements clearly stated.

Precautions should be taken to reduce the transfer/spread of plant and animal species and shall include:

- planning the activity/works to reduce the risk of picking up and spreading INNS;
- inspecting equipment, clothing and footwear for soil, seeds and live organisms;
- cleaning, washing and drying all equipment, footwear and clothing thoroughly;
- disinfection of all equipment and clothing where the spread of microorganisms is possible; and
- before and after being used for works, vehicles should be thoroughly cleaned.

3.3 Bat Roost Mitigation

Works on site will not commence until a licence has been granted by Natural England in relation to disturbance of the Daubenton's bat roost within Old Mill Lane Culvert. A licence application has been submitted to Natural England, based on the mitigation measures outlined below. On approval of the bat licence, this section of the BEMP should be checked and updated to ensure any changes to the required mitigation are recorded.

3.3.1 Bat Boxes

Six bat boxes will be installed in suitable locations away from the works area. These will be placed on trees close to the River Dearne both upstream and downstream of the project site to provide alternative roost provision in proximity to the culvert (but away from potential disturbance at the works site). Boxes have been selected that provide opportunities for summer, maternity and hibernation roosts:

- 2 x Vivara Pro Large Multi Chamber WoodStone Bat Box or similar.

- 2 x 2FN Schwegler bat box or similar.
- 2 x 1FF Schwegler Bat Box With Built-in Wooden Rear Panel or similar.

The installation of bat boxes should be overseen by a suitably qualified ecologist. Bat boxes are best positioned at a height of between 4 to 6 metres and should be positioned close to the River Dearne but not overhanging the watercourse.

3.3.2 Noise Reduction Shields

Specialist noise reduction shields and covers will be utilised during hydro-demolition of the parapet e.g. 'Soundex Performance Curtains'. These will be used to create temporary enclosures for compressors and generators etc. and provide up to 32.9dB reduction in noise.

Hydro-demolition will not commence until the shields/covers have been installed by a qualified operative.

3.3.3 Task Lighting

Night working will be avoided as far as possible. Road resurfacing activities are required to be undertaken during night-time road closures, however all other demolition/construction activities will be carried out during daylight hours to eliminate potential disturbance to foraging bats. For works undertaken at night, task lighting will be minimised as far as possible. Lighting will be directed towards the road/work area and will not be directed toward the river or adjacent habitats. Baffles will be utilised to focus lighting and reducing light-spill on surrounding habitats.

3.4 Otter Mitigation

A Reasonable Avoidance Measures Method Statement (RAMMS) will be followed during all construction activities on site (Appendix B).

3.5 Emergency Procedure for Unexpected Ecological Issues

In the event that an unexpected discovery is made during works such as the presence of wildlife within the works area, or sightings of a protected species not previously recorded on site, all works should cease with immediate effect and the site manager and project ecologist/Ecological Clerk of Works (ECoW) informed.

The ECoW will attempt to resolve the issue as soon as possible to enable work to re-commence. In some cases this may require the ECoW to attend site to facilitate movement of the species away from the works area, or consultation with the relevant consenting authority in relation to next steps.

4. Habitat Creation and Management

4.1 Habitat Creation

The following habitats will be created on site:

- Broadleaved woodland incorporating planting of standard trees and shrubs, in addition to woodland ground flora seed mix (Emmorsgate EW1 or similar).
- Proposed shrub planting adjacent to Asda car park boundary.
- Proposed grassed embankment with Emorsgate EG1 mix or similar.
- Scattered broadleaved trees.

The BNG calculation undertaken to inform the planning submission allowed for the provision of replacement woodland planting (0.05ha) and assumed this will achieve moderate condition within the standard time to target condition of 15 years.

At the time the BNG calculation was undertaken, it was not certain whether further planting would be provided around Asda car park. Therefore, the provision of shrub planting and scattered broadleaved trees in this part of the site represents a gain in biodiversity above the no net loss achieved through the Section 106 agreement.

The following is an outline of the implementation techniques to be employed for the creation of habitats shown in the Proposed Planting Plan (Drawing 1). It is not a detailed specification for the implementation of contract works, which will be prepared at a later stage by the appointed landscape architect.

4.1.1 Broadleaved Woodland

A locally appropriate mix of tree and shrub species has been selected, to provide landscape integration and replace woodland temporarily lost to facilitate access and working areas during construction. The species mix has also been selected to complement existing habitat within Old Mill Lane LWS and to provide a mix of fruiting and pollinating species that will attract a range of invertebrate species to provide foraging resource for bats.

A shrub layer has been included to provide structural diversity and additional shelter/foraging resource for birds. The planting mix encompasses a range of sequential flowering and fruiting species which will provide seasonal continuity of foraging resources for birds.

Planting will include a mix whips and feathered trees, ranging from 100-180cm in height (Table 2).

Table 2: Woodland canopy and shrub layer species mix.

Common Name	Scientific Name
Canopy Layer	
Field maple	*Acer campestre*
Silver birch	*Betula pendula*
Beech	*Fagus sylvatica*
Wild cherry	*Prunus avium*
Crack willow	*Salix fragilis*
Rowan	*Sorbus aucuparia*
Small-leaved lime	*Tilia cordata*
Shrub Layer	

Common Name	Scientific Name
Common dogwood	*Cornus sanguinea*
Hawthorn	*Crataegus monogyna*
Common hazel	*Corylus avellana*
Common holly	*Ilex aquifolium*
Wild privet	*Ligustrum vulgare*
Dog rose	*Rosa canina*
Elder	*Sambucus nigra*
Guelder rose	*Viburnum opulus*

The ground flora would re-establish naturally following completion of works on site, however due to the level of ground disturbance and compaction likely to occur during works, there is a risk of ruderal species establishing most quickly and out-competing finer species that would provide greater diversity and pollination. Therefore, the ground flora will be seeded with an appropriate woodland seed mix comprising shade-tolerant species that will support pollinators in spring and early summer. (Table 3).

Table 3: Emorsgate EW1 Woodland Mixture.

Common Name	Scientific Name	Composition (%)
Wild Flowers – 20%		
Garlic mustard	*Alliaria petiolata*	1.00
Cow parsley	*Anthriscus sylvestris*	0.50
Grey sedge	*Carex divulsa ssp divulsa*	2.00
Pendulous sedge	*Carex pendula*	0.10
Rough chervil	*Chaerophyllum temulum*	4.00
Foxglove	*Digitalis purpurea*	1.00
Meadowsweet	*Filipendula ulmaria*	1.10
Hedge bedstraw	*Galium album – (Galium mollugo)*	0.50
Hedge crane's-bill	*Geranium pyreniacum*	2.00
Wood avens	*Geum urbanum*	0.80
Bluebell	*Hyacinthoides non-scripta*	1.00
Red campion	*Silene dioica*	5.00
Ragged robin	*Silene flos-cuculi*	1.00
Grasses – 80%		
Common bent	*Agrostis capillaris*	1.00
Sweet vernal-grass	*Anthoxanthum odoratum*	2.00
False brome	*Brachypodium sylvaticum*	1.00

Common Name	Scientific Name	Composition (%)
Crested dogs-tail	*Cynosurus cristatus*	50.00
Tufted hair-grass	*Deschampsia cespitosa*	2.00
Red fescue	*Festuca rubra*	20.00
Wood meadow-grass	*Poa nemoralis*	4.00

4.1.2 Shrub Planting

Shrub planting will be undertaken in accordance with the planting plan and schedule (Drawings 1 and 2). Prior to planting, topsoil will be cultivated to a fine, even consistency with no clumping or pieces larger than 25mm. Planting pits will be backfilled with 80% topsoil won from site (if shown to be fit for purpose by soil testing) mixed with 20% peat free organic compost. Recycled HDPE & LDPE photodegradable tree shelters will be used, secured to pressure-treated FSC softwood stakes using biodegradable ties.

Organic bark mulch will be spread to a depth of 50mm after planting.

Table 4: Shrub planting

Common Name	Scientific Name
Shrub	
Japanese laurel	*Aucuba japonica* 'Golden King'
Mexican orange	*Choisya ternata*
Hebe *'sutherlandii'*	*Hebe sutherlandii*
Oak-leaved hydrangea	*Hydrangea quercifolia* 'Munchkin'
Hidcote lavender	*Lavandula angustifolia 'Hidcote'*
Box-leaved honeysuckle	*Lonicera pileata* 'Loughgall Evergreen'
Skimmia confusa 'Kew Green'	*Skimmia confusa* 'Kew Green'
Herbaceous	
Sedum 'Purple Emperor'	*Sedum* 'Purple Emperor'

4.1.3 Scattered Broadleaved Trees

Broadleaved trees will be placed within the shrub planting adjacent to Asda car park. Heavy standard trees will be planted with species comprising silver birch, small-leaved lime, and Shirofugen cherry *Prunus 'Shirofugen'*.

Tree roots will be dipped/ inoculated with mycorrhizal fungi prior to planting. Biodegradable tree ties and spacers will be secured to stakes with a galvanised nail. Tree stakes are to be pressure treated FSC softwood, 50-60mm diameter of sufficient length to ensure tree stability.

4.1.4 Grassed Embankments

Widening of Old Mill Lane bridge will result in the creation of steep embankments leading from the A61 road down to the level of adjacent woodland. As the embankments cannot support tree planting, they will be sown with a native grassland seed mix (Table 5).

Grass seeding will be undertaken in accordance with the plant Specification and suppliers guidance. Topsoil will be cultivated to a fine even consistency with no clumping or pieces larger than 25mm.

Table 5: Emorsgate EG1 General Purpose Meadow Grass Mixture.

Common Name	Scientific Name	Composition (%)
Common bent	*Agrostis capillaris*	15
Crested Dogs-tail	*Cynosurus cristatus*	35
Red fescue	*Festuca rubra*	30
Smooth-stalked meadow-grass	*Poa pratensis*	20

4.2 Management Measures

This section provides an overview of the maintenance and aftercare/management techniques to be employed for newly created habitats within the site.

Management and maintenance techniques for habitats should be environmentally sound and utilise current ecological best practice principles. Personnel involved with the maintenance and management of the site should adopt and employ best practice techniques, with particular reference to:

- the reuse and recycling of materials and waste products wherever practicable including waste material arising from maintenance and management works;
- the use of energy conservation, pollution reduction and resource (including water) conservation measures; and
- the minimisation of pesticide use.

All maintenance will be carried out in accordance with good horticultural and silviculture practices including BS 7370-4:1993 Grounds Maintenance: Recommendations for maintenance of soft landscape. Maintenance contractors will be suitably experienced and suitably qualified where necessary, with experience of working across a wide range of applications including water-based environments. Operatives will be trained to PA4 and PA4AW in the application and spraying of herbicides.

4.2.1 Newly Planted Woodland, Shrub and Scattered Trees

The following measures will be implemented in relation to management of newly created woodland, shrubs and scattered trees:

- During the first growing season the newly planted trees and scrub will be watered as necessary during periods of drought.
- Weed control around the base of the trees and scrub will be undertaken through hand-pulling or an annual application of herbicide (where necessary). Within woodland this may be undertaken by maintaining mulch mats or mulching around the base of each plant.

Regular maintenance will also include:

- All stakes will be checked to ensure they are firm and ties correctly adjusted.
- All broken tree guards/shelters, stakes and ties will be replaced.
- Planted specimens will be inspected at each maintenance visit and after strong winds, frost heave or other disturbances, and any disturbed trees will be replanted. All tree and shrub guards/shelters, stakes and ties will be removed after five years.
- Dead and damaged branches will be removed. Pruning will be undertaken of scattered trees adjacent to Asda car park (where necessary) to retain and promote natural, healthy growth and form.

- Any dead or diseased plants will be replaced during the next planting season to the original specification or to match the size of adjacent or nearby plants of the same species, whichever is the greater.
- During the initial establishment phase of newly planted woodland (first ten years), the EW1 seed mix should be managed as grassland. Once the tree canopy has closed sufficiently to reach approximately 50% shade, sowing of additional wildflower seed from EW1 mix may be required to encourage a diverse ground flora. This requirement will be determined during habitat monitoring surveys (Section 5.1). Once the woodland is established, the ground flora should require little maintenance but will benefit from good tree management, on-going INNS management and removal of litter and other erroneous material from site.
- All arisings will be removed from the landscaped area of site adjacent to Asda. Deadwood or arisings from tree management can be left within the broadleaved woodland, and stacked to create habitat features.

4.2.2 Grassland Embankments

The embankments will be mown twice during the first year, cut to a height of 50-75mm and all arisings removed. In subsequent years, the banks will be mown once per year.

Control of unwanted/invasive species will be undertaken by hand pulling or, if appropriate, spot herbicide treatment.

4.3 Maintenance Programme

The habitat maintenance schedule below (**Table 6.**) will be implemented to ensure that habitats are maintained appropriately during the first five years.

All habitats within the red line boundary will be maintained for a minimum period of 30 years, in accordance with requirements under the Environment Act (2021) and the DEFRA Biodiversity Metric calculation used to inform planning consent. Table 7 details the annual maintenance required in years 6-30 post-construction.

Table 6: Habitat Maintenance Schedule for Years 1 to 5.

Maintenance operation	No. operations per year	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Assessment of newly established habitats and preparation of a programme of remedial action as required.	Once annually in spring/summer.																				
Signs of disturbance to be rectified, litter and other erroneous material to be removed from site.	As necessary during maintenance visits.																				
Shrub & tree planting (adjacent to Asda car park)																					
Watering to ensure establishment of plants.	As necessary during periods of drought throughout first 2 years.																				
Removal of weeds at base of trees. Weeds to be removed by hand pulling in 500mm dia. circle around base of each plant. Spot treatment using herbicide may be undertaken where necessary.	Two visits during Year 1. One visit during Years 2-5.																				
Maintain all plants in a firm and upright position. Stakes/supports may be required dependant on size of tree.	As necessary during maintenance visits.																				

Maintenance operation	No. operations per year	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Check and maintain, replacing where necessary, all tree and shrub guards.	At each maintenance visit.																				
Replace any dead or dying plants within next planting season.	One visit per year.																				
Removal of tree and shrub guards and associated stakes and ties.	Once in Year 5.																				
Pruning to remove dead and damaged branches, to promote natural growth and form.	One visit per year.																				
Grassland embankments and woodland ground flora																					
Control of unwanted/invasive species by hand pulling or, if appropriate, spot herbicide treatment.	One visit per year.																				
Mowing of newly established grasslands. Cut to a height of 50-75mm and remove arisings.	Two visits during Year 1. One visit during Years 2-5.																				
Invasive species (post-construction)																					
Control of invasive species by hand pulling, cutting back or, if appropriate, spot herbicide treatment.	One visit per year.																				

Table 7: Habitat Maintenance Schedule for Years 6 to 30.

Maintenance operation	No. operations per year	Year 6-30			
		Q1	Q2	Q3	Q4
Assessment of habitats and preparation of a programme of remedial action as required.	Once annually in spring/summer.				
Signs of disturbance to be rectified, litter and other erroneous material to be removed from site.	As necessary during maintenance visits.				
Shrub & tree planting (adjacent to Asda car park)					
Replace any dead or dying plants within next planting season.	One visit per year.				
Pruning to remove dead and damaged branches, to promote natural growth and form.	One visit per year.				
Grassland embankments					
Control of unwanted/invasive species by hand pulling or, if appropriate, spot herbicide treatment.	One visit per year.				
Annual mowing of grassland embankment. Cut to a height of 50-75mm and remove arisings.	One visit per year.				
Invasive species					
Control of invasive species by hand pulling, cutting back or, if appropriate, spot herbicide treatment.	One visit per year.				

5. Post-Construction Monitoring

5.1 Habitat Monitoring

Habitat monitoring will be undertaken in years 2, 5, 10, 20 and 30. This will comprise a review of the habitats on site and condition assessment in accordance with the Biodiversity Metric 3.0 technical guidance. This will be used in place of any more recent versions of the Metric guidance released, for consistency with the baseline BNG assessment (Appendix A).

Habitat condition will be assessed using the DEFRA guidance to ensure that habitats are developing toward their target condition in the appropriate timeframes. The relevant Condition assessment sheets are detailed in Table 8 and provided in Appendix C.

Only broadleaved woodland creation was included in the Biodiversity Metric produced for planning, and a target condition score of Moderate was assigned. The following habitats have now been incorporated into the landscape planting plans (Drawings 1 and 2):

- Proposed shrub planting: To be assessed as BNG habitat type *Urban: Introduced shrub* – condition Poor.
- Proposed grassed embankment: To be assessed as BNG habitat type *Modified grassland* – condition Moderate.
- Scattered broadleaved trees: To be assessed as BNG habitat type *Urban tree* – condition Moderate.

Table 8: Condition Assessment Sheets

BNG Habitat Type	Target Condition	Standard Time to Target Condition	Condition Assessment Sheet
Other broadleaved woodland	Moderate	15 years	No. 24: Woodland
Introduced shrub	Poor	1 year	N/A – Condition fixed at 'Poor' in Metric.
Modified grassland	Moderate	4 years	No. 5: Grassland (low distinctiveness).
Urban tree	Moderate	10 years	No. 22: Urban trees

5.2 Bat Monitoring

The bat licence application submitted to Natural England recommends post-construction population monitoring of the culvert, comprising emergence/re-entry surveys in 2025 (1 year after planned project completion) and 2027 (3 years after planned project completion).

On approval of the bat licence by Natural England, this document should be reviewed and updated if any amendments to this monitoring schedule have been imposed.

Appendix A

Biodiversity Metric

Appendix B

Otter Reasonable Avoidance Measures Method Statement

ARUP

Technical Note

Project title	Old Mill Lane, A61
Job number	253511-00
File reference	0-15-08
cc	
Prepared by	Victoria Newlove
Date	5 January 2023
Subject	Reasonable Avoidance Measures Method Statement for Otter

Admiral House Rose Wharf 78 East Street Leeds LS9 8EE United Kingdom
t +44 113 242 8498
arup.com

1. Introduction

This Reasonable Avoidance Measures Method Statement (RAMMS) and toolbox talk has been produced in relation to the potential for otter to be impacted by the proposed works at Old Mill Lane, Barnsley.

1.1 Purpose of the RAMMS

No signs of otter *Lutra lutra*, e.g. spraints, footprints or holts, were recorded during surveys on site. No suitable habitat for holt construction was identified along the banks of the River Dearne. However, the river provides foraging and commuting opportunities for otter and desk study records showed the species has been previously recorded in proximity to the site.

Otter are sensitive to development, and require their resting places to be protected from disturbance. Any otter holt or couch within 30m of the proposed Scheme has potential to be impacted by disturbance from construction works. Natal dens are sensitive to disturbance up to 150 m from the proposed Scheme. Consideration has been given to otter present in the wider area that may utilise watercourses within the Site for commuting and foraging.

2. Otter Ecology

3. Relevant Legislation

3.1 Wildlife and Countryside Act (1981) (as amended)

Otter are fully protected through their inclusion in Schedule 5 of the Wildlife and Countryside Act (WCA) 1981 (as amended) and in Schedule 2 of The Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019. Under the legislation, it is an offence to intentionally or recklessly:

- capture, kill, disturb or injure otters;

- damage or destroy a breeding or resting place; • obstruct access to their resting or sheltering places; and
- possess, sell, control or transport live or dead otters or parts of otters.

Disturbance includes, but is not limited to, any disturbance which is likely to:

- impair the ability of an otter to survive, breed, reproduce or nurture young; or
- to significantly affect the local distribution or abundance of otter.

3.2 Natural Environment and Rural Communities Act 2006

The Natural Environment and Rural Communities (NERC) Act 2006, is designed to help achieve a rich and diverse natural environment and thriving rural communities. Under Section 40 there is a Duty to conserve biodiversity; specifically Subsection (1) states "*Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity*."

Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under Section 40. Otter is designated as a S41 Species of Principal Importance.

4. Reasonable Avoidance Measures

All contractors and site operatives must read this information before starting any works on site. They must confirm that they understand the information provided and agree to comply with this RAMMS by signing the declaration in Section 5.

- Toolbox talks will be implemented in relation to the presence of otter to site staff, including information on recognising otter and their signs including couch/holt sites. This will be delivered by a suitably qualified ecologist.
- Any temporary site lighting required during night works or in the winter months (i.e. in the early and late parts of the day to enable safe working) will be directional to avoid unnecessary lighting on the watercourse so as not to disturb foraging otter.
- One bankside (or area of in channel where both banks are reinforced), must remain clear for the duration of the works to ensure that access to foraging otter are not obstructed.
- All excavations will be covered over-night. Where this is not possible a suitable means of escape must be installed to ensure otter do not become trapped.
- Items potentially harmful to order will be stored in a secure manner.
- Measures will be implemented in the event of an otter or a holt/couch being identified during construction, i.e. all works will cease and advice sought from a suitably qualified ecologist in the first instance.

5. Signed Declaration

The below declaration should be signed by all contractors/site operatives undertaking works on site that have potential to impact otter. Additional copies of the form should be made if required.

I agree to comply with the RAMMS prescribed in Section 4 of this document in order to avoid adverse impacts on otter within the site.

Date	Name	Company	Signature

Appendix C

Habitat Condition Assessment Forms

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)	
UKHab Habitat Type(s)	
Grassland - Modified grassland	
Habitat Description	
See UKHab	
Condition Assessment Criteria	
1	There must be 6-8 species per m^2. Note - if a grassland has 9 or more species per m^2 it should be classified as a moderate distinctiveness grassland habitat type. **NB - this criterion is non-negotiable for achieving good condition.**
2	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
3	Some scattered scrub (including bramble) may be present, but scrub accounts for less than 20% of total grassland area. Note - patches of shrubs with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.
4	Physical damage evident in less than 5% of total grassland area, such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities.
5	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.
6	Cover of bracken less than 20%.
7	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and undesirable species[1] make up less than 5% of ground cover.

Condition Assessment Result	Condition Assessment Score
Passes 6 or 7 of 7 criteria including non-negotiable criterion 7	Good (3)
Passes 4 or 5 of 7 criteria; OR Passes 6 of 7 criteria excluding non-negotiable criterion 7	Moderate (2)
Passes 0, 1, 2 or 3 of 7 criteria	Poor (1)

Notes

Footnote 1 - Species considered undesirable for this habitat type include: Creeping thistle *Cirsium arvense* , spear thistle *Cirsium vulgare* , curled dock *Rumex crispus* , broad-leaved dock *Rumex obtusifolius* , common nettle *Urtica dioica* , greater plantain Plantago major, white clover *Trifolium repens* , cow parsley *Anthriscus sylvestris* .

Condition Sheet: URBAN TREES (INCLUDING STREET TREES) Habitat Type	
UKHab Habitat Type(s)	
Urban - Urban tree	
Habitat Description	
Covers the following topographical formations most commonly found in urban areas[1]: **Individual Trees:** Young trees over 75mm in diameter measured at 1.5m from ground level and individual semi-mature and mature trees of significant stature and size that dominant their surroundings whose canopies are not touching but that are in close proximity to other trees. **Perimeter Blocks:** Groups or stands of trees within and around boundaries of land, former field boundary trees incorporated into developments, individual trees in gardens whose canopies overlap continuously **Linear Blocks:** Lines of trees along streets, highways, railways and canals whose canopies may or may not overlap continuously.	
Condition Assessment Criteria	
1	More than 70% of trees are native species.
2	Tree canopy is predominantly continuous with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide.
3	More than 50% of trees are mature[2] or veteran[3].
4	There is little or no evidence of an adverse impact on tree health by anthropogenic activities such as vandalism or herbicide use. There is no current regular pruning regime so the trees retain >75% of expected canopy for their age range and height.
5	Management regime has encouraged micro habitat sites for birds, mammals and insects e.g. presence of deadwood, cavities or loose bark etc.
6	Trees are immediately adjacent to other vegetation, and tree canopies are oversailing vegetation beneath.

FC	Condition Assessment Score
Passes 5 or 6 of 6 criteria	Good (3)
Passes 3 or 4 of 6 criteria	Moderate (2)
Passes 0, 1 or 2 of 6 criteria	Poor (1)
Notes	

Footnote 1 - This covers all trees in artificial urban habitats such as private gardens, private land, institutional land and land used for transport functions; roads, streets, canals, rail, footpaths etc. Trees in urban areas can under the right conditions provide a large range of habitat opportunities, supporting lichens, invertebrates and birds. Tree planting in urban areas has for over two hundred years also introduced non-native species into towns and cities. In the context of biodiversity native species are the preferred option. However, non-native tree species can contribute positively to biodiversity richness particularly in relation to providing a seasonal food source for nectar feeders and other invertebrates as well as supporting vertebrates that feed on species that are hosted by non-native trees. Examples are early and late flowering species of *Prunus* and aphids on varieties of *Acer* providing food for species higher up the food chain. The species of trees (native or non-native) together with the intensity and type of management they are subject to will determine the biodiversity value of the trees in question. Trees in urban areas provide opportunistic sites for biodiversity to colonise and re-colonise, increasing connectivity and contributing to biodiversity critical mass between already established patches or sites. This is especially so where transport corridors are populated with mixed native species

Footnote 2 - A mature tree in this context is one that is at least 2/3 expected fully mature height for the species.

Footnote 3 - All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value. Veteran trees can be classified if they have four out of the five following features:

1. Rot sites associated with wounds which are decaying >400cm2;
2. Holes and water pockets in the trunk and mature crown >5 cm diameter;
3. Dead branches or stems >15 cm diameter;
4. Any hollowing in the trunk or major limbs;
5. Fruit bodies of fungi known to cause wood decay.

Condition Sheet: WOODLAND Habitat Type

UKHab Habitat Type(s)

Woodland and forest - Lowland beech and yew woodland
Woodland and forest - Lowland mixed deciduous woodland
Woodland and forest - Native pine woodlands
Woodland and forest - Other coniferous woodland
Woodland and forest - Other Scot's pine woodland
Woodland and forest - Other woodland; broadleaved
Woodland and forest - Other woodland; mixed
Woodland and forest - Upland birchwoods
Woodland and forest - Upland mixed ashwoods
Woodland and forest - Upland oakwood
Woodland and forest - Wet woodland

Habitat Description

See UKHab

This condition sheet is based on the England Woodland Biodiversity Group (EWBG) Woodland Condition Survey Method, available here: https://woodlandwildlifetoolkit.sylva.org.uk/assess

Condition Assessment Criteria

	Indicator	Good (3 points)	Moderate (2 points)	Poor (1 point)	Score per indicator
1	**Age distribution of trees[1]**	Three age classes present	Two age classes present	One age class present	
2	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2]	Evidence of significant browsing pressure is present in 40% or less of whole woodland	Evidence of significant browsing pressure is present in 40% or more of whole woodland	
3	**Invasive plant species[3]**	No invasive species present in woodland	Rhododendron or laurel not present, other invasive species < 10% cover	Rhododendron or laurel present, or other invasive species > 10% cover	
4	**Number of native tree species**	Five or more native tree or shrub species found across woodland parcel	Three to four native tree or shrub species found across woodland parcel	None to two native tree or shrub species across woodland parcel	
5	**Cover of native tree and shrub species**	> 80% of canopy trees and >80% of understory shrubs are native	50-80% of canopy trees and 50-80% of understory shrubs are native	< 50% of canopy trees and <50% of understory shrubs are native	
6	**Open space within woodland[4]**	10 – 20% of woodland has areas of temporary open space, unless woodland is <10ha in which case lower threshold of 10% does not apply	21- 40% of woodland has areas of temporary open space	More than 40% of woodland has areas of temporary open space	
7	**Woodland regeneration[5]**	All three classes present in woodland; trees 4-7cm dbh, saplings and seedlings or advanced coppice regrowth	One or two classes only present in woodland	No classes or coppice regrowth present in woodland	
8	**Tree health**	Tree mortality less than 10%, no pests or diseases and no crown dieback	11% to 25% mortality and/or crown dieback or low risk pest or disease present	Greater than 25% tree mortality and or any high risk pest or disease present	
9	**Vegetation and ground flora**	Ancient woodland flora indicators present	Recognisable NVC plant community present	No recognisable NVC community	
10	**Woodland vertical structure[6]**	Three or more storeys across all survey plots or a complex woodland	Two storeys across all survey plots	One or less storey across all survey plots	
11	**Veteran trees[7]**	Two or more veteran trees per hectare	One veteran tree per hectare	No veteran trees present in woodland	

12	**Amount of deadwood**	50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Between 25% and 50% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	Less than 25% of all survey plots within the woodland parcel have standing deadwood, large dead branches/ stems and stumps	
13	**Woodland disturbance[8]**	No nutrient enrichment or damaged ground evident	Less than 1 hectare in total of nutrient enrichment across woodland area and/or less than 20% of woodland area has damaged ground	More than 1 hectare of nutrient enrichment and/or more than 20% of woodland area has damaged ground	
				Total score (out of a possible 39)	

Condition Assessment Result	Condition Assessment Score
Total score >32 (33 to 39)	Good (3)
Total score 26 to 32	Moderate (2)
Total score <26 (13 to 25)	Poor (1)

Notes

Footnote 1 - See EWBG method INDICATOR 1 for more information. If tree species is not a birch, cherry or Sorbus: 0 – 20 years (Young); 21 - 150 years (Intermediate); and >150 years (Old). A recognisable age class should be a consistent recognisable layer across the woodland or stand being assessed. Presence of a few saplings would not indicate that the woodland has an 'age class' of young trees.

Footnote 2 - See EWBG method INDICATOR 2 for more information. Browsing pressure is considered to be significant where >20% of vegetation visible within each survey plot shows damage from any type of browsing pressure listed.

Footnote 3 - See EWBG method INDICATOR 3 for more information. Check for presence of the following invasive non-native species: American skunk cabbage *Lysichiton americanus;* Himalayan balsam *Impatiens glandulifera;* Japanese knotweed *Fallopia japonica;* Cherry Laurel *Prunus laurocerasus;* Shallon *Gaultheria shallon;* Snowberry *Symphoricarpos albus;* Variegated yellow archangel *Lamiastrum galeobdolon subsp. argentatum;* and Rhododendron *Rhododendron ponticum.*

Footnote 4 - See EWBG method INDICATOR 6 for more information. Open space within woodland in this context is temporary open space in which trees can be expected to regenerate (e.g. glades, rides, footpaths, areas of clear-fell). This differs from permanent open space where tree regeneration is not possible or desirable (e.g. tarmac, buildings, rivers). Area is at least 10m wide with less than 20% covered by shrubs or trees.

Footnote 5 - See EWBG method INDICATOR 8 for more information. This indicator measures regeneration potential of the woodland by considering three classes: seedlings; saplings; and young trees of 4-7 cm DBH. All three classes would fall in the 'young' category of the 'age distribution of trees' indicator, the regeneration indicator is gathers additional information by considering regeneration potential i.e. if seedlings, saplings and young trees are all present that means natural regeneration processes are happening.

Footnote 6 - This indicator is looking at structural diversity and is useful to understand in conjunction with the age of trees in a woodland. Vertical structure is defined as the number of canopy storeys present. Possible storey values are: 1) Upper; 2) Complex: recorded when the stand is composed of multiple tree heights that cannot easily be stratified into broad height bands (such as upper, middle or lower); 3) Middle; 4) Lower; and 5) Shrub layer.

Footnote 7- See EWBG method INDICATOR 12 for more information. All ancient trees are veteran trees, but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing. These features contribute to its biodiversity, cultural and heritage value. Veteran trees can be classified if they have four out of the five following features:

1. Rot sites associated with wounds which are decaying >400 cm^2;
2. Holes and water pockets in the trunk and mature crown >5 cm diameter;
3. Dead branches or stems >15 cm diameter;
4. Any hollowing in the trunk or major limbs;
5. Fruit bodies of fungi known to cause wood decay.

Footnote 8 - See EWBG method INDICATOR 15 for more information. Examples of disturbance are: significant nutrient enrichment; soil compaction from trampling, machinery or animal poaching; litter.

Drawing 1: Proposed Planting Plan

Planting Schedule

Herbaceous

Name	Abb	Height	Girth	ClrStm	Mix%	Root	Cntr	Ctrs(m)	Dsty(/m²)	Qty
Sedum 'Purple Emperor'	Sdm PE				15.00 %	C	3L	0.447	5	98
										98

Shrub

Name	Abb	Height	Girth	ClrStm	Mix%	Root	Cntr	Ctrs(m)	Dsty(/m²)	Qty
Aucuba japonica 'Golden King'	Acb jp GK	40-60cm			10.00 %	C	5L	0.577	3	40
Choisya ternata	Chsy tr	40-60cm			10.00 %	C	5L	0.577	3	40
Cornus sanguinea	Crns sn	60-80cm			5.00 %	B		1.000		59
Corylus avellana	Cryls av	60-80cm			5.00 %	B		1.000		59
Hebe sutherlandii	Hb st	30-40cm			15.00 %	C	3L	0.447	5	98
Hydrangea quercifolia 'Munchkin'	Hyd qrc Mnc	50-60cm			10.00 %	C	5L	0.577	3	40
Ilex aquifolium	Il aq	60-80cm			5.00 %	B		1.000		59
Lavandula angustifolia 'Hidcote'	Lvn an H	25-30cm			15.00 %	C	3L	0.447	5	98
Ligustrum vulgare	Lgs vl	60-80cm			5.00 %	B		1.000		59
Lonicera pileata 'Loughgall Evergreen'	Lnc pl LE	40-50cm			15.00 %	C	5L	0.577	3	59
Rosa canina	Rs cn	60-80cm			5.00 %	B		1.000		59
Sambucus nigra	Smb ng	60-80cm			5.00 %	B		1.000		59
Skimmia confusa 'Kew Green'	Sk cn KG	40-60cm			10.00 %	C	5L	0.577	3	40
Viburnum opulus	Vb op	60-80cm			5.00 %	B		1.000		59
										828

Tree

Name	Abb	Height	Girth	ClrStm	Mix%	Root	Cntr	Ctrs(m)	Dsty(/m²)	Qty
Acer campestre	Acr cm	100-125cm			10.00 %	B		1.500		53
Acer campestre	Acr cm	160-180cm			5.00 %	RB		1.500		26
Betula pendula	Be pnd	100-125cm			15.00 %	B		1.500		79
Betula pendula	Be pnd	160-180cm			5.00 %	RB		1.500		26
Betula pendula	Be pnd	350-400cm	14-16cm	175-200cm		RB				1
Crataegus monogyna	Crtg mn	100-125cm			15.00 %	B		1.500		79
Crataegus monogyna	Crtg mn	160-180cm			5.00 %	RB		1.500		26
Fagus sylvatica	Fgs sy	100-125cm			10.00 %	B		1.500		53
Fagus sylvatica	Fgs sy	160-180cm			5.00 %	RB		1.500		26
Prunus avium	Prns av	100-125cm			5.00 %	B		1.500		26
Prunus avium	Prns av	160-180cm			10.00 %	RB		1.500		53
Prunus 'Shirofugen'	Prns S	200-250cm	14-16cm	175-200cm		RB				5
Salix fragilis	Slx frg	100-125cm			10.00 %	B		1.500		53
Sorbus aucuparia	Srbs ac	100-125cm			5.00 %	B		1.500		26
Tilia cordata	Tl cr	350-400cm	14-16cm	175-200cm		RB				3
										530
										1461

Approximate extent of proposed drainage.
Take extra care while planting in this area
and keep min.1.5m distance to edges of manholes.

Weir

1nr Be pnd

3nr Tl cr

3nr Prns S

2nr Prns S

OLD MILL LANE

Old Mill Bridge

47.2m

River Dearne

Gas Gov

Warehouse

Woodland Mix
17nr Acr cm
17nr Be pnd
51nr Be pnd
38nr Crns sn
17nr Crtg mn
51nr Crtg mn
38nr Cryls av
17nr Fgs sy
34nr Fgs sy
38nr Il aq
38nr Lgs vl
17nr Prns av
34nr Prns av
38nr Rs cn
34nr Slx frg
38nr Smb ng
17nr Srbs ac
38nr Vb op

Woodland Mix
19nr Acr cm
9nr Acr cm
28nr Be pnd
9nr Be pnd
21nr Crns sn
28nr Crtg mn
9nr Crtg mn
21nr Cryls av
19nr Fgs sy
9nr Fgs sy
21nr Il aq
21nr Lgs vl
19nr Prns av
9nr Prns av
21nr Rs cn
19nr Slx frg
21nr Smb ng
9nr Srbs ac
21nr Vb op

Ornamental Shrub mix
24nr Acb jp GK
24nr Chsy tr
59nr Hb st
24nr Hyd qrc Mnc
36nr Lnc pl LE
59nr Lvn an H
59nr Sdm PE
24nr Sk cn KG
Species specified at 3/m² to be planted in groups of 3, 5, and no more than 7;
Species specified at 5/m² to be planted in groups of 5, 7, and no more than 10.

Ornamental Shrub mix
16nr Acb jp GK
16nr Chsy tr
39nr Hb st
16nr Hyd qrc Mnc
23nr Lnc pl LE
39nr Lvn an H
39nr Sdm PE
16nr Sk cn KG
Species specified at 3/m² to be planted in groups of 3, 5, and no more than 7;
Species specified at 5/m² to be planted in groups of 5, 7, and no more than 10.

Notes:

1. For general arrangement refer to A61-ARUP-XX-XX-DR-CH-101.
2. For site clearance, refer to A61-ARUP-XX-XX-DR-CH-110.
3. For pavement and kerb information, refer to A61-ARUP-XX-XX-DR-CH-112, A61-ARUP-XX-XX-DR-CH-113, A61-ARUP-XX-XX-DR-CH-114.
4. For drainage information refer to A61-ARUP-XX-XX-DR-CH-115 and 116.
5. Detailed service locations to be confirmed with utility companies at detailed design. Locations of utilities are indicative only.
6. For planting details refer to A61-ARUP-XX-XX-DR-LA-102.
7. Plants shall be first class examples of their species or variety, free from pests and diseases, with good fibrous roots systems and materially undamaged, refer to relevant section of BS 3936 Part 1-4 Specification of Nursery Stock.
8. All planting is to be in general compliance with BS 4428:1989 Code of practice for general landscape operations (excluding hard surfaces).

LEGEND

- Proposed woodland area with woodland planting and Emorsgate EW1* mix or similar and approved.
- Proposed shrub planting area to ASDA car park boundary. (Species specified at 3/m² to be planted in groups of 3, 5, and no more than 7; Species specified at 5/m² to be planted in groups of 5, 7, and no more than 10.)
- Proposed grassed embankment with Emorsgate EG1* mix or similar and approved.
- Proposed trees
- Existing trees to be retained

*Proposed meadow or grass seed mix to be applied to the entire proposed areas.
EW1 to be sown at 4g/m²; EG1 to be sown at 5g/m².

Rev	Date	By	Chkd	Appd
P01	13/01/23	YZ	ZT	CW
	For Approval			

ARUP
Admiral House, Rose Wharf,
78 East Street, Leeds, LS9 8EE
Tel +44(0)113 242 8498 Fax +44(0)113 242 8573
www.arup.com

Client
SYMCA SOUTH YORKSHIRE PASSENGER TRANSPORT EXECUTIVE

Project Title
A61 Corridor

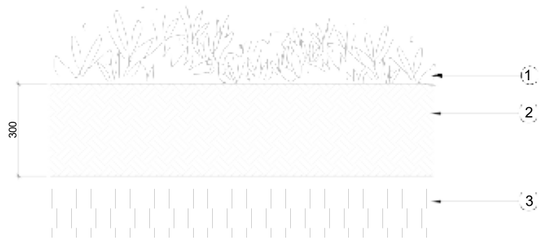
Drawing Title
A61 Old Mill Lane
Proposed Planting Plan

Scale at A1 1:250
Role Landscape Architect
Suitability S - Issued for Planning
Arup Job No 253511-00
Rev P01
Name A61-ARP-XX-XX-DR-LA-101

Do not scale

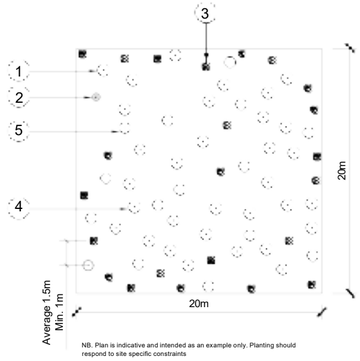
Drawing 2: Proposed Planting Details

Notes
1. Shrub planting in accordance with the Plant Plan and Schedule.
2. Cultivate topsoil to a fine even consistency with no clumping or pieces larger than 25mm.
3. Existing Subsoil.



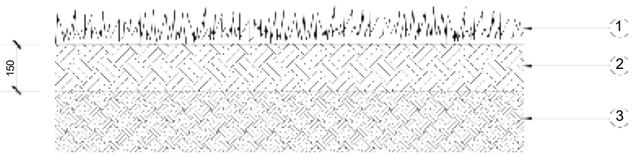
Shrub Planting
Scale 1:10

Notes
1. Bare root feathered trees and whips/transplants in accordance with the National Plant Specification.
2. Bare root shrubs in accordance with the National Plant Specification.
3. Shrub species mostly focussed at edges of woodland to create ecotone.
4. Natural variations in spacing and layout of species. Naturalistic glades to be designed into larger areas of woodland planting as appropriate (not shown due to size of area selected).
5. Areas of woodland planting to have feathered edges.
6. Bare root willow tree in accordance with the National Plant Specification.

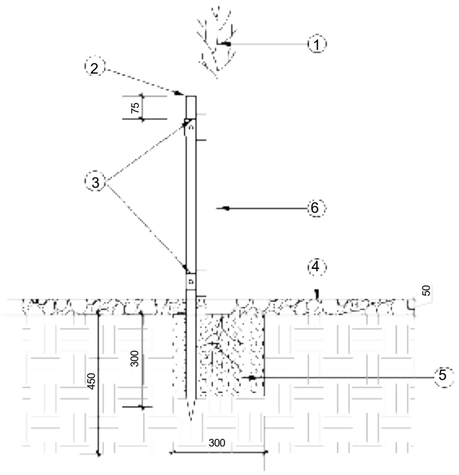


Broadleaf Woodland Layout Plan
Scale 1:250

Notes
1. Grass seeding in accordance with the Plant Specification and suppliers guidance.
2. Cultivate topsoil to a fine even consistency with no clumping or pieces larger than 25mm.
3. Subsoil.

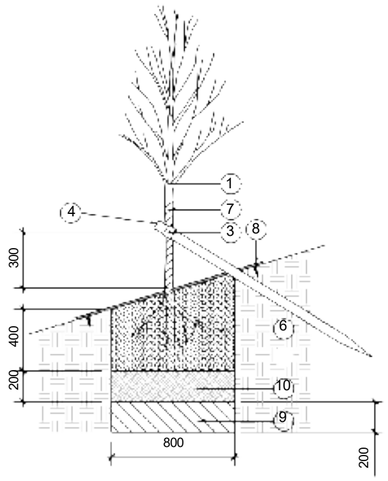


Grass Seeding
Scale 1:10

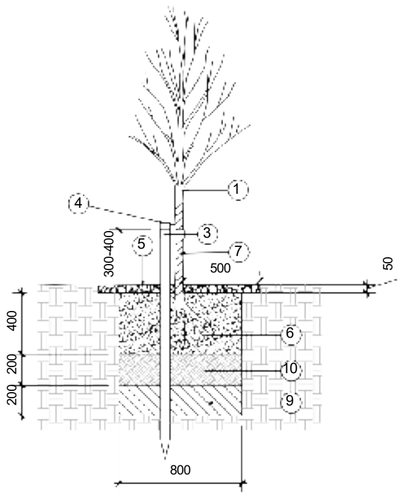


Tree or Shrub Transplant/Whip Planting
Scale 1:10

Notes:
1. Tree or Shrub Transplant/Whip bare root and in accordance with the National Plant Specification. For plant species and sizes refer to planting schedules.
2. Stakes to be pressure treated 32x32mm FSC softwood or 32mm dia. Chestnut. Stakes to be sufficient length to ensure stability, pointed at the base and must be at least 75mm above top of tie.
3. Minimum 2 No. biodegradable ties positioned 75mm from top of stake and 100mm above ground level to ensure stability of plant.
4. 50mm deep Organic Bark Mulch. Sample to be approved.
5. Planting pits to be minimum of 300 x 300 width x 300mm depth. Backfill with 80% topsoil won from site if shown to be fit for purpose by soil testing, mixed with 20% peat free organic compost.
6. Recycled HDPE & LDPE Photodegradable, olive green colour shelters, 750mm height x 80-110mm dia. Set 25mm below ground level.
7. Tree roots to be dipped/ innoculated with mycorrhizal fungi prior to planting.



Feathered Tree Planting on slope
Scale 1:20



Feathered Tree Planting on levelled ground
Scale 1:20

Notes
1. Feathered Tree bare root and in accordance with the National Plant Specification. For plant species and specific sizes refer to planting schedules.
2. Tree roots to be dipped/ innoculated with mycorrhizal fungi prior to planting.
3. 1 No. tree tie and spacer secured to stake with galvanised nail. Sample to be approved.
4. Tree stakes to be pressure treated FSC softwood, Sweet Chestnut or Larch, length as necessary to ensure tree stability, 50-60mm dia. Tree stakes to be driven into ground prior to planting until secure, in the direction of prevailing wind.
5. 50mm deep Organic Bark Mulch. Sample to be approved.
6. Tree pit to be minimum of 800 x 800 wide x 600mm deep. Remove arisings. Backfill with 80% topsoil won from site if shown to be fit for purpose by soil testing, mixed with 20% peat free organic compost. Remainder of arisings to be spread locally with agreement of landowner or removed from site.
7. Recycled PVC, photodegradable, green-tinted spiral shelter with perforated strips, 600mm height x 63mm dia. Sample to be approved.
8. Pegged biodegradable hessian mulch mats (where slope steeper than 1:5)
9. Cultivate and break up base of pit to 200mm to ensure free drainage.
10. General purpose subsoil, no organic material, low in nutrition, suitable for root growth, well drained and free from compaction. Arisings from site to be used subject to testing to confirm suitability.

Notes:
1. For planting plan refer to A61-ARUP-XX-XX-DR-LA-101.
2. For general arrangement refer to A61-ARUP-XX-XX-DR-CH-101.
3. For site clearance, refer to A61-ARUP-XX-XX-DR-CH-110.
4. For pavement and kerb information, refer to A61-ARUP-XX-XX-DR-CH-112, A61-ARUP-XX-XX-DR-CH-113, A61-ARUP-XX-XX-DR-CH-114.
5. For drainage information refer to A61-ARUP-XX-XX-DR-CH-115 and 116.
6. Detailed service locations to be confirmed with utility companies at detailed design. Locations of utilities are indicative only.

Rev	Date	By	Chkd	Appd
P01	22/12/22		YZ	YZ
	For Approval			

ARUP
Admiral House, Rose Wharf,
78 East Street, Leeds, LS9 8EE
Tel +44(0)113 242 8498 Fax +44(0)113 242 8573
www.arup.com

Client
SWIFT YORKSHIRE PASSENGER TRANSPORT EXECUTIVE

Project Title
A61 Corridor

Drawing Title
A61 Old Mill Lane
Proposed Planting Details

Scale at A1
As shown

Role
Landscape Architect

Suitability
S - Issued for Planning

Arup Job No
253511-00

Rev
P01

Name
A61-ARP-XX-XX-DR-LA-102