

PHOENIX SOLAR PARK



Landscape and Ecological Management Plan

December 2023

Document Reference BL012

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1 Introduction

1.1 Site Details

1. The proposed Solar Park site is centred at Ordnance Survey (OS) Grid Reference 201580, 203280. The site comprises 3 fields (arable), covering a total area of approximately 13.84 hectares (ha). The site is flat for the most part, with a north-south slope which is more exaggerated in the northern part of the site.
2. Access to the site is achieved via a private road from the A447 to the site entrance.
3. SK Environmental Solutions Limited undertook an Extended Phase 1 Habitat Survey of the proposed solar park and immediate surroundings in June 2019 and November 2023.

1.2 Habitat Summary

4. The main habitats recorded during the survey area were:
 - Improved grassland;
 - Arable;
 - Semi-natural broadleaved woodland;
 - Tall ruderal vegetation;
 - Trees
 - Hedgerows;
 - Drains and small streams; and
 - Swale.
5. The dominant habitat within the proposed solar park site is improved grassland. Discrete areas of tall ruderal vegetation can be found generally located on and around the site peripheries. The site abuts a square of semi-natural broadleaved woodland to the north, with hedgerows and occasional to frequent individual mature trees located along the field boundaries.
6. Individual and groups of trees are confined in the main to the field boundaries in the northern half of the site. Early mature to mature ash and sycamore dominate, with occasional elm, grey willow and rare overgrown hawthorn and hazel present. Many of the trees show signs of being wind damaged and contain cavities or other features that may be used by roosting bats.
7. Ten hedgerows were recorded on site. There are numerous intact and defunct hedgerows present. They tend to be earth banked and comprise woody species. Many of the hedgerows contain gaps and are not stockproof, with bracken and grasses currently filling the voids. The highest quality hedgerows bound the site and roads to the south and east, these are intact, dense and stockproof.
8. Two seasonally wet drains are located along field boundaries to the north of the site. They are inundated with leaf litter, heavily shaded and holding little water.
9. A spring is located to the west of the site. This is flowing and heavily overgrown.
10. A dry swale is located on the southern site boundary. The swale is well maintained.

1.3 Document Structure

11. This Landscape and Ecological Management Plan is designed to protect, maintain and enhance the ecological and landscape resource and features within and adjacent to the Phoenix Solar Park site. The ecological mitigation and management plan sets out the protected species and general habitat objectives. The Landscape Management Plan provides further details regarding the protection, creation and ongoing maintenance of habitats across the site and describes horticulture operations to ensure successful establishment of the site landscape.

2 Ecological Mitigation and Management Plan for Phoenix Solar Park

2.1 Relevant Legislation

12. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.
13. The Wildlife and Countryside Act 1981 (as amended) is the primary legislation which protects animals, plants, and certain habitats in the UK.
14. The Natural Environment and Rural Communities (NERC) Act 2006 contains details of priority species and habitats which need to be given due consideration during the planning process. This act also places an emphasis on developers to not only provide mitigation when there are negative impacts on species and habitats but also to provide enhancements to improve the biodiversity within the site.
15. A number of species and habitats are listed on the UK Biodiversity Action Plan (UKBAP) 1994, which sets out priorities throughout the whole UK. Pembrokeshire also has its own Local Biodiversity Action Plan (LBAP) which is aimed at species and habitats which are a priority within the local area. Both of these Action Plans have been taken into account while compiling this document to ensure that both national and local priorities are reflected.
16. Other relevant legislation, policy and guidance documents used to underpin this management plan include:
 - Habitats and Species Directive (92/43/EEC) 1992;
 - Bern Convention (on the Conservation of European Wildlife & Natural Habitats; and on the Conservation of Migratory Species of Wild Animals) 1979;
 - Countryside and Rights of Way Act 2000;
 - Environment (Wales) Act Section 7 2016;
 - Technical Advice Note 5: Nature Conservation and Planning; and
 - Protection of Badgers Act 1992;

2.2 Aims

17. The aim of this document is to provide mitigation and management measures which can be implemented to maintain and improve the Phoenix Solar Park site for a variety of wildlife. This will be done by setting a number of objectives and then prescriptions which contribute towards these objectives.

Objectives

18. Below are six objectives which will lead to the enhancement of Phoenix Solar Park.
 - O1 – To ensure protection of designated sites (both statutory and non-statutory);
 - O2 – To ensure that plans are in line with international legislation and priorities (e.g. conservation of European Protected Species)
 - O3 - To ensure that plans are in line with national legislation and priorities such as the Wildlife and Countryside Act 1981 (as amended) and the UKBAP;
 - O4 - To ensure that plans are in line with local priorities such as the PBAP;
 - O5 – To increase biodiversity within the site; and

- O6 - To implement sustainable measures.

2.3 Prescriptions

19. Each prescription is designed to achieve at least one of the objectives detailed above. As such the objectives that the prescription contributes towards are listed.

Prescription 1

20. Solar panels will not be installed within 5m of a hedgerow centreline (apart from where the perimeter fencing passes through existing gateways which are narrower than 5m). No works will be undertaken within the Root Protection Areas (RPAs) of any trees or hedgerows located within and adjacent to the site as per the Arboricultural Impact Assessment Report (AIA) (ES Vol 2: Appendix A9.5). This is to prevent accidental damage to the hedgerows and trees as well as to provide a buffer zone to the hedgerows and trees. Hedgerows and trees are considered to have an intrinsic value as well as potentially providing shelter, foraging opportunities and commuting routes for a number of species. No monitoring is proposed for this prescription. This achieves O1, O3 and O4.

Prescription 2

21. The use of any pesticides on the site will be stopped. The exception to this will be where a particular pesticide remains the only, or recognised best practice methodology as an effective means of controlling a particular pest detrimental to the health of the landscape and habitats intended to be established and those stated within the Landscape Management Plan as designed to target newly planted vegetation and increase the likelihood of the landscape becoming established. This will increase the number and diversity of invertebrates within the site which will in turn attract other species such as bats. If a pest species becomes a persistent problem then biological control measures will be investigated prior to any pesticides being used. If pesticide is the only option then this will be targeted to specific areas rather than blanketing the whole area. No monitoring is proposed for this prescription. This achieves O5 and O6.

Prescription 3

22. The use of any fertilisers on the site will be stopped. The exception to this will be those stated within the LVIA and the Landscape Management Plan as these are designed to target newly planted vegetation and increase the likelihood of them becoming established. This will increase the number and diversity of flora species within the site which will in turn attract other species such as invertebrates. No monitoring is proposed for this prescription. This achieves O5 and O6.

Prescription 4

23. A native species-rich wildflower seed mix will be spread within the buffers between the hedgerows and trees and the development. In order to ensure the maximum increase in diversity the site will be surveyed by an ecologist a year after the seed has been spread and a record made of the species within the sward. If there is a gain of less than half the species sown then additional seed mix will be applied. This will

improve the flora diversity within the site which in turn will attract other species. This achieves O4, O5 and O6.

Prescription 5

24. Additional planting will occur along the existing hedgerows with particular attention paid to areas containing gaps. This planting will comprise a variety of native species to try to make the hedgerows more diverse, wider and denser as defined in detail in the Landscape Management Plan. This will provide additional foraging habitat and shelter for a variety of species including bird species. If the hedgerows can be made species-rich then they will also contribute the UKBAP and PBAP. The hedgerows will be surveyed for the first three years and any plants not thriving will be replaced. This will achieve O3, O4 and O5.

Prescription 6

25. After year 5, new and existing hedgerows will be cut in rotation to ensure that no more than one third of the hedgerows are flailed in any one year. The exception to this is where there are specific constraints such as maintaining visibility of the highway and near to electrical lines. This will create a more diverse structure within the hedgerows therefore improving them and providing additional habitat for fauna. No monitoring is proposed for this prescription. This will achieve O3, O4, O5 and O6.

Prescription 7

26. 5 Schwegler 2F bat boxes will be installed on trees on the boundaries of the site. They will be spread throughout the site but exact locations will be dictated by the availability of suitable trees (i.e. those with a diameter of 30cm or greater at 1.2m in height). This type of box has been selected as it is constructed from woodcrete which will last longer than timber. This will achieve O1, O2, O3, O4 and O5.

Prescription 8

27. 5 bird boxes designed for smaller species of bird will be installed within trees on the boundaries of the site. They will be spread throughout the site but exact locations will be dictated by the availability of suitable trees (i.e. those with a diameter of 30cm or greater at 1.2m in height). This will achieve O3, O4 and O5.

Prescription 9

28. The perimeter fencing of the site has the potential to prevent larger mammals such as badgers and brown hares accessing the site. For this reason, scrapes, gaps or badger gates to allow these species access to the site will be inserted every 50m as well as on any mammal runs. The size of the scrapes depends upon the topography of the site but will be sufficient to allow at least a 20cm gap between the bottom of

the fencing and the ground. They will also be at least 30cm in width. This will achieve O3, O4 and O6.

2.4 Summary

29. The enhancements listed within this document are intended to maximise biodiversity within the Phoenix Solar Park site while the park is operational which will be approximately 40 years. The measures are designed to reduce the potential impacts to more sustainable habitats and management practises which will contribute towards national and local biodiversity policies.

3 Landscape Management Plan

3.1 Introduction

30. Without cutting or grazing by sheep, coarse grass and scrub will dominate the grassland areas and will outcompete the flowering species leading eventually to dense scrub.
31. Without management, the hedgerows will become misshaped and develop gaps. The positive management outlined in the objectives below will provide wide biodiversity gains in the long-term resulting from these proposals.

3.2 Objective 1: No dig zones created within RPZs and RPAs of trees within construction site.

32. The presence of construction vehicles, large volumes of heavy materials and equipment on site throughout the period of construction and decommissioning creates a risk of adversely impacting root protection areas/zones.
- Prior to commencement of any construction works being undertaken on site exclusion zones shall be clearly marked out around all RPA's within the current redline boundary (identified in the Arboricultural Impact Assessment (AIA) (ES Vol 2: Appendix A9.5). Protective fencing will be constructed to prevent works within the RPAs.
 - All existing hedges will be cut (for management purposes) then perimeter deer fencing will be constructed prior to construction of solar PV tables – this buffer zone shall ensure protection for hedgerows and trees from any construction vehicles on site during construction.
 - There will be no dig construction areas between gaps and openings in hedgerows.
 - Where necessary, as detailed within the AIA, above ground access track construction (Neoweb) will be installed to ensure that roots to hedgerows are not compromised during the construction period.
 - No Swales or Ditches are to be constructed within any of the RPZs.
 - Cabling for CCTV cameras sited adjacent to the perimeter fence will skirt around the RPZ of trees in the vicinity of this fencing.

3.3 Objective 2: Following the period of construction seeding of grasslands and wildflower meadow areas shall take place

33. Following construction and the presence of construction vehicles on site the ground surface will likely have been turned over to some extent. As such, existing hardy grasses and plants are expected to be reduced in density across the site.
34. The areas between and beneath solar PV tables will be sown with a grass seed mix of Emorsgate seed mix ESG2 broadcast sown @ 20kgs/ha combined with ESF1 @

2kgs/ha during the first available planting season, once the construction of the solar park is complete.

35. Emorsgate ESF2 shall be sown within the buffer zone between existing field hedgerow boundaries and the newly constructed perimeter deer fencing.
36. ESG2 is a fine leaved grass mix, allowing space for wildflowers to establish and thrive year after year.
37. ESF1 is predominantly a nectar rich mix that includes a high proportion of clover, which is not ideal for sheep, so it is suggested for the less accessible grazing locations.
38. ESF2 has a high proportion of meadow wildflowers and tends to persist for the long term. It should suit the damper soils on the site. However individual mixes can be provided to the farmer / site operator to address unique locations.

First year management. (Year 1)

39. In the first year, annual weed seeds are likely to germinate. To prevent these overwhelming the preferred wildflowers, top or mow at least 3 times and rake up and remove arisings or where practical between the panel rows take a hay crop.

Management of Established Grassland. Years 2 to 40.

40. Sheep grazing grass areas located within the perimeter deer fencing is proposed for successful grassland management. Sheep shall be used to graze the grass at a low density. Sheep shall be removed during May and June to allow plants to flower successfully and to improve the diversity of grassland.
 - After the 1st year, cut in July/August with complete removal of arising's (some could be used to form grass piles as habitats for grass snakes), OR in the second year graze in July/August
 - If grazing with sheep, use low stocking density during May and June when grazing on site should be restricted; and
 - No pesticides or fertilisers will be used at any time.
 - The use of spot weedkiller treatment of emerging perennial weeds will be undertaken to prevent them from establishing.
41. Areas within the buffer zone (between the perimeter deer fencing and the existing hedgerow boundary) will feature longer grasses and provide suitable habitats for smaller mammals and suitable hunting habitats for owls and other birds. This will be strimmed once a year to 150mm height in September with arisings raked up. Areas of new hedgerow planting and new trees are to be kept weed free to 1m radius from stems for at least the 1st 5 years as per the LVIA.

3.4 Objective 3 and 4; Improve and maintain a network of species rich hedgerows and Provide new tree/hedgerow planting and screening to boundary edges

42. Without effective management hedgerows can become outgrown and will eventually become mature trees with gaps at ground level. Management of hedgerows to encourage dense and bushy growth enables hedgerow shrubs to flower and fruit, providing shelter and a source of food for a diversity of wildlife including invertebrates, birds and small mammals.

Plant Supply and Planting

43. All plant material shall be from a local nursery or grown on in a local nursery for at least 12 months prior to planting on site. This is to ensure acclimatization to local weather conditions. Such plant material shall also be to BS3936 Part 1. "Nursery Stock Specification for Trees and Shrubs." All planting and subsequent care shall be to BS 4428 "General Landscape Operations". Hedge plants are to be planted as a staggered row 300mm apart with 450mm between plants with 2 slow release fertiliser tablets 300mm deep per plant and topped with 50mm consolidated depth of mulch across a 1m width centred on the plant in natural ground. Trees planted in natural ground are to have a mulched tree station 1m in radius from the trunk.
44. Table 1: Plant Schedule for new hedges and gapping up existing hedgerows except along the southern boundary.

Native Hedgerows in Open Areas.			
Species		Nursery stock specification	% of mix.
<i>Acer campestre</i>	Field maple	60-80cms bare root	20%
<i>Corylus avellana</i>	Hazel	60-80cms bare root	20%
<i>Crataegus monogyna</i>	Hawthorn	60-80cms bare root	40%
<i>Lonicera periclymenum</i>	Honeysuckle	2 litre pot grown	In gapped up hedges only. 1 / 10 lin m.
<i>Prunus spinosa</i>	Blackthorn	60-80cms bare root	10% used in damp areas
<i>Sambucus nigra</i>	Elder	60-80cms bare root	5%
<i>Ulmus glabra</i>	Wych Elm	60-80cms bare root	5%

Table 2: Species for hedgerow trees in natural ground planted in groups but no closer than at 10m centres in hedgerows.

Native Trees for Hedgerows in Open Areas.				
Species		Nursery Stock Specification	Accessories	% of mix
<i>Acer campestre</i>	Field maple	2.4m – 3.6m feather whips	5 slow release fertiliser tablets. 1 short stake and tie. 1 spiral guard.	25% overall

<i>Alnus glutinosa</i>	Alder	2.4m – 3.6m feather whips	As above	5% in damp places.
<i>Betula pendula</i>	Birch	2.4m – 3.6m feather whips	As above	5% towards east of site
<i>Prunus padus</i>	Gean Cherry	2.4m – 3.6m feather whips	As above	20% overall
<i>Quercus robur</i>	Oak	2.4m – 3.6m feather whips 12 -14 cms standards	As above 9 No slow release fertilizer tablets + stake etc.	40% overall 6 No in off site hedge.
<i>Sorbus aucuparia</i>	Rowan	2.4m – 3.6m feather whips	As above	5% on northeast boundary

Table 3: Species for gapping up the southern site boundary hedge under the shade of the existing tree canopy.

Native Hedging Plants for Gapping Up Hedges in Shady Locations			
Species		Nursery stock specification	% of mix.
<i>Alnus glutinosa</i>	Alder	60-80cms bare root	10% in damp places
<i>Crataegus monogyna</i>	=Hawthorn	60-80cms bare root	35%
<i>Fagus sylvatica</i>	Beech	60-80cms bare root	10%
<i>Ilex aquifolium</i>	Holly	2 litre pot grown	20%
<i>Ilex aquifolium</i>	Holly	60-80cms bare root or 2Ltr PG	5%
<i>Prunus spinosa</i>	Blackthorn	40-60cms bare root	10% in damp places
<i>Quercus robur</i>	Oak	40-60cms bare root	10%
<i>Ulmus glabra</i>	Wych Elm	60-80cms bare root	5%

45. Yew has been omitted as it is poisonous to sheep.

New hedgerow planting and existing hedgerow improvement. Year 1.

New Ground Level Hedgerow Cultivation. This is to be undertaken by hand within the rootzone of existing trees.

- In open areas the new hedgeline is to be broken up by a single pass of a tyne or rotovator to break up the ground to 500mm depth.

- A trench should then be dug 500mm deep x 400mm wide or shallower and wider if ground water is encountered.
- Where soil depths allow a 50mm depth of well rotted stable manure is to be placed in the base of the trench, lightly covered with 50mm reserved soil so the roots do not touch the manure, prior to planting. Where soils are shallow, place additional stripped soil over the cultivated ground and plant into the linear mound. Omit the manure but use generous quantities of mulch over the whole surface of the planted mound.
- In the first 5 years new plants will be maintained weed free across a 1m diameter planting station and watered whenever there is prolonged drought.

New hedging is to be planted at ground level along the field boundaries indicated within the landscape mitigation plan (ES Vol 3: Figure 8.6, doc ref BL003).

- Excavate the trench to the dimensions above, reserving the topsoil.
- Supply and place 50mm depth of well rotted manure or compost in the base of the trench.
- Cover with a 50mm minimum depth of reserved soil.
- Supply and plant hedging plants as specified in a staggered row 300mm apart with a minimum of 400mm between the plants.
- The plant numbers below have been calculated on the basis of 5 plants per linear meter.
- Place slow release fertiliser tablets in the base of the trench and backfill and firm as the work proceeds.
- Backfill with excavated soil, compost and fertilisers as described above.
- On completion water with a fine spray and place 50mm consolidated mulch over the hedgeline to 0.5m from the centreline of the hedge.
- Loose mulch will be easier to place than cutting a mulch blanket and pinning around the staggered stems.
- Keep the hedgeline free from weeds.
- In the first 5 years new plants should be maintained weed free across a 1m diameter planting station and watered whenever there is prolonged drought.

Newly Planted Trees and Hedges. New trees are to be planted at ground level close to or within gaps in the existing hedgerow.

- All newly planted trees and hedging plants will be checked every month during the winter, especially after heavy rain and / or strong wind and firmed as necessary.
- Stakes and ties will be adjusted to avoid chafing with a view to removing these by the end of Year 3. During the remainder of the year all planting stations will be kept free of weed, with mulch topped up in autumn.
- Water at the rate of 15 litres per day, per tree if no rain has fallen in the previous 2 weeks.
- Sufficient fertiliser has been specified for the first three years.

Trees

- Plant between November and the end of March in any year.

- In each case a square pit will be dug, retaining the excavated topsoil separately from the subsoil. The base of the pit will be broken up to allow free drainage and slightly domed.
- A 100mm depth of organic matter such as well rotted manure or compost will be spread in the base of the pit with a further 75mm of reserved topsoil spread over to ensure the roots do not directly touch the manure.
- The new tree will be set in the centre of the pit and a stake driven in either through the rootball or between the bare roots, as applicable, so as to be as close to the trunk as possible without chafing. As with the hedging plants, in damp soil, cultivate the ground above the water table and increase the quantity of soil by creating a linear mound. Plant into the mound plus the natural ground and drive at least one stake, firmly into the natural ground and secure.

Future maintenance. Years 2 to 10.

Newly Planted Trees and Hedges

- Stakes and ties will be adjusted to avoid chafing with a view to removing these by the end of Year 3. During the remainder of the year all planting stations will be kept free of weed, with mulch topped up in autumn.
- Sufficient fertiliser has been specified for the first three years. After this time a general fertiliser may be applied. The frequency will depend on the type of fertiliser used but a well balanced slow release with trace elements once in three years should be sufficient in these soils. Fertilising may cease after 7 years when young trees should have established a good root structure, unless foliage and general condition suggests otherwise.
- Litter that may collect in guards and shrub shelters should be removed at each visit. Aim to remove all shelters, guards, stakes and ties by the end of Year 3.
- It is recommended that the tips of the branches of young plants be snipped back, by say 1cm, in June for the first 5 years. This will encourage bushy growth. Each September clip to the required profile, a trapezium shape broader at the base than at the top to allow light to all parts of the hedging plant and avoid a bare base developing.

Long-term management. 10 Years +

Newly Planted Hedgerow

46. Each September clip to the required profile, a trapezium shape broader at the base than at the top to allow light to all parts of the plant and avoid a bare base developing. Continue until the required height is reached as specified on the landscape mitigation plan (ES Vol 3: Figure 8.6, doc ref BL003) with the trees achieving full canopies above.

3.5 Objective 5: Maintain existing trees

47. The trees along the site boundaries and adjacent woodland have features that provide good habitat for a variety of wildlife including bats and birds.

48. At all times, before during and after construction the root protection area (RPA) should be protected in accordance with BS5837: 2012. The construction of swales will not occur within the root protection areas.
49. A tree constraints survey has identified the RPAs, which have been detailed for all trees within the development area. Please refer to ES Vol 3: Figure 1.2 and ES Vol 2: Appendix A9.5.

Construction phase & Year 1

- Ensure no equipment or materials are stored within the root protection zone.
- All trees within the tree constraints plan are to be protected in accordance with BS5837. This protective fencing (deer fencing) will be erected during 'site set up'.
- Ensure that machinery is not driven or materials stored within the root protection zone. If the installation of solar panels or any other form of construction is proposed within the RPZ of any tree, guidance should be sought from the local planning authority's tree officer.
- Where tracks are installed within the root protection areas of tree, above ground access track construction shall be utilised; such as Neoweb. This is only detailed to occur where gravel access tracks cross existing hedge openings.
- Swales should not be dug or constructed within the RPA of root protection zones.

Long-term management Years 2 to 40

- Regular (every 10 years,) inspection by qualified arborist to advise on any essential works such as limb reduction, removal or crown reduction.
- Ensure that the root protection areas are not compacted during solar panel maintenance.

3.6 Objective 6; Monitor grassland; Years 2 to 40

50. The grassland should be checked for successful establishment and species diversity.
51. This should be both for the buffer wildflower areas and the main solar park areas. In the long-term the grassland should be monitored for diversity.
 - Survey the grassland in June/July and October for the first 3 years to check establishment.
 - Monitor for diversity in June/July for 3 years using the DAFOR scale (dominant, abundant, frequent, occasional, rare) and compare to species composition in the seed mixes. It is unlikely that all sown species will establish in all areas of the site due to localised site conditions such as damp or dry areas. The results of the above monitoring will be assessed and remedial action taken as required to maximise the biodiversity gains across the site. Such measures may include reseeding of specific species.

- Monitor for diversity in June/July in years 5, 7, 9, 15, 20, 25, 30, and 35 using the DAFOR scale (dominant, abundant, frequent, occasional, rare) and compare to species composition in the seed mixes. Should a significant decrease in species occur, remedial action will be taken as required to maximise the biodiversity gains across the site. Such measures may include reseedling of areas of the site with a different seed mix.

3.7 Reinstatement of land following decommissioning of solar park 40 years +

52. The solar park is to be decommissioned after 40 years and the land restored to its former land use.
53. In this regard all underground cabling will be removed, all above ground cables and modules will be dissembled and recycled, where possible. All trenches will be backfilled and a final layer of 300mm of topsoil will be provided.
54. As part of this process all access tracks and above ground access track construction related to the management and maintenance of the park will be removed.
55. Where possible all gravel chippings will be recycled or reused within local construction projects. All track areas will be reinstated with 300mm of topsoil and seeded as above.
56. All foundations will be removed to a minimum depth of 1m.
57. All perimeter fencing will be removed from the site. All posts will be dug up and holes reinstated with topsoil and seeded.

3.9 ADDITIONAL NOTES

3.9.1 Weedkilling

58. All areas to be soil stripped e.g. under the Control Room and Inverter housings, will be trimmed or mown to a maximum of 150mm vegetation height. Arisings will be raked up and removed to a green waste recycling facility. After a few days growth when plants such as brambles, nettle, docks etc have leafed out sufficiently to absorb the weedkiller the area will be sprayed with glyphosate. All chemical weedkillers are to be mixed and applied in accordance with the Manufacturer's instructions by trained and certificate holding personnel wearing / using personal protective equipment (PPE). After spraying the vegetation will be left in situ for a minimum of 3 weeks of day time temperatures over 6 degrees C to thoroughly kill the root system. Topsoil will then be stripped from these areas plus any parts of the access route needing reinforcement, to a maximum of 300mm depth and stored in heaps no greater than 2m high, all as defined in BS3882, until needed for horticultural operations.
59. Where gapping up an existing hedge or hedge bank a planting station 1m in diameter may be created by careful glyphosate application, taking care to avoid spray drift or evaporation damage to existing adjacent vegetation.

60. Alternatively, where a non-glyphosate regime is preferred, surface vegetation may be cleared and weeds prevented from re-establishing by pinning a mulch mat, carpet tile or thick black polythene of appropriate dimension over the intended planting station to exclude light for 6 months. When digging the plant station care will be needed to remove all weed roots encountered. Subsequent maintenance will require similar diligence.

3.9.2 Topsoil

61. Topsoil will be stripped from areas of proposed construction and hard surfacing. Stripping and storage will be undertaken in accordance with “BS3882 - Topsoil” of which general purpose grade and occasionally subsoil clauses apply. It is anticipated that new ground level hedges and tree planting will have adequate topsoil in situ. Areas to receive topsoil are therefore repaired hedgerows plus any planting areas found to be lacking in this respect. A minimum of 1 cubic meter is to be available for each new feathered tree and 0.5 cubic metres for each linear metre of new ground level hedgerow.

3.9.3 Works Required For Buffer Strips

Introduction

62. The buffer areas will be seeded with varied grasses. (Emorsgate ESF2). ESF2 contains species that have been shown to be particularly important to bumblebees, like red clover and birdsfoot trefoil as well as open flowered plants like wild carrot and oxeye daisy, which are important for other beneficial insect groups such as hoverflies.

Ground preparation

63. The newly excavated swales, recently maintained ditches and buffer strips are to be roughly raked or cultivated to 150mm depth where level and sown with a damp meadow wildflower mix to ditches / swales and a shade tolerant hedgerow mix typical of the locality in permanently shady locations.

Sowing

64. This seed mix (ESF2) is best sown in the autumn or spring. The seed must be surface sown and can be applied by machine or by hand. To get an even distribution and avoid running out divide the seed into two or more parts and sow in overlapping sections. Do not cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact. Mix ratio is 20kg/ha.

First Year Management

65. Most of the sown species are perennial and will be slow to germinate and grow and will not usually flower in the first growing season. There will often be a flush of annual weeds from the soil in the first growing season. This weed growth is easily controlled by mowing or grazing. It is important to cut back any annuals before they die back, this cut will reveal the developing tussock mixture and give it the space it needs to develop.

66. Once established the area shall require minimal maintenance. Any unwanted perennial weeds (docks, thistles) might need to be controlled through the spot application of weedkiller or through hand digging or additional grazing. To control scrub and bramble development, tussocky areas may need cutting every 2-3 years between October and February. For wildlife this cutting is best done on a rotational basis so that no more than half the area is cut in any one year leaving part as an undisturbed refuge.

3.9.4 Works Required For Grassland Between Panels

Introduction

67. This larger area of grassland will be seeded with a mixture of ESG2 and ESF1.

Ground Preparation

68. The centre of the site is currently ploughed for arable land. On completion of harvesting of the current crop and presuming consent to this proposal, all inorganic fertilising and pesticide control will cease.
69. Plough or dig to bury any remaining surface vegetation, harrow or rake to produce a medium tilth, and roll to produce a firm surface.

Sowing

70. Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown and can be applied by machine. To get an even distribution and avoid running out divide the seed into two or more parts and sow in overlapping sections. Do not incorporate the seed but firm in with a roll to give good soil/seed contact. Seed should be sown at a rate of 20kg/ha.

First Year Management

71. Most of the sown meadow species are perennial and will be slow to germinate and grow and will not usually flower in the first growing season. There will often be a flush of annual weeds from the soil in the first growing season. Topping or mowing or grazing easily controls this weed growth. It is important to cut back any annuals before they die back, set seed and collapse. This cut will reveal the developing meadow mixture and give it the space it needs to develop.

Longer Term Management.

72. The meadow grassland should not be cut or grazed from May to June to give the sown species an opportunity to flower. After flowering in July or August take a 'hay cut': cut back with a tractor mower to approx. 40-70mm. Leave the 'hay' to dry and shed seed for 1-7 days then remove from site. Mow or graze the re-growth through to late autumn/winter to approx. 50mm and again in spring if needed.

73. Inspection every three months is advised to check the growth of dominant species and ruderal species. Management of these areas may have to be adapted to allow for less dominant species to predominate.