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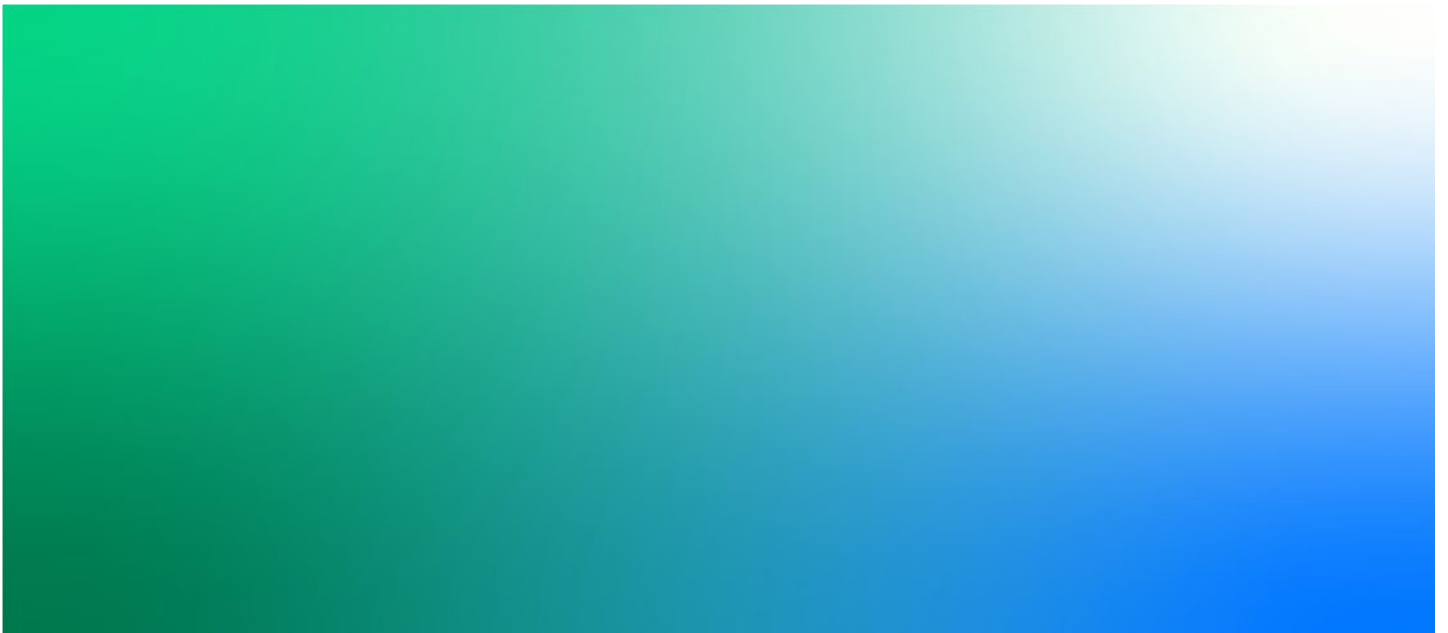
## **Preston and South Ribble Flood Risk Management Scheme** **Landscape and Habitat Establishment and Management Plan**

ENV0000009C-JAC-ZZ-ZZ-RP-EN-0002 | P03

27 May 2021

**Environment Agency**

ENV0000009C



## Preston and South Ribble Flood Risk Management Scheme

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### Document history and status

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## 1. Introduction

This Landscape and Habitat Establishment and Management Plan (LHEMP) has been produced for the Environment Agency to assist in the implementation of the landscape and ecology management of the Preston and South Ribble Flood Risk Management Scheme. It should be read in conjunction with the landscape masterplan drawings (drawing no. ENV0000009C-JAC-ZZ-ZZ-DR-L0001 to L0009 and ENV0000009C-JAC-ZZ-42X-DR-L0001) included in Appendix B, or any subsequent revisions.

The purpose of the LHEMP is to discharge condition 12 of planning consent reference LCC/2021/0002 which states the following.

The plan shall include the following detail:

- a) The nature and depth of any soil making materials.
- b) The design, construction and planting of waterbodies.
- c) Locally native tree/shrub planting and seed specification.
- d) Detail of habitat establishment (including seasonal timing), management, monitoring, and review and reporting methods.
- e) Details of the type, number and location of bird and bat boxes.
- f) The ongoing maintenance and management of the landscaping and habitats at the site for a period of 15 years.

Thereafter, the approved landscaping and habitat establishment and management plan shall be implemented within the first available planting season (the period between 31 October in any one year and 31 March in the following year) following completion of the development.

## 2. Scheme overview

### 2.1 Site context

The Areas 1 and 2 of the Preston and South Ribble FRMS are located along the north and south banks of the River Ribble to the south of Preston city centre at national grid reference (NGR) SD 53174 28203 (refer to Figure 1). The proposed Scheme will extend from Liverpool Road Bridge to the West Coast Main Line (WCML) on the north bank (Area 1) and from Penwortham Old Bridge to the WCML on the south bank (Area 2). The scheme comprises the replacement of existing flood defences, the majority of the works will be undertaken along the existing alignments.

Figure 1 General site location



The proposed Scheme is located to the south of Preston city centre and extends eastwards along the River Ribble corridor from north of the A59 Liverpool Road bridge at Sea Cadets to the railway viaduct carrying the WCML. The river defines the southern edge of Preston. The area is predominantly urban with housing, offices, commercial units, car parks some recreational areas, parks and allotments adjacent to the riverside. The areas of Broadgate and Lower Penwortham extend to the north and south of the river corridor respectively. These well-defined residential neighbourhoods have a similar density and built character.

To the east of Broadgate, on the north bank of the river, the area is more open in character, there are playing fields, open space and Miller and Avenham Park. To the east of Lower Penwortham, on the south bank of the river, open fields are bisected north to south by a number of old railway lines. Mature trees and woodland define the railway embankments and field boundaries. To the west of Lower Penwortham, there are large areas of allotments, recreation areas and transport corridors lined by mature trees and hedgerows adjacent to the river. These areas provide a green urban network of spaces along the river corridor.

The River Ribble and adjacent mature trees and recreational areas are important historically, ecologically and recreationally and include features such as the Ribble Way long-distance footpath, The Preston Guild Wheel (National Cycle Route 622) cycle/footpath, National Cycle Route (NCR) 55 and 62, and local footpath and trails. The railway and river corridors, recreation areas, allotments and some fields contain many mature trees and shrubs which provide a predominantly green setting to the river corridor and adjacent urban areas.

## 2.2 Designated sites

### Statutory designations

- Penwortham Old Bridge is a Scheduled Monument
- The River Ribble is located within the Ribble Estuary Marine Conservation Zone.
- There are a number of listed buildings and features within the study area. These include a number of residences along Broadgate (Grade II), Penwortham Old Bridge (Grade II), railway viaduct (Grade II). Avenham Park and Miller Park are both Registered Historic Parks and Gardens (grade II\*) which contain a number of grade II listed features.

### Non-statutory designations

The scheme is located within the Avenham Conservation Area adjacent to the railway viaduct.

There are a number of Biological Heritage Sites located within the study area, these include,

- River Ribble Upper Tidal Section Biological Heritage Site;
- Preston Junction Local Nature Reserve (LNR) and Adjacent Habitats Biological Heritage Site; and
- Cop Lane Cutting

## 2.3 Habitats

The Scheme encompasses habitats associated with the urban location along the River Ribble, i.e. amenity grassland, planted trees, treelines (planted and self-seeded), roads, bridges, and pedestrianised areas. The Ribble and Alt Estuary Special Protection Area (SPA), and Ribble and Alt Estuary Ramsar are situated approximately 6.5km downstream from the scheme. The Ribble Estuary Marine Conservation Zone (MCZ) is designated for smelt (*Osmerus eperlanus*)

Stands of Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glanduiflora*), and giant hogweed (*Heracleum mantegazzianum*) have been identified throughout the area.

### 2.3.1 Species

Bat activity and bat roost potential surveys have confirmed low level bat activity in Areas 1 and 2. The majority of bat species were common and soprano pipistrelle, very low numbers of other species were recorded. Bats require freshwater habitats to rehydrate. The brackish water conditions at site could be a possible factor in terms of the low levels of bat activity. The urban nature of the site and the noise and light pollution could also be another factor influencing the levels of bat activity and the species recorded.

Otter are known to be present within the area of the Scheme. Otter surveys confirmed presence of commuting otter, however no active couches or holts, or resting features were identified on either the right or left banks within the Scheme.

Trees and scrub vegetation have the potential to support breeding birds between March and August inclusive.

## 2.4 Scheme description

The Scheme involves planting and seeding works to replace cleared areas of existing vegetation, which will be or have been removed to enable the engineering works, including for site access, transport of materials on site, construction of flood walls and earth moving for embankments.

The site includes Broadgate Gardens, Broadgate, Riverside, Ribble Sidings, Riverside Road, Penwortham Methodist Church and the A582 Golden Way, and areas of habitat creation at Ribble Sidings.

## Landscape and Habitat Establishment and Management Plan

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The following section provides a description of the landscape design and habitat management philosophy to inform the establishment maintenance requirements and long-term management of the site.



### **3. Landscape design and habitat management philosophy**

The following section provides a description of the landscape design, habitat creation and management philosophy to inform the establishment maintenance requirements and long-term management of the site.

#### **3.1 Landscape Design**

The flood defences have been carefully designed to minimise impacts on existing landscape and visual resources and to integrate the proposed scheme as sensitively as possible into the receiving landscape. The proposed works have been developed so as to minimise direct impact on vegetation of landscape value, particularly specimen trees. Existing vegetation will be retained wherever practicable and the alignments of the defences throughout the Scheme have been adjusted in order to achieve this. Trees and other vegetation located very close to the working area or impacted by the unavoidable incursion of plant and machinery within the root zones will be retained where safe to do so and will be monitored during the five-year establishment period. Precautionary measures will be taken in these circumstances to help protect root zones during the works.

The planting design complements the existing vegetation, to provide long term, low maintenance native tree and scrub cover, wetland habitat and species grassland, and areas of ornamental planting which reflect the existing vegetation and habitat types located within the urban area. Grassland design is intended to reinstate and improve existing amenity grassland areas of the site. The combined planting and seeding works mitigate vegetation losses required to accommodate the scheme to restore amenity value of the area on completion of the works for the long term benefit and use of the local community.

#### **3.2 Biodiversity Net Gain**

Biodiversity Net Gain (BNG) is an approach that leaves the natural environment in a better state than before the development. It uses a metric approach that allow losses and gains in biodiversity to be measured in an objective and repeatable manner. The results of the assessment for this scheme are provided in the BNG report (ENV0000009C-JAC-ZZ-ZZ-RP-BD-0002).

All areas of habitat creation and reinstatement can contribute towards BNG. The key areas for ecological benefit at this site include new wetland, woodland and species rich grassland at Ribble Sidings and new woodland in the land adjacent to A582 Golden Way (see Section 3.3.). Other areas include re-instating existing amenity grassland and new landscape planting in keeping with existing planting.

The target value of each habitat, as detailed in the BNG report, depends on the condition the habitat achieves. Habitat condition is a score based on the quality of the habitat, judged against the perceived ecological optimum state for that particular habitat. The process of assessing habitat condition considers how many of the key physical characteristics and typical species of a particular habitat type are present in a habitat patch (Crosher *et al.* 2019). Many of these features will gradually develop over time and some habitats such as woodland may take decades to achieve an optimum state. Indicators of success have been set for an initial 1 year period. However, a review of this document should be carried out every 5 years by the maintaining organisation to confirm each habitat is on the right trajectory to achieve the target condition set in the BNG report.

### 3.3 Landscape and Habitat Areas

For ease of reference the site has been split into six management areas (Figure 2). A description of each area is provided below. Also refer to the 'Landscape Masterplan' drawings Figure 1.4 to 1.12, - 'Environmental Masterplan' drawings (drawing no. ENV0000009C-JAC-ZZ-ZZ-DR-L0001 to L0009 and ENV0000009C-JAC-ZZ-42X-DR-L0001) for further details.

#### Area 1 Broadgate Gardens and Sea Cadets

Broadgate Gardens is a public amenity space. The grasslands will be reinstated and pollinator friendly ornamental shrub planting will be provided to visually enhance the area. A new footpath, seating area will be created, and the existing viewing platform will be restored and incorporated into the flood wall design.

Shrub beds are designed to be an attractive mix of foliage and flower, with a proportion of evergreen or semi-evergreen and a variety of sizes. Low level shrubs and groundcover are planted adjacent footpaths to improve pedestrian safety. Larger shrubs are planted to the rear of beds. Specimen shrubs are planted amongst ground cover or low/medium height shrubs. Ground cover shrubs, perennials are located at the front of beds. Pollinator friendly planting provide periods of floral colour and seasonal interest. The planting may benefit from thinning out in year 5 onwards to allow thriving individuals to dominate.

The amenity grassland will be reinstated in the area adjacent to the Sea Cadets building.

#### Area 2 Broadgate and Riverside

This is a narrow strip of land with few opportunities for new habitat creation. The amenity grassland will be reinstated, and new street tree planters and ornamental shrub planting will be provided. There will also be improvements to the public access routes along Riverside and seating along Riverside and near Penwortham Old Bridge to enhance the street scene.

Native hedgerow planting is proposed along the boundary to Miller Gardens Apartments where planting is lost to facilitate the proposed scheme. Hedgerow planting will be maintained as a low hedge. The hedgerow will enhance biodiversity and enhance visual amenity within the grounds of the apartments.

Enhancements to the area beneath the WCML railway viaduct to improve the entrance into Miller Park. Hard landscaping to improve the access to the park.

Along the riverside the only planting opportunity is on the new Redi-rock structures and tree planting along the riverbank in front of the BAC/EE Preston Social and Sports Association grounds. A tussock seed mix will be sown along the top of the structure and within the recesses of each Redi Rock block. Pre-planted coir roll will be installed along the toe of the structure. The tussock seed mix and pre-planted coir rolls will soften the appearance of the structure and enhance biodiversity.

#### Area 3 Flood Embankment and Hawkhurst Road

The existing flood embankment will be improved along the northern edge of the Ribble Sidings (Area 4). A species rich grassland will be created on the embankment and on the wet-side of the embankment towards the river. Pockets of scrub and tree planting will be provided along the banks of the river. This will aim to provide screening and in time possible shelter opportunities for otter. Root plates from felled trees will be used on the river banks to provide habitat for juvenile fish. Interpretation boards relating to heritage assets such as Penwortham Ferry Crossing will also be provided in this area.

The open space at the end of Hawkhurst Road will be enhanced with new footpath routes and tree and ornamental shrub planting to replace the existing vegetation.

A tussock seed mix will be sown along the top of the structure and within the recesses of each Redi Rock block. Pre-planted coir roll will be installed along the toe of the structure. The tussock seed mix and pre-planted coir rolls will soften the appearance of the structure and enhance biodiversity.

### Area 4 Ribble Sidings

This area has been designed and developed in consultation with local stakeholders and in response to comments received during the planning submission. The area has been designed as a community space, with improved access for nature and recreation opportunities. A network of new footpaths will be created to improve access across this area.

A species rich grassland is proposed across the majority of the area, with additional pockets of new wetland, ponds and woodland habitat. The central area will be fenced off, to help protect the area from dogs and human activities. A pond dipping platform will be provided on one of the ponds. The new native shrub and woodland planting will help to integrate the flood embankment into the surrounding area, filter views of the replacement flood wall. A community orchard is also proposed to the east of the area.

An area of amenity grassland will be provided at the southern end of the area to retain recreation provision.

### Area 5 Penwortham Methodist Church and Golden Way

Replacement shrub planting near property boundaries will contain a mix of native and ornamental species to tie in with the existing planting by the church. The amenity grassland will also be reinstated in this area.

A new area of woodland will be created in the open grassland area to the east of Golden Way. The woodland will contain a similar mix to the existing woodland in this area.

### Area 6 Crossley House Industrial Estate

The amenity grassland will be reinstated in this location.

## **3.4 Soil**

Where it is not possible to re-use existing topsoil on site for the reinstatement of landscape areas imported topsoil to BS 3882 general purpose grade will be used to make up any deficiencies in existing topsoil levels on site.

Topsoil depths will be 100mm for amenity grassland areas and 300mm for shrub planting. Topsoil will be laid to smooth flowing contours, with falls adequate for drainage with no hollows and ridges. Finished levels after settlement will be 25mm above adjoining paving, kerbs manholes etc. to allow for settlement.

Species-rich grassland areas will be sown on subsoil only.

Handling of subsoil and topsoil will be in accordance with BS 3882.

Planting compost to all ornamental tree and shrub planting areas to be in accordance with PAS 100:2018, locally sourced, sanitised and stabilised. compost. Horticultural parameters: pH (1.5 water extract) 7.0 to 8.7, electrical conductivity 200mS/cm, 35-55% moisture content, 25% minimum organic matter, grading 99% passing 25mm screen, and 90% passing a 10mm screen mesh aperture, Carbon: Nitrogen ratio (maximum) 20:1. Friable texture, no odour, Composting Association certification required. Submit a declaration of analysis. Supply 5kg sample before ordering. Application rate to be as detailed in sections 5.2, 5.3, 5.4 and 5.5 of this document. Timing to be prior to cultivation.

No peat or products containing peat will be used.

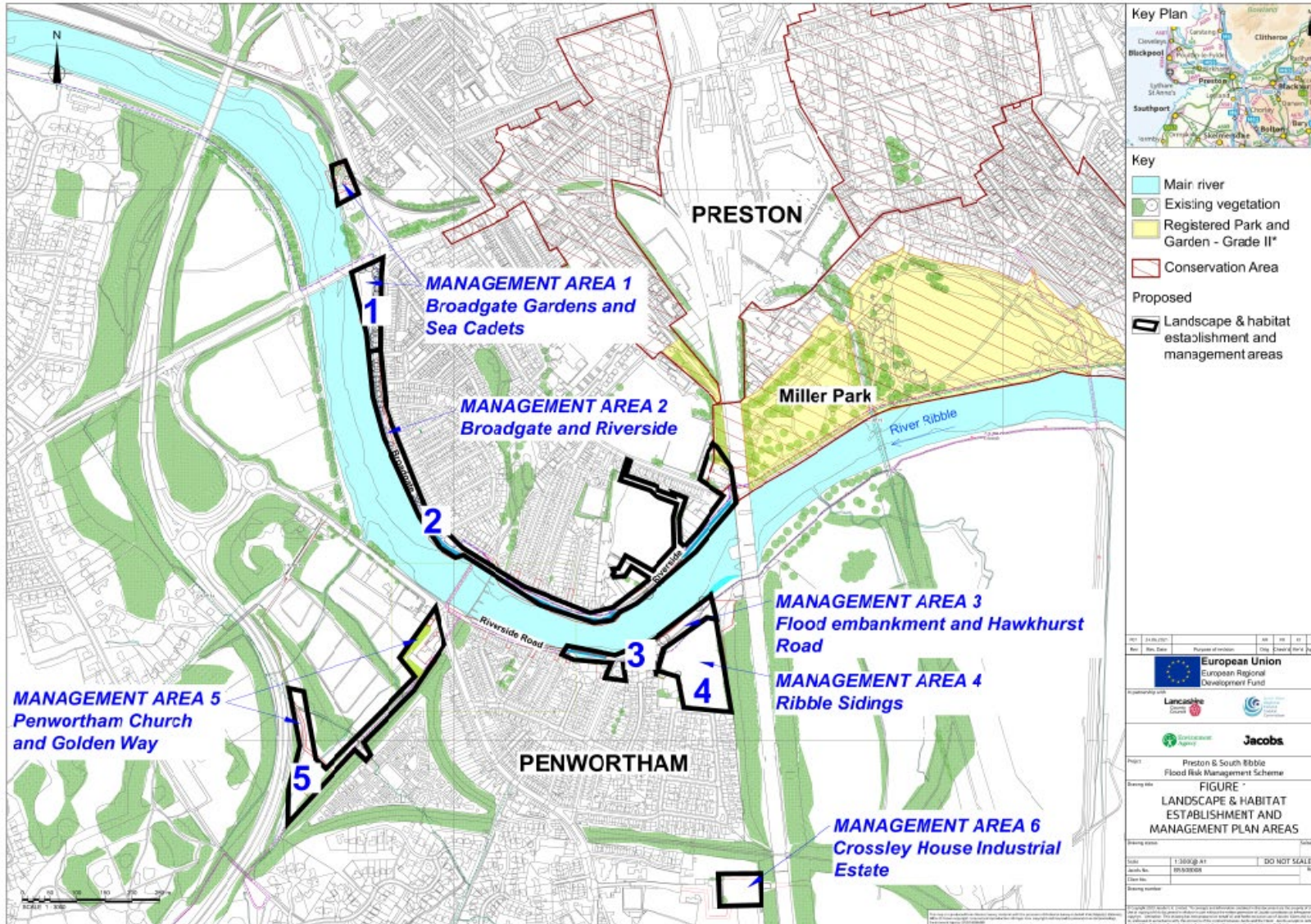
### **3.5 Design, construction and planting of waterbodies**

The design, construction and planting of the pond/scrape habitat creation area is as detailed on drawing ENV0000009C-JAC-42X-DR-L-0001.



# Landscape and Habitat Establishment and Management Plan

Figure 2 Landscape and habitat establishment and management areas



## 4. Roles and Responsibilities

The planning condition states that maintenance and management should continue for a period of 15 years. This has been separated into the establishment phase and the management phase. The EA (or their agents) will be responsible for the establishment phase, which includes creating the habitats, replacing any defects and taking remedial action if the habitats have not established.

### 4.1 Establishment phase and management phase responsibilities

The EA (or their agents) will be responsible for the establishment phase for a period of 1 year post construction. All ongoing maintenance and management beyond the year 1 period will fall under the responsibility of Preston City Council (Areas 1 and part of Area 2) and South Ribble Borough Council (Area 3 and part of Area 5), with the following exceptions summarised in table 1.

Table 1: Establishment phase period and post establishment phase management responsibilities

Location		Establishment Phase (by EA or their Agents)	Management Responsibility beyond Establishment Phase
Management Area 2	BAC/EE Preston Social and Sports Association	1 year	BAC/EE Preston Social and Sports Association
Management Area 4	Ribble Sidings	1 year	South Ribble Borough Council
Management Area 5	Penwortham Methodist Church	1 year	Penwortham Methodist Church
Management Area 5	Leyland Road Allotments	1 year	Penwortham Allotment & Gardens Association
Management Area 6	Crossley House Business Park	1 year	Crossley House Business Park
Management Area 6	St Mary's Magdalen's Catholic School	1 year	St Mary's Magdalen's Catholic School

#### 4.1.1 Habitat Re-instatement Areas

The EA (or their agents) will re-instate the post-construction habitats. Once the indicators of success, as defined below, have been achieved, management and responsibility can revert back to the landowner. In some instances, this will be within the first growing season, when the grassland sward has established and can be managed under the current management regime. In this instance, the EA will agree with the landowner when management responsibilities can be transferred.

#### 4.1.2 Injurious weeds and Invasive Non-Native Species.

The EA have a responsibility to manage and control of injurious and INNS on land which is either under their management or owned by the EA. Once the management responsibility has been passed to another landowner, the responsibility to manage and control of injurious and INNS will lie with the landowner.

## 4.2 Monitoring

The EA will utilise staff with appropriate knowledge and experience to monitor the scheme as set out in this document. Where specialist input is required, this has been specified in the document.

The EA (or their agents) will monitor the success of the habitat creation areas for a period of 15 years.

Regular inspections will be carried out in the establishment phase by the landscape contractor. Monitoring by an Arborist, for trees impacted by the works will be undertaken for a period of 1 year.

An annual audit will initially be carried out by the appointed landscape architect for the 1 year establishment period. After this time, audits will be conducted biannually then every four years in years 3, 7, 11, and 15 by the maintaining authority.

Remedial action will be required if the habitats have failed or are unlikely to achieve the target condition set in the BNG report.

### **4.2.1 Landscape Contractor**

The EA will appoint a landscape contractor to reinstate and create habitats, as prescribed in this document. A Landscape Architect or Landscape Clerk of Works will carry out the monitoring as defined in this document to ensure the landscape proposals and habitat areas have successfully established across the defects period.

### **4.2.2 Landscape Architect**

During the post construction one year establishment maintenance period, a suitably qualified Landscape Architect / Landscape Clerk of Works shall be commissioned to undertake the necessary monitoring, to ensure the landscape planting and habitat areas have successfully established.

The Landscape Architect shall keep the Employer informed of the progress of management operations through the submission of Landscape Inspection Reports. This shall include a summary of the figures agreed between the Contractor and the Landscape Architect regarding plant failures undertaken in September of each year during the one year establishment maintenance period, and an appraisal of whether any alterations should be made to the following year's management regime.



## 5. Landscape and habitat objectives and clauses

This section sets out the principles of landscape proposals, habitat creation and management that have been incorporated into the environmental masterplan, in order to maximise benefits to biodiversity. The key biodiversity benefits described under each management principle are based on the species and/or habitats that have been identified as present within the Site or are associated with the local area included in the baseline study. Each task ensures habitats are re-instated and the conservation objectives are met. A prescriptive method for how this will be achieved is provided, including the timings and consideration of potential constraints for each task. Refer to ENV000009C-JAC-ZZ-ZZ-SP-L-0001 for full details of the landscape specification for the landscape and habitat establishment and management proposals.

### 5.1 Native Broadleaved Woodland

Areas of proposed woodland adjacent to the Golden Way and within Ribble Sidings contribute to biodiversity. Transplants (60-80cm, 1+1) are specified to provide the replacement trees with the best opportunity of establishment. Plants to be of local provenance and planted at 1.5m centres, tree species to be planted at a minimum of 3.0m centres.

Ribble Sidings (Area 4 - woodland): *Betula pendula* (Silver Birch) 10%, *Quercus robur* (Oak) 5%, *Corylus avellana* (Hazel) 30%, *Crateagus monogyna* (Hawthorn) 20%, *Cornus sanguinea* (Dogwood) 25%, *Salix caprea* (Goat Willow) 10%.

Penwortham Church and Golden Way (Area 5): *Quercus robur* (Oak) 10%, *Prunus avium* (Cherry) 5%, *Sorbus aucuparia* (Rowan) 5%, *Betula pendula* (Silver Birch) 5%, *Ilex aquifolium* (Holly) 10%, *Corylus avellana* (Hazel) 20%, *Crataegus monogyna* (Hawthorn) 25%, and *Salix caprea* (Goat Willow) 20%.

Objective	Establishment of woodland planting incorporating a range of native species to increase diversity of habitat and provide food for wildlife, and enhance visual amenity. To replace tree planting removed to allow for the scheme.
Task	Maintenance and monitoring of newly planted trees (1 year establishment maintenance period plus 14 years following handover).
Location	Ribble Sidings (Management Area 4) Penwortham Church and Golden Way (Area 5)
Method	<p>The EA will appoint a Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) SITE CLEARANCE: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil. Removed stones exceeding 50mm in any dimension.</li> <li>2) PLANTS: To BS:4043, BS3936 and the National Plant Specification, plant handling/storage, transport and planting to HTA 'Handling and Establishing Landscape Plants' and CPSE 'Handling and establishing landscape plants'. Surplus material to be removed off site.</li> <li>3) PLANTING: All plants to be pit planted, planting pit to be of a sufficient size to accommodate roots when fully spread or rootball and 75mm deeper than root system. Pit bottom to be broken up to a depth of 150mm. Backfill reusing excavated material. Surplus material to be spread locally on site to match existing ground levels. All containers to be removed prior to planting. All planting plots to be set out evenly avoiding straight lines in densities and species mixes as shown on the drawings and schedules.</li> <li>4) PROTECTION: Biodegradable translucent plastic tubes 130-160mm diameter, 750mm high. Top of shelters to be formed to prevent abrasion damage to the enclosed plants. Shelters fixed using softwood or hardwood stakes and ties. Dimensions 1000mm x 25mm x 25mm with a four-way point. Ensure stake</li> </ol>



is below the flared rim at the top of shelters and is inserted into the ground by at least one third of the stake height. Push shelter lightly into ground to remove the gap at the base.

### Maintenance

- 5) **CHECK STAKES, SHELTERS/GUARDS AND TIES:** Check stakes for looseness, breaks and decay and replace as necessary to original specification. If a plant with a defective stake has grown sufficiently to become self-supporting, inform the Contract Administrator (CA) and, if instructed, remove stake(s) and fill the hole(s) with lightly compacted soil. Adjust, refix or replace loose or defective ties as necessary. Remove redundant tapes, tags, ties, labels and other encumbrances. Check all shelters/guards at regular intervals to ensure they are secure. Notify the CA of number of missing and replace as per original specification.
- 6) **STRAIGHTEN PLANTS:** Straighten plants and refirm around roots, re-firm soil around any loose plants, without compacting and ensure that all plants are upright after each visit. Ensure any recently replaced planting is re-visited to refirm and straighten as necessary.
- 7) **HAND WEEDING:** Keep tree and shrub bases (and guards/tubes) clear of weeds, by hand weeding to ensure there is no weed growth within the ring spray area (where herbicide ring spraying misses weeds growing close to each tree/shrub). Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to trees and leaving the area in a neat, clean condition.
- 8) **SLOW RELEASE FERTILISER:** In March or April, evenly spread and incorporate 15:15:15, N:P:K granular slow release fertilizer at a rate to suit manufacturer's instructions within woodland planting stations only. No fertilizer to be applied in sensitive habitat areas including field layer planting, species rich grassland or marginal / aquatics.
- 9) **REMOVE DAMAGED BRANCHES, GROWTH, THIN AND PRUNE:** Remove Dead, dying, or diseased wood, broken branches and stubs, fungal growths and fruiting bodies, rubbish, wind-blown or accumulated in branch forks. Do not prune natural form of feathered trees unless damaged, diseased or deadwood present. Do not prune during the late winter/early spring sap flow period, unless specified otherwise. Prune in accordance with good horticultural practice. Thin, trim and shape appropriately to each species, location, season, and stage of growth, leaving a well-balanced natural appearance. Use clean sharp secateurs, hand saws or other tools approved by the CA. Trim off ragged edges of bark or wood with a sharp knife. Remove branches without damaging or tearing the stem. Keep wounds as small as possible and cut cleanly back to sound wood. Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area. Prune larger branches neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide. Notify the OCA of any disease or fungus. Do not apply growth retardants, fungicide or sealant unless instructed by the CA. Inform CA if any growth is encroaching onto paths, tracks, structures etc.
- 10) **REPLACE LOSSES:** Inform CA of any plants which are dead or dying and obtain instructions for replacement. Replacements to be the same species and of a comparable size with the surrounding plants (where practical to do so) or default to original specification (if site constraints reduce viability of planting larger nursery stock). Additional watering and fertiliser applications are to be undertaken, sufficient to ensure successful establishment. Do not undertake replacement planting in periods of drought or out of season.
- 11) **WATER TO FIELD CAPACITY:** Water as necessary to field capacity to ensure the continued thriving of all planting.
- 12) **LITTER REMOVAL AND CLEANLINESS:** Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from all planted and grassed areas, particularly immediately prior to mowing and/or strimming grass. Keep footpaths and kerb lines clear of leaves, litter, clippings and grass cuttings, following any operation that produces such debris.
- 13) **REMOVE STAKES, TIES AND SHELTERS/GUARDS:** Once the tree/shrub has successfully established with firm root support and no indications of movement around the root ball, remove the stake, tie and guard

from the tree. Bear in mind individual plants may not develop at the same rate and each plant should be checked independently before removing support.

- 14) THINNING/COPPACING: Thinning and coppicing operations to be undertaken at year 5 and subsequently on 5 yearly cycles subject to development of the planting and following a review by the landowner. or suitably qualified personnel. Thinning and coppicing only to be undertaken to promote healthy vegetation cover, structural/age diversity and to retain preferred species content of the original planting. Where thinning is required treat the cut stump immediately after felling with a suitable herbicide to prevent re-growth. Arisings from thinning or coppicing operations should be removed from site, a small percentage to be used to create habitat piles, the location and extent to be agreed with the landowner.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner.

<p>Activity and Timings</p>	<p>Bare root stock planted November until the end of March while the plants are dormant.                  Check stakes, shelters/guards and ties - 3 per year February, June, October                  Straighten plants and refirm around roots – 3 per year February, June, October                  Hand weed around base of trees as necessary - 2 per year. April and August.                  Slow release fertiliser (years 2 and 4). April.                  Remove damaged branches, growth, thin and prune. February.                  Replace losses (first year only). November until the end of March while the plants are dormant                  Water to field capacity to ensure growth. As required.                  Litter removal and cleanliness. As required following maintenance operations                  Remove shelters/guards and associated stakes and ties from plants and recycle during or at the end of year 5 or as required.                  Thinning/coppicing – once planting is fully established, during November in years 5, 10 and 15.</p>
<p>Indicators of Success</p>	<p>Established tree canopy in good health with no signs of disease or decay.                  All trees have enough space for canopy spread and natural growth forms.                  Signs of ground flora developing to enhance biodiversity and landscape integration.                  BNG success criteria measured in year 15 against target condition.</p>
<p>NG Target</p>	<p>Woodland – Broadleaved other.                  Good (32 years +). Poor condition achieved by year 20, moderate condition achieved by year 30.                  Good condition = Meets at least 10 of the criteria as defined in Crosher <i>et al.</i> 2019, with only minor variation. No more than 1 of the indicators of poor condition are present and stands of native trees that do not obviously originate from planting.</p>
<p>Personnel</p>	<p>A suitability qualified Landscape Architect will inspect the trees at the end of year 1 at the joint plant replacement count with the Contractor to confirm the management prescription have been followed.                  At the end of the establishment period, the EA will transfer management responsibilities to the landowner as detailed in Section 4.1, who will continue management in years 2 to 15.                  The EA (or an appointed supplier) will monitor the site annually between years 2 and 15 to confirm the management has been carried out and the indicators of success have been achieved.</p>

## 5.2 Specimen Trees

The preference is to mitigate on site but in places there is limited space due to existing underground services and proximity to flood walls. Where possible replacement native tree planting is proposed in similar locations to where trees have been lost. Tree planting species include the following are specified as heavy standards 12-14cm girth and Goat Willow as a standard at 8-10cm girth:

Main scheme (Areas 2, 3 and 5):

- *Acer campestre* (Field Maple)
- *Alnus glutinosa* (Alder)
- *Betula pendula* (Silver Birch)
- *Populus alba* (White Poplar)
- *Salix alba* (White Willow)
- *Salix caprea* (Goat Willow)
- *Sorbus aucuparia* (Rowan)
- *Pyrus calleryana* 'Chanticleer' (Callery Pear) in tree planters (Area 1)

Ribble Sidings (Area 4):

- *Acer campestre* (Field Maple)
- *Betula pubescens* (Downy Birch)

An area of Orchard tree planting is proposed at Ribble Sidings. Tree planting species include the following are specified as heavy standards 12-14cm girth.

Ribble Sidings (Area 4 - orchard): *Malus domestica* 'Cox's Orange Pippin (apple), *Pyrus communis* 'Conference' (Pear), *Prunus domestica* 'Victoria' (Plum), *Prunus instituta* 'Merryweather' (Damson) and *Prunus avium* 'Stella' (Cherry)

Objective	Establishment of trees incorporating a range of native species where possible to increase diversity of habitat and provide food for wildlife, and enhance visual amenity.
Task	Maintenance and monitoring of newly planted trees (1 year establishment maintenance period plus 14 years following handover).
Location	Broadgate and Riverside (Management Area 1) ornamental trees Flood Embankment and Hawkhurst Road (Management Area 3) native trees Ribble Sidings (Management Area 4) orchard Penwortham Methodist Church and Golden Way (Management Area 5) native trees
Method	
The EA will appoint a Landscape Contractor to carry out the following tasks: - Specification summary	
<ol style="list-style-type: none"> <li>1) SITE CLEARANCE: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil. Removed stones exceeding 50mm in any dimension. Clear scrub and herbaceous material to ground level using suitable tools and remove arisings. Grub up large roots and dispose of without undue disturbance of soils and adjacent areas. Apply a suitable non-residual herbicide to all planting areas.</li> <li>2) PLANTING: Plants to BS:4043, BS3936 and the National Plant Specification, plant handling/storage, transport and planting to HTA 'Handling and Establishing Landscape Plants' and CPSE 'Handling and establishing landscape plants'. Surplus material to be removed off site.</li> <li>3) TREE PITS: Tree Pits: to be excavated 1000 x 1000 x 750mm for heavy standard trees, pit bottom to be broken up to a depth of 200mm and sides scarified. Backfilling material: top backfill in top 300mm of the pit with mix of 80% topsoil (existing or site and peat free organic planting compost with a pH of 6.5-7.5.</li> </ol>	

Incorporate Enmag slow release fertiliser tablets in accordance with the manufacturers recommendations. Lower depth of pit to be backfilled with site won subsoil/topsoil.

- 4) **STAKE AND TIES:** Staking: Double staking for rootballed trees. Stakes to BS 4043m softwood, peeled chestnut, larch or oak. Nails galvanised to BS 1202-1. Stake diameter 75mm, height of stake sufficient to ensure that are firm when driven into the ground and the top of the stake extends above ground level to approximately one third the height of the tree. trees to be secured firmly to two stakes with one rubber strap per stake within 25mm from the top of each stake . Drive staked vertically at least 300mm into bottom of pit on either side of tree position before planting. Consolidate material around stakes, firmly fix on windward side of tree as close as possible to stem. Reinforced rubber ties with spacers, secure tree firmly but not rigidly to stakes.
- 5) **MULCH:** Mulching trees: (within amenity grassland areas): Amenity grade bark mulch free from pests, disease, fungus and weeds. Prior to mulching clear all weeds and water soil thoroughly. Coverage, 75mm depth in a circular are of 500mm radius measured from the tree stem. Finished level of mulch 30mm below adjacent grass or paved areas.

### Maintenance

- 6) **CHECK STAKES, GUARDS AND TIES:** Check stakes for looseness, breaks and decay and replace as necessary to original specification. If a tree with a defective stake has grown sufficiently to become self-supporting, inform the CA and, if instructed, remove stake(s) and fill the hole(s) with lightly compacted soil. Adjust, refix or replace loose or defective ties as necessary. Remove redundant tapes, tags, ties, labels and other encumbrances.
- 7) **STRAIGHTEN PLANTS:** Straighten plants and refirm around roots: re-firm soil around any loose plants, without compacting and ensure that all plants are upright after each visit. Ensure any recently replaced planting is re-visited to refirm and straighten as necessary.
- 8) **HAND WEEDING:** Keep areas around trees to a radius of 500mm clear of weeds, by hand weeding. Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to planting and leaving the area in a neat, clean condition.
- 9) **SPOT TREATMENT OF PERSISTENT WEEDS:** use a suitable herbicide and appropriate method of application to maintain the site predominantly free of noxious and notifiable weeds or other undesirable species. Treatments should ensure that general grass cover and vegetation established is retained and adjacent grass cover and planting are not detrimentally affected by any such herbicide application
- 10) **SLOW RELEASE FERTILISER:** In March or April, evenly spread and incorporate 15:15:15, N:P:K granular slow release fertilizer at a rate to suit manufacturer's instructions for trees.
- 11) **REMOVE DAMAGED BRANCHES, BASEL GROWTH, THIN AND PRUNE:** Prune in accordance with good horticultural practice. Do not prune during the late winter/early spring sap flow period, unless specified otherwise. Thin, trim and shape appropriately to each species, location, season, and stage of growth, leaving a well-balanced natural appearance. Use clean sharp secateurs, hand saws or other tools approved by the CA. Trim off ragged edges of bark or wood with a sharp knife. Remove branches without damaging or tearing the stem. Keep wounds as small as possible and cut cleanly back to sound wood. Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area. Notify the CA of any disease or fungus. Do not apply growth retardants, fungicide or sealant unless instructed by the CA. Inform CA if any growth is encroaching onto paths, tracks, structures etc.
- 12) **REPLACE LOSSES:** Inform CA of any plants which are dead or dying and obtain instructions for replacement. Replacements to be the same species and of a comparable size with the surrounding plants (where practical to do so) or default to original specification (if site constraints reduce viability of planting larger nursery stock). Additional watering and fertilizer applications are to be undertaken, sufficient to ensure successful establishment. Do not undertake replacement planting in periods of drought or out of season.

- 13) WATER TO FIELD CAPACITY: Water as necessary to field capacity to ensure the continued thriving of all planting.
- 14) LITTER REMOVAL AND CLEANLINESS: Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from all planted and grassed areas, particularly immediately prior to mowing and/or strimming grass. Keep footpaths and kerb lines clear of leaves, litter, clippings and grass cuttings, following any operation that produces such debris.
- 15) REMOVE STAKES, TIES AND GUARDS: Once trees have successfully established with firm root support and no indications of movement around the root ball, remove the stake, tie and guard from the tree. Bear in mind individual trees may not develop at the same rate and each tree should be checked independently before removing support.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. This is a community orchard and it expected that the fruit will be collected by members of the public. The grassland will be managed separately.

Activity and Timings	<p>Bare root stock planted November until the end of March while the plants are dormant.</p> <p>Check stakes, ties and guards – 3 per year February, June, October.</p> <p>Straighten plants and refirm around roots - 3 per year</p> <p>Hand weed around base of trees as necessary - 3 per year. April, July, October.</p> <p>Spot treatment of weeds – 2 per year, April and August.</p> <p>Slow release fertiliser (years 2 and 4). April.</p> <p>Remove damaged branches, basal growth, thin and prune. 1 per year, February.</p> <p>Replace losses (first year only). November.</p> <p>Top up mulch to ornamental trees. 1 per year, March.</p> <p>Water to field capacity to ensure growth). As required.</p> <p>Litter removal and cleanliness – 3 per year. February, June , October.</p>
Indicators of Success	<p>Established tree canopy in good health with no signs of disease or decay. Native trees add to the biodiversity.</p> <p>BNG success criteria measured in year 15 against target condition.</p>
BNG Target	<p>Urban - Orchard</p> <p>Good (25 years). Poor condition achieved by year 5, moderate condition achieved by year 15.</p> <p>Good condition = Meets the majority of the criteria as defined in Crosher <i>et al.</i> 2019, with only minor variation. None of the indicators of poor condition are present.</p>
Personnel	<p>A suitability qualified Landscape Architect will inspect the trees annually as part of the September plant replacement count with the Contractor to confirm the management prescription have been followed.</p> <p>At the end of year 1 the EA will transfer management to the landowner who will continue management in years 2 to 15.</p>

### 5.3 Hedgerows

All native transplants (60-80cm, 1+1) of local provenance to be supplied as bare root stock. In keeping with existing hedgerows, planting to include:

- *Crataegus monogyna* (Hawthorn) 30%, *Corylus avellana* (Hazel) 30%, *Ligustrum vulgare* (Privet) 35%, *Prunus spinosa* (Blackthorn) 5%.

## Landscape and Habitat Establishment and Management Plan

Objective	Establishment of new native hedgerow incorporating local native species to increase diversity of habitat, provide food for wildlife, contribute to existing wildlife corridors. The hedgerows will also provide sheltering, foraging and commuting habitat for bats, nesting birds, hedgehog, harvest mouse and badger.
Task	Maintenance and monitoring of newly planted hedgerow for 15 years (1 year establishment maintenance period plus 14 years following handover).
Location	Miller Gardens Apartments (Management Area 2)
Method	
<p>Specification summary</p> <p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <ol style="list-style-type: none"> <li>1) <b>SITE CLEARANCE:</b> remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil. Removed stones exceeding 50mm in any dimension. Clear scrub and herbaceous material to ground level using suitable tools and remove arisings. Grub up large roots and dispose of without undue disturbance of soils and adjacent areas. Apply a suitable non-residual herbicide to all planting areas.</li> <li>2) <b>PLANTS:</b> Plants to BS:4043, BS3936 and the National Plant Specification, plant handling/storage, transport and planting to HTA 'Handling and Establishing Landscape Plants' and CPSE 'Handling and establishing landscape plants'. Surplus material to be removed off site.</li> <li>3) <b>PLANTING:</b> Plant as a double staggered row at 4 plants per metre squared in trenches wide enough to take full spread of roots. Set out plants evenly as scheduled. Backfill to be 50:50 mixture of topsoil and peat free compost to PAS100 to depth of planting pit. Surplus material to be spread locally on site to match existing ground levels.</li> <li>4) <b>PROTECTION:</b> shrub shelters, biodegradable translucent plastic tubes 130-160mm diameter, 750mm high, shall be used. The top edge of shelters shall be formed to prevent abrasion damage to the enclosed plants. Shelters fixed using softwood or hardwood stakes. Dimensions 1000mm x 25mm x 25mm with a four way point. Ensure stake is below the flared rim at the top of shelters and is inserted into the ground by at least one third of the stake height. Push shelter lightly into ground to remove the gap at the base.</li> </ol> <p>Maintenance</p> <ol style="list-style-type: none"> <li>5) <b>CHECK, STAKES, SHELTERS/GUARD AND TIES:</b> Check stakes for looseness, breaks and decay and replace as necessary to original specification. If a plant with a defective stake has grown sufficiently to become self-supporting, inform the Contract Administrator and, if instructed, remove stake(s) and fill the hole(s) with lightly compacted soil. Adjust, refix or replace loose or defective ties as necessary. Remove redundant tapes, tags, ties, labels and other encumbrances. Check all shelters/guards at regular intervals to ensure they are secure, Notify CA of number of missing and replace as per original specification.</li> <li>6) <b>STRAIGHTEN PLANTS:</b> Straighten plants and refirm around roots, re-firm soil around any loose plants, without compacting and ensure that all plants are upright after each visit. Ensure any recently replaced planting is re-visited to refirm and straighten as necessary.</li> <li>7) <b>HAND WEEDING:</b> Keep tree and shrub bases (and guards/tubes) clear of weeds, by hand weeding to ensure there is no weed growth within the ring spray area (where herbicide ring spraying misses weeds growing close to each tree/shrub). Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to trees and leaving the area in a neat, clean condition.</li> <li>8) <b>SLOW RELEASE FERTILISER:</b> In March or April, evenly spread and incorporate 15:15:15, N:P:K granular slow release fertilizer at a rate to suit manufacturer's instructions within woodland planting stations only. No fertilizer to be applied in sensitive habitat areas including field layer planting, species rich grassland or marginal / aquatics.</li> <li>9) <b>REMOVE DAMAGED BRANCHES, GROWTH, THIN AND PRUNE:</b> Remove Dead, dying, or diseased wood, broken branches and stubs, fungal growths and fruiting bodies, rubbish, wind-blown or accumulated in branch forks. Do not prune natural form of feathered trees unless damaged, diseased or deadwood</li> </ol>	



present. Do not prune during the late winter/early spring sap flow period, unless specified otherwise. Prune in accordance with good horticultural practice. Thin, trim and shape appropriately to each species, location, season, and stage of growth, leaving a well-balanced natural appearance. Use clean sharp secateurs, hand saws or other tools approved by the CA. Trim off ragged edges of bark or wood with a sharp knife. Remove branches without damaging or tearing the stem. Keep wounds as small as possible and cut cleanly back to sound wood. Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area. Prune larger branches neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide. Notify the CA of any disease or fungus. Do not apply growth retardants, fungicide or sealant unless instructed by the CA. Inform CA if any growth is encroaching onto paths, tracks, structures etc. Once established Shrub mix A is to be maintained as a low hedge refer to section 5.6 for hedge cutting frequencies.

- 10) HEDGE CUTTING: No trimming or clipping shall take place during the bird nesting season. The bird nesting season to apply to this contract is March to August inclusive. Once established hedgerows to be cut biennially in February where safety and sightlines are not compromised. Hedges to be cut at the same time each 2nd year. Hedges to be cut so that they have straight sides and a flat top. Hedge to be maintained at a height of 1.2m or as agreed with the CA.
- 11) REPLACE LOSSES: Inform CA of any plants which are dead or dying and obtain instructions for replacement. Replacements to be the same species and of a comparable size with the surrounding plants (where practical to do so) or default to original specification (if site constraints reduce viability of planting larger nursery stock). Additional watering and fertiliser applications are to be undertaken, sufficient to ensure successful establishment. Do not undertake replacement planting in periods of drought or out of season.
- 12) WATER TO FIELD CAPACITY: Water as necessary to field capacity to ensure the continued thriving of all planting.
- 13) LITTER REMOVAL AND CLEANLINESS: Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from all planted and grassed areas, particularly immediately prior to mowing and/or strimming grass. Keep footpaths and kerb lines clear of leaves, litter, clippings and grass cuttings, following any operation that produces such debris.
- 14) REMOVE STAKES, TIES AND SHELTERS/GUARDS: Once hedgerow plants have successfully established with firm root support and no indications of movement around the root ball, remove the stake, tie and guard from the tree. Bear in mind individual plant may not develop at the same rate and each plant should be checked independently before removing support.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Hedge cutting will continue biennially in February, in accordance with item 10 above.

Timings	<p>Bare root stock planted November until the end of March while the plants are dormant.</p> <p>Check stakes, ties and guards – 3 per year February, June, October</p> <p>Straighten plants and refirm around roots - 3 per year February, June, October.</p> <p>Hand weed around base of hedge as necessary - 2 per year April and August.</p> <p>Slow release fertiliser (year 2 and year 4). April</p> <p>Remove damaged branches, growth, thin and prune. 1 per year, February.</p> <p>Hedge cutting (biennially once established). February</p> <p>Replace losses (first year only). November.</p> <p>Water to field capacity to ensure growth. As required.</p> <p>Litter removal and cleanliness – as required.</p>
Indicators of Success	<p>Linear hedgerow with dense foliage from hedge base to top and a diverse mix of species (as near to the original specification as possible). Hedge base free of injurious weeds.</p> <p>BNG success criteria measured in year 15 against target condition.</p>

BNG Target	Native Species Rich Hedgerow Good (10 years). Poor condition achieved by year 1, moderate condition achieved by year 5. Good condition = No more than 2 failures in total and no more than 1 in any functional group, criteria as defined in Crosher <i>et al.</i> 2019.
Personnel	A suitability qualified Landscape Architect will inspect the hedgerows annually as part of the September plant replacement count with the Contractor to confirm the management prescription have been followed.

## 5.4 Native shrub planting

Reinstatement works following the construction of the proposed scheme provides the opportunity to provide areas of shrub planting adjacent to the River Ribble to provide suitable habitat for Otters (Shrub mix A). The shrub planting will be maintained as a low hedge.

Replacement shrub planting near property boundaries will contain a mix of native (60-80cm, 1+1) and ornamental species (60-80cm, 2L) to tie in with the existing planting. The replacement shrub planting within the open space will filter views of the replacement flood wall and embankment.

Shrub Mix A: *Cornus sanguinea* (Dogwood) 20%, *Crataegus monogyna* (Hawthorn) 40%, *Prunus spinosa* (Blackthorn) 10%, *Rosa arvensis* (Field Rose) 5%, *Rosa canina* (Dog Rose), *Salix cinerea* (Grey Willow) 25%.

Shrub Mix B: *Cornus sanguinea* (Dogwood) 20%, *Corylus avellana* (Hazel) 20%, *Ligustrum vulgare* (Privet) 30%, *Salix viminalis* (Common Osier) 20%, *Sambucus nigra* (Elder) 10%.

Shrub Mix C: *Cornus sanguinea* (Dogwood) 10%, *Corylus avellana* (Hazel) 15%, *Crataegus monogyna* (Hawthorn) 40%, *Prunus spinosa* (Blackthorn) 10%, *Ilex aquifolium* (Holly) 5%, *Ligustrum vulgare* (Privet) 20%, *Prunus Laurocerasus* (Laurel) 20%.

Shrub Mix D: *Cornus sanguinea* (Dogwood) 20%, *Corylus avellana* (Hazel) 20%, *Ligustrum vulgare* (Privet) 20%, *Prunus Laurocerasus* (Laurel) 40%.

Objective	Establishment of native shrub planting to replace vegetation removed to allow for the scheme. Native species will increase diversity of habitat, provide food for wildlife, and contribute to existing wildlife corridors. The shrubbery will also provide sheltering, foraging and commuting habitat for bats, nesting birds, otter and other small mammals.
Task	Maintenance and monitoring of newly planted native shrub planting (1 year establishment maintenance period plus 14 years following handover)
Location	Flood Embankment and Hawkhurst Road (Management Area 3)
Method	<p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) SITE CLEARANCE: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil. Removed stones exceeding 50mm in any dimension. Clear scrub and herbaceous material to ground level using suitable tools and remove arisings. Grub up large roots and dispose of without undue disturbance of soils and adjacent areas. Apply a suitable non-residual herbicide to all planting areas.</li> <li>2) PLANTS: To BS:4043, BS3936 and the National Plant Specification, plant handling/storage, transport and planting to HTA 'Handling and Establishing Landscape Plants' and CPSE 'Handling and establishing landscape plants'. Surplus material to be removed off site.</li> <li>3) PLANTING: All plants to be pit planted, planting pit to be of a sufficient size to accommodate roots when fully spread or rootball and 75mm deeper than root system. Pit bottom to be broken up to a depth of</li> </ol>



150mm. Backfill reusing excavated material, ornamental shrubs backfill to be 50:50 mixture of topsoil and peat free compost to PAS100 to depth of planting pit. Surplus material to be spread locally on site to match existing ground levels. All containers to be removed prior to planting. All planting plots to be set out evenly avoiding straight lines in densities and species mixes as shown on the drawings and schedules.

- 4) **PROTECTION:** Spiral guards clear/transparent, recycled PVC, 50mm diameter, 750mm high with bamboo cane support. Shrub shelters for holly to be, biodegradable translucent plastic tubes 130-160mm diameter, 750mm high, shall be used. The top edge of shelters shall be formed to prevent abrasion damage to the enclosed plants. Shelters fixed using softwood or hardwood stakes. Dimensions 1000mm x 25mm x 25mm with a four way point. Ensure stake is below the flared rim at the top of shelters and is inserted into the ground by at least one third of the stake height. Push shelter lightly into ground to remove the gap at the base.

### Maintenance

- 5) **CHECK, STAKES, SHELTERS/GUARD AND TIES:** Check stakes for looseness, breaks and decay and replace as necessary to original specification. If a plant with a defective stake has grown sufficiently to become self-supporting, inform the Contract Administrator and, if instructed, remove stake(s) and fill the hole(s) with lightly compacted soil. Adjust, refix or replace loose or defective ties as necessary. Remove redundant tapes, tags, ties, labels and other encumbrances. Check all shelters/guards at regular intervals to ensure they are secure, Notify CA of number of missing and replace as per original specification.
- 6) **STRAIGHTEN PLANTS:** Straighten plants and refirm around roots, re-firm soil around any loose plants, without compacting and ensure that all plants are upright after each visit. Ensure any recently replaced planting is re-visited to refirm and straighten as necessary.
- 7) **HAND WEEDING:** Keep tree and shrub bases (and guards/tubes) clear of weeds, by hand weeding to ensure there is no weed growth within the ring spray area (where herbicide ring spraying misses weeds growing close to each tree/shrub). Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to trees and leaving the area in a neat, clean condition.
- 8) **SLOW RELEASE FERTILISER:** In March or April, evenly spread and incorporate 15:15:15, N:P:K granular slow release fertilizer at a rate to suit manufacturer's instructions within woodland planting stations only. No fertilizer to be applied in sensitive habitat areas including field layer planting, species rich grassland or marginal / aquatic.
- 9) **REMOVE DAMAGED BRANCHES, GROWTH, THIN AND PRUNE:** Remove Dead, dying, or diseased wood, broken branches and stubs, fungal growths and fruiting bodies, rubbish, wind-blown or accumulated in branch forks. Do not prune natural form of feathered trees unless damaged, diseased or deadwood present. Do not prune during the late winter/early spring sap flow period, unless specified otherwise. Prune in accordance with good horticultural practice. Thin, trim and shape appropriately to each species, location, season, and stage of growth, leaving a well-balanced natural appearance. Use clean sharp secateurs, hand saws or other tools approved by the CA. Trim off ragged edges of bark or wood with a sharp knife. Remove branches without damaging or tearing the stem. Keep wounds as small as possible and cut cleanly back to sound wood. Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area. Prune larger branches neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide. Notify the CA of any disease or fungus. Do not apply growth retardants, fungicide or sealant unless instructed by the CA. Inform CA if any growth is encroaching onto paths, tracks, structures etc. Once established Shrub mix A is to be maintained as a low hedge refer to section 5.6 for hedge cutting frequencies.
- 10) **SHRUB MIX A CUTTING:** No trimming or clipping shall take place during the bird nesting season. The bird nesting season to apply to this contract is March to August inclusive. Once established shrub to be cut biennially in February where safety and sightlines are not compromised. Shrub to be cut at the same time each 2nd year. Shrub to be cut so that they have organic shape with varied structure. Hedge to be maintained at a height of 1.2m or as agreed with the CA.

- 11) REPLACE LOSSES: Inform CA of any plants which are dead or dying and obtain instructions for replacement. Replacements to be the same species and of a comparable size with the surrounding plants (where practical to do so) or default to original specification (if site constraints reduce viability of planting larger nursery stock). Additional watering and fertiliser applications are to be undertaken, sufficient to ensure successful establishment. Do not undertake replacement planting in periods of drought or out of season.
  - 12) WATER TO FIELD CAPACITY: Water as necessary to field capacity to ensure the continued thriving of all planting.
  - 13) LITTER REMOVAL AND CLEANLINESS: Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from all planted and grassed areas, particularly immediately prior to mowing and/or strimming grass. Keep footpaths and kerb lines clear of leaves, litter, clippings and grass cuttings, following any operation that produces such debris.
  - 14) REMOVE STAKES, TIES AND SHELTERS/GUARDS: Once plants have successfully established with firm root support and no indications of movement around the root ball, remove the stake, tie and guard from the tree. Bear in mind individual plants may not develop at the same rate and each plant should be checked independently before removing support.
- At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Shrub control will continue biennially in February, in accordance with item 10 above.

Timings	<p>Bare root stock planted November until the end of March while the plants are dormant.</p> <p>Check stakes, ties and guards – 3 per year February, June, October</p> <p>Straighten plants and refirm around roots - 2 per year</p> <p>Herbicide ring spraying. 2 per year, April and August</p> <p>Hand weed around base of trees as necessary - 2 per year April and August.</p> <p>Slow release fertiliser (year 2 and year 4). April</p> <p>Remove damaged branches, growth, thin and prune. 1 per year, February.</p> <p>Replace losses (first year only). November.</p> <p>Water to field capacity to ensure growth. As required.</p> <p>Litter removal and cleanliness – as required.</p> <p>Trim hedges (Shrub mix A) – February (once per year biennially once established).</p>
Indicators of Success	<p>Shrub planting with dense foliage from base to top and a diverse mix of species (as near to the original specification as possible). Planting free of injurious weeds.</p> <p>BNG success criteria measured in year 15 against target condition.</p>
BNG Target	<p>Mixed Scrub</p> <p>Good (7 years). Poor condition achieved by year 1, moderate condition achieved by year 3.</p> <p>Good condition = Meets all of the 5 criteria, as defined in Crosher <i>et al.</i> 2019 with only minor variation. None of the indicators of poor condition are present.</p>
Personnel	<p>A suitability qualified Landscape Architect will inspect the hedgerows at the end of year 2 and 5 to confirm the management prescription have been followed.</p>

### 5.5 Ornamental shrub and perennial planting

Ornamental and perennial shrub planting is proposed within amenity areas where the reinstatement of trees removed to make way for the scheme is not possible due to the location of underground surfaces at Broadgate Gardens. And where existing ornamental planting has been removed to make way for the scheme at Penwortham Methodist Church and at the end of Hawkhurst Road. All ornamental planting to be supplied as container grown stock and include following species.

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▪ <i>Cornus sanguinea</i> 'Midwinter Fire'	Shrub	3L	30-40cm
▪ <i>Cistus x hybridus</i>	Shrub	2L	20-30cm
▪ <i>Euonymus fortunei</i> 'Silver Queen'	Shrub	3L	20-30cm
▪ <i>Euonymus fortunei</i> 'Emerald Gaiety'	Shrub	3L	20-30cm
▪ <i>Hypericum moserianum</i>	Shrub	3L	20-30cm
▪ <i>Lavandula angustifolia</i> 'Munstead'	Shrub	2L	20-30cm
▪ <i>Mahonia aquifolium</i> 'Apollo'	Shrub	3L	20-30cm
▪ <i>Olearia x haastii</i>	Shrub	3L	30-40cm
▪ <i>Philadelphus</i> 'Belle Etoile'	Shrub	3L	40-60cm
▪ <i>Photinia</i> 'Little Red Robin'	Shrub	3L	20-30cm
▪ <i>Potentilla davurica</i> 'Abbotswood'	Shrub	3L	20-30cm
▪ <i>Potentilla</i> 'Tangerine'	Shrub	3L	20-30cm
▪ <i>Ribes sanguineum</i> 'Pulborough Scarlet'	Shrub	3L	60-80cm
▪ <i>Spiraea japonica</i> 'Darts Red'	Shrub	2L	20-30cm
▪ <i>Spiraea japonica</i> 'Little Princess'	Shrub	2L	20-30cm
▪ <i>Symphoricarpos x chenaultii</i> 'Hancock'	Shrub	3L	40-60cm
▪ <i>Vinca minor</i>	Shrub	3L	30-40cm
▪ <i>Vinca minor</i> 'alba'	Shrub	3L	20-30cm
▪ <i>Bergenia</i> 'Bressingham Ruby'	Perennial		2L
▪ <i>Bergenia</i> 'Silberlicht'	Perennial		2L
▪ <i>Festuca amethystina</i>	Grass		2L
▪ <i>Stachys byzantina</i>	Perennial		2L
▪ <i>Verbena bonariensis</i>	Perennial		2L

Objective	Establishment of ornamental shrub planting to reinstate planting removed to allow for the scheme and to enhance visual amenity within the urban area.
Task	Maintenance and monitoring of newly planted ornamental shrub planting (1 year establishment maintenance period plus 14 years following handover).
Location	Broadgate and Riverside (Management Area 1), Flood embankment and Hawkhurst Road (Area 4), and Penwortham Methodist Church and Golden Way (Management Area 5).
Method	<p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) <b>SITE CLEARANCE:</b> Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil. Removed stones exceeding 50mm in any dimension. Clear scrub and herbaceous material to ground level using suitable tools and remove arisings. Grub up large roots and dispose of without undue disturbance of soils and adjacent areas. Apply a suitable non-residual herbicide to all planting areas.</li> <li>2) <b>CULTIVATION:</b> Within a few days of planting, during suitably dry weather conditions, break up topsoil to full depth, cultivate, loosen and break up soil into particles of 2-8mm size to 300mm depth. Incorporate slow release fertiliser to top 300mm of topsoil at a rate of 70 grams per m<sup>2</sup> by hand or mechanical means. Remove all undesirable material brought to the surface including weeds, roots and large stones with any dimension exceeding 38mm. Reduce top 50mm of topsoil to a fine tilth.</li> <li>3) <b>PLANTS:</b> Plants to BS:4043, BS3936 and the National Plant Specification, plant handling/storage, transport and planting to HTA 'Handling and Establishing Landscape Plants' and CPSE 'Handling and establishing landscape plants'. Surplus material to be removed off site.</li> </ol>

- 4) **PLANTING:** All plants to be pit planted, planting pit to be of a sufficient size to accommodate roots when fully spread or rootball and 75mm deeper than root system. Pit bottom to be broken up to a depth of 150mm. Backfill a previously prepared 50:50 mixture of topsoil and peat free compost to PAS100 to depth of planting pit. Surplus material to be spread locally on site to match existing ground levels. All containers to be removed prior to planting. All planting plots to be set as shown on the drawings and schedules. After planting water immediately thoroughly without damaging roots. Lightly firm around plants and fork or rake soil, without damaging roots, to a fine tilth.
- 5) **MULCH:** Mulch planting beds with amenity grade bark mulch free from pests, disease, fungus and weeds. Clear all weeds, only spread when the soil is moist, water soil thoroughly if the weather is dry. Coverage to be 75mm depth after settlement. Finished level of mulch to suit final topsoil levels or as directed on site.

**Maintenance**

- 6) **STRAIGHTEN PLANTS:** Straighten plants and refirm around roots, re-firm soil around any loose plants, without compacting and ensure that all plants are upright after each visit. Ensure any recently replaced planting is re-visited to refirm and straighten as necessary.
- 7) **HAND WEEDING:** Keep shrub beds clear of weeds, by hand weeding to ensure there is no weed growth within the bed. Remove all weeds, including roots, by hand using hoes, trowels or forks, taking care to remove not more than a minimum quantity of soil, causing minimum disturbance to planting and leaving the area in a neat, clean condition.
- 8) **SLOW RELEASE FERTILISER:** In March or April, evenly spread and incorporate 15:15:15, N:P:K granular slow release fertilizer at a rate to suit manufacturer's instructions within woodland planting stations only. No fertilizer to be applied in sensitive habitat areas including field layer planting, species rich grassland or marginal / aquatics.
- 9) **PRUNING:** Prune in accordance with good horticultural practice. Thin, trim and shape appropriately to each species, location, season, and stage of growth, leaving a well-balanced natural appearance. Use clean sharp secateurs, hand saws or other tools approved by the CA. Trim off ragged edges of bark or wood with a sharp knife. Remove branches without damaging or tearing the stem. Keep wounds as small as possible and cut cleanly back to sound wood. Make cuts above and sloping away from an outward facing healthy bud, angled so that water will not collect on cut area. Notify the CA of any disease or fungus. Do not apply growth retardants, fungicide or sealant unless instructed by the CA. Inform CA if any growth is encroaching onto paths, tracks, structures etc.
- 10) **REPLACE LOSSES:** Inform CA of any plants which are dead or dying and obtain instructions for replacement. Replacements to be the same species and of a comparable size with the surrounding plants (where practical to do so) or default to original specification (if site constraints reduce viability of planting larger nursery stock). Additional watering and fertiliser applications are to be undertaken, sufficient to ensure successful establishment. Do not undertake replacement planting in periods of drought or out of season.
- 11) **TOP UP MULCH:** Top up the general amenity bark mulch to a nominal depth of 75mm.
- 12) **WATER TO FIELD CAPACITY:** Water as necessary to field capacity to ensure the continued thriving of all planting.
- 13) **LITTER REMOVAL AND CLEANLINESS:** Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from all planted and grassed areas, particularly immediately prior to mowing and/or strimming grass. Keep footpaths and kerb lines clear of leaves, litter, clippings and grass cuttings, following any operation that produces such debris.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Pruning will continue annually in February, in accordance with item 9 above.

<b>Timings</b>	Container grown stock planted November until the end of March. Straighten plants and refirm around roots 3 per year February, June, October
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	<p>Hand weeding - 2 per year. April and August.</p> <p>Slow release fertiliser (year 2 to year 5). April</p> <p>Pruning and removal of dead plant material. February</p> <p>Replacement planting, of dead, dying or otherwise defective plants during the next suitable planting season (first year only). November</p> <p>Top up mulch (annually). March</p> <p>Water to field capacity to ensure growth. As required.</p> <p>Litter removal and cleanliness - Litter removal and cleanliness – 3 per year. February, June , October</p>
Indicators of Success	Shrub planting with dense foliage from base to top and a diverse mix of species (as near to the original specification as possible). Shrub areas free of injurious weeds.
BNG Target	Poor – achieved by year 1. Meets indicators of success as defined above.
Personnel	A suitability qualified Landscape Architect will inspect the planting areas annually as part of the September plant replacement count with the Contractor to confirm the management prescription have been followed.

## 5.6 Amenity Grassland

Existing amenity grassland areas disturbed by the proposed scheme will be reinstated.

- Amenity grassland seed mix: EG22C Strong lawn mixture with Clover, sowing rate 25g/m<sup>2</sup>  
Supplier: Emorsgate Seeds, tel 01553 829028. [www.wildseed.co.uk](http://www.wildseed.co.uk) or similar approved

Existing sports pitches within the BAC/EE Preston Social and Sports Association site will be reinstated.

- Sports Turf LT6 Sports. Supplier: Lindum Turf Ltd, tel 01904 448675 or similar approved;
- Sports grass seed SOS mix, sowing at 40g/m<sup>2</sup>. Supplier Barenbrug, tel 01359 272000 or similar approved.

Objective	Reinstatement of existing amenity grassland areas disturbed by the scheme.
Task	Maintenance and monitoring of newly seeded amenity grassland areas (1 year establishment maintenance period plus 14 years following handover).
Location	Site-wide
Method	<p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) PREPARATION: Apply a suitable approved herbicide and allow period of time to elapse as recommend by the manufacturer before cultivation.</li> <li>2) CULTIVATION: break up compacted soil to full depth, fully incorporate an approved slow release fertiliser (70g/m<sup>2</sup>) into topsoil depth. Reduce topsoil to a tilth suitable for seeding (100mm depth), particle size 5mm. Remove stones and clay balls larger than 50mm in any dimension, roots, tufts of grass, rubbish and debris.</li> <li>3) FINAL CULTIVATION: Reduce 25mm depth to a fine, firm, tilth with good crumb structure. Rake to free, even surface, friable and lightly firmed but not over compacted. Remove surface stones/earth clods exceeding 38mm. Extend cultivation into existing adjacent grassland areas sufficient to ensure full marrying in of levels.</li> </ol>

- 4) **SOWING:** distribute seed evenly in two equal sowings in transverse directions. Lightly harrow or rake to cover seed. On light soils roll and cross roll after seeding using a lightweight roller.
- 5) **FIRST CUTS:** When grass is reasonably dry and height of initial growth is 75mm. Remove debris and litter and stones and earth clods larger than 25mm in any dimension. Two cuts each reducing growth to 40mm. Box arisings from site.
- 6) **TURFING:** Sport's pitch reinstatement to be carried out by a specialist sports pitch contractor. Turfing to be carried out in accordance with BS 3969 and BS 4428. Imported turf shall be delivered to site within 24 hours of lifting and laid within 18 hours of delivery. Turf to be laid on soil that is moist but not frozen or waterlogged or within periods of drought or onto soil than is excessively dry or during heavy rainfall. All newly turfed areas to be watered to field capacity to ensure establishment, irrigation shall be applied at a rate of 15 l/m<sup>2</sup> using low pressure hose sprinkler or spray evenly over entire area. Opening of joints caused by shrinkage of turf or settlement to be made good using 50% sieved topsoil/50% fine sand mix.

**Maintenance**

- 7) **GRASS CUTTING/MAINTENANCE CUTS:** Cut to maintain height of between 50-75mm during the growing season. Do not cut bulb planting areas until bulb foliage has died down. Remove stones greater than 50mm in any direction and other debris. At the end of each cut, trim all grass edges, around the base of trees, manholes etc., and remove arisings. Sweep all adjoining hard areas clear of cuttings and remove. Sport pitch grass cutting frequency to match the cutting regime of the existing sports pitch areas.
- 8) **FERTILISER:** Apply an approved slow release fertiliser application at 35g/m<sup>2</sup>.
- 9) **LITTER AND CLEANLINESS:** Cleanliness: at each maintenance visit, remove all deleterious items, litter, fallen branches, and other rubbish leaving the site in a clean and tidy state. Hard surfaces adjoining planted areas shall be swept clear of soil, mulch, other arisings and litter at each maintenance visit.
- 10) **REPLACE LOSSES:** Make good all defects and work which in the opinion of the CA is unsatisfactory.
- 11) **WATERING:** as required to ensure full establishment of grass sward.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Grass cutting will continue in accordance with item 7 above.

Timings	<p>Areas to be reinstated to be fully prepared and seeded between April to June or August to October.</p> <p>First cuts when sward reaches 75mm high, two cuts each reducing growth to 40mm.</p> <p>Once established all areas are to be cut to maintain height of between 50mm to 75mm during the growing season. Do not cut bulb planting areas until bulb foliage has died down. (8 cuts per year March to October)</p> <p>Weed control with a suitable selective herbicide.</p> <p>Litter removal</p> <p>Re-seed areas that are dead or failing to thrive of dead/damaged lawn (first 5 years only).</p> <p>Watering (as required)</p> <p>Fertiliser once per year (first year only). Spring</p> <p>Replace losses: (first year only), October.</p>
Indicators of Success	Established sward with mix of species as near to the original specification as possible. Grass areas free of injurious weeds.
BNG Target	Poor (N/A) – achieved by year 1. Meets indicators of success as defined above.
Personnel	A suitability qualified Landscape Architect/or EA Operative will inspect May and September annually. Recommendations for cutting regime, removal of weed species and re-seeding if required to be submitted to the CA.



## 5.7 Grassland

Flood embankment and adjacent areas to be seeded with a species rich grassland mix and tussock grassland. Ecological and landscape enhancements at Ribble Sidings (Area 4) will include areas of species-rich grassland.

- Species-rich Grassland seed mix: EM2 Standard General Purpose Meadow Mixture, sowing rate 4g/m<sup>2</sup>
- Tussock seed mix – EM10 Tussock Mixture, sowing rate 4g/m<sup>2</sup> (Redi Rock)
- Wet Meadow seed mix: EM8 Meadow Mixture for Wetlands, sowing rate 4g/m<sup>2</sup>. (Ribble Sidings)
- Wildflower mix: EL1 Flowering Lawn, sowing rate 4g/m<sup>2</sup> (Ribble Sidings).

Supplier: Emorsgate Seeds, tel 01553 829028. [www.wildseed.co.uk](http://www.wildseed.co.uk) or similar approved

Objective	Establishment of species rich grassland and tussock grassland to increase diversity of habitat and enhance visual amenity.
Task	Maintenance and monitoring of newly seeded species rich grassland and tussock grassland areas (1 year establishment maintenance period plus 14 years following handover).
Location	Broadgate and Riverside (Management Area 2) Flood embankment and Hawkhurst Road (Management Area 3) Ribble Sidings (Management Area 4)
Method	<p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) CULTIVATION: break up compacted soil to full subsoil equivalent depth. Reduce soil to a tilth suitable for seeding (100mm), particle size 5mm. Remove stones and clay balls larger than 50mm in any dimension, roots, tufts of grass, rubbish and debris.</li> <li>2) FINAL CULTIVATION: Final cultivation: after grading, reduce 25mm depth to a fine, firm, tilth with good crumb structure. Rake to tree, even surface, friable and lightly firmed but not over compacted. Remove surface stones/earth clods exceeding 38mm for general areas. Extend cultivation into existing adjacent grassland areas sufficient to ensure full marrying in of levels.</li> <li>3) SOWING: Distribute seed evenly in two equal sowings in transverse directions. Lightly harrow or rake to cover seed. On light soils roll and cross roll after seeding using a lightweight roller.</li> <li>4) FIRST CUTS: when grass is reasonably dry and height of initial growth is 75mm. Remove debris and litter and stones and earth clods larger than 25mm in any dimension. Mow regularly (monthly) throughout the first growing season (generally March - October), to a height of 40-60mm. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers. Arisings to be removed off site.</li> </ol> <p>Maintenance</p> <ol style="list-style-type: none"> <li>5) GRASS CUTTING/MAINTENANCE CUTS: 2 cuts per year once established to 50mm high. Allow for strimming of grassland areas on steeper sloping ground where mowing is impracticable. Matching mowing requirements. Allow for strimming of 500mm margin along footpaths through grassland areas and within planting plots only 3 times per year removing arisings from site. No strimming within 500mm of new or established trees or shrubs. All arising to be removed off site.</li> <li>6) LITTER AND CLEANLINESS: At each maintenance visit, remove all deleterious items, litter, fallen branches, and other rubbish leaving the site in a clean and tidy state. Hard surfaces adjoining planted areas shall be swept clear of soil, mulch, other arisings and litter at each maintenance visit.</li> <li>7) REPLACE LOSSES: Over-seed areas where grass seeding has failed to establish.</li> </ol>

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At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Grass cutting will continue in accordance with item 5 above.	
Timings	<p>Areas to be reinstated to be fully prepared and seeded between April to June or August to October.</p> <p>First cuts when sward reaches 75mm high, monthly cuts (first year only) each reducing growth to 50mm.</p> <p>Once established all areas are to be cut twice per year (July and October-December), height of growth permitted 150mm until established. Height of cut in second growing season to be 50mm. All arising to be removed off site.</p> <p>Weed control with a suitable selective herbicide – as necessary.</p> <p>Litter removal at each maintenance visit.</p> <p>Re-seed areas that are dead or failing to thrive (first year only).</p>
Indicators of Success	<p>Cover of wildflowers in the sward (excluding undesirable species but including rushes and sedges), should be between 20% and 90%. At least 40% of wild flowers should be flowering during May-June. Grass areas free of injurious weeds.</p> <p>BNG success criteria measured in year 15 against target condition.</p>
BNG Target	<p>Good (15 years). Poor condition achieved by year 1, moderate condition achieved by year 10.</p> <p>Good condition = Species-rich Grassland of all Priority Habitat Types. Of high to moderate quality. Wildflower and sedges above 30% excluding white clover <i>Trifolium repens</i>, creeping buttercup <i>Ranunculus repens</i> and injurious weeds. Meets all the condition criteria with only minor variation, as defined in Crosher <i>et al.</i> 2019. None of the indicators of poor condition are present.</p>
Personnel	A suitability qualified Landscape Architect / Ecologist will inspect May and September annually. Recommendations for cutting regime, removal of weed species and re-seeding if required to be submitted to the CA.

### 5.8 Pre-planted Coir roll

Pre-planted coir rolls to be installed to base of Redi Rock. Redi Rock to be seeded with a tussock seed mix (refer to section 5.2).

Supplier: Salix (tel 0370 3501852, [www.salixrw.com](http://www.salixrw.com)) or similar approved.

Indicative species

- *Phalaris arundinacea* (Canary Grass)
- *Carex acutiformis* (Lesser Pond Sedge)
- *Iris pseudocorus* (Yellow Flag Iris)
- *Lythrum salicaria* (Purple Loosestrife)
- *Juncus effusus* (Soft Rush)

Objective	Establishment of pre-planted coir roll to increase diversity of habitat and enhance visual amenity.
Task	Maintenance and monitoring of coir rolls (1 year establishment maintenance period plus 14 years following handover).
Location	Broadgate and Riverside (Area 2), Flood Embankment and Hawkhurst (Area 3)
Method	The EA will appoint a Landscape Contractor to carry out the following tasks: - Specification summary



- 1) COIR ROLL: Supplied pre-seeded and pre-planted to the locations and layout as specified on the drawings. Install in accordance with the manufacturers recommendations.
- 2) SIZE: Logs to be a minimum of 300mm diameter x 3.0m in length and are to be fixed by staking alternately to either side of the log at 0.8m centres. Coir rolls to be secured together in accordance with the suppliers recommendations.
- 3) STAKING: Staking of coir rolls/logs: Position chestnut stakes, 1.2m long x 75mm diameter at 0.8m centres along both sides of the logs and drive into the ground. Consolidate material around the stake after backfilling to ensure integrity of the stake. Cut to approximately 100mm above finished level of the coir roll/log. Driven posts: Prevent damage to heads of posts when driving. Neatly finish post tops after installation.

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- 4) HAND WEEDING: Keep coir rolls clear of weeds, by hand weeding to ensure there is no weed growth. Remove all weeds, including roots, by hand, taking care to remove not more than required and leaving the area in a neat, clean condition.
- 5) PRUNING & REMOVAL OF DEAD, DYING AND DISEASED MATERIAL: Cut back damaged plant material and remove from site. Prune plants at appropriate time to remove dead or dying and diseased material to promote healthy growth and natural shape. Dress cut ends exceeding 25mm diameter with fungicidal sealant. Remove invasive non-native plants. Advise Contract Administrator of any damage caused by vandalism or by others, as soon as possible.
- 6) STAKES AND FIXINGS: Check the integrity and firmness of coir log stakes. Ensure stakes are securely anchored and in position. Ensure broken or missing stakes are replaced.
- 7) REPLACE LOSSES: Replace losses and areas that fail to thrive as per original specification or as agreed with the CA (first 5 years only).
- 8) LITTER REMOVAL AND CLEANLINESS: Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris from Redi Rock area.

At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner.

Activity and Timings	<p>Areas to be fully prepared and seeded between March and April (Tussock Seed Mix). Coir rolls to be installed as recommended by the supplier. September and October</p> <p>Herbicide treatment - 2 per year, April and August</p> <p>Hand weeding – 4 per year, March, May, July and September as a minimum.</p> <p>Pruning and removal of dead, dying and diseased material – 4 per year, March, May, July and September as a minimum.</p> <p>Stakes and fixings– 4 per year, March, May, July and September as a minimum.</p> <p>Replace losses (first year only). November.</p> <p>Litter removal and cleanliness. 3 per year. At each maintenance visit.</p>
Indicators of Success	<p>Established and healthy wetland planting and seeding with mix of species as near to the original specification as possible. Areas free of injurious weeds.</p>
BNG Target	<p>Poor (N/A) – achieved by year 1. Meets indicators of success as defined above.</p>
Personnel	<p>A suitability qualified Landscape Architect / Ecologist monthly visits during the growing season and as necessary to fulfil requirements of the specification. will inspect May and September annually. Recommendations for maintenance regime, removal of weed species and re-instatement if required to be submitted to the CA.</p>

## 5.9 Wetland Planting and Management of Waterbodies

Small areas of wetland planting proposed within the pond/scrape areas at Ribble Sidings habitat enhancement area to enhance visual amenity within existing open space whilst allowing the majority of the area to naturally regenerate. Planting a range of species to develop reed beds, marginal wetland and aquatics within the pond/scrape areas. The wetland planting will rely on establishment maintenance initially and natural regeneration with monitoring and management to ensure preferred habitat develops throughout these areas.

Objective	Establishment of wetland planting with new pond/scrape areas to increase diversity and enhance visual amenity at Ribble Sidings.
Task	Maintenance and monitoring of wetland planting (1 year establishment maintenance period plus 14 years following handover).
Location	Ribble Sidings (Management Area 4)
Method	
<p>The EA will appoint a Landscape Contractor to carry out the following tasks: -</p> <p>Specification summary</p> <ol style="list-style-type: none"> <li>1) <b>AQUATIC/MARGINAL PLANTING:</b> Aquatic/marginal plants supplied in growing medium with adequate nutrients for the plant to thrive until permanently planted. Centred in the container, firmed and well-watered. With root growth substantially filling the container, but not root bound, and in a condition conducive to successful transplanting. Grown in the open for at least two months before being supplied at a density similar to the final planting specification. Where containers/bags are not pre-weighted, cover with sufficient ballast to prevent flotation and keep plants secure against likely maximum water flow. The ballast material is likely to consist of clean, inert stone of local provenance. No man-made materials are to be used.</li> <li>2) <b>PLANTING:</b> plant in depths below 200mm or to allow growing tip 50mm above water level at time of planting, whichever is the lesser. All plants to be planted in a zone parallel to the shore between existing water level and up to 200mm, as directed by the CA. All plants to be firmed in to prevent stock floating away. Protect planted areas, if required, with high visibility 1m high safety fencing. Handling: Keep plants watered and in shade until planted. Do not allow to dry out. Preparation: Remove coarse weeds, debris etc. from planting sites prior to planting. Planting sites to be as shown on drawings. Waterproofing membrane below soil: Do not puncture. Planting: Into a hole to suit plug size and shape. Create a cleft at bottom of hole to improve rooting. Gently firm the plant into hole to ensure good root hold into substrate. Or lower containers/ bags/ bunches gently into place, keeping plants upright. Where containers/ bags are not pre-weighted, cover with sufficient ballast to prevent flotation and keep plants secure against likely maximum water flow. Ballast to be approved by CA.</li> </ol> <p>Maintenance</p> <ol style="list-style-type: none"> <li>3) <b>HAND WEEDING:</b> Keep all areas clear of weeds, by hand weeding to ensure there is no weed growth. Remove all weeds, including roots, by hand, taking care to remove not more than required and leaving the area in a neat, clean condition. Remove all invasive native and non-native plants. Deposit arisings from pond and marginal clearance next to pond and leave for 24 hours to allow invertebrates to return to pond before relocating to areas of low conservation value as instructed by Contract Administrator. Dredgings must not be left on the bank as bankside vegetation may be smothered.</li> <li>4) <b>PRUNING &amp; REMOVAL OF DEAD, DYING AND DISEASED MATERIAL:</b> Cut back damaged plant material and remove from site. Prune plants at appropriate time to remove dead or dying and diseased material to promote healthy growth and natural shape. Dress cut ends exceeding 25mm diameter with fungicidal sealant. Remove invasive non-native plants. Advise Contract Administrator of any damage caused by vandalism or by others, as soon as possible.</li> </ol>	

<p>5) REPLACE LOSSES: Replace losses and areas that fail to thrive as per original specification or as agreed with the CA (first 5 years only).</p> <p>6) LITTER REMOVAL AND CLEANLINESS: Collect and remove all extraneous rubbish detrimental to the appearance of the site, including paper, packaging materials, bottles, cans, and similar debris.</p> <p>7) SILT REMOVAL: Remove litter, debris, accumulated silt offsite. As a single operation unless otherwise instructed.</p> <p>At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner. Once establish the pond should not require any interventions unless the indicators of success have not been achieved.</p>	
Activity and Timings	<p>Wetland planting to be undertaken April to May.</p> <p>Hand weeding – 4 per year, March, May, July and September as a minimum.</p> <p>Pruning and removal of dead, dying and diseased material – 4 per year, March, May, July and September as a minimum.</p> <p>Stakes and fixings– 4 per year, March, May, July and September as a minimum.</p> <p>Replace losses (first year only). November.</p> <p>Litter removal and cleanliness. As required.</p>
Indicators of Success	Established and healthy wetland planting and seeding with mix of species as near to the original specification as possible. Areas free of injurious weeds.
BNG Target	<p>Good (10 years). Poor condition achieved by year 2, moderate condition achieved by year 5.</p> <p>Good condition = Meets the majority of the criteria, as defined in Crosher <i>et al.</i> 2019 with only minor variation. Few of the indicators of poor condition are present.</p>
Personnel	A suitability qualified Landscape Architect / Ecologist monthly visits during the growing season and as necessary to fulfil requirements of the specification. will inspect May and September annually. Recommendations for maintenance regime, removal of weed species and re-instatement if required to be submitted to the CA.

## 5.10 Bird and Bat Boxes

Objective	To maintain bat roosting and bird nesting opportunities.
Task	Install three Schwegler nest boxes and install three Schwegler bat boxes in trees.
Location	To be agreed with the CA prior to installation.
<p><b>Method</b></p> <p>The EA will appoint a Contractor to carry out the following tasks: -</p> <p>1 – Install boxes on the larger trees. Boxes should be placed out of reach of members of the public. The entrance of the box should have a clear flightpath to the box and the boxes should be positioned with a slight downward angle to provide protection from the rain.</p> <p>At the end of the 1 year establishment period, the EA will transfer management responsibilities to the landowner.</p>	
Timings	Boxes to be installed in Autumn (September to November inclusive). Installing boxes in autumn can provide a winter refuge and potentially increase the chance of the box being used in spring. If the boxes are installed in spring or summer, they are unlikely to be used until the following year.

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Indicators of Success	Boxes installed in trees.
Personnel	N/A
Objective	To maintain bat roosting and bird nesting opportunities.

## 6. Injurious weed and Invasive Non-Native Species control

### 6.1 Injurious and Problem Weed Control

The land will be managed to make sure none of the five injurious weeds proliferate on-site and ensure they do not spread under the Weeds Act, (1959). These weeds are:

- Common ragwort (*Senecio jacobaea*);
- Spear thistle (*Cirsium vulgare*);
- Creeping thistle (*Cirsium arvense*);
- Broad-leaved dock (*Rumex obtusifolius*); and
- Curled dock (*Rumex crispus*).

Weed control will be carried out twice annually in all planting and seeding areas to eradicate or control injurious weeds one or more of the following measures:

- grass cutting (as per management tasks above);

If grass cutting is not sufficient then the following methods may be applied:

- hand-weeding or digging out (ragwort only); and
- spot-spraying with an appropriate, approved herbicide.

Attention is required during the initial 1 year establishment period, where there will be spot checking two times a year and immediate remedial action taken as required. The LHEMP review will determine after year five, whether the frequency of inspections can be reduced.

### 6.2 Invasive Non-Native Species Control

All Invasive Non-Native Species (INNS) within the Proposed Works will be removed and eradicated prior to construction (see Invasive Species Management Plan). New planting areas should not contain any INNS.

Where INNS have been removed, these areas will need to be monitored to ensure the plants do not re-grow in these locations. It is the Contractors responsibility to ensure INNS do not re-grow in these locations.

Attention is required during the initial 1 year establishment period, where there will be spot checking two times a year and immediate remedial action taken as required. This will be carried out in conjunction with the injurious weed inspection, specified above. The LHEMP review will determine after year five, whether the frequency of inspections can be reduced.

## **7. Review**

The information gained through annual monitoring shall be used to inform the management operations required in the subsequent year of management. Agreements made in relation to changes or continuation of management regimes shall be recorded, and the LHEMP documents updated annually.

In addition, a formal review of the LHEMP shall be undertaken every five years to assess whether the objectives and aims for vegetation management are being met and the management operations altered accordingly. Agreements made in relation to changes or continuation of management regimes shall be recorded during the annual update of the LHEMP documents.

Table 1: Landscape and Ecology Management Operations Schedule

item	Description	Month												Total Visits	Years	Comments / Notes		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
General																		
G.1	Spot treatment of persistent weeds															3	1-15	
G.2	Litter Removal															-	1-15	As required following maintenance operations
G.3	Cleanliness															-	1-15	As required following maintenance operations
Woodland																		
W.1	Check stakes/guards and ties															3	1-5	Years 1 to 5 unless removed earlier
W.2	Straighten trees and refirm around root															3	1-5	Years 1 to 5 only
W.3	Handweeding															2	1-5	Years 1 to 5 only
W.4	Slow release fertiliser															1	2,4	Years 2 and 4
W.5	Remove damaged branches, growth / thin / prune															1	1-5	Years 1 to 5 only
W.6	Replace losses															1	1	Year 1 only
W.7	Water to field capacity (as required)															-	1-5	As required to ensure healthy growth
W.8	Grass cutting in planting plots															3	1-5	All arising to be removed offsite
W.9	Remove stakes, ties, shelters/guards															1	5	Before year 5 subject to establishment
W.10	Thinning / coppicing															1	5, 10, 15	1 no visits per years 5, 10 and 15 (5 year cycles long term)
Specimen trees																		
ST.1	Check stakes, guards and ties															3	1-5	Years 1 to 5 unless removed earlier
ST.2	Straighten trees and refirm around root															3	1-5	Years 1 to 5 only
ST.4	Handweeding															2	1-5	Years 1 to 5 only
ST.5	Slow release fertiliser															1	2,4	Years 2 and 4
ST.6	Remove damaged branches, growth / thin / prune															1	1-5	Years 1 to 5 only
ST.7	Replace losses															1	1	Year 1 only
ST.8	Watering to field capacity (as required)															-	1-5	As required to ensure healthy growth
ST.9	Remove stakes, ties															1	5	Before year 5 subject to establishment
Hedgerows																		
H.1	Check stakes and ties, guards															3	1-5	Years 1 to 5 unless removed earlier
H.2	Straighten plants and refirm around root															3	1-5	Years 1 to 5 only
H.3	Handweeding															2	1-5	Years 1 to 5 only
H.4	Slow release fertiliser															1	2,4	Years 2 and 4
H.5	Remove damaged branches, growth / thin / prune															1	1-5	Years 1 to 5 only
H.6	Hedge cutting															1	1, 3, 5, 7, 9, 11, 13, 15	Biennially once established



Landscape and Habitat Establishment and Management Plan

item	Description	Month												Total Visits	Years	Comments / Notes	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec				
H.7	Replace losses														1	1	Year 1 only
H.8	Water to field capacity (as required)														-	1-5	As required to ensure healthy growth
H.9	Grass cutting in planting plots														3	1-5	All arising to be removed offsite
H.10	Remove stakes, ties and guards														1	5	Before year 5 subject to establishment
Native shrub planting																	
S.1	Check stakes, shelters/guards and ties														3	1-5	Years 1 to 5 unless removed earlier
S.2	Straighten plants and firm around root														3	1-5	Years 1 to 5 only
S.3	Handweeding														2	1-5	Years 1 to 5 only
S.4	Slow release fertiliser														1	2,4	Years 2 and 4
S.5	Remove damaged branches, growth/ thin/ prune														1	1-5	Years 1 to 5 only
S.6	Shrub mix A hedge cutting														1	1,3,5,7,9,11,13,15	Biennially once established
S.7	Replace losses														1	1	Year 1 only
S.8	Water to field capacity (as required)														-	1-5	As required to ensure healthy growth
S.9	Grass cutting in planting plots														3	1-5	All arising to be removed off site
S.10	Remove stakes, ties and guards														1	5	Before year 5 subject to establishment
Ornamental planting																	
OP.1	Straighten planting and refirm around the root															1-5	Years 1 to 5 only
OP.2	Handweeding														2	1-5	Years 1 to 5 only
OP.3	Slow release fertiliser														1	2,4	Years 2 and 4
OP.4	Pruning														1	1-15	
OP.5	Replace losses														1	1	Year 1 only
OP.6	Top up mulch														1	1	Year 1 only
OP.7	Water to field capacity (as required)														-	1	As required to ensure healthy growth
Amenity grassland																	
G.1	First initial cuts (pre practical completion)														3	1	Allow 3 establishment cuts once seeding areas have established.
G.2	Maintenance cuts														8	1-15	8 cuts per year
G.3	Fertiliser														1	1	Year 1 only
G.4	Replace losses - overseeding														1	1-5	Prepare and reseed areas of unsuccessful establishment
G.5	Water to field capacity (as required)														-	1	As required to ensure healthy growth
Species rich grassland																	
SP.1	First initial cuts (pre practical completion)														8	1	8 cuts per year in first growing season.
SP.2	Maintenance cuts														2	2-15	2 cuts per year

## Landscape and Habitat Establishment and Management Plan

item	Description	Month												Total Visits	Years	Comments / Notes				
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec							
SP3	Replace losses – over-seeding															1	Prepare and reseed areas of unsuccessful establishment			
SP4	Water to field capacity (as required)															-	As required to ensure healthy growth			
Bulb planting																				
B.1	Cutting back of bulb foliage															1	1-5			
B.2	Replace losses															1	1			
Pre-planted coir rolls and tussock seed mix																				
CR.1	Herbicide spot treatment																1-5			
CR.2	Handweeding																1-5			
CR.3	Pruning and removal of dead, dying and diseased material																1-5			
CR.4	Stakes and fixings																1-5			
CR.5	Replace losses																1			
Wetland planting																				
WP.1	Herbicide spot treatment																1-5			
WP.2	Handweeding																1-5			
WP.3	Pruning and removal of dead, dying and diseased material																1-5			
WP.4	Replace losses																1			
WP.5	Silt removal																1	3-15	As required to ensure indicators of success are maintained.	
Hard landscape elements																				
H.1	Tree planters, fencing, gates, benches, litterbins – inspect and repair, maintenance upkeep paint, graffiti removal.																1	1		
Ecology																				
B.1	Install Bird and Bat boxes																		1	1

### NOTES:

1. Where no duration is specified it is suggested that these operations will be carried out for the full 15 year period and for the longer term management of the site (extended in 5 year cycles from year 10 onwards for thinning and coppicing cycles for example). Some operations such as vegetation control, litter picking and site cleanliness will be subject to resource availability and revenue costs in the long term and may vary depending on the future operational requirements of the local authority or use of the site. Future variations should be recorded in the LHEMP to register changes in management operations.

2. The number of visits indicated for the establishment period maintenance (year 1) is to be taken as a minimum, the contractor is to ensure enough additional visits or combine operations to ensure compliance with the clauses in section 5.

3. Changes in management operations arising from change in construction approach or resulting from changes as vegetation establishes in particular areas of the site should be recorded in the LHEMP in order to inform ongoing and future management operations and requirements.

4. Changes on site should be monitored and recorded in order that the LHEMP can be adapted to respond to changes in habitat establishment or development.

## **Appendix A – Environmental Masterplans**

Landscape Masterplan' drawings Figure 1.4 to 1.12, - 'Environmental Masterplan' drawings (drawings: ENV0000009C-JAC-ZZ-ZZ-DR-L-0002 TO 0010)

Ribble Sidings Draft Landscape Sketch (drawing ENV0000009C-JAC-42X-DR-L-0001)