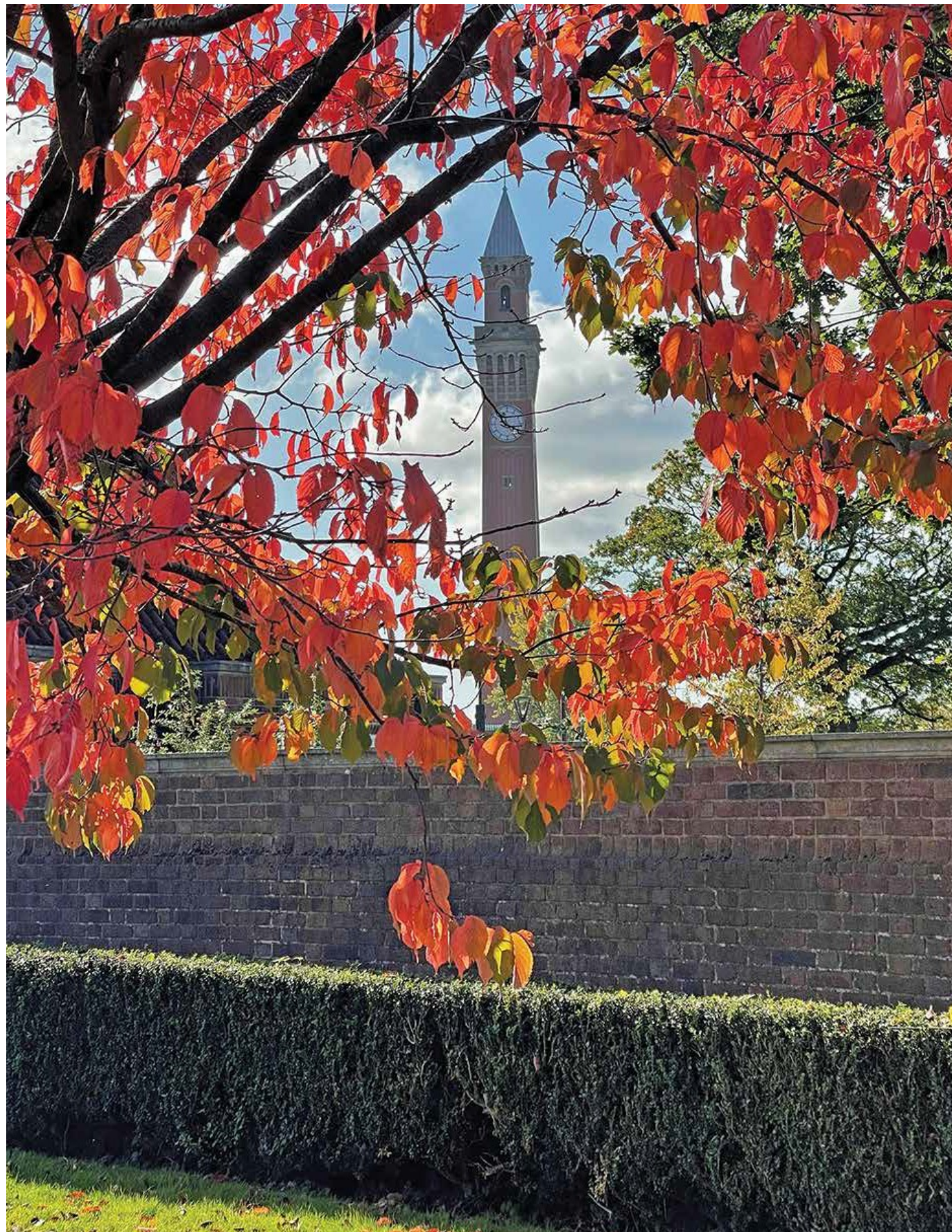




# Birmingham Design Guide

Landscape and Green Infrastructure City Manual

September 2022

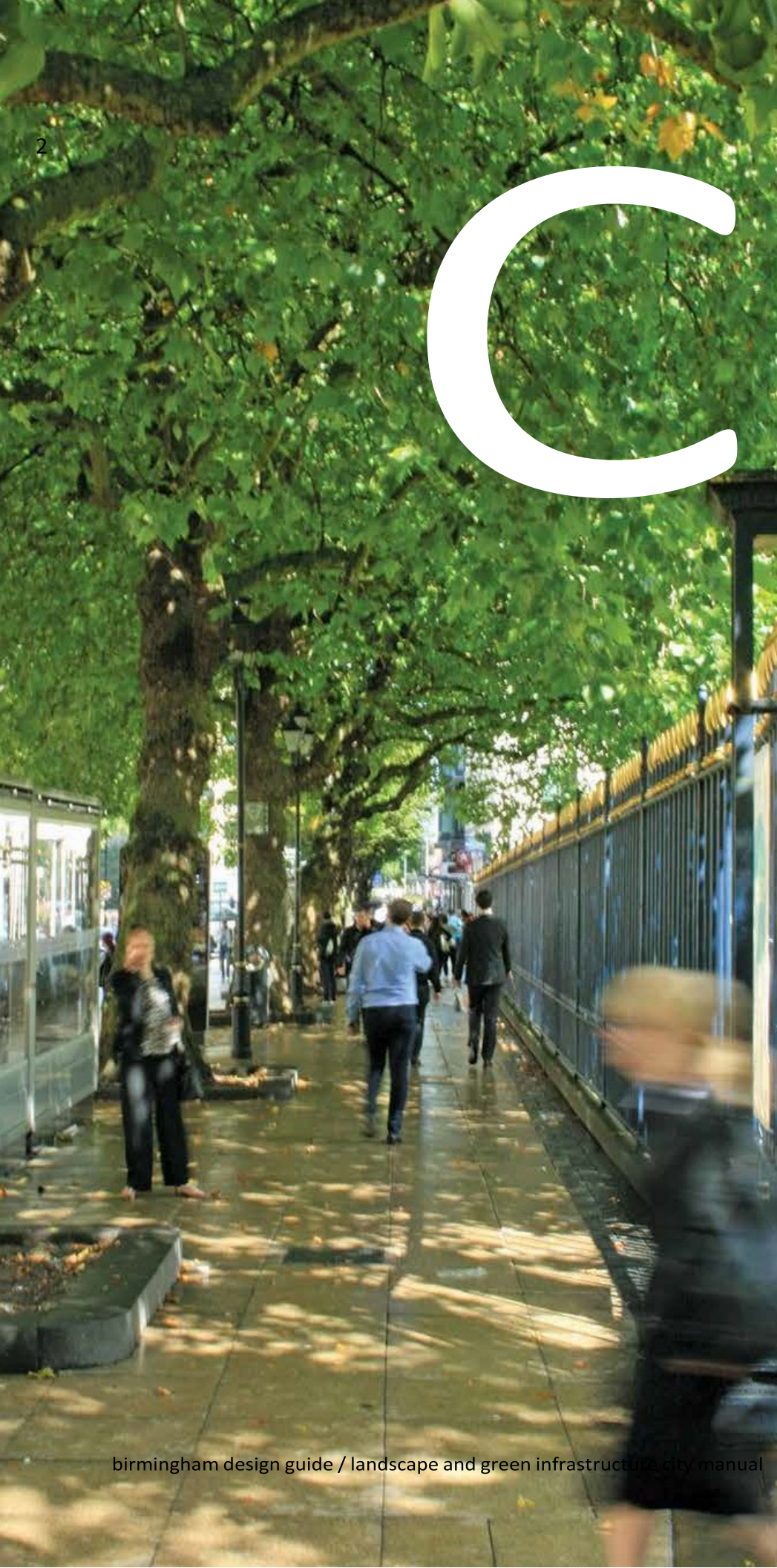


# Birmingham Design Guide

## Landscape and Green Infrastructure City Manual

September 2022





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# 1 Creating resilient and enduring landscape

## CITY NOTE GI-1

Protect and use existing landscape assets

1.1 Development sites and their immediate surroundings often contain existing landscape features and assets that contribute positively to the landscape character, appearance of the site and surrounding area. These can include existing trees, shrubs and hedgerows, ponds, streams and grassland; and where appropriate, these features must be retained and integrated into the development. This will help retain an element of the existing landscape character and local distinctiveness, bring a sense of maturity to the scheme and inform the wider design for the site.

1.2 Sites may also possess archaeological remains, which if present should be protected and incorporated into a design, where appropriate.

1.3 A site survey and assessment should identify the existing landscape features on the site and establish their value and contribution. Features to be retained should be incorporated positively into the proposal's landscape design. Where development would result in the loss of existing features, this must be robustly justified and appropriate mitigation provided as part of the scheme.

1.4 Landscape features to be retained, should be protected during construction. Careful consideration is required when planning construction activities. Where temporary site compounds are to be located on open space areas, trees and other vegetation should be protected and the area made good before completion.

1.5 Soil is a finite, non-renewable landscape resource which must be appropriately protected and managed during construction activity. The City supports the application of the guidance contained in the Department for Environment, Food and Rural Affairs (DEFRA) 'Construction Code of Practice for the Sustainable Use of Soils on Construction Sites'.<sup>1</sup>

<sup>1</sup> Government Code of practice website

## CITY NOTE GI-2

Respecting existing character areas

1.6 New development will often be proposed in areas with an established positive urban realm or landscape character and a distinctive sense of place. In these situations, landscape proposals should assist in integrating the development seamlessly into its context. Using typical features and characteristics of the area will often help achieve this. For example:

- Retaining the existing balance of hard and soft landscape;
- Proposing species which are typical of the context;
- Using retained landscape features as focal points and to frame views;
- Specifying paving materials used locally and which complement existing buildings; and/or
- Using locally typical boundary treatments, such as hedgerows, walls and railings.

1.7 However, nearby examples of landscape design which are considered poor and detract from the quality of the area should not be used as a precedent.





Port Loop masterplan, Glenn Howells Architects.  
© Shaw & Shaw.



Royal Wharf masterplan, Glenn Howells Architects.  
© Edward Hill.

### CITY NOTE GI-3

#### Giving space to soft landscape

1.8 Whether designing a landscape proposal to effectively integrate the scheme into the local context, or creating a place with a completely new character, soft landscape should form a key element of the scheme. It must successfully complement the architecture to create high quality places.

1.9 Proposals must devote sufficient space to soft landscape, enabling the design to maximise green infrastructure gains, provide amenity for building users, aid surface water management and enhance the surrounding environment.

1.10 To ensure soft landscape proposals are deliverable and robust, it is necessary to consider:

- Whether site conditions will allow the successful establishment of the proposed scheme;
- How the landscape will establish over time;
- Whether there is sufficient space for the proposed planting to reach maturity;
- Whether the mix of species is appropriate, considering biodiversity benefits, local climate, soil composition and site characteristics;
- How people will use, interact with and value the landscape;
- Whether potential conflicts with adjacent buildings, vehicles or users can be designed;
- The levels of direct sunlight a space will receive throughout the year; and
- Future management and maintenance requirements (annual and life-time costs).

1.11 Considering these factors at the outset should lead to a robust landscape scheme that can successfully mature and not require onerous maintenance or replacement over time.

### CITY NOTE GI-4

#### Create spaces to aid health and wellbeing

1.12 Landscape design has an important role to play in health and wellbeing. Open spaces provide opportunities for exercise and recreation; contact with nature and green environments are known to benefit mental health; and the city's outdoor streets and spaces are a vital setting for social contact and interaction.

1.13 In designing and specifying new spaces and environments, designers must consider how people use, engage with and enjoy the places being created. Where appropriate, opportunities for seating, exercise, cultural and social activity should be incorporated into the design.

1.14 Designers should gain an understanding of the local demographic and wider intended users, to help identify any specific requirements that should influence the overall design of outdoor spaces. For instance they may need to be steered by the needs of children, provide dementia friendly environments, or have relevance to the culture or faith of the people who use them.

1.15 Consideration should also be given to how scent, movement, texture and colour can enhance the human experience of outdoor spaces, selecting trees and plants to appeal to all the senses through the seasons.

1.16 The creation of innovative public spaces can be enhanced through the commissioning of a professional artist whose creative input as part of the landscape team in the early planning stages could help to deliver greater value from a pre allocated budget.

## CITY NOTE GI-5

### Spaces for children and young people

1.17 Designers must give specific consideration to the wellbeing of children and young people, and how their formal and informal use of space can be accommodated in outdoor spaces. Birmingham's children and young people are one of its greatest assets and the city's landscapes must be accessible to them and meet their needs.

1.18 Open space provision often provides formal recreation facilities for children, but the design of all the city's public realm must be informed by how young people want to use its streets and spaces. Moreover, designs driven by children, which are influenced by how their young, inquisitive minds see, engage with and explore places can result in landscapes that delight and benefit all age groups.

1.19 Teenagers and young people often use spaces to meet, socialise and undertake urban sports such as skateboarding. Whilst in many cases their use of landscapes is informal, designers must consider young people and wherever appropriate engage with them in designing public landscape. Designs often seek to prevent sports such as skateboarding taking place, but they are part of the city's culture, and where appropriate designers should enable and design for urban sports taking place.

1.20 Developers are encouraged to refer to city policy on play and public open space provision when developing their proposals for a site.

## CITY NOTE GI-6

### Designing out potential for crime

1.21 The design of the city's outdoor space, and the choice of planting, hard landscape, furniture and other features influence how places are perceived and the way they function. Above all, landscape design should help create safe environments, be it for people in adjacent buildings or others interacting with the landscape. When creating designs for landscape and public realm, consideration must be given to ensuring safety, security, quality and

robustness over the long term. Designs and management plans should build in the maintenance and cleansing needed to retain the quality of spaces and ensure they function safely.

### Defensible space

1.22 Planting and boundary treatments along building frontages can be used to help create defensible space and define public and private areas. This is particularly important where development has limited setback from pavement or public space. The degree of setback will be influenced by local character, however care should be taken not to block light or outlook from living rooms, or create hiding places.

### Public landscapes

1.23 Landscape design in the public realm should be designed to help support safe use and activity. The nature, role and location of a space or route may dictate specific measures or features that need to be incorporated, but all spaces should be effectively overlooked and have clear lines of sight through them.

1.24 Where features are needed to safeguard users or buildings against potential threats or unwanted activity, measures must be effectively integrated into the design. These features should not dominate or have a negative impact on the quality of the places. Where possible, security features should be integrated into everyday landscape elements such as seating, bins, signage, fencing or level changes. This dual function approach will help reduce clutter and avoid an overly defensive character. Trees may also serve as barriers in some situations.

1.25 The design of outdoor space should promote the safety of its users. It should be well overlooked by active frontages and uncluttered by furniture or other features. Planting should be specified to avoid creating hiding places or block sight lines. Movement and interaction between pedestrians, cyclists and vehicles in the public realm should be carefully considered.

1.26 To help reduce the potential for littering, schemes should ensure sufficient litter bins are provided in convenient and desirable locations. Where there is the potential for unwanted graffiti, appropriate surface treatments or coatings should be used to limit the potential or enable cleaning.



## CITY NOTE GI-7

### Landscape elements and features

1.27 Successful landscape designs derive from the interplay of carefully selected hard and soft features. Together these will contribute to engaging environments which respond to local character, create a positive sense of place, function well and contribute to the city's green infrastructure network.

### Soft landscape features

1.28 When specifying and designing the soft landscape elements of a scheme, designers must take into account aspects of the site and its surroundings such as local topography, soil composition and microclimate (including sunlight, shade, temperature, frost pockets, wind, rainfall). This will help ensure that planting establishes well and makes a positive contribution to the city's green infrastructure in the long term. Promoting biodiversity should be a key aim in virtually every planting scheme, playing an active role in habitat creation (as detailed in City Notes GI-21 to GI-23).

1.29 Using species which are already present in the environment may be appropriate. However, landscape designers should seek to apply variety across a scheme, helping to add visual interest and seasonal variation. Designers must also be well informed about current biosecurity issues, threats and resilience to disease when selecting species.

1.30 Consideration should also be given to the future management of proposals, taking into account the level of future maintenance that can or is likely to be committed to a scheme.

1.31 Existing trees - informed by a tree survey, existing trees should be retained and integrated into landscape proposals for new developments. Existing trees can be important landmarks, increase the visual appeal of a development, add maturity to the landscape, benefit local microclimates and safeguard sense of place for future generations.

1.32 Proposed trees - where possible, proposals should seek to accommodate a variety of tree species, with a range of ultimate sizes, forms, foliage, flowers and fruit to create visual interest across the seasons and provide wider biodiversity gains. The emphasis

should be on 'right tree, right place'. Where there is insufficient space for tree planting, larger feature shrubs with tree-like forms such as Amelanchier should be used to help give structure, height and stature to the proposals.

1.33 Where trees are to be introduced into a predominantly hard paved environment, enhanced tree pits should be installed to provide appropriate growing conditions for the species. Refer to City Notes GI-19 and GI-20 for further details.

1.34 When considering siting and species selection, designers must seek to minimise potential conflicts with adjacent buildings and their users. For instance, fruit or sap dropping species should be avoided close to car parking and dense canopied trees should be located a sufficient distance from primary living spaces, to reduce impact on natural light. By reducing the potential for future conflicts, designs will help reduce the threat of future tree removal.

1.35 More detailed guidance related to existing trees and the planting of new trees is detailed below in City Notes GI-8 to GI-20.

1.36 Shrubs, hedgerows and structure planting - can be used effectively to help frame and enclose spaces, delineate boundaries, provide screening, introduce layering and variety; and help buildings 'tie' into the ground. Whilst a species mix should be informed by its function, using a limited palette of species or a repetitive layout should be avoided, unless there is a clear design justification. An appropriate mix of species should be included to provide variety in colour, form, height, density and seasonal interest.

1.37 Designers should seek to incorporate native species within shrub and structure planting, particularly where sites lie close to protected green space or established areas of green infrastructure such as woodlands, rivers or canal corridors, countryside or parks.

1.38 Mixed native species hedgerows will support wildlife and provide a robust boundary once matured.

1.39 Incorporating ornamental (exotic or non-native) species into landscape proposals will add further interest, for instance by introducing flowering species that can add layers of colour and pollinating species to support a range of insects.

1.40 A mix of native and non-native planting can be useful in some situations. For instance, a mix including hardy dense evergreen species may be appropriate when creating a defensible barrier. When tall evergreen shrubs are required to screen built elements, these should be mixed with native species and climbers.

1.41 Species selection must also consider the context. For instance, if planted adjacent to driveways or within a visibility splay, shrubs must be robust and low growing (to no more than 60cm height when mature). Spiny plants are often inappropriate in housing schemes.

1.42 Further detail on biodiversity aspects is provided in City Note GI-21 to GI-24.

1.43 Lawns and grassland - these will rarely be acceptable as the only component of a soft landscape scheme but can be useful within a wider landscape proposal. The choice of seed mix will be driven by context, microclimate, ground conditions, purpose and maintenance expectations. Wildflower grassland or meadows should be considered where appropriate to the use and where space allows, as the biodiversity gains can be significant. A method statement and management plan will usually be required for wildflower grassland, which is less straightforward to establish than amenity grass.

1.44 The selected mowing regime for an area of grass is important to get right, with the cutting height, timing and mowing frequency influencing the desired appearance and species richness of the sward. Wildflower grass in particular has specific maintenance requirements to be successful in the long term. Allowing for a close mown margin around areas of longer grassland can reassure the public that the management regime is intentional.

1.45 Water assets and features - the integration and use of water in landscape can provide a range of benefits to the space and its users. They can provide a focal point within a design; support the health and wellbeing of users (via interaction, movement, noise); attract wildlife; and contribute to a SuDS system. The introduction of new assets that expand the city's blue infrastructure network is supported; but where existing assets lie within a site or adjacent to its proposals, proposals must seek to integrate and enhance the asset within the design.

1.46 Sustainable urban drainage systems (SuDS) - primarily these reduce the risk of flooding from both surface water and watercourses in a sustainable and cost-effective way. However there are many other benefits to be had, including improved water quality, habitat creation, biodiversity, and the design of more attractive and less engineered environments. SuDS can be retrofitted into streets, gardens, parks and open spaces, but in the context of new development, they should be considered at the earliest opportunity, with landscape designers working in tandem with drainage engineers and ecologists. The City Council promotes soft landscape led solutions such as soakaways, filter drains, swales, rain gardens and attenuation ponds rather than more engineered solutions.

1.47 In designing the SuDS system for a site, applicants must engage with the Lead Flood Risk Authority (LFRA) during the early stages of a design and align with 'The Birmingham Sustainable Drainage: A Guide to Design, Adoption and Maintenance' document. The Design Guide does not supersede or seek to duplicate any element of this document.

1.48 Further guidance is available in the City Council document 'Sustainable Drainage: Guide to Design, Adoption and Maintenance'<sup>2</sup> and the CIRIA 'Guidance on the construction of SuDS'<sup>3</sup> or as amended.

1.49 Wetlands - these can include features such as ponds, reed beds and marshes, which may exist as natural features, or constructed wetlands which are also SuDS. These can be designed on a variety of scales and in dense urban areas can form part of a streetscape with a hard edge. However more often they can form part of a wider landscape and water management scheme on larger development sites. Expert advice from a drainage engineer and ecologist should be sought when considering the inclusion of these features on a site.

1.50 Edible landscapes - these can be created by integrating edible plants into ornamental landscapes, such as berrying shrubs, vegetables or orchard trees. Benefits can include improved food security, sustainable living, health and nutrition, food source for pollinators, and learning opportunities, for instance in schools.

<sup>2</sup> Sustainable Drainage Guidance

<sup>3</sup> Guidance on the construction of SuDS

**Hard landscape features**

1.51 Hard landscape features are often in place for the lifetime of a development, and sometimes longer. With this in mind, they should be carefully designed and specified. A scheme of external works should be comprehensive and coherent, using elements that are complementary to one another and the soft landscape design. A scheme should usually take its cues from local character and context, building on what has endured well in the setting, although sometimes a completely new, more contemporary design will be more appropriate depending on the situation. The design rationale should also be influenced by the architecture and materials of the surrounding buildings. Poor quality detailing, dated designs and schemes that have not endured, should not be used as a precedent.

1.52 Paving - paved areas are often a major element in a development and its design has the potential to have a significant impact on the character and quality of place. A high quality paving scheme will recede visually rather than dominate the environment, however it can offer visual cues to guide behaviour, such as defining areas of pedestrian and cycle priority or low vehicle speeds.

1.53 Where a scheme is in an area with an established palette of high quality materials, new paving should match, or at least be complementary, unless there is a clear justification for moving away from the existing material mix.

1.54 High quality natural materials are often most appropriate in conservation areas, or in high profile public realm schemes and developments; concrete or clay blocks may be more appropriate or cost effective elsewhere, however the most sustainable products available should be used.

1.55 Sustainability needs to be a key factor in choice, considering whole life costs and the impact on the wider environment. It is always better to re-use materials, especially natural stone. Where new materials are necessary for a project, high quality, robust locally sourced products should be specified.

1.56 Schemes must not be dominated by tarmac. Where its use in a paving scheme cannot be avoided, other higher quality paving types such as flags, blocks and cobbles should be used to break up its impact and provide visual relief.

1.57 Materials and their bonding should generally be permeable, to help manage surface water run-off and drainage, whilst considering any wider implications to drainage systems and waterways.

1.58 Street furniture - this can include a wide range of elements such as seating, rubbish bins, tree protection, shelters, bollards, barriers, signage and lighting. Landscape and public realm proposals must incorporate high quality, robust street furniture that is appropriate within the scheme and the wider context. Where there is an established palette of furniture elements, new furniture should match this closely if appropriate. For larger development schemes or regeneration proposals it may be better to develop a new coherent furniture palette which adds to the sense of place and complements the rest of the landscape proposals. Unnecessary clutter must be avoided at all costs.

1.59 Where opportunities exist, proposals should seek to include public art. This could include artistic elements integrated into proprietary street furniture items, or specially developed bespoke pieces of furniture designed with an artist's input.

1.60 Designs and specifications should consider how furniture may be used by skateboard, scooter, roller blade, parkour and BMX users. Proposals should either accommodate these activities, or include appropriate measures to restrict them.

1.61 Where PAS 68/IWA 14-1 barriers are required, these should be integrated into the landscape design to reduce the impact of their presence and prevent them dominating the scheme. Subtly combining them with street furniture elements or within walls or level changes is the optimal solution.

1.62 Boundary treatments - these can take the form of walls, fences, railings, bunds, or planting such as hedging. They can be important in defining ownership, delineating public and private space and creating a barrier to movement. Boundary treatments visible from public places can also make a key contribution to the character of an area, and should be of high quality.

1.63 Front boundary treatments are often appropriate for housing, particularly in suburban areas. High quality treatments such as walls or railings are usually most suitable, and where appropriate to local character these should be combined with hedging or planting. However, not all housing will require a front boundary. Estates dating from the mid 20th Century often have an open character, with houses and flats set back from the street behind large grassed front gardens with no front boundary.



Paradise masterplan, Glenn Howells Architects. © Hufton + Crow.



1.64 Front boundary treatments may also be appropriate in settings other than housing, dependent on local character. Within city centre environments where buildings are often sited at back of pavement, the introduction of fences, walls, railings along frontages is rarely possible or desirable. First and foremost, local character should be the guide.

1.65 The height of a front boundary treatment will depend on the character of the area and what will work well in the setting. However, to maximise natural surveillance and avoid blocking light and outlook to ground floor rooms, these should be no taller than 1.2m in most situations. Occasionally there will be the need for taller, more secure boundaries around uses such as schools, but the use of these should be kept to the minimum necessary. Here, high quality solutions are required which combine the security specifications with an acceptable aesthetic appearance. Palisade security fencing is rarely appropriate in new developments, apart from very sensitive uses. Tall fencing should be visually permeable and combined with planting wherever possible.

1.66 Where new development is planned adjacent to an established built-up area, the duplication of boundary treatments along a shared boundary should be avoided. This may mean negotiating with the existing landowner(s) to agree a joint way forward.

1.67 Where existing high quality boundary treatments make a positive contribution to the street scene, these should be retained in new schemes or projects. This applies in particular to historic walls or railings and existing hedges or other green infrastructure. Where necessary, repairs or enhancements should be allowed for.

1.68 If bin storage is to be designed into a boundary system, it must be an integral element that effectively disguises the bin store function.

### Green elements on buildings

1.69 The integration of green elements into a building's design will result in many environmental gains, bringing green infrastructure into environments where it is lacking. The range of advantages include benefits to wildlife, an aesthetically improved street scene, urban cooling, improved air quality, sustainable drainage, user benefits, and in certain scenarios benefits to the building itself such as insulation, solar shading and weather protection.

### Green roofs

1.70 Green or living roofs offer a range of benefits to the developer and occupier of a building.

1.71 From a thermal perspective, they have the potential to aid building cooling during summer months and provide insulation during winter, reducing the energy burden during these periods. They can also contribute to a site-wide SuDs system, capturing rainwater and managing its runoff. From a user perspective, the roof can serve as a garden space contributing to health and well-being support associated with biophilic design.

1.72 There are numerous systems available often using similar base drainage systems, adjusted to serve the type of green roof proposed and its associated planting strategy. Green roofs are often categorised into three categories - intensive green roofs, extensive green roofs and brown roofs.

1.73 Intensive roofs are essentially parks or gardens used by the occupants of a building or its visitors. Usually the range of species will be varied, with potential biodiversity benefits as well as contributing to the enjoyment of the space and the well-being value of the space. The structural requirements of intensive roofs will normally be considerably greater due to the weight of the soil needed, and maintenance may also be more onerous.

1.74 Extensive roofs generally fall into two categories. A sedum roof consists of pre-cultivated sedum mats or blankets. The other option is a substrate based biodiverse green roof, with an upper vegetation layer of a mix of sedums and wildflowers. The benefits of extensive roofs are that they are relatively lightweight, have shallow growing medium depths, and need minimum maintenance including no permanent irrigation system.

1.75 Brown roofs use commercial crushed brick or other porous substrates which are left to self seed. They can include rubble mounds and dead wood for invertebrate habitats.

1.76 It is possible to combine the benefits of green roofs with energy generation. These are known as biosolar living roofs where green roof and solar technologies are integrated. The living roof can increase the effectiveness of solar panels by reducing the ambient temperature of the roof area.

1.77 Apartment and office developments are encouraged to integrate intensive green roofs into their buildings to contribute to amenity provision, the health and well-being of occupants, biodiversity enhancement and aid rainwater management. Other non-residential uses should integrate extensive roofs into their design, aiding rainwater management and contributing to the building's GI provision.

### Living Walls

1.78 These plant based systems can provide opportunities to visually enhance facades (particularly blank elevations and elements), whilst also being a biodiversity asset, urban air cooling system and a method of filtering airborne pollutants. They can also help to reduce surface water run off volumes.

1.79 Living walls can be ground based, with a wire trellis system to support climbing plants; or wall based and modular, employing hydroponics or soil systems.

1.80 Wire systems - these include tensioned wires, frames or cables attached to the building, acting as a trellis for plants to climb. Species options are limited (but can be robust) and may take years to create visual coverage, unless pre-grown systems are used. Whilst wire systems may not achieve the impact provided by a soil system they may prove a viable solution to a range of site constraints.

1.81 Hydroponic systems - these comprise a man-made growing system mounted to panels and attach to a building or structure. Due to the omission of soil, the systems are lightweight, but require an effective irrigation and nutrient system to maintain the plants. Maintenance requirements can be high.

1.82 Soil-based systems - are troughs or containers filled with a free-draining growing soil and attach to a wall. The soil enables plants to create a deeper root system allowing them to grow in size and withstand periods without water. These are the heaviest systems, requiring structural considerations.

1.83 Pot or pocket systems - each plant is provided with its own pot, effectively stacked together to create a visual 'wall'. The constrained space may limit plant development, requiring high maintenance and frequent replacement, but the system can be free-standing and deliver visual change quickly.

### System selection and maintenance

1.84 The most appropriate green roof or wall system for a proposal will need to be influenced by the characteristics of the site, structural considerations and local climate. Species selection should also be informed by these site specific characteristics, with an effective maintenance and irrigation system (if required) established and adopted.

### OTHER DETAILED DESIGN CONSIDERATIONS

#### Services and infrastructure

1.85 In designing landscape schemes and specifying hard and soft elements, consideration needs to be given to any service easements or highway design requirements that may be a constraint to the proposals. An understanding of constraints at the outset will allow for a fully considered landscape design which meets utility providers' requirements, limits potential conflict with public realm users and effectively integrates requirements into a high quality design.

#### Topography and levels

1.86 The topography (land levels and undulations) of a site and its surroundings can play an important role in defining the landscape character of an area. Whilst challenging site topography can be an asset in terms of local distinctiveness, significant level changes can also present difficulties in design, particularly on small sites. Landscape design can help to manage proposed levels, and the design of steps, ramps, retaining walls and earthworks are key to ensuring an attractive and accessible development for all.

1.87 As well as managing levels effectively within a development site or public realm project, the external works design must also ensure that proposals seamlessly integrate with their surroundings without awkward changes in level where the two come together.

1.88 Specific consideration must also be given to the retention of existing trees. Level changes should be avoided with root protection areas.

# 2 Protecting Birmingham’s trees

## TREE ASSESSMENT

2.1 Where a development site contains, or lies adjacent to existing trees, these must be assessed in accordance with BS 5837: 2012 ‘Trees in relation to design, demolition and construction’ (or as updated/replacement). For small scale developments (non-majors) where statutory tree protection does not exist, an alternative to the BS5837 procedure is set out at City Note GI-11.

2.2 This requires the sequential production of the following, by a qualified arboriculturist, to inform the design and layout of a proposal:

- 1. Tree Survey (TS);
- 2. Tree Constraints Plan (TCP);
- 3. Arboricultural Impact Assessment (AIA);
- 4. Arboricultural Method Statement (AMS); and
- 5. Tree Protection Plan (TPP).

2.3 The TS and TCP should be produced before a layout is designed, the AIA evolves with the design; and the AMS and TPP are undertaken once the design is finalised.

2.4 As required by paragraph 4.3 of BS 5837 proposals should undertake a soil assessment to help inform decisions relating to the Root Protection Area (RPA), tree protection and new planting and design. Where this assessment is also in relation to foundation design the arboriculturist should liaise with structural and geotechnical engineers to develop foundations that satisfy engineering requirements without compromising important trees.

### CITY NOTE GI-8

#### Tree Survey

2.5 The TS should be supported by a scaled plan based on a submitted topographical site survey plan, showing plotted positions of the surveyed trees.

2.6 The TCP should be based on the same topographical site survey plan as the plan supporting the TS. It should be annotated to depict the effects of trees in terms of:

- Root Protection Areas (RPAs);
- Current branch spread;
- Likely ultimate branch spread; and
- Shading.

2.7 Circular depictions of RPAs may not always be a true reflection of the distribution of roots in reality, therefore, polygonal depictions should be used.

2.8 Trees achieving ‘A’ (high quality and value) or ‘B’ (moderate quality and value) categorisation following a TS should be retained and a design adapted to protect them from unacceptable harm. This means that development should not incur into their RPA, or their current or likely ultimate branch spread. Where incursions are proposed, the Arboriculturist should explain how it will not result in unacceptable harm.

2.9 Informed by the TS and TCP, site layout options must consider and effectively respond to the following, ensuring harm to trees is minimised; and potential for future conflict is reduced from the outset.

#### Direct harm

2.10 Direct, unacceptable harm to trees will occur where they suffer damage to or pruning of roots or branches, such that they are physiologically, structurally or aesthetically damaged to an irrecoverable level. It can also occur where the functionality of soil within an RPA is compromised to an irrecoverable level by compaction, contamination and/or cultivation.

#### Indirect harm

2.11 Indirect, unacceptable harm to trees will occur where changes in their growing environment make them more vulnerable to structural damage.

#### Perceived nuisance

2.12 Large trees close to dwellings can cause symptoms of anxiety, depression, fear and claustrophobia. This should be considered by designs; ensuring buildings are not sited in positions where trees might be perceived as an unreasonable nuisance. As a minimum, this should usually mean locating buildings outside of RPAs, current and likely ultimate branch spreads, and areas of gross shading. Where honeydew is present, wider easements are recommended.

#### Tree removal and mitigation

2.13 Where there are justified, overriding delivery and design considerations that necessitate the removal of ‘A’ , ‘B’ or ‘C’ category trees, the City Council may accept their loss, where appropriate mitigation can be achieved by new tree planting and/or a financial contribution, equivalent to the existing tree stock value, in accordance with Policy DM4 of the adopted Development Management in Birmingham Document. See GI-9 for details.

2.14 Mitigating the loss of mature, high quality trees takes a generation, so should always be a last resort. To demonstrate how such losses will be mitigated, it will be necessary to show how the new trees will have access to sufficient above and below ground growing space to support their healthy, unconstrained future growth.

2.15 In all cases it should be demonstrated how the development will contribute to the enhancement or preservation of a sustainable urban forest. The best way to achieve this is to provide for a mixed age range of trees across a site.

**CITY NOTE GI-9**

**Replacement planting and off-site compensation**

2.16 Where on-site replacement is not achievable, planning contributions to off-site tree planting will be sought through a planning condition or Section 106 agreement. Planning contributions will be required where either:

- New planting is required on public land to mitigate the impact of a development; or
- Where trees covered by categories A, B and C of BS5837 are felled as part of development, and replacement planting is required on public land.

2.17 Planning contributions will not be accepted as compensation for loss of trees where the Council is satisfied that an on-site solution is viable.

2.18 Tree planting on public land is to be undertaken by the City Council to ensure a consistent approach and level of quality and adoption, and to reduce the likelihood of new tree stock failing to survive.

2.19 The full method of the Capital Asset Value for Amenity Trees (CAVAT) system (or other future equivalent) will be used to calculate the existing value of the tree(s) to be removed. The use of CAVAT will be a last resort as the City Council’s preferred position will always seek to ensure the retention of trees. Access to CAVAT is free of charge and further details can be found on the London Tree Officer’s Association website<sup>4</sup>.

<sup>4</sup> London Tree Officer’s Association website

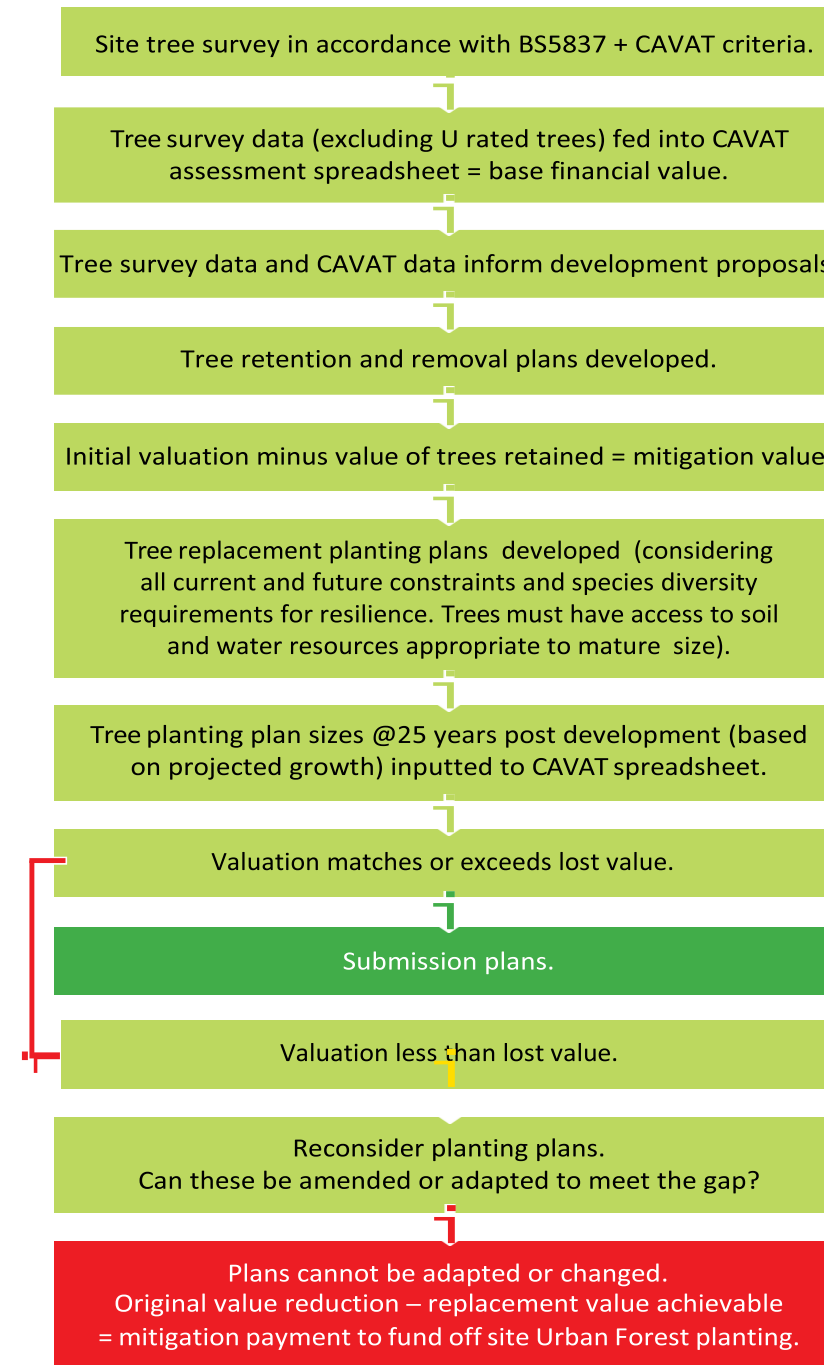
2.20 The City Council will consider reasonable deductions to contributions based on the value of any replacement planting works and the individual circumstances of the proposal. This may include where significant investment has been made for delivery of complex or technically challenging tree planting or where greater benefits are being delivered such as green roofs, green walls and nature based SuDS systems.

2.21 Where a S106 contribution is made that sum will be ringfenced to cover the following costs:

- Site selection and investigation works;
- Construction of specialised tree pits and tree protection measures where required;
- Tree purchase and planting (with a provisional sum for any loss or failure);
- Establishment costs (5 years); and/or
- Adoption into BCC tree stock, 30 years maintenance and survey costs.

2.22 Replacement tree planting funded through S106 will occur within the ward of the development site. However, if there are no appropriate areas of open space within the ward, contributions may be spent in neighbouring wards or where canopy cover is particularly deficient against the city’s target of 25%. A Tree Board will be set up and this body will agree planting sites and report recommendations for expenditure to the appropriate Cabinet Member.

2.23 The flow chart shows how CAVAT fits into the process early in the design and layout stage.



**CITY NOTE GI-10**

**Arboricultural Impact Assessment, Method Statement and Tree Protection Plan**

2.24 Having designed a site layout (and associated infrastructure routing) informed by the TS and TCP, proposals should prepare an Arboricultural Impact Assessment to explain the direct and indirect effects of the proposed development on existing trees (as detailed in BS 5837).

2.25 In turn, this should inform the Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) detailing how the development will be implemented to avoid unacceptable harm to retained trees and areas designated for structural landscaping. In some cases, there may be no requirement for an AMS, other than a statement explaining that development will be carried out in accordance with an approved TPP.

2.26 The TPP should be superimposed on a site layout plan, based on a topographical site survey plan.

2.27 Where the implementation of development does not adhere to an approved AMS and TPP it may be subject to enforcement action, including prosecution where protected trees are damaged or destroyed.



Sense Touchbase Pears, Glenn Howells Architects.  
© Rob Parrish.

CITYNOTE GI-11

Tree surveys and protection for small scale developments

2.28 For small scale developments (non-major applications), where there is no statutory tree protection, the following basic principles should be considered and addressed in the application. These principles should be applied to trees within a site and/or those adjacent to it (applicants are liable for damage caused by their development):

- The Root Protection Area (RPA) of all trees in and around the site should be established to inform the layout of proposals and highlight where removals may need to be considered. The basic RPA of a tree is a radius twelve times the diameter of its trunk 1.5m above ground level. Within this area it can be assumed that any excavation or change in ground levels greater than 100mm are very likely to have an effect on the tree.
- In certain circumstances it can be assumed that a tree has developed roots asymmetrically. For example; if the RPA includes existing building foundations, substantial retaining walls or wide expanses of hard, impermeable surface then it is likely that the tree has avoided those areas in favour of more open ground where water and air are available. In this case it may be possible to reasonably offset the RPA.
- Buildings/elevations should be appropriately set back (at least 2 metres) from the expected canopy extent at maturity to reduce potential conflict and enable the continued growth of the tree. The canopy area of a typical tree is often similar to the extent of its RPA, but may be less for certain species, such as tall cypress that have an RPA much larger than the canopy.
- Once the constraints and extent of existing trees are properly understood, the quality of the trees should be assessed to understand which trees it may be acceptable to remove and those which must be retained. Low quality 'scrubby' trees or those with obvious significant defects should not be a constraint. Trees of apparent high quality, especially those that are publicly prominent, should be retained in a proposal.
- The combination of RPA and canopy spreads of retained trees, after any reasonable modification, become the 'Construction Exclusion Zones' which should be temporarily fenced off during construction in a way that will withstand the normal rigors of construction activity. The fencing also excludes storage from those areas and should be monitored and maintained throughout the development.

CITYNOTE GI-12

Hard landscape, roads and surface construction considerations

2.29 Specialist building techniques and materials may need to be applied to help ensure existing trees can be safely integrated into a development. In the majority of cases, not intruding into or over the agreed root protection area (RPA) will be one of the primary constraints. However, there may be exceptional cases where it is possible to cover elements of the RPA:

Hard landscape

2.30 By utilising appropriate materials, it may be possible to locate private roads or hard landscape over elements of an RPA, if finished levels allow. The ability to effectively achieve this will relate to site and species specific factors, requiring bespoke solutions in agreement with the City Council's Tree Officer.

2.31 The existing ground levels and finished levels for a surface are very important considerations when designing layouts near trees. It should be noted that suspension 'webbing' that is often used as a 'no dig' solution for surfaces near retained trees has a total finished thickness of at least 250-300mm deep (light use with block paving). Use of these techniques will raise the existing ground level and will need to be contained at the sides with a no dig solution. Suspension webbing cannot be an adopted surface so is only suitable for private roads/driveways. Where adopted surfaces are required, these must avoid the RPA.

Piles and foundations

2.32 In some instances foundations can be piled with rafts or cantilevered over RPAs in a way that avoids digging although this will usually bring the building closer to, or under, the canopy of a tree and the suitability of this relationship will also need to be considered.

2.33 Wherever special construction techniques are proposed or implied, details of construction methods will need to be submitted with the application and not be deferred to planning conditions.

**CITY NOTE GI-13**

Neighbouring trees

2.34 Issues can arise with third party trees where they overhang boundaries. Common law enables neighbours to prune non-statutory protected overhanging trees to their boundary, without requiring any consents for the Council. However, it should be recognised that applicants are liable in law if they cause a tree to fail on neighbouring land by cutting roots and branches. In these circumstances it is strongly advised that all persons take arboricultural advice before severing the roots or branches of a neighbouring tree.

2.35 If a tree is statutorily protected, permission must be sought from the City Council to undertake any works to the tree, including neighbours wishing to prune to their boundary.

**CITY NOTE GI-14**

Pruning of retained tree stock

2.36 Trees that have been identified for retention as part of a development site may require some proactive pruning works in order to minimise any health and safety risk, conflict with construction activities or prevent identifiable future issues. Where pruning works are undertaken these should not be excessive or compromise the integrity of the tree limiting its future retention lifespan and adhere to the current best practice as set out in BS 3998 Tree Work - Recommendations.

2.37 Where trees have or are to be returned to the public realm, consideration needs to be given to how any tree works will affect the CAVAT valuation. Where tree work is deemed to have been disproportionate to the need and this has impacted the valuation, compensation equal to the loss in value may be sought.

**CITY NOTE GI-15**

Development adjacent to woodlands

2.38 Where development adjoins woodland, an eco-zone should be allowed to develop, or planted, to provide a gradual transition between forest trees (such as Oak, Ash and Beech), woodland edge trees (such as Birch, Hawthorn, Rowan and Willows) and shrubs (such as Blackthorn, Dogwood, Elder, Hazel and Guelder Rose), herbaceous vegetation and gardens. This will minimise the potential for conflict and help protect the woodland.

2.39 An appropriate default width for a woodland eco-zone is 15m wide, measured from the centre of the trunk of the largest forest tree species growing closest to the edge of the existing woodland.

2.40 Greater widths may be necessary for ecologically or structurally vulnerable woodlands. Reductions in the default width are only likely to be acceptable where assessment of the woodland demonstrates satisfactorily that the development and woodland will co-exist harmoniously.

**CITY NOTE GI-16**

Hedgerows

2.41 Hedgerows within and bounding a development site should be assessed in accordance with the Hedgerows Regulations 1997. The assessment may form part of an Archaeological or Ecological Impact Assessment.

2.42 Hedgerows found to be important in accordance with the Hedgerows Regulations 1997 should normally be retained and incorporated into the design of development. Where overriding design considerations necessitate the removal or translocation of important hedgerows, it must be clear within the submitted Design and Assessment Statement and/or landscape proposals, how the loss will be mitigated through new planting and/or a translocation methodology.





**CITY NOTE GI-17**

Canopy coverage

2.43 Development should seek to increase tree coverage within a site, through the retention of existing trees; and the introduction of well-placed new trees within landscape proposals.

2.44 Informed by a tree coverage assessment (2016) the City Council has established the existing average canopy coverage by land uses across Birmingham, providing it with a baseline understanding of Birmingham’s tree population and the important role different land uses play in sustaining this.

Land Use	Average site% Data (2016)
Commercial	8
Education	16
Housing	16
Industrial	4
Leisure	31
Road (Highway)	14
Services	10
Religious	35

2.45 Across all use classes the City Council will seek to create canopy gains, with particular focus given to commercial and industrial uses, where baseline contributions are low; and where mature trees contribute significantly to the character of an area.

2.46 Assessments should be made of the percentage canopy coverage prior to development with a view to maintaining or increasing that coverage. Sites with zero percent coverage should seek to include some tree planting, with consideration given to the city-wide average canopy coverage for the proposed use.

2.47 In assessing the level of existing canopy coverage on a site, the City realises there may be sites where self-seeded trees have increased coverage. Whilst these trees may have worth, flexibility in calculating existing canopy coverage may be given, with trees that have a trunk less than 7.5cm at chest height excluded from the calculation.

2.48 Where it has been clearly demonstrated that maintaining pre-development canopy coverage will impact on delivery and/or viability, the variance may be offset via a contribution to the Birmingham Tree Bank. Funds sought will be based on the existing tree stock value.

2.49 Where new trees are to be planted to help compensate for canopy loss, or enhance canopy coverage on a site, the focus must be on delivering long term canopy gains, through the considered placement of trees and sufficient soil volume to allow them to mature. This may lead to fewer trees planted, but a greater long-term survival rate.

2.50 In establishing canopy coverage, proposals should base estimation on existing mature species to be retained on a site and/or the expected canopy spread of a newly planted tree when mature.

# 3 Tree planting in new development

## DESIGNING TREE PLANTING INTO A DEVELOPMENT

3.1 Successful tree planting as part of development depends on:

- Co-operation between the developer and the City Council;
- Space designed specifically to support the growth of trees;
- Appropriate specifications; and
- Correct implementation and aftercare.

### CITY NOTE GI-18

#### Effectively responding to on-site constraints

3.2 In order to successfully integrate new tree planting into a scheme, proposals must have a clear understanding of the existing constraints and characteristics of the site, to inform the design process.

3.3 The primary constraints will be identified by a detailed topographical survey; and a utilities survey. This should be further supplemented by an understanding of additional infrastructure and utilities needed to serve the development. In some cases physical constraints to planting will also need to be understood following consideration of:

- A Tree Constraints Plan in accordance with British Standard 5837:2012; or any standard that replaces it;
- A geotechnical/geo-environmental assessment; and
- A soil assessment.

3.4 Having established the primary constraints within a site, planting layouts (as part of wider landscape proposals) should be designed to respond to these constraints, reducing the potential for future conflict as the trees mature and establish.

3.5 Whilst appropriate infrastructure and measures will be needed, designs should recognise that services and trees need not always be mutually exclusive. Service corridors can provide valuable rooting space and liaison between service providers, engineers, landscape architects and arboriculturists may allow for co-existence.

#### Highways

3.6 Highway sections should show how safe vehicle and pedestrian movement, services and trees will coexist. Trees planted close to a highway should have sufficient space to prevent conflict with the kinematic envelope of the largest vehicle likely to use the highway. The kinematic envelope is the outline of a moving vehicle affected by tilt, slope, adverse camber etc.



3.7 Avoiding conflict with the kinematic envelope does not mean that all trees planted close to roads must be small or columnar, since large, spreading trees can develop up and above the highway, whereas smaller trees may grow directly into the highway. Careful species selection, and where necessary, provision for formative pruning, can help to prevent conflict.

#### Climate

3.8 Localised climate and the effect development may have on this should be considered by planting proposals. The orientation of the site, allied with the siting and scale of development may lead to micro-climates which may influence where trees should be planted; and the level of resulting benefit achieved by them.

3.9 Primary considerations should be shadow paths of proposed buildings and wind tunnels generated by the proposal. Trees will provide the most benefits in terms of air cooling when planted in full/partial sun. Areas of permanent shade could be reserved for services corridors freeing up those sunnier locations for planting.

3.10 BRE Digest 209 and Forestry Commission Research Note 012 provide guidance on design to maximise the microclimatic benefits trees provide.

#### Long term benefits - long-living trees

3.11 The City Council wants to ensure newly planted trees have the potential to establish and mature with a development. To help achieve this, it favours schemes that seek to introduce a smaller number of well-spaced, long-living, large species trees in wide, continuous, soft landscaping; rather than larger numbers of small, short-living trees in narrow planters, hard landscape, or leftover space.

3.12 Where planting is restricted to hard landscape, openings of minimum 1.5m x 1.5m should be provided. The larger the opening the better trees will grow.

#### Groupings

3.13 Trees planted in companionship are likely to grow better than those in isolation. Canopy and under-storey planting that is appropriately spaced to avoid mutual suppression, represents the optimal layout to avoid the development of structural weaknesses.

3.14 Wherever possible, tree-lined avenues should be provided, with staggered rather than linear layouts, where this would lead to streetscape or microclimate benefits.

3.15 Staggered planting using build-outs, central reservations and roundabouts can help to avoid wind tunnel effects, and can allow the planting of large trees where verges are otherwise too constrained.

**CITY NOTE GI-19**

**Root Available Soil Volume (RASV)**

3.16 Root Available Soil Volume (RASV) is the volume available to roots due to its physical accessibility and suitable conditions of aeration, irrigation and fertility.

3.17 Target, minimum RASV should be provided as follows:

- 30m<sup>3</sup> for individually planted large-medium trees.
- 20m<sup>3</sup> per large-medium tree when planted as a group of two or more with shared RASV.
- 10m<sup>3</sup> for individually planted small trees of approximately 6m height and 3m diameter branch spread after 25 years.
- 5m<sup>3</sup> per small tree when planted as a group of two or more with shared RASV.

3.18 Rather than depicting a planting hole and opening, landscaping drawings must show the RASV for each tree or planting situation, in plan-view and with sections expanded to show not only the treatment of the planting hole and opening, but also the soil and any openings surrounding the planting hole.

3.19 Various products, including structural soils, tree sands, and void forming soil crates and rafts, can extend RASV beneath engineered surfaces. These products should be specified where sufficient uncompacted RASV is unavailable and/or they can provide a link between soft landscape and hard landscape tree pits.

3.20 Where proposed, specifications should be submitted, demonstrating how RASV will be provided for, including plan view drawings and details of irrigation, aeration, drainage and load capacity.

3.21 Structural soils and tree sands typically require large volumes of stone or sand to give them physical strength, this can often impact on its 'nutritious' value compared with 'natural' soils. Consequently, when specifying RASV, it will be necessary to have regard to the particular product being used, since 5m<sup>3</sup> of structural soil is not equivalent to the same volume of 'natural' soil.

3.22 The use of site-won or imported soils to backfill crates or rafts is supported in principle, but the fitness for purpose of the soils should first be demonstrated. This should include a physical and chemical analysis by a soil scientist, and their placement overseen by a Soil Scientist, or other suitably qualified landscape professional.

3.23 The pH of tree sands, structural soils and soils to back-fill crates/rafts must be known and appropriate to the tree species planted.

3.24 Adequate soil aeration is essential to the effective functioning of tree sands, structural soils and soil crates/rafts and it should be clear how this will be provided for. Voids and pipe and vent systems can help in this regard, but there should be a sufficient number, extent and provision to prevent them becoming blocked. A minimum of two aeration inlets per tree, or per 5m<sup>3</sup> of soil, is considered appropriate.

3.25 Subject to engineering advice, bespoke designs can extend RASV. For example, root paths and trenches are drained subgrade tunnels containing soil compacted to a level that does not prevent root growth, bridged by reinforced concrete or similar.

**CITY NOTE GI-20**

**Tree pit openings**

3.26 The tree pit openings must effectively balance the visual/material desires of the public realm and maintenance, with the need to support healthy tree growth. Where an appropriate balance cannot be achieved, functionality in terms of long-term tree growth should be placed above aesthetics, and it should be clear why a particular treatment is proposed. To aid this approach, the City does not support the use of grilles, unless there is a clear justification for their use.

3.27 The London Tree Officers Association produced a guide 'Surface Materials Around Trees In Hard Landscapes'<sup>4</sup> to inform suitable choices and functionality; which developers should use to inform the most appropriate pit opening for their site.

<sup>4</sup> Surface Materials Around Trees Guidance





## 4 Birmingham's biodiversity and geodiversity

4.1 Birmingham's ecological network supports a diverse range of notable biological and geological assets, including:

### Designated sites

4.2 Nationally designated sites of importance - Sites of Special Scientific Interest (SSSIs) and Local Nature Reserves (LNRs); and Non-statutory Local Sites - Sites of Importance for Nature Conservation (SINCs) and Sites of Local Importance for Nature Conservation (SLINCs).

4.3 The location of designated sites (and potential Sites of Importance) can be viewed via the City Council's website.<sup>6</sup>

### Important habitats and geological features

4.4 Nationally important habitat types listed in Section 41 (S.41) of the Natural Environment and Rural Communities (NERC) Act 2006.

4.5 Local priorities are identified in the Birmingham and Black Country Biodiversity Action Plan (BBCBAP).<sup>7</sup>

### Important species

4.6 Species protected by national and European legislation (including eleven bat species, badger, otter, water vole, black redstart, peregrine, kingfisher, great crested newt and slow worm).

4.7 Priority species (ie listed in S.41 of the NERC Act or identified in BBCBAP) which are rare or in decline, (including hedgehog, house sparrow, common toad and a number of butterflies, moths and other invertebrates).

4.8 EcoRecord (the ecological database for Birmingham and the Black Country) holds lists of other notable species found in the city, which includes Red and Amber List Birds of Conservation Concern.

<sup>6</sup> [www.localview.birmingham.gov.uk/Planning/Sites/Public\\_Access/](http://www.localview.birmingham.gov.uk/Planning/Sites/Public_Access/)

<sup>7</sup> Birmingham and Black Country Biodiversity Action Plan

### CITY NOTE GI-21

Ecological and geological surveys

#### Ecological and/or geological reports

4.9 Ecological and/or geological reports should:

- Clearly describe the extent and location of designated sites, important habitats, geological features, and the status and distribution of important species;
- Assess the likely impacts of development on these receptors, following standard methodologies, such as Chartered Institute of Ecology and Environmental Management (CIEEM) guidance on Ecological Impact Assessment (EclA);
- An explanation of the measures taken to avoid adverse impacts (eg. alternative designs and locations). Where adverse impacts cannot be avoided, a mitigation strategy should be submitted, which clearly sets out how adverse impacts will be mitigated or reduced;
- Details of compensation to be provided where impacts cannot be avoided or mitigated; and
- Proposals for biodiversity/geodiversity enhancements.

#### Ecological and/or geological surveys

##### Preliminary Ecological Appraisal

4.10 A Preliminary Ecological Appraisal (sometimes called an extended Phase 1 habitat survey) should include a site visit to identify the geological assets, plant communities and habitats

present; and assessing their potential to support legally protected and other important species. Ecological and geological records for the site and surrounding area (obtained from EcoRecord and other appropriate sources) should be used in combination with information obtained from the site visit to identify any further survey needs. Although some species records are available from the National Biodiversity Network (NBN), these data are supplementary to, and not a substitute for, records from EcoRecord. Reliance solely on NBN<sup>8</sup> data will not be accepted.

##### Detailed species surveys

4.11 Where there is a reasonable likelihood of a protected species being present and affected by development, detailed surveys should be carried out to confirm its presence or likely absence.

4.12 Ecological surveys must be undertaken by suitably qualified, licensed and experienced persons.

4.13 Any reports concluding that a species is not present must be able to demonstrate that an adequate level of survey effort has been completed in accordance with published guidance on survey methods. Areas identified as being of botanical or geological interest should also be re-surveyed in detail to confirm their extent and conservation value; in some cases, a Local Sites Assessment Report (LSAR) may also be required. These detailed surveys should be completed prior to the planning application being determined.

4.14 All surveys should follow published good practice guidelines. If it is necessary to vary from accepted survey methods, the reason should be clearly explained (and its impact on the reliability of the results) and agreed with the City Council before the planning application is submitted. Surveys should be as up-to-date as possible, preferably from the most recent survey season. Those more than two years old are unlikely to be considered valid.

<sup>8</sup> [www.nbnatlas.org/](http://www.nbnatlas.org/)

4.15 Most ecological surveys can only be completed at specific times of the year (as detailed within a Survey Calendar), so it is important that these are built into the development schedule at an early stage in the process to reduce the risk of delay or objection. The City Ecologists should be contacted for further advice on this.

##### Geodiversity

4.16 Important elements of Birmingham's geodiversity can be found in designated nature conservation sites in the north, west and south-west of the city, including Sutton Park SSSI, Land at Queslett SINC, Rubery Cutting and Leach Green Quarries SINC and LNR and Rubery Hill SINC. They are also present within flood plains and terraces of the rivers Tame, Cole and Rea and their tributaries; where the watercourses flow through green spaces such as Perry Hall playing fields, Woodgate Valley Country Park and The Shire Country Park.

4.17 Where development is proposed in these identified locations, a geological survey and assessment will be required to understand the potential impact on the site's geodiversity interest. Geodiversity aspects may also be covered in EIAs, relating to ground conditions.

##### Potential Impact on Sites of Special Scientific Interest (SSSI)

4.18 Where development proposals could impact on Sutton Park SSSI or Edgbaston Pool SSSI, Natural England should be consulted as early as possible in the development process. Natural England guidance on SSSI Impact Risk Zones (IRZs) may also be of assistance in determining types of development which may impact on these two SSSIs. Where legally protected species could be affected, applicants are encouraged to consult Natural England's standing advice for protected species; pre-application advice relating to development proposals affecting European Protected Species (all bat species, great crested newt, otter), is also available via Natural England's Pre-Submission Screening (PSS) service.



**CITY NOTE GI-22**

**Ecological and geological impact mitigation**

4.19 Consideration should also be given to potential impacts beyond the site, where the proposed development could have an adverse impact by causing environmental change such as hydrological change, pollution, isolation or severance of ecological connectivity. The distance from the site at which such impacts may occur will vary dependent on the nature of development, its zone of influence and the sensitivity of habitats and species in the surrounding landscape.

4.20 The mitigation hierarchy is a sequential process: each step should be considered in turn and incorporated into the scheme design before the next step in the hierarchy is considered. The overall aim of a development proposal should be to ensure, as a minimum, no net loss of biodiversity or geodiversity; and preferably, to deliver a net gain.

4.21 The mitigation hierarchy seeks to:

- 1. Avoid impacts;
- 2. Then mitigate unavoidable impacts; or
- 3. As a last resort, compensate for unavoidable residual impacts that remain after avoidance and mitigation measures.

**Avoidance**

4.22 The primary objective should be to avoid adverse impacts, by ensuring important habitats or features are retained, or by scheduling works to avoid sensitive periods when important species are present or breeding. Avoidance is often the cheapest and most effective way of reducing potential impacts, but it requires biodiversity and geodiversity to be considered at the very earliest stages of design.

**Mitigation**

4.23 Where adverse impacts cannot be avoided, steps should then be taken to minimise their intensity, duration and/or extent. Mitigation measures minimise the negative impact of a development proposal during or after its completion, for example by adopting construction methods to reduce pollution to watercourses, retaining geodiversity on-site, or designing new lighting to minimise disturbance to nocturnal wildlife. Mitigation should be proportionate to the level of impacts anticipated and should include clear, site-specific prescriptions, not generic or indicative measures. All mitigation measures will be secured through planning conditions or obligations.

**Compensation**

4.24 Compensation should only be considered in exceptional circumstances, and as a last resort. It should only be used to address any residual impacts that cannot be avoided or mitigated. Compensatory measures, which can be delivered on-site or off-site, must take account of the quality and extent of the asset being lost or damaged, and the risks associated with habitat creation or restoration. Given these sensitivities, areas of compensatory habitat will need to be greater than the area to be lost, to take account of failure risk or other factors.

4.25 Wherever possible, compensatory measures should be in place and assessed as being successfully established (therefore allowing species to colonise from the area to be lost) before losses of biodiversity assets occur. Developers will also need to put in place measures to secure the ongoing management of the compensatory habitat or feature. It is beyond the scope of this guidance to define how the required compensation should be calculated. Bespoke, site specific solutions will be required that respond appropriately to the habitat affected, with compensation measures informed by expert ecological advice. Compensation will only be acceptable where independent ecological advice indicates there is a high likelihood of success.

## CITY NOTE GI-23

### Creating biodiversity and geodiversity enhancements

4.26 Biodiversity enhancements should be provided in the context of the strategic framework of the Birmingham and Black Country NIA Ecological Strategy. Development should deliver enhancements which add to existing Core Ecological Areas, Ecological Linking Areas or create new habitat resources in Ecological Opportunity Areas (as identified on Birmingham City Council Local Nature Recovery Network mapping). These enhancements can be achieved through a range of resources, which should incorporate the following (allied with wider guidance in this City Manual) where appropriate:

- Public Open Space should include semi-natural habitats. Larger spaces are easier and cost-effective to manage than smaller ones. They will also deliver greater biodiversity and amenity benefits;
- Green infrastructure should be designed to deliver multiple benefits. For example, SuDS should create new habitats which benefit wildlife as well as providing flood attenuation or reducing surface water runoff. Pedestrian and cycle routes should include planting that provides habitat resources for pollinating insects;
- Biodiversity features should be incorporated into the design of new buildings wherever possible, for example:
  - Living roofs and/or living walls. These benefit urban wildlife while reducing storm water runoff providing insulation for buildings and helping to reduce the cost of cooling in summer.
  - Nest units for bird species typically associated with built structures, such as swift and house sparrow, can be incorporated directly into the building fabric.
  - Bat access tiles in roofs, bat bricks, tubes or cavities in walls;
- Where possible and practical, native species should be used in landscaping schemes. Species should be appropriate to the local context. The use of locally sourced seed and plants is encouraged;

- Ornamental planting should include a high proportion of species and varieties that support butterflies, moths, bees and other pollinating insects. Landscaping schemes should include plants that flower at different times throughout the year so as to extend the period during which foraging resources for pollinators are available. The RHS 'Perfect for Pollinators' lists are a good starting point for selecting pollinator-friendly plants; and/or
- Tree species should be considered within the context of existing ecological conditions and those associated with predicted changes in climate. Further advice about selecting climate resilience tree species is available from Forest Research.<sup>9</sup>

4.27 Many geologically important sites are being successfully conserved on an individual basis, as part of the ongoing management of the city's suite of designated nature conservation sites. However, conservation and enhancement of geodiversity in the wider landscape is also vital, reflecting its importance as a valuable environmental asset.

4.28 Geological features can be enhanced by:

- Recording of temporary exposures;
- Preservation of site investigation and borehole samples and records;
- Stabilisation and consolidation of rock features;
- Creation of new rock exposures;
- Management of vegetation to improve the visibility of existing rock exposures;
- Provision of site interpretation;
- Provision of safe access to view exposures and other geological features; and/or
- Re-use of locally quarried building materials where these cannot be retained in-situ.

<sup>9</sup> Forest Research website

## CITY NOTE GI-24

### Management plans and monitoring

4.29 The City Council may use planning conditions or obligations to require plans for the long-term management of habitats, species and other biodiversity and geological features. The management plan should identify the features that will be managed to maintain or enhance the site's biodiversity or geodiversity value.

4.30 The plan should set out objectives for the habitats or features to be managed, with detailed management specifications and a monitoring programme of at least ten years. The organisation(s) responsible for implementation of the plan should be identified, as well as the funding and legal mechanisms by which implementation will be secured by the developer and the organisation(s) responsible for delivery. Wherever possible, management of habitats and features should be co-ordinated with other site management requirements. It is likely to prove more efficient and cost-effective to integrate management of habitat and landscape features, as there will often be considerable overlap in aims, objectives and management actions.

4.31 Monitoring is an important element of post-development aftercare. Monitoring provides objective data to assess the overall net effect of development on biodiversity and geodiversity and the scale of losses/gains in habitats and other features. Such information is important in providing evidence of the effectiveness of mitigation and compensation measures, which will help to guide future decision-making. Monitoring also provides evidence of compliance with planning conditions/obligations and/or protected species licensing requirements imposed by Natural England. In this latter situation, the period of monitoring will be defined as part of the protected species licence conditions.

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# Birmingham Design Guide

Landscape and Green Infrastructure City Manual

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