Camden Lock Village

Biodiversity Action Plan

September 2014

Waterman Energy, Environment & Design Limited
Merchants House, Wapping Road, Bristol, BS1 4RW, United Kingdom
www.watermangroup.com

Camden Lock Village

Biodiversity Action Plan

Client Name:	Stanley Sidings Ltd
Document Reference:	EED14664-100-R-2-2-1-JB
Project Number:	EED14664-100

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2008, BS EN ISO 14001: 2004 and BS OHSAS 18001:2007)

Issue	Date	Prepared by	Checked by	Approved by
First Issue	September 2014	Jessica Balai Graduate Ecologist	Niall Machin Associate Director	Niall Machin Associate Director
Second Issue	September 2014	Jessica Balai Graduate Ecologist	Niall Machin Associate Director	Niall Machin Associate Director

Comments	References added

Disclaimer

This report has been prepared by Waterman Energy, Environment & Design Ltd, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

Contents

Tables

Figures

Appendices

1. Introduction

1.1. This Biodiversity Action Plan (BAP) has been prepared by Waterman Energy, Environment & Design Ltd (Waterman EED) on behalf of Stanley Sidings Ltd (the 'Applicant'). It sets out the creation and long-term management strategy of ecological resources at an area of land located within the administrative boundary of London Borough of Camden (LBC), north London (hereafter referred to as the 'Site').

1.2. An outline planning application (**2012/4640/P**) was submitted to the Local Planning Authority (LPA) for the development of a school in the north east section of the Site. In addition, a full planning application (**2012/4628/P**) was submitted to the LPA for the development of a mixed-use development comprising employment, residential, retail and leisure uses, in the second part of the Site. A subsequent Reserved Matters Application (**2014/2712/P**) was submitted and approved by the LPA in June 2014. Several planning conditions have been attached to these planning applications and this report has been prepared in relation to planning condition 28 and planning condition 3 for the school site and planning condition 49 for the main site.

1.3. Planning condition 28 (**2012/4640/P**) and planning condition 49 (**2012/4628/P**) state:

"Prior to commencement of any relevant part of the development, the applicant must submit a Biodiversity Action Plan and implement the measures in the approved Biodiversity Action Plan and maintain them thereafter including the enhancement of, and provision of additional wildlife habitat on site."

1.4. Planning condition 3 (**2014/2712/P**) states:

"Prior to the commencement of the relevant part of the development hereby permitted, details of the type and location of bird/bat bricks and boxes shall be submitted to, and approved in writing by the Local Planning Authority. The bricks and boxes shall be installed in accordance with the approved plans prior to the occupation of the development and thereafter retained."

1.5. An Ecological Appraisal was undertaken by Waterman EED in October 2010 (ref: 30222E-103_R_1.1.2_RH_Ecological_Appraisal) following an 'Extended' Phase 1 Habitat Survey undertaken at the Site on 16th September 2010. The methodology was 'extended' by assessing the potential for protected or notable species within and directly adjacent to the Site. This survey highlighted the Grade II Listed Number 1 Hawley Road as the only building on the Site as having potential to support roosting bats. As such an internal and external inspection of this building for bats was undertaken in combination with the 'Extended' Phase 1 Habitat Survey undertaken in 2010. No evidence of bats was found during the inspection; however it was assigned a low potential rating to support roosting bats. Subsequent bat surveys, comprising an evening emergence and dawn re-entry survey were undertaken on 15th and 16th September, 2010. No bats were recorded emerging or entering Number 1 Hawley Road.

1.6. Results of the 'Extended' Phase 1 Habitat Survey found the Site to predominantly comprise hard standing and buildings in the form of houses, offices, market stalls and the railway line and associated infrastructure. Scattered trees and small areas of scrub and amenity grassland are also present on Site.

1.7. Update bat surveys were undertaken at the Site by Waterman EED in June 2012 (ref: E30222E-109_R_1_1_2_HMB). This consisted of an external and internal inspection for bats on Number 1 Hawley Road and a subsequent evening emergence and dawn re-entry survey. No evidence of bats was found during the internal and external building inspection and no bats were recorded

emerging or entering Number 1 Hawley Road during the evening emergence and dawn re-entry surveys.

1.8. The Site has recently (August 2014) been subject to update surveys of buildings and trees on Site (ref: EED14664-100_R_1_1_6_SD). It was considered necessary to update the bat surveys previously undertaken at the Site in order to discharge planning condition 30 for the school site and planning condition 47 of the main site.

1.9. This BAP sets out management objectives and prescriptions to:

- Enhance the ecological value of the Site, where possible;
- Maintain favourable status through sensitive management of ecological resources (where required); and
- Cover the management of the Site for at least the first five years after project construction completion.

1.10. A summary table outlining the key actions required to be undertaken each year for the first five years following project completion can be found in Section 5.

2. Existing Condition

Site Location

2.1. The Site is located at Ordnance Survey (OS) Grid Reference TQ 2878 8420 and has an area of approximately 2 hectares. The majority of the Site consists of hard standing and buildings with limited areas of vegetation. The Site is immediately bound by Hawley Road to the north, the rear of the properties along Kentish Town Road, and Kentish Town Road itself to the east, Regent's Canal to the south and Chalk Farm Road and Castlehaven Road to the west.

Statutory and Non-statutory Sites for Nature Conservation

2.2. The Site is not subject to any statutory or non-statutory nature conservation designations. The nearest statutory site is Camley Street Natural Park Local Nature Reserve (LNR), which lies approximately 1.3km from the Site. There are seventeen non-statutory sites within 2km of the Site, however, given the scale of the development and the proximity of the Site to these sites, it is considered that the only site which could be significantly affected by the proposed development is the Regent's Canal section of the London Canals Site of Metropolitan Importance (SMI).

Habitats

2.3. An 'Extended' Phase 1 Habitat Survey of the Site was undertaken in September 2010 as part of the Ecological Appraisal. This survey methodology is intermediate between the standard Phase 1 and Phase II surveys. This involved recording the main plant species and classifying and mapping broad habitat types within the Site, using assigned categories defined by the Joint Nature Conservation Committee[1]. All habitat types within the survey area were mapped (see **Figure 1**). Each habitat type present at the Site has been assigned a value based on published guidance from the Institute of Ecology and Environmental Management (IEEM, 2006)[2]. Although four years has elapsed since the 'Extended' Phase 1 Habitat Survey was undertaken, the Site visit undertaken in August 2014 found the habitats to remain largely unchanged due to the location of the Site and the types of habitat found on Site.

2.4. The Site supports the following habitats:

- Amenity grassland (negligible value);
- Buildings (of value within the Site only);
- Hard standing (negligible value);
- Ruderal (negligible value);
- Scrub (of value within the Site only); and
- Trees (of value within the Site only).

Protected Species

2.5. Protected species surveys for bats were undertaken at the Site in 2010 and updated in 2012 and again in 2014. A summary of the results is provided below and should be read in conjunction with **Figure 2**. Incidental observations of other protected species made during the 'Extended' Phase 1 Habitat Survey are detailed below where appropriate.

[1] Joint Nature Conservation Committee (2004) Handbook for Phase 1 Habitat Survey.
[2] Institute of Ecology and Environmental Management (2006). *Guidelines for Baseline Ecological Assessment in the United Kingdom*. E & F.N. Spon, Chapman & Hall, London.

Bats

2.6. An internal and external inspection for roosting bats was undertaken at Number 1 Hawley Road on 15th September 2010. Although no evidence of bats was found, due to the presence of suitable features, this building was considered to be of low potential to roosting bats. Therefore, an evening emergence and dawn re-entry survey was undertaken on the 15th – 16th September 2010 based on best practice guidelines at the time. The surveys recorded no bats emerging or entering the building. Although, a single common pipistrelle *Pipistrellus pipistrellus* was recorded commuting along Hawley Road.

2.7. In 2012 update bat surveys were undertaken on Number 1 Hawley Road as per the 2010 surveys. The 2012 surveys at the buildings were based on current best practice guidelines (Hundt, 2012[3]).

2.8. During the 2012 update surveys no evidence of roosting bats was recorded and no bats were recorded emerging from or entering Number 1 Hawley Road. During the evening emergence survey on 11th July 2012, a total of eight commuting and foraging common pipistrelle bats were recorded. During the dawn re-entry survey undertaken on 25th July 2012, a total of thirteen common pipistrelle bats were recorded commuting and foraging within the vicinity.

2.9. In August 2014 the Site was subject to further update internal and external building inspections. This survey identified eight buildings on Site to have low potential for roosting bats. Therefore, it is considered necessary to undertake a single evening emergence or dawn re-entry survey on each of these eight buildings (these surveys are due to be undertaken in September 2014).

Other Protected/Notable Fauna

2.10. The Site also has the potential, albeit limited, to support nesting birds. Nesting birds and their eggs are protected (under the Wildlife and Countryside Act 1981 (as amended)[4] during the breeding bird season (March to August inclusive).

Context

Biodiversity Action Plans

2.11. The Environment Departments of all four governments in the UK work together through the Four Countries Biodiversity Group. Together they have agreed, and Ministers have signed, a framework of priorities for UK-level work for the Convention on Biological Diversity. Published on 17 July 2012, the 'UK Post-2010 Biodiversity Framework'[5] covers the period from 2011 to 2020. This now supersedes the UK Biodiversity Action Plan (UK BAP) and the current strategy for England is 'Biodiversity 2020: A Strategy for England's wildlife and ecosystem services'[6]. Although the UK BAP has been succeeded, Species Action Plans (SAPs) developed under the UK BAP still remain important and valuable reference sources for background information on priority species under the UK Post-2010 Biodiversity Framework.

2.12. Although the UK Post-2010 Biodiversity Framework does not confer any statutory legal protection, in practice many of the species listed already receive statutory legal protection under UK and/or European legislation. In addition, the majority of priority national biodiversity action plan (BAP) habitats and species are now those listed as Habitats and Species of Principal Importance in England listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act

[3] Hundt (2012) 'Bat Surveys – Good Practice Guidelines' Bat Conservation Trust, London.
[4] HMSO, 1981 'The Wildlife and Countryside Act (WCA) (as amended).
[5] JNCC and DEFRA (on behalf of the Four Countries' Biodiversity Group). 2012. UK Post-2010 Biodiversity Framework. July 2012. Available from: http://jncc.defra.gov.uk/page-6189.
[6] Defra (2011): 'Biodiversity 2020: A strategy for England's Wildlife and ecosystem services'.

2006[7]. All public bodies have a legal obligation or 'biodiversity duty' under Section 40 of the NERC Act to conserve biodiversity by having particular regard to those species and habitats listed under Section 41 (S41). A key purpose of this duty is to embed consideration of biodiversity as an integral part of policy and decision making throughout the public sector, which should be seeking to make a significant contribution to the achievement of the commitments made by Government in its Biodiversity 2020 strategy.

2.13. For the purpose of this BAP, habitats and species listed under S41 of the NERC Act are referred to as having superseded the UK BAP. Many of the tools developed under UK BAP remain of use, for example, background information about the lists of priority habitats and species. The lists of priority species and habitats[8] agreed under UK BAP still form the basis of much biodiversity work in the UK.

2.14. Habitats and species listed under S41 of the NERC Act are incorporated into BAPs at regional (London BAP[9]) and local (London Borough of Camden[10] (LBC)) levels.

London Biodiversity Action Plan

2.15. The Site is covered by the London BAP, which was the region's response to the NERC Act and sets out conservation actions and objective features of importance for the region.

London Borough of Camden Biodiversity Action Plan

2.16. The LBC has launched its local BAP, a collaboration of the Council and a partnership made up of voluntary, private and public organisations working together to improve the biodiversity of the area.

2.17. The Species Action Plans (SAPs) and Habitat Action Plans (HAPs) that are potentially relevant to the Site and which have been taken account of in this assessment include the following S41 , LBC BAP and London BAP habitats and species:

- Common pipistrelle bat (LBC BAP and London BAP);
- House sparrow *Passer domesticus* (S41 and London BAP);
- Starling *Sturnus vulgaris* (S41); and
- The Built Environment (LBC BAP).

2.18. It should also be noted that although not a London BAP priority habitat, the London BAP also lists 'Built Structures' as an important habitat type.

[7] ODPM (2006) 'Natural Environment and Rural Communities Act (2006)
[8] JNCC (2008). 'UK Biodiversity Action Plan: New List of Priority Species and Habitats' Available from: http://www.ukbap.org.uk/NewPriorityList.aspx.
[9] London Biodiversity Partnership: 'The London Biodiversity Action Plan'. Available on-line from http://www.lbp.org.uk/index.htm
[10] London Borough of Camden Biodiversity Action Plan, 2013 - 2018.

3. Evaluation and Potential

Identification of Important Features

3.1. The Site comprises predominately buildings and hard standing with scattered trees and small areas of ruderal, scrub and amenity grassland habitats. The habitats on Site, with exception of the scattered trees, buildings and scrub present, are considered to have negligible ecological value. However, during 2014 building inspections, eight buildings were identified as having low potential for roosting bats, and further surveys are required.

Potential

3.2. The majority of habitats present at the Site would be removed in order to facilitate the proposed Development. However, new habitat areas at the Site are proposed as part of the landscape strategy (**Appendix A**). The proposed habitats will replace and enhance those habitats removed during the construction phase. New habitat areas will include tree planting, hedgerows, climbing plants, green and brown roofs, a wildflower meadow, amenity grassland and shrub, herbaceous and ornamental grass planting. Furthermore, a proportion of existing trees on Site will be retained.

3.3. Whilst it is considered that the creation of the above habitats would enhance the Site for biodiversity, there also exists the potential to enhance the ecological value of the Site further through the appropriate management of these habitats. This in addition to the creation of additional artificial habitats, such as the erection of artificial bird boxes and bat tubes/bricks and habitats for invertebrates would ensure that opportunities for a range of S41, London BAP and LBC BAP species remain at the Site in the long-term.

Assumptions/Limitations

3.4. As stated above, at the time of writing this BAP, further surveys on the eight buildings on Site with low potential for roosting bats have not yet been undertaken. This survey is planned to be undertaken as soon as possible and the results will be detailed in the Protected Species Report to be undertaken by Waterman. Should evidence of roosting bats be recorded amendments to the BAP would be made as necessary and resubmitted.

3.5. This BAP has been based on the planting schedules provided within the landscape strategy (**Appendix A**). Should the planting schedules or landscape proposals be altered and be different to those described within this BAP, this BAP should be updated accordingly to reflect these changes.

3.6. This BAP does not take into account any Health and Safety requirements or CDM regulations with regards to any maintenance or works described within this BAP. It is assumed that the client/developer will undertake the necessary steps in order to appropriately satisfy these issues.

4. Biodiversity Action Plan Aims and Objectives

4.1. The aim of this BAP, in addition to creating habitats of value on Site, is to provide a framework for long term management and maintenance of the Site. This BAP will also ensure that the creation of new habitats is appropriate to the local area as well as being of potential benefit to S41, London BAP and LBC BAP species. Landscaping proposals for the Site can be found within **Appendix A**.

Objectives

1. To create habitats of ecological value on Site; and
2. To ensure suitable maintenance of the Site is undertaken to retain amenity and ecological value in the long-term.

Rationale

Objective 1: To create habitats of ecological value on Site.

Habitats

4.2. The current landscape plans include the creation of a number of different habitats. Habitats within the landscape proposals include tree planting, hedgerows, climbing plants, green and brown roofs, a wildflower meadow, amenity grassland and shrub, herbaceous and ornamental grass planting. The landscape design incorporates both native and non-native species. The habitats to be created on Site would provide a mosaic of habitat types and would also enhance the on-Site foraging and nesting opportunities for birds and invertebrates (and therefore bats).

Fauna

4.3. To enhance the Site further for faunal species, artificial nesting opportunities for birds and roosting opportunities for bats are recommended to be incorporated into the proposed Development.

Bird boxes and Bat Tubes/Bricks

4.4. Bat tubes/bricks should be included within the proposed development to enhance the value of the Site for bats, see **Figure 3** and **Figure 4** for recommended locations. This would include suitable models aimed at species typically found within London such as soprano pipistrelle *Pipistrellus pygmaeus* and common pipistrelle bats. These models would comprise 'Schwegler 2FR Bat Tube' and 'Schwegler Brick Box Type 27' or similar, which can be incorporated into the fabric of the building. At least eight bat tubes/bricks should be erected at a height of 4-6m, located on buildings in suitable locations to provide additional roosting habitat for foraging and commuting bats. These should be placed in areas not lit by artificial lighting, with a clear aspect (a clear flight path for bats entering/leaving the box) and ideally face different directions in order to provide bats with a range of roosting temperatures at different times of the year e.g. north, south-east and south-west. Exposure to sunlight should be maximised where possible, with prevailing wind, rain or excessive heat avoided.

4.5. It is recommended that the provision of at least six bird boxes are included as part of the proposed development, see **Figure 3** and **Figure 4** for recommended locations. These bird boxes should be aimed at S41 species such as house sparrow and starling, in addition to other common species. Suitable models would comprise 'Schwegler 1SP Sparrow Terrace', 'Schwegler 3S Starling Box' and 'Schwegler Bird House' or similar. These should be mounted at a height of 2-4m above ground level on buildings within areas of minimal human disturbance and out of direct wind, sun and rain.

These boxes should be cleaned out annually outside of the breeding bird season (September to February inclusive).

Other Features

4.6. It is recommended that the provision of at least five insect boxes, small bunds, mounds and/or log piles are included upon the brown and green roofs. This would provide suitable habitat for invertebrate species and therefore a foraging resource for birds and common species of bat. Invertebrate hibernacula could be created simply with a central mound area of sand and compacted crushed brick and concrete angled at approximately 30 degrees with the broadest area south facing. The mound should be covered with small boulders placed loosely to allow entry by invertebrates into the central area.

4.7. The placement of netted log piles upon the brown and green roofs would create suitable habitat for invertebrates. The log piles should be made from tree trunks or large branches sawn in to logs no more than 1500mm in length and 200mm in width and stacked no more than 350mm high. Netting these log piles and attaching this to the roof would prevent movement of the piles in high winds. The log piles will also create perching opportunities for birds.

4.8. In addition, the provision of at least two Schwegler Insect Houses could be included as part of the proposed development. These should be mounted at a height of 1-2m above ground level on buildings within areas of minimal human disturbance and out of direct wind, sun and rain. Should boxes be erected on any suitable trees, aluminium nails would be used to prevent fatal damage to trees.

Objective 2: To ensure suitable maintenance of the Site is undertaken to retain amenity and ecological value.

4.9. Management objectives and prescriptions for key features are set out below. These are designed to ensure the suitable maintenance of the Site is undertaken to retain ecological value whilst ensuring minimal damage and disturbance to the habitats and species they support.

Trees

Objectives

4.10. Management of existing and newly planted trees to encourage plant growth whilst also providing habitats for species such as birds and invertebrates as well as any bats in the local area.

Management and Monitoring

4.11. Protective fencing will be erected around retained trees prior to the commencement of the development and will remain in place and effective until the end of the construction period and will be re-erected where necessary in accordance with provisions set out in British Standard (BS) 5837: 2012[11].

4.12. Newly planted trees would be checked twice a year and watered as necessary during establishment. Stakes and ties would be adjusted as required and once no longer required (usually after 5 years) these should be removed. Where stake removal would disturb the rooting area these would be sawn off at the base. Any broken or damaged stakes during this time would be removed (as above) and replaced with ties re-fixed.

[11] BS5837 Trees in Relation to design, demolition and construction – Recommendations, 2012, BSI

4.13. Should any trees fail to establish, these should be replaced. Watering may be required during periods of prolonged drought.

4.14. To reduce excessive competition, mulching should be laid to a diameter of 0.5m around the base of the trees to suppress weed growth and should be maintained to a depth of c.75mm.

4.15. Strimming should be avoided around the base of the trees (especially when immature) in order to prevent any fatal damage occurring and the tree having to be replaced.

4.16. All trees would be subject to a safety survey by a suitably qualified arboriculturalist every 18 months and after high winds to prevent hazards to publicly accessible areas. Any pruning works should be carried out only where the condition of the tree or public safety requires and undertaken according to BS 3998:2010[12]. Wood collected from pruning would be chipped and used on Site for mulching. Any large branches removed (unless diseased) would be used to replenish any log piles (should they be created).

4.17. Formative tree works such as pruning will be undertaken during the winter months (September to February inclusive) outside of the bird breeding season. If this is not possible then a suitably qualified ecologist would be consulted to enable the works to be undertaken without adversely affecting any breeding birds.

4.18. Existing trees to be retained should also be subject to the formative tree works and monitoring, as required.

Success Indicators

4.19. Trees should show good growth structure and form with no evidence of disease or other impairment.

Grass Lawns

Objectives

4.20. The grass lawns would be cut as required to maintain a neat and tidy appearance.

Management and Monitoring

4.21. All grassed areas will be mown once a week during the main growing season. Outside of this period the grass will be cut as necessary (in suitable weather conditions) to maintain a neat and tidy appearance.

4.22. The requirement for grass cutting will be determined by a suitably experienced landscape contractor following regular on-site inspections.

Success indicators

4.23. The grassed areas will appear neat with a well-developed, even sward.

[12] British Standards (2010): 'BS 3998:2010 Tree work. Recommendations'

Wildflower Meadow

Objectives

4.24. To maintain a diverse wildflower grass sward and prevent single species dominance. Creating a species rich meadow would benefit local faunal groups such as bats, birds and invertebrates, by providing habitat and foraging opportunities.

Management and Monitoring

4.25. Maintain as long grass with no cuts from June to September. Cuts outside of this period would leave areas of uncut grass to provide a heterogenic sward. A rotational mowing regime would be implemented to manage the sward and prevent single species dominance.

4.26. This area should not be top-soiled or fertilised in order to conserve the diversity of the sward. Should soil importation be necessary due to poor growing conditions, low fertility sub-soil should be used.

4.27. If a significant number of plants/seeds fail to establish these will be replaced following consultation and review of the suitability of the seed mix. Watering may also be required during periods of prolonged drought, especially during the establishment period.

Success Indicators

4.28. A diverse and dense wildflower sward. Evidence of foraging birds may also be present.

Climbing Plants

Objectives

4.29. Maintain and enhance the value of climbing plants to nesting and foraging birds and for butterflies and other terrestrial invertebrates.

Management and Monitoring

4.30. Galvanised steel wire should be placed across screens or at least that part where the proposed climbing plants are to grow. Wires should be placed in horizontal lines c.300mm apart, from c.600mm off the ground. The wire should be attached to brass screws at c.400mm centres along each length.

4.31. During establishment pruning would be undertaken as required in order to promote healthy, bushy growth. Following this, pruning would only be undertaken to prevent obscuring any required views or prevent hazards to publicly accessible areas. Wood collected from pruning would be chipped and used on Site for mulching.

4.32. To reduce excessive competition, mulching would be laid around the base of all plants to suppress weed growth and would be maintained to a depth of c.50mm. Should any weeds require removal, this would be undertaken by hand.

4.33. If a significant number of plants fail to establish these will be replaced by like for like specimens. Watering may be required during periods of prolonged drought.

4.34. Works would be undertaken during the winter months and outside of the breeding bird season. Cutting later in the year will retain berries, seeds and flowers which will benefit birds and invertebrates (and therefore bats).

Success Indicators

4.35. The climbers will be dense to act as suitable screening with no evidence of disease or other impairment. Fruiting and flowering bodies should be present after a few years. Evidence of nesting and foraging birds as well as foraging invertebrates may also be present.

Shrub, herbaceous, ornamental grass and hedgerow planting

Objectives

4.36. Shrub, herbaceous, ornamental grass and hedgerow planting using both native and non-native species will be used. Although this habitat will primarily be for aesthetic purposes, it will still be of benefit to the Site's ecology. Management will focus on maintaining continuous shrub/plant cover with a neat and tidy appearance.

Management and Monitoring

4.37. During establishment, pruning and watering would be undertaken as required in order to promote healthy, bushy growth. Following this, pruning would only be undertaken to prevent obstruction to footpaths and prevent shading to smaller shrubs. This will retain the availability of nesting and foraging opportunities for birds. Wood collected from pruning would be chipped and used on Site for mulching.

4.38. Other than ornamental grasses, spent flowers from perennial plants should be removed through 'deadheading' in order to allow the plants to place more energy into strengthening itself rather than seed production. Where each flower head is on its own stem, the entire stem should be removed from the base of the plant. When a plant's older leaves start to look worn, these should be pruned back to where there is still fresh growth, or back to any new basal growth. Should any plants begin to die out within their centre, 'division' may be required.

4.39. To reduce excessive competition, mulching would be laid around the base of all plants to suppress weed growth and would be maintained to a depth of c.50mm. Should any weeds require removal, this would be undertaken by hand.

4.40. Should any plants fail to establish, these will be replaced by like for like specimens. Watering may be required during periods of prolonged drought.

4.41. Works would be undertaken during the winter months and outside of the breeding bird season. Cutting later in the year will retain berries, seeds and flowers which will benefit birds and invertebrates (and therefore bats).

Success Indicators

4.42. Areas of shrub and hedgerow planting will be dense and have aesthetic value with no evidence of disease or other impairment. Fruiting and flowering bodies should be present after a few years. Areas of perennial planting will establish quickly and show longevity. Self-seeding may also occur, evidence of foraging birds and invertebrates may also be present.

Green Roofs

Objectives

4.43. To produce a green roof with a diverse mix of wildflower and sedum species and prevent single species dominance.

Management and Monitoring

4.44. The requirement of maintenance visits (including the removal of undesirable vegetation, checks on drainage outlets and replacement of failed plants (where this is in excess of 5%)) would be determined by the manufacturer's recommendations, however this is likely to involve at least two visits per year. Such visits would ideally be undertaken outside of the breeding bird season.

4.45. The roofs would be thoroughly watered after installation and for a period of two weeks. All drainage points would be checked annually and cleared out if necessary to ensure optimum performance. Excess water must be able to leave the roof, to avoid pooling and overloading.

4.46. Any unwanted vegetation such as buddleia *Buddleja davidii* and other scrub species should be removed by hand whilst still immature. Weeds should also be removed by hand with any resulting bare areas left to naturally regenerate with sedum or other naturally colonising vegetation such as grasses. Alternatively, new wildflower plugs can be placed within these bare areas, covered with substrate and watered. This would be carried out during April and/or late September to ensure climatic extremes such as frosts or hot sun will not inhibit growth.

4.47. All vegetation barriers at up-stands, roof penetrations and fire breaks must be maintained at their original width and cleared of any encroaching plants.

4.48. To allow the wildflowers within the green roof to prevail it is generally recommended that vegetation be cut once the height exceeds 10cm (in early spring) reducing the height to between 4-7cm according to evenness of the ground for the first year only. The vegetation should then be cut in autumn after most species have set seed. In subsequent years the vegetation should be cut once a year in autumn, again after the plants have set seed. These works should be conducted outside of the bird breeding season.

4.49. In order to avoid any unnecessary damage, contractors would be briefed as to the build-up of layered components. Any works would be undertaken by hand, however where this is not possible tools must be carefully chosen so as not to interfere or damage anything below the substrate. All works would be programmed in order to minimise the amount of footfall across the roof after installation to minimise substrate compression and damage to vegetation.

Success Indicators

4.50. A dense carpet of wildflowers would establish with no evidence of disease or other impairment. Invertebrates and foraging birds would also be present.

Brown Roofs

Objectives

4.51. To provide a mosaic of habitats within an urban area.

Management and Monitoring

4.52. The requirement for maintenance visits would be determined by the manufacturer's recommendations (likely to involve at least two visits per year), whilst any disturbance to nesting birds is likely to be negligible, where possible work would be undertaken outside of the breeding bird season.

4.53. Selected rubble will be used on the roofs and lightly sculpted to create different aspects. This would provide a mosaic of environments on the rooftops, creating habitats for a wider range of species and maximising biodiversity. Materials used for the substrate should be in line with relevant British

Building Regulations ensuring that no potentially polluting elements are contained within these materials.

4.54. The roofs would be thoroughly watered after installation and all drainage points checked annually and cleared out if necessary to ensure optimum performance. Excess water must be able to leave the roof, to avoid pooling and overloading.

4.55. Suitable plants for brown roofs are not readily air-borne. Should there be a lack of suitable plants establishing in the first year, low density plug planting of specific drought tolerant plants could be undertaken to aid colonisation.

4.56. Any unwanted vegetation such as buddleia and other scrub species would be removed by hand whilst still immature. Weeds and other vegetation would also be removed by hand, with sparsely vegetated areas maintained and areas of bare ground re-created where vegetation has encroached.

4.57. All vegetation barriers at up-stands, roof penetrations and fire breaks must be maintained at their original width and cleared of any encroaching plants.

4.58. In order to avoid any unnecessary damage, contractors would be briefed as to the build-up of layered components. Any works would be undertaken by hand, however where this is not possible tools must be carefully chosen so as not to interfere or damage anything below the substrate. All works would be programmed in order to minimise the amount of footfall across the roof after installation to minimise substrate compression and damage to vegetation.

Success Indicators

4.59. Once established the roofs should have a wild appearance mimicking ephemeral and ruderal habitat. Invertebrates and foraging birds would also be present.

Bird Boxes and Bat Tubes/Bricks

Objectives

4.60. To enhance the potential of the Site for bats and birds by providing suitable roosting and nesting opportunities.

Management and Monitoring

4.61. The erection of bird boxes and bat tubes/bricks and the creation of any log piles should be undertaken during winter to allow weathering in prior to the active seasons.

4.62. Bird boxes should be cleared out annually over the winter months (September – February inclusive) to avoid disturbance to breeding birds. Hole-fronted boxes are best cleared out in October, open-fronted boxes are best cleared out in late winter (i.e. February) as some boxes may be used over-winter as roosting sites by smaller birds such as wrens *Troglodytes troglodytes* and should ideally be left undisturbed during this time. Any old nests should be removed entirely and the box should preferably be cleaned with boiling water to kill-off any remaining parasites. This will also indicate if birds are using the boxes to nest. Any damaged boxes should be repaired or replaced as necessary. The boxes should then be replaced in their original positions.

4.63. Bat tubes/bricks erected should not require any maintenance (if the specifications within this BAP are followed) other than replacement or repair if damaged. Roosting bats are protected from disturbance under UK and EU legislation, therefore, if any tubes/bricks need to be removed this must be carried out by a licenced bat worker as there is a possibility of bats being present.

4.64. Any log piles created to enhance the Site for invertebrates should be replenished as required.

4.65. Any insect houses erected should be repaired or replaced as necessary.

Success indicators

4.66. Evidence of bats and birds using the boxes/tubes/bricks and the presence of a diverse range of invertebrates.

Other

4.67. As a general recommendation, where new landscaping is to be undertaken, horticultural practice should include the use of peat-free composts, mulches and soil conditioners. The use of pesticides (herbicides, insecticides, fungicides and slug pellets) and chemical fertilizers would be discouraged to prevent fatal effects on the food chain particularly invertebrates, birds and/or mammals and any weed removal should be undertaken by hand. Any pesticides used should be non-residual.

4.68. Where rainwater is harvested from a green roof, fertiliser would not be applied.

4.69. Provision for regular litter removal should be made.

Monitoring and Reporting

4.70. A suitably qualified ecologist and arboriculturalist will have an on-going role to monitor the Site's management through an annual monitoring report which will be produced for at least the first five years. To inform this report, periodic inspections of the Site will be undertaken, the results of which will be documented within the annual monitoring report, which should also summarise the management of the Site over the last year and the measures achieved.

Review

4.71. This BAP should be reviewed on an annual basis at least for the first five years and amended as required in order to maintain the original management aims and objectives, as well as responding to the needs of the Site (if required).

5. Summary of Management for First Five Years after Project Completion

5.1. **Table 1** below summaries the key actions required to be undertaken each year for the first five years following project completion as highlighted within Objective 2.

Table 1: Key actions required to be undertaken each year for the first five years following project completion

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
Trees	Stakes and ties on newly planted trees to be checked regularly (every couple of months) and adjusted at least twice annually, or as required. Any broken or damaged stakes to be replaced and ties re-fixed. Stakes to be removed as necessary when the tree is suitably established, but should remain in place for at least the first year.	✓	If Required	If Required	If Required	If Required	Landowner / Contractor
	Newly planted trees to be checked twice a year and watered as necessary during establishment. Should any trees fail to establish these should be replaced. Watering may be required during periods of prolonged drought.	✓	✓	✓	✓	✓	Landowner / Contractor
	Mulching to be laid to a diameter of 0.5m around the base of the trees to suppress weed growth and maintained to a depth of c.75mm.						Landowner / Contractor
	Inspections to be undertaken between April and September. Weeds to be removed by hand or with suitable herbicide.						Landowner / Contractor
	Annual inspections of all mature trees on Site or adjacent to areas of public access for damage and disease.						Landowner / Contractor
	Pruning to be undertaken to maintain appropriate height clearances for safe pedestrian access as well as						

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
	maintaining the health and structural stability of the trees. Formative tree works to be undertaken during the winter months (September to February inclusive) outside of the bird breeding season. If this is not possible then a nesting bird check by a suitably qualified ecologist prior to works will be undertaken to avoid disturbance to breeding birds.						Landowner / Contractor
Grass Lawns	Grassed areas to be mown once a week during the main growing season. Outside of main growing season, cut as required to maintain a neat and tidy appearance.	✓	✓	✓	✓	✓	Landowner / Contractor
Wildflower Meadow	No cuts from June to September to maintain long grass. Mowing regime implemented, including areas of uncut grass. Re-seeding if the sward fails to grow. Watering may be required during periods of prolonged drought.	✓	✓	✓	✓	✓	Landowner / Contractor
Climbing Plants	During establishment pruning to be undertaken as required in order to promote healthy, bushy growth. Following establishment, pruning to only be undertaken to prevent obscuring any required views or prevent hazards to publicly accessible areas. Wood collected from pruning would be chipped and used on Site for mulching. Any weed removal to be undertaken by hand. Plants that have failed to establish to be replaced. Watering during periods of prolonged drought.	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
	Works to be undertaken outside of the breeding bird season.						
	Mulching to be laid around the base of plants and maintained to a depth of c.50mm.	✓	✓	✓	✓	✓	Landowner / Contractor
Shrub, Herbaceous, Ornamental Grass and Hedgerow Planting	During establishment, pruning and watering to be undertaken as required. Following establishment, pruning to only be undertaken to prevent obstruction to footpaths and prevent shading to smaller shrubs. Wood collected from pruning to be chipped and used on Site for mulching. Any weed removal to be undertaken by hand. Plants that have failed to establish to be replaced. Watering during periods of prolonged drought. Works to be undertaken during the winter months and outside of the breeding bird season. Spent flowers from perennial plants should be removed through 'deadheading'. Should any plants begin to die out within their centre, 'division' may be required.	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor
	Mulching to be laid around the base of plants to suppress weed growth and maintained to a depth of c.50mm.	✓	✓	✓	✓	✓	Landowner / Contractor
	Should any plants fail to establish these should be replaced.	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor
Green Roofs	Roofs thoroughly watered after installation.	✓					Landowner / Contractor

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
	Cutting of meadow species (twice in first year, once in autumn thereafter).	✓	✓	✓	✓	✓	Landowner / Contractor
	Replacement of failed plants (where this is in excess of 5%).	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor
	All drainage points checked and cleared out if necessary. All vegetation barriers maintained at their original width and cleared of any encroaching plants. Works (including removal of unwanted vegetation) to be undertaken by hand. Where this is not possible tools would be carefully chosen. Where required, fertiliser use to be kept to a minimum. Works to be programmed to minimise amount of footfall after installation. Works undertaken outside of breeding bird season where possible.	✓	✓	✓	✓	✓	Landowner / Contractor
Brown Roofs	Roofs thoroughly watered after installation.	✓					Landowner / Contractor
	Low density plug planting should there be a lack of suitable plants establishing in the first year.	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor
	All drainage points checked and cleared out if necessary. All vegetation barriers maintained at their original width and cleared of any encroaching plants. Works (including removal of unwanted vegetation) to be undertaken by hand. Where this is not possible tools	✓	✓	✓	✓	✓	Landowner / Contractor

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
	would be carefully chosen. Works to be programmed to minimise amount of footfall after installation. Works undertaken outside of breeding bird season where possible.						
Bird Boxes, Bat Tubes/Bricks and Other Features	Bird boxes to be cleared out annually over the winter months (September to February inclusive).	✓	✓	✓	✓	✓	Landowner / Contractor
	Any damaged bird or insect boxes or bat tubes/bricks should be repaired or replaced as necessary (disturbance to bat boxes undertaken by a licenced bat worker only). Any log piles created to enhance the Site for invertebrates should be replenished as required.	If Required	If Required	If Required	If Required	If Required	Landowner / Contractor
Other	Peat free composts, mulches and soil conditioners to be used. The use of pesticides (herbicides, insecticides, fungicides and slug pellets) to be discouraged. Any pesticides used to be non-residual. Where rainwater is harvested from a green roof, fertiliser would not be applied. Provision for regular litter removal to be made.	✓	✓	✓	✓	✓	Landowner / Contractor
Monitoring and Reporting	Annual inspections to be undertaken and results documented within the annual monitoring report. Report to include management of Site over the last year and the measures achieved.	✓	✓	✓	✓	✓	Suitably Qualified Ecologist

Key Feature	Prescription	Year					Responsibility
		1	2	3	4	5	
Review	Biodiversity Action Plan to be reviewed on an annual basis and amended as required	✓	✓	✓	✓	✓	Suitably Qualified Ecologist

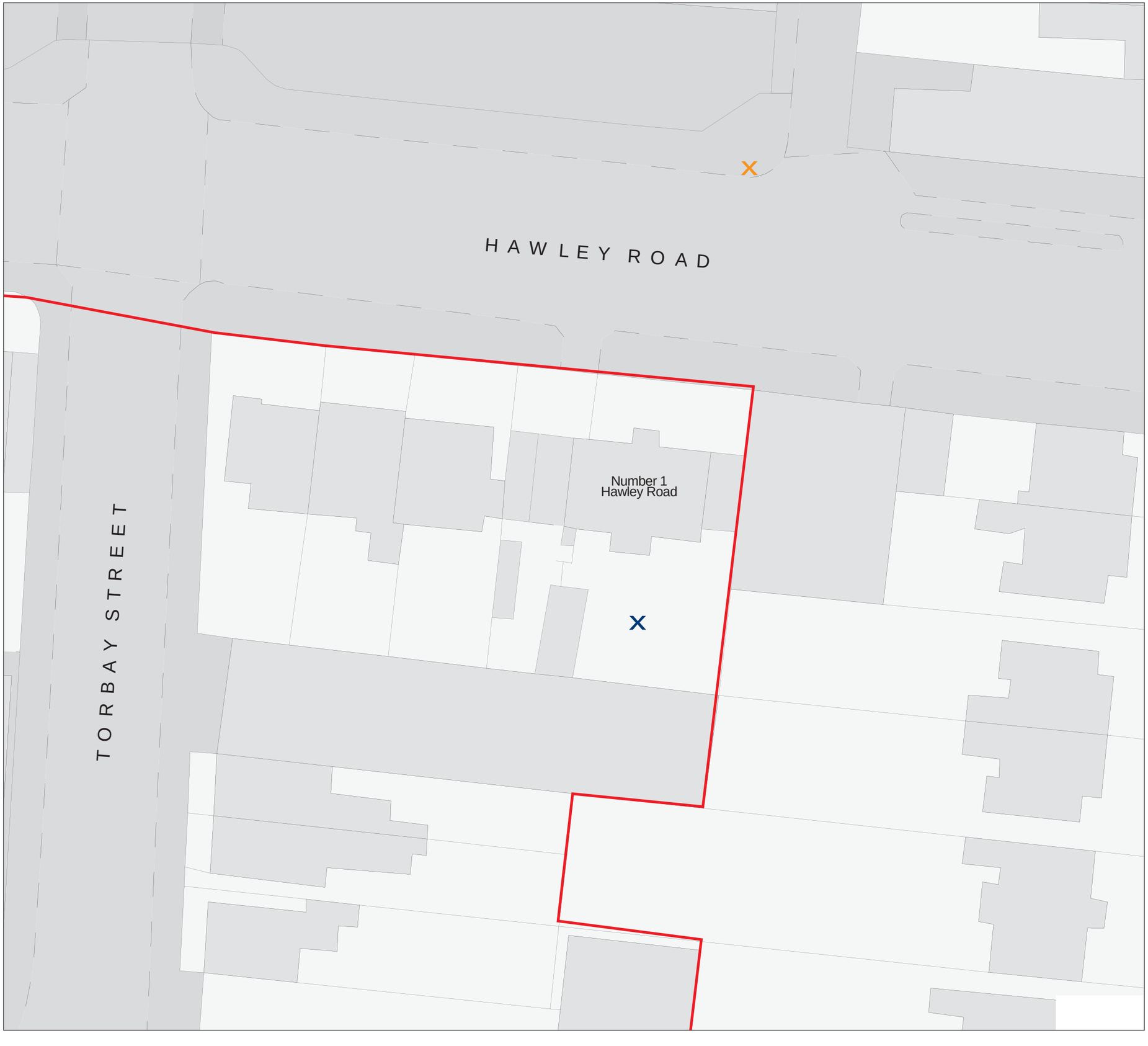
FIGURES

waterman
Energy, Environment & Design

- The SIte
- A — Site Component
- Tree
- Amenity Plants
- Scrub
- Buildings
- Hardstanding
- Not Surveyed

Project Details	30222E-102: Camden Lock Village (Hawley Wharf)
Figure Title	Figure 18.2: On Site Habitat Features
Figure Ref	30222E-102_GR_ES_18.2A
Date	2011
File Location	\\nt-lnpg2\weedl\projects\30222e\102\graphics\es\issued figures

www.watermangroup.com



waterman
Energy, Environment & Design

Site Boundary

Surveyor 1 Position

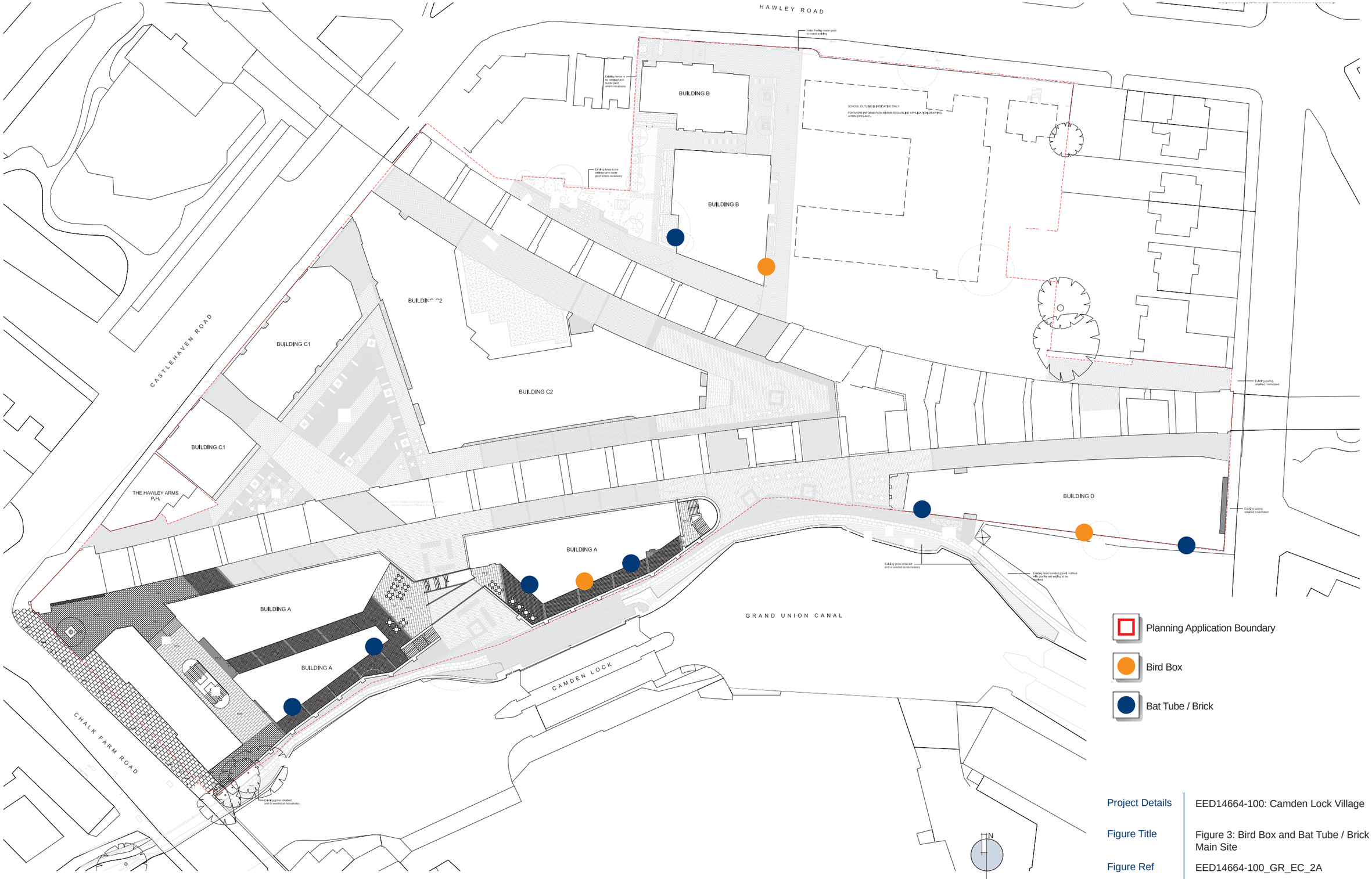
Surveyor 2 Position

N

Project Details	30222E-109: Camden Lock Village
Figure Title	Figure 2: Bat Surveyor Positions
Figure Ref	30222E-109_GR_EC_2A
Date	2012
File Location	\\nt-lncs\weedl\projects\30222e\109\graphics\ec\issued figures

www.watermangroup.com

Waterman
Energy, Environment & Design



- Planning Application Boundary
- Bird Box
- Bat Tube / Brick

Project Details	EED14664-100: Camden Lock Village
Figure Title	Figure 3: Bird Box and Bat Tube / Brick Locations - Main Site
Figure Ref	EED14664-100_GR_EC_2A
Date	September 2014
File Location	\\nt-lncs\weedl\projects\eed14664\100\graphics\ec\issued figures

www.watermangroup.com

Waterman
Energy, Environment & Design

Planning Application Boundary

Bird Box

Bat Tube / Brick

mm 0 5 10 20 30 40 50 60 70 80 90 100
Scale 1:1

north

N

Project Details	EED14664-100: Camden Lock Village
Figure Title	Figure 4: Bird Box and Bat Tube / Brick Locations - School Site
Figure Ref	EED14664-100_GR_EC_3A
Date	September 2014
File Location	\\nt-lncs\weedl\projects\eed14664\100\graphics\ec\issued figures

www.watermangroup.com

APPENDICES