Brighton & Hove Green Infrastructure Study

Draft Report

Brighton & Hove City Council

Final Report

Prepared by LUC

March 2024

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1	Interim Report	H Ward L Bushby J Akerman	S Crewe	D McNab	15/12/2023
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Chapter 1

Introduction

1.1 LUC was commissioned by Brighton & Hove City Council (BHCC) to develop a Green Infrastructure (GI) Study (hereafter referred to as the 'Study') to update the baseline understanding of GI, with the aim of contributing to its enhancement within the urban context of the city.

1.2 The Study is one of a number of evidence base documents that BHCC will be considering that will feed into and inform the review of the Brighton & Hove City Plan. The findings of the Study will help to improve the understanding of existing GI provision across the city and provide recommendations for strengthening planning policy to deliver the high quality GI required to meet local needs. However, GI assets situated within the wider administrative boundary of Brighton & Hove are also considered and analysed within the Study due to their proximity and importance to the wider GI network within the city.

1.3 The Study will also be used to inform policy options for a potential Urban Greening Factor (UGF) policy in the new City Plan. This includes the potential for different policy approaches in different areas of the city and / or different development typologies to respond to specific contexts or circumstances. The document also explores if specific types of GI measures should be prioritised.

1.4 The Study is structured as follows:

- **Chapter 1: Introduction**
  - The remainder of this chapter provides an overview of GI, its benefits, and outlines the thematic approach to analysing GI.
- **Chapter 2: Green Infrastructure context in Brighton & Hove**
  - This chapter summarises the GI context within the city and outlines the policy context for GI at the national, regional and local levels.
- **Chapter 3: Existing Green Infrastructure provision**

- This chapter explores the existing GI assets in accordance with the themes, highlighting patterns of GI provision and deficiency. The chapter concludes with a summary of GI need and GI deficiency across the city.

- **Chapter 4: Application of the Urban Greening Factor Standard**
  - This chapter reviews the application of UGF policy to eight consented schemes within Brighton & Hove, reflecting a range of development types within the city.
- **Chapter 5: Policy recommendations**
  - This chapter outlines policy options for the city to help deliver high quality GI across Brighton and Hove that meets local needs.
- **Appendix A: Datasets used to inform the analysis of Green Infrastructure need and deficiency**
- **Appendix B: Urban Greening Factor – Quantitative Findings**

What is Green Infrastructure and why is it important?

1.5 GI refers to the network of green and blue spaces that surround and run through our towns and cities. GI helps connect people, wildlife and nature and supports the life-sustaining environmental processes which underpin healthy places. GI is not limited to traditional greenspaces such as parks and often involves various interventions for example street trees, sustainable drainage measures to bring nature into streetscapes or to increase connectivity between assets at various landscape scales.

The National Planning Policy Framework (NPPF) December 2023 **[See reference** 1**]** defines GI as: ‘A network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of

delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity.'

1.6 The concept of GI continues to strengthen in national and regional policy (see **Chapter 2**). To support this push for GI on the planning agenda, the Natural England GI Framework (NEGIF) was launched in February 2023, a commitment made within the 25 Year Environment Plan **[See reference** 2**]**. The tool provides a new mechanism to support both local authorities and developers to deliver well planned, designed and maintained GI. Comprised of GI Mapping, Principles, Standards, Design Guide and Process Journeys, the NEGIF is intended to guide decision makers, policy makers and developers into delivering successful and good quality GI.

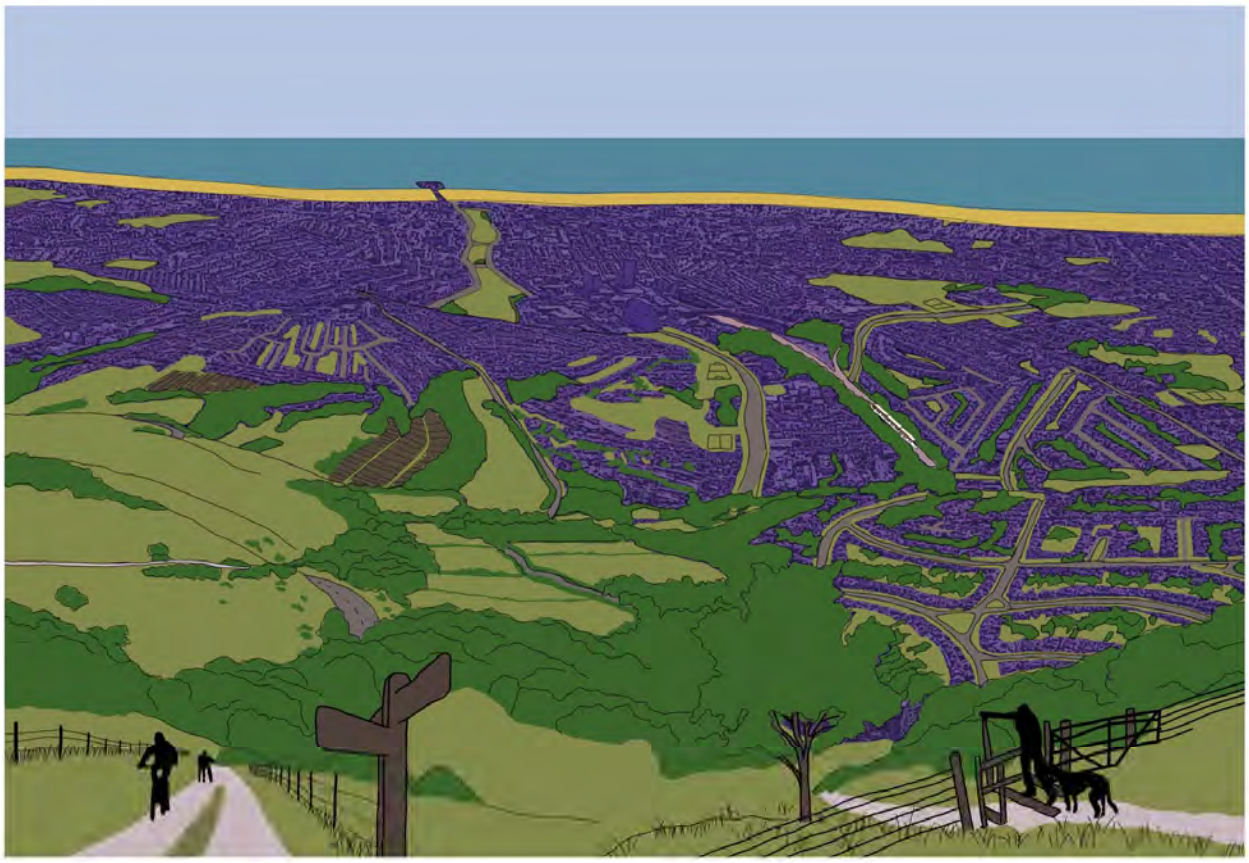
1.7 The NEGIF also highlights the important role of GI in delivering multiple benefits across health and wellbeing, climate, biodiversity and economic agendas. Furthermore, it provides a key link between other ongoing initiatives, including Biodiversity Net Gain (BNG), Local Nature Recovery Strategies (LNRS) and natural capital. In recent years, increasing attention has been given to GI as a central component of how the planning system can adapt to better address nature recovery challenges, net zero and climate change adaptation.

1.8 The GI assets considered for the purpose of this Study are listed below, with some displayed visually in **Figure 1.1:**

- Managed and semi-natural greenspaces:
- Public parks and gardens;
- Formal and informal open space, including civic spaces, churchyards, amenity greenspace, play space, orchards and allotments; and
- Nature conservation sites.
- Linear linkages:
- Public Rights of Way (PRoW), promoted routes and cycle infrastructure; and
- Wider habitat areas and the coastal environment.

- Elements of the built environment:
- Road verges and street trees;
- Private gardens;
- Urban greening features, including green walls, green roofs and Sustainable Drainage Systems (SuDS).
- Aspects of the wider landscape:
- Woodland cover.

Figure 1.1: Components of GI in Brighton & Hove



Linear linkages Public Rights of Way (PRoW), promoted routes, cycle infrastructure, railway corridor	**Managed and natural green spaces** Nature reserves, parks, formal and informal open space, allotments and publically accessible nature conservation sites	**Elements of the built environment** Road verges, street trees, private gardens, amenity space, urban greening	**Aspects of the wider landscape** wider habitat areas and the coastal environment

Benefits of Green Infrastructure

1.1 GI is defined by its multifunctionality, with a single asset having the ability to provide a number of benefits to people, wildlife and wider environmental functions. It is this variety of societal, environmental and economic benefits that enables GI to play an important role in the delivery of sustainable, healthy places. This can be achieved through the use of nature-based solutions (NbS) which seek to protect or enhance nature in a way that helps tackle climate change, whilst also benefiting biodiversity and human well-being. Furthermore, in most cases NbS are mutually supportive of other benefits, meaning one goal does not have to suffer at the expense of another.

> Planning Practice Guidance **[See reference** 3**]** states that: 'GI is a natural capital asset that provides multiple benefits, at a range of scales. For communities, these benefits can include enhanced wellbeing, outdoor recreation and access, enhanced biodiversity and landscapes, food and energy production, urban cooling, and the management of flood risk. These benefits are also known as ecosystem services.'

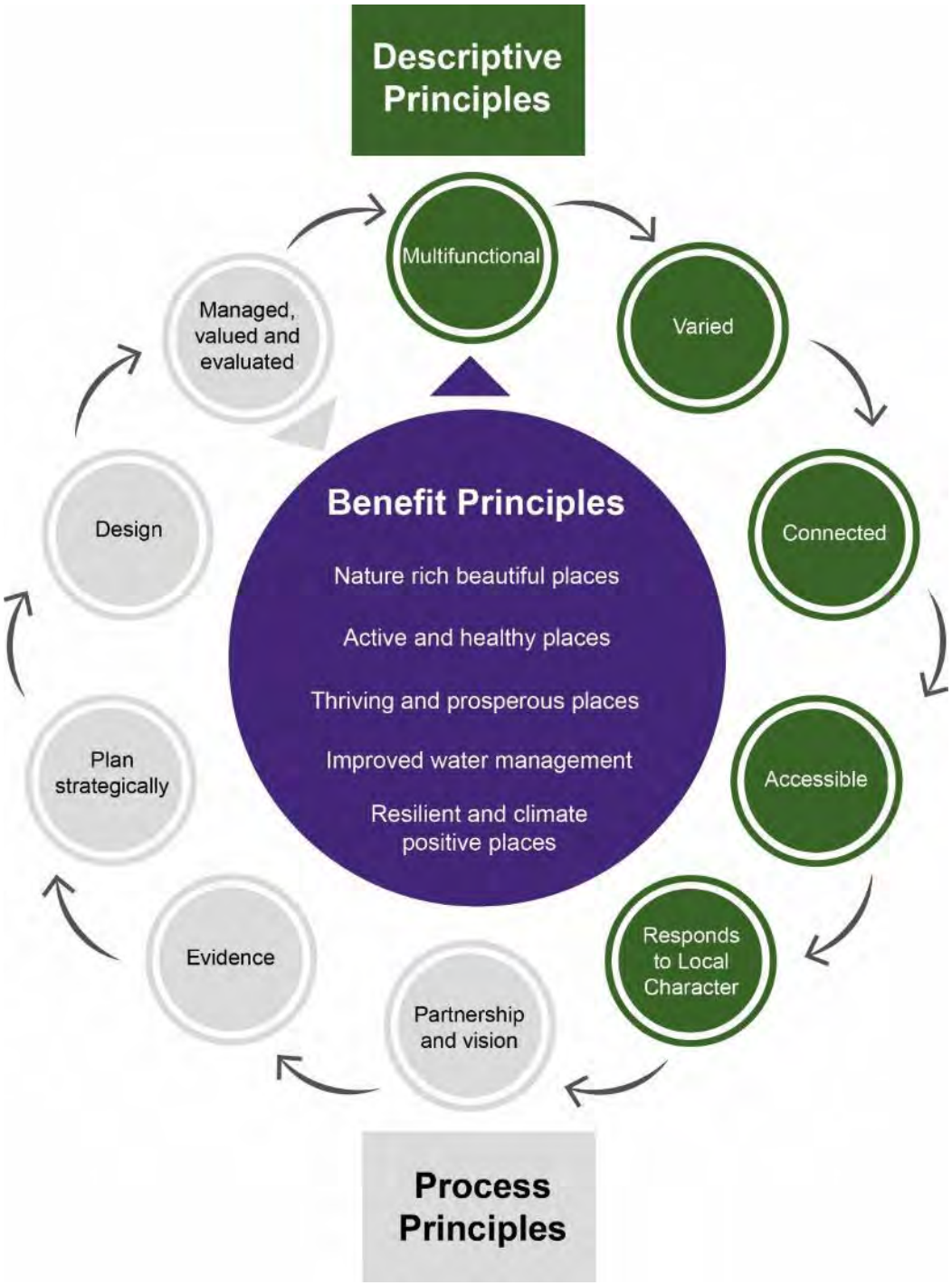
1.2 GI can be designed to provide a number of different functions, the prioritisation of which should be determined by local needs. Some functions / purposes may conflict with one another so there may be trade-offs to consider. For example, the delivery of biodiversity enhancements (for example favourable status of statutorily designated sites or species) at select locations should be balanced with the need to provide for active travel or recreation.

A themed approach

1.3 To establish a comprehensive baseline, a 'themed' approach was adopted to explore the existing GI assets, consider key needs and explore deficiencies

within the city. Four themes have been identified, informed by the 'GI Principles Wheel', as developed by Natural England (see **Figure 1.2**).

Figure 1.2: 'GI Principles Wheel' (Natural England)



Theme 1: Liveable spaces

1.4 This theme explores the key assets which deliver life-supporting environmental processes, including carbon sequestration, flood management, cooling and air quality improvement. It incorporates many of the smaller GI features which are often located within wider spaces discussed in the other themes. This includes trees, SuDS and green roofs. This theme primarily relates to the ‘resilient and climate positive places’ benefit within the 'GI Principles Wheel'. It also incorporates elements from the ‘improved water management’ and the environmental health aspect of ‘active and healthy places’ benefits.

Theme 2: Nature-rich spaces

1.5 This theme explores how GI supports wildlife and nature recovery. It is related primarily to large-scale semi-natural habitats, natural heritage designations and connectivity for key species. This theme aligns with the ‘nature-rich beautiful place’ benefit within the 'GI Principles Wheel'. It also includes the ecological benefits associated with good quality blue assets associated with the ‘improved water management’ benefit.

Theme 3: Active spaces

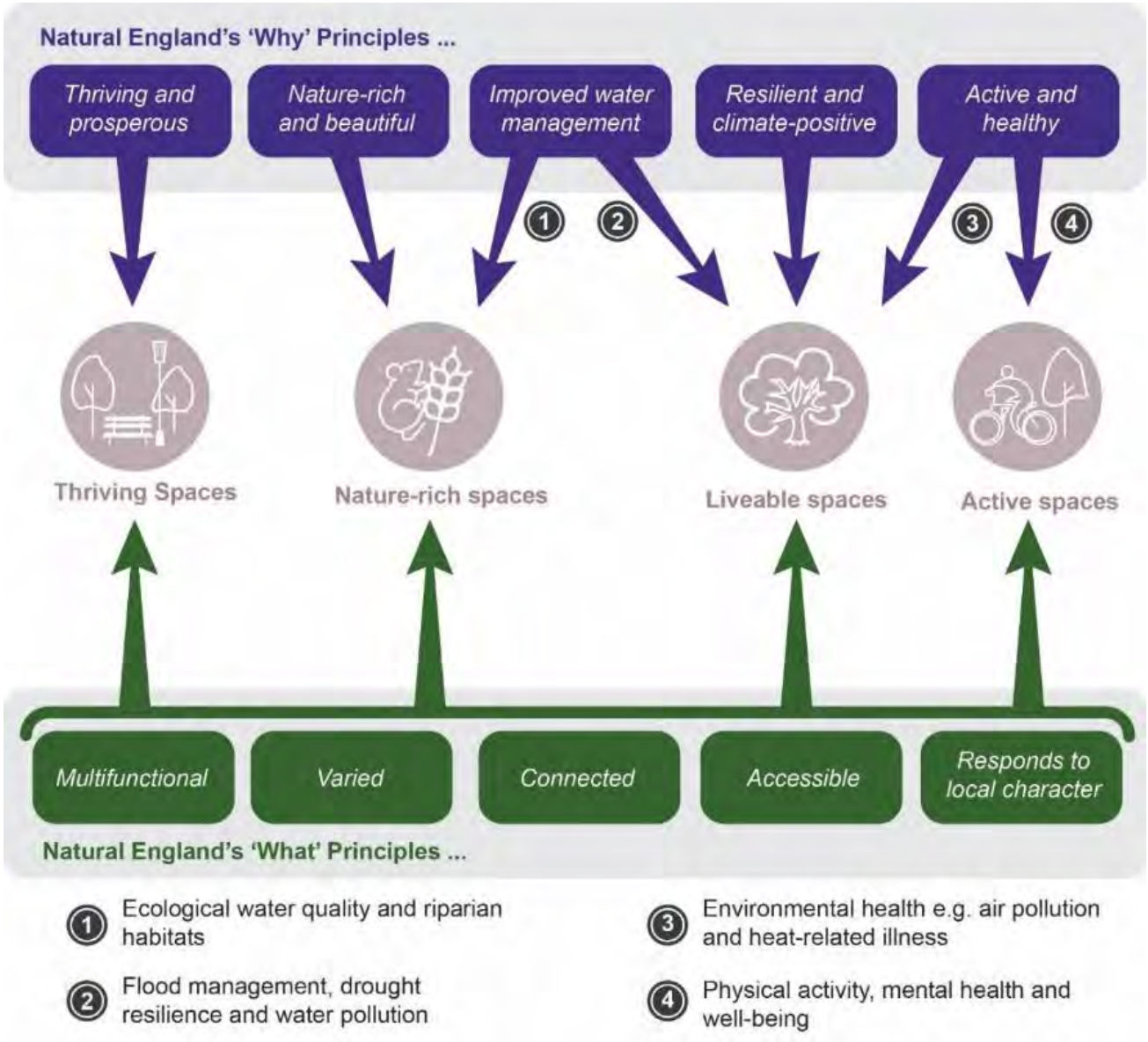
1.6 This theme explores GI which is publicly accessible, including footpaths, cycle routes, parks and all open access land. These assets support physical activity and wellbeing benefits associated with access to greenspace and nature. It also incorporates key demographic and health data. This theme aligns with the ‘active and healthy places’ benefit within the 'GI Principles Wheel'.

Theme 4: Thriving spaces

1.7 This theme explores GI which enhances sense of place and supports both thriving, prosperous communities and businesses. It incorporates national parks, historic features and other flagship or destination sites that attract visitors and investors. Consideration of equality and deprivation are also key elements of this theme. This theme supports the ‘thriving and prosperous places’ benefit within the 'GI Principles Wheel'.

1.8 Figure 1.3 demonstrates how the four themes align with the Natural England ‘GI Principles Wheel’.

Figure 1.3: Development of the four themes



Chapter 2

Green Infrastructure context in Brighton & Hove

2.1 This chapter summarises the GI context within the city and outlines the policy context for GI at the national, regional and local levels.

A portrait of Green Infrastructure in Brighton & Hove

2.2 The city is characterised by a tightly constrained, urban context situated between the South Downs National Park (SDNP) and the English Channel. Much of Brighton & Hove is underlain by chalk, which underpins many of the special qualities of the SDNP. This includes the establishment of distinctive sheep-grazed downland landscapes and species-rich chalk grassland.

2.3 The chalk formations provide a characteristic smooth rolling relief, with broad rounded ridges and sweeping dry chalk valleys which extend into the urban area. The ridgelines are typified by a mosaic of woodland and grassland, creating a distinct setting for the city between rolling downland and the sea **[See reference** 4**]**. The highly permeable chalk increases stores of groundwater, and the aquifer is an important source of drinking water. As a result of the high infiltration rates, above ground stream channels are uncommon and there are no major rivers.

2.4 The city grew from a fishing town with historic development resulting in a tight grid pattern associated with the medieval core. Complex land ownerships associated with the five ‘laines’ also contributed to the city’s incremental growth, resulting in relatively dense built development around the area to the east and west of a central valley. Later suburban development since the 1920s has

extended the city into the downlands where residential streets are often interspersed by wooded and grassed ridges.

2.5 Within the urban area, a network of parks and open spaces provide important benefits to Brighton & Hove's diverse communities and visitors. These often form the venue for community and cultural events, providing places of relaxation, recreation and nature connection whilst also helping to reduce flood risk and peak summer temperatures.

2.6 The visitor economy is well-established, bolstered by Brighton & Hove's image as a cosmopolitan, free-thinking city. Over 11 million trips per year deliver nearly £886 million of spend **[See reference 5]**. Tourism also accounts for approximately 14% of all employment, equivalent to 21,000 direct jobs in the local economy **[See reference 6]**. The Victorian seafront and Regency architecture further inform its sense of place.

Policy Review

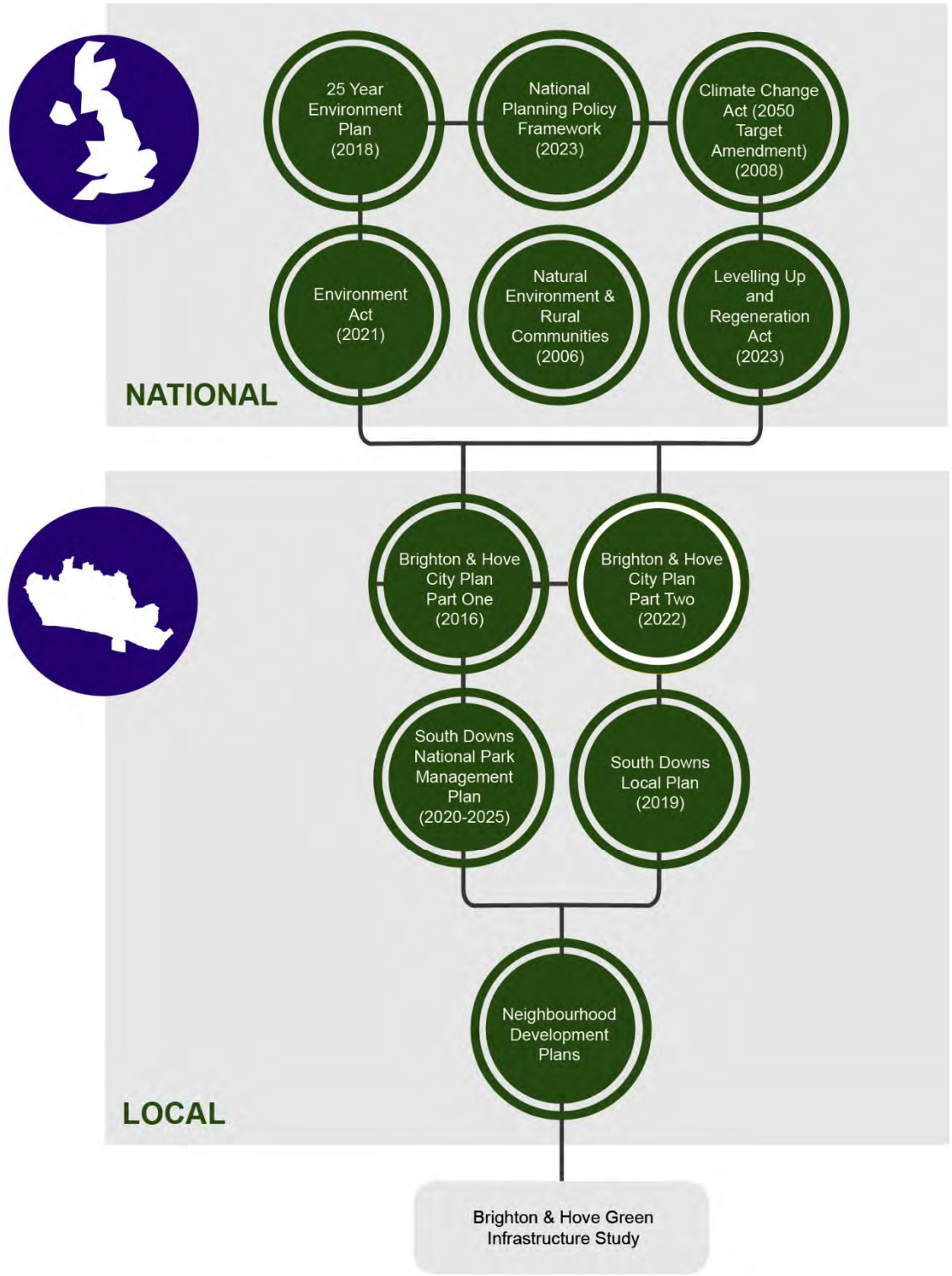
National Policy

2.7 The principal drivers behind GI delivery at the national level include:

- National Planning Policy Framework (NPPF) (as amended in December 2023);
- 2018 Government's 25 Year Environment Plan (25YEP);
- 2023 Environmental Improvement Plan;
- 2021 Environment Act;
- 2006 Natural Environment & Rural Communities (NERC) Act;
- 2008 Climate Change Act (2050 Target Amendment) Order 2019; and
- 2023 Levelling Up and Regeneration Act.

2.8 **Figure 2.1** illustrates the policy context.

Figure 2.1: Policy context



2.9 The NPPF (updated December 2023) **[See reference 7]** emphasises the importance of placing GI at the heart of plan making, reinforcing the value of taking a strategic approach to maintain and enhance networks of GI, and planning for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries (Paragraph 181). GI is identified as a tool to help meet the challenge of climate change (Paragraph 20), notably in relation to the planning of new development (Paragraph 159) and to promote healthy and safe communities (Paragraph 96).

2.10 The 2018 25YEP set the direction for the Environment Act, including long-term targets for environmental improvement. It committed to a national GI framework, a network of 'nature recovery areas' and to embed the principle of 'environmental net gain' to development (see later subheadings). These emerging approaches will become established during the lifespan of this GI Study. The Study must recognise and, through future reviews, accommodate their requirements. The 2023 Environmental Improvement Plan builds on the 25YEP vision, setting out how government, landowners, communities and businesses should deliver each goal for improving the environment. This is matched with interim targets to measure progress.

2.11 The 2021 Environment Act **[See reference 8]** requires the development of targets by government to enact change, and drives a landscape-scale, network-led response. The Act addresses four 'priority areas' of air quality, water, biodiversity and resource efficiency/waste reduction. It requires a minimum 10% Biodiversity Net Gain (BNG). The Act includes a duty on local authorities to review every five years all policies regarding nature conservation.

2.12 The 2006 NERC Act **[See reference 9]** places a duty on public and local authorities to have 'regard to the conservation of biodiversity in exercising their functions', including the provision of local polices and strategies, in planning and development control, and in managing their estates. Section 41 of the Act lists the habitats and species of principal importance; these are used to inform the identification of local conservation priorities.

2.13 A legal commitment to reach net zero carbon emissions by 2050 was also introduced in a 2019 amendment to the 2008 Climate Change Act **[See reference 10]**.

2.14 The Levelling-up and Regeneration Act 2023 enhances the status of Protected Landscape Management Plans and places a stronger requirement on partners such as local authorities and public bodies to contribute to their delivery. The SDNP Partnership Management Plan 2020-2025 **[See reference 11]** is relevant to the city due to the adjoining SDNP boundary.

Local Policy

Brighton & Hove City Plan Part One (adopted March 2016)

2.15 Brighton & Hove's City Plan Part One **[See reference 12]** was adopted in March 2016. It provides an overall strategic and spatial vision for the future of Brighton & Hove to 2030.

2.16 The policies relating to GI (although not all specifically reference GI) in the adopted Brighton & Hove City Plan Part One are listed below:

- SS1 Presumption in Favour of Sustainable Development – sets out the Council's approach to delivering development in line with the NPPF, including securing development that improves the economic, social and environmental conditions in the area.

- DA1-DA8 – set out the requirement for sustainable development at Development Areas, including to provide GI, incorporating public open space and semi-natural greenspace, and increasing biodiversity, in addition to delivering sustainable transport links, and ensuring there are no adverse impacts on the setting of the protected landscape, as appropriate to the context of the Development Area.

- SA4 Urban Fringe - promotes and supports the careful use and management of land within the city's urban fringe to protect its landscape and the setting of the SDNP, achieve environmental improvements and better public access, enhancement of the city's green network and groundwater source protection zones.

- SA6 Sustainable Neighbourhoods – promotes sustainable neighbourhoods including through supporting and promoting sports, local food growing, tree planting, physical activities, arts and cultural initiatives and projects that improve the environment and help deliver community cohesion. It also sets out aims to reduce inequalities between neighbourhoods through supporting improvements to the public realm, biodiversity and open space in areas identified with significant environmental, community safety and access concerns and to promote healthier lifestyles and wellbeing.

- CP8 Sustainable Buildings – seeks to ensure that all development proposals address climate change mitigation and adaptation, makes effective use of land, reduces the urban heat island effect and surface water run-off, enhances biodiversity and encourages biodiversity.

- CP9 Sustainable Transport – includes measures to increase physical activity, improving health, safety and quality of life, through working with communities to identify priorities for improved public realm, safer areas such as child-friendly streets and sustainable transport improvements. Active travel measures include enhancing the public realm in key areas, implementing an integrated cycle network by 2030, promoting active travel, and improving rights of way and access to open spaces and the SDNP.

- CP10 Biodiversity – sets out the Council's approach to developing programmes and strategies to conserve, restore and enhance biodiversity and improve access to it. The aim is to contribute to biodiversity improvements within the South Downs Way Ahead Nature Improvement Area, and ensure that development proposals conserve biodiversity, provide net gains where possible and positively contribute to ecosystem services.

- CP11 Flood Risk – seeks to ensure that flood risk is managed through development, including through SuDS where appropriate, recognising that there is an opportunity through flood risk management or mitigation to achieve wider sustainability and biodiversity objectives for the city.

- CP16 Open Space – describes BHCC's approach to safeguard, improve, expand and promote access to the city's open spaces through retaining and enhancing open space and requiring new development to contribute to the provision of open space. It sets out open space standards, providing information on the types of open space that people should be able to access within a given distance of their home.

- CP17 Sports Provision – sets out BHCC's aspiration to increase participation in sports and physical activity through safeguarding, expanding, enhancing and promoting access to the city's sports services, facilities and spaces.

- CP18 Healthy City – seeks to reduce health inequalities and promote healthier lifestyles through requiring larger developments to demonstrate how they impact on health, encouraging development that works toward 'Lifetime Neighbourhood' principles, promoting healthy safe and active living for all age groups, encouraging the role of allotments, gardens and small scale agriculture to provide access to healthy and affordable locally produced food.

2.17 The strategic policies within the City Plan Part One are currently under review, with the first stage of public consultation on Issues & Options expected in Summer 2024. The new City Plan will set out the planning framework for the city for the period to 2041. This Study is a key piece of evidence to support the new local plan.

Brighton & Hove City Plan Part Two (adopted October 2022)

2.18 Brighton & Hove's City Plan Part Two **[See reference 13]** was adopted on 20 October 2022. It complements Part One of the City Plan, providing additional policies for managing new development and further site allocations to deliver new homes. Policies are set out spatially on the City Plan Adopted Policies Map **[See reference** 14**]**.

2.19 Policies relating to GI in the Brighton & Hove City Plan Part Two are:

- DM22 Landscape Design and Trees – promotes good design by seeking to integrate development into its surroundings, retaining and enhancing landscape elements where possible, and incorporating GI measures appropriate to the type and context via a GI masterplan / strategy

- DM37 Green Infrastructure and Nature Conservation – seeks to ensure development safeguards and/or positively contributes to the existing multifunctional GI network as a fundamental part of sustainable development. It establishes that GI should be integral to the design of a scheme, ensuring that benefits to communities, the environment and economy are realised. It seeks to conserve and enhance biodiversity and geodiversity features, and protect sites designated for their biodiversity.

- DM38 Local Green Spaces – establishes four areas that are designated as Local Green Spaces due to their value to the local community, and their role in acting as green wedges into the urban area used as wildlife corridors and routes for people accessing the SDNP.

- DM43 Sustainable Drainage – seeks to ensure that Sustainable Drainage Systems (SuDS) are incorporated into the design and layout of all new buildings, car parking and hard standing, to reduce surface water leaving the site, in order to mitigate against climate change. The policy encourages sensitively located and designed SuDS, using a landscape-led approach to improve biodiversity, enhance landscape/townscape and improve public amenities.

- SA7 Benfield Valley – sets out a comprehensive approach for the protection, enhancement and long term management of Benfield Valley as an important green wedge into the urban area, a valued Local Wildlife Site and Local Green Space.

- Strategic Site Allocations SSA1-SSA7 and H2 Housing Sites – Urban Fringe – set out varying requirements for developments to contribute towards GI and biodiversity, including delivering BNG, as appropriate to these sites.

2.20 The City Plan Part Two also outlines policies covering topics that relate to GI but do not currently reference GI including:

- DM19 Maximising Development Potential – establishes that development proposals should maximise opportunities for the development and use of land, including for providing effective open space and amenity space.
- DM33 Safe, Sustainable and Active Travel – seeks to ensure that new developments are designed to be safe and accessible for all users, encouraging sustainable and active forms of travel, including pedestrians, cyclists and public transport.
- DM42 Protecting the Water Environment – sets out requirements for developers to include measures to reduce risks to the water environment and its ecology and aim to protect and improve water quality.

South Downs National Park

2.21 Part of the administrative area of the city is covered by the SDNP and is subject to the South Downs Local Plan adopted on 2 July 2019 **[See reference 15]**. The SDNP Partnership Management Plan 2020-2025 **[See reference 16]** is also relevant. This sets out an overarching five-year strategy for the management of the SDNP. Although the City Plan area does not include land within the SDNP, the setting of the SDNP and linkages to it are important considerations in planning GI in Brighton & Hove.

Neighbourhood level

2.22 There are currently seven designated neighbourhood areas in the city and two Neighbourhood Development Plans (NDPs) which have been formally 'made' by BHCC.

Rottingdean Parish Neighbourhood Plan designates nine 'Local Green Spaces', in accordance with the criteria contained in the NPPF.

Chapter 3

Existing Green Infrastructure provision

3.1 This chapter explores the existing GI assets by each of the four themes, highlighting existing patterns of GI provision, benefits provided and key needs, issues and deficiencies across Brighton & Hove. It concludes by drawing out spatially specific priority needs for GI investment across the city.

3.2 This baseline assessment of GI combines data from the recently published NEGIF as well as an analysis of current provision at the local level to provide a holistic evidence base.

Theme 1: Liveable spaces

Assets

3.3 Vegetation, particularly urban vegetation, performs an important role in creating liveable spaces. Key functions include carbon sequestration, urban cooling, the absorption and capture of pollutants and noise attenuation. Urban vegetation and vegetation carbon stores are indicated on **Figure 3.1**. Tree canopy cover totals approximately 900 hectares, which equates to just over 10% of land within the Brighton & Hove administrative boundary and 11% of the City Plan area. The % density of tree cover over 50m^2 across the city is shown in **Figure 3.2.** Tree canopy coverage is most extensive within the city's open spaces, with the distribution of street trees generally lower within closer proximity to the seafront. Significant blocks of tree planting are located at North Moulsecoomb and Great Wood, Stanmer Park, with linear woodland belts also evident bordering both the A23 and A27. The pattern of tree canopy coverage in the urban area of the city broadly follows the route of local roads and rail corridors.

3.4 Soil and vegetation act as carbon stores. The largest stores of carbon in vegetation are found in the north of the city, associated with land at Stanmer Park, Great Wood and vegetation tracts at Waterhall Golf Club. Vegetation stores equate to approximately 6kg of carbon per square kilometre at these locations. Additional urban vegetation is also provided by 16 green walls and 67 green roofs, which have been provided by new development. Road verges are generally limited in extent and fragmented, covering just 25 km within the city (see **Figure 3.1**).

3.5 There are no major rivers or watercourses in the city due to its chalk geology, which is highly permeable resulting in a reduction in above-ground water flow.

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Figure 3.1: Liveable space assets

- Brighton and Hove administrative area
- City Plan boundary
- Tree canopy
- Verge
- Green roof or wall

Carbon storage in vegetation (tonnes per ha)

21

0

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.2: Tree canopy density

Brighton and Hove administrative area
City Plan boundary

Tree density

% tree canopy cover over 50m2

100%

0%

0 1 2 km

Map scale 1:44,000 @ A3

Issues, deficiencies and needs

3.6 GI plays an important role in increasing the resilience of neighbourhoods, notably in relation to adaptation to the impacts of climate change (including increased frequency of storms, heatwaves and droughts) and the creation of healthy environments which address pollution concerns. In addition, more intense rainfall events may increase surface water run-off, with subsequent additional risk of sewerage overflow and the potential for damage to property and people. GI can begin to address these risks through the creation of additional flood storage and by slowing the rate at which overland flow reaches watercourses. Urban greening interventions can also play a fundamental role in the management of surface water run-off in the city through a reduction in the proportion of impervious surfaces.

3.7 Analysis of the deficiencies and needs for GI in this theme focusses on where there is a particular risk from these risks in order to plan for GI and maximise the delivery of multi-functional benefits.

3.8 Figure 3.3 indicates the source of air, noise and water pollution issues. Nitrogen dioxide levels are a key concern within specific locations within the city. There are six Air Quality Management Areas (AQMAs) **[See reference** 17**]**, and within these designations the national standard for nitrogen dioxide is at risk of exceeding air quality management area orders **[See reference** 18**]**. The largest of these is centred around the city centre along the A23, A2010, A270 and B2066 road corridors. The Brighton & Hove Air Quality Action Plan **[See reference** 19**]** sets out key performance indicators to work towards interim World Health Organisation (WHO) targets for nitrogen dioxide (NO2).

3.9 Microscopic Particulate Matter (PM2.5) concentrations are close to meeting WHO 2005 recommended levels. However, the updated 2021 recommendation to not exceed 5µg/m^3 annually is not currently met. Further urban and rural monitoring is planned from 2024.

3.10 Long term exposure to noise levels above 50 decibels (dB) has been shown to lead to negative health effects **[See reference** 20**]**. Approximately 25% of the Brighton & Hove administrative boundary (equating to approximately 20% of the City Plan boundary) experiences daily or nightly noise exposure above this threshold, including the corridor of the A27 and the routes of the A293, A2038, A23 and A270 which radiate from this carriageway. The alignment of rail lines within the city lies broadly parallel to the routes of the A23 and A270. The communities which lie close to these road and rail corridors include West Hove, Preston, Withdean, Westdene, Hollingdean and Moulsecoomb.

3.11 There is limited data availability relating to water quality across the city. However, there are a number of Zone I – Inner Protection Zone source protection zones. These areas are particularly vulnerable to contamination of water supplies because of pollution. The city's chalk bedrock is highly permeable and therefore vulnerable to surface derived pollutants entering the groundwater stores **[See reference** 21**]** (see **Figure 3.3**).

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Figure 3.3: Air, noise and water pollution

- Brighton and Hove administrative area
- City Plan boundary
- Rail noise (where both daytime and nightime averages are above 50 dB)
- Road noise (where both daytime and nightime averages are above 50 dB)
- Air Quality Management Areas (AQMA)

Source Protection Zone

- Zone I - Inner protection zone

0 1 2 km

Map scale 1:44,000 @ A3

3.12 The Brighton & Hove Urban Heat Island (UHI) Assessment **[See reference** 22**]** highlights the findings of the Climate Risk and Vulnerability Assessment. In 2022, surface temperatures across the city were on average 8°C higher in some locations of the inner built environment compared to the downland areas (range 26.4°C to 18.75°C). Lower heat risk was associated with larger areas of open space. Air temperature was more consistent, with only a 1°C difference at night (when the impact of the UHI effect is at its peak). High wind speeds, particularly due to the coastal location, reduce the UHI effect on air temperature.

3.13 The absence of main rivers or watercourses reduces the risk from fluvial flooding. Areas within Flood Zone 2 cover just under 2% of the Brighton & Hove administrative boundary (approximately 3% of the City Plan boundary), exclusively along the seafront where there is a risk of tidal flooding **[See reference** 23**]**. However, flood risks from groundwater and surface water (pluvial) flooding are more prevalent. Surface water flood risk occurs where surface water accumulates or is conveyed during a flood event. This is primarily an issue where there is a greater level of impermeable built surfaces **[See reference** 24**]**. Groundwater flood risk is due to high groundwater levels, associated with highly permeable chalk bedrock, resulting in a greater potential for flooding in response to rainfall events **[See reference** 25**].**

3.14 Figure 3.4 illustrates flood risk and UHI risk based on the findings of the Brighton & Hove UHI Assessment. Particular areas of flood risk include:

- Linear infrastructure corridors within predominantly urban areas of the city. Major road networks, including the A270 and A23 road corridors as well as land lying between the A293 and A2038 at Hangleton are at risk of flooding due to surface water. Land centred on Saltdean Vale in Saltdean as well as land lying parallel to the B2123 from Rottingdean to Woodingdean is also susceptible to these risks. In addition, the data indicates that some areas of Portslade, West Blatchington (including Hove Park), Patcham, Hollingbury and Whitehawk exhibit surface water flood risk.

- Tidal flooding along the seafront, including Brighton Marina and stretches of land to the south of the A259 at Portslade; and

- Groundwater risk where the water table is high, including along the seafront as well as land within Patcham, Falmer and West Hove.

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Figure 3.4: Flood risk and the Urban Heat Island (UHI) effect

- Brighton and Hove administrative area
- City Plan boundary
- Flood zone 2 and 3
- Risk of flooding from surface water extent 1% (1 in 100)
- Land at risk from groundwater flooding

Surface temperature during summer 2022 (°C)

- > 18 - 20
- > 20 - 22
- > 22 - 24
- > 24 - 26
- > 26 - 28

Heat mapping data obtained from Brighton & Hove Urban Heat Island Assessment Report (2023) produced by Arup on behalf of BHCC

0 1 2 km

Map scale 1:44,000 @ A3

Theme 1: Summary of key findings

- Trees and the downland play an important role in sequestering carbon, acting as a 'green lung' around the city. Tree canopy coverage is generally lower within closer proximity to the seafront.
- Tree canopy coverage is most extensive within the city's open spaces, with the distribution of street trees generally lower within closer proximity to the seafront. The pattern of tree canopy coverage in the urban area of the city broadly follows the route of local roads and rail corridors.
- Greening the urban environment, if implemented correctly, can also have significant benefits in relation to air quality through the removal of some forms of air pollution. AQMAs are located in six locations across the city, the largest of which is centred along the corridors of the A23, A2010 and B2066 in the city centre. In these locations, GI could be used to improve air quality through the use of interventions which are suitable to the urban context and space restrictions.
- Daily or nightly exposure to noise levels above 50 dB due to road / rail corridors affects approximately 25% of the administrative boundary of Brighton & Hove (20% of the City Plan boundary). The opportunity exists to ameliorate the negative perception of noise within the city through the enhancement of the GI network.
- Surface temperatures within the urban environment of the city were on average 8°C higher than some downland areas within the SDNP. GI offers the opportunity to mitigate the impacts of the urban heat island within dense areas of the city.

Theme 2: Nature-rich spaces

Assets

3.15 The SDNP covers approximately 43% of Brighton & Hove's administrative area. As indicated by **Figure 3.5,** the majority of Brighton & Hove's nature-rich spaces, particularly priority habitats, are located within the SDNP, which is also an International Dark Sky reserve. There are two designated Sites of Special Scientific Interest (SSSI) that fall partially within the city's boundary, covering approximately 135 hectares. Brighton to Newhaven Cliffs SSSI is located on the eastern coastline. To the north east, Castle Hill is designated as both a SSSI and Special Area of Conservation (SAC), with parts of its northern extent designated as a National Nature Reserve (NNR).

3.16 Brighton & Hove administrative area contains eight designated Local Nature Reserves (LNR), comprising 594 hectares. Six of these are located wholly or partially within the City Plan area, and two are wholly within the SDNP. The largest are Wild Park LNR (240 hectares) and Stanmer Park / Coldean LNR (188 hectares), located in the north east of the city and providing a valuable connection between the city and SDNP. In addition, land at Waterhall is proposed to be designated as an LNR. Local Wildlife Sites (LWS) provide important further nature-rich assets within the city. There are 51 of these sites within land covered by the City Plan, which make an important contribution to the provision of access to nature in the urban setting. A further 36 LWS are situated on land identified as SDNP within Brighton & Hove. Established in 2018, the Sussex LWS Initiative aims to maintain a functioning network of LWS within Sussex. The Sussex Biodiversity Record Centre provides a repository of data relating to biodiversity and natural history, including the network of LWS and other non-statutory ecological designations within Brighton & Hove.

3.17 Figure 3.6 displays priority habitats. These priority habitats most notably include semi-improved grassland, deciduous woodland, and lowland calcareous grassland, covering 10%, 5% and 4% of the Brighton & Hove administrative boundary respectively. Overall, priority habitats encompass a total of 2012

hectares, equating to 24% of the Brighton & Hove administrative boundary and 6% of land within the City Plan area.

3.18 Several projects associated with the Living Coast UNESCO World Biosphere region and SDNP Partnership Management Plan aim to enhance habitat connectivity and the condition of priority habitats at both the local and landscape scale. Projects targeting chalk grassland restoration include the Changing Chalk and Wilding Waterhall initiatives. Improved management of roadside verges for biodiversity is also delivered as part of the Wilder Verges project.

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Figure 3.5: Nature conservation designations

- Brighton and Hove administrative area
- City Plan boundary
- National Nature Reserve
- Local Nature Reserve
- Local wildlife site
- Special Area of Conservation
- Sites of Special Scientific Interest

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.6: Priority habitats and ecological networks

- Brighton and Hove administrative area
- City Plan boundary
- Ecological network

Priority Habitats Inventory

- Coastal vegetated shingle
- Deciduous woodland
- Good quality semi improved grassland
- Lowland calcareous grassland
- Lowland meadows
- Maritime cliff and slope
- No main habitat but additional habitats present
- Saline lagoons
- Traditional orchard

0 1 2 km

Map scale 1:44,000 @ A3

Issues, deficiencies and needs

3.19 The ecological network shown in **Figure 3.6** highlights the extent of strategic ecology in the city, including existing habitats, nature conservation sites and areas of opportunity. West Hove, Central Hove, land to the south of Portslade as well as sections of Preston Park and Hollingdean, are the locations most deficient in nature-rich spaces in the city. This reflects a wider gap in ecological connectivity in Portslade and Hove, including within close proximity to the seafront.

3.20 Most nature-rich spaces of significant size are within the SDNP and have a limited presence in the built up area. LNRs and Local Wildlife Sites go some way to extending this, but physical barriers such as the A27 Bypass result in partial fragmentation of wildlife corridors between the SDNP and the eastern and western parts of the city.

3.21 Chalk or calcareous grassland is an important habitat within Brighton & Hove, with its floristic diversity supporting many invertebrate species. The SDNP recommends 20 hectares as the minimum size required to secure this habitat **[See reference 26].** Within the Brighton & Hove administrative boundary, only three areas of chalk grassland meet this size threshold. These are located wholly within the SNDP, and therefore do not fall within the City Plan area.

Theme 2: Summary of key findings

- The presence of the SDNP is a significant asset of the city and includes the majority of the priority habitat and ecological network of significant scale.
- The opportunity exists to increase the size and connectivity of nature-rich spaces in the urban area, particularly in Portslade, Central Hove and West Hove where there is most deficiency in access to natural greenspace.
- The Living Coast UNESCO World Biosphere project provides an opportunity to collaborate regarding GI projects and approaches in the city.

Theme 3: Active spaces

Assets

3.22 The extent of accessible open space equates to approximately 1,471 hectares, covering 17% of Brighton & Hove administrative area and 13% of the area defined within the City Plan (see **Figure 3.7**).

- 216 hectares of parks and gardens;
- 984 hectares of natural and semi-natural greenspace (including natural and semi-natural urban greenspace and countryside sites);
- 158 hectares of amenity greenspace;
- 5 hectares of green corridor;
- 69 hectares of churchyards and cemeteries;
- 13 hectares of civic space;
- 11 hectares of provision for children and young people;
- 508 hectares of formal and informal sports (access may be restricted) (including school grounds and sports pitches, outdoor sports facilities, golf courses and race courses); and
- 86 hectares of community parks and gardens (access may be restricted) (including allotments and urban farms, community gardens, privately owned parks and gardens).

3.23 The accessible open space data does not include the beach as a mapped asset. However, the beach offers recreational opportunities and forms an important and well used asset within the city.

3.24 There are approximately 124 km of Public Rights of Way (PRoW) within Brighton & Hove administrative boundary, as shown on **Figure 3.8**. These routes are broadly concentrated outside the urban area, resulting in a much lower PRoW density within the City Plan area than the SDNP. However, the dense urban areas of the city are supplemented by an extensive network of informal routes which support active travel across the city. The King Charles III England Coast Path provides a strategic linkage following the coastline. In addition, the South Downs Way National Trail passes within 1 km of the city boundary to the north east towards land at West Hill. Promoted routes include the Monarch's Way and Sussex Border Path. These routes provide a degree of connectivity between the urban area and the SDNP to the north and east.

3.25 Open Access Land designated under the Countryside and Rights of Way (CRoW) Act 2000 equates to approximately 1,235 hectares (approximately 14% of the Brighton & Hove administrative area). This figure reduces to less than 1% when only the City Plan boundary is considered. Whilst there are pockets of access land within the urban fringe, such as Whitehawk Hill, much of this land lies within and extending into the wider SDNP.

3.26 The cycle network includes 53 km of routes designated as National Cycle Network, including Route 2 and Route 20. These routes are located along the seafront, forming wider linkages which radiate to the north and largely accommodated along main roads. There are a further 259 km of local cycle networks which provide additional connectivity, including between the urban area and SDNP. Despite the presence of PRoW and cycle routes, large parts of the urban area have limited connectivity to the SDNP by foot or by bike.

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Figure 3.7: Local open space typologies

- Brighton and Hove administrative area
- City Plan boundary

Local open space

- Parks and gardens
- Natural and semi-natural greenspace
- Amenity greenspace
- Green corridor
- Churchyard and/or cemetery
- Civic spaces
- Provision for children and young people
- Formal and informal sports (access may be restricted)
- Community parks and gardens (access may be restricted)
- School grounds and sports pitches

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.8: Access routes

- Brighton and Hove administrative area
- City Plan boundary
- Accessible green space
- Public Right of Way (PRoW)
- Local cycle route

PRoW density (m per 1km square)

- 0
- 1 - 115
- 115 - 525
- 525 - 904
- 904 - 1190
- 1190 - 1545
- 1545 - 1964
- 1964 - 2458
- 2458 - 3217
- 3217 - 16609

0 1 2 km

Map scale 1:44,000 @ A3

Issues, deficiencies and needs

3.27 6.8% of children aged 4-5 years and 17% of children aged 10-11 years in the Brighton & Hove administrative boundary were classified as obese in 2022 / 23 **[See reference** 27**]**. Although these rates are better than the regional and national average, the results mask the variations at ward level.

3.28 A number of health inequalities are prevalent, strongly correlated to levels of deprivation. This pattern is reflective of a national pattern of deprived areas and less availability of access to private garden space. At the LSOA level, 15 neighbourhoods (9%) are considered to lie within the 10% most deprived in England. In contrast, ten neighbourhoods fall within the least deprived 10% in England **[See reference** 28**]**.

3.29 Figure 3.9 shows areas where Accessible Greenspace Standards (AGS) have been achieved. These standards, set out in the NEGIF, are based on an ambition to ensure everyone has access to greenspaces close to home. A distance buffer is applied to each accessible greenspace, based on the size of the greenspace, with larger buffers applied to larger sites. This is based on the assumption that people are willing to travel further to reach larger greenspaces. The AGS define good provision based on different size-proximity, capacity and quality criteria. The criteria states that provision should include either a doorstep greenspace (of at least 0.5 hectares within 200 metres) or a local natural greenspace (of at least 2 hectares within 300 metres walk from home) within 15 minutes' walk of people's homes. In addition, a medium sized neighbourhood natural greenspace (10 hectares in size and within 1km) should be provided. Beyond a 15 minutes' walk, provision should include a wider neighbourhood natural greenspace (20 hectares with 2km), a district natural greenspace (100 hectares within 5km) and a sub-regional greenspace (500 hectares and within 10km).

3.30 Areas best served by accessible greenspace are generally in the northern and central areas of the city, with fewer buffers met in the urban areas of

Portslade, Central Hove, West Hove and Hangleton. However, the access opportunities offered by the beach / seafront should also be considered, despite this not being considered as a natural greenspace asset within the AGS analysis. Residential areas where all size-proximity criteria of the AGS buffers are met include areas of Whitehawk, Bevendean, Moulsecoomb, Coldean, Patcham, Withdean and Preston Park. Major barriers to access are provided by road corridors (such as the A27) and railway lines heading north, north east and west.

3.31 The city's population is most dense in the west and central areas of the city, becoming less dense to the north and east of the urban area (and within the SDNP itself where there is no significant residential development). Areas with the greatest accessible natural greenspace inequality and population density (such as highest population density and lowest % AGS buffer coverage) at a neighbourhood level are generally located in Portslade, Central Hove, West Hove, Brunswick Town and Hanover as shown in **Figure 3.10**.

3.32 When combining accessible greenspace inequality and deprivation, as shown in **Figure 3.11**, areas with the greatest inequality are generally located in the west of the city. Areas experiencing greatest deprivation and low access to greenspace are located south of Portslade, the area between Hangleton Road and Old Shoreham Road (the Knoll Estate), west of West Hove Infant School, north of Pavilion Gardens and an area defined by Albion Hill, John Street, Kingswood Street and Grand Parade.

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Figure 3.9: Access to Natural Greenspace Standards (ANGSt)

Brighton and Hove administrative area

City Plan boundary

ANGSt profile - buffers met

0
1
2
3
4
5

Major barrier affecting ANGSt buffers

Rail network

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.10: Accessible natural greenspace inequality and population density

Brighton and Hove administrative area

City Plan boundary

Major barrier affecting ANGSt buffers

Rail network

Accessible natural greenspace inequality and population density, neighbourhood buffer coverage (1km)

Population density (population per km²)

10,000+
2,500 - 10,000
0 - 2,500

0 - 5 | 5 - 50 | 50 - 100

ANGSt buffer coverage (%)

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.11: Accessible natural greenspace inequality and deprivation

Brighton and Hove administrative area

City Plan boundary

Major barrier affecting ANGSt buffers

Rail network

Accessible natural greenspace inequality and inequality and deprivation, neighbourhood buffer coverage (1km)

IMD decile

1 - 2
3 - 8
9 - 10

0 - 5 5 - 50 50 - 100
ANGSt buffer coverage (%)

0 1 2 km

Map scale 1:44,000 @ A3

Summary of key findings

- The location of the SDNP offers recreational opportunities. However, a gap in PRoW connectivity results in limited provision of routes which provide access by foot or cycle.
- The potential exists to increase connectivity of the PRoW network into the urban area to provide increased accessibility, extending the cycle network and enhancing open space in areas where population is most dense and / or deprived.
- The delivery of GI enhancements, including open space improvements, where population is most dense and / or deprived would provide a suite of multi-functional benefits.
- Areas best served by accessible greenspace are generally in the northern and central areas of the city, with fewer buffers met in the urban areas of Portslade, Central Hove, West Hove and Hangleton. These areas of need in relation to access to greenspace could be addressed by GI enhancement and creation.
- Areas with the highest population density and lowest % AGS buffer coverage at a neighbourhood level are generally located in Portslade, Central Hove, West Hove and Brunswick Town.

Theme 4: Thriving spaces

Assets

3.33 Economies are embedded within nature and therefore investment in GI can bring economic benefit to communities by attracting inward investment, creating green job opportunities, supporting high streets, attracting visitors and

acting as a catalyst for regeneration. Brighton & Hove welcomes over 9.5 million day visitors each year, accounting for just over 85% of all visitors to the city.

3.34 Figure 3.12 indicates the relationship between the distribution of heritage assets and tree canopy coverage, including how this pattern contributes to the historic seafront and setting of the urban context within the city. The historic character and associations of greenspaces are important to the city's distinctiveness and act as a major draw for their use. Tree cover forms a key component of the character of conservation areas. Trees are therefore recognised as key natural heritage assets and are in some instances important to the setting of built heritage assets. Informed by individual conservation area character statements **[See reference** 29**]**, the conservation areas provide a significant opportunity and setting for the integration of bold GI interventions.

3.35 Six Registered Parks and Gardens (RPG) are located within the administrative boundary of the city. Within the urban area, Preston Manor and Preston Park are the largest of these and contain multiple listed features. Preston Park has also been awarded a Green Flag Award along with seven other parks. **[See reference** 30**]**. Conservation areas are generally clustered in the central area of the city, parallel with the seafront and largely associated with the characteristic Regency and Georgian architecture. Significant areas of tree planting within conservation areas are located within Queen's Park and Victoria Gardens, sites also partially or wholly designated as RPGs.

3.36 Figure 3.13 demonstrates that tree canopy coverage is generally most sparse where population density increases. However, this pattern is complicated somewhat by the dense urban fabric of the city. Constraints posed by the historic urban fabric, proximity of the seafront and the complexities of successful tree establishment in coastal locations are also factors likely to influence the pattern of tree coverage in the city.

3.37 Figure 3.14 indicates the percentage of man-made area (surface that is not water, vegetation or soils) within the city. The mapping output demonstrates the contrast between areas identified as 90-100% man-made within the city centre and those to the north defined largely as 0-10% man-made within the

SDNP. This pattern is exacerbated by the fact that the greenness grid dataset does not account for canopy coverage or urban greening interventions such as green walls or street trees.

3.38 As part of The Living Coast UNESCO World Biosphere, projects such as One Brighton aim to deliver sustainable development within the city. Moulsecoomb Forest Garden and Changing Chalk have improved access and understanding of local habitats for young people from deprived backgrounds at Albion Hill, Whitehawk Hill and Camp, and Dorothy Stringer and Surrenden School Campus. In addition, the Biocultural Heritage Tourism project forms a partnership between the Living Coast in the Brighton & Lewes Downs area and three other UNESCO Biosphere regions **[See reference** 31**]**. This project examines how tourism offers the opportunity to provide positive social, economic and environmental impacts within the city, promoting sustainable tourism experiences.

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Figure 3.12: Cultural heritage designations and tree canopy coverage

- Brighton and Hove administrative area
- City Plan boundary
- Conservation Area
- Registered Parks and Gardens
- Tree canopy (Data obtained from National Tree Map © Blue Sky International)

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.13: Population density and tree canopy coverage

Brighton and Hove administrative area
City Plan boundary
Tree canopy

Population density (number of usual residents per square kilometre)

290

32,000

0 1 2 km

Map scale 1:44,000 @ A3

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Figure 3.14: Greenness grid

Brighton and Hove administrative area
City Plan boundary

Greeness grid - percentage manmade

- 0 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80
- 80 - 90
- 90 - 100

0 1 2 km

Map scale 1:44,000 @ A3

Issues, deficiencies and needs

3.39 Launched in winter 2023 by American Forests, the Woodland Trust and the Centre for Sustainable Healthcare, the Tree Equity Score **[See reference** 32**]** seeks to identify the areas in greatest need of people-focused investment in trees within the UK (see **Figure 3.15**). The map-based application examines disparities in urban tree distribution and measures how well the benefits of trees are reaching communities living on low incomes and others disproportionately impacted by extreme heat, pollution and other environmental hazards. The score uses six climate, health and socio-economic datasets that measure social deprivation and quality of life, Collectively, these indicate how vulnerable a community is to environmental hazards and how beneficial tree equity would be to them.

3.40 Brighton & Hove administrative boundary is allocated a composite score of 86 (out of 100), demonstrating a moderate overall assessment of tree equity. However, this figure masks a complex variation in tree equity scores across the Lower Super Output Areas (LSOAs) of the city. Five LSOAs (within Kemp Town, Portslade, Whitehawk and two LSOAs bordering Queen's Road from King's Road to North Road) lie within land defined as high priority for tree planting. Tree equity is achieved (equates to a score of 100) within 24 LSOAs. The LSOA encompassing the seafront at Portslade exhibits the lowest tree equity score within the city (score of 60 out of 100).

3.41 The highest concentrations of socio-economic deprivation are evident in the Whitehawk, Moulsecoomb, Woodingdean and Hollingbury neighbourhoods (see **Figure 3.16**). Although these areas partially or wholly fall within land where a number of accessible greenspace buffers are met, they may not currently support wider social and economic infrastructure that could expand the accessibility, integration and positive benefits of these greenspaces. For instance, issues such as quality and safety concerns may prevent the public from feeling comfortable accessing greenspaces. In addition, physical barriers to access, such as major roads, may discourage use. Pockets of deprivation are

also evident in the west of the city around Victoria Recreation Ground, as well between Hangleton Road and Old Shoreham Road.

3.42 Across the city, a total of eight parks have achieved the Green Flag Award. This award forms the benchmark international standard for publicly accessible parks and greenspaces in the United Kingdom, recognising parks and greenspaces that are well managed and of high quality **[See reference** 33**]**. However, access to these sites by foot or cycle from areas of relatively higher deprivation is generally limited. Of the eight Green Flag awarded parks, only one site (The Level) neighbours an area of high deprivation. This highlights that deprived communities in the city are not benefitting from proximity to parks achieving Green Flag standards.

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Figure 3.15: Tree Equity Score

Brighton and Hove administrative area
City Plan boundary

Tree Equity Score

< 70

100

Map scale 1:44,000 @ A3

0 1 2 km

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Figure 3.16: Indices of Multiple Deprivation (IMD) and tree canopy coverage

Brighton and Hove administrative area

City Plan boundary

Tree canopy

Indices of Multiple Deprivation (IMD) 2019

1 (Most deprived)

10 (Least deprived)

0 1 2 km

Map scale 1:44,000 @ A3

Theme 4: Summary of key findings

- The existing GI network contributes positively to the high quality living environment. The city provides a significant opportunity for the integration of bold GI interventions.
- In general, tree canopy coverage is most sparse where population density increases.
- The Greenness Grid data demonstrates the contrast between areas identified as 90-100% man-made within the city centre and those to the north defined largely as 0-10% man-made within the SDNP.
- Five locations within the city (Kemp Town, Portslade, Whitehawk and two LSOAs bordering Queen's Road from King's Road to North Road) lie within land defined as high priority for tree planting.
- Although some areas of deprivation are close to accessible greenspaces, there is potential to expand the accessibility and integration of these GI assets to benefit these communities.
- The shared positive impact of GI assets for people and nature have been enhanced by projects supported by the Living Coast UNESCO World Biosphere project.

Identification of Green Infrastructure need and deficiency within the city

3.43 Baseline spatial data was gathered as part of the preceding theme analysis using Geographical Information Systems (GIS) to understand and guide future enhancements to the GI network within the city. Using a 25m grid, overall GI need and GI deficiency across Brighton & Hove has been calculated. GI need examines the existing environmental and social issues within the city

which GI could help alleviate. GI deficiency refers to an absence of green and blue multifunctional assets which make up the GI network.

3.44 The datasets used to contribute to GI need and GI deficiency scores are listed in **Appendix A.**

Application of the needs and deficiency mapping

3.45 Mapping of different combinations of GI need and deficiency can act as a high level guide to help prioritise where GI is most required and indicate spatially any gaps in the existing GI network. Both need and deficiency have been plotted on a bivariate map, as shown on **Figure 3.17.** A user guide relating to the outputs is shown in **Figure 3.18**, highlighting how the map should be used to prioritise the creation or enhancement of GI interventions in the administrative boundary of Brighton & Hove. A description of the areas falling under each outcome (Outcomes A-D representing different combinations of GI need and deficiency) within the city is provided below.

Figure 3.18: Needs and deficiency user guide

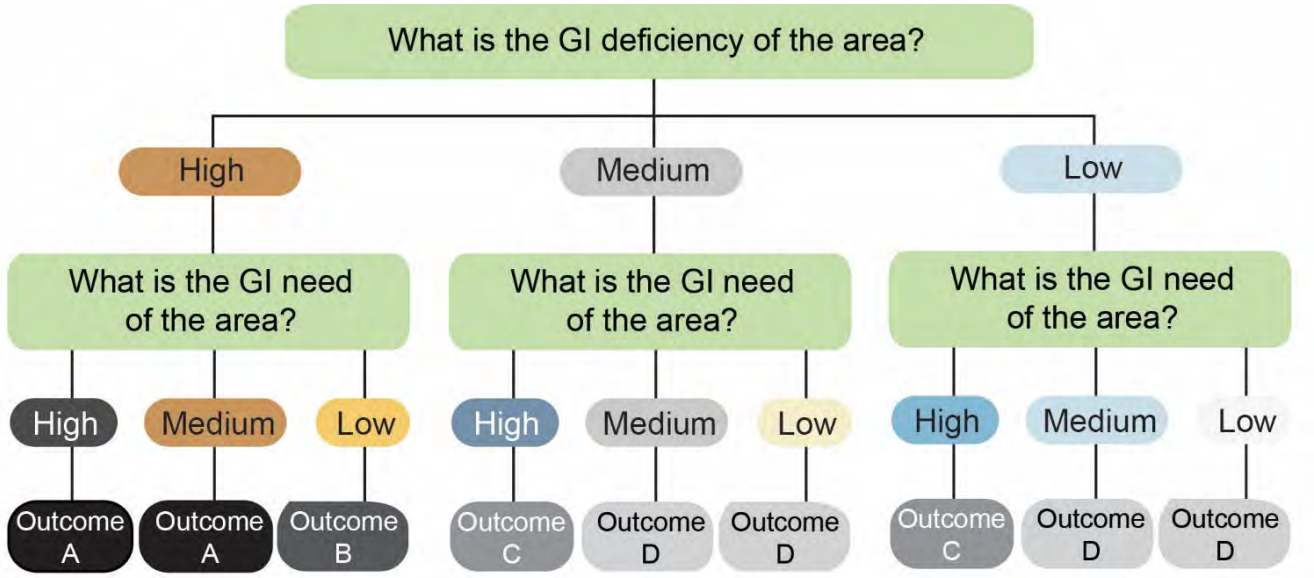

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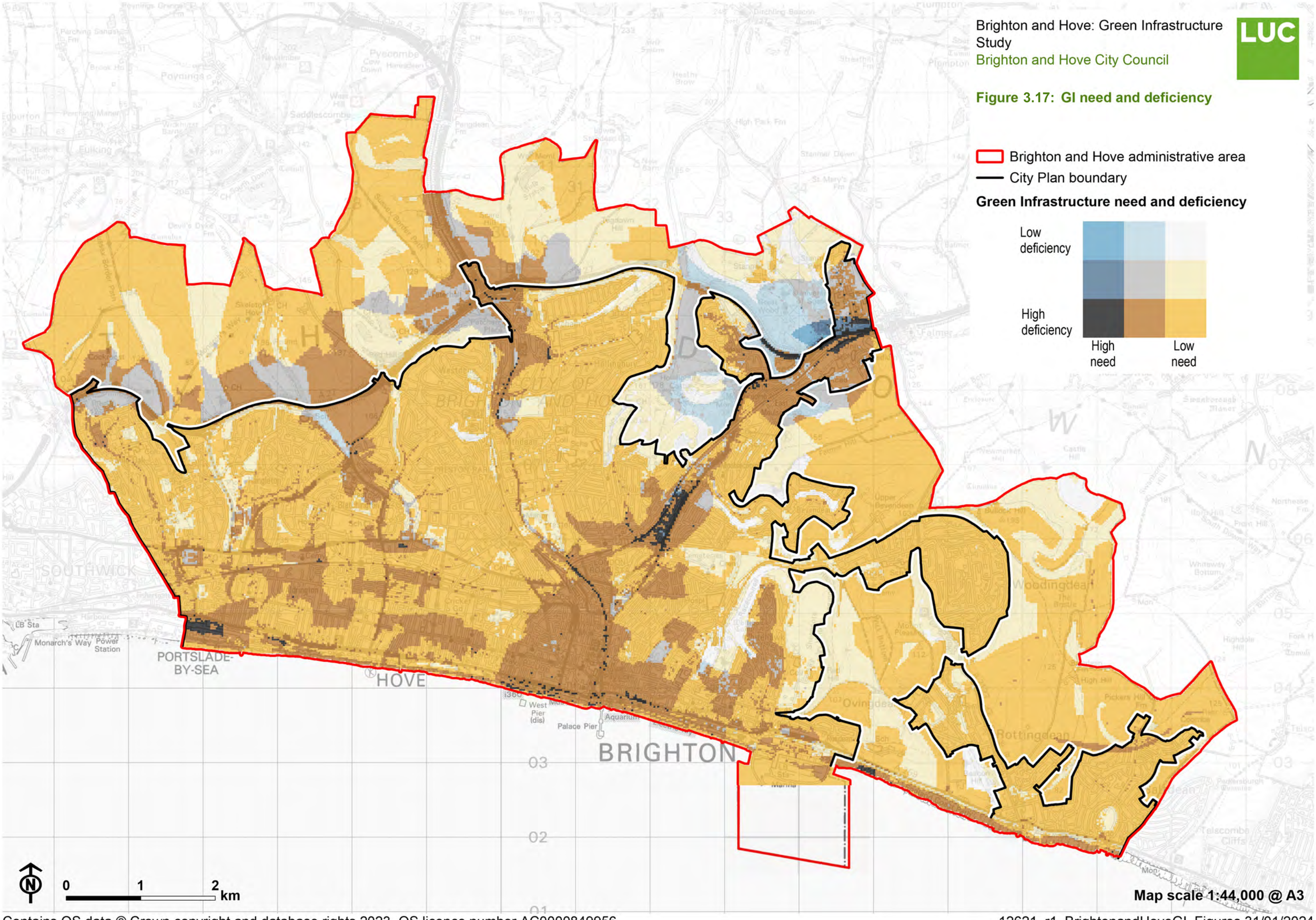
Figure 3.17: GI need and deficiency

Brighton and Hove administrative area
City Plan boundary

Green Infrastructure need and deficiency



Map scale 1:44,000 @ A3

Outcome A - high deficiency of existing GI and a high or medium GI need

3.46 Areas within Outcome A should become priority sites for creation of new GI within the city. GI interventions within these areas should be designed carefully to ensure they can contribute towards the specific issues which contribute to the higher GI need in these locations. Designing for multifunctionality will be crucial in order to address multiple issues simultaneously.

Areas identified as Outcome A within Brighton & Hove

- The mapping outputs indicate that large areas of the city centre lie within Outcome A. These include locations within the dense urban fabric centred around the corridors of the A23 (Grand Parade / London Road), the A2010 (Queens Road / Terminus Road / Buckingham Place), as well as sections of the A259 forming the seafront. These locations are characterised by a high proportion of man-made surfaces, access to just one of the AGS buffers, lack of greenness, impacts of the UHI effect, surface water flood risk and road noise exposure. Additional pockets of high density urban areas defined as Outcome A include areas within Hove (such as Church Road and the A2023 (Sackville Road)) as well as areas within West Hove (such as sections of Portland Road and New Church Road) and Whitehawk.
- The corridor of the A259 (Wellington Road) within Portslade exhibits high deficiency of GI and medium or high GI need. As a result of the man-made wharf / coastal location, this area of Brighton & Hove lies within Flood Risk Zones 2 and 3. There are also pockets of surface-water flood risk at this location, as well as areas subject to road noise pollution. In addition, this location records low scores on the greenness grid, highlighting a high percentage of man-made surfaces.
- Land lying between the corridor of the A270 (Lewes Road) and the rail line falls within Outcome A. This location is subject to relatively high

levels of road and rail noise, and the presence of the AQMA designation. There is also relatively high health deprivation in this part of the city. The greenness grid score within this area reflects the presence of urban development, corridor of tree planting associated with the rail corridor and open spaces such as Saunders Park Recreation Ground. However, the presence of the railway line partially restricts access to these open spaces. This area of the city is devoid of sites designated for their conservation value.

- In the north east of the city, the junction of the A27 and A270 (Lewes Road), including the southern extent of the University of Sussex, lies within land defined as Outcome A. This area of Brighton & Hove is subject to higher groundwater flood risk, road and rail noise as well as the presence of an Inner Zone 1 Source Protection Zone. Whilst this area lies adjacent to an area of low GI deficiency associated with Stanmer Park, the wide dual carriageway of the A27 presents a major barrier to access within this part of the city. Land lying to the south of the A27 corridor, stretching from East Moulsecoomb to the campus of the University of Brighton, also lies within Outcome A.
- Land bordering the corridors of the A2023 (Nevill Road) and the A2038 (King George VI Avenue) and the Toad's Hole Valley site, as well as sections of the A23 corridor (Patcham By-Pass / London Road) at Patcham / Withdean lie within areas defined as Outcome A. This is due to the proximity of an Inner Zone 1 Source Protection Zone as well as road noise on the A27 corridor. This area of land also exhibits relatively higher levels of deprivation, as indicated by the Indices of Multiple Deprivation.

Outcome B - high deficiency of existing GI but low GI need

3.47 Areas within Outcome B would also benefit from increased coverage of GI; however these areas are of a lesser priority than those in Outcome A. There should be an opportunistic approach to creating GI in these locations. In many cases, GI within these areas may contribute to the wider GI network or address single issues within the city.

Areas identified as Outcome B within Brighton & Hove

- Areas of the city which exhibit high deficiency of GI assets and low GI need cover large areas of the urban context of the city. Many of these areas form buffers around the areas of high deficiency and high need identified as Outcome A. Pockets of land identified as Outcome B are located within Hove, West Hove, Mile Oak, Portslade Village, Hangleton, Hollingbury, Westdene and Preston. Lying to the east of the city, portions of land within Woodingdean, Rottingdean and Ovingdean are also defined as Outcome B.
- Tracts of undeveloped land lying within the boundary of the South Downs National Park are also identified as Outcome B. This is due in part to the proliferation of agricultural land in these areas which is rarely considered as a GI asset due to its lack of multi-functional benefits.

Outcome C - medium or low GI deficiency but a high GI need

3.48 Areas within Outcome C are characterised by an existing network of GI assets. However, enhancement or restoration of these GI assets may be needed to ensure that the GI is performing multiple functions. Opportunities to address the high GI need in these locations through GI creation and enhancement should be considered.

Areas identified as Outcome C within Brighton & Hove

- Areas to the north east of the city, located immediately north of the A27 corridor are characterised by medium or low GI deficiency and a high GI need. The pattern of high GI need in this area is due to the presence of a Zone 1 Source Protection Zone, higher groundwater flood risk, intrusion from road noise, and higher levels of living environment deprivation. However, the area comprises a number of GI assets,

contributing to medium or low GI deficiency. These GI features include playing fields, areas of deciduous woodland priority habitat and sections of the ecological network.

Outcome D - medium or low GI deficiency and medium or low GI need

3.49 Areas within Outcome D form the least priority for new GI within the city. However, ongoing maintenance and protection of existing GI assets should continue to maximise the benefits provided by GI in these areas. In addition, areas within Outcome D should also be considered within the wider context. For example, a large open space may appear in an Outcome D area, but the surrounding population it serves may exhibit a wider need for GI, and delivering GI directly within these areas may be challenging due to space constraints. Therefore, there may be a justification for enhancing or creating GI within areas identified as being in Outcome D if they are able to provide wider benefits to a population with a high GI need.

Areas identified as Outcome D within Brighton & Hove

- Brighton & Hove contains a number of sites defined as exhibiting medium or low GI deficiency and medium or low GI need, including areas of open access land at Whitehawk Hill / Race Hill Nature Reserve and Castle Hill. Whilst there is high health deprivation in Whitehawk, there are a number of existing GI assets which overlap within this area, contributing to low GI need. This notably includes natural heritage and biodiversity features such as priority habitat for semi-improved grassland and orchards, local nature reserves and portions of the ecological network. In addition, most of this area is identified as local open space and exhibits a relatively high greenness grid score, indicating a low percentage of man-made surfaces.
- Located to the south east of Ovingdean, land at Beacon Hill demonstrates low GI need and low GI deficiency. Whilst there are

pockets of surface water flood risk, and some intrusion from road noise, this part of the city generally has a low GI need, and is within a wider area with relatively low deprivation. Beacon Hill is an open space, identified within the natural and semi-natural greenspace typology. Ecological assets include semi-improved grassland and deciduous woodland, forming part of the wider ecological network. In addition, there is a very high greenness grid score, indicating a low presence of manmade surfaces.

- A number of parks and open spaces within the city are defined as Outcome D within the mapping output. These include Hollingbury Park, Preston Park, Dyke Road Park, Hove Park, Withdean Park and St. Anne's Well Gardens.
- In the north, within the SDNP, there are several pockets of land defined as Outcome D. These areas include Hollingbury Hillfort, Stanmer Park / Great Wood, Tegdown Hill, Scare Hill and Varncombe Hill. These areas typically include areas of woodland offering higher levels of tree canopy cover, natural and semi-natural open space, exhibit a relatively high greenness grid score and / or form part of the ecological network.
- Swathes of relatively low GI need characterise land to the north of the A27 associated with the SDNP. However, GI need within the SDNP generally increases within closer proximity to this corridor.

3.50 When using the map and user guide, a number of caveats should be considered. The mapping only includes datasets where spatial data is available. For example, the GI needs section of the map includes several different data sets on flood risk, but no data on the risk of drought, which is not publicly available at an appropriate scale for the mapping. In addition, the results of the combined mapping will only be as good as the data itself: so if green roofs, walls or verges are not recorded within the dataset, they will not feed through into the mapping output.

3.51 The findings should be considered carefully to ensure that proposed GI solutions fit the specific needs of the populations they serve. When targeting GI enhancements within Brighton & Hove, it is important to consider the individual

drivers in specific locations of the city, together with the functionality of proposed GI interventions. The NEGIF Design Guide **[See reference 34]** aligns with the ten characteristics of a well-designed place, as set out within the National Design Guide and National Model Design Code. This document should be used as a foundation for designing good quality GI in the city, ensuring the integration of multifunctional GI within future place-making projects and developments.

Chapter 4

Application of the Urban Greening Factor Standard

4.1 This chapter reviews the application of the model UGF policy to eight consented schemes within Brighton & Hove, representative of a range of development types within the city. The approach considers how the potential introduction of a UGF policy would need to respond to the different geographies of Brighton & Hove, including specific contexts and circumstances. The chapter also explores the contribution of different GI interventions ('surface cover types') to the total UGF scores achieved by developments.

4.2 The analysis will inform policy options for a UGF policy in the new City Plan (see **Chapter 5**), including potential differentiation of the policy approach across different parts of the city and / or different development typologies.

Urban Greening Factor Headline Standard

4.3 The UGF has been developed by Natural England **[See reference** 35**]** and forms one of the five Headline Standards outlined in the NEGIF. Created as a planning tool, the UGF aims to improves the delivery and provision of good quality GI in urban environments.

4.4 The UGF is calculated by assigning a score to all the surface cover types in a proposed development based on the ability of the GI measure to provide a variety of benefits, such as reducing storm water run-off. Typically, the better-quality surface cover types that score highest in the UGF are also those which have the most potential to provide benefits for biodiversity. However, the UGF is

not a tool to measure biodiversity benefits *per se*. In addition, UGF scoring does not offer measurement of GI enhancements against a baseline score.

4.5 London was the first city in the UK to adopt a comprehensive urban greening policy. The adopted London Plan includes a policy requirement to achieve specific UGF target scores (a target score of 0.4 for predominantly residential development and a target score of 0.3 for predominantly commercial development). Natural England has adopted the same targets in their model policy. Achieving the scores requires the integration of urban greening features (green roofs, green walls, SuDS, trees, etc.) into a development scheme. By providing a simple metric, the UGF can secure improvements in urban greening of sites whilst giving a degree of flexibility to the developer to devise an approach that is site specific and responds to local context.

Surface cover types

4.6 The UGF is comprised of a menu of 22 surface cover types describing a range of GI interventions, structured around four key headings as outlined below:

- Vegetation and Tree Planting;
- Green Roofs and Walls;
- SuDS and Water Features; and
- Paved Surfaces.

4.7 Each surface cover type has a weighting factor between 0.0 and 1.0 that is used to calculate the UGF score.

4.8 The UGF surface cover types that score highly include retained or created semi natural vegetation, trees, native hedgerow, orchards and allotments, intensive and extensive green roofs, flower rich herbaceous planting, and rain gardens. More detailed information about each surface type and their

application can be found in the Urban Greening Factor for England User Guide **[See reference 33]**

4.9 The option of combining solar panels and green roofs, known as bio-solar roofs, is a GI intervention recognised in the UGF surface cover types. In this scenario, the green roof creates an optimal microclimate for solar panels to run efficiently all year, with the addition of panels resulting in variations in shade and moisture which supports a greater diversity of vegetation. The success of this approach, however, is dependent on the correct design and installation of both elements.

Application of the Urban Greening Factor Headline Standard to consented developments within the city

4.10 This section provides analysis of eight consented developments, provided by BHCC, as example case studies to review the application of UGF scoring to schemes covering a range of development types and locations. The examples include residential, commercial and mixed-use developments in a mixture of city centre, suburban and urban fringe locations. The review assesses whether the model UGF target (0.4 for predominantly residential and 0.3 for predominantly commercial development types, as per the NEGIF) would have been achieved.

4.11 The analysis includes the following information for each development assessed:

- Description of the consented development;
- Summary of proposed surface cover types included in the development proposals;
- Calculated UGF score, outlining whether the model UGF target would have been achieved; and

- Supporting commentary identifying the key findings, including whether alternative surface cover types could have been specified to achieve the UGF target score (if the target was not achieved).

4.12 The quantitative findings of the UGF analysis are provided in **Appendix B.**

Residential developments

Land Off Overdown Rise and Mile Oak Road, Portslade (BH2017/02410 (outline) / BH2018/01441 (reserved matters))

Description of consented development: Outline application for the erection of up to 125 dwellings with associated access from Overdown Rise, landscaping and informal open space and approval of reserved matter for access only.

Summary of surface cover types included in the consented development: Retained semi-natural vegetation, semi natural vegetation (including restored chalk grassland), trees, amenity shrub planting, amenity grass, rain gardens, attenuation basins, in addition to smaller areas of ornamental planting.

Calculated UGF score: 0.48. The consented scheme achieved the model target score of 0.4 for predominantly residential developments, as per the NEGIF.

4.13 The development is accommodated within a site which includes land retained as existing open space or semi-natural habitat immediately south of the

A27. Approximately 25% of the land included within the red line boundary of the scheme is retained semi-natural vegetation, contributing to the UGF score of 0.48. The inclusion of this existing landscape framework within the red line boundary of the development enables the development to achieve the model target score for predominantly residential developments.

4.14 The UGF score for the development reduces to 0.31 if the large expanse of semi-natural vegetation immediately south of the A27 is omitted from the red line boundary.

4.15 Based on its former undeveloped land use prior to development, the site achieved a UGF score of 0.96. Most of the site was comprised of grassland priority habitat with areas of scrub, calcareous grassland and a small area of short sward horse-grazed pasture. This demonstrates that although this development achieved the UGF target, the overall GI on site reduced due to the undeveloped nature of the existing site.

Land to the East of Coldean Lane, North of Varley Halls, Coldean (BH2018/03541)

Description of consented development: Erection of 2 No. seven storey buildings and 4 No. six storey buildings (including lift overruns) to provide 242 No. residential dwellings (C3), 162 car parking spaces, 365 cycle parking spaces, new access from Coldean Lane; associated landscaping incorporating areas of play/amenity space/active learning and substations.

Summary of surface cover types included in the consented development: Retained semi-natural vegetation, semi natural vegetation (including restored chalk grassland and native shrub mix), trees, amenity grass, swale, in addition to smaller areas of ornamental planting and hedging.

Calculated UGF score: 0.63. The consented scheme achieved the model target score of 0.4 for predominantly residential developments, as per the NEGIF.

4.16 This development scores highly due to the relatively large extent of existing semi-natural vegetation which is retained within the red line boundary of the scheme. Built form and sealed surfacing comprises only approximately 30% of the total development area. The development also includes the creation and restoration of chalk grassland, which contributes to the UGF score of 0.63.

4.17 Due to the extensive nature of the grassland retained as part of the scheme, the UGF calculations indicate that even if the areas of proposed restored chalk grassland were substituted for amenity grassland, the development would still achieve the model target score for predominantly residential developments with a score of 0.51.

Commercial developments

270 Old Shoreham Road, Hove (BH2019/00544)

Description of consented development: Demolition of existing buildings (Sui Generis) and the erection of a part 2 storey, part 3 storey building plus lower ground floor and basement comprising self-storage facility (B8) and flexible office space (B1) together with vehicular and pedestrian accesses, parking, associated works and landscaping.

Summary of surface cover types included in the consented development: Trees, ornamental hedging species, amenity shrub planting, sedum green roof and a small area of green wall (climbing plants).

Calculated UGF score: 0.08. The consented scheme did not achieve the model target score of 0.3 for predominantly commercial developments, as per the NEGIF.

4.18 The development is characterised, in part, by a large industrial shed which are often designed to be a relatively lightweight shell structures and often unable to accommodate integrated urban greening. Approximately 92% of the red line boundary of the development is comprised of built form or sealed surface.

4.19 Where planting areas are included in the scheme, these consist of amenity shrub planting of limited biodiversity value which also contribute to the low UGF score. However, even if all the planting areas specified the inclusion of semi-natural vegetation, which is not always appropriate within a densely urban context, the total UGF score would only have reached 0.1.

4.20 Although the scheme includes a green roof on a section of the roof, it consists of a lightweight sedum blanket which provides limited GI benefits. To achieve the model UGF target of 0.3 for commercial development, a development of this scale would likely require an area of extensive species-rich green roof that covers most of the rooftop area, in addition to proposed planting areas at ground level.

Land at Station Street, Blackman Street and Cheapside, Brighton (BH2016/05493)

Description of consented development: Erection of a seven storey office building (B1) plus basement with associated car and cycle parking and landscaping. New vehicular access off Blackman Street.

Summary of surface cover types included in the consented development: Extensive green roof and small areas of amenity shrubs.

Calculated UGF score: 0.12. The consented scheme did not achieve the model target score of 0.3 for predominantly commercial developments, as per the NEGIF.

4.21 An extensive green roof covers approximately 30% of the roof of the development. However, the analysis indicates that a larger area of green roof would be required in order to achieve the UGF target score for commercial developments. There is a lack of GI surface cover types at ground level, with the exception of two raised planters with shrubs, which contribute little to the UGF score.

4.22 If the same area of roof was specified as an intensive green roof, with a minimum depth of 150mm, the UGF score of the development would have increased to 0.18. However, if the extensive green roof was substituted for a bio-solar roof, combined with the area proposed for PV installation, the score would have increased to 0.21.

4.23 In order for this development to achieve the model target score of 0.3 for commercial developments, 65% of the total roof area would need to be an extensive biodiverse green roof / bio-solar roof, or 55% as an intensive green roof.

Mixed-use developments

Sackville Trading Estate and Hove Goods Yard, Sackville Road, Hove (Moda Living scheme) (BH2019/03548)

Description of consented development: Demolition and comprehensive redevelopment of Sackville Trading Estate and Hove Goods Yard, comprising 'build to rent' residential units (C3) with associated internal and external amenity provision; a care community (C2) together with associated

communal facilities, flexible office accommodation (B1); flexible retail floorspace (A1 and/or A3) and community/leisure floorspace (D1/D2); car and cycle parking; integrated public realm; and vehicular access via existing entrance from Sackville Road.

Summary of surface cover types included in the consented development: Semi natural vegetation (native shrubs and groundcover), trees, amenity shrub planting, amenity grass, intensive green roof, in addition to smaller areas of retained semi-natural vegetation (mature trees) and food growing provision.

Calculated UGF score: 0.17. The consented scheme did not achieve the model target scores for either predominantly residential (0.4) or predominantly commercial developments (0.3), as per the NEGIF.

4.24 The proposed development consists largely of built form and sealed surfacing, equating to approximately 80% of the development area.

4.25 Despite the inclusion of an intensive green roof, the proposed planting covers only approximately 3% of the total roof area and therefore does not make a significant contribution to the UGF score.

4.26 The data indicates that if 50% of the total roof area was covered by extensive species-rich green roof, a UGF score of 0.3 would be achieved.

4.27 Substitution of ornamental low growing evergreen hedging with native hedging species would have resulted in an overall UGF score of 0.17, albeit the model UGF score would still not have been achieved.

29-31 New Church Road, Hove (BH2018/02126)

Description of consented development: Demolition of existing synagogue, detached buildings providing rabbi accommodation, synagogue social hall and children's nursery. Erection of a mixed-use development comprising central single storey synagogue and four, five and six storey buildings to provide a replacement children's nursery, 2 No. classrooms for shared use by St Christopher's School, offices, meeting rooms and cafe, underground car park and 45 No. residential dwellings (C3) comprising 35 No. flats and terraces of 10 No. houses to the rear.

Summary of surface cover types included in the consented development: Retained semi-natural vegetation (mature trees), smaller areas of ornamental planting, amenity grass as well as smaller areas of semi natural vegetation.

Calculated UGF score: 0.30. The consented scheme did not achieve the model target score of 0.4 for predominantly residential developments, as per the NEGIF.

4.28 The development results in a reduction in the percentage of greenspace within the red line boundary from 38% to 20% in order to accommodate the proposed built form. Although much of the existing tree canopy is retained and areas of amenity grass are replaced with perennial planting and hedging, the model UGF score for residential developments is not achieved. The existing site would have reached a UGF score of 0.32. Consideration would need to be given to the addition of intensive or sedum green roofs in order to achieve the UGF target score.

Former Dairy, 35 - 39 The Droveway, Hove (BH2020/00931)

Description of consented development: Change of use from former Dairy Crest depot (B8) to mixed-use development comprised of 19 No. dwellings (Use Class C3) & commercial space (Use Class E), including partial demolition of the existing & erection of a new northern wing; erection of a new central wing to courtyard; onsite car & cycle parking and associated works.

Summary of surface cover types included in the consented development: Trees, hedging and amenity grass.

Calculated UGF score: 0.07. The consented scheme did not achieve the model target scores for either predominantly residential (0.4) or predominantly commercial developments (0.3), as per the NEGIF.

4.29 The development forms a refit and refurbishment of existing buildings, potentially limiting the inclusion of urban greening features within the fabric of the scheme.

4.30 The total development area is comprised of approximately 87% built form and sealed surface. Generic green areas on the planning application drawings were assumed to be amenity grass for private residential gardens. This surface cover type made up 87% of the landscape treatments within the proposed scheme. Substitution of some of these areas with species-rich grassland or semi-natural vegetation would have contributed positively to the UGF score, albeit the target score would not have been achieved.

4.31 In order to achieve the model UGF target score, consideration would need to be given to the inclusion of a green roof due to the extent of the building footprints.

118-132 London Road, Brighton (BH2018/02699)

Description of consented development: Demolition of existing building and the erection of a five storey building with retail (A1 use class), community hub, student accommodation reception, laundry, plant room, bin store and cycle store at ground floor level, 232 student rooms (sui generis use class) at first, second, third and fourth levels, and solar PV array on the roof.

Summary of surface cover types included in the consented development: Amenity shrubs in raised beds.

Calculated UGF score: 0.02. The consented scheme did not achieve the model target score of 0.4 for predominantly residential developments, as per the NEGIF.

4.32 Landscape measures are limited to shrub planting and amenity grass located in the first-floor courtyard. Due to the extent of the building footprint and the inclusion of solar PV arrays on the roof, consideration would need to be given to the potential inclusion of a bio-solar roof as a surface cover type in order to achieve the model UGF score.

Summary of key findings

- Of the schemes assessed, only two (BH2018/03541 and BH2018/01441) would have achieved the UGF model target scores recommended by Natural England as part of the NEGIF.
- The two consented schemes that achieved the target UGF score were located within the urban fringe and reliant mostly on the fact that the red line boundary of each scheme included areas of existing greenspace, semi-natural habitat or trees that were retained as part of the development proposals.
- Neither of the schemes that would have met the UGF target scores included urban greening features such as green roofs or walls that are integral to the built form of the proposed development.
- For both of these schemes, it is likely that existing City Plan policies with respect to protection of trees, protection of sites of nature conservation importance and provision of sufficient open space were the main factor that resulted in their achieving the UGF target scores. Furthermore, the introduction of mandatory BNG would further increase the likelihood of these types of schemes meeting the UGF target scores irrespective of any new urban greening policy in the new City Plan.
- The six consented developments that did not achieve the target UGF scores did not incorporate, or were limited in incorporating, urban greening features, green roofs, green walls, new trees or naturalistic SuDS into the schemes.
- Discounting scheme BH2020/00931 (as it was largely a refurbishment project), the schemes that did not meet the UGF target scores are all sites with tightly defined red-line boundaries due to their locations within existing highly urbanised areas of Brighton & Hove.
- For developments in the more densely developed areas of the city, the urban greening measures that would likely be required to achieve the UGF target scores would be a significant increase in the extent and quality of green roofs (and/or planted podiums) and, where feasible, green walls.

- Green roofs are of particular value in confined urban plots as they can be designed to provide benefits such as SuDS, whilst reducing the impact of the urban heat island. However, there are increasing demands on the use of roof-space on new developments due to an increase in the kit required for heat pumps and photovoltaic arrays, and, in certain developments the need for additional stairwells to meet updated fire regulations.

Chapter 5

Policy Recommendations

5.1 This chapter focuses on recommendations for using planning policy and guidance in the new City Plan to help to deliver high quality GI across Brighton and Hove that meets local needs. These are LUC's independent recommendations which will be considered by BHCC during the preparation of the new City Plan.

Embedding GI in the new Local Plan

5.2 BHCC is clearly committed to expanding the GI network alongside new development to ensure 'good growth' is delivered that contributes to high quality places, nature recovery and resilience to the impacts of climate change. Planning policy can play a critical role in meeting this objective, by clearly indicating what land is to be protected from development and/or enhanced, where necessary, and setting clear expectations about what individual developments should provide to contribute to a network of GI across the city.

5.3 BHCC's existing planning policies on Open Space, Biodiversity and Green Infrastructure provide the core planning policy framework for delivering GI. They highlight the importance of existing public open spaces for amenity and recreation - and the need to create additional public open space in certain parts of the city, where possible - and the value of the 'Green Network' as a series of ecologically connected greenspaces and nature conservation features linking the seafront and urban context with the surrounding downland.

5.4 The City Plan Part One also has an underlying theme of greening the urban environment, albeit the policy intent is less clear as it is threaded throughout a range of policies. It is expressed most clearly in the Urban Design Framework SPD which has less direct influence over the design of new development

proposals and identifies a wide range of potential design issues that can contribute to sustainability and better quality development.

5.5 To deliver BHCC's ambition that development contributes to high quality places, nature recovery and resilience to climate change all new development needs to contribute to improved GI. However, due to factors such as scale and location it should be acknowledged that some developments will be able to contribute more than others. BHCC is advised to set out clear expectations of new development, guided by the evidence and opportunities set out in this Study.

5.6 With the introduction of mandatory BNG for most new development, developers are more keenly aware of the need for landscape and habitat creation to feature more prominently in development proposals. However, the BNG approach is not designed to deliver other environmental benefits such as cleaner air or reduced flood risk, albeit the habitats created through this mechanism may provide these as secondary or incidental outcomes. Furthermore, some development proposals in Brighton & Hove may not have to deliver a significant amount of biodiversity net gain – for example – if the site has a very low or zero biodiversity baseline. Consequently, clearer policy and guidance on urban greening in the Local Plan will be necessary to ensure all development makes a contribution.

'Mainstreaming' and other key principles for GI policy development

5.7 When considering future policy requirements, it is important to ensure that there is a GI narrative that is fully embedded within the new City Plan rather than GI being dealt with through an isolated policy alone. GI should be 'mainstreamed' by weaving references to GI throughout other policy areas, including the overarching vision / objectives for the new City Plan and policies on related themes such as regeneration, climate change, active travel and

health and wellbeing. This will allow GI to move beyond being perceived purely as an environmental policy.

5.8 The NEGIF identifies some key principles that should be reflected in local plan policy on green infrastructure and urban greening. These include:

- **Setting out a vision for green infrastructure across the city:** to enable developers and their design teams to understand how their proposal can contribute or 'plug-in' to the wider strategic network.
- **Providing a good evidence base:** enable developers and their design teams to deliver meaningful contributions by being able to access or commission the most appropriate information.
- **Developing clear strategy and policies:** the need to give developers certainty over what GI is needed on a site, including by defining quantitative standards/targets and site-specific requirements in site allocation policies.
- **Influencing the design process:** the need for developers and their design teams to consider multi-functional GI design from the pre-application stage onwards through engagement with relevant stakeholders and analysis of the site and wider context. GI should be multi-functional, varied, connected (for people and nature), designed to be accessible for all and responsive to an area's landscape / character.
- **Ensuring long-term management, maintenance and monitoring:** the need for developers and their design teams to provide sufficient information about long-term management and maintenance to ensure new green infrastructure provides the long-term benefits desired. Also the importance of local authority monitoring and evaluation of GI delivery.

5.9 The NEGIF also suggests that for major developments, developers should be required to submit a Green Infrastructure Plan, potentially integrated into their design and access statement, setting out how the development will meet the GI principles plus Local Policy requirements, standards and design guidance. Natural England states that this plan should include arrangements to ensure that GI is managed, maintained and monitored for a minimum of 30 years.

5.10 This would appear to be a sensible recommendation to allow BHCC to quickly and easily understand how GI has been included in the design of the proposed development. However, we recommend that BHCC considers how GI Plans would relate to draft / final Biodiversity Gain Plans (which will be required for those developments having to deliver BNG) and Landscape and Ecology Management Plans (the documentation currently required as a condition for many developments) before introducing such a requirement. This is to avoid the possibility of requiring overlapping and duplicative documentation that could create an unnecessary burden for both applicants and the planning authority.

5.11 Updated or revised GI policies should be supplemented by clear supplementary guidance (or a design code) explaining how GI should be integrated into the design process, how it can help to meet wider policy requirements and what information should be provided to demonstrate policy compliance.

Policy recommendations

5.12 Based on the analysis set out in this report we recommended that existing policies in the new City Plan should be expanded upon. GI should be addressed within a distinct GI policy separate to other equally important matters such as open space and biodiversity, to ensure that whilst specific policy topics are addressed when and where there is a requirement to do so, they are always considered in relation to the strategic objective of creating an integrated GI network. In addition to a distinct GI policy, reference to GI should also be embedded in other policies / supporting text, where relevant. Inevitably there will be some overlap between policies and, potentially, some tension between different GI functions (for example biodiversity and access), but the proposed policy framework should help to deliver optimal outcomes by encouraging design teams to seek synergies where possible and identify trade-offs where necessary.

5.13 We recommend developing a new GI policy plus an Urban Greening policy to sit alongside updated policies of Open Space and Biodiversity. We have

provided provisional policy wording as draft core policies below, but these will require further testing and refinement. In accordance with the recommendations of the NEGIF, requirements for major developments have been provided to ensure a proportionate approach. It is recommended that a targeted approach to UGF is introduced in order to target areas of high deficiency and high / medium need. We would also recommend that any site specific GI requirements are highlighted in site allocation policies.

5.14 In developing this provisional policy wording and recommendations for supplementary guidance we have considered the NEGIF, including the menu of standards therein. However, we have been mindful of the challenges of delivering new greenspaces in the city to address deficiencies in access to greenspace; the limited scope for tree planting on many development sites in the city given the compact urban form; and existing policies such as DM22 Landscape Design and Trees.

Draft core policies

Green Infrastructure

5.15 Green infrastructure (GI) plays an integral role in making Brighton & Hove a healthy, attractive and climate resilient city and is important in meeting the Local Plan and UNESCO Biosphere objectives.

5.16 All development should avoid the loss and fragmentation of the existing GI network and seek to maximise the provision of GI to benefit both people and nature and to address deficiencies and needs identified in the GI Study and Green Network.

5.17 All major developments must:

- Take a GI design-led approach, and use the GI design checklist to ensure multi-functional GI is considered and well-integrated into developments at the earliest stages, taking into account local needs.
- Consider connectivity as a core principle, integrating active travel and recreational routes which connect with existing and new open spaces and provide onward connections to local facilities and services.
- Demonstrate how delivery of on-site GI, including urban greening features such as green roofs and street trees, complement and/or support the delivery of the mandatory BNG requirement.
- Demonstrate how delivery of GI on-site will be maintained and monitored, and its multi-functional benefits secured, for a minimum of 30 years, including details on how this will be funded.
- Contribute towards the management or improvement of existing GI where the proposed development would result in significant increased use or potential degradation of existing GI.

Urban Greening

5.18 Integrating specific elements of green infrastructure into the fabric of new buildings and associated civic spaces is particularly important in those parts of the city which lack existing GI. These are the parts of the city where the adverse impacts of climate change and the adverse health effects of increased urbanisation are most likely to be felt most acutely.

5.19 Major development within areas falling within Outcome A (exhibiting high GI deficiency and a high or medium GI need) should include GI as part of the site and building design, integrating features such as green roofs or walls, nature-based sustainable drainage, and trees in streets or civic space.

5.20 GI must be provided on site and the proposal should show how design development has carefully considered the potential to achieve an Urban Greening Factor score of 0.4 for residential development and 0.3 for

commercial development in line with the methodology provided in the Natural England Urban Greening Factor Standard.

Supplementary guidance on what good looks like and the GI design / planning process

5.21 BHCC could consider supporting new GI planning policies by developing revised and updated supplementary guidance (or guidance note, design code or design guide) setting out what GI will be expected to be delivered through development. This would help to ensure stakeholders understand what GI should look like in different locations/development types. It could also explain further how developers should seek to meet GI, BNG, SUDS and open space requirements jointly using a structured, context-led approach to design that reduces complexity for developers and planners.

5.22 One option would be to expand on, or develop an addendum to, the existing Urban Design Framework SPD (which already includes some guidance on GI/urban greening in chapters 2 and 3). This could cross reference important wider information sources such as the Green Infrastructure Planning and Design Guide (which forms part of the NEGIF); the National Model Design Code and National Design Guide; and good practice BNG guidance, such as the Greater London Authority's 'Urban Greening for Biodiversity Net Gain: A Design Guide'. However, this approach might compound an existing likely problem of developers and their design teams not reading supplementary documents which do not provide clear, specific guidance that it clearly pertinent to the particular circumstances of Brighton & Hove.

5.23 An alternative approach could be to prepare concise design codes or design guides for specific policies which can be updated regularly with pertinent links to further information and case-studies. Where a development is likely to have a very significant impact on GI this could include recommendations on key

stakeholders that developers should engage with (for example Sussex Local Nature Partnership or Natural England area team).

5.24 In addition, for those developments which, for reasons of size, scale and likely impact, are not likely to be accompanied by detailed supporting information such as strategies for landscape or ecology, a simple checklist could be developed to prompt both developers and planners to ensure that GI and urban greening has been considered throughout the process. Key GI questions that could provide the basis for checklist are set out below. An alternative or complementary approach would be to signpost the Building with Nature standards **[See reference 34]**.

GI checklist

1. Has the development proposal avoided any adverse impacts on existing GI?

5.25 Has information been provided that demonstrates that there will be no direct or indirect adverse impact on any of the GI assets shown as protected features in the City Plan?

2. How has the legal requirement to deliver at least 10% BNG (where applicable) driven the design?

5.26 Where it would be appropriate and feasible, biodiversity net gain should be delivered on-site. Where BNG is a key driver of the landscape design other green infrastructure or urban greening opportunities may be incompatible with the BNG requirement. If this is the case, this should be explained. Where possible GI should be designed to be multi-functional, achieving BNG but also addressing local needs (for example by improving access to existing greenspaces or providing new food growing spaces).

3. Does the development proposal result in the loss of any trees with a diameter at breast height of >10cm

5.27 Existing trees are one of the most important elements of GI especially in the most developed parts of Brighton & Hove. The loss of any trees should be justified and details provided about compensation for any loss. [N.B. This may be covered in a draft Biodiversity Gain Plan where BNG applies].

4. Has sustainable drainage been the starting point for the drainage solution for the site?

5.28 Where evidence indicates surface water flood risk is significant and/or run-off from new development would lead to increased downstream flooding SuDS should be designed into all new development to ‘slow the flow’. These should be designed to maximise benefits for amenity and biodiversity as well as flood risk management and water harvesting/reuse. Access should be provided where it is safe to do so.

5. Does the development provide additional public realm or active travel links through and / or beyond the site boundary

5.29 Where relevant, development proposals should include a clear context map that illustrates how the proposed development will link into the wider active travel network (for example walking and cycling routes) and identify ways the development can strengthen the network, taking into account key destinations (for example schools, workplaces, public transport).

6. How will new GI be maintained in the long-term?

5.30 Consideration of the stewardship of GI should be demonstrated, to ensure long-term management and maintenance. Maintenance arrangements,

responsibilities and long-term funding arrangements must be clearly identified as part of all planning applications.

Wider delivery mechanisms

5.31 A wider delivery plan for the GI opportunities was beyond the scope of this Study but it is recommended this is developed as a follow-on activity. This would include the identification of key delivery partners (for example Natural England; Environment Agency; Sussex Wildlife Trust; Sussex Local Nature Partnership; Sustrans; Brighton BID) as well as key funding mechanisms. The latter will include new Environmental Land Management Scheme funding for land managers (particularly on the downs), government grant funding for woodland creation and management and active travel improvements, mandatory biodiversity net gain funding from developers for onsite and offsite habitat creation and enhancement and potentially also emerging private payments for ecosystem services (for example carbon offsetting via the Woodland Carbon Code or funding from water companies).

Appendix A

Datasets used to inform the analysis of Green Infrastructure need and deficiency

Layers used to calculate GI need

- In 2022, monitoring of the surface and air temperature was undertaken as part of the Brighton & Hove Urban Heat Island Assessment **[See reference 36]**. The UHI effect occurs when urban areas experience temperatures between 1 and 5 degrees warmer than surrounding rural areas. GI interventions can reduce these effects by providing shading, deflecting radiation from the sun, and releasing moisture into the atmosphere. The average surface temperature for Lower Super Output Areas (LSOAs) outside the built footprint across the monitoring period was 19.29°C.
    - Score of 1 where average surface temperature for summer 2022 monitoring period was greater than 24.29°C;
    - Score of 0.5 where average surface summer temperature for summer 2022 monitoring period was greater than 20.29°C but lower than 24.29°C; and
    - Score of 0 for remaining areas.
- The Environment Agency's Flood Zones **[See reference 37]** identify areas at risk of flooding from rivers and the sea. GI can enhance natural flood defences along the seafront and help to mitigate against flood risk. Flood Zone 3 covers areas with a 1 in 1000 year fluvial flood risk and 1 in 200 year coastal flooding. Flood Zone 2 encompasses areas with a 1 in 1000 year fluvial and coastal flood risk.
    - Score of 1 for areas in Flood Zones 2 and 3;

- Score of 0.5 for areas in Flood Zone 2 only; and
- Score of 0 for remaining areas.

- The Environment Agency provides detailed mapping for surface water flood risk **[See reference 38]**, including a 1 in 30 year, 1 in 100 year and 1 in 1000 year likelihood of flooding. GI can reduce the risk of surface water flooding by increasing infiltration, facilitating water storage and slowing the conveyance of water.
  - Score of 1 for greater than 1 for 1 in 30 year flood risk;
  - Score of 0.5 for greater than 1 in 1 in 100 year flood risk; and
  - Score of 0 for remaining areas.
- Risk of flooding from groundwater has been identified based on the depth of groundwater levels **[See reference 39]**. GI offers the opportunity to convey surface water away from areas at higher risk of groundwater flooding, whilst larger scale areas of vegetation can reduce overall water availability through evapotranspiration and groundwater uptake.
  - Score of 1 for water levels within 0.025m of the surface;
  - Score of 0.5 for water levels below 0.5m of the surface; and
  - Score of 0 for remaining areas.
- The Environment Agency identify Source Protection Zones **[See reference 40]** which show the level of risk to groundwater drinking sources from contamination. GI in the form of reed beds and other vegetation can help filter water and remove contaminants of water which infiltrate into the ground.
  - Score of 1 for areas within Source Protection Zone 1; and
  - Score of 0 for remaining areas.
- Air Quality Management Areas (AQMAs) **[See reference 41]** are declared where air quality monitoring indicates an area where national standards for air quality are not achieved. GI can reduce exposure to air pollution, and, on a larger scale, vegetation can remove pollutants.
  - Score of 1 in AQMA; and

- Score of 0 for remaining areas.

- DEFRA provides data on average daytime and night-time noise levels as a result of road **[See reference 42]** and rail **[See reference 43]** sources. Prolonged exposure to noise of 50dB or more has been shown to have negative health risks by increasing stress hormones. Vegetation can reduce exposure to rail noise by creating a barrier to noise, as well as mediating the stress levels associated with exposure to noise.
  - Score of 1 where road **or** rail noise is greater than 75Db;
  - Score of 1 where road noise **and** rail noise are greater than 55Db;
  - Score of 1 where road **or** rail noise is greater than 55Db; and
  - Score of 0 for remaining areas.
- NEGIF mapping records the number of greenspace buffers achieved across a given area **[See reference 44]**. The buffers have been applied based on the size of open spaces within the Ordnance Survey open space dataset according to the Accessible Greenspace Standards (AGS) set out in the NEGIF. GI can increase and enhance the provision of greenspace or provide additional greening which can deliver a suite of health benefits.
  - Score of 1 for areas where no buffers met;
  - Score of 0.5 for areas where only one buffer met; and
  - Score of 0 for remaining areas.
- Indices of Multiple Deprivation (IMD) **[See reference 45]** is a measure of relative deprivation in England. Each LSOA is ranked according to seven domains. GI can be particularly relevant to the Health Deprivation & Disability and Living Environment and Deprivation Domains, by creating high quality, attractive places which promote active lifestyles and improve mental wellbeing.
  - Score of 1 for areas within the 10% most deprived nationally (health deprivation and disability domain);
  - Score of 0.5 for areas within the 10-20% most deprived nationally (health deprivation and disability domain;

- Score of 1 for areas within the 10% most deprived nationally (living environment deprivation domain);
- Score of 0.5 for areas within the 10-20% most deprived nationally (living environment deprivation domain); and
- Score of 0 for remaining areas.

- Historic England's Heritage at Risk (HER) identify heritage assets which are most at risk of being lost as a result of neglect or decay due to inappropriate development. GI can be used as a tool within these areas to help restore the wider setting of historic assets.
  - Score of 1 if within the heritage at risk feature; and
  - Score of 0 everywhere else.

Layers used to calculate GI deficiency

- The National Tree Map **[See reference** 46**]** indicates the locations and extent of canopy cover in England and Wales. Tree canopy cover is an important component of the GI network, offering shading, air filtration, and aesthetic benefits. The tree density for each 25m grid square across Brighton & Hove has been calculated.
  - Score of 0 for the highest tree density;
  - Score of 1 for no tree canopy; and
  - Sliding scale from 0 to 1 for highest to lowest tree canopy.
- BHCC hold point data for green roofs and walls within the city. These features can form important green assets within urban areas. Well-designed green roofs and walls can provide permeable surfaces, offer insulation for buildings, decrease noise levels and purify the air.
  - Score of 0 where green roofs and walls have been recorded; and
  - Score of 1 for remaining areas.

Appendix A Datasets used to inform the analysis of Green Infrastructure need and deficiency

- Verge data provided by BHCC on some of the grass verges within the city. These can offer green linear corridors within the city, supporting connectivity of species.
    - Score of 0 along where road verges are present; and
    - Score of 1 for remaining areas.
- Forming a component of the NEGIF, the Greenness Grid **[See reference 47]** calculates the average percentage of man-made surface coverage on a 250m grid. GI can help reduce flood risk by offering permeable surfaces and reducing the impact of the Urban Heat Island effect. Score of 1 for greater than 90% man-made surfaces;
    - Reduction in 0.1 from score for every 10% reduction in man-made surfaces; and
    - Minimum of 0 for everywhere with 10% of less man-made surface.
- Local open space data within Brighton & Hove includes 16 different open space typologies (as detailed in paragraph **3.9**). These areas form important recreational assets, offering space to participate in physical activity and play, as well as social spaces which promote contact with nature and wider health benefits.
    - Score 0 for accessible open space;
    - Score of 0.5 for restricted access open space; and
    - Score of 1 for remaining areas.
- The Public Rights of Way (PRoW) network offers connectivity to the wider landscape within Brighton & Hove, promoting physical activity.
    - Score of 0 along Public Rights of Way; and
    - Score of 1 for remaining areas.
- Open access land, under the Countryside and Rights of Way (CRoW) Act 2000 **[See reference** 48**]** and National Trust: Land Always Open **[See reference** 49**]** highlight areas with the right to free access, including areas of common. As with the PRoW network, these spaces offer greater opportunity to connect local populations with the wider landscape.

  - Score of 0 within open access / always open land; and
  - Score of 1 for remaining areas.

- Sites of Special Scientific Interest (SSSI) **[See reference** 50**]** form core habitat areas, offering the opportunity to form wider habitat networks.
  - Score 0 within SSSI; and
  - Score of 1 for remaining areas.
- National Nature Reserves (NNR) **[See reference** 51**]** are managed by Natural England and offer open access to the public, providing opportunities for visitors to connect with nature.
  - Score of 0 within NNR; and
  - Score of 1 for remaining areas.
- Local Nature Reserves (LNR) in Brighton provide wild spaces which support plant and animal communities, whilst offering spaces for people to connect with nature.
  - Score of 0 within LNR; and
  - Score of 1 for remaining areas.
- Natural England identifies areas of ancient and semi-natural woodland **[See reference** 52**]**. These are species rich habitats and provide cultural and landscape value. Soils within ancient woodland are particularly important, and can contribute to large carbon capture stores, mitigating the impacts of climate change.
  - Score of 0 within ancient and semi-natural woodland; and
  - Score of 1 for remaining areas.
- The Priority Habitat Inventory **[See reference** 53**]** identifies habitats which have been recognised as important for conserving biodiversity.
  - Score of 0 within areas identified as priority habitat; and
  - Score of 1 for remaining areas.

Appendix A Datasets used to inform the analysis of Green Infrastructure need and deficiency

- The Forestry Commission's National Forest Inventory **[See reference** 54**]** identifies areas of woodland, including young woodland and scrubland. Trees offer shading, are able to stabilise soil and reduce erosion, intercept rainfall as well as reduce flood risk. Trees also act as carbon stores.
  - Score of 0 within woodland; and
  - Score of 1 for remaining areas.
- Registered Parks and Gardens (RPG) **[See reference** 55**]** denote sites of heritage significance. Whilst these sites may not be accessible to the public, they exhibit cultural and historic landscape value, and can contribute to the wider character of an area.
  - Score of 0 within RPG; and
  - Score of 1 for remaining areas.
- Brighton & Hove's Ecological Network identifies all habitats within the city, including areas of ecological connectivity.
  - Score of 0 within ecological network; and
  - Score of 1 for remaining areas.

Appendix B

Urban Greening Factor – Quantitative Findings

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: Bh2016 05493

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	0.00	1.0	0.00	
2	Semi-natural vegetation established on site	0.00	1.0	0.00	
3	Standard / semi-mature trees (planted in connected tree pits)	0.00	0.9	0.00	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	0.00	0.7	0.00	
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	0.00	0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	0.00	0.6	0.00	
9	Amenity shrub and ground cover planting	5.46	0.5	2.73	
10	Amenity grasslands including formal lawns	0.00	0.4	0.00	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	217.32	0.5	108.66	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	0.00	0.5	0.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	83.27	0.2	16.65	
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	0.00	0.0	0.00	

Total Value	128.04
Total Development Site Area (m2)	1100
Urban Greening Factor	**0.12**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: Bh2018 01441

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	3,011.57	1.0	3,011.57	
2	Semi-natural vegetation established on site	20,910.90	1.0	20,910.90	
3	Standard / semi-mature trees (planted in connected tree pits)	1,265.50	0.9	1,138.95	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	0.00	0.7	0.00	
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	220.25	0.7	154.18	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	567.51	0.6	340.51	
9	Amenity shrub and ground cover planting	3,129.01	0.5	1,564.50	
10	Amenity grasslands including formal lawns	35,325.58	0.4	14,130.23	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	288.74	0.7	202.12	
18	Open swales and unplanted detention basins	1,192.65	0.5	596.33	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	0.00	0.2	0.00	
21	Partially sealed and semi-permeable paving	4,658.12	0.1	465.81	
22	Sealed paving (including concrete and asphalt)	0.00	0.0	0.00	

Total Value	42,515.09
Total Development Site Area (m2)	88800
Urban Greening Factor	**0.48**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: Bh2018 02126

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	634.70	1.0	634.70	
2	Semi-natural vegetation established on site	114.29	1.0	114.29	
3	Standard / semi-mature trees (planted in connected tree pits)	0.00	0.9	0.00	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	0.00	0.7	0.00	
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	303.79	0.7	212.65	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	4.29	0.6	2.58	
9	Amenity shrub and ground cover planting	202.06	0.5	101.03	
10	Amenity grasslands including formal lawns	258.73	0.4	103.49	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	0.00	0.5	0.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	59.42	0.2	11.88	
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	0.00	0.0	0.00	

Total Value	1,180.62
Total Development Site Area (m2)	4000
Urban Greening Factor	**0.30**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: BH2018 02699

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)		1.0	0.00	
2	Semi-natural vegetation established on site		1.0	0.00	
3	Standard / semi-mature trees (planted in connected tree pits)		0.9	0.00	
4	Native hedgerow planting (using mixed native species)		0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)		0.7	0.00	
6	Food growing, orchards and allotments		0.7	0.00	
7	Flower rich perennial and herbaceous planting		0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)		0.6	0.00	
9	Amenity shrub and ground cover planting	93.10	0.5	46.55	
10	Amenity grasslands including formal lawns	81.60	0.4	32.64	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)		0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)		0.7	0.00	
13	Extensive green roof (meets GRO Code)		0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)		0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)		0.5	0.00	
16	Wetlands and semi-natural open water		1.0	0.00	
17	Rain gardens and vegetated attenuation basins		0.7	0.00	
18	Open swales and unplanted detention basins		0.5	0.00	
19	Water features (unplanted and chlorinated)		0.2	0.00	
20	Open aggregate and granular paving		0.2	0.00	
21	Partially sealed and semi-permeable paving		0.1	0.00	
22	Sealed paving (including concrete and asphalt)	183.00	0.0	0.00	

Total Value	79.19
Total Development Site Area (m2)	3400
Urban Greening Factor	**0.02**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: BH2018 03541

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	6,804.00	1.0	6,804.00	
2	Semi-natural vegetation established on site	13,396.00	1.0	13,396.00	
3	Standard / semi-mature trees (planted in connected tree pits)	235.00	0.9	211.50	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	185.00	0.7	129.50	
6	Food growing, orchards and allotments	51.00	0.7	35.70	Fruit trees
7	Flower rich perennial and herbaceous planting	0.00	0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	0.00	0.6	0.00	
9	Amenity shrub and ground cover planting	1,108.00	0.5	554.00	
10	Amenity grasslands including formal lawns	2,602.00	0.4	1,040.80	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	602.00	0.5	301.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	1,401.00	0.2	280.20	including area labeled 'chalk pathway' in landscape strategy, and woodchip mulch forest walk
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	7,521.00	0.0	0.00	

(Buildings footprint: 3,329.7)

Total Value 22,752.70

Total Development Site Area (m2) 35,932.88

Urban Greening Factor **0.63**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: BH2019/00544

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	0.00	1.0	0.00	
2	Semi-natural vegetation established on site	0.00	1.0	0.00	
3	Standard / semi-mature trees (planted in connected tree pits)	52.70	0.9	47.43	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	0.00	0.7	0.00	
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	0.00	0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	33.16	0.6	19.90	Hedging- but non-native species such as pyracantha, prunus lusitanica, and ornamental Ilex species
9	Amenity shrub and ground cover planting	264.70	0.5	132.35	
10	Amenity grasslands including formal lawns	0.00	0.4	0.00	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	341.00	0.3	102.30	
15	Green facades and modular living walls (rooted in soil or with irrigation)	23.00	0.5	11.50	23m length of external wall planting with climbing species 'vitis coignetiae'
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	0.00	0.5	0.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	0.00	0.2	0.00	
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	1,782.77	0.0	0.00	(Including 565.23m2 access road)

(Building footprint: 1860.88m2)

Total Value 313.48

Total Development Site Area (m2) 3,982.30 (as measured on our scaled CAD drawing)

Urban Greening Factor **0.08**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: BH2019 03548

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	39.00	1.0	39.00	Retained mature trees (excluding those rooted outside RLB)
2	Semi-natural vegetation established on site	2,934.26	1.0	2,934.26	
3	Standard / semi-mature trees (planted in connected tree pits)	0.00	0.9	0.00	
4	Native hedgerow planting (using mixed native species)	0.00	0.8	0.00	
5	Standard / semi-mature trees (planted in individual tree pits)	993.00	0.7	695.10	210m2 from trees on rooftop
6	Food growing, orchards and allotments	15.00	0.7	10.50	Rooftop raised beds for food growing
7	Flower rich perennial and herbaceous planting	0.00	0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	0.00	0.6	0.00	
9	Amenity shrub and ground cover planting	2,506.25	0.5	1,253.13	(including 608.02m2 hedging using low growing evergreen species)
10	Amenity grasslands including formal lawns	1,661.23	0.4	664.49	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	474.42	0.8	379.54	Raised planters with ornamental planting (413.64m2) and hedging (60.78m2).
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	0.00	0.5	0.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	0.00	0.2	0.00	
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	14,673.06	0.0	0.00	

Buildings footprint: 14,041.46m2

Total Value 5,976.01

Total Development Site Area (m2) 35,816.85

Urban Greening Factor **0.17**

Urban Greening Factor User Guide Spreadsheet - Natural England Green Infrastructure Framework Version 1.1 31012023

Application: BH2020 00931

Excel Spreadsheet for calculating the Urban Greening Factor (UGF)
Refer to UGF User Guide for description and specification of surface cover types and guidance on completing the UGF calculation
The applicant should provide area figures for the cells highlighted in yellow and all area figures are to be in Square Meters (m2)

No.	Surface Cover Type	Area (m2)	Factor	Value	Notes
1	Semi-natural vegetation and wetlands retained on site (including existing / mature trees)	0.00	1.0	0.00	
2	Semi-natural vegetation established on site	0.00	1.0	0.00	
3	Standard / semi-mature trees (planted in connected tree pits)	15.00	0.9	13.50	No tree species given- mature canopy spread estimated on space available between tree symbols (2.5m for smaller, 5m for larger)
4	Native hedgerow planting (using mixed native species)	72.62	0.8	58.10	No information about species used
5	Standard / semi-mature trees (planted in individual tree pits)	62.50	0.7	43.75	No tree species given- mature canopy spread estimated on space available between tree symbols (2.5m for smaller, 5m for larger)
6	Food growing, orchards and allotments	0.00	0.7	0.00	
7	Flower rich perennial and herbaceous planting	0.00	0.7	0.00	
8	Single Species or mixed hedge planting (including linear planting of mature shrubs)	0.00	0.6	0.00	
9	Amenity shrub and ground cover planting	0.00	0.5	0.00	
10	Amenity grasslands including formal lawns	522.91	0.4	209.16	
11	Intensive green roof (meets the Green Roof Organisation / GRO Code)	0.00	0.8	0.00	
12	Extensive biodiverse green roof (meets the GRO Code, may include Biosolar)	0.00	0.7	0.00	
13	Extensive green roof (meets GRO Code)	0.00	0.5	0.00	
14	Extensive sedum only green roof (does not meet the GRO Code)	0.00	0.3	0.00	
15	Green facades and modular living walls (rooted in soil or with irrigation)	0.00	0.5	0.00	
16	Wetlands and semi-natural open water	0.00	1.0	0.00	
17	Rain gardens and vegetated attenuation basins	0.00	0.7	0.00	
18	Open swales and unplanted detention basins	0.00	0.5	0.00	
19	Water features (unplanted and chlorinated)	0.00	0.2	0.00	
20	Open aggregate and granular paving	0.00	0.2	0.00	
21	Partially sealed and semi-permeable paving	0.00	0.1	0.00	
22	Sealed paving (including concrete and asphalt)	3,082.80	0.0	0.00	No description for paving/surfacing types given

(Buildings footprint: 752.74)

Total Value 324.51

Total Development Site Area (m2) 4,431.07 (as measured on our scaled CAD drawing)

Urban Greening Factor **0.07**

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