www.landuse.co.uk

Opportunities for Greening Camden Town

A Green Infrastructure Audit of the Camden Town Unlimited Business Improvement District

Prepared by LUC in association with The Green Roof Consultancy, and Engineering Design and Analysis
March 2012

Project Title: Opportunities for Greening Camden Town

Client: Camden Town Unlimited

Version	Date	Version Details	Prepared by	Checked by	Approved by Principal
1	01/03/12	First Draft	Peter Lawrence	Philip Smith	Philip Smith
2	19/03/2012	Final issue	Peter Lawrence	Philip Smith	Philip Smith

www.landuse.co.uk

Opportunities for Greening Camden Town

A Green Infrastructure Audit of the Camden Town Unlimited Business Improvement District

Prepared by LUC in association with The Green Roof Consultancy, and Engineering Design and Analysis
March 2012

Planning & EIA
Design
Landscape Planning
Landscape Management
Ecology
Mapping & Visualisation

LUC LONDON
43 Chalton Street
London NW1 1JD
T 020 7383 5784
F 020 7383 4798
london@landuse.co.uk

Offices also in:
Bristol
Glasgow
Edinburgh

FS 566056
EMS 566057

Land Use Consultants Ltd
Registered in England
Registered number: 2549296
Registered Office:
43 Chalton Street
London NW1 1JD

LUC uses 100% recycled paper

Contents

Figures

Executive Summary

LUC was appointed by Camden Town Unlimited (CTU) in February 2012 to undertake a green infrastructure audit and feasibility study of the Business Improvement District (BID) area. Greening has the potential to deliver a range of benefits to the Camden area, including a more attractive working and living environment.

Existing Conditions:

- The study area includes **very little greenspace**, with about three quarters of the area comprising impermeable surfaces.
- 178 street trees were recorded, but **the majority of the area lacks trees** and the various benefits that they provide.
- Pockets of the area are **vulnerable to surface flooding**, with potential economic impacts.

Opportunities:

- A total of 30 areas, comprising 3.35 ha, were identified at ground level with **potential to be greened**.
- This included opportunities for planting around **160 new street trees**, and twelve sites identified for the creation of 'rain gardens'. Both measures would help reduce surface water flooding whilst providing urban cooling and a more attractive environment.
- Other opportunities included **creation of green walls**, localised installation of **planting beds and planters**, and temporarily **greening derelict sites** as pop up habitats and gardens.
- In addition, of 1220 roofs assessed, **176 roofs were identified as with high potential[1] for conversion to green roofs**, particularly extensive and biodiverse roofs.

[1] Assessed as Indicative Priority Rating 4 or 5 as defined in **Appendix 1**.

1 Introduction

1.1 LUC was commissioned by Camden Town Unlimited (CTU) in February 2012 to undertake a green infrastructure (GI) audit and feasibility study of the Business Improvement District (BID) area. This project was facilitated by the Greater London Authority and Cross River Partnership to assist BIDs achieve urban greening.

1.2 CTU has been appointed by the business community to improve Camden Town as a place to work, live and visit. This GI audit builds on the Camden Town First Streetscape Strategy which aims to significantly improve the attractiveness of Camden Town, whilst development of the Camden Town Creative Quarter aims to encourage expansion of the existing dense creative (design and media) hub.

1.3 This report presents a summary of the study findings and presents a vision for greening the Camden area. Detailed audit findings are provided in the report Appendices, with all data held within a GIS linked database.

Benefits of Green Infrastructure

1.4 The Mayor's London Plan and his Climate Change Adaptation Strategy call for the protection, promotion, and management of London's GI – its green and open spaces, river corridors and greenways, greens roofs and street trees - in order to deliver a range of benefits including:

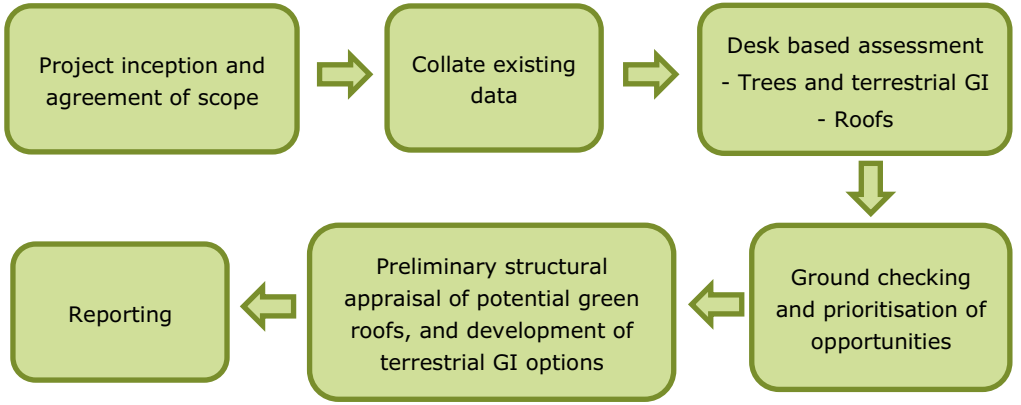
- Increased access to open space and contact with nature.
- Adaptation to the impacts of climate change.
- Sustainable travel connections and promotion of cycling and walking.
- Healthier living.
- Sustainable food growing.
- Enhanced destinations and streetscape supporting the visitor economy and commercial footfall.
- Promotion of green skills and sustainable approaches to design, management and maintenance.

Objectives

1.5 This audit will help to meet the following objectives:

- Increasing the resilience of the Camden Town area to surface water flooding, poor air quality and warm summer temperatures associated with predicted climate change.
- Enhancing the Camden townscape through green measures, creating a more attractive working and living environment, whilst also benefiting visitors and shoppers.
- Collaborative working to deliver Corporate Social Responsibility commitments.

Study Approach



2 Audit Results

Study Area

2.1 The study area, shown in **Figure 2.1**, covers an area of 35.4ha. It focuses on the north-south corridor formed by Camden High Street and Chalk Farm Road, with the northern extent at Chalk Farm London Underground Station and Mornington Crescent at the south. The study area also includes other major roads, including Jamestown Road, Parkway and Pratt Street, with other larger blocks of land also included.

Existing Green Infrastructure

2.2 This area has **very little existing open green space**, with about three quarters of the study area comprising impermeable surfaces (**Figure 2.1**). The **Regent's Canal** and associated towpaths form the largest single block of public open space within the study area, with **Saint Martin's Gardens** partly included (**Figure 2.2**). Both of these open spaces are designated as **Sites of Importance for Nature Conservation** within local planning policy. **Twelve of the existing green spaces were identified as with potential for enhancement**, with only one recorded as with no or limited potential (St. Martin's Gardens given its existing high value and as it was considered more appropriate to focus resources elsewhere).

2.3 Compared with other parts of London, **the study area has few street trees and some parts have no trees**. The consequential benefits of tree cover are therefore limited. This may be a result of a perceived lack of space for tree planting, and the high footfall within many of the pedestrian areas. **Ninety five trees were recorded within data provided by Camden Council** (**Figure 2.2**), with the majority of these comprising London plane, species of *Acer*, and Turkish hazel (32 species in total were recorded). However, it is important to note that this data is relatively old (2008), with **178 trees recorded during the terrestrial GI audit** undertaken as part of this study. This is likely, in part, to relate to recent tree planting associated with streetscape enhancements (including implementation of the Camden Town First Streetscape Strategy) and as landscaping and public realm improvements as part of built developments.

The Regent's Canal

Flood Risk

2.4 Data provided by Drain London[2] highlights a number of pockets across the study area at **risk of surface flooding**, with particular areas identified at the following locations:

- Entrance road to Morrisons Supermarket, below the rail bridge.
- Locations along the Regent's Canal.
- East of Camden Town, between Camden Road and Kentish Town Road.
- Locations near Mornington Crescent London Underground Station.

[2] Note that this data is not yet publically available

Greening the BIDs
Camden Town Unlimited
Green Infrastructure Audit

Current land use

Figure 2.1

- Camden study boundary
- Water
- Paths/steps
- Rail
- Road or track
- Roadside
- Manmade surface or step
- General surface (natural)
- General Surface (unknown)
- Gardens
- Manmade landform (slope)
- Trees/shrubs
- Building/archway

Map Scale @ A3:1:5,500

LUC

CAMDEN TOWN UNLIMITED

Source: GLA, Ordnance Survey

Greening the BIDs
Camden Town Unlimited
Green Infrastructure Audit

Existing terrestrial GI assets

Figure 2.2

Camden study boundary

Sites of Importance to Nature Conservation

Areas of deficiency for access to nature

Camden street trees (species)*

- Platanus X hispanica
- Acer
- Corylus colurna
- Other species

GIGL Open space by PPG17 category

- Amenity
- Green Corridors
- Natural and Semi-natural Urban Greenspace
- Other
- Outdoor Sports Facilities
- Parks and Gardens

* Camden street tree data is for 2008. More recent data was not abailable at the time of this study.

Map Scale @ A3:1:5,500

LUC | CAMDEN TOWN UNLIMITED

Source: GLA, Ordnance Survey, GIGL, Camden

3 Key Opportunities

3.1 The audit identified **12 areas existing green areas with potential for further enhancement** (2.95ha), and **30 areas of mostly hardstanding suitable for greening**, comprising 3.35 ha.

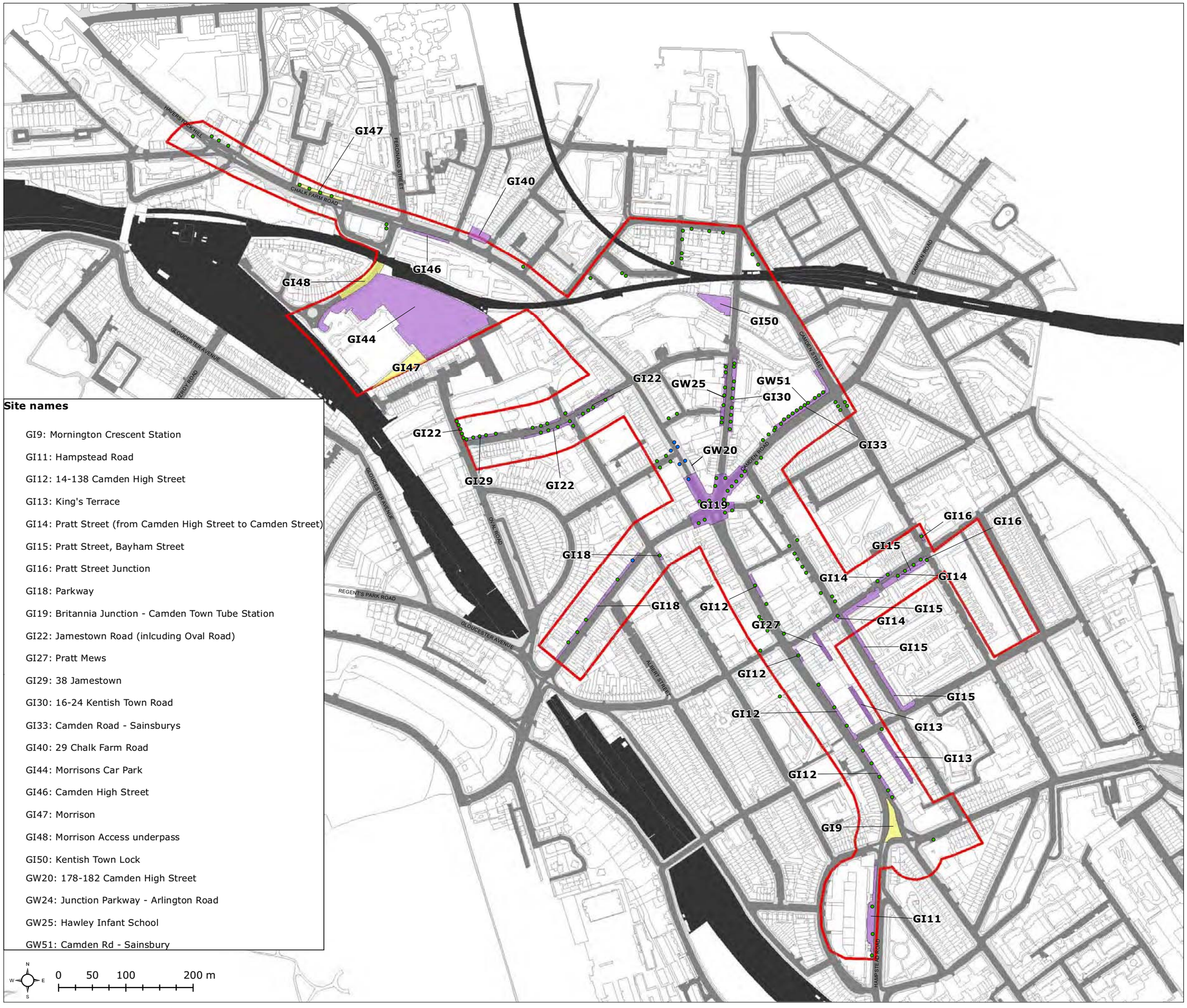
3.2 The majority of opportunity areas comprised tree planting (26 sites), shrub planting (21 sites) and the creation of wetland or rain garden features (12 sites). In addition, of 1220 roofs assessed, **176 roofs were identified as with high potential for conversion to green roofs** (those classified as with a priority rating of 4 and 5 roofs – see Appendix 1 for definition).

3.3 Further detail is provided below regarding the key opportunities identified for greening of the public realm, with key areas shown on **Figure 3.1**.

Greening the BIDs
Camden Town Unlimited
Green Infrastructure Audit

Key terrestrial and tree planting opportunities

Figure 3.1



Site names

GI9: Mornington Crescent Station

GI11: Hampstead Road

GI12: 14-138 Camden High Street

GI13: King's Terrace

GI14: Pratt Street (from Camden High Street to Camden Street)

GI15: Pratt Street, Bayham Street

GI16: Pratt Street Junction

GI18: Parkway

GI19: Britannia Junction - Camden Town Tube Station

GI22: Jamestown Road (inlcuding Oval Road)

GI27: Pratt Mews

GI29: 38 Jamestown

GI30: 16-24 Kentish Town Road

GI33: Camden Road - Sainsburys

GI40: 29 Chalk Farm Road

GI44: Morrisons Car Park

GI46: Camden High Street

GI47: Morrison

GI48: Morrison Access underpass

GI50: Kentish Town Lock

GW20: 178-182 Camden High Street

GW24: Junction Parkway - Arlington Road

GW25: Hawley Infant School

GW51: Camden Rd - Sainsbury

N W E S 0 50 100 200 m

Camden study boundary

Key tree planting opportunities

- Proposed tree
- Empty tree pit

Key terrestrial opportunities

- Existing site with scope for enhancement
- Potential site

Labels on map refer to site IDs.
GI = Terrestrial site, GW = Green wall

Map Scale @ A3:1:5,500

LUC

CAMDEN TOWN UNLIMITED

Source: GLA, Ordnance Survey, GIGL, LUC

Public Realm – Street Trees

3.4 **Large areas of Camden are devoid of street trees**, particularly large areas of the high street. There has been an increase in planting in recent years in association with streetscape enhancements, for example along Chalk Farm Road, and built development, such as on Jamestown Road. Street trees can be particularly valuable in providing greening where space is limited, with use of sensitive tree planting methods (such as the design of tree pits) and species adapted to urban situations.

New tree planting on Chalk Farm Road.

Street trees provide an attractive environment and wildlife habitat.

3.5 Large canopy trees provide greatest benefits in terms of **alleviating the heat island effect** through shading. This can be particularly valuable in busy urban areas, providing shade and a cooler environment, as well as visually enhancing an area. The shelter from trees and woods in towns can **reduce the heating and air-conditioning costs of buildings**, which can save as much as 10% of annual energy consumption[3]. Trees also **filter air pollution** which can be particularly useful along busy streets, such as Camden High Street, with resultant health benefits. The trees of Chicago, USA, have been shown to remove 10.8 tonnes of particulate air pollution (PM_{10}s) on an average summer's day[4]. The tree canopy also intercepts rainwater and slows its deliver to the surface drainage system, and assists infiltration to substrates at their base. A study estimated that a 20% loss of trees and vegetation in the Atlanta metropolitan region would produce a one billion cubic foot increase in storm water run-off[5]. Larger canopy species fulfil all these roles to a greater degree, although the value of smaller canopied species should not be underestimated. Street trees also **provide wildlife habitat**, including movement corridors for wildlife. There is also significant evidence relating to the **psychological benefits** including reduced stress in urban environments.

3.6 In Camden, opportunities were identified for planting nearly **160 individual trees, with 26 key areas identified**. In addition a number of empty tree pits were identified during the audit where tree planting had apparently failed, as well as a number of damaged trees (although others may exist as this was not a focus of the audit). The tree planting opportunities are illustrated in **Figure 3.1**, with key areas including Camden High Street, Cobden Junction, Parkway and Jamestown Road.

New tree planting associated with development on Mandela Street.

Large canopy trees provide shading.

[3] Heisler GM (1986) *Energy Savings with Trees* Journal of Arboriculture, 12 (5)

[4] Bradshaw AD, Hunt B & Walmsley T (1995) Trees in the Urban Landscape; Principles and Practice, E & F N Spon

[5] Soltis D (1997) *Loss of trees increase stormwater runoff in Atlanta* Water Engineering and Management 144 : 6

Public Realm - Rain Gardens

3.7 **A 'rain garden' is an area of green space which is designed to collect and absorb rainwater runoff from buildings and urban areas** (in the UK they are also often known as 'bio-retention features'). Rain gardens **reduce flood risk and soil erosion in periods of heavy rainfall**, and can collect and store water in the locality to reduce reliance on mains water supplies. In addition to providing a water management solution in urban areas, rain gardens are also **attractive to people and wildlife**, and can be designed to **trap and filter waterborne pollutants**.

Rain Garden, City of Portland (GRC)

3.8 In essence these features are 50 or 100mm below grade and have a depth of at least 200mm - 300mm. They are planted with low maintenance vegetation that can withstand being waterlogged for short periods. The soils are specifically designed to take pollutants out of the water and to be very porous. Once they are at capacity excess water needs to be able to leave the feature and return to the conventional drainage system, and therefore integration with existing systems is required. The water that is retained eventually infiltrates deeper in to the soils or is evaporated into the atmosphere. This evaporation can also help to reduce local air temperatures.

3.9 Normally a rain garden is designed to take the amount of water falling on any given impermeable surface. However, the opportunities identified in Camden are for existing areas of public realm to be retrofitted and it is therefore difficult to estimate a volume of water which may be removed from the existing drainage system. As a rule of thumb these features can be designed to accommodate the first 15mm of a rainfall falling on the feature during a rainfall, which in most events comprises 95% of rainfall[6]. This importantly decreases the pressure placed on the surface water drainage system, particularly during intense summer storms when surface flooding can be particularly severe.

3.10 There are a number of perceived and real barriers to retrofitting such features into the urban realm:

- Presence of underground services and street furniture.
- Requirement for vegetation management and litter picking.
- Space is required and design measures to minimise impacts on pedestrians.
- Design requirements to address health and safety concerns, such as use of edging to minimise tripping.

3.11 However, these issues can be overcome through design and the incorporation within street management regimes, as they regularly are in American cities such as Portland.

3.12 Twelve sites were identified within Camden with potential for rain garden retrofitting. This included unused areas of pavement, conversion of existing gully drains along pavements, and installation within a car park. **Two particularly promising case studies are illustrated below (see Figure 3.1 for their location):**

- **Bayham Street Rain Gardens.**
- **Morrisons Supermarket rain gardens and wetland.**

[6] Pers. comm. Bob Bray of Bray Associates (GRC)

Bayham Street Rain Gardens

Existing

Existing grated rainwater gully within pavement - unlikely to support services

Asphalt hardstanding between trees - little used by pedestrians

Vision

Rain garden

Channel to direct run-off into rain garden or allow excess water to return to drainage system

Channel with grating to maintain pedestrian access

Planting selected to provide visual and wildlife benefits

Planting surface 50-100mm below grade to provide capacity

Rain garden with substrate depth of at least 200-300mm with porous substrate to hold water

Surface run-off from hardstanding directed into rain garden

Morrisons Supermarket Rain Gardens & Wetland

Existing

Vision

Livingroofs/Green Roof Consultancy

Breaking out and adapting island

Livingroofs/Green Roof Consultancy

Adapting existing linear planting beds

Livingroofs/Green Roof Consultancy

Adapting existing planting beds

Creation of wetland habitat with redirection of roof gutters

City of Portland

Public Realm - Green Walls

3.13 A single green wall was identified during the audit (immature planting in the garden of the Oxford Arms adjacent to Jamestown Road), with **five opportunities to create green walls identified**.

3.14 Green walls can have a **dramatic and visible greening effect**, and have the added advantage of screening unattractive buildings, whilst they can also **provide habitats for wildlife**. However, **to be a sustainable greening feature it is also important that a watering system is employed that does not rely on mains water**, for example using rainfall runoff (and thereby potentially reducing surface flooding), or using waste water such as from refrigeration units. The most economical way of achieving a green wall is with climbing or hanging plants, although introducing plug plants within a vertical growing system is a more expensive option with a more immediate effect (a 'modular, system).

3.15 Opportunities for green walls included those within busy areas of Camden to maximise the visual benefits, including along the retaining wall to Stables Market along Chalk Farm Road; on the frontage of Sainsbury's Supermarket on Camden Road; and a Transport for London building, 178 Camden High Street near Camden London Underground Station.

Sainsbury's potential green wall

Oval Cricket Ground

For example, the frontage to the Sainsbury's supermarket on Chalk Farm Road could be greened throguh installation of planting boxes associated with an extetrnal staircase, plants hanging down or climbing up a mesh on the frontage. A similar approach has been used at the Kia Oval (Surry County Cricket Club, Lambeth).

Transport for London building with potential for the installation of a modular green wall

Example of a modular green wall system attached to a wall face.

Public Realm - Planting Beds and Planters

3.16 Opportunities were also identified for the installation of localised green features such as **beds and planters**. Simple approaches can **enhance an area visually**, whilst also providing habitats for wildlife. These small-scale features will not provide the flood alleviation functions which larger features deliver, but cumulatively can deliver **assist with reductions in surface water**.

Pratt Mews, Camden, with potential for installation of planters to enhance the appearance of the street.

Local planting at the base of street can provide an attractive feature, wildlife habitat and enhance water infiltration.

3.17 Through careful design it may be possible to deliver local benefits, for example if planters are fed by downpipes to reduce watering whilst resulting in some water attenuation during rainfall.

3.18 Other small scale options include the enhancement of beds along the Canal towpath although these are subject to very heavy footfall, and use of planted coir rolls installed along the canal edge to create wetland habitats.

Planters in Melbourne, Australia, watered from downpipes (raingardens.melbournewater.com.au/)

A pop-up orchard at Bankside in 2010 provided temprary greening and public use of derelict land

Public Realm - Pop-Up Habitats and Gardens

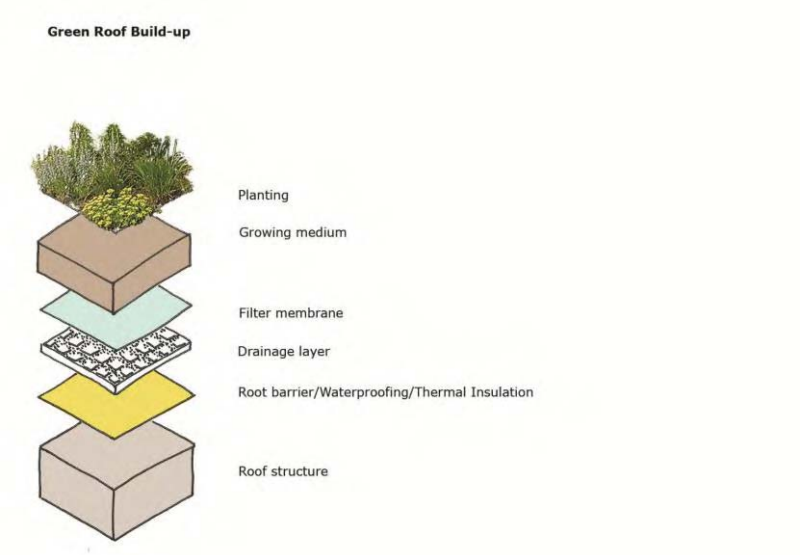
3.19 Sites awaiting redevelopment provide opportunities for temporary greening, through the provision of 'pop-up' habitats and gardens, similar to the successful BID pop-up shop programme. Opportunities include a site on Chalk Farm Road and a plot immediately to the north of Regent's Canal. With the assistance of the landowners and developers, such sites could be relatively simply enhanced, from sowing wildflowers on, to the creation of temporary gardens or food growing areas managed by the local community, providing a range of benefits.

A small-scale community allotment in Islington.

Buildings – Green Roofs

Typology

3.20 Different types of green roofs can be installed, depending on the structural loading of the roof, the amount of substrate which can be supported (as well as potential for public access), and the resultant vegetation which could survive. The below diagram illustrates the indicative structure of a green roof:



3.21 The Green Roof Code (Groundwork Sheffield, 2011) identifies four main types of green roof:

- Extensive: lightweight, low maintenance system with a substrate depth of between 80 – 100mm.
- Biodiverse: similar to extensive but designed specifically to benefit wildlife.
- Semi-intensive: deeper substrate typically of 100-200mm and therefore able to support a greater range of vegetation. Irrigation and maintenance may be required.
- Intensive: More akin to a roof garden or small urban park with public access. Require maintenance and irrigation.

An extensive *Sedum* roof, comprising a pre-planted mat and shallow substrates (GRC)

A biodiverse roof with wildflower species adapted to shallow substrates (GRC)

A semi-intensive roof with greater substrate depth and plant diversity (GRC)

An intensive, formal roof garden (GRC)

Benefits of Green Roofs

3.22 Dependent on the roof type, a range of benefits can be provided including water attenuation, improved thermal efficiency of buildings, air pollution control, provision of wildlife habitat and the provision of open space. A modelling scenario undertaken in New York by the New York Heat Island Initiative determined that providing 50 per cent green roof cover within the metropolitan area would lead to an average 0.1-0.8°C reduction in surface temperatures. Studies have also illustrated energy saving associated with the insulation properties of green roofs, reducing the need for heating buildings in winter and cooling in summer, with resultant cost savings. In Canary Wharf, London, it was estimated that an 850m retrofitted green roof has achieved a reduction of 25,920kWh a year in heating and cooling of the spaces below the roof, an estimated cost saving of £4,000-£5,000 per year in electricity[7].

3.23 In terms of water attenuation, the different roof types are capable of attenuating approximately the following amount of rainfall:

- Extensive/Biodiverse roof: between 45-55% of annual rainfall.
- Semi-intensive roof: between 60-65% of annual rainfall.
- Intensive roof: between 90-100% of annual rainfall.

Study Approach

3.24 The desk based assessment of roofs within Camden was undertaken using aerial photography, and therefore there may have been changes on the ground such as demolition or alterations to buildings, or more recent installation of green roofs. During this assessment, **12 existing green roofs were identified** including extensive, semi-intensive and intensive roofs with planters.

3.25 Of the 1220 roofs assessed, **176 roofs were identified as with high potential for conversion to green roofs** (those classified as with a priority rating of 4 and 5 **Appendix 1**). Of the roofs identified as with potential, almost 90% were assessed as suitable for extensive green roofs, with almost 8% as potential semi-intensive roofs (note that certain buildings include a number of different roof spaces presenting different opportunities). Roofs with an exposed membrane offered the greatest resource of roof types suitable for greening.

3.26 Following this desk-based assessment, **five roofs were selected for a preliminary structural appraisal** (see **Figure 3.2** for location). These were selected partly on the basis of their character and likely suitability as a green roof considering, for example, their flatness, orientation, and amount of clutter on the roof (such as plant). Practical issues in terms of access were also considered, as well as the aim to appraise various types of buildings.

3.27 This preliminary appraisal was based on an appraisal of the structural form, and the statutory requirements for superimposed loading on roofs that prevailed at the time of construction. Where reinforced concrete is the form of construction of a roof panel, the potential for adding load is usually greater than for lightweight alternatives (for example, timber), but it is not possible to determine capacity from a visual inspection alone. In these cases, a detailed examination of the structure, establishing quantities and types of reinforcing steel, and a rigorous analysis may well yield higher capacities. More detailed structural assessment should be undertaken prior to the design and installation of a green roof, particularly if this exceeds the loads identified in the preliminary structural appraisal.

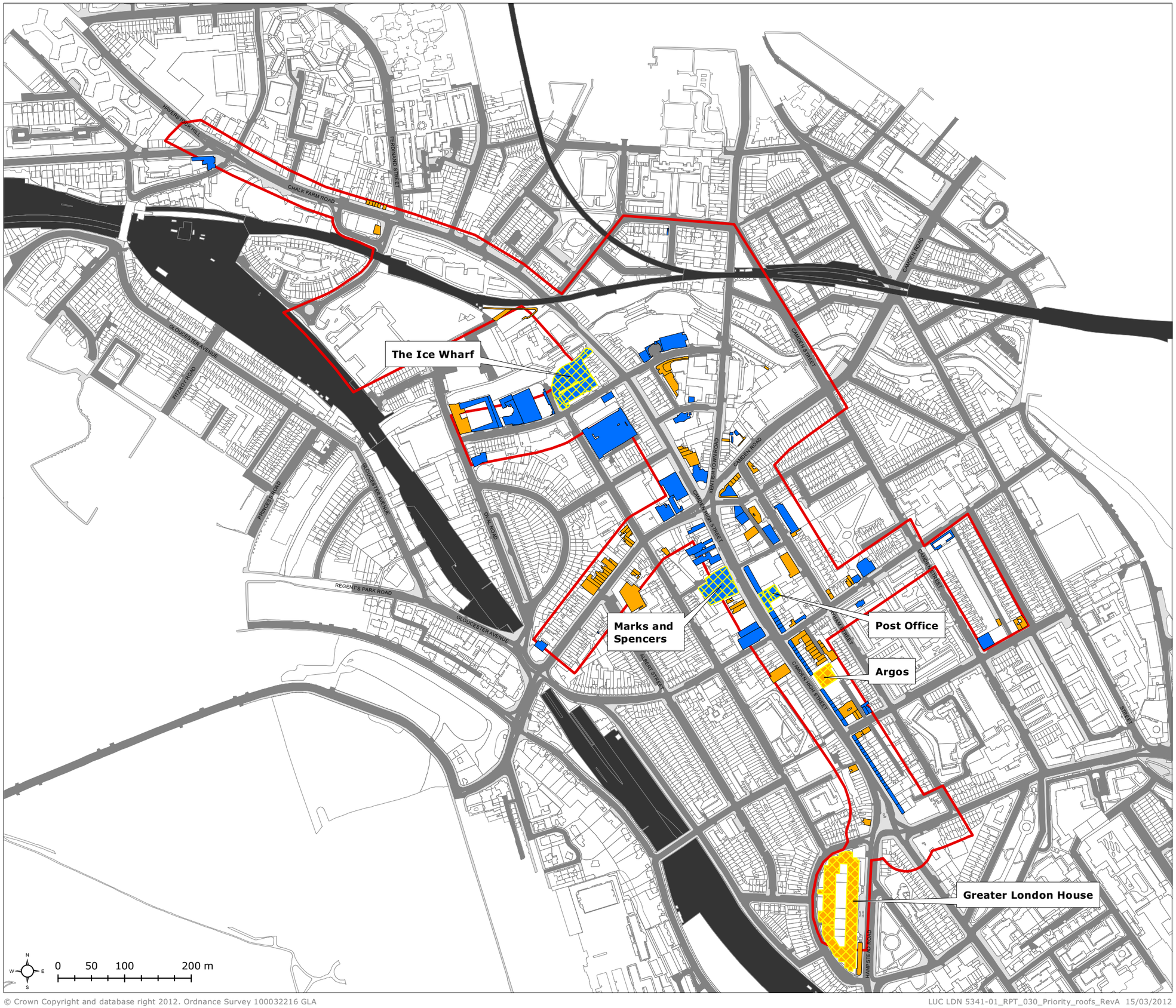
3.28 Visualisations are provided below of three of the five roofs subject to preliminary structural appraisal which were assessed as suitable for greening. The remaining two were found to have reduced potential to support a green roof following the appraisal, in particular given the presence of 'clutter' on the roof, such as air conditioning units, which reduce the space available for greening. The location of these roofs is provided in **Figure 3.2**).

[7] Case studies from: GLA (2008) Living Roofs and Walls Technical Report: Supporting London Plan Policy

Greening the BIDs
Camden Town Unlimited
Green Infrastructure Audit

High priority roofs for greening

Figure 3.2



Camden study boundary

Roofs that underwent preliminary structural appraisal

Indicative priority rating

- 4
- 5

Descriptions of roof potential ratings

4: Roofs with either a shingle or paving or tile finish, which meansthat if removed a high quality green roof of at least 100mm depth could installed, pending structural assessment.

5: Roofs that could be greened immediately, pending a structural assessment, with potential for a substrate depth of 133mm planted with a selection of sedums and wildflowers.

Please note: The desk based assessment of roofs within Camden was undertaken using aerial photography, and therefore there may have been changes on the ground such as demolition or alterations to buildings, or more recent installation of green roofs.

Map Scale @ A3:1:5,500

LUC

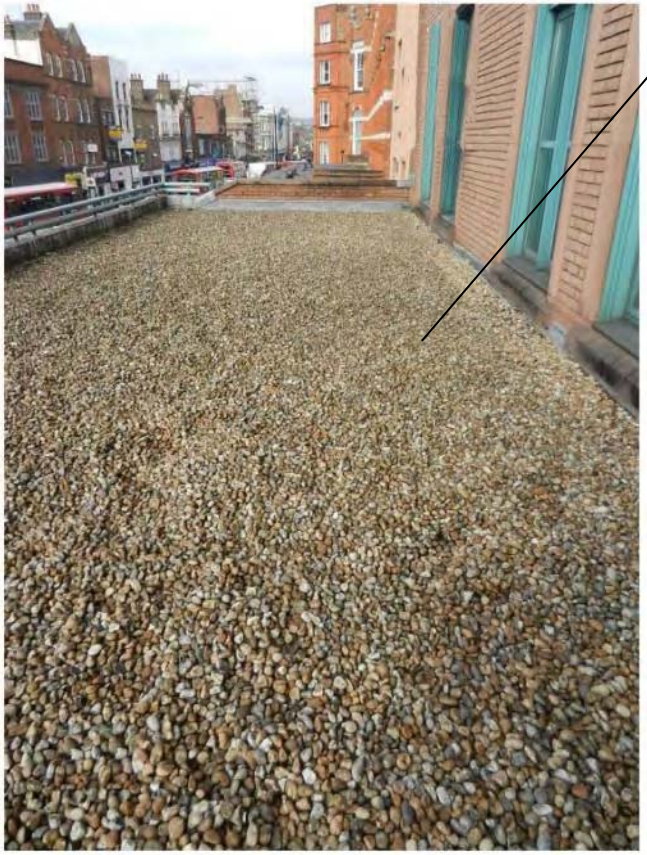
CAMDEN TOWN UNLIMITED

Source: GLA, Ordnance Survey, GRC, EDA

Post Office, 112 – 114 Camden High Street

3.29 The existing roof is an inverted roof, where the shingle acts as ballast to hold down the insulation. The removal of the shingle is likely to allow a load of 125kg/m2 to be applied to the roof which would allow a hybrid sedum/biodiverse green roof to be installed. This could comprise a sedum matt. With a more rigorous analysis and further investigation of the concrete slab, evidence may be provided that a greater load could be applied to the roof. This may well allow a design to be produced that allows for a mix of semi-intensive planting along the perimeters to provide visibility from ground level and a biodiverse roof with increased substrate depth elsewhere on the roof.

Post Office – existing



Removal of shingle ballast

Installation of *Sedum* mat (20mm) on a substrate depth of at least 60mm (as well as additional membranes etc.)

Sedums are succulent species adapted to low water environments and shallow substrates. The lower diversity of flowering plants and structures is of less value to wildlife than other roof types, and shallower substrates hold less water.

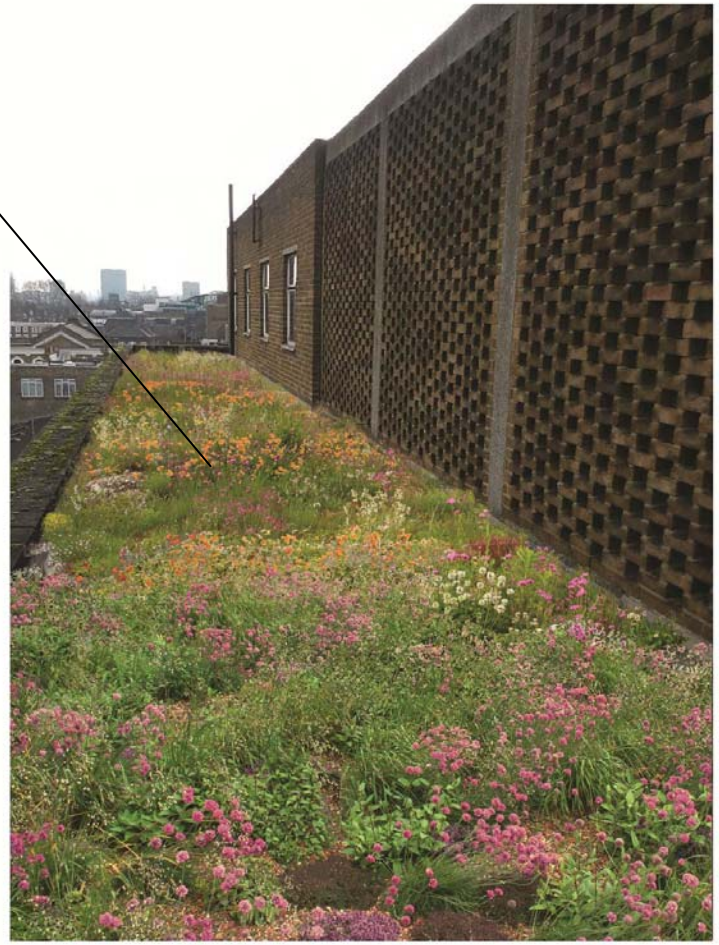
Post Office – with extensive roof

Argos 72-76 Camden High Street

3.30 This roof is of similar construction to the above, and it is considered likely that this could support a hybrid sedum/Biodiverse roof with the potential for further loading capacity to be identified on further, detailed investigation.

Argos – Existing

Argos – With biodiverse roof



Installation of *Sedum* mat with additional wildflower seed sown within the mat, young plants planted through the mat and/or bulbs under planted.

A greater diversity of plant species provides greater opportunities for wildlife, with more structural variation and nectar provided at different times of year. Denser vegetation may increase water retention, and thermal regulation.

Ice Wharf, Suffolk Wharf

3.31 As above the removal of the pebble surface would be likely to allow installation of a sedum/biodiverse roof, although further investigation may identify additional load capacity. This could, for example, enable the creation of a semi-intensive green roof with restricted public access. Given its location overlooking the Camden Lock and Market, this would also deliver visual benefits, whilst taller more luxuriant vegetation would be visible from the ground.

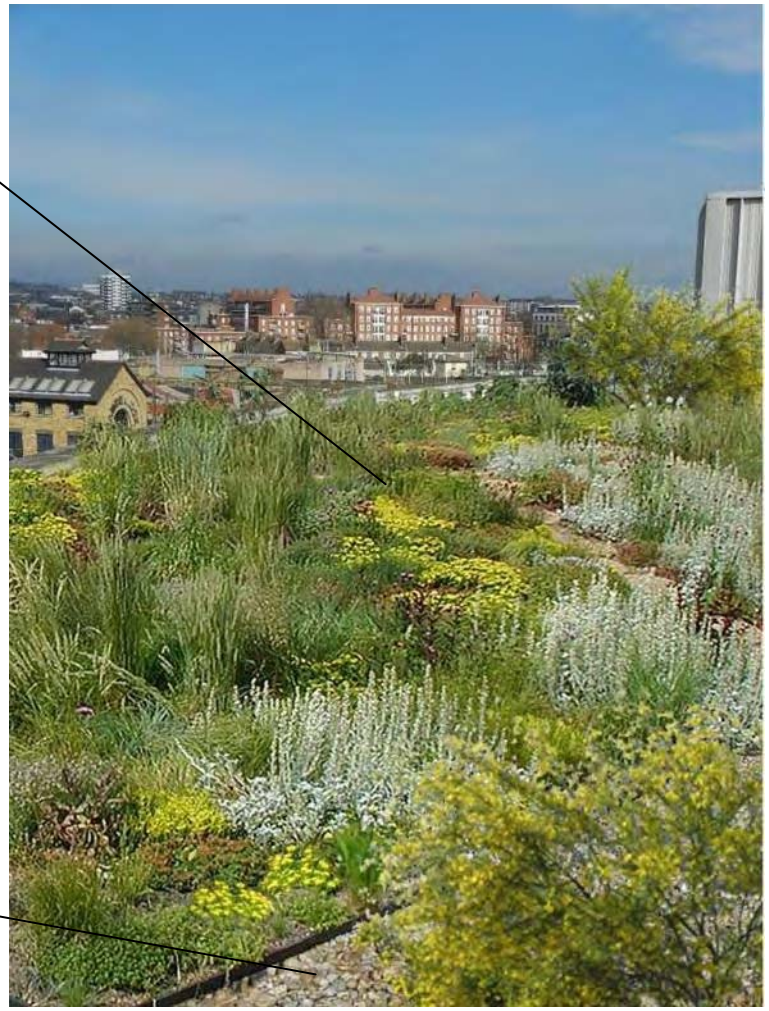
Ice Wharf – Existing

Subject to further investigation, a greater substrate could be supported. Depths of 100-200mm would support a greater diversity of vegetation.

A greater variety of plant species and deeper substrates can provide greater wildlife, water attenuation and thermal efficiency benefits. This would also allow creation of a more visually attractive display, including from street level.

Possible provision of public access in certain locations could be investigated.

Ice Wharf – With semi-intensive roof



4 Next Steps

Consultation

1.2 Consultation and joint working between landowners, local groups and community representatives would be highly beneficial to the effective delivery and long term maintenance of the GI features. This could be managed through CTU and BID partners to achieve the following:

- Allow interested parties to comment on opportunities which have been identified on their property, or related to sites and infrastructure in which they have an interest.
- Ensure that an opportunity is provided to raise any concerns about the proposals, identify constraints, and comment on potential design.
- Enable the refinement of priorities and enable BID partners and other local groups to identify any other priorities or opportunities they would be keen to help deliver.

1.3 As part of this, consultation with Camden Council would be very important as many of the opportunities identified are within the public realm and public open spaces, the management of which is the Council's responsibility. This may also help identify community groups to involve in the process.

Additional surveys

1.4 For some of the opportunities identified, further survey work would be required to ensure that the site or building is suitable for the proposed feature. This is particularly true of the green roof opportunities, and all any building to be taken forward will require a structural survey to ensure the building can safely take the additional weight that the installation of a green roof generates.

1.5 For some terrestrial proposals, surveys should be undertaken to identify the presence of soil or substrate under the existing hard surface, as well as any underground infrastructure. This will help to prioritise opportunities further, as some may be more easily delivered.

Design

1.6 Many of the smaller terrestrial proposals can be delivered without the need for design input from specialists. For the larger features however, design advice may be sought. Appropriate types of design guidance include:

- Planting advice, including species which are beneficial to wildlife. The Council may be able to provide this expertise in-house.
- Horticultural/landscape expertise will be important for most features, in order to ensure that an appropriate suite of species is identified for the conditions.
- Townscape assessment and design plans to ensure continuity with existing streetscape enhancement proposals.

1.7 The use of independent consultants experienced in these features such as green roofs and green walls (as opposed to contractors and suppliers) can advise on the creation and design based on the roof style and a range of environmental factors. Such advice may also be beneficial in identifying bespoke or innovative solutions.

1.8 For the larger opportunities, such as large green roofs and creation of new green spaces, it is also possible that planning permission may be required.

Delivery

BID partners

1.9 Funding sources may become available for delivery of GI and CTU may provide a valuable tool in managing such applications. Other funding mechanisms are present for the delivery of community based environmental enhancements. Where enhancements will deliver direct benefits to specific companies, it may be appropriate for the BID to negotiate for the enhancement to be partly or wholly funded by with these business partners. This would maximise the enhancements that can be delivered with other funding sources.

New developments

1.10 There is potential to deliver GI features within new development, as the BID is currently undergoing significant change, with a number of potential development sites identified within local planning policy. This may involve the BID identifying and working with developers and the Council as the planning authority, and potentially partner organisations who are statutory planning consultees, such as Natural England and the Greater London Authority, to encourage the inclusion of green features within planned new developments in accordance with the London Plan.

Maintenance

1.11 Maintenance of the new GI features will be required to maintain both the provision of functions such as alleviation of surface water flooding, and their visual appearance. The options for maintenance will need to be considered at the outset of the consideration of options, as this is likely to influence prioritisation. Development of a clear maintenance plan prior to delivery, including identification of the key partner organisation(s) responsible for maintaining the features, to ensure long term benefits. As many of the identified opportunities are within the public realm, Camden Council would be likely to have a key role to play in agreeing where responsibility for management and maintenance will lie. There may be a need to consider creating an independent body which will oversee GI maintenance, for example a GI Trust, or a partnership approach could be followed with delivery of various aspects shared between the Council and BID, and therefore partly funded by the BID levy (this model is used, for example, to deliver environmental maintenance within the Heart of London BID).

1.12 An 'adopt a feature' scheme could also be implemented, with local businesses and community groups encouraged to adopt and look after greening features installed within the vicinity as these features will provide local benefits. This could include, for example, watering street trees and planters, litter picking, and reporting any damage or vandalism.

Monitoring

1.13 A monitoring approach would be beneficial to determine progress and success including:

- The delivery of the GI features and the extent of green features across the BID.
- The quality of the GI features, and whether they are being appropriately maintained.

4.1 Monitoring would help inform priorities for future investment, and should seek to provide quantified information to enable the success and outputs of the BID investment to be measured. Importantly this would require some baseline data against which to compare any changes. Monitoring the outputs will support the promotion of this innovative approach as an inspiring example of retrofitting GI into the urban environment.