

St. Athan Northern Access Road

Landscape and Ecological Management & Maintenance Plan

**Prepared for:
Welsh Government**

**Prepared by:
AECOM Limited**

AECOM Limited
1 Callaghan Square
Cardiff
CF10 5BT
United Kingdom

Telephone: +44(0)29 2067 4600

www.aecom.com

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Planning Submission Issue	27/03/2017	Issue for Planning	Richard Bassindale	Principal Landscape Architect
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1. INTRODUCTION

The following management plan has been prepared in relation to the extent of landscape proposals as shown on Drawing series '60509148-SHT-00-0000-CT-3001 to 3008 'Landscape Proposals'.

The content of this document should also be read in conjunction with Appendices 30/1 to 30/11 of the Manual of Contract Documents for Highway Works (MCHW) Specification for Landscape Works.

This document has been prepared with reference to BS42020: 2013 *Biodiversity- Code of practice for planning and development* and is based upon the information available during the design stage of the scheme, as such the document will be subject to a process of on-going review and amendment during the construction stage of the scheme to ensure it remains relevant to the current issues. The Highways Agency 'Landscape Management Handbook' states that the landscape management plan should be updated annually and formally reviewed every 5 years.

The most immediately relevant item is the Landscape Maintenance Programme in Appendix 1. This document should be read in conjunction with the following key documents:

- The Highways Agency Routine and Winter Service Code;
- The Highways Agency Network Management Manual;
- The Highways Agency DMRB (Vol10 Section 1) Integration with Rural Landscapes; and
- The Highways Agency DMRB (Vol10 Section 3 Part 2) Landscape Management Handbook.

The content of these documents is not repeated here as their coverage is extensive, however where issues are relevant to particular items listed below these are cross referenced for further information.

2. BACKGROUND

The management operations are driven by the 'overall vision' design intentions of the scheme described in Section 3. Cyclical maintenance operations and phased management operations are then identified in subsequent sections as a means of achieving this vision.

The soft estate will be managed to protect its flora and fauna and its value for wildlife (as detailed in Section 2.1) and aesthetic aspects whilst preventing hazards to road users and the contractor.

2.1 Summary of ecological features

Extensive ecological surveys were undertaken in 2016 to inform the planning application and subsequent development and landscape design, the key ecological features and constraints recorded are summarised below:

- No statutorily designated sites for nature conservation or non- statutory sites are present within the site;
- The site contains a mosaic of habitats, being largely dominated by grassland, subject to varying levels of agricultural improvement, and arable fields. Smaller areas of habitat

present include dense scrub, semi-natural broadleaved woodland and amenity grassland (which is associated with the St Athan military base). The site is drained by Llanmaes Brook, which flows in a southerly direction through the centre of the site with Boverton Brook located to the south. Field boundaries within the site largely comprise hedgerows of varying species diversity some of which are classified as 'important' under the Hedgerow Regulations 1997;

- A hazel dormouse nest and single adult hazel dormouse were recorded in the east of the site. Based on connectivity of suitable habitats, their presence has been assumed within hedgerows across the site;
- Two badger setts were recorded on site including a large main sett and an outlier sett;
- Small numbers of slow worm were recorded within the Llanmaes Brook stream corridor;
- A total of 142 invertebrate species were recorded including 12 notable species;
- A total of 38 bird species of bird were recorded during the surveys. Notable species recorded included 5 Red List Birds of Conservation Concern (BoCC) species and eleven Amber list BoCC. No Schedule 1 species were recorded onsite;
- No evidence of water vole, otter or great crested newt was recorded during the surveys, but it has been assumed that otter may commute along Llanmaes Brook and Boverton Brook;
- No bat roosts were recorded within the site and bat activity surveys recorded relatively low levels of activity across the site, with six bat species recorded. Bat activity was largely associated with the field boundaries and streams.

3. OVERALL VISION

The soft landscape proposals for the site have been designed to reflect the existing landscape character and context of this section of the Northern Access Road (NAR) whilst accommodating mitigation principles established within the Landscape and Visual Impact Assessment (document reference 60509148/LDRP/0004) and the Ecological Assessment (WYG, 2017) and achieving the following environmental functions and objectives:

- Integrate the proposed highway with the wider landscape of the site;
- Minimise the landscape and visual impact of associated infrastructure e.g. access tracks, drainage ponds and fencing;
- Retain existing vegetation where possible;
- Use indigenous and ecologically appropriate plant material (it is proposed to source plant material from the local area where availability allows, i.e., native seed from local seed stocks for the species rich grassland);
- Promote ecological enhancement and wildlife with appropriate planting types;
- Provide a link to existing trees and hedgerows which are known bat commuting and feeding routes;
- Provide appropriate habitat features for dormice with translocated hedgerows and creation of 'dead hedgerow' ecological feature to provide connectivity;
- Maintain a species composition natural to the soil type, fertility levels and locality;

- Maintain a high richness and diversity of native species; and
- Mitigate the loss the existing trees and shrubs due to the construction of the NAR and associated infrastructure.

4. GENERAL MAINTENANCE PRINCIPLES

The bodies responsible for implementing this plan shall be:

- Years 1 to 5 – The Contractor appointed by the Welsh Government to construct the new road; and
- Year 6 onwards – The Vale of Glamorgan Council.

For an initial period of five years (60 months) after completion of the road the contractor shall remain responsible for maintaining all landscaping elements of the works, which includes all 'soft' works from the edge of carriageway/footway to the fence line on each side of the road. After this initial five year period maintenance responsibilities will transfer to the local authority, the Vale of Glamorgan Council, under a Section 38 and 278 Agreement.

Maintenance operations can be defined as short term regular operations that are required on a day to day, week to week basis.

The 'Landscape Maintenance Programme' for the 60 month period following completion of the soft landscape works is included in Appendix 1. Whilst the nature of the maintenance operations set out in the table will typically be repeated year on year, the frequency of such operations should be considered as flexible in order that response can be made to any change in circumstances. The maintenance schedule will therefore need to be reviewed on an annual basis to determine the exact requirements to suit the longer-term management objectives and feed into the Handover Environmental Management Plan.

Tree species have been specified in the planting mixes at 2m centres in order to limit the future requirement for intensive thinning. Maintenance operations will therefore need to ensure that trees are treated as distinct from shrub planting to ensure they achieve the desired screening function.

Shrub mixes are typically specified at 2m planting centres whilst hedges are specified as a double staggered row with plants 300mm apart in rows 300mm apart.

The tree and shrub planting areas are to be maintained with weed free stations around the base of individual plants.

Shrubs should be pruned in accordance with accepted horticultural best practice for each species/variety - flat top pruning across planting beds will not be acceptable.

The detailed requirements to achieve the above principles are set out in the following Manual of Contract Documents for Highway Works specification Appendices (refer to separate documents as listed):

- Appendix 30/2 Weed Control
- Appendix 30/3 Control of Rabbits and Deer
- Appendix 30/5 Grass Seeding, Wildflower Seeding and Turfing
- Appendix 30/6 Planting
- Appendix 30/7 Grass, Bulbs and Wildflower Maintenance

- Appendix 30/8 Watering
- Appendix 30/9 Establishment Maintenance for Planting
- Appendix 30/10 Maintenance of Established Trees and Shrubs

A summary programme of the key maintenance operations set out in the above specification documents is included in Appendix 1 of this report.

For the purpose of this document, management operations are defined as long term cyclical operations over a number of years. The maintenance principles described above and in the supporting specification information provide the basis of the management principles over the initial 5 years following completion of the works. It would be anticipated that a further management regime for subsequent years would be prepared to reflect conditions on site at the time with reference to achievement of the objectives in the original overall vision described above.

5. PROPOSED HABITAT CREATION

A number of habitats will be created as part of the landscape proposals, their location as shown on Drawing series '60509148-SHT-00-0000-CT-3001 to 3008 'Landscape Proposals'. The landscape proposals have been designed with ecological input to increase habitat connectivity between areas identified as important for a range of protected species, provide areas of habitat compensation for important habitats lost to the proposed development and provide additional habitats of biodiversity value during the operational phase.

Further details of the habitats biodiversity value are provided below where applicable.

Amenity grass

New areas of amenity grassland are largely associated to the immediate highway boundaries, adjacent to the road, to provide a grassland verge habitat suitable for regular management. The habitat is not specifically provided for its biodiversity value however it may provide habitat for a range of species (although this is not the primary reason for their inclusion).

The amenity grassland will be seeded with an appropriate seed mix including a range of grass species.

Species rich grassland

New areas of species rich grassland will be located in areas of proposed surface water attenuation features. The areas will be sown with a suitable wildflower mix, such as Emorsgate Seeds EM8- Meadow Mixture for Wetlands that is suitable for seasonally wet soils and is based on the vegetation of traditional water meadows that may flood for short periods in winter but are usually well drained in summer. The grassland type provides suitable habitat for a range of species recorded onsite including invertebrates, small mammals, birds and reptiles.

Open grassland

New areas of open grassland areas will be located in areas of open space set back from the highway including the flood bunds associated with Llanmaes Brook. The areas will be sown with a suitable wildflower mix, such as Emorsgate Seeds EM10- Tussock Mixture that has been devised to create areas of tussocky grassland that, once established, require little or no maintenance. The grassland type provides suitable habitat for a range of species recorded onsite including invertebrates, small mammals, birds and reptiles.

Linear trees and shrubs, linear trees and shrubs mix 2, shrubs and shrubs with intermittent trees

New areas of trees and shrub habitats comprising four separate habitat types will be provided to the proposed highway boundaries, to provide screening and additional habitat for protected species, including hazel dormice, bats and breeding birds. The planting will be carried out at 2m centres (1.5m centres for shrub planting) to provide additional habitat and linkage between the current hedgerow habitats adjacent to the site.

The species composition includes a variety of species (with slight variations between the mix types) including alder *Alnus glutinosa*, field maple *Acer campestre*, crab apple *Malus sylvestris*, silver birch *Betula pendula*, hazel *Corylus avellana*, hawthorn *Crataegus monogyna*, holly *Illex aquifolium*, pedunculate oak *Quercus robur*, wild cherry *Prunus avium*, blackthorn *Prunus spinosa*, grey willow *Salix cinerea* and small leaved lime *Tilia cordata*.

Native hedgerow (and native hedgerow with trees)

New native hedgerow planting, and native hedgerow planting with trees, will be provided to the highway boundary, adjacent to the fence line, for all the site length where translocated native hedgerows are not utilised. The planting provides potential additional habitat for hazel dormice, foraging bats and birds and enhances the habitat connectivity.

The hedgerow will be planted as a double staggered row at a 0.3m offset with species including field maple, hazel, hawthorn, blackthorn, guelder rose *Viburnum opulus*, wayfaring tree *Viburnum lantana* and common buckthorn *Rhamnus cathartica*.

Translocated native hedgerow

Current areas of hedgerow habitat proposed to be lost to the development will be translocated to the highway boundary (where feasible) to allow rapid establishment of suitable habitats.

6. MANAGEMENT PRESCRIPTIONS

The following specific maintenance/management principles relate to both the initial 5 year establishment period and to subsequent years. The list will be subject to modification to accommodate any change in circumstances. Guidance on landscape management techniques is provided in Chapter 6 of the Highways Agency DMRB (Vol10 Section 3 Part 2) Landscape Management Handbook.

Amenity grassland

Creation prescriptions

The following measures will be carried out to prepare the habitat and sow / establish the grass seed:

- A fine seed-bed with a good tilth will be created through repeated harrowing and rolling;
- The seed mixture will be sown in spring / autumn at a rate of 35g/m²;
- Following sowing, the soil will be rolled to ensure good contact between the soil and the seed and to help promote rapid germination.

Management prescriptions

Amenity grass areas will be mown to a short sword (c.25mm) which will benefit certain species, increase biodiversity and will be suitable for highway safety issues.

Species rich grassland

Creation prescriptions

The following measures will be carried out to prepare the habitat and sow / establish the wildflower seed:

- A fine seed-bed with a good tilth will be created through repeated harrowing and rolling;
- Emorsgate Seeds EM8- Meadow Mixture for Wetlands mixture will be sown in autumn or spring. Seed will be surface sown at a rate of 5g/m² by machine or by hand. The seed will then be firmed in with a roll to give soil/seed contact.

Management prescriptions

The extent of species rich grass areas to be maintained is illustrated in drawing series 60509148-SHT-00-0000-CT-3001 to 3008 Landscape Mitigation'. All areas are to be maintained for a 60 month period following practical completion.

Grass shall be cut cleanly and evenly, at the frequencies and to the heights specified without damage to the existing surface. Soft vegetative growth such as clover and broad-leaved vegetation shall be deemed to be part of the cutting operation where it falls within areas of grass.

All arisings from species rich grassland areas shall be left in-situ for 3 days in dry conditions to allow for seed dispersal before being raked up and removed from site.

Where grass coincides with woodland and shrub planting plots the grass may be left within the planted area but not within 300mm of individual plants.

Allowance should be made for retention of some of the species rich cuts in heaps for habitat benefit – locations to be agreed with the designer's representative.

During periods when ground conditions are so wet as to prevent grass cutting without causing damage to the surface or producing divots, operations shall cease and shall recommence only when ground and weather conditions are suitable.

No fertilisers will be used as this will promote the proliferation of competitive species at the expenses of botanical diversity.

Establishment Cuts – Year 1

In anticipation of autumn sowing, species rich seed mix areas will receive the first cut in March to a height of 60mm if there is sufficient material to cut. The second establishment cut will be carried out in May to a height of 60mm if there is sufficient material to cut. The final cut will take place in September following flowering (subject to confirmation of flowering period of selected species mix). At this point the sward will be cut to a height of 50mm.

All arisings from areas to be maintained as species rich grass shall typically be removed. Allowance should however be made for retention of some of the wildflower cuts in heaps for habitat benefit (locations to be agreed with the designers site representative).

Maintenance Cuts - Year 2 onwards

The cutting of the grassland should occur after breeding birds have hatched and populations of characteristic annual, biennial or short-lived perennial species such as yellow rattle (*Rhinanthus minor*) have set seed. The dates will vary according to seasonal weather but will tend to range from late June to late July in most years, as such the maintenance contracts must maintain a flexible approach to hay cutting dates once the grassland is established, i.e., it is dependent upon suitable weather conditions and the growth stage of the plants.

An additional late hay cut (late August/September) should be undertaken 1 year in every 5 to ensure the long term viability of late flower species.

Where it is clear the undesirable grass or weeds are becoming established, it may be necessary to introduce an additional cut earlier in the year (March or April). Where it is clear that species are still flowering, it may be necessary to delay cutting.

Areas subject to grass cutting are to include all grass beneath planted woodland, woodland edge and shrub planting as shown on drawing series 47066449/3000 to 3003 Landscape Mitigation'.

Weed Control

All areas of grassland are to be weeded as required to eradicate all injurious and nuisance weeds within all planting areas.

Herbicides shall be used in accordance with Environment Agency guidance to use near waterbodies, including banks adjacent to ditches and regard to soil conditions.

Spot treatment should be used when the weed species present is a large enough target for effective control, but well before evidence of imminent seeding, or is within 2m of sensitive vegetation to be retained or treatment is required and weather does not permit spraying (high winds).

No invasive species such as thistles, dock, nettle and bramble shall be retained for nature conservation within the areas of species rich grassland.

Hand weeding may be considered as an alternative to spot weed control where appropriate to the extent and type of weed control required. This should only be used where the weed species present is of a size where it can practically be removed by such a control method, but well before evidence of imminent seeding, and/or is within 2m of sensitive vegetation to be retained or treatment is required and weather does not permit spraying as a viable alternative (high winds).

Where cutting is used as a means of vegetation clearance to allow proposed planting or seeding it should initially be cut to remove green growth followed by herbicide application timed to affect subsequent vigorous regrowth.

All arisings from weed control operations are to be removed in accordance with the standard specification. Injurious weeds shall be disposed of in accordance with the standard specification or the relevant government guideline

Open grassland

Creation prescriptions

The following measures will be carried out to prepare the habitat and sow / establish the wildflower seed:

- A fine seed-bed with a good tilth will be created through repeated harrowing and rolling;
- Emorsgate Seeds EM10- Tussock Mixture will be sown in autumn or spring. Seed will be surface sown at a rate of 4g/m² by machine or by hand. The seed will then be firmed in with a roll to give soil/seed contact.

Management prescriptions

Establishment Cuts – Year 1

Refer to *species rich grassland* requirements.

Maintenance Cuts - Year 2 onwards

Once established, the open grassland requires minimal maintenance. Unwanted perennial weeds (docks, thistles) may need control by occasional spot treatment with a herbicide.

The grass should be cut on a rotational basis to maintain wildlife refuges (with no more than half the area is cut in any one year), with individual areas being cut every two to three years between October and February to control scrub and bramble development.

Linear trees and shrubs, linear trees and shrubs mix 2, shrubs and shrubs with intermittent trees

Creation prescriptions

The following measures will be carried out to prepare and plant the areas:

- Where required the soil will be ripped to a depth of 450mm where possible and stones of greater than 50mm will be removed;
- All tree and shrub planting will be undertaken between mid-October and April into free-draining and friable rootable soil;
- All failed planting will be replaced during the next suitable planting period.

Management prescriptions

Maintenance commitments for the proposed trees and shrubs will be minimal after the initial establishment period although it may be necessary to undertake occasional pruning and thinning; where management occurs in the bird breeding season (March – September), works will avoid impacting active nests. If an active nest is found during pruning operations, an appropriate buffer (usually considered to be a minimum of 5.0m) will be established around the nest in which no works will occur until any young have fledged. The period that nests are active for varies between species of birds but can be several months.

Native hedgerow (and native hedgerow with trees)

Creation prescriptions

The following measures will be carried out to prepare and plant the areas:

- Hedgerows will be planted as a double staggered row at a 0.3m offset;
- All tree and shrub planting will be undertaken between mid-October and April into free-draining and friable rootable soil;
- All failed planting will be replaced during the next suitable planting period.

Management prescriptions

New native hedging will be cut back initially to encourage bushy growth. Once established all hedgerows will be trimmed on a two to three year rotation in January – February, to allow berries to fruit, provide foraging opportunities to wildlife and limit impacts on protected species, such as hazel dormice. Hedgerows will be maintained at a height of 2-3m. Not all the hedgerows on site will be trimmed in the same year so as to retain a variety of habitats.

Cutting will be undertaken outside the bird breeding season (March – September).

Management of ground vegetation should be kept to a minimum and only where vigorous growth of coarse grasses threatens to smother the transplants in the first three to four years following planting. Where necessary, ground vegetation should be restricted, either through the cutting of annuals in late summer or the spot application of a suitable herbicide to undesirable perennials.

It will be necessary to undertake occasional formative pruning of certain shrubs; this should be done with respect to the overall form and shape of the hedgerow. Species selection and the location of planting should ensure that shrubs will not require severe pruning. It is not intended that the shrub planting will be cut back on a frequent basis.

No fertilisers will be used as this will promote the proliferation of competitive species at the expenses of botanical diversity.

Translocated native hedgerow

Creation prescriptions

Prior to translocation hedgerow vegetation will be cleared in to 300mm in line with methodologies detailed within the Natural Resources Wales (NRW) European Protected Species Licence (EPSL) for hazel dormouse gained for the site. All vegetation clearance and hedgerow translocation including hand searches prior to cutting and translocation stages will be supervised by a licenced hazel dormouse ecologist and completed in line with the below methods:

- Immediately prior to the translocation a receptor trench will be excavated with soil from the trench placed in an area agreed with the licenced hazel dormouse ecologist adjacent to the receptor trench with topsoil and subsoil stored in separate piles;
- The substrate at the bottom of the trench will be loosened with an excavator bucket to a depth of at least 25cm and slow release fertiliser and water retaining gel will be spread along the trench;
- The hedgerow to be translocated will be dug out in sections (approx. 1.5m width by 1m length) across the line of the hedge to a depth of at least 1m using a tracked 360 excavator with the largest ditching bucket available. During the excavation a chainsaw will be used to free roots and branches where necessary to prevent them being torn. Sections of hedgerow with thick horizontal stems will be moved without severing the stems;
- The hedgerow sections will be replaced in the receptor trench in the order they were removed with any soil used to backfill any voids and gaps. Subsequent watering will be undertaken during dry conditions;
- Where required additional planting will be carried out of translocated hedgerows to increase connectivity and diversity.

Management prescriptions

Once established management will be carried out in line with *native hedgerows* as detailed above.

7. MONITORING

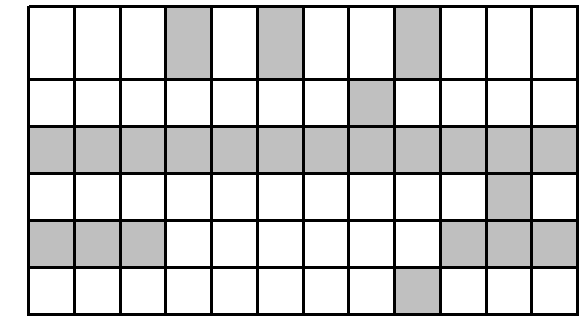
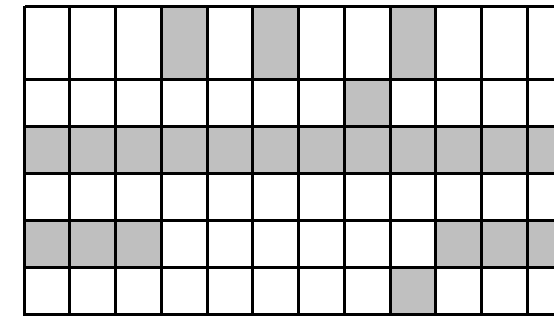
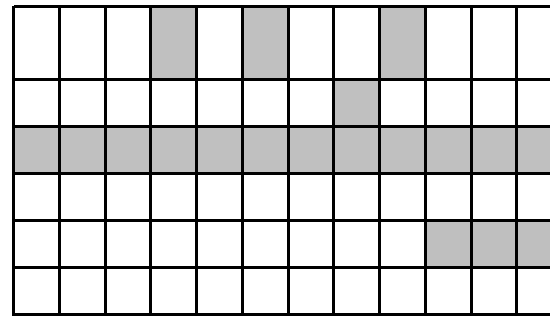
The monitoring commitment for the proposed scheme is five years post construction of the development.

An annual assessment of the habitats will be carried out by a suitably qualified ecologist / landscape architect in June to establish the extent of the habitats, their species composition and their general condition.

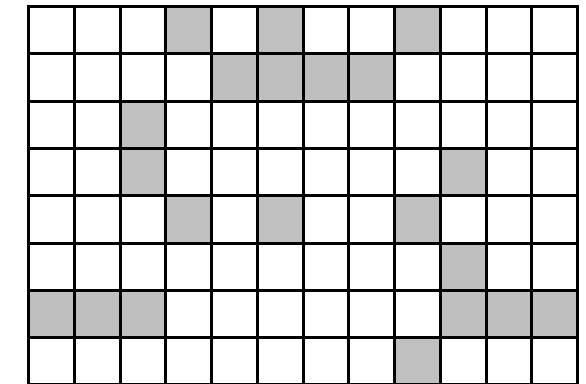
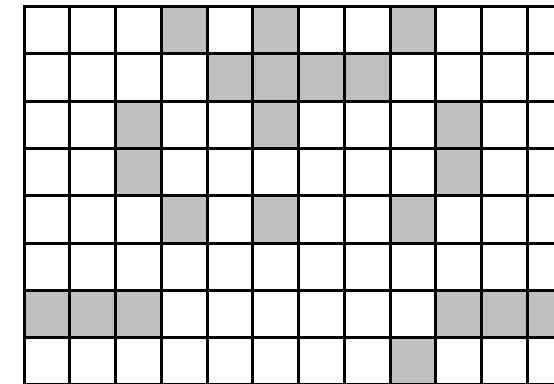
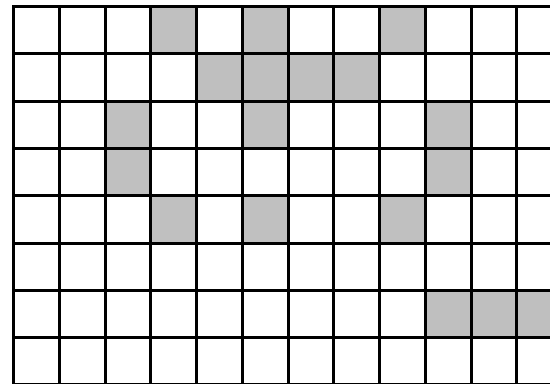
A monitoring report will be compiled which reviews the aims and the management advice, with update recommendations where necessary.

APPENDIX A LANDSCAPE MAINTENANCE PROGRAMME

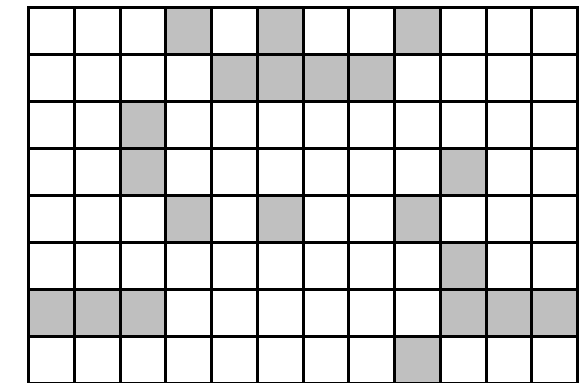
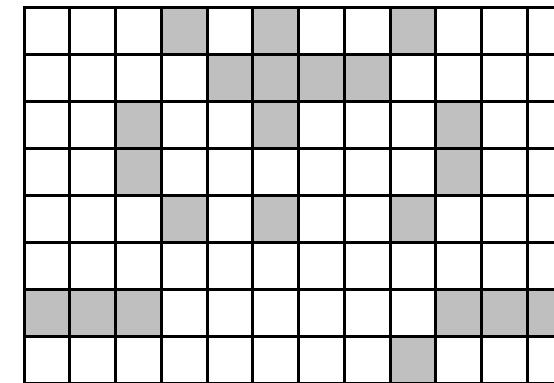
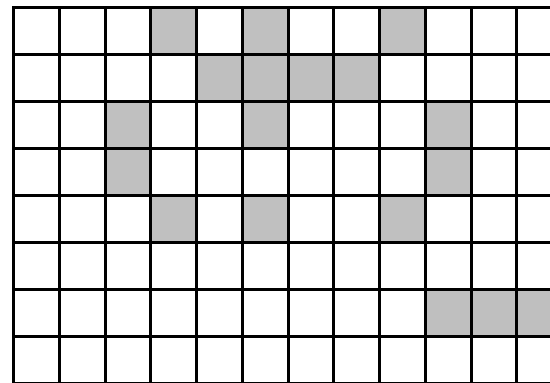
Apply herbicide to plant circles	3009
Control unwanted emerging scrub within plots	3010
Watering (timing as required)	3008
Thinning and coppicing	3010
Replacement of failed/failing plants	3006
Remove stakes and guards (year 3 onwards)	3009



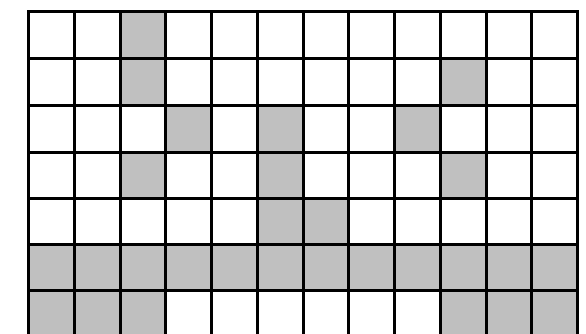
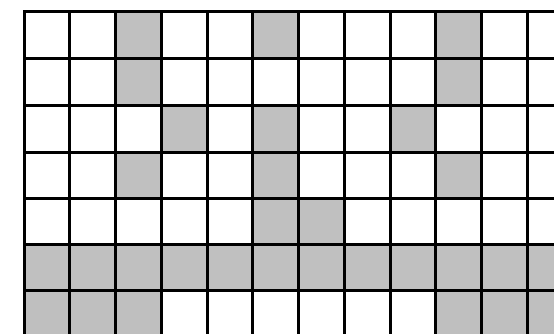
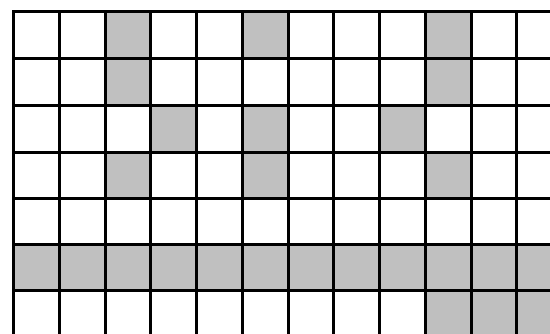
Native Hedgerows (LE4.2) & Native Hedgerows with Trees (LE 4.4)	
Spot treat undesirable species	3002
Hand-pulling of Ragwort (if required)	3002
Re-firm plants	3009
Inspect and adjust stakes, guards and ties	3009
Apply herbicide to hedge base	3009
Trim hedge / formative pruning	3010
Replacement of failed/failing plants	3006
Remove stakes and guards	3009



Translocated Native Hedgerow (LE4.2.1)	
Spot treat undesirable species	3002
Hand-pulling of Ragwort (if required)	3002
Re-firm plants	3009
Inspect and adjust stakes, guards and ties	3009
Apply herbicide to hedge base	3009
Trim hedge / formative pruning	3010
Replacement of failed/failing plants	3006
Remove stakes and guards	3009



Individual Trees (LE5.1)	
Re-firm plants	3009
Inspect and adjust stakes, guards, irrigation pipes and ties	3009
Apply herbicide to plant circles (or hand weed)	3009
Inspect and top-up mulch as required (depends on location)	3009
Formative pruning	3009
Establishment watering (timing as required)	3008
Replacement of failed/failing plants	3006



Remove stakes and guards	3009			
Total weed control				
Hard standings, gravelled / paved areas	3002			
Drainage ditches as required to maintain drainage (mechanical mea	3002			
Monitoring and Inspection				
Monthly weed control inspection	3002			
Annual inspection of all planted areas to record failed or defective p	3011			
Monitoring of landscaped areas to access species divesity and establishment.				

NOTE: The number and timing of visits illustrated is for guidance only - actual visits are to be as necessary to achieve the requirements stated in the specification or as directed by the Overseeing Organisation

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Contact
Rhys Mander
Associate
T +44 (0)29 2067 4600
E rhys.mander@aecom.com

1 Callaghan Square
Cardiff
CF10 5BT
United Kingdom