

Landscape and Ecology Management Plan (LEMP)

Central Brent Riverside Park Brent Cross Cricklewood

1065-03-SP-02

Phase 1AN RMA Submission

Revision	Description	Issued by	Checked by	Date
-	Phase 1AN RMA Submission	GJ	IG	07.11.2014
A	Para 1.1 amended. Phase 1AN RMA Submission	GJ	IG	28.11.2014
B	Planting plans updated. Phase 1AN RMA Submission	JR	GJ	04.12.2014
C	Updated sections 1.5.18, 2.2.10, 2.3.8, 2.4 and 3.2 as shown underlined following Capita comments dated 17.12.2014.	GJ	JP	14.01.2015
D	Section 2.5 included	GJ	JP	28.01.2015
E	Appendix E clarified	JR	GJ	26.05.2015

Macgregor Smith Ltd
Christopher House
11 –12 High Street
Bath BA1 5AQ

Tel: 01225 464690

enquiries@macgregorsmith.co.uk

Contents

1. General Information

- 1.1. Purpose of this document
- 1.2. The Site
- 1.3. Management Arrangements
- 1.4. Scope of Work
- 1.5. General Requirements

2. Landscape Maintenance Operations

- 2.1. Amenity Grassland
- 2.2. Tree Planting
- 2.3. Aquatic, Marginal and Riverside Planting
- 2.4. Wild Flower Meadows
- 2.5. Hard Landscape Areas

3. Ecological Requirements

- 3.1. Creation of Wildlife Refugia
- 3.2. Bird Boxes + Bat Roosts

4. Appendices

- A Maintenance and Management Schedules
- B Maintenance Record Sheet
- C Site Maintenance Visit Report Sheet
- D Planting Plans
- E Biodiversity Strategy

1.0 General Information

1.1 Purpose of this document

This document is submitted in draft but will ultimately be used to address Planning Condition 27.9 of the S73 Permission.

No development shall commence in any Phase or Sub-Phase of the Development unless and until a Landscape and Ecology Management Plan (LEMP) for that Phase or Sub Phase including long term design objectives, proposed management responsibilities and draft maintenance schedules for all landscape areas (except privately owned domestic garden), shall be submitted to and approved in writing by the LPA. The LEMP shall be carried out and implemented as approved and subsequent variations shall be agreed in writing by the LPA. Further to the above, the LEMP shall include the following elements:

- a) *Detail extent, type and provenance of new planting (native species only)*
- b) *Details of maintenance regimes*
- c) *Details of monitoring for all landscape and ecological elements*
- d) *Details of treatment of site boundaries and /or buffers around water bodies*

1.2 The Site

The development of the Central Brent Riverside Park forms a key part of new network of open space across the Brent Cross Cricklewood Regeneration site. The park along the banks of the River Brent will provide a variety of experiences along its length, from ecological areas, to more intensive urban environments where the river passes the Brent Cross Shopping Centre. Within the riverside park there will be opportunities for seating and informal recreation, the experience of nature, as well as strategic east west cycle and footpaths link across the site.

1.3 Management Arrangements

The implementation, management and maintenance of the central Brent Riverside Park, will be the sole responsibility of the Brent Cross Development Partners.

1.4 Scope of Work

The work required on this site will involve regular maintenance and monitoring visits to ensure the landscape on this site is maintained to the standards laid down. The landscape on this site will encompass the following categories of maintenance work:

- Maintenance of Amenity Grassland
- Maintenance of Wildflower Meadow Area
- Maintenance of Tree Planting

- Maintenance of Aquatic, Marginal and Riverside Planting
- Maintenance of Hard Landscape Areas
- Maintenance of Street Furniture

1.5 General Requirements

The Maintenance Contractor is expected to apply best practice landscape management and maintenance, to develop a uniformly full cover of vegetation throughout the park, to present a crisp, leafy environment. Grass areas should be uniformly deep green; areas of ornamental grasses and shrub planting should have complete leaf-to-leaf cover. Planting has been designed for a maximum potential for colour, biodiversity and year-round interest; and structural forms of herbaceous planting and ornamental grasses should be left to overwinter where appropriate. Both individual trees and tree groups should be maintained to be healthy specimens with good long-term shape and canopy structure. The maintenance contractor is also expected to comply with all Environmental and Ecological requirements, including those described in section 3 of this report.

1.5.1 The Maintenance Contractor's Specific Responsibilities:

The Maintenance Contractor shall:

- Maintain the whole of the grassed and planted areas in a manner which ensures the establishment of healthy and vigorous plants and a close textured, weed-free sward and which creates a tidy appearance. Keep all shrub beds and tree planting areas weeded and cleared of litter.
- Establish a regular pattern of maintenance operations throughout the season and according to best practice.
- Ensure all areas are regularly fertilised with appropriate fertilisers. Wildflower areas are not to be fertilised.
- Water following handover to provide optimum conditions for early establishment of all subjects. Following the establishment phase, water during prolonged dry periods, particularly in spring, with water focussed onto trees and shrubs, particularly semi mature specimens.
- Allow for extra maintenance in any periods of unusually prolific grass and weed growth.
- Ensure that the height of amenity grass areas shall not exceed 35mm except in prolonged periods of dry weather, when the mown height should be raised to 50mm.
- Correct any defects which become apparent during the earliest suitable weather conditions.
- Check all tree ties, stakes and other accessories, and remove when appropriate.
- Ensure all hard surfaces and footways are swept and kept weed free

- 1.5.2 The Maintenance Contractor shall employ skilled supervisors and operatives who deliver a high quality level of workmanship. Where necessary, employ specialists, such as arboriculturalists, where specialist workmanship and knowledge is required.
- 1.5.3 Special attention should be given to the maintenance of all newly planted schemes during their most sensitive phase, which is for several years following planting. Particular focus should be placed on watering, tree pruning etc. during this period.
- 1.5.4 Where there is an issue which may affect the initial design or a change in the overall design intent, the Maintenance Contractor should seek instruction before any work begins on site. The Maintenance Contractor shall refer to the 'Design / Maintenance Intent' drawing for reference or contact the Landscape Architect for approval.
- 1.5.5 Special attention shall be given in respect of water requirement, particularly in relation to newly planted stock. It is the Maintenance Contractor's responsibility to always be aware of any statutory restrictions on water, and advise the client where restrictions are likely to occur.

1.5.7 **Contract Management**

The contractor shall confirm a named contract supervisor to manage this contract and take instructions on his behalf. The supervisor will not be changed without advanced notice. All work on this contract will be undertaken by suitably skilled and trained staff, provided with appropriate well-maintained and safe equipment.

1.5.8 **Inspections and Monitoring**

The site will be subject to inspection by the client's representative. The contractor shall allow for attendance by the supervisor at regular intervals to monitor the work and to report on progress. The supervisor shall monitor the site for damage, defects, vandalism or thefts. The client's representative should be notified directly of any problems relating to the condition of the landscape outside the remit of the contract.

1.5.9 **Record Sheets**

The operations undertaken during all maintenance visits should be recorded. A monthly record sheet is included in the Appendices. The dates of each visit, and application of all fertiliser, pesticides and herbicides will be confirmed along with the details of the other general operations undertaken that month. The monthly record sheets will be forwarded to the contractor's agent at the end of each month.

1.5.10 **Health & Safety**

The contractor will be responsible for ensuring the work is carried out in a safe manner avoiding risks to the health and safety of his employees, users of the site and the general public. A site specific risk assessment for this project should be submitted prior to commencement of the work.

1.5.11 Protection of the Public

The works shall be undertaken without risk or inconvenience to the public, site occupants or neighbours. Access to the site and the work shall be undertaken with due regard to the needs of those using the site and surroundings. Work shall be timed to avoid causing unnecessary nuisance or disturbance to site occupants or adjoining residents.

1.5.12 Protection of Property / Utilities

All existing features including, fencing, paving, drains, services, surrounding landscape and other property is to be protected from damage during the course of the works. The contractor shall allow for any protective measures required to facilitate the maintenance operations within the price for the work. Any damage caused to such the property, highways, services or other property will be made good by the contractor at his own expense.

1.5.13 Workmanship and Cleanliness

The Landscape Maintenance is to be carried out to a high standard. Planted areas must be kept neat and clean in appearance at all times, weed and litter free, with all planting in a healthy state. The landscape maintenance contractor shall ensure that the works themselves do not cause inconvenience or danger to users of the site. At the end of each day of each visit, the contractor shall remove from site all rubbish, trimmings and superfluous materials, leaving the works in a clean and tidy condition. All hard areas are to be left in a clean condition, free from any soil, mud, leaves, cuttings and plant prunings.

1.5.14 Disposal of Waste Material

The contractor shall allow for the removal and safe disposal of all waste materials arising from the landscape maintenance works. Litter collection is to be undertaken on a twice weekly basis from all landscape areas and public realm areas. The contractor shall allow for the disposal of all litter off site and will be responsible for all waste disposal costs and approvals. Fly tipping and improperly disposed trade waste shall be reported to the clients representative and removed on instruction.

The use of mechanical shredders or chipping machinery on site is not permitted.

1.5.15 Irrigation/ Watering Arrangements

Following the successful completion of the maintenance and defects liability period. It's not anticipated that the contractor will need to regularly water after this.

However, the contractor will be required to monitor the weather conditions and water the soft landscape areas as appropriate. Watering point(s) are provided on the site area allowing hose connection and watering to most site areas.

1.5.16 Use of Pesticides and Herbicides

The contractor must use a certified operator, take appropriate safety precautions and comply with the Control of Pesticides Regulations 1986, the conditions of approval for the chemical, and any relevant Code of Practice issued by DEFRA. The contractor must keep full and accurate records of all herbicides used, the area in question, the amounts and the date of completion.

Unintentional spray overlap must be avoided. Spraying must stop whilst turning. The contractor must mark the point where spraying has stopped for refilling or for breaks. Herbicide must never drift, fall or run-off onto open water or onto adjacent sites, gardens or ground not intended for treatment.

The contractor must dispose of unused and unwanted containers, and chemicals, including unused dilute tank mixtures, in a safe way in accordance with the methods approved by the Control of Pesticides Regulations and relevant Codes of Practice. Disposal will be off site.

1.5.17 Excess Wet Weather

If excess wet weather has caused areas of water of to stand, the ground should be spiked in order to facilitate drainage of water.

1.5.18 Programming Works

The Maintenance Contractor will allow for carrying out all maintenance works in such a manner to avoid unreasonable disturbance of the buildings after occupation.

New planting should be monitored, in order to ensure that there is no loss / deterioration of habitats. This would include undertaking pruning. Pruning should be undertaken during autumn / late winter / early spring in order to avoid disturbance during the bird breeding season, which is March to August inclusive. A proportion of the pruning of fruiting trees / shrubs should be undertaken during late February in order to ensure that this foraging resource is available to birds throughout the wintering period.

Any necessary removal should be undertaken outside of the main bird breeding season (which is March to August inclusive) or where this is not possible, checks should be undertaken by a suitably trained ecologist prior to clearance works within the bird nesting season and 5m buffer zones of 'no disturbance' implemented where active nests are found. The nests should be checked weekly until the suitably experienced ecologist has confirmed that the nests are no longer in use, before works can continue within the former buffer zone area.

Note: All vegetation management work should avoid disturbance to nesting birds, which is an offence under the Wildlife and Countryside Act 1981 (as amended).

1.5.19 Noxious and Invasive or Harmful Weed and Pest Species

The following species are either Noxious Weeds as defined by the Weeds Act or invasive or harmful species.

Noxious Weeds (must be destroyed or controlled)	Species covered by the Wildlife and Countryside Act (illegal to spread)	Other Harmful Species
<p>Spear Thistle (Cirsium vulgare) Creeping or Field Thistle (Cirsium arvense) Curled dock (Rumex obtusifolius) Ragwort (Senecio jacobaea)</p>	<p>Japanese knotweed (Reynoutria japonica) Giant Hogweed (Heracleum mantegazzianum)</p>	<p>Marestails Invasive plant difficult to control Brown Tail Moths Caterpillars occur in large numbers and can cause skin irritation</p>

The Contractor is to note the presence of any such species on site and bring to the attention of the Contract Administrator(CA). Appropriate control measures should be agreed with the CA and implemented at the earliest opportunity.

(note the next paragraph is specific to Clitterhouse- taken from Waterman Guidance Document)

Invasive species listed under Schedule 9 of the Wildlife and Countryside Act (1981, as amended) and / or the London Invasive Species Index (LISI) were recorded to be present on the Site in the invasive species report (Elcot Environmental 2014); species include false acacia Robinia pseudoacacia, Japanese knotweed Fallopia japonica and Giant Hogweed Heracleum Mantegazzianum.

To control the spread of the weeds in the existing locations the area should be cleared in line with the method statements approved under condition 27.8 and in accordance with the Environmental Protection Act 1990; Japanese Knotweed is classed as ‘controlled waste’ and as such must be disposed of safely at a licensed landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991.

To prevent the spread of invasive plants, regular once the Site is operational, checks should be made to record the extent of any invasive species and to remove seedlings / young plants of invasive species such as false acacia and to check for the presence of Japanese knotweed, which requires specific management and removal processes.

1.5.20 Control of Wildlife Pest Species

The contractor is to maintain any protective fencing or guards provided with the landscape work and monitor the occurrence of pest species on the site.

Employ an approved pest control specialist to control wildlife pest species. Notify the client's representative in advance of any control operation.

1.5.21 Reinstatement Works

Where reinstatement works are required either due to contractors' damage or when instructed under the contract, these shall be undertaken in accordance with good horticultural practice. The contractor will be expected to undertake and maintain any reinstatement works so that new works establish well and tie in with existing planting as quickly as possible. The contractor will be responsible for all defects on reinstatement works until the end of the maintenance contract.

Any reinstatement or replanting works on site should respect the original intent of the design and planting proposals. Attention is drawn to the plant list contained in the appendices which highlights plants which are considered inappropriate for use in school areas due to their potential to cause harm through poisoning, irritation etc. Avoidance of the use of these plants in any reinstatement works is therefore recommended.

2.0 Landscape Maintenance Operations

2.1 Maintenance of Amenity Grassland

Objectives

Grass areas are to be maintained to establish a healthy vigorous sward free of moss, thatch, weeds, casts, discoloration, scorch, litter or leaves. Areas are to be maintained in a tidy condition within specified height ranges. Where different mowing regimes are intended to provide varying character to the landscape these shall be closely followed to ensure the design effects as planned.

Maintenance operations should aim to deliver high quality grasslands with optimum use of inorganic fertilizers and minimal use of pesticides and herbicides.

Operations

2.1.1 Amenity Grassland

Mowing

Mowing is to be undertaken between March and October, to a regular programme but avoiding periods of water logging or drought. All areas are to be cut within the specified height ranges throughout the growing season. All litter or other debris is to be removed prior to mowing. Areas are to be cut to a neat even finish, without rutting or compaction. All grass is to be neatly trimmed around edges, manholes and other obstacles. Avoid damage to trees; no strimming to be undertaken within 250mm of the base of any trees.

2.1.2 Mowing Programme

Grass Mowing during normal weather conditions

Area	Max Height	Min No. of Cuts	Removal of Mowings
Mowing strips	35mm	30	Mowings Boxed Off
Amenity Grass Areas	50mm	25	Mowings Boxed Off

During prolonged dry periods mowing should occur throughout the growing season to a maximum height of 50mm.

2.1.3 Grass Edging

A mowing strip of 300mm is to be maintained adjacent to all paths and hard landscape areas to a height of 35mm. Edges to mowing strips are to be trimmed with edging shears at time of each mowing visits. Path edgings, hard surface edges are to be cut with half moon once per month. Remove arisings.

Allow for reforming edges once per winter to all edges including paths, borders, and mowing edges; using a suitable edging tool, to clean straight lines or smooth flowing curves. Form a clean edge and remove soil.

Grassland immediately adjacent to boundary hedgerows will have longer edge zones left where possible to create varied height and structure;

2.1.4 Bulbs

Where flowering bulbs species occur delay cutting to bulb growth until 6 weeks after flowering.

2.1.5 Fertilizers

Allow for applications of fertilisers to all amenity grass in spring and autumn:

Spring : 12-0-9 NPK + 2% Fe + 2% mg 35-70g /m²

Autumn: 3-12-12 NPK 35-70g/m²

Apply in accordance with manufacturer's instructions.

2.1.6 Herbicides

Monitor sward for growth of broadleaved weed species. Allow for selective and spot herbicide applications as necessary to remove weed species from amenity grasslands.

2.1.7 Aeration

Allow for spiking over grass areas to aerate soil and improve drainage in late spring or autumn. Ensure spikes or hollow tines reach to a depth of 75mm. Fork over any areas of compacted soil or where ponding occurs to a minimum of 200mm.

2.1.8 Scarifying

Allow for scarifying amenity grassland areas once in spring and autumn.

2.1.9 Leaf Removal

Allow for removal of leaves on regular basis from grass areas during October/ November.

2.1.10 Reinstatement

Make good worn or damaged areas by reseeding or turfing (depending on original specification). Allow for cultivations, levelling, topdressing and pre-seed turfing fertilizer. Ensure new seed/ turf will match the existing in quality and appearance. Allow for protection to ensure germination/ establishment.

2.2 Maintenance of Tree Planting

Objectives

Maintenance operations geared towards the full establishment of healthy trees with good long-term shape and canopy structure and ensure a diverse age structure of trees across the site. Groups of trees need to be encouraged to develop with consistent shape. Trees also need to be managed to ensure long-term health and safe condition and avoidance of conflict with buildings and other site features.

Trees also need to be managed to:

- Ensure a safe condition.
- Avoid conflict with buildings and other site features.
- Ensure that their design intent is met.
- Promote satisfactory establishment and development.
- To manage the new trees in a traditional manner to promote longevity for the benefit of foraging bats, birds and invertebrates.

All trees, particularly retained mature trees, should be subject to a safety survey every 18 months and after high winds to prevent hazards to publicly accessible areas. Regular examination of trees within woodland areas should be made with proposals for thinning as necessary, to ensure the health and vigour of the trees whilst still maintaining the overall character of the site.

Operations

2.2.1 **Weed Control**

Maintain area of the root ball in a weed free condition. Monitor the growth of shrub material and grass around the base of trees to ensure trees are not suffering from undue competition. Remove selected plants as may be necessary. For all trees in open grass areas maintain a 1.0m Ø clear zone around the base of trunk for first 3 years after planting and 0.5m beyond tree trunk area for older trees.

2.2.2 **Stakes Ties and Grills and Guards**

All accessories to be checked at the time of each maintenance visit. Adjust stakes and ties to allow for increases in stem growth check during May – June and September – October in each year. Ties must be adjusted to allow for stem thickening in the autumn. Ensure accessories do not rub against trees. Replace broken or damaged accessories as and when any damage or breakages are found and remove redundant stakes and ties as appropriate.

All stakes and ties ought to be removed from healthy trees by the end of the third winter after planting. Trees still requiring support after this time should have stakes reduced in height to 1/3 of stem height.

Regularly check condition of tree grille fixings and levels of soil/ mulch under grills. Allow for top up of soil to within 50mm of underside of grill and 50mm of pea shingle mulch (to

be undertaken at beginning of maintenance contract and checked/ topped up again at the end).

2.2.3 Underground Guys

Check condition of underground support systems. Retighten cables as and when required. Remove materials where it is clear they have become redundant.

2.2.4 Fertilizer

Apply Spring top dressing of Enmag or similar approved to root zone of all trees allowing 70g/m² to full area of canopy spread. Unless in wildflower areas, where the use of fertilisers should be avoided. In accordance with manufacturer's recommendations.

2.2.5 Watering

Allow for watering during dry/ drought periods up to year 5. Apply sufficient water to bring whole root ball to moist condition. Do not over-water.

Allow for top watering as necessary during the 24 month establishment period (following Practical completion), and during drought periods up to five years following planting. It is the Maintenance Contractor's responsibility to always be aware of any statutory restrictions on water, and to advise the client where restrictions are likely to occur.

The principal watering of trees should be through top watering, with the surface of the soil around each tree slightly dished to hold irrigation water. If necessary, the bark mulch should be partially pulled away from the ground over the rooting zone to produce a dishing effect.

During the initial two year establishment phase, watering should occur, particularly during dry spells at a minimum of three times a week. Apply sufficient water to bring whole root ball to moist condition. The frequency of watering should be subject to review following inspections of the trees and the moisture content of the rootballs.

Prior to applying water, a core sample should be taken from the top 500mm of soil to the rootball, from a random one in five trees, to ascertain the moisture content of the soil. If the soil is found to be dry, then water should be applied. Core sampling should take place on a minimum of a weekly basis during dry spells.

All watering should occur in a slow, controlled manner, allowing the water to percolate the soil surface. Should water run off the soil surface, the speed / volume of the application should be adjusted. It should be noted that manual watering can result in the loss of 50% of the water through evaporation before it percolates the ground.

Between **50-200 litres** of water should be applied per tree, as often as daily if required, to all semi mature tree stock. The quantity of water required is dependent on tree species, size, location and weather conditions, and should be judged in accordance with the core samples taken.

2.2.6 Formative Pruning

During the winter months inspect the shape of all trees and allow for formative pruning to appropriate species to ensure continued development of even shape and single central leader. Check for damaged branches after storms or strong winds and remove any damaged growth. Cut back to clean sound wood with angled cuts. Epicormic buds to be rubbed off and basal growth to be pruned off.

Tree avenues/grids: Formative pruning of avenue trees during the establishment phase of tree development should be carried out to encourage trees to develop with continued consistent trunk height and shape of stem and branch structure. On no account shall the shape of a tree be altered through pruning from the shape it was when planted, unless otherwise instructed.

2.2.7 Selective thinning

Where established trees are growing closely together to the point that they are prejudicing the formation of good specimens and/ or long term health, they should be thinned to allow proper development of the best specimens, and to allow them to grow to maturity, either by:

- Crown pruning
- 'Lifting' of lower branches
- Complete removal

Careful selection should be made with the aesthetics of the removals/ retentions considered, for example, with a group of three trees reduced to two, etc. Where new trees have been planted in tight groups, thinning should occur to allow selection and retention of the best specimen, with removal of the others. However, the contractor must ensure any clearance works do not involve any of the individual or Group Tree Preservation Orders (TPO's).

2.2.8 Replacements

Monitor establishment of trees. Where stock fails to establish seek instruction for replacement planting. Any replacements for grouped trees must replace with matched stock from an appropriate supplier.

2.2.9 Log/ Brash Piles

Any dead wood (unless diseased) should be used to create small log piles to provide habitat for invertebrates within the existing tree line.

2.2.10 Ecological Timing of Works

Vegetation management will be carried out outside of the main bird breeding season, March to August inclusive. Where essential works occur within that timeframe, a suitably qualified Ecologist will carry out a check of vegetation to ensure no nesting birds are present or would be disturbed by works. 5m Buffer zones of 'no disturbance' can be used to demarcate nests to be protected and areas where cutting can take place, where active nests are found. The nest should be checked weekly until the suitably experienced has confirmed that the nest is no longer in use, before works can continue within the former buffer zone area.

Note: All vegetation management work must avoid disturbance to nesting birds, which is an offence under the Wildlife and Countryside Act 1981 (as amended).

2.3 Maintenance of Aquatic, Marginal and Riverside Planting

Objectives

Planting within the river channel, including areas of marginal and terrestrial planting on the riverbanks and adjacent paths have been selected to create a diverse range of species to reflect the historic indigenous plants that would have been found on the River Brent. The species mix have been selected from a mixture of herbs, sedges and rushes, grasses and other marginal planting to accommodate a range of water levels and marginal habitats. Once the aquatic, marginal and terrestrial plants are established it's expected that some of the species may be lost with those best suited to the actual conditions thriving. Should any species become too dominant these should be thinned or removed in accordance with this specification.

Operations

2.3.1 Control of planted material

Plant communities will be constantly changing throughout the year. Monitor the condition of planted areas and the growth of individual species. Plants will be thinned every 2 years to prevent dominant species outcompeting less vigorous species. Ensure banks and other features are properly protected during such work and are not left damaged.

All planting is to be maintained in a tidy condition with litter picking and removal of dead plant material on a weekly basis.

The stream channel should be kept clear of debris to increase the flow, light and oxygenation levels of the water, which improves water quality and therefore its ability to support aquatic invertebrates.

Scrub clearance should be undertaken in winter to ensure the channel does not become too overgrown

- 2.3.2** Live Willow stakes sections of live willow stakes on the south bank of the river to be coppicing on a 5 year cycle. Cut back to 450mm of base of break. Once established the willow stakes should be coppiced 20% per year.

2.3.3 Control of algal growth

Should any weed problems appear, the contractor shall promptly inform the supervising officer and propose a method statement for dealing with the matter.

Pending establishment of any planting incorporated within the scheme the method statement shall include chemical control and/or physical removal of weed and employment of additional means such as contained barley straw. These measures shall, at all times, be in accordance with current Environment Agency regulations and ensure a high standard of presentation.

2.3.4 Chemical Control

These measures shall at all times be strictly in accordance with current Environment Agency published regulations and be carried out by properly trained operatives, with due regard to the health of aquatic planting and water quality.

2.3.5 Physical Removal of Weed

In the event of any algae bloom or blanket forming prior to treatment, the weed shall be removed by netting or similar effective means or by an approved algaecide. All hard surfaces of weirs, cascade etc. shall be kept clean of algae and staining.

2.3.6 Litter / Rubbish Removal

Litter collection should be undertaken all year round and offers an opportunity to get the local community involved in maintenance of their local open space, as does creating areas where local school groups can eventually survey for aquatic invertebrates and plants within this watercourse.

2.3.7 Mulch

Allow for a localised top up of mulched areas. Reinststate gravel mulch to 50mm depth over all marginal and grass planting with the 6m footpath cycleway where plants have yet to establish leaf-to-leaf cover and will not do so during the approaching growing season. Use a gravel mulch to the same specification as the specification.

2.3.8 Ecological Timing of Works

Vegetation management will be carried out outside of the main bird breeding season, March to August inclusive. Where essential works occur within that timeframe, a suitably qualified Ecologist will carry out a check of vegetation to ensure no nesting birds are present or would be disturbed by works. 5m Buffer zones of 'no disturbance' can be used to demark nests to be protected and areas where cutting can take place, where active nests are found. The nest should be checked weekly until the suitably experienced has confirmed that the nest is no longer in use, before works can continue within the former buffer zone area.

Note: All vegetation management work must avoid disturbance to nesting birds, which is an offence under the Wildlife and Countryside Act 1981 (as amended).

2.4 Maintenance of Wildflower Meadow Areas

Objectives

To establish and maintain a diverse sward of wildflower and grasses that

- provides a habitat for invertebrates, birds and mammals
- foraging opportunities for wildlife
- promoting the growth of less competitive species
- maximum flowering interest

Note: All vegetation management work must avoid disturbance to nesting birds, which is an offence under the Wildlife and Countryside Act 1981 (as amended). The area should be checked by a suitably qualified ecologist if works are to be carried out within the Bird Nesting season of March to August (inclusive).

Operations

(Maintenance notes supplied from Manufacture Emorsgate Seeds)

2.4.1 First Year Management

Meadow mixtures are composed mainly of perennial species which take at least a full year to establish.

For new sowings on bare soil the first summer will be dominated by a flush of annual weeds arising from the soil seed bank and by grass growth. This annual growth should be controlled by mowing throughout the first year to minimise competition and weed seed production.

Cutting should be frequent enough to disperse the cuttings, or if less frequent remove the cuttings.

Where cornfield annuals or other annuals are sown with a meadow mixture as a 'nurse crop' cutting must be delayed until after flowering in July / August and arising, removed from site.

Do not, however, wait for the annuals to set seed, and if the growth begins to collapse cut and remove as soon as possible or the perennial development will be compromised.

Once the annual cornfield nurse is cut back in July/ August and the cuttings removed, the sown meadow species will be revealed as small green plants, separated by bare ground. These seedlings will then fill out using the light and space provided.

2.4.2 Management of established wildflower meadow areas.

The second year from sowing is the first in which a sown meadow is left uncut to flower, and a first "hay crop" taken in mid summer. The early years of a sown meadow (years 2/3 from sowing) are characterised by the more quickly establishing pioneer perennials such as oxeye

daisy and sorrel, and the growth is vigorous. In following years the meadow will become more diverse as slower establishing species like cowslip appear and growth is less vigorous as nutrients become fixed in root systems and herbage.

The character and composition of the meadow will continue to change with time. Eventually a relatively stable community will develop, the balance of which will reflect management, soil fertility and the natural environment of the site. In this way the outcome of each sowing will in practice differ, and will not be a direct reflection of the species balance in the sown mixture.

A mowing regime for managed grassland will contain one or more of the following elements:

Summer hay cut:

The main cut each year is the summer "hay cut". This is when the main part of the year's growth is cut back in one operation by other suitable mower (lawn mowers are generally not up to this task). The growth should be cut back to a height of 40-75mm. The cut grass should be dried on site, turning it to assist drying and disperse seeds (this also significantly reduces the weight and bulk of material to be removed). The dried 'hay' should be removed within 7 days of cutting. Arisings may be composted or placed in heaps on sacrificial parts of a site. A meadow will yield 2 - 8 tonnes of dry hay per hectare (0.2 - 0.8 kg/m²) A 250m² (tennis court size) meadow will produce about 5 x 25kg hay bales (typical small square type).

Timing of the summer hay cut

There are a number of conflicting factors that determine the best time for the main hay cut. The choice is always a compromise between these factors: in our view the best compromise is wherever possible to mow in sections at different times through the season from late June to the end of August. This maximises variation and diversity on your site and spreads the workload over the summer making larger areas manageable even with simple equipment such as a scythe.

Early mowing commencing in late June produces the best hay feed quality with optimum sugar and mineral content. Hay removal at this optimum time also means the maximum harvest of nutrients from site which may be important in the longer term for the fertility balance of the soil. However early cutting brings a premature end to enjoyment of the flowers and can compromise nesting birds which don't fledge until late July as well as insects and other wildlife using the meadow. Mowing a meadow in sections at different dates prolongs the overall flowering season and gives wildlife a chance to move aside. Start by cutting lush areas where nutrient removal will be of most benefit. Areas with dense, lush or laid vegetation are also likely to be the least attractive to nesting birds.

Late mowing in August and September when the meadow is 'overstood' is more difficult as the plant stems become dry and tough. Grassland which is consistently cut late in the season year on year loses species diversity as late cutting gives more time for coarse grasses and other dominant plants to grow unchecked. Whilst in the short-term later cutting avoids any disturbance to birds and insects, in the long term the richness of the meadow as a source of pollen and nectar is lost, and the coarse structure of the sward becomes less attractive to

breeding birds. Again varying the mowing times both within the meadow and from year to year is the best way to maintain a diverse balanced sward.

In summary

To maintain maximum diversity and flowering interest mow the meadow in sections at different times from late June to the end of August. Do not cut meadows in May or early June as you might disturb nesting birds. The main mowing season is July and to maintain flowering interest and balance it is best to complete hay cutting by the end of August. Parts of the meadow may be left occasionally (one year in three in rotation) into September so that late flowering species can seed. Leave some patches or edges uncut through winter to provide winter refuge for insects.

Thin open swards that stand well and retain interest can be left longer than dense or collapsing vegetation. If the grass collapses because it is too lush or because of bad weather a hay cut needs to be taken sooner (this is most likely with young swards on fertile soils). With the exception of yellow rattle (which seeds early) most meadow species are perennial and do not need to set seed each year - some species will last indefinitely in a meadow without ever setting seed.

Autumn cutting:

After the main cut, additional mowing during late summer and autumn is very effective in removing excessive grass growth and encouraging flowers -particularly on more fertile sites. Mow with a rotary flail or other suitable mower to 40-75mm. Ideally cut at least twice from the time the hay is removed to the end of November, aiming to leave the grass short through winter. The amount of mowing required will again depend on the fertility of the site; areas can be mown regularly (weekly) if a more tidy appearance is wanted. If any cut produces significant quantities of material this should be removed

Spring cutting:

Spring cutting to remove the first flush of grass can produce a later flowering meadow that is shorter, more open and less prone to collapse. Spring cutting or grazing is particularly useful on more fertile soils and in the early years of newly sown grassland; on settled infertile sites this may be unnecessary. The need to mow can be assessed by the amount and type of growth in the spring. Mow with a rotary, flail or other suitable mower to 40-75mm. For meadow grassland mow around Easter, and no later than the first week in May. For short flowering turf and pasture grassland, regular mowing or grazing may continue into June provided the grass is kept short enough to discourage use by nesting birds.

Harrowing:

Swards tend to become dense and matted and harrowing should take place. The accumulation of dead material (thatch) prevents the re-establishment of yellow rattle and other perennials, resulting in a progressive loss of flowering plants. Late autumn is the best time to harrow as it creates gaps which remain open to flower seed germination from autumn through to spring. There is an opportunity to add seeds to grassland at this time.

Meadows were traditionally harrowed in spring to level mole hills and make mowing easier in summer.

Weed control:

On most soils there will be some initial problems with perennial weeds. Most grassland weeds such as docks and thistles are suppressed by the annual hay cut in July and will gradually decline with good management. Low level weed populations may be spot sprayed with a herbicide, or pulled (eg ragwort). Selective herbicides are only worth using as a last resort for serious infestations as they will result in the loss of many wild flower species.

2.4.3 Management of Damp Grassland Areas

(Notes supplied from Seed Supplier "Emorsgate Seeds")

First year management

In the first year annual weed growth may be cut back to encourage the development of a good perennial ground cover. Establishment on sites prone to flooding may be patchy and may take several years to become fully colonised.

Management once established

Wet grassland which only occasionally or seasonally floods can be managed as meadow or grassland as described elsewhere (see Management of meadows and grassland).

Plant communities established in areas that are more frequently or continuously wet may benefit from a different management approach. Vegetation associated with ponds, ditches and other open water is of particular benefit providing food and shelter to wildlife such as newts and water voles. From a wildlife point of view ponds do not need to have large areas of open water; ponds which appear to be choked with vegetation often support the greatest diversity of plant and animal species. The habitat value is, however, enhanced if there are a variety of vegetation structures from dense tussock stands to bare and recently colonised mud. Management of these wetland areas should therefore aim to create variation with minimum disturbance to animal populations.

Variation in structure can be achieved by cutting back and removing short sections of vegetation every 2-3 years in rotation. In ditches, cut out sections and /or work from one bank each year. With ponds remove vegetation as a wedge, like removing a slice of cake.

Dense stands of single species (e.g. yellow iris) may benefit from selective thinning. Vegetation removal causes the least disruption to wildlife when carried out between September and November.

2.5 Hard Landscape Areas

2.5.1 Weed Control

Allow for non-chemical weeding treatment to any vegetation emerging in hard paved areas or along kerb lines. All public areas to be maintained completely weed free. General areas to be treated on a bi-monthly basis.

2.5.2 Litter

Remove all litter and deleterious material from hard landscape areas at the time of each main visit.

2.5.3 Bark Mulch

Remove any wind blown bark mulch from hard landscape areas, parking or roadways. Return to planting beds unless contaminated with litter or other material.

2.5.4 Leaf Sweeping

Allow for the removal of autumn leaf fall from hard paved areas during October / November / December along with any other plant material at any other time of year. Allow for the removal of autumn leaf fall from hard paved areas during October / November / December along with any other plant material at any other time of year.

2.5.5 Gabions

During regular maintenance visits, remove any litter caught in gabions, and any potential obstructions which have become lodged, such as branches, and other fallen vegetation, or large items of rubbish and debris. Over and above regular maintenance visits, after flood events or periods of exceptionally heavy rain check gabions and repair as necessary.

2.5.6 Textured Concrete

Anti-graffiti coating should be applied to surfaces to allow easy removal of graffiti as per product method. Anti-graffiti coating should be reapplied when necessary and in accordance with supplier recommendations.

Powerwash with water to remove mould, lichen, moss and dirt when necessary – this operation to be undertaken by a skilled operative. Do not spray too close to wall so as not to damage concrete finish.

3.0 Ecological Requirements

3.1 Creation of Wildlife Refugia

Maintenance of the habitats on site will result in the ongoing generation of waste brash and non-woody plant material, such as grass clippings and weeds.

Waste brash and logs created should be located within the woodland belt and grass strip out of public view / access so they are not disturbed.

The compost heaps and brash piles will be of benefit to a variety of wildlife including invertebrates and the birds that feed on them.

3.2 Bird Boxes and Bat Roosts

The bird boxes should be checked each autumn to clear out debris (where appropriate), ensure the boxes are still correctly located and in good condition and also to assess their success rate or whether the boxes need repositioning. Any boxes can be replaced in the autumn to be in place for the following activity season. The bat boxes are relatively maintenance free: if required (e.g. by the local planning authority) an ecologist with a bat licence can monitor successful use of bat boxes (e.g. during the first 5 years).

Note:

All inspections of bird boxes must avoid disturbance to nesting birds, which is an offence under the Wildlife and Countryside Act 1981 (as amended).

All UK bat species are protected under Schedule 2 of EC Council Directive Conservation of Natural Habitats & Wild Fauna & Flora (the Habitats Directive) as European Protected Species. This Directive is transposed into UK legislation via the 2010 Conservation of Habitats & Species Regulations, Regulation 41 of which makes it an offence to:

- i) deliberately capture or kill bats;
- ii) deliberately disturb bats; or
- iii) damage or destroy a place of shelter used by bats (e.g. roosts and breeding sites) regardless of whether bats are present or not.

All UK bat species receive additional protection under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended), which makes it an offence to:

- i) possess or advertise, sell or exchange a bat (dead or alive) or any part of a bat; or
- ii) intentionally or recklessly obstruct access to a bat roost.

Any maintenance to the Bat Boxes that is required must either be undertaken by a licenced bat ecologist or under the direct supervision of a licenced bat ecologist.

APPENDIX A

Maintenance and Management Schedules

1. Vegetation Management Schedule - Over 20 Years

Operation	Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.1 Existing vegetation - trees and shrubs																				
Ideally, tree works should occur in September / October , which avoids the period of bird nesting, hibernating bats and bats with dependent young present. If the presence of bats / nesting birds etc is suspected, an ecologist should be employed to carry out the necessary surveys, and appropriate action taken.																				
Remedial tree works to maintain trees in a safe condition	█		█	█		█		█		█		█		█		█		█		█
Dead wood removal	█		█	█		█		█		█		█		█		█		█		█
Prune shrubs to maintain in tidy condition (exact timing dependent on species)	█		█	█		█		█		█		█		█		█		█		█
Prune / trim hedges	█					█					█					█				█
1.2 Newly planted trees																				
Formative pruning	█									█										
Adjust tree ties, check stakes / guys and replace as necessary	█	█	█																	
Remove stakes and ties			█																	
Weed control around base of trees	█	█	█																	
Apply fertiliser	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█

Operation	Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Firming																				
Tree replacements as necessary																				
Watering as necessary																				
Pest and disease control																				
1.3 Amenity Grass and Verges																				
Mowing																				
Weed control (using approved herbicide)																				
Strimming (to borders and road edges)																				
Fertiliser																				
Aeration																				
Scarifying																				
Rolling of formal lawns																				
Replacement as necessary																				
1.4 Wildflower Areas and Rough Grass																				
Cutting and removing arisings																				
Strimming (at the same time as every grass cut - to borders, road and footpath edges)																				
Replacement as necessary																				
1.5 Aquatic, Riverside Marginal Planting																				
Prune (exact timing dependent on species)																				

Operation	Year																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Weed control (spot treatment)																				
Pest and disease control (when required)																				
Replacements as necessary;																				
Thinning as necessary																				
Replacements as necessary																				
Coppice live willow State – Willow are to be cut back 20% by area every year on a 5 year rotation		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
1.6 Other																				
Litter picking - all areas																				
Check furniture - repair and replace as necessary																				
Check footpaths - repair and replace as necessary																				
Lifebelt - inspect																				

2.0 Annual Soft Landscape Maintenance Schedule - 1 Year Operations

Operation	Annual frequency of operation	Month												
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
2.1 Existing vegetation - trees and shrubs														
Ideally, tree works should occur in September / October , which avoids the period of bird nesting, hibernating bats and bats with dependent young present. If the presence of bats / badgers / watervoles / nesting birds etc is suspected, an ecologist should be employed to carry out the necessary surveys, and appropriate action taken.														
Remedial tree works to maintain trees in a safe condition	1X													
Dead wood removal (retained on site wherever possible)	1X													
Re-planting of trees and shrubs	1X													
Prune shrubs to maintain tidy condition (exact timing dependent on species)	1X													
Trim hedges	1X													
2.2 Tree planting														
Formative pruning	1X													
Adjust tree ties, replace as necessary	1X													
Weed control around base of trees	1X													
Apply fertiliser														

Operation	Annual frequency of operation	Month											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Firming													
Check stakes and guys, and re-tighten / replace / remove as necessary	2X												
Watering as necessary	12X												
Tree replacements when required	1X												
Pest and disease control (when required)													
2.3 Shrubs Planting													
Prune (exact timing dependent on species)	2X												
Pruning of herbaceous perennials	monthly												
Apply fertiliser	1X												
Weed control (spot treatment and / or hand weeding)	as required												
Re-mulch	1X												
Watering as necessary	as required												
Trim hedges (exact timing dependent on species)	1X												
Pest and disease control (when required)	as required												
Replacements where necessary	1X												
Thinning as necessary	1X												

Operation	Annual frequency of operation	Month											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
2.4 Amenity Grass and Grass Verges													
Mowing	20-24X												
Weed control (using approved herbicide)	as required												
Strimming and / or edging with edging shears (to borders and road edges) to occur at each cut	20-24X												
Fertiliser	2X												
Aeration (every 3 years)													
Scarifying	2X												
Rolling of formal lawns	1X												
Reinstatement as necessary	as required												
2.5 Wildflower Areas - following the first year only													
Cutting and remove arisings	2X												
Strimming where required, to occur at each cut	2X												
Weed Control													
Harrowing													
Replacement as necessary													

Operation	Annual frequency of operation	Month											
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Pruning	1x												
Weed control around base of plant	as required												
Apply fertiliser	1x												
Watering as necessary	as required												
Plant replacements when required	1x												
Pest and disease control	as required												
2.6 Aquatic, Riverside Marginal Planting													
Prune (exact timing dependent on species)	1X												
Weed control (spot treatment)	2X												
Pest & disease control (when required)													
Replacements as necessary													
Thinning as necessary													
Copping of willow 20% by area on a 5 year rotation													

3.0 Annual Hard Landscape Maintenance Schedule - 1 Year Operations

Feature	Task	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
3.1 Benches/Seats														
	Inspect bench	2	2	4	4	4	4	4	4	4	4	2	2	
	Clean bench	2	2	4	4	4	4	4	4	4	4	2	2	
	Stain bench			1										
	Repair / remove graffiti	As needed												
3.2 Rubbish / Recycling Bins														
	Empty bins	15	15	30	30	60	60	60	60	60	60	30	15	
	Clean bins	1	1	2	2	2	2	2	2	2	2	1	1	
	Repair and Remove Graffiti	As needed												
3.3 Footpaths														
	Inspect													
	Remove rubbish													
	Spray weeds		1		1		1		1		1			
	Sweep		1		1		1		1		1			
	Pressure wash		1		1		1		1		1			
	Repair													
3.4 River														
	Maintain streams clear of vegetation													

APPENDIX B: - Maintenance Record Sheet

PROJECT:

CONTRACTOR:

This sheet is to be presented by the Landscape Contractor to the School and Community Centre Manager for signature each month as per the maintenance programme.

Month: 20.....

Summary of Specified Operation Specified Frequency

Date(s) Carried Out

Grass

- (i) Mowing grass areas
- (ii) Edge trimming
- (iii) Fertiliser/weed killer

Shrub/Groundcover Planting

- (i) Watering
- (ii) Weeding
- (iii) Top up mulch
- (iv) Pruning/pest/disease control
- (v) Check for damage/failures

Trees

- (i) Watering
- (ii) Adjustment of stakes and ties
- (iii) Firming up
- (iv) Weed control

Replacement Planting

- (i) Shrubs
- (ii) Trees

Operations instructed (written instructions required).

.....
.....

Contractor's Rep. Initials/date

.....

Contractor's comments

..... Visit No 1 Visit No 2

..... Visit No 3 Visit No 4

Client's Rep. Initials/date

.....

Client's comments, if any

..... Visit No 1 Visit No 2

..... Visit No 3 Visit No 4

Appendix C : Site Maintenance Visit Report

DATE:

Address of Store:

.....

.....

Contractor:

.....

Time Arrived:

Time Departed:

Work Done:

.....

.....

.....

.....

Signed:

(Contractor)

.....

(Manager)

COMMENTS FOR ATTENTION OF LANDSCAPE ARCHITECT/SUPERVISING OFFICER

.....

.....

.....

.....

.....

.....

.....

Appendix D : Planting Plans

Refer to drawings:

1065-03-203

1065-03-204

1065-03-205

1065-03-206

Appendix E : Biodiversity Strategy

Refer to section 5.9 of the Central Brent Riverside Park Design Development Report, document reference 1065-03-G517