

Landscape Design Guide



1 Introduction

Background

1.1 This guide illustrates the approach to landscape design that Harrogate Borough Council expects for new development planning applications and replaces Harrogate Borough Council's Landscape Design Guide 1999. It interprets the requirements of the National Planning Policy Framework and the National Design Guide 2021 which sets out the governments planning policies and demonstrates what good landscape design means in practice. It is prepared in support of policies set out in Harrogate District Local Plan 2014-2035 and to co-ordinate with and support supplementary Planning Documents and Guidance. Relevant guidance can be found by the following the links below:

[Harrogate District Local Plan](#)

[National Planning Policy Framework](#)

[National design guide - GOV.UK \(www.gov.uk\)](#)

- [Green Infrastructure SPD 2014](#)
- [Providing Net Gain for Biodiversity SPD 2021](#)
- [Provision of Open Space and Village Halls SPD 2021](#)
- [Farm buildings design guide \(northyorks.gov.uk\)](#)
- [Landscape Character Assessment SPD 2004](#)
- Tree and Woodland Policy 2022-2027

1.2 Reference should also be made to North Yorkshire Council's draft Climate Change Strategy which sets out the key priorities and is out for consultation at the time of writing:

[North Yorkshire Climate Change Policy](#)

Who is it for?

- 1.3** The aim of the guidance is to raise awareness of the contribution that Landscape Design makes to place-making at all stages of the design process and to:
- Help applicants submit good quality and appropriately prepared landscape design proposals that conserve and enhance local distinctiveness by responding to context whilst leaving scope for the individuality and creativity of the designer.
 - Provide guidance that will be used to assess the quality of landscape proposals by the planning authority when planning applications are made

What do we mean by Landscape?

We use drawings and models to compose land form, vegetation and water in relation to paths, roads, dwellings, offices...to create harmony between man and land

- 1.4** Landscape design is a creative discipline practiced by Landscape Architects and might best be described as the organisational structure by which land and buildings are arranged harmoniously for human use and enjoyment which we see as landscape. A further definition, by the Landscape Architects Association, sets out succinctly what Landscape Architects do and the contribution that they make to design quality.



Figure 1.1 The organisational structure by which land and buildings are arranged

have a strategic role to play in master planning to integrate development into the natural environment from which all detailed landscape proposals should flow.

The Space between buildings – external spaces need as much care and thought as internal ones, they are shaped and made sense of by space-shapers – the buildings, boundaries, land form, trees, hedges and shrubs that enclose them.



Space that's left over x

Space that is designed at the outset v

Figure 1.2 The space between buildings

Why is it important?

- 1.5** Landscape design needs to be seen as a process by which good quality place making can be arrived at rather than the horticultural decoration of the spaces left over between buildings once all the other design decisions have been made. Landscape Architects

- 1.6** Landscape Architects should be working at three scales to optimise the benefit they bring to high quality design and place-making:

- Strategically to identify which land should and should not be built upon to conserve the environment and create new development which settles into the landscape through Landscape and Visual Impact Assessments

- At the town scale – master planning of green blue infrastructure to define parks, squares, cycle-ways etc in relation to streets and the urban fabric
- At the local scale composing land form, paving, vegetation and water



Figure 1.3 Landscape design at three scales

1.7 In major developments Harrogate Borough Council will be looking for evidence of integrated work at all three scales and a truly Landscape- Led approach to design in the application. It is strongly recommended that a qualified and experienced Landscape Architect who is ,as a minimum, a chartered member of the Landscape Institute is appointed at the outset so that landscape design can develop in tandem with other design issues. The Landscape Institute provides a list of registered practices and information on the appointment of Landscape Architects which can be found at:

Landscape Institute



Figure 1.4 The Landscape Institute chartered members and registered practice

When to appoint a Landscape Architect?

1.8 It has been common practice to appoint Landscape Architects at RIBA Stages 2/3 as 3rd party consultants but this is sub-standard practice especially on major applications where Green infrastructure is likely to be a guiding and organising component of the design. Aim to appoint Landscape Architects at RIBA Stage 0: Strategic Definition- in accordance with the RIBA Plan of Work 2020.

RIBA Plan of Work

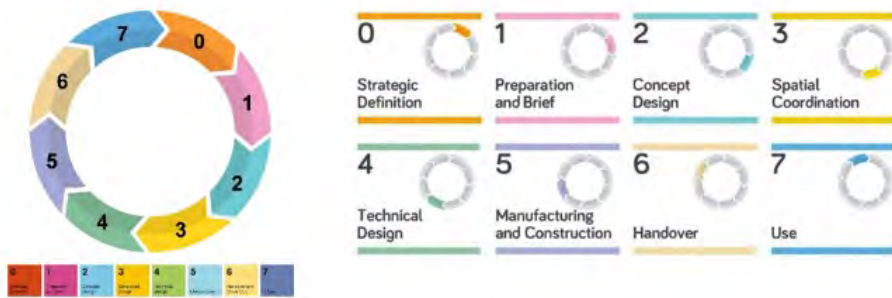


Figure 1.5 RIBA Plan of Work

How to Use this Guide

- 1.9** The substantive aim of the Landscape Design Guide is to guide applications for major development where there is scope for landscape design to integrate new development into its setting. This guidance will help applicants to produce good design solutions and make appropriately prepared proposals but it should not be interpreted, that if followed, the application will necessarily be successful as there are many other factors affecting decisions in the planning balance.

Nearly half of the District is within the Nidderdale Area of Outstanding Natural Beauty (AONB) where the objective of national and local planning policy is to conserve the special landscape qualities that underpin the designation and to restrict major development. Therefore some of this guidance does not necessarily apply to development proposals that affect the AONB. Policies and objectives in the 2019 2024 Management Plan should be a starting point in approaching new development and AONB staff will be able to provide detailed advice on many of the issues covered in the guidance including woodland establishment, meadow restoration and pond creation for

example. The AONB also provides a pre-application advice service and AONB staff welcome opportunities to comment on proposals at an early stage in scheme design. The purpose of the designation is outlined in National Planning Policy paragraph 176.

[National Planning policy Framework](#)

Nidderdale 2019-2024 Management Plan can be found at the following link:

[Nidderdale AONB Mangement Plan](#)



Figure 1.6 Nidderdale AONB Management Plan

1.10 For guidance everywhere else, the following sections within the Landscape Design Guide cover common areas of design and how to prepare proposals but note that not all will be relevant for every application.

1.11 It is intended that this guidance will be updated regularly, as a working document, and further chapters may be added, revised or removed according to requirements.

2: Landscape Design and the Planning Application: This section covers the requirements for completing landscape proposals in support of Outline as well as Full applications and for discharging conditions, the Design and Access Statement and the special purpose of Landscape and Visual Impact Assessments.

3: Residential Landscape Design: This is a specific section on the standards and requirements the council expects for landscape design in residential applications with a focus on green blue infrastructure, garden sizes, planting and good urban design.

4: Hardworks – footpaths, walls and fences: Sets out the council's expectations in relation to the design and layout of pedestrian circulation and the use of materials informed by context and frequency of use. Accessibility within the landscape, steps and ramps are also addressed.

5: Hardworks - Boundaries and External furniture: Covers the standards and expectations for seats, bins, lighting, boundary treatments and other external furniture such as cycle parking/ shelter in the public realm, parkland and rural contexts.

6: Planting and Softworks Generally: The main uses of planting and how it can structure spaces with a range of environmental benefits including habitat creation and blue green infrastructure extending beyond the site and responding to landscape character. Further specific guidance is given on site and soil preparation for planting, land form and modelling and the creation of ponds, wetlands and swales.

7: Ground cover Planting: Ground cover is a common term used for a wide range of planting types which are generally low growing and used to carpet open space at the edges of borders, on mass and beneath larger shrub and tree planting. At its most ubiquitous amenity lawn is a versatile and multi-functional ground cover, other types include herbaceous mass planting, ground cover shrubs and bulb planting. This section describes uses and how to design and establish all types of groundcover.

8: Urban Tree Planting: In a recent revision to National guidance all new streets must now be tree lined (NPPF July 2021) and this chapter sets out how to plant and manage new urban street trees to ensure that they thrive. A suggested species list is incorporated along with how to plant for diversity and resilience in the face of climate change. The retention and protection of existing trees in relation to development is also given consideration.

9: Wildflower Meadows: There are opportunities for planting wildflower meadows within major development sites and guidance is given on how to establish and manage a wildflower meadow. It does not cover meadow restoration or enhancement in detail as this is a specialist area, where this is proposed in the AONB specific guidance must be sought from the AONB office.

10: Woodland Planting: This section is devoted to woodland planting - design considerations, species mix, resilience and how to plant. Species selection is covered in relation to National Character Areas and the National Vegetation Classification but the designer is encouraged to take reference from species found locally to the site and the character, shape and size of woodland within the landscape. Any proposed scheme or woodland restoration scheme within Nidderdale AONB must make contact with the AONB office for specific advice.

11: Shelterbelt Design: Following on from woodland planting detailed advice is given in the creation of shelterbelts with particular reference to farms. Any proposed scheme within Nidderdale AONB must make contact with the AONB office for specific advice.

12: Hedges, Green Walls and Roofs: Linear, vertical and podium landscapes offer diverse features in confined or unused areas and provide valuable wildlife corridors extending green blue infrastructure within and beyond the site. Hedges are the most common place feature in the English pastoral landscape and this guidance covers native hedgerow management and planting as well as ornamental hedges for garden boundaries and parkland landscapes. Alternative features including climbing plants, fedges and roof gardens are also covered in the guidance.

2 The Planning Application and Landscape Design

Introduction

- 2.1** Major applications for full planning permission should ordinarily include landscape proposals as detailed in the schedule. Where the scope of the application is such that landscape design has a peripheral role to play, for example in an urban setting, landscape details may be a condition if approval is granted. In all cases the Design and Access statement or a separate Landscape statement should include the approach to Landscape Design accompanied with an indicative Landscape Parameters Plan to accompany the planning application. Tree and Ecological surveys may also be required- detailed information on these requirements can be found at:

[Making a Planning Application](#)

Landscape Design and the Outline Application:

- 2.2** An outline application allows for a decision to be made on the general principles of how a site can be developed and is granted subject to conditions requiring the approval of one or more reserved matters. Landscape treatment can be a reserved matter, where applicants can choose not to submit details in an outline application as defined in article 2 of the Town and Country Planning (Development Management procedure) (England) Order 2015 along with access and appearance. However, the council may decide that the landscape treatment is critical or a major component of the design and can request detailed landscape proposals to accompany the application.
- 2.3** In all cases, major outline applications, must include an indicative landscape strategy with evidence of site survey and analysis presented as a parameters plan showing the principles to be

applied. Accompanying Design and Access statements or separate Landscape Statement must reference the landscape strategy even where details are reserved matters.

- 2.4** Where landscape treatment is conditioned, or conditioned as a reserved matter, the applicant must submit details prior to implementation as required in the grant of planning permission letter. Some planning applications may require a separate specialist Landscape Visual Impact Assessment or a Landscape Visual Appraisal . The requirements for LVIA's and LVA's are covered later in this chapter.
- 2.5** The council will be looking for clear evidence of design process and the following factors need to be considered. Further advice can be sought from the Council by booking a pre-application discussion.

The Design Process

Site survey

- 2.6** The site survey will lay the foundations for a meaningful landscape strategy and design and should map the existing and adjacent spatial context which may include:
- 2.7** *Landscape features – woodland, trees, hedges, field pattern, countryside character and open space; vegetation, habitat type and condition; topographical survey and slope analysis; pedestrian and cycle networks and desire lines; key views; built form, boundaries and verges; Environmental factors – wind direction, sun path, micro-climate; hydrology, drainage and soils; position of utilities, easements or covenant*



Figure 2.1 Example of site survey

Site analysis

- 2.8** Site analysis should demonstrate how the survey information has been appraised and identify what opportunities have been used to promote a responsive approach to local context and should make the connection between site survey and landscape strategy. Site analysis may include the following themes in relation to relevant policies and Supplementary Planning Documents.
- 2.9** *Development of an emerging spatial structure and character zones; analysis of views and how they should be treated and potential for vistas and new landmark features; potential for*

gateways and points of arrival; means of dealing with sloping land and building mass on prominent land-forms; means of mitigating adverse development impact on the edge of open land; strategy for the preservation of existing habitats; new planting context and how this will contribute to local distinctiveness; environmental factors such as shelter and shade; connection with pedestrian and cycle links with existing urban fabric and green blue infrastructure



Figure 2.2 Example of site analysis

Landscape Strategy and Masterplan

2.10 The landscape strategy should demonstrate a clear link from survey and analysis to the detailed design proposals. The landscape masterplan may be a plan or a suite of drawings (depending on the complexity of the scheme) and should be accompanied with a supporting landscape design statement to demonstrate the layout of the proposals and green blue infrastructure of the site within the context of built development and the wider landscape and may include the following:

2.11 *Existing site features including trees to be retained; existing site features including trees to be removed; character zones; indicative hard and soft landscape treatment, materials palette and how it contributes to local distinctiveness; provision of street trees; the layout and typology of open space; treatment for mitigation on the edge of open countryside, adjacent to heritage assets and nature conservation areas; visual considerations and off-site factors affecting the design; spatial arrangement and evidence that the design maintains/ enhances the wider networks of nature conservation, green-blue infrastructure and pedestrian and cycle routes; how environmental factors such as wind, energy efficiency and noise have informed the design; location and type of drainage; built form outline; existing and concept for proposed topography.*

The Design and Access Statement or separate Landscape Statement must accurately describe the design presented on the drawings submitted and is the opportunity to explain and justify the scheme and to demonstrate that the design is good enough to approve.

Design and Access Statement

2.12 The landscape strategy can be described in a standalone Landscape Statement or within the Design and Access statement to accompany the planning application.



Figure 2.3 Example of masterplan with materials palette

2.13 The submission should comprise of site photographs, written analysis, plans, sections, diagrams and perspective sketches sufficient to fully illustrate the scheme and prepared by an experienced Landscape Architect with support from an Ecologist and Arboriculturalist as necessary. The statement should provide a design narrative to accompany the required plans in the planning application and clearly show the design process that has been followed from site assessment, involvement (consultation), evaluation and design and any alternative designs that have been considered.

2.14 Even if detailed decisions have not been made, the statement needs to explain and justify the design decisions taken so far and the design principles that will be followed when all the details are finalised and should include a materials palette to be used in the

detailed design. Harrogate Borough Council as the Planning authority will use this statement to evaluate details submitted to discharge conditions.

2.15 There are also specific requirements the Design and Access Statement needs to address which are **Use, Amount, Layout, Scale, Landscaping, Appearance** and **Access**.

2.16 **All** of these aspects of the scheme can be applied to landscape design and should be addressed in the design and access statement or Landscape Statement unless it can be demonstrated that they are not relevant. The following gives an outline of the ways in which these considerations can be interpreted and applied to Landscape design.

Use: How different uses within and adjacent to the development will work together, how they are informed by land-use policy and how they will allow for multi-functional uses. For example how requirements for sustainable urban drainage, bio-diversity net gain and active transport will be met in combination with amenity open space for play and informal recreation within and beyond the site boundaries.

Amount: Details of how much of each type of open space in hectares or square metres must be provided along with an explanation of why this is an appropriate amount for the development. A zoned Plan should be included to show the different typology of open space with overlapping hatching to denote multi-functional spaces so that the planning authority can understand where the site allocations are. Assessment may not be confined to the site boundaries and a description of how development will change a neighbourhood may be required for example by adding sports fields or increasing demand for an existing park off-site. The applicant must make reference to:

[Provision of Open Space and Village Halls SPD](#)

Layout: Alongside the Landscape masterplan or landscape parameters plan, for outline applications, the statement needs to explain why this layout was chosen, what alternatives were considered and how it will work within its context. For example, an edge of settlement site will need a narrative on how the development allows for a sensitive interface with open countryside. For larger developments there is a need to explain the balance of features and how buildings, infrastructure and spaces will work together to make a successful place which is accessible and safe.

Scale: Take account of site constraints and restrictions and show how the scale of the development physically and visually fits into the site. Consider the balance of features in relation to topography and height of buildings - for example the relationship between the village green and enclosing built form or the scale of the street taking account of movement corridors, accessibility, verges, tree planting, hedgerows and built edge.

Landscaping: Landscape design is about much more than just plants and where the development has scope it is expected that the design will demonstrate a landscape strategy where built form, circulation and green blue infrastructure is organised spatially to create a great place. Quality, in this respect, is more about design layout than materials but details such as the type and nature of planting or hard surfacing also have an important role to play in determining character, quality and functionality. The statement should explain how landscape treatment will work with other design decisions even if the details have yet to be decided and must consider long-term management and maintenance.

Appearance: The appearance of the development should be the embodiment of all the design decisions taken. The applicant needs to make a vision statement for the scheme which is what they want the place to look like and why. The vision statement can be based on a theme and as a result of Urban and/ or Landscape character analysis and should underpin all detailed aspects of the scheme. Useful detailed guidance on the Design and Access Statement has been prepared by CABE 2006.

[Design and Access Statements](#)

Detailed Landscape Proposals

- 2.17** Detailed landscape proposals will be required either as part of a planning application or to discharge conditions detailed in the grant of planning permission.
- 2.18** The scale of planting plans should be tailored to the complexity of the scheme for ease of legibility and accompanied with a planting schedule and specification of works which includes ground preparation. Plans must show the position of proposed trees, species, size, stock type, variety, method of support, furniture, rooting zone type with calculations and structural soil specification, trees to be retained on site and measures for protection during the works. The plant beds for different types of shrub, herbaceous and woodland planting must be shown on plan with species, variety, nursery stock type, size, density and mix percentages all referenced in the planting schedule. Sectional details may accompany planting plans and schedules to show how the tree will be supported, any furniture, backfill and surface finishing. Detailed proposals must also show existing and proposed levels with contours and spot heights where appropriate. Existing and proposed grass areas must be defined on plan with detail on the seed mix or type of turf to be used included in the plant schedules.
- 2.19** Detailed hard landscape proposals must show the general arrangement on plan of surfacing, steps, boundary treatments, retaining walls, lighting, street furniture and the location and design of special features such as public art, play equipment etc and existing and proposed levels including spot heights.
- 2.20** Plans should be accompanied with fully dimensioned, sectional details and/ or photographs as necessary to show the detailed design and size of structures. Draw plans to metric scale with a north point and scale bar.

- 2.21** Where there is more than one drawing on a sheet they should be separately labelled as plans, elevations or sections with the scale and include dimensions. The scale and sheet size should be noted in the title block with multiple plans cross -referenced with an inset plan.

Drawings	Plans	Sections/ Details	Perspective Sketches	Photos	Samples
Site Location	1:1250/ 1:2500				
Site Survey and Analysis	1:500/ 1:1250	1:500/ 1:200		Yes	
Landscape Strategy	1:500/ 1:1250	1:500/ 1:200	Yes	Yes	
Tree Protection Plan	1:500/ 1:1250				
Landscape Layout	1:500/ 1:1250	1:200/ 1:100	Yes	Yes	
Planting Plans	1:100/ 1:200/ 1:500	1:5/ 1:10		Yes	Yes
Hardworks	1:200/ 1:500	1:5/ 1:10		Yes	Yes
Design and Access Statement	Yes - all to be included or referenced	1:500/ 1:200	Yes	Yes	Palette

Table 2.1 Landscape drawing details

Environmental Impact Assessment (EIA)

2.22 Certain types of development may require an Environmental Impact Assessment, if it is likely to have a significant effect on the environment, governed by the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Projects are listed in two schedules with schedule 1 projects requiring an Environmental Impact Assessment in all cases and Schedule 2 projects requiring an EIA if they meet certain size thresholds and are considered likely to have a significant effect on the environment as set out in Schedule 3 of the regulations. Ask the council for an EIA screening opinion at the pre-application stage.

Landscape Visual Impact Assessment (LVIA)

2.23 It may be concluded that there are likely to be significant landscape and visual effects in which case a Landscape and Visual Impact Assessment (LVIA) will be required as part of the EIA. A LVIA is a specialist report and must be prepared by a qualified Landscape Architect with specific experience in this type of work but it should not be considered as divorced from design development.

2.24 Harrogate Borough Council may require a **Landscape Visual Appraisal (LVA)**, if an EIA is not required, where it is considered that there are aspects of a development which may have a visual or landscape effect. Consult the council at the pre-application stage to ask for further guidance at an early stage.

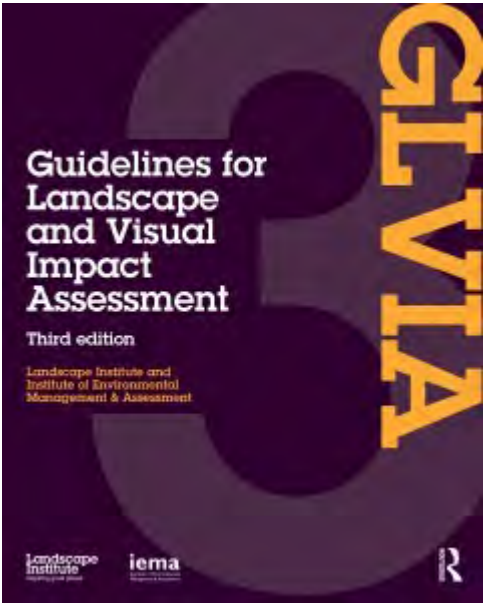
2.25 The assessment must be carried out in accordance with industry standard documentation *Guidelines for Landscape and Visual Impact Assessment 3rd Edition* Landscape Institute and Institute of Environmental Management and Assessment 2013 (GLVIA 3)

2.26 In accordance with GLVIA 3 the consultant must agree the study area, viewpoints and methodology of the LVIA/LVA with HBC's Principle Landscape Architect prior to undertaking the assessment.

2.27 The council's Landscape Architect will review submitted assessments in accordance with *Reviewing Landscape and Visual Impact Assessments (LVIA's) and Landscape and Visual Appraisals Technical Guidance Note 1/20* Landscape Institute 2020.

2.28 The LVIA/LVA is a separate strategic assessment and must be conducted rigorously, using professional experience, in accordance with the agreed methodology and industry standard practice. The assessment must not be used as an opportunity to commend the scheme for approval (this is the purpose of the Landscape Statement/ Design and Access Statement). Harrogate Borough Council review will be looking for evidence of:

- How the outcome of the LVIA has informed the design process ie how decisions about whether or where to develop have evolved or been modified as a result of the assessment. Where no changes have been made this must be fully justified.
- The cumulative impact of this proposal together with any development proposals on adjacent land
- Full and accurately assessed Landscape and Visual baseline studies which can be supported by assessment against criteria set out in the methodology
- A clear methodology for making judgements on the landscape and visual impacts and a full statement for each judgement given which can be justified by application of the methodology and against the baseline studies.
- A statement on the significance of judgements in the case of LVIA's (LVA's do not require a statement of significance)
- A clear distinction must be made between Landscape and Visual effects
- Use *Assessing Landscape Value Outside National Designations Technical Guidance Note 02/21* Landscape Institute 2021 [TGN 02/21](#) in the assessment of baseline landscape character



Picture 2.1 Guidelines for Landscape and Visual Impact Assessment 3rd edition

- The visual content of LVIA's and LVA's must be in accordance with *Visual Representation of Development Proposals* [Technical Guidance Note 06/19](#) Landscape Institute Sept 2019 [TGN 06/19](#)

2.29 Finally, the LVIA often includes a lot of documents and much critical information is often buried in the appendices which is difficult to cross reference in the on-line document management system. Consultants can make it easier to comprehend their findings if they set out all relevant information for each receptor including visualisations and a summary on a single sheet – even if this is duplicated elsewhere in tables.

3 Residential Landscape Design

3.1 This section of the Landscape Design Guide provides a quick reference to standards expected specifically within new residential development and covers strategic issues relating to landscape setting, visual character and townscape as well as more detailed standards in relation to site layout, gardens and street trees.

Landscape Character

3.2 At the site analysis stage residential development should be considered in relation to the character of the surrounding landscape as described in National Character Areas and Local Landscape Character Assessments and by looking at viewpoints into and out of the site and taking account of the following:

The form of landscape design and planting as this plays a major part in the way development relates to its setting and fits into the existing landscape.



Figure 3.2 Adding new landscape features can connect new development with existing settlement pattern

Colour- as this plays a part in appearance and the degree of visual intrusion. Compare colours from a distance and reference the colour of local building materials.



Picture 3.1 The use of colour can make buildings recede and blend in with the landscape



Figure 3.1 New development can look disconnected

A concept for the built form and the way buildings fit into the **land form** and the general shape and massing of development. Buildings arranged parallel or at right angles to contours sit more comfortably within the landscape than those arranged at random and varying angles. Otherwise buildings may be a visually confused sprawl of elements which do not relate to the sites setting or existing development.

Adding to existing patterns of development in the landscape will aid integration of new with the old and existing site features. Consider the existing relationship of buildings to landscape and take into account form, scale and balance.



Figure 3.3 New development successfully integrated using pattern, colour and landscape features

Avoid blocking important views and retain a gap in new development to frame important viewpoints. Keep buildings below the **skyline** where they will fit more comfortably into their setting and allow the landscape to dominate.



Figure 3.4 Framing views and making a feature of the surrounding landscape



Figure 3.5 Avoiding the skyline is sympathetic to the existing landscape pattern

Modifications to the Micro-climate to provide shelter and shade and also help to reduce energy loss.

Edges occur where one type of space meets another for example at the interface between settlement and open countryside, where a new development overlooks open space or meets established townscape, where new development meets a major road. Edges need to be clearly defined with a clear distinction between public and private. The specific interface will influence the treatment but there are some rules as follows:

- Edges need to be defined with a clear distinction between public and private open space
- To avoid the visual domination of rear fences, edges adjacent to major roads, existing public footpaths, public open space and open countryside should face outwards to provide an active frontage that contributes to landscape/ townscape character and reduces the possibility of anti-social behaviour.
- Edges adjacent to open countryside – dwellings need to respond to the rural character. Larger detached dwellings with an irregular or varying distance from the edge, larger gardens and some softening with groups of tree planting to frame views of buildings from outside add a feathered and softened appearance. Strong screen planting will not normally

be necessary unless there is a requirement for buffer planting in relation to heritage assets or sites of interest for Nature Conservation (SINC).

- Existing boundary features worthy of retention or capable of restoration such as hedges, ditches, trees or dry stone walls should be considered early in the design stage and incorporated into proposals
- Where development will be adjacent to Sites of Interest for Nature Conservation a public open space buffer of 20m is required which should be designed with a footpath link to take recreational pressure off the SINC.
- Edges/ boundaries between incompatible land uses for example industrial and residential may be planted for screening or to create a sound buffer (see structure planting for further information)



Figure 3.6 Example of landscape buffer to site of interest for nature conservation



Figure 3.7 Retain site features such as hedges, ditches, walls and trees and incorporate into proposed development

Place-making and Site Layout

3.3 The layout of residential neighbourhoods either as new settlement, urban extensions or infill within smaller settlements should aim to create permeable, legible and distinctive places which respond well to landscape and settlement pattern by employing good urban design practices.

Gateways

3.4 Distinctive features at entrances act as an aid to legibility for pedestrians and road users and help people navigate their way around a new area; signify an entrance to a particular character area and act as a cue to drivers that they are approaching a special area such as home zone or communal space.

3.5 Gateways can be suggested with pinch points between buildings, specimen trees or they can be marked by a physical gateway such as brick piers an archway, gated entrance or public art.

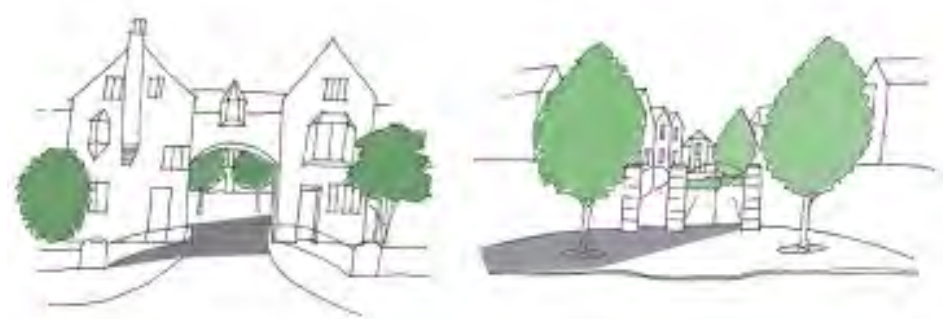


Figure 3.8 Gateways can be architectural features, planting or physical enclosure or a combination

Landmarks

3.6 Views into development along streets are important from outside and need careful consideration. Landmarks are designed to be visible from a wider area and can be employed in townscape to terminate a view or create a strong vista which is appealing, memorable and distinctive. Landmarks do not need to be new features – they can be retained or enhanced existing features such as a building or mature trees or a view beyond the proposed development.

3.7 Where newly created, Landmarks can be buildings which step out along a street, buildings with distinctive features on a bend or end of a street which closes a view or distinctive landscape features such as trees or hedges which terminate a vista.



Figure 3.9 Landmarks can be existing buildings or new ones of architectural quality which terminate a view

Nodal Points

- 3.8** Residential areas should be structured around nodal points where there is a convergence of routes and transport opportunities, for example, a train station or bus stop. Nodal points should accommodate the co-location of community facilities structured around public open space where residential densities may be higher forming a village cluster.



Figure 3.10 Plan community facilities around nodal points

Garden Sizes

Rear Gardens

- 3.9** A rear garden is defined as a garden space entirely on the private, non-entrance side of the house.
- 3.10** The minimum rear garden size that the council will accept for three bedroom homes and above is 100m² for most house types. This size has been found to be acceptable and workable to accommodate the range of functions and activities associated with private domestic open spaces. Provision needs to be made for storage sheds, drying areas and wheelie bins as well as visual

delight and the potential for plant growth. In rear gardens a minimum 50% portion or more should be laid to real grass lawn (not artificial turf).

3.11 Bin storage needs to take account of provision for one 240 litre bin/ household for fortnightly collection plus similar for recycling. In multiple occupancy buildings bin stores need to be sufficient to hold this for the number of households within it.

3.12 At least three fifths of the garden must be capable of receiving sunshine and not over shadowed by buildings, walls and fences. Plan for rectangular gardens as they perform best in relation to sunlight and provide optimal potential for amenity.

3.13 Two and single bed roomed house types must provide a minimum of 75m² of rear garden.

3.14 There are certain exceptional circumstances where a relaxation on these minimum standards may be allowable as follows:

- Provision of Communal open space adjacent to smaller town houses and flats where a substantial enclosed communal open space can be secured for the use of residents to the front or rear of properties.
- Houses performing a special role in townscape terms, for example, turning a corner or providing a vista where the garden size of an occasional house may need to be relaxed in the interest of strengthening the urban form of development overall.
- Flats – communal gardens must be provided on the basis of 25m²/ flat. Communal spaces must be appropriately screened and secured with hedges and provide patio areas to sit out. Balconies over 5m² in area may count towards the overall allocation.
- One and Two bedroom Flats in higher density urban situations garden sizes may be relaxed if within very close

proximity to central green spaces and facilities (less than 250m)

Front Gardens

3.15 All house types and blocks of flats must have a frontage onto the street with defensible private front gardens and boundary treatments at the back edge of the pavement/ public realm and between properties. Front boundaries should be between 900-1100mm in height with gated entrance and paved threshold/ path to front doors or paved off shoot from driveways. Driveways may be left ungated.



Figure 3.11 Provide communal space for flats or locate next to public open space, give all houses a frontage and plant small front gardens

3.16 Site layout must also take account of the following:

- Existing trees should be retained within the public realm or front gardens as it adds a sense of establishment and maturity but they do require adequate space above and below ground in order to thrive and prevent nuisance.
- The National Planning Policy Framework (July 2021) now requires that all new streets must be tree lined. Tree planting

may be undertaken within the public realm on primary and secondary streets or front gardens and urban lanes where they will be the subject of Tree Preservation Orders

- Hedge Planting to front boundaries as it makes a significant contribution to place-making, softening built edges and adding to biodiversity and green-blue infrastructure
- Hard surfacing should be permeable and reduced to essential areas only (driveways and paving to front entrances)
- Smaller front gardens are better planted than laid to lawn for maintenance reasons
- Provide hard standing (500mm) below windows and to built edges to allow for window cleaning and to provide a mowing edge.



Figure 3.12 Make provision for a maintenance strip around built edges and walls

Side Gardens and Gable Ends

- 3.17** Side gardens and gable ends fronting the street should be avoided wherever possible but especially in relation to the frontage of main streets and terminating views along side streets and urban lanes.

House types that turn the corner to contain perimeter blocks with frontages facing frontages and the rear of properties enclosed with backs facing backs should be applied.

- 3.18** Where the occasional gable end or side wall of properties on the street cannot be avoided within development, make sure it isn't in a conspicuous position within the townscape and that no close boarded timber fencing is visible on the street. Instead plant the side edge with suitable groundcover to soften the built form.

The Public Frontage

- 3.19** As well as fronting the street, housing should front on to existing Public Rights of Way, public open space and perimeter footpaths within development to allow for passive surveillance and to avoid odd edges and areas where people can congregate or hang out unseen. Avoid rear courtyards with public access to a space that is not overlooked.

Housing and Street Trees

- 3.20** The type and style of tree planting to new streets will depend on the scale and hierarchy of the street but the council requires all new residential streets to be tree lined in accordance with new guidance contained within NPPF (July 2021). Species should be selected that are appropriate to their location, well planted and maintained.
- 3.21** Major transport corridors should incorporate wide grass verges and sufficient space above and below ground to plant large canopy trees in avenues which will create a unifying feature at the edges of development, adjacent to mixed use streets and between established and new residential areas



Figure 3.13 Tree planting along transport corridors



Figure 3.14 Large canopy parkland trees should also be planted in public open space

3.22 Primary streets should also incorporate trees within grass verge and public open space in such a way that medium to large canopy trees can be planted along the street.



Figure 3.15 Large canopy tree planting in verges along primary routes

3.23 Trees within urban lanes and secondary routes can be used as gateway features and to guide and slow vehicles down, to narrow the street and to zone streets as well as giving character and distinctiveness. In these locations, species selection may be smaller more fastigate in habit where space above and below ground is likely to be limited.



Figure 3.16 Tree planting within urban lanes and courtyards where smaller trees and fastigate varieties may be acceptable

3.24 In all cases, Tree Preservation orders will be sought for new street tree planting to ensure trees are retained or replaced if they fail to thrive.

3.25 Further guidance is given on street tree planting within chapter 8.

Streets without trees look barren and are not attractive to residents or visitors.

Landscape and Open Spaces

3.26 The following principles should be demonstrated in the planning and design of green-blue Infrastructure in new residential development and with reference to the council's Green Infrastructure SPD 2014 and Provision of Open Space and Village Halls SPD 2021.

3 Residential Landscape Design

- Provide a coherent network of spaces that are joined together to make a multi-functional green network that has edge to edge connectivity with the wider green infrastructure and movement corridors beyond the confines of the site
- Integrate the provision of open space with the natural drainage of the site, surface water run-off and Sustainable Urban Drainage to provide green-blue infrastructure
- Open spaces to be strategically co-located with community facilities which encourages activity by all users
- Provision and type of ground surfaces considered at the outset with an approach taken which balances current and futures needs of residents with the requirements for biodiversity net gain
- Green spaces should complement and draw from the positive aspects of the sites wider landscape character and setting
- A network of open spaces which supports the movement strategy making provision for attractive, direct and convenient active travel
- Align amenity spaces with site attributes for comfort and to meet the needs of users making best use of environmental factors such as topography, sunlight, shelter from prevailing wind and enclosure to encourage use. For example a play area with seating needs to be sheltered and have a sunny aspect with good surveillance. An informal play/ kick-a bout area needs to be fairly level, hard wearing and not directly outside dwellings
- The future management and care of open spaces must be considered at the outset and a management and maintenance plan will be a condition of any planning approval.
- Details of how much of each type of open space in hectares or square metres must be provided along with an explanation of why this is an appropriate amount for the development in accordance with Harrogate Borough Council's Provision of Open Space and Village Halls SPD 2021



Figure 3.17 Some good examples of public open space where buildings are orientated to overlook it and there is a clear connection to the wider landscape beyond the site



Picture 3.2 New streets without trees look barren and there is an expectation that all new streets must be tree lined



Figure 4.3 Detail of the finished school design

Design Principles

4.3 At the concept design stage the following design principles can assist in providing good design for active transport (walking and cycling) and will be used in the assessment of major planning applications:

- Integrate new development into the existing urban fabric connecting existing and proposed streets and routes to neighbouring housing estates and facilities such as public parks, cycling routes and public rights of way, shops, bus stops and schools.

- As a general rule, avoid segregated routes and accommodate pedestrians and cyclists on streets. Routes across open space should be broad and overlooked by housing fronting onto them and not fully enclosed by planting.
- Where paths will cross open space consider the type of space and its use alongside the need for desire lines, for example, paths are best located to one side of informal recreational areas and in some cases more informal paths are acceptable in low use areas.
- Development should be pedestrian led and permeable which tends to give rise to straight direct streets and small perimeter blocks of development with minimal use of cul de sacs. Where streets are very long, however, straight streets can lead to higher speeds and irregularity or a bend can be incorporated but avoid overly curved street layouts with lots of dead ends as these will be inconvenient for pedestrians.

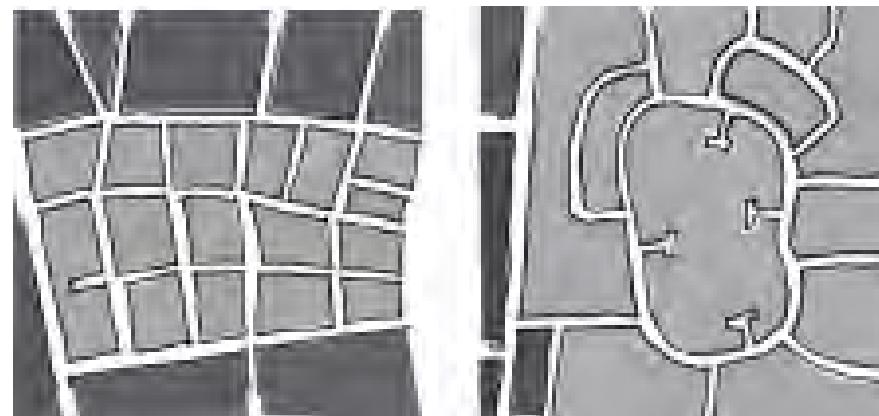


Figure 4.4 Rectilinear layouts and short perimeter blocks are more convenient than curvilinear ones for pedestrians

- Areas of local amenity should have good connectivity to provide safe and direct access to schools, parks and shops and should be fully integrated with parking. The design

should aim for walkable neighbourhoods with a range of facilities within 800m or a 10 minute walk.

- All routes must be overlooked to prevent anti-social behaviour but also consider the position of seats in relation to the front of properties to prevent nuisance.
- A peripheral or perimeter path may be incorporated into a scheme where the main purpose is recreational. In larger housing schemes routes may be necessary to take recreational pressure off sensitive edges such as Sites of Importance for Nature Conservation (SINC) and provide alternative provision for residents to walk their dogs or take a stroll. Some developments by their very nature are less built up such as holiday parks, or cemeteries where peripheral routes for recreation may be required or expected to link destinations. Connect these routes to site wide circulation and design in easy flowing curves which reflect the topography, existing site features and planting scheme.
- Path intersections provide nodal opportunities for positioning amenity open space, play areas, meeting places or a public square.
- Avoid networks of paths which create maintenance problems in open space such as tight bends or triangular patches of grass. Pave tight intersections or realign paths to provide sweeping curves

4.4 For further detailed advice consult:

[Manual for Streets](#)

Any footpath which provides access to a building must conform to the Building Regulations Part M 2015 as amended and updated 2016 and 2020 Volume 1: dwellings and Volume 2: Buildings other than dwellings [Building Regulations Part M 2015](#)

Footpaths and Accessibility

- 4.5** Pedestrian circulation needs to accommodate changes in level on sloping land and provide equitable, barrier-free access that is also functional and aesthetically pleasing rather than an add-on.
- 4.6** Provision for access in the countryside and in public open spaces and parks, where paths do not serve a building, also needs to be to a good standard. The Council expects standards that conform to Countryside for All Accessible Standard which can be found in guidance by the Fieldfare Trust 2005 which shows how accessibility can be assessed and provides standards in different settings from urban formal landscapes to remote open countryside. Applicants must consider the following:

Paths for All

- Gentle slopes of 1:20 or less are preferable for easy year round accessibility. Where ramps have to be steeper bear in mind ambulant and wheelchair users can manage slopes up to 1:16 but most cannot manage a slope of 1:12. A 1:12 slope is often cited as the maximum slope that can be applied but it should be reserved for very short distances only.
- Consider providing handrails to both sides of the path especially where slopes are steeper than 1:20 and a surface that has good traction
- Carry out an access audit and prioritise routes from entry points to important visitor attractions, pic-nic areas, toilets and car parks. Consider advertising the accessible routes on websites and with tactile way-finding
- Regular landings and rest areas must be incorporated into the design and provide space off the path for a seat and adjacent space for wheelchairs
- The width of paths at which two wheelchairs can comfortably pass is 1.8m but generally the council requires widths of 2m for new footpaths. The minimum allowable width of footpaths

is 1.2m which enables a wheelchair to pass a person or two people to pass but this should be reserved for informal low use paths. Further guidance on path widths can be found in the following resources:

[Metric Handbook Planning and Design Data](#) *The Metric Handbook: Planning and Design Data*, Buxton, 7th Edition, Taylor and Francis 2021

[Inclusive mobility and Transport Access](#)

- 4.7** Some ambulant people with disabilities prefer steps to ramps and they should be integrated into the design as an alternative when negotiating slopes in the landscape.

Path surfacing:

- 4.8** Surfacing materials and edging details should be selected that are appropriate to function, reflect the character of the setting and overall external design. Sites in Conservation Areas or historic designed landscapes will require the use of traditional pavements wherever possible such as granite setts and York stone flags or a viable high quality alternative that suits the context. Design for Highways and Public Realm works in Historic Places should follow the guidance provided by Historic England:

[Streets for All London](#)



Figure 4.5 Examples of traditional materials used in pavements at Ripley and in Harrogate

In the AONB new footpaths must only form part of proposals where strictly necessary and must be of an informal unsealed construction without edging and frequently cut-off drains are recommended to prevent erosion and sediment deposition. Seek further advice and guidance from the AONB office.

- 4.9** In open countryside or adjacent to open countryside, outside the AONB, footpaths should also be as informal as possible and unsealed, for example using crushed stone a self-bound aggregate such as hoggin or crushed limestone surface with or without an ash dressing with no edging, an informal edging of stones or timber edging.



Figure 4.6 Examples of informal paths - self bound gravel with a timber edge and bark chippings without an edge

- 4.10** On multi-functional routes, of high intensity in urban/ suburban areas, the most practical surfacing may be tarmac, with or without a resin bonded aggregate or concrete. Tarmac and resin bound surfacing can be provided to a porous specification which in combination with a free draining DTP type 3 sub base will allow water to infiltrate. Porous surfaces do have a tendency to silt up over time and should always be used in combination with other forms of positive drainage. The use of porous materials to ordinary footpath widths may not be necessary where they can drain adequately to grass with a cross fall or camber of 1:40.
- 4.11** Generally, footpath edging should be flush with the surface to allow drainage unless an up-stand is required to stop wheelchairs from over running for example on ramps. Some surfacing is less practical for cyclists and can also be a deterrent to skateboarders for example resin bound surfaces and block paviers.
- 4.12** Certain specialist surfacing such as wet pour rubber has a critical fall height rating suitable for use in play areas and grass mat surfacing also has an impact absorption rating suitable beneath

some types of play equipment – contact specialist suppliers for technical guidance. In some situations, footpaths double as maintenance or emergency access and the selection of surfacing, type and depth of bedding as well as edge restraint requires design advice from a highway engineer to ensure the pavement can take the additional load.



Figure 4.7 Examples of wet pour rubber surfacing in valley gardens and resin bound surfacing with aluminium edging

- 4.13** Edging is often selected to complement the character of selected surfacing but design considerations might also include provision to a certain geometry. In-situ concrete with shuttering to the edges provides for smooth flowing curves and aluminium and steel edges can be bent to curves, sett or block edges can easily accommodate curves due to the small unit size while concrete pin kerbs and timber edge boarding cannot.

4 Hardworks: Footpath Design and Paving



Figure 4.8 Examples of small paving units in Limestone and York stone laid to curves

- 4.14** Where access is required below pavements to maintain services, surfaces need to be easily taken up and replaced. Surfacing such as resin bound gravel, concrete and to a lesser extent tarmac can be broken out but replacement surfacing will show the line of the trench. If care is taken setts, blocks and slabs can be lifted, set aside and reinstated without evidence that work has been undertaken.
- 4.15** Most paving materials can be recycled these days at end of life. Although bitumen bound materials, such as tarmac, cannot be broken up and reused as hardcore, it is now easy to recycle it back into the aggregate needed for new tarmac. A useful source of technical guidance on how to lay different types of pavement can be found at:

[Paving expert](#)

Surface	Colours/ Finishes	Purpose	Use	Porous	Character	Edging
Tarmac	pigment applied, chippings	multi-purpose	Intensive	Porous option	urban/ suburban	pin kerb/ blocks/setts
In-situ Concrete	pigmented/ exposed aggregate	multi-purpose	Intensive	no	urban/ Suburban	no edge/ timber/ steel
Block Paviments	range of colours	pedestrian/ access friendly	Intensive	Porous option	Urban	pin kerb/ block
Concrete slabs	range of colours	pedestrian/ access friendly	Intensive	no	urban/ suburban	pin kerb/ blocks/ setts
Stone flags	natural colour range	pedestrian access friendly	Intensive	no	urban/ heritage	setts/ stone kerbs
Stone setts	natural colour range	pedestrian	Intensive	no	urban/ heritage	setts
Resin bound gravel	natural colour range	pedestrian/ tree pit	intensive	yes	urban/ suburban/ heritage/ rural	steel/ timber/ setts
Resin bonded aggregate	natural colour range	pedestrian	medium	no	urban/ heritage/ rural	steel/timber/ setts/ pin kerb

Surface	Colours/ Finishes	Purpose	Use	Porous	Character	Edging
Self bound aggregate	range of natural colours	pedestrian	low/ medium	yes	rural/ heritage	timber
Loose gravel/ loose stone	range of natural colours	pedestrian	low	yes	rural/ heritage	timber/ informal stones/no edge
Grass mat	gravel or grass infil	vehicular, play surface, tree pit surfacing	medium	yes	car park/ play areas/ maintenance tracks	concrete kerb/ pinned/ timber
Bark chip	none	tree pit surface/ pedestrian	low	yes	rural woodland/ tree pits/ play areas	timber
Wet pour rubber	full range of colours	play/ pedestrian	medium	yes	play surfacing	timber/ pin kerb

Table 4.1 Paving materials purpose and function

Steps:

4.16 Steps are a great opportunity for creating character and drama and they provide an alternative to ramps which some ambulant users prefer. Where steps provide access to a building they must be designed in accordance with the Building Regulations Part M 2015 as amended and updated 2016 and 2020 Volume 1: dwellings and Volume 2: Buildings other than dwellings

Building Regulations Part M

4.17 In the landscape, steps should not be designed to interior standards as people tend to move faster outdoors and they should accommodate the ease at which they can be used at a natural pace. The steepness of a flight of steps is crucial to its character and in general steps in the landscape tend to be more relaxed and generous in keeping with the scale of the environment. A higher tread riser ratio is desirable and risers should be a minimum of 112 mm and maximum of 170 mm with treads of around 500 mm or as generous as space will allow and not less than 300mm. In an historic environment, such as a designed landscape, the step riser ratio should be taken from existing examples or site evidence along with the design, detailing and materials.

4.18 Materials chosen should be co-ordinated to adjacent pavements but it is advisable to use textured finishes or none slip materials for treads as they provide grip in icy conditions. Steps can be monolithic in construction or constructed in different materials with an overhang or nosing which gives some shadow and definition to the steps and makes them visually distinct from each other.

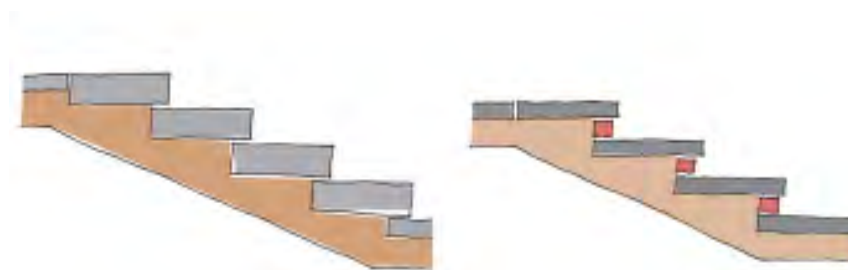


Figure 4.9 Steps can be monolithic or constructed from different materials with an overhang

- 4.19** Steps can be hazardous to people with visual impairment and should be located off the main footpath line. In the public realm, steps should incorporate tactile strips at the top and bottom to warn of the level change. Risers and treads must be regular in size and in a minimum flight of 3 steps. In hard public areas visibility strips in a contrasting colour should also be incorporated into the treads and risers – introducing contrasting stone inserts in historic environments. Handrails should extend beyond the top of steps by 300mm and from the bottom by 450mm, should be continuous across any landings and easy and comfortable to grip. Handrail height outdoors should be in the range of 750-850mm.



Picture 4.1 Steps can be hazardous and should incorporate nosings in a contrasting colour and hazard paving at the top and bottom of flights

- 4.20** Where sloping land presents a challenge stepped ramps may also be considered which are usually manageable for pushchairs but these are not accessible for wheelchair users and unsuitable as cycle routes or for maintenance vehicles.

5 Hardworks: Street Furniture and Boundary Treatments

Street furniture Generally

5.1 Street furniture includes seats, trees and tree furniture (guards and grilles), bollards, direction signs, parking meters, cycle stands and shelters, litter bins, fountains and sculpture. The following general principles should be employed to guide the selection and placement of street furniture:

- Keep furniture to the minimum that is required for streets and spaces to function and remove any redundant or surplus items, attach signs to existing lamp posts or walls wherever possible to reduce clutter.



Figure 5.1 Clutter can be poorly sited bins or just too much unnecessary furniture

- Situate furniture in avoidance zones (off the main direction of travel) where they will not impede movement or cause a

hazard in a co-ordinated position and demarcated with a linear strip of tactile paving in a contrasting colour.



Picture 5.1 Example of co-ordinated furniture in the avoidance zone

- Where furniture is necessary, the selection needs to contribute to a strong sense of place and should be high quality, simple, elegant and appropriate to context. Co-ordinate pieces and show how the selection has been arrived at through a furniture strategy or demonstrate

conformance with an existing furniture strategy, for example, the Harrogate Town Centre Masterplan

- Retain and preserve historic furniture examples such as street signs or seats and consider recasting or replacement where individual examples have been lost or where a replacement strategy has been agreed. Historic designs are in some cases still being made or can be fabricated to historic pattern book designs



Figure 5.2 Street furniture can contribute to a strong sense of place through its style for example this bin at Ripley or because it is strongly associated with place such as Serpentine benches in Valley Gardens

- In special locations such as a market square or urban park consider one-off bespoke pieces to reinforce the local sense of place but use this tool sparingly and in accordance with existing strategies – too much variety can visually fragment the public realm.
- Fix furniture below ground wherever possible with extended legs embedded into concrete or bolted to a concrete pad foundation to prevent theft or vandalism.



Figure 5.3 Bespoke seats in special locations such as a town square

Seats:

5.2

Consider the surface around seats carefully and the interface with surrounding surfacing including grass. The area under and surrounding seats should be hard in most cases as this is easy to mow around and maintain.

- 5.3 Design seats as an integral part of the street and select high quality understated pieces which are comfortable, robust and capable of on-going maintenance. Along paths, locate seats at regular intervals to allow elderly, young and people with disabilities to rest. In town centres and urban parks the need for seats will be considerable and seating can be arranged in banks of 6-8 benches.

- 5.4 Locate seats with a variety of aspects, in a sheltered position and in places of interest or activity or where there is a view. Provide all- purpose seats with back and arm rests and select seat coverings for comfort and warmth. Timber slats are ideal as they can be replaced when damaged, composite plastic slats offer a good alternative to timber but avoid metal coverings which are too cold in winter and too hot in summer. Informal perching areas seat a lot of people but should complement provision of seats rather than replace them.



Figure 5.4 Seats Integrated into the Public Realm with Timber Slats and an example of Perching Places

Litterbins:

- 5.5 Should be robust, fixed to ground and co-ordinated with other furniture in siting and colour. Sensitive placement is required especially in relation to historic streets, entrances and buildings and advice should be sought from the Council's Conservation officer. Avoid placing bins adjacent to seats as they attract wasps in the summer and can give off odour. Site to avoid key view lines, to avoid clutter at the back edge of the footpath and at the entrance to play areas rather than in them. Consult Harrogate Borough Council's Bin Strategy and Street Cleaning on the management arrangements and refer to WRAP Right Bin, Right Place.

- [binfrastructure right bin right place](#)

- 5.6 Dog owners are expected to be responsible for their dogs' waste, bagging it and if local disposing of it in their general waste bins. There is no requirement to provide bins specifically for dog waste.

Cycle Parking:

- 5.7 The siting of cycle parking should be co-ordinated with other street furniture, be convenient for cyclists and provide for a high level of natural surveillance. The best location may not be in pedestrian zones but within or near vehicular routes used by cyclists such as central reservations or car parks. Where cycling would be anti-social or cause nuisance, for example, in civic parks, play areas or fountains locate at the entrance to amenities to encourage dismount.

- 5.8 Consider shelters for comfort in managed areas such as schools or hospital. Cycle racks are rarely part of a suite of furniture and are usually simple and practical. Except in historic locations, choose brushed stainless steel over powder coated or painted options as coated surfaces tend to get scratched with bike locks and require regular maintenance. In historic locations, consider

solutions such as locking points attached to walls, or in some sensitive heritage locations a black powder coating may be acceptable on heritage grounds.

Bollards:

- 5.9** Bollards should only be used as a traffic management tool when there are no other options because they give the public realm a cluttered appearance and present a hazard. Good design can reduce or eliminate the need for bollards through better kerb definition or using other elements to form a barrier such as street trees, seats or planting subject to requirements.
- 5.10** Select designs appropriate to function and context and consider the need for removable lockable type to provide access for emergency or maintenance vehicles or provide an anti-terrorist barrier. In Conservation Areas, consider re-casting local designs, elsewhere bollards should be simple and elegant. In rural areas, use natural materials such as stone or timber. Resist use of lighting bollards in all but the most managed of spaces as they tend to attract vandalism and the lighting of pavements is better achieved from overhead.

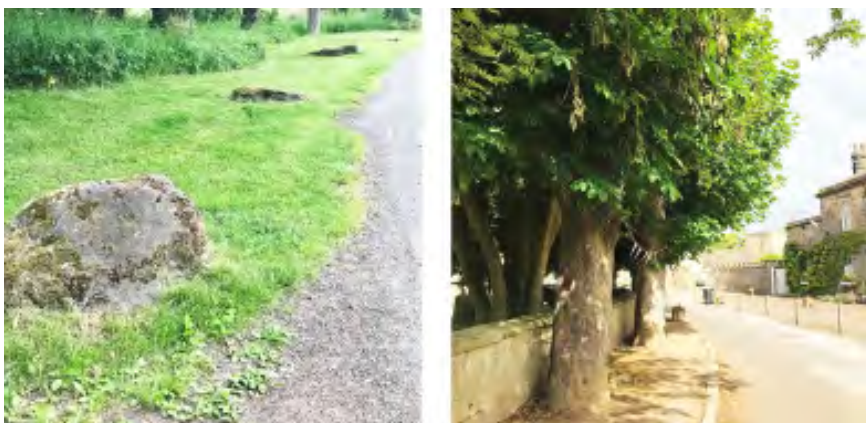


Figure 5.5 Embedded natural stone used along a verge to deter parking and post and chain used for access control in Ripley

Lighting:

- 5.11** Select lighting which suits place and purpose and co-ordinate with the family of street furniture. In narrow streets, a wall mounted option may be the best solution or lampposts can be multi-functional accommodating hanging baskets, banners or street signage to reduce clutter. Consider the daytime appearance of units and consider in relation to other light sources to restrict light pollution. The main purpose of street lighting is to light the street for pedestrians and vehicles but additional aesthetic up-lighting of buildings and trees can contribute significantly to the sense of place after dark. Lighting strategies need to be fully co-ordinated and must be led by a specialist lighting consultant.
- 5.12** In rural and edge of settlement locations, especially adjacent to woodland, lighting needs to take account of any biodiversity implications for example the presence of bats. The Landscape and Visual effects of lighting in relation to a feeling of remoteness and tranquility also needs consideration in these locations.

Public Art:

- 5.13** The public realm can be designed flexibly to promote temporary displays and performance that will liven up spaces. Commission permanent pieces from artists through limited competitions in response to a brief. Artwork must respond to context and scale and be robust and durable with sufficient room to be viewed and appreciated and for pedestrians to circulate without hazard. Sometimes the best public art is embedded in design- in pavements, walls, seats and railings and can even tell a story through an art trail. Trails provide entertainment and a learning experience, create a route to show-off buildings and historic sites within a town centre and become a destination in themselves bringing in visitors. Designs must clearly show the materials to be used, dimensions and position within the public realm as well as fixing details.



Figure 5.6 An example of an art trail within the public realm

Play Equipment:

- 5.14 Details must include photographs of the type of play equipment specified in play areas, critical dimensions such as height and width and the layout and surfacing details on plan together with any other elements such as furniture, path layout and earth mounding. Surfacing must be impact absorbing to the critical fall heights given by manufacturers for the equipment selected.
- 5.15 The council's preference is for metal equipment, rather than timber, but equipment should be selected which is suited to the character of the site in both material terms and design. Informal play trails and the inclusion of natural play as well as ground features such as mazes and labyrinths is encouraged in play areas and along routes as it allows children to use their imagination and interact more directly with nature. Outdoor fitness equipment trails for all along running or cycling routes are also encouraged.
- 5.16 Consider the location of play areas in relation to other amenities and infrastructure as well as the local microclimate. They must be safe, accessible, overlooked and easy for parents to supervise

but equally must not present a nuisance to local residents. Design with adequate seating for parents and with provision for shelter and shade using existing or proposed planting. Bins and cycle parking should be located at the entrance rather than in play areas. Locate Neighbourhood Equipped Areas of Play (NEAPs) in greenspace near to local centres, sports hubs and primary schools. Local Equipped Areas of Play should be closer to housing and placed at points where several paths intersect. Informal play trails should be considered along routes to school and incorporate some natural play features such as mounds, boulders, tree trunks or stepping stones.

- 5.17 Play equipment needs to be selected in consultation with the Harrogate's Community Development Team and include accessible play. Equipment must be installed to current British Standards with an independent ROSPA inspection before planning conditions can be discharged. The expectation is that on-going maintenance is to ROSPA standards too which requires regular inspections in accordance with these standards.

Landscape Structures:

- 5.18 Elements such as bandstands, pergolas and bridges should be clearly shown on layout plans and include details such as photographs or sketches to indicate materials and style and include critical dimensions.

Boundary Treatments Generally:

- 5.19 Boundary treatments are necessary to delineate land uses, define spaces and provide security and privacy. Boundary treatments must be sensitively designed and detailed in response to local context and must ensure:
 - Reinforcement of Harrogate's distinctive character and co-ordination with materials used in the surrounding environment.

- The number of materials and colours kept to a minimum to create unity and avoid visual fragmentation.
- A high perimeter fence line is avoided- housing fronting outwards onto streets and overlooking green space /open countryside with low front boundaries and back gardens at the rear of perimeter blocks
- A strong relationship with the surrounding landscape. Run boundaries with the slope of the land so that steps in walls, fences and railings are minimised as this can be very visually intrusive. Where steps cannot be avoided use brick or stone piers to take up changes in level in urban situations. In rural situations use less intrusive treatment such as post and wire fencing and stock fencing in preference to post rail
- Boundary treatments have a good visual appearance and are robust to last over time.
- Maintenance is considered – how will boundaries be maintained and how will they allow for grass and hedge cutting?

Walls:

- 5.20** The types of traditional walling across the District varies and reflects local character and the underlying geology. The type of building material and the local variety in the way it is used, the bond and sometimes incorporation of other materials reinforces the sense of place and local identity.
- 5.21** Traditional boundaries in the **Vale of York** are predominantly brick with older examples made from the local clay and with variations in the coping style with flat field stones, glacial moraine sometimes combined with brick. Look for evidence of bonds used locally and for other details such as corbelling.



Figure 5.7 Example of traditional brick walls with panels of field stones in Green Hammerton

- 5.22** On the **Limestone Ridge** local Limestone is sometimes used on its own for walls but traditionally it was usually combined with field picked stone cobbles and brick.
- 5.23** On the rural uplands in the **Gritstone Plateaux** dry stone walls of gritstone are a notable feature and this style varies across the district. For example, at Coldstones in the vicinity of the mines the style is more like that found in Grassington and may reflect the style brought in from elsewhere by miners.
- 5.24** In **towns and villages** low mortared Gritstone walls are characteristic and would have supported railings as a front boundary treatment but most were removed during World War II. Now the low walls are often backed with evergreen hedges. Copings vary from barrel half round lengths to short copings of rectangular section and flat sections of stone flags with overhang to shed water. In some cases stone piers are incorporated at entrances and can be topped with ornate copings or simpler more domestic styles depending on the grandeur of the property.

Continuous high walls of stone are a distinctive feature around historic parks enclosing the designed landscape and estates from working farmland beyond.



Figure 5.8 Traditional stone walling and gate piers in Harrogate

- 5.25** In the transitional area of the Dales Fringe, walls vary from Gritstone dry stone walls to stone and cobble or brick reflecting the varied geology. It is important to identify the characteristic walling pattern and materials within the local context and use traditional stone masons from the area.

Retaining Walls:

- 5.26** By their very nature, retaining walls are artificial interventions being structures which hold back material to one side. In most situations a sloping bank is preferred because retaining walls are both costly and visually intrusive but where there is a significant change in level within a restricted space embankments are likely to fail and slump.



Figure 5.9 Use of traditional walling at Studley Royal and around new housing in Burnt Yates

- 5.27** Retaining walls carry a substantial amount of loading not only from the retained material but also from water built up in the ground and the weight of any structures or trees on the land behind. For this reason, retaining walls need to be designed and supervised by a qualified structural engineer.
- 5.28** The style of retaining walls also needs to respect local distinctiveness and the Landscape Architect should pay close attention to local materials and detailing for example retaining walls of local Millstone Grit are a traditional and characteristic feature of upland farms and villages. Stone walls can be vertical or battered and lower walls can be constructed as dry stone walls to fit in with local vernacular styles. In designs over 1m in height concrete walls can be faced with pitched stone walling or stone walls can be constructed in mortared ashlar.
- 5.29** Modular retaining walls are often used where there is a significant cut in slope to accommodate a new road and commonly provide a cellular retaining structure to encourage vegetation to grow and

soften the appearance. However, the low soil content and drought conditions doesn't suit many species and the wall can look raw in appearance and insensitive to the landscape without the softening effect of vegetation.

- 5.30** Gabions are wire baskets filled with stones and placed together to form a dead weight wall. They allow for the free movement of water but will not readily support vegetation as any soil placed in the baskets washes away. The baskets must be filled evenly and with care and the selection of the gauge of metal wire is important to the design to prevent the baskets from deforming. The stone selection can improve the aesthetic appeal of gabions.
- 5.31** A simple wall can be constructed by driving in piles to take up less room below ground and avoid tree roots for example on river banks to reduce excavation back into the slope which could be problematic. Soil nailing and benching engineering works involves tying back the outer face of a wall or slope into stable ground behind and must be designed and supervised by a qualified structural engineer.

Timber Fencing:

- 5.32** Timber fences and gates must respond to context in both rural and urban situations. In rural areas, agricultural post and wire fencing may be used as it is inexpensive and can be designed to be deer and/ or rabbit proof. However, where hedges or walls are the characteristic boundary treatment post and wire fencing should be a temporary measure to allow a hedge to grow. Post and rail fencing is more robust but visually intrusive especially where it is not aligned with the topography and should be used with care.
- 5.33** Close boarded timber fencing is a convenient and relatively cheap alternative to other forms of boundary but use for rear fencing only as it is ubiquitous across the whole country and does not create a strong sense of place. Close boarded timber fence should not be visible in the public realm as back gardens should be facing

back gardens and housing should front onto the street, footpaths and open countryside. Use robust timber sections and specify with concrete, metal posts or metal shoes for longevity. Stain in a natural shade such as dark brown, dark grey or clear. Brash unnatural wood stains and cheap off the peg alternatives to close boarded fencing such as Larch Lap will not be acceptable. Incorporate holes at the base of fences to make provision for hedgehog highways.

Metal Railings:

- 5.34** Ornamental iron railings were used to top low stone walls in towns and villages as front boundary treatments and many were removed during World War II. Schemes to replace lost railings or to imitate this treatment should look in the vicinity for original examples or historic photographs and look to replicate designs paying attention to detail. Where the original colour scheme is important paint scrapes can be taken from original railings and sent off for analysis. Cheap off the peg solutions are less durable, lack authenticity and are not acceptable especially in Conservation Areas.



Figure 5.10 Examples of sympathetic replacement railings to domestic boundaries in Harrogate and Knaresborough

5.35 Traditional railings have an order and it is important to look carefully at the detail such as the scale of the railings, the sizes of different components and how they are fixed. The use of modern galvanised and painted or powder coated mild steel hollow section for balusters and solid flat bar for rails may be acceptable as an alternative to cast iron but do not use aluminium. The finials along with the thickness of the metal sections and other details such as leaf catchers and back stays are important. The finials must be cast and can either be mechanically fixed or welded. Post size and design will vary depending to the fixing method but posts can be hollow section mild steel.

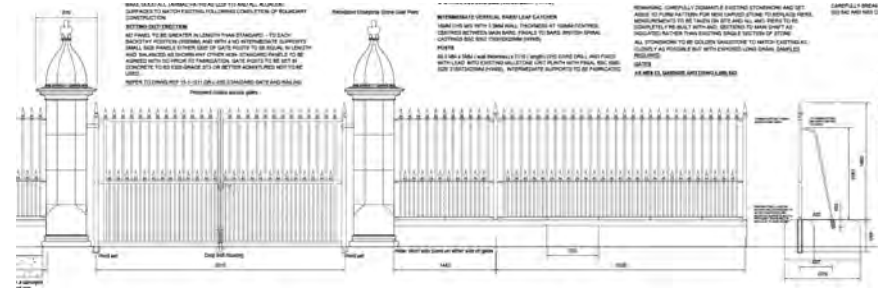


Figure 5.12 Detail for replacement railings outside a public building

The design of railings need to be appropriate in scale and design to the setting. Railings enclosing a Park or a public building were usually taller and more ornate than domestic boundary treatments – look carefully at original examples in the vicinity.



Figure 5.11 Examples of original railings to boundaries in Harrogate and Knaresborough

Where railings are in curtilage or in the setting of Listed Buildings and reinstatement or repair is considered seek additional advice from the Council's Conservation Officer.

5.36 Railings and Fences must be designed to BS 1722: 2019 Fences and as revised.

5.37 Where posts have finials make sure these are scaled up to reflect the scale of the posts relative to the balusters, leaf catcher finials are usually scaled down as are the bars. Traditional railings tended to be fixed into low brick or stone walls and the presence of a wall beneath the railings along with the proportion of railing to wall is important too. Some shapes and designs in wrought iron can only be replicated in the original material and will require specialist fabrication.

5.38 Estate bar fencing is a common treatment within designed parkland and estates. Metal sections in this type of railings are small as it is designed to delineate space rather than for security and is usually painted black or dark green or occasionally in the estate livery colour. This type of railing is traditional and can be supplied off the peg but look at existing examples to see if there are any local variations to the design which can be incorporated.

Hedges

- 5.40** Proposals to change boundary treatments should take into account established character and removal of hedges should be avoided. Further guidance is given on hedges in chapter 12.

Gates and Stiles:

- 5.41** Gates and stiles should be designed to fit into the character of the landscape or townscape and fully co-ordinate with the boundary treatment. Ensure that gates can be fully opened, and are sufficiently wide for their use. Consider how they will be managed, who will use them and how they will be maintained.



Figure 5.13 Note the changes in bar thickness and finial size between the leaf catcher and the main railing. This railing was informed with reference to historic photographs

- 5.39** Palisade security fencing is visually intrusive especially in open countryside, has negative connotations and will not normally be acceptable where there is a viable alternative. In the first instance, consider site needs, could a stock fence or deer proof fence be sufficient. Where security is a definite requirement look to use an alternative such as rigid weld-mesh powder coated green which will be visually recessive. This type of fencing is also suitable as ball stop fencing around facilities such as multi-use games areas.



Figure 5.14 Traditional examples of stiles include a squeeze stile and a ladder stile

6 Planting and Softworks Generally

Introduction

Planting within the District should be vibrant, memorable, resilient and sustainable, contributing to the rich and varied landscapes of the District. It will acknowledge, protect and enhance historic landscapes, the character of remote upland moors, incised valleys of Nidderdale and Washburn and the rural agricultural landscapes and promote distinctive design which responds to landscape character in existing and new urban settlement and extension.

- 6.1** Within larger site development the landscape masterplan is the main organising element and sets out the green-blue infrastructure for the site. Planting and earthworks need to work hard providing attractive green spaces and routes which connect streets, the public realm and recreational spaces with the wider countryside and knits it into existing urban fabric. Green-blue infrastructure includes parks, open spaces, sustainable urban drainage, playing fields, woodlands, allotments, riverbanks, hedgerows, meadows and private gardens.
- 6.2** For further advice on the strategic role of green assets and the opportunities that new development can present to enhance and reinforce Green infrastructure consult:

[Green Infrastructure SPD 2014](#)

What are Softworks?

- 6.3** Softworks consists of planting and grassland cover but also includes earthworks and natural elements used by the designer which in combination with hard landscape materials create a new and dynamic environment which has a strong sense of place. There are a variety of planting types that can be used singularly

or in combination to create the desired effect which can be categorised broadly as trees, shrubs, ground cover, grasses and climbing plants.

- 6.4** The design function of planting and earth modelling are to provide the following:

- The shaped structural landscape framework to a new development which can include screening, woodland planting, shelterbelts and mounding
- Shaping spaces, creating enclosure and controlling how public open spaces are connected, experienced and revealed
- Visual effects such as focal points or framed views, layering and filtering views
- Shape, colour, texture and seasonal interest – often called year round interest
- Softening and harmonising of hard building edges
- Relating buildings to site and to each other

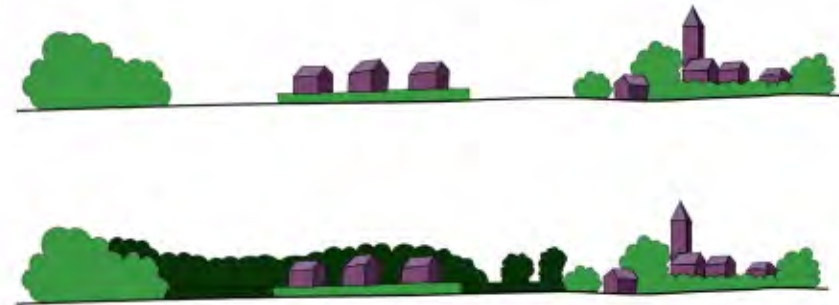


Figure 6.1 Planting Can relate BUILDINGS to Site and to Each Other

- 6.5** Planting and softworks also have practical functions within Green Infrastructure which are as follows:

- New habitat formation and meeting the requirements of Biodiversity Net Gain
- Rainwater interception and increased infiltration rates
- Creating barriers, screens and privacy
- Defining boundaries
- Creating Shelter and Shade
- Environmental benefits which include contribution to offsetting the effects of climate change
- Carbon capture and sequestration – refer to index [Carbon calculator Top Trunks Guide](#)
- Helping ameliorating nuisance such as noise and headlights
- Filtering pollutants
- Ameliorating and providing a setting for sustainable urban drainage
- Detering crime
- Amenity, recreation and health benefits
- Improving the Microclimate
- Creating edible environments

The term biodiversity refers to the existing ecosystem of an area which may be damaged or affected by planned or sought after development. Biodiversity Net Gain is the process of measuring a site's biodiversity value and making an enhancement over and above the current value. In late 2023 the Environment Act will place a legal obligation on developers to ensure they increase the biodiversity value through the proposed development of a site by at least 10%. Further guidance on Biodiversity can be found in HBC's Providing Net Gain for Biodiversity SPD 2021.

[Providing Net Gain for Biodiversity SPD 2021](#)

Designing with Plants

Planting needs to respond to the local microclimate, soils and hydrology of a site and the designer must aim for the design to evolve and respond to climate change. The design needs to integrate surface water management and support biodiversity as well as incorporating productive landscapes and responding to place.

- 6.6** Planting must be appropriate to the particular location and take into account visual character, setting, ecological context and function. The main considerations to create a successful planting design are as follows:

Analyse the site conditions

- 6.7** It is especially important to consider climate including trends in climate change. Evidence suggests that presently the North of England maybe getting wetter with more severe flooding events rather than increased drought but this is constantly in flux. Consider soil type, topography and aspect - soil tests may be undertaken or available for the site to inform species selection.
- 6.8** The designer should know and understand the hardiness zones and have an appreciation of any contamination or other factors which may affect selection – such as permeability of soils. Further information can be gathered by observing which plants already thrive in the locality and which don't and from native vegetation with reference to the National vegetation survey and *Plant Atlas of Midwest Yorkshire* P.P.Abbot 2005. Harrogate district lies within hardiness zone 9a which is -6.7 to -3.9 further detail can be explored with the interactive map: [United Kingdom Plant Hardiness](#)
- 6.9** Be aware of the ecological benefits of species choice and consider the use of native plants wherever suitable.

6.10 Environmental Impact

6.11 Plant sustainably using plants adapted to the existing site conditions reducing the need for water management practices and choose plants which are long-lived or self-rejuvenating. Plant specifically for biodiversity including insect pollinators with a variety of different planting and flower shapes with reference to [RHS Plants for Pollinators](#)

6.12 Choose native plants with a UK provenance and which are proven to thrive within the Yorkshire Area to reduce the likelihood of importing diseases and introducing plants which compete with native species. Check the native status of plants using the on-line plant atlas [Plant Atlas](#)

Connect to Context

In Harrogate District planting, may for example, pick up on themes such as Moorland, Hay Meadows, Agricultural Landscapes, Wooded landscapes, Historic designed Landscapes or formal planting in the Spa town.

6.13 Look at the big picture and consider what is the setting surrounding the site is it urban, suburban, disturbed industrial, semi-rural or rural, formal or informal? Check the National Character Area profiles and Harrogate Borough Council's Landscape Character Area Assessment and try to make connections between the planting design and surroundings to maintain a sense of place. Planting design principles derived from landscape character will enhance local distinctiveness and will also help to establish a theme or style to base plant selection around.



Figure 6.2 For example the site could be connected to the wider landscape by making reference to grassland through the use of prairie style landscape treatment using native grasses

Design by Layers

6.14 Design planting schemes from big to small starting with tree planting either as street trees or woodland to give a structure, larger shrubs and work down to ground cover shrub planting and the grassland/ field layer. Consider how the scheme will be viewed from every angle and think in foreground, middle ground and background layers. External spaces may not always be in the full line of sight and planting may be used to create drama and intrigue and gradually reveal spaces and views. Avoid any gaps and break up lines visually by overlapping and massing plants within layers both vertically and horizontally. Trees are the dominant form due to their height and the space enclosed beneath their canopies. Horizontal forms such as sprawling groundcover give width. Shrubs between fill in and create balance.



Figure 6.3 Druids Temple is an early example of connecting to the landscape through the control of views and use of planting

size of leaves, stems, flowers and seed heads all contribute aesthetically to the planting design and are often of particular importance during the winter months. Texture can be coarse, medium or fine. Coarse textures are the most dominant with the best example being bold features such as large irregular leaves. Examples of fine texture may include ornamental grasses or needles.

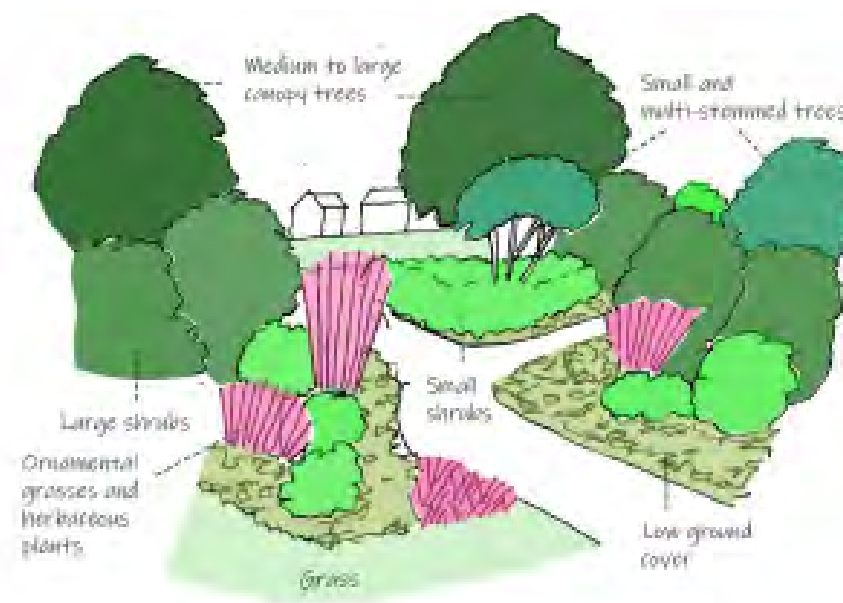
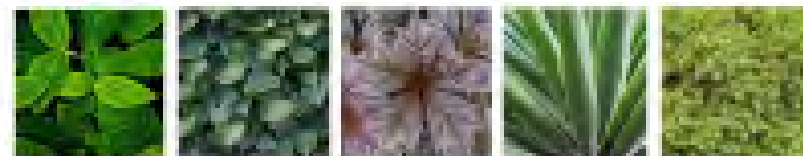


Figure 6.4 Planting in layers to create structure

Use Variety of Forms /Texture/ Colour and Seasonal Interest

- 6.15** Colour on its own can bring a composition together but it is only transient. A successful planting design provides beauty and interest all year round. Think about opposite seasons and plan how the design will look in winter and summer, spring and autumn. In consideration of the colour palette the importance of texture in planting is often overlooked. The variety, shape and



Picture 6.1 Examples of texture from foliage alone, seeds, fruit and flowers can also contribute to variety

Scale and Enclosure

- 6.16** Consider the purpose of planting design. Planting can create enclosure, link spaces together, link buildings to the landscape and to each other, make links with the wider landscape by framing views or through the continuation of features such as hedges, hay meadows or woodlands. A pedestrian environment relies on spatial enclosure that feels comfortable where planting can alter the micro-climate and create for example a sunny sheltered and peaceful environment in otherwise exposed or noisy locations. Understand the power of scale and the hierarchy of linked spaces which make up green infrastructure and the importance of planting in sculpting and controlling these spaces.
- 6.17** Guidance to follow will centre on different types of planting in modern landscape schemes making reference to the design and practical functions as well as technical assistance and the suitability of different treatments with reference to case studies where applicable:

Chapter 7: Groundcover – which includes shrubs, herbaceous mass planting, bulb planting and amenity grass lawn

Chapter 8: Urban Tree Planting – which covers planting of trees in hard and soft areas within an urban or sub-urban setting

Chapter 9: Wildflower Meadows – uses, ground preparation, establishment and maintenance

Chapter 10: Woodland Planting – as structure planting and in rural locations

Chapter 11: Shelterbelt Design

Chapter 12: Hedges, Climbing plants and Green roofs – vertical and elevated planting choices

Soil Preparation for Planting:

6.18 Preparing ground for planting will very much depend on the current ground cover, condition of the soil and the type of planting proposed but there is rarely just one way of reaching the desired result. The designer will need to weigh up and consider how best to arrive at a suitable substrate for planting.

6.19 *For example: Existing grassland which is to be planted with ornamental shrubs will need to be sprayed off and assuming an average 150mm depth of topsoil can be improved in-situ by incorporating compost to a full planting depth of 450mm. Topsoil can also be stripped and stored, and the underlying subsoil excavated to reduced levels before making up a full depth of 450mm topsoil using existing augmented with imported topsoil for planting beds (this option may well depend on the availability of imported topsoil).*

6.20 *If the area is to be planted with wildflowers the topsoil can be stripped for use elsewhere or the soil can be inverted so that the existing subsoil becomes the planting substrate as this will be less fertile and more suitable for wildflower establishment.*

6.21 The following schedule gives an overview of the min requirements expected by the council. Further advice can be found in the National Building Specification.

Type of Planting	Substrate	Treatment
Amenity Grass Seeding	150mm Topsoil	Cultivate, bring to a fine tilth and remove stones greater than 20mm in diameter

Type of Planting	Substrate	Treatment
Amenity Grass Turfing		
Wildflower Meadow Seeding		
Ornamental shrubs/ Herbaceous Planting		Cultivate, bring to a fine tilth and remove stones greater than 50mm in diameter
Tree Planting into soft planted areas		
Urban Trees in Hard surfaces and road verges		
Woodland Planting		

Table 6.1 Types of planting and soil preparation

6.22 In all cases the underlying conditions of the site should be considered to ensure it is free draining. Where subsoil is compacted this should be alleviated with deep tine ripping. In certain situations, land drainage may be required for example sports pitches. Imported topsoil and subsoil must conform to British Standards (and as revised) as follows:

- BS3882:2015 Specification for Topsoil and Requirements for Use or as amended
- BS8601:2013 Subsoil or as amended

Suitability of Nursery Stock:

6.23 Plants can be container grown, root balled or bare rooted or grown as plugs and selection will depend on the type and style of planting proposed as well as the species selected, for example, some shrubs may only be readily available as bare rooted stock. The following schedule provides guidance on what the Council will accept for each style and type of planting. Choose plant suppliers/nurseries which have a Plant Healthy Certification Scheme [Plant Healthy](#)

6.24 Plant sizes and specification must conform to BS 3936-1-1992 or as amended

6.25 The National Plant Specification produced by the Joint Council of Landscape Industries gives further advice on handling and establishment.

Planting	Stock	Size	Indicative Density
Woodland Planting	Bare rooted whips and transplants/ bare rooted feathers	60-90 cm/ 90-150cm	1/m2 or 1/ 2m2

Planting	Stock	Size	Indicative Density
Hedge Planting	bare rooted whips and transplants	60-90 cm	500-600 mm centres double staggered row
Ornamental Shrub Planting	Container grown/ bare rooted (some species)	3L pots/ 12L pots (Specimen shrubs) 60-90 cm - bare rooted stock	2-5/ m2 depending on species and ultimate size/ spread
Herbaceous Planting	Container grown	0.5- 3L pots	6-10/ m2 depending on species, effect and ultimate size
Urban Tree Planting in Soft Planted Areas	Rootballed or Air pots	10-12 cm girth Standards	5-12m centres depending on species
Urban Trees in Public Realm	Rootballed or Air Pots	14-16 cm girth Extra Heavy Standards or 20-25 cm girth Semi-Mature in civic spaces	5-12m centres depending on species

Planting	Stock	Size	Indicative Density
Street Trees in Residential areas	Rootballed or Air Pots	10-12 cm girth Standards up to 14-16 cm girth Extra Heavy Standards	5-12m centres depending on species

Table 6.2 Nursery stock sizes and densities

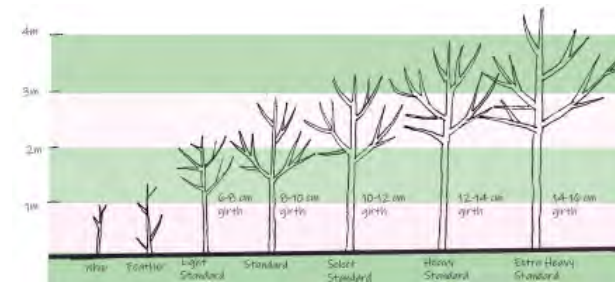
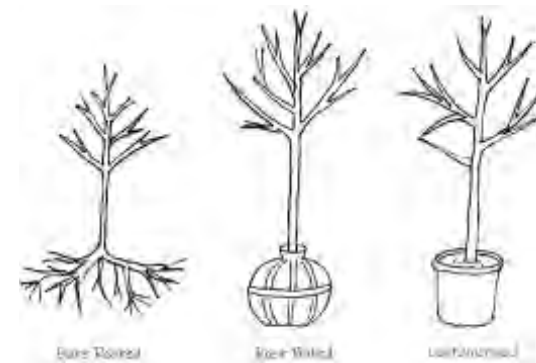


Figure 6.5 Nursery sizes for trees



Picture 6.2 Types of tree stock

Management and Maintenance

Specific guidance on management and maintenance is given in individual chapters by type of planting and a full management and maintenance plan will be required to discharge conditions of any grant of planning permission.

Earthworks and ground modelling:

- 6.26** Land form can provide screening, create a setting for new buildings, relate to the wider landscape, reduce noise and provide an enclosing element to development. Land form also provides an aesthetic three dimensional element and is increasingly used to create sculptural features in the landscape. Working with land form may be a practical way of using fill material arising from site or to solve problems such as protecting land from flooding but it must always be a positively designed feature which looks natural and integrates into the overall landscape.



Figure 6.6 Mounding is a sculptural tool in landscape design to create linked play features or for use in conjunction with planting to create enclosure

- 6.27** Non-linear mounds are often oval or kidney shaped in form to flow like the natural land form the exception to this is where they are designed as sculptural viewing mounds or other features. In the outfields of sports pitches as a run out area and where slopes are to be planted and mulched gradients must not exceed 1:6 and slopes elsewhere should not be greater than 1:4 in order to allow access and the safe operation of maintenance machinery. Mounds should not be seen as a cheap alternative and where slopes are likely to exceed 1:4 gradient, retaining structures should be incorporated into the design.

Location	Maximum Gradients
Naturalistic grass mounds	1:4
Viewing mounds and sculptural land-form	1:4
Planted mounds with bark mulch	1:6
Planted mounds mulched with matting	1:4
Sports outfields	1:6

Table 6.3 Maximum gradients

- 6.28** Create naturalistic mounds which are broad and low like an island with a gentle rounded transition at the top and toe of banks to blend into the surrounding land form and for ease of maintenance. In nature very little is symmetrical, so create mounds of an irregular shape with sweeping curves and a high point set at one end or the other and never in the centre. Sculpt the high point to a flat top so water applied here can infiltrate the soil and reduce excess run-off. Graded mounds used site wide should be similar in scale and height to better integrate with the character of the surrounding landscape.

6.29 Linear berms along riverbanks, canal sides or attenuation basins may need to be more continuous to be fit for purpose but can also appear more naturalistic by varying the slope ratio at different points.

6.30 Mounds and land form are only likely to be cost effective on projects that generate fill on site due to excavation for roads, pavements and building foundations. During excavation inorganic material (for reuse) subsoil and topsoil should be stored on site in separate spoil heaps. There are several steps to the creation of successful land form as follows:

- Consider the design of the mound, its purpose and the existing hydrology of the site and the potential for impact on any existing trees and hedges carefully
- Work out the scale and size of the mound and show the proposed mound on the topographical base drawing with contours and spot heights
- On site spray off grass or vegetation within the footprint of the mound
- Strip and store any topsoil for re-use
- Spread a thick layer of subsoil arising from site and stored for re-use (min recommended 600 mm layer) compact and blade grade to smooth flowing curves)
- Spread topsoil layer (min 150 mm for seeding or turfing and 450 mm for planting) and compact to finished levels
- Prepare soil and seed or plant in accordance with the design

Ponds, Wetlands and Swales:

6.31 Ground can also be sculpted to provide depressions for ponds, swales and wetlands. On development sites land and surface water are a valuable resource, waterbodies need to be multi-functional and the Green Blue infrastructure needs to be designed collaboratively with an interdisciplinary team at the outset which includes hydrologists and drainage engineers.

6.32 Sustainable urban drainage often drives the design of Green Blue infrastructure on larger sites where the aim is to mimic natural drainage in a departure from traditional more heavily engineered solutions. SUD's is a very flexible drainage solution, however, and the skill of the designer should be used to maximise its potential for site biodiversity, amenity and aesthetics.

Sustainable Urban Drainage:

Broad shallow swales store and/ or convey surface run-off and promote infiltration where soil and ground conditions allow. Dams and berms can be installed across the flow path to promote attenuation and removal of pollutants through sedimentation and infiltration. As the last stage of SUD's management, larger waterbodies such as wetlands and ponds can be created to treat polluted run-off and provide attenuation as well as delivering bio-diversity and amenity. To meet multi-use criteria for all uses other than visual amenity and biodiversity swales and attenuation ponds need to be accessible with gently sloping sides and barrier free. However, accessibility to any water body will depend on the location as well as design and will need to be subject to a health and safety audit.

Existing ponds:

6.33 Ponds are vital habitats for wildlife providing water, food and places to shelter and breed. They are defined as up to 2 hectares in area and hold water for 4 months of the year or more. Where there are existing ponds on a site, they should be retained and managed. As part of the planning application, specialist ecological surveys will be required to check for protected species such as Great Crested Newts. Great Crested Newts are fully protected in the UK under the Wildlife and Countryside Act 1981 and are European protected species. The applicant needs to apply for a

license from Natural England if planning an activity that will disturb them, their eggs, breeding sites and resting places (ponds and land around ponds). Seek further advice from an ecologist who is a full member of the Chartered Institute of Ecology and Environmental Management.

Creating new Ponds:

- 6.34** Since the nineteenth century over 70% of ponds have been lost as a result of drainage and infilling. The creation of new ponds is positively encouraged for both aesthetic ornamental purposes and for biodiversity as well as to support multi-functional green-blue infrastructure.

Nidderdale AONB hosts a ponds and wetland project in conjunction with the Freshwater Habitats Trust. Please contact the AONB for advice and practical help with pond design in the designated area

- 6.35** Unless ponds are formal in nature, as part of a historic designed landscape or within an urban context, ponds should be designed to be as naturalistic as possible, formed to attract wildlife and to settle into the landscape. As with mounds, natural curved and non-symmetrical designs work best with a gentle transition at the margins. Set out the footprint of the pond on an existing topographical base, show proposed contours and the desired surface water level. The water level may fluctuate substantially and the pond may even be seasonally dry in the summer months but the full size of the pond should be designed and planned for within existing land form and to suit the position of inlet and outlet pipes (where provided).

- 6.36** Avoid pond creation on historic, geological or archaeological sites and sites with existing important habitats and check that there are no underground services which could be damaged.

Freshwater ponds are a priority wildlife habitat. Create wildlife stepping stones by positioning new ponds close to existing ponds and connecting with grass, scrub or hedges or create a series of ponds of different sizes, depths and shapes.

- 6.37** Pond margins are the richest areas for wildlife and a varied shallow edge with undulating banks and niches will attract a larger variety of species. Gradients to shelved edges should be no greater than 1:5 and preferably less than 1:20. The depth of the pond should vary as some species like cold deep water and others prefer shallow warmer water. Seasonal ponds provide additional wildlife benefits as they reduce the fish population which is good for amphibians and invertebrates.

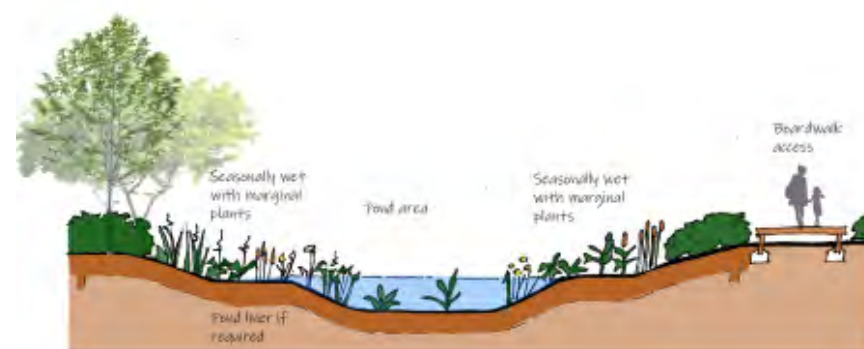


Figure 6.7 Indicative section through pond

- 6.38** Ponds can be created in all soil types but in sand, gravel or peat they may not retain water without a pond liner unless groundwater is close to the surface. The cleanest water to fill the pond is

groundwater or surface water run-off from unpolluted land and it is preferable to allow the pond to fill naturally. Where this is not possible or the use of liners requires the pond to be filled immediately then use stored rainwater or tap water do not fill from a drain, ditch or river.

- 6.39** The use of a pond liner has a number of advantages as it prevents erosion at the pond edges during heavy rainfall, it prevents leakages so maintains a more constant water level (which may be important for ornamental situations), it keeps the water clean and is easy to maintain. However, it will prevent infiltration where ponds and wetlands are part of SUD's scheme and it is unsuitable for seasonal ponds as the weight of the water holds flexible liners in place and they are not meant to be exposed. Where puddled clay is used as a liner it will crack and lose its water retaining characteristics if exposed.
- 6.40** Advice should be sort on pond drainage, requirements for oxygenating water and preventing the build-up of nutrients (eutrophication). Ponds are best designed in full sun on land that is not being improved with nutrients and away from trees to avoid leaf litter. Further measures to oxygenate the water might include inlet and outlet pipes to allow the water to gently flow or the use of marginal vegetation or hay bales to clean the water.

7 Groundcover

- 7.1** Groundcover is a well-established type of planting used to cover the ground and suppress weed growth. The term groundcover is used to describe mass planting with smaller often hummock forming or creeping forms of woody perennials or evergreen shrubs which are less than 1 m in height and therefore do not restrict visibility. More recently it has also been used to describe mass herbaceous or prairie-style planting popularised in *Planting a New Perspective Oudolf P. and Kingsbury N.* 2013 Timber Press. Groundcover may also be used to describe wildflower planting and amenity grass lawn and incorporate components such as wildflowers, bulbs, ornamental grasses, roses and ferns, specimen shrubs or multi-stem trees. Guidance on wildflower planting is covered separately and in detail in chapter 9.

Uses of Groundcover planting:

- Verges *
- Roundabouts*
- Central reservations *
- Edge of development –where inter-visibility is required
- Front gardens/ adjacent to walls
- Low maintenance situations
- Shade tolerant situations
- Grassland or Grass substitute
- Mass planting
- Parks and edges of recreational areas

- 7.2** *When considering groundcover shrub planting close to the public highway (footpath and carriageway) set back distances should be considered to ensure that the planting will not encroach or minimise the width of the highway or cause an obstruction within visibility splays. For specific guidance on groundcover planting in relation to the highway consult *North Yorkshire County Council Interim Advice Note 19 Landscaping and Trees, Sept 2020.*

Suitable surface treatments such as slate or gravel should be considered alongside plants in relation to the highway to suppress weeds and minimise maintenance..

Traditional Groundcover with Ornamental Shrubs

- 7.3** This type of planting is particularly robust and suitable for smaller verges, central reservations or tree pits, urban lanes and front gardens as well as parks beneath trees. Mass planting with single species in bold blocks can be used to create an impact especially in combination with multi-stem trees or specimen shrubs. Such mass planting has a dramatic impact even at a distance and can give contrast and structure among other elements. This effect is also well suited to roadsides where the receptor is travelling at speed and can appreciate bold statements with planting more readily than intricate designs appreciated by pedestrians at path edges.

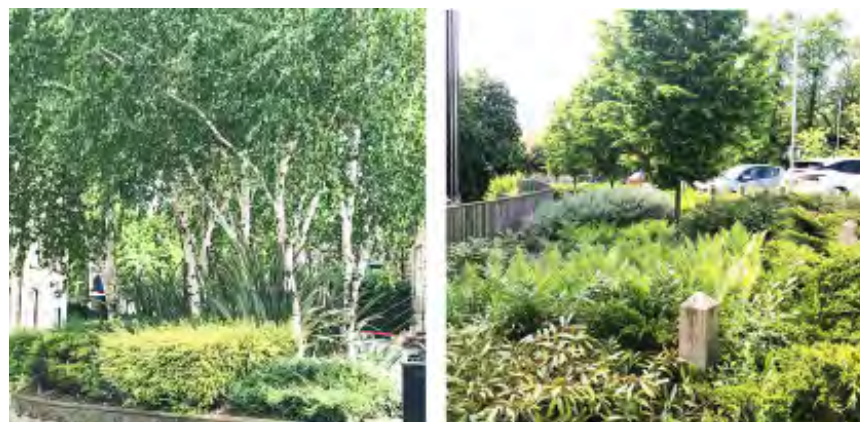


Figure 7.1 Groundcover shrub planting beneath trees on Kings Road and within the car park at the Civic Centre, Harrogate

- 7.4** Planting in groups helps to create structure and unity but it is now advisable to intermix species to guard against the spread of disease or death of a single species due to water-logging for

example. Repetition of species in groups can also have a bold and dramatic effect and helps to create pattern and movement through the composition. The style can be further developed to create a softer more naturalistic feel using long season grasses which reference arable crop fields or ferns which take inspiration from local woodland landscapes for example. Inter-planting with larger spring bulbs such as Daffodils, Iris and Tulips helps to extend the season and provides interest when deciduous or herbaceous plants are cut back in winter.

- 7.5** As with all types of planting, chose species which are fit for purpose and suited to both the local area, environment and intended use. For example, road verge species need to be salt tolerant and resistant to pollutants from run-off and planting in areas of high intensity need to be capable of withstanding trampling. The form and habit of plants may also be of particular importance so as not to create a nuisance. Species may be selected with restricted growth to reduce maintenance or produce a particular aesthetic effect.

Mass Herbaceous Planting

- 7.6** Traditional bedding planting in parks and gardens reflects a culture which seeks order arranged in neat rows of colourful annuals which are usually non-native. By contrast herbaceous mass planting made popular by Piet Oudolf and Noel Kingsbury (2013) is a modern take on groundcover which is freer seeking to reflect nature and support improved sustainability and biodiversity whilst also looking recognisably ornamental. This style of planting should include perennials, bi-annuals and annuals and in urban areas a mix of native and non-native plants is acceptable planted in drifts but a palette of purely native species in rural areas and sites adjoining open countryside is a requirement. Components may also include ornamental grasses, bulbs, ferns and even specimen shrubs or trees to evoke natural habitats and provide more structure.



Figure 7.2 Example of herbaceous mass planting

- 7.7** These plantings can reduce the amount of energy and water consumption and the manpower costs of repeat planting of annuals every year but plants have to be selected that work well together without much intervention, maintenance or watering. Plants that are robust, long lasting, hardy and tolerant of a wide range of conditions are to be preferred but avoid species which will take over to retain diversity and decorative qualities over time. This style of planting lends itself to changes in climate and further species can be added or removed to suit.

- 7.8** An element of spontaneity and intrusion of wilderness is accepted and is part of the appeal but if not actively managed species diversity will decline and planting will lose its appeal. It is a stylistic human centred version of nature that is sought as it must also be considered attractive in order for it to survive, for communities to enjoy it, value it and look after it. Plantings with no structure in their design or that are untidy due to poor maintenance will not gain popular support.

Herbaceous plants are plants that have no persistent woody stem above ground. They are classified following life-cycle classification as annuals, biennials or perennials.

How herbaceous mass planting works

- 7.9** Plant closely to minimise weed growth and plant for successional layering so that earlier flowering plants are covered over by later flowering species. Use a palette of purely native species in rural areas but elsewhere such as the public realm and urban parks mix a high proportion of native plants with some exotic plants and ornamental cultivars in a ratio of 60:40. Native planting enhances distinctiveness and makes links to wider habitats of meadows, hedgerows, woodlands, wetlands and heath whilst exotic additions will make the landscape recognisably ornamental and appealing to people, increase genetic diversity and the richness of food supply for wildlife and habitat provision. In the same way that shrubby groundcover can be combined with large specimen shrubs so can herbaceous plantings and there are many examples of successful combinations.
- 7.10** It is not the case that exotic species equates to invasive species as few will be but consult *Wildlife and Countryside Act Schedule 9 Controlled species* before selection.

[Wildlife and Countryside Act Schedule 9.](#)

- 7.11** Nurseries also have an obligation to assess the potential for species to become invasive before cultivation and supply. To date native herbaceous species are hugely under exploited and more need to be brought into cultivation so that they are readily available in plant lists.

Checklist:

- Use a high percentage of native species 50-60% in the public realm, parks and urban areas and mix with exotic cultivars
 - Use 100% native species in rural areas or adjoining the countryside
 - Use long lived robust but non-invasive species
 - Use 2 or more cultivars from the same species alongside native species to allow for self-seeding and genetic diversity
 - Allow for spontaneity and the self-seeding of plants
 - Use grasses which have already colonised ground as part of the design
 - Use signature plants which are locally native to the site
 - Use plants which recognisably belong to a particular habitat
 - Keep untidy post flowering plants to a maximum of 30%
 - Retain seed heads post flowering to allow the setting of seed and to provide food and shelter for wildlife before removal
 - Manage for replanting and rejuvenation over time and to adapt to climate change
 - Plant to please people as well as for biodiversity
 - Use a few distinctive structure plants
 - Contrast order with disorder
 - Use plants that flower successively ie at differing times of the year
 - Choose plants for long seasonal interest
- 7.12** As a replacement for shrub planting, a complex mix of herbaceous plants are used rather than monocultural blocks of shrub planting. As inspiration, Piet Oudolf and Noel Kingsbury looked to the

colonisation of post-industrial landscapes for example the Highline in New York and abandoned agricultural landscapes, low-intensity pasture, hay meadow or woodlands where ferns may predominate for inspiration.

7.13 Herbaceous mass planting is well suited to large scale landscapes, however, traditional herbaceous borders are an alternative for smaller formal locations where plants may be in smaller groups or drifts for an intimate effect. Even in the most formal of situations in town centres consider mixing annuals with unusual bulbs, herbaceous plants and ornamental grasses and soften the colour palette.

7.14 The Prairie or grassland planting technique is a variation which can be applied for particular ornamental effect where space is more limited for example in the public realm. With such a wide combination of species possible this style of planting is adaptable to marginal situations including ponds, swales and rain gardens.

How to plant:

7.15 The mass herbaceous planting technique is achieved through a process of blending species. Select plants that perform the following functions:

- **Primary** - a small percentage of plants for structure and to provide feature in the planting design due to their distinguishing features. Specimen shrubs can also be included.
- **Matrix plants** to be planted en masse and provide the staple of the planting for example a single grass or limited mixture of grasses
- **Scatter plants** – randomly distributed throughout to give a sense of naturalness and spontaneity

7.16 Then consider the design - there are some tried and tested techniques that can be used but this area of practice continues to evolve leaving plenty of room for innovation by designers:

- **Randomised planting.** A mix of herbaceous plants planted in a random fashion but not evenly. The use of limited mixes, however, does not respond to place.
- **Modular repetition** Plant in groups, blocks or drifts with varying sizes of group and use repeated key groups to develop a rhythm. Repeated groups work best if they are made up of species with very good structure over a long time and allows for distinctions between separate species as well as for the intermingling of complementary plant combinations. Drifts can be long and thin and snaking evoking the subtle patterns of natural grasslands and an advancement is the use of 5-6 varieties in one drift to create the illusion of a more complex mixed planting.
- **Designed intermingling** requires a high degree of skill from the designer. This structured approach aims to produce a stylised interpretation of natural plant communities with large groups interspersed with scattered repeating patterns in small groups of 2 or more species. The groups are made up of plant species which work well together and a small percentage that flower earlier or later than the majority.

7.17 Use smaller plants at a higher density as they tend to establish better, have better availability at local nurseries and often catch up and overtake larger plants. Larger plants are also at higher risk of wind damage and drying out. Plant at high densities of 6-10 plants per square metre depending on the size of plants when fully grown.

- 7.18** Consider the fertility of the soil and possible improvement with the incorporation of compost into the top layers. Alternatively, select species which will thrive in the site conditions for example grasses such as *Molinia caerulea* prefer poor acidic and waterlogged soils.
- 7.19** An active management and maintenance regime is critical to mass herbaceous planting where some species may not succeed and others may dominate to the detriment of the overall effect. Planting must be managed to introduce new species, reduce or remove dominating plants and prevent loss of diversity. In some situations, a tidier appearance will be a requirement due to the formality of the setting or the available maintenance resource and plants which continue to look neat post flowering or die back inconspicuously are to be preferred but in all situations untidy post flowering plants should be minimised. Retain seed heads to allow seed to set and to provide food and shelter for wildlife but cut back in the winter to allow plants to rejuvenate and produce new growth in the spring.

Species and Plant Lists:

- 7.20** The RHS gives an extensive list of herbaceous plants by colour, month of flowering and for situations which include dry shade, moist shade and full sun and many have RHS Award of Garden Merit. Check availability with local nurseries that specialise in herbaceous plants and ornamental grasses.

[RHS Plantfinder](#)

- 7.21** To identify native species these lists can be cross referenced with the Online Atlas of British and Irish Flora

[Plant Atlas](#)

- 7.22** Bulb planting can also be added to all types of ground cover including amenity grass and even wildflower meadows. It provides an additional dimension with swathes of seasonal colour making an impact from late winter through to early summer depending on which bulbs or combinations are planted. Consider use at entrances or approaches such as drives and along verges.

Bulb Planting:

- 7.23** The form and height of the flowers derived from bulbs is important when considering the ground cover they are planted into. Spring Crocus, Anemones and Snowdrops are very early and suited to close mown amenity grass or woodland floor due to their size. Grass left short will not start to grow until after the carpet of these spring bulbs have finished flowering and they can be planted to flower beneath trees yet to come into leaf.



Figure 7.3 Bulbs planted into verges and amenity grass

- 7.24** Taller flowering bulbs such as Daffodils, Tulips, Iris and Alliums can be planted into low shrubby groundcover, grass or herbaceous planting but consider the compatibility of the flowers to the form and style of groundcover. Some flowers such as Daffodils and Tulips may look too contrived for Wildflower Meadows or

herbaceous planting for example but Iris or Alliums may blend well. Where planted into amenity grass for example along avenues keep grass long and mow at the end of flowering.

7.25 Certain bulbs are mainly suited to woodland situations and this includes Bluebell, Wood Anemone, Lily of the Valley, Wild Garlic, Celandine and Wild Cyclamen others may be specifically selected for wetland/ marginal habitats such as Flag Iris.

7.26 Plant smaller bulbs such as Crocus and Snowdrop at a density of around 50-75/m². Daffodils, Bluebells, Tulips, and Alliums may be planted at around 20-25/m². Large *Iris pseudacorus* or *Iris pallida* are better planted individually or in small groups of 3-5 amongst complementary shrub or herbaceous plants.

7.27 Useful websites for supply and guidance are as follows:

[Crocus](#)

[Bulb Planting Advice Sheet](#)

Amenity Lawn

7.28 The most ubiquitous of groundcovers with its benefits often overlooked in favour of more ornamental and more biodiverse treatments. Lawns are adaptable, easy to maintain, look neat and tidy and last over time as well as making the perfect surface for all kinds of sports, informal games and recreation. Ornamentally they provide an inexpensive green foil and horizontal plane against which more ornamental planting can show off and a neat and tidy foreground to more naturalistic treatments such as meadows and woodland edge at the margins of housing developments, parks and recreation grounds.

7.29 Biodiversity enhancement is encouraged across all open space types but consideration also needs to be given to the playability and usability of the surface where appropriate. Close mown

amenity lawn is of low biodiversity value but provides the best natural surface for sports and recreation. Choose hard wearing mixes for open space typologies which include Outdoor Sports arising from development of new housing and provision for children and young people where play such as kick-about are encouraged. Outfield margins to both these open space typologies, however, may incorporate softer long grass and meadow. Amenity lawns should predominate in Parks and Gardens where formality and intensity of use are a priority but with softer wildflower meadows to margins along hedgerows and under trees. In natural and semi-natural green space an accessible native habitat such as woodland margin and hay meadows should be encouraged



Figure 7.4 Long grass swaths on the Stray and at the margins in Valley Gardens

7.30 For open space typologies Consult Harrogate Borough Council's *Provision of Open Space and Village Halls Supplementary Planning Document 2021*

[Open Space and Village Halls](#)

- 7.31** Seed mixes are available for a wide variety of soils and situations including low maintenance, shade tolerance and intensive use as well as general purpose. Mixes can include typical lawn flowering plants such as clover, daisies and buttercups for added seasonal interest and seasonal bulbs can be planted into amenity grass such as snowdrops, crocus, anemones, daffodils and tulips.
- 7.32** An alternative to grass is turf which can be laid for immediate effect in more formal areas or where an immediate aesthetic is required. Turf is expensive compared to seeding which limits its use to smaller areas and it is also expensive to maintain especially in dry weather, however, grass seed will take a couple of seasons to establish.
- 7.33** Amenity grass lawns require reasonably fertile and well drained soils to succeed and should be seeded into a min 150 mm depth of topsoil. Prepare the seed bed in accordance with National Building Specification and seed. Maintain grass height in accordance with use but usually 40 – 100 mm except where grass is being left seasonally long beneath trees and to accommodate bulb planting.
- 7.34** The mowing of bulb areas must be properly managed to allow bulbs the opportunity to flourish and potentially to multiply. Mowing once the leaves of bulbs have died off gives a better chance of display in future years.

8 Urban Tree Planting

Introduction

- 8.1 Trees are a vital living component in towns absorbing carbon dioxide and oxygenating the air we breathe whilst also providing qualities such as variety, diversity and seasonal colour. Designers use trees to enrich places and add amenity through visual effects in the landscape/ townscape such as vistas, framing views, giving scale, adding layers or creating a feeling of openness or enclosure.
- 8.2 Trees also have wider environmental benefits such as provision of shade, absorption of pollution, promotion of health and well-being, enhancement of biodiversity and meeting key challenges such as climate change through air cooling, carbon capture and rain water infiltration. Successfully integrating trees into new development and planting new trees in streets and hard urban areas is not only desirable but necessary to realise the full range of benefits they bring.



Figure 8.1 Successful street tree planting on Kings Road and a Lime avenue in Valley Gardens, Harrogate

- 8.3 Recent revision to National Planning Policy guidance (July 2021) places emphasis on the important contribution to the character and quality of the urban environment made by trees and now specifically makes provision for planning policy and decisions to ensure new streets are tree-lined.

National Planning Policy Framework

- 8.4 However, hard urban environments present a challenge to the vitality and longevity of existing trees and the planting and establishment of new. The specific technical requirements for designing with urban trees is the focus of this chapter – chapter 10 contains further detailed guidance on woodland tree planting.

Consult *Interim Advice Note 19: Landscaping and Trees*, North Yorkshire County Council 2020 for guidance specifically in relation to the Highway, including visibility splays, Trees and Street lighting, minimum distances from footpaths and roads and recommended minimum distances from built development by species.

Planning and Tree Protection

- 8.5 *The Town and Country Planning (Tree Preservation) (England) Regulations 2012* enable trees to be protected in one of two ways:
 - Through Tree preservation Orders
 - Through Conservation Area status – all trees in Conservation Areas with a stem diameter in excess of 75 mm are protected
- 8.6 It is an offence to fell or carry out unauthorised work on protected trees. Anyone wishing to carry out work must make an application and must have permission granted before carrying out the work. Unauthorised work to protected trees carries a heavy penalty but

trees which are dead, dangerous or dying are exempt. A tree survey in accordance with BS5837:2012 will be required to prove tree condition.

- 8.7** *Harrogate District Local Plan Policy NE7: Trees and Woodland.* As a council Harrogate Borough Council are legally required to preserve and protect trees and can make Tree Preservation Orders on trees and woodlands to ensure their long term future. There are also many trees of value that are not protected and the council will look to safeguard their loss to development through conditions attached to planning permission.

Anyone can request a Tree Preservation Order in writing to the Council if they feel that a tree or woodland is at risk giving the location, reasons why they are worthy of retention and why they are under threat.

- 8.8** Where development sites have existing trees the applicant must:

- Check to see if trees are protected with a TPO
- Check Conservation Area Boundaries

- 8.9** Trees may also have added protection if they have Veteran status. Veteran trees are protected in planning under NPPF paragraph 180 as ‘irreplaceable habitat’ and can be considered for a Tree Preservation Order under category A3. Further information can be found in:

[Habitat Action Plan 2012- Wood Pasture Parkland and Veteran Trees](#)

Trees and the Planning Application

- 8.10** Preparing planning applications relating to trees requires consideration of the following:

- BS5837:2012
- Planning Policy NE7
- Tree and Design Action Group (TDAG) guidance
- North Yorkshire Council Tree and Woodland Policy
- Emerging Policy and Professional Standards
- *Interim Advice Note 19 Landscaping and Trees, North Yorkshire Council, September 2020*

- 8.11** Where development is likely to affect trees on site or on an adjacent site the applicant must:

- Appoint a specialist arborist early in the design process to prepare a tree survey in accordance with BS 5837:2012 to enable a balanced and evidence based approach to decision making on tree retention and to inform the design. The applicant should aim to have surveys undertaken early to support pre-application discussions with the Council and for submission with the planning application.
- A Phase 1 Habitat Survey together with any protected species surveys for example Bats or Nesting Birds may also be required in line with the Council’s validation criteria biodiversity proforma.

- 8.12** The applicant must also give the following supporting information in the Planning application.

In the Design and Access Statement

- A full rationale for the approach taken in relation to retention and removal of existing trees based on the tree survey and arborists advice.
- Tree Survey, Arboricultural Impact Assessment (AIA) and Arboricultural Method Statement (AMS) in line with BS5738:2012 and subsequent revisions.

- A landscape strategy for proposed compensatory replacement tree planting along with proposed planting generally across the site.

Proposal Drawings:

- A plan showing the proposed site layout overlaid with the tree survey - the root protection area (RPA) of retained trees in relation to buildings/ hard surfaces and the proposed planting scheme.
- Existing trees on site - the RPA of trees, the position of protective fencing and any trees that are to be removed (1:1250/ 1:500)
- A plan showing the planting strategy for proposed compensatory tree planting as part of landscape proposals for a whole site (scale 1:200/ 1:100)

Biodiversity Net Gain and Urban Trees – Replacement Planting

- 8.13** There are additional requirements for the planning application in relation to Biodiversity Net Gain (BNG) and urban tree planting as follows.

[Natural England BNG and tree planting](#)

- 8.14** Urban Trees are considered, under BNG, to be all trees in urban situations, including individual street trees and linear and perimeter blocks of trees. (individual trees in rural situations, such as field trees can also be considered as ‘urban trees’ for the purposes of accounting for them in the metric, but lines of trees in rural situations should be considered as linear features).

- 8.15** Urban trees are treated as area-based habitat, so that their Root Protection Area is used as a proxy for canopy cover, using the formula $area = \pi \times r^2$ where $r = 12 \times DBH$ (Diameter at Breast Height).

- 8.16** RPAs are provided for individual trees as part of the standard arboricultural survey which must be undertaken for development sites that contain trees. Where the DBH of individual trees is not available the ‘tree helper’ tool can be used to estimate the canopy areas of ‘large’ ‘medium’ or ‘small’ trees. The areas calculated for urban trees do not contribute towards the area-based total for habitat areas on a site, as it is considered that the canopy is elevated above other habitats, such as grassland, which continue to exist beneath the tree.

- 8.17** The calculated area of existing urban trees is an important consideration when calculating replacement planting required to compensate for urban trees lost as a result of development. A very large number of young saplings would be required to compensate for the canopy area of a large urban tree. However, the biodiversity metric calculations work on the basis of the assumed RPA of a sapling after 30 years growth. In most cases standard whips would still fall into the urban tree helper’s ‘small tree’ category after 30 years. Only extra heavy standards or larger might be expected to become medium-sized trees after 30 years. As it takes 30 years for trees to reach these sizes, and there is a risk that some saplings may be lost, the metric ‘discounts’ these values by around a third.

- 8.18** The loss of a large, mature urban trees may require a significant number of replacement young trees, which must be given adequate space in which to grow. So, for example Bristol Tree Forum have used the Biodiversity Metric 3.1 to estimate that 21 young small trees might on average be required to compensate for the loss of one large urban tree (although this will depend on the actual root protection area of the individual large tree, taken from the arboricultural survey of the site).

[Bristol Tree Forum Tree Replacement Standards](#)

- 8.19** Where a planning application shows planting proposals which include the retention or loss of existing trees and planting of new the Council will attach a condition to any grant of permission for further details to be submitted. Technical information on acceptable standards for planting, maintenance and species selection follows in this chapter and shall be referenced in the development of planting details.

Discharge of Planning Conditions:

- 8.20** The applicant must include detailed planting proposals prepared in accordance with Chapter 2: The Landscape Content of Planning Applications and include the following shown on associated plans, details, schedules and specifications (as appropriate).
- Detailed Planting Plan must include location and species of all trees to be planted and retained at a suitable scale **Plan** (1:200/ 1:100)
 - Planting schedules to include size, nursery stock, species, number of trees to be planted. Street trees to be a minimum 14-16cm girth Extra Heavy Standard trees and in hard public squares to be 20-25 cm girth Semi-mature stock. In soft spaces such as wide verges, green spaces and parks a minimum size of 10-12 cm girth Standard nursery stock must be specified all in accordance with BS8545: 2014 **Schedule**
 - Tree species – full scientific name with genus, species and cultivar for example *Sorbus aria* ‘*Lutescens*’ **Plan and Schedule**
 - The type of Nursery stock - Urban trees must be either root balled or container grown and the applicant should ensure that tree roots have been checked from a sample provided by the nursery **Schedule**
 - The nursery supplying the trees and evidence of transplantation history of the trees and confirmation of species – **Schedule/ Specification**

- Calculation of the volume of rooting medium – see technical guidance for information on formula and how to calculate this **Schedule**
- Details of the planting soil/ medium and any proprietary products **Specification**
- Means of support – underground guys are suited to trees planted in hard areas, planting trees within softer areas in the street for example swales may be supported with double timber stakes and ties **Construction Detail**
- Details of tree furniture such as guards and tree grilles should be kept to a minimum to avoid clutter **Construction detail/ Plan/ Schedule**
- Pervious surfacing type and area around the root zone of the tree **Construction Detail**
- A 3 year tree maintenance and management plan **Schedule**
- Use of ancillary items to support urban tree establishment and health such as hydration bags to water the tree **Schedule/ Specification**

New Urban Tree Planting

- 8.21** The case for planting new urban trees is compelling both to replace those which eventually die through age or disease or are lost to development and to increase the urban tree population for the many long term amenity and environmental benefits they bring.
- 8.22** Planting urban trees which will not just survive but thrive requires careful planning. The designer must have detailed knowledge of tree species and nursery stock how trees should be protected, supported and maintained and plan for the conditions required for tree health with an appreciation of the buildings, services, structures and surfaces which will surround the tree.



Figure 8.2 A treeless street with wide verges and wide verges with fastigiata trees. Both could support medium to large canopy trees with design consideration at the outset

Conditions for Growth

- 8.23** Urban areas present a challenging environment for the successful establishment and long term growth of trees and this environment is subject to change as trees are likely to outlive all other components of urban infrastructure even buildings. Put simply they require Soil, Air and Water but existing streets, urban squares and car parks are compromised with surfacing that is mostly impervious with highly compacted soils. Planting trees in new streets or hard urban areas also requires consideration of the available rooting volume of the tree and the ability of the soil and surfacing to deliver water and air to the roots.

Soil Volume

- 8.24** Together with oxygen, the provision of adequate soil volume is fundamental to tree health and growth. Trees planted in a lower soil volume than the requirements will not reach full potential and will have a shortened life span. The soil volume is proportionate to the mature size of the tree species and should be calculated

based on the metric formula provided in research papers by *Arboricultural Journal* 1992 vol 16 pp 25-39 Lindsey and Bassuk as follows:

0.6 m³ of soil/ 1 m² of crown area

Mature canopy can be calculated using $A=\pi r^2$ and soil volume shall be based on a depth of 900 mm as this is the maximum useful depth of soil for trees as BS 5837 states that the tree root system is typically concentrated in the top 600 mm of soil.

Full details of calculations, soil volumes and rooting areas including trenches /continuous verges or root paths for all trees must be submitted with planting details to discharge planning conditions.

For example:

A large tree with a mature canopy of 8 m dia (4m radius) $A=\pi r^2$ gives a canopy area of 50 m²; 50 m² x 0.6 m³ = 30 m³ soil volume; 30 m³ Divided by 0.9 m depth = 33.3 m² (area of soil around the tree)

- 8.25** Soil volume can be calculated utilising adjacent soft areas such as verges, gardens or parks where a physical connection can be formed with a root path.
- 8.26** Soil volume may be expanded with the use of load bearing crates where trees can be planted in continuous trenches or where they are planted in wide continuous soft areas such as verges or swales. Trenches must be wider than the root ball of trees. In these circumstances a 25% reduction in volume per tree may be applied. However, soil volume is based on unscreened loam topsoil and the volume that cells take up cannot be included in the soil volume calculation and must be subtracted from the rooting area.

Soil Medium

- 8.27** Use as dug existing soil as tree planting medium wherever possible within tree pits and trenches and to full extent of the rooting volume (mix with tree compost if necessary to improve the organic content). Provided the mineral content is good, soils can be improved with organic matter. If it is not possible to re-use existing soil due to poor quality in made up ground then take soil samples from nearby and import soil for backfill matched as closely as possible to the texture and structure of the indigenous soil. Any imported soil must be in accordance with BS8545:2014. Provide details of soil medium for pits and trenches.

Compaction and Load Bearing

- 8.28** For roots to absorb water and nutrients, the soil needs to be aerated and have voids. Where the soil is heavily compacted and voids in the soil are at 10% or below then the tree will cease to grow. The oxygen level of soil is affected by soil sealing, poor drainage, a high water table and soil compaction.
- 8.29** The need for oxygenated and aerated soil for street trees is not compatible with the engineered load spreading requirements for hard pavements and roads which rely heavily on compacted layers of stone. There are technical solutions aimed at enhancing the load bearing capacity of tree root growing environments.

Structural growing media

- 8.30** *Trees in Hard Landscapes: A guide to Delivery Trees and Design Action Group* 2014 gives an extensive review of all options currently available and should be used as reference by designers but the suitability of products or techniques requires expert advice. The manual has informed this guidance.

- 8.31** Structural growing media, designed to take the weight of hard surfaces, is installed around the planting hole and beneath existing surfaces. Structural soils have inherently low water holding capacity and risks a low PH due to the need to add organic matter both of which limit species choice. As the soil volume calculations are based on unscreened loam topsoil the soil volume of structural soils will need to be much greater to compensate for the growing medium being less than ideal for optimum tree growth.

- 8.32** Sand based media (known as Amsterdam Soil) needs very high rates of compaction of about 80% which inhibits root growth in all but the least load bearing situations. Structural soils are not an acceptable choice for the reasons outlined.

- 8.33** ***Skeletal substrate*** where stone provides a high load bearing strength and is then flushed with soil is a relatively new system known as the ***Stockholm Treepit*** but more research is needed to prove this method is effective and this system is not acceptable as a substrate for planting new street trees at this time. However, skeletal soil (***Stockholm Treepit***) could offer some utility as a retrofitting substrate around existing large trees which are showing signs of premature decline or where there are issues of surface upheaval caused by roots subject to expert technical advice.

Crate Systems

- 8.34** Crate systems are modular suspended pavement systems and allow decompacted soil volumes to support tree growth. They are exclusively proprietary products from companies which specialise in the planting of Urban street Trees such as *Deep Root Silva Cells* and Green Blue Urban *Strata Cells*. A system of plastic or concrete cells is installed around the planting hole and beneath the existing pavement to provide load bearing capacity and then back filled with soil to provide soil volume for the tree without the need for compaction. One advantage is that the crates can be

back filled with as dug soil but the system selected may affect the soil volume as the space taken up by crates needs to be subtracted from the soil volume calculations.

- 8.35** Crate systems are expensive to install but they are a tried and tested long term solution, the pavements can be replaced above them without disruption. They are the preferred choice for planting street trees but seek technical support from proprietary manufacturers and installers.



Picture 8.1 The principles of crate systems

Raft Systems

- 8.36** Raft systems are commercial products and there are two types:
- honeycomb shaped mattress which is stretched over the rooting zone, pinned to the ground and partially filled with a soil mix or self-binding gravel
 - Interlocking shallow plastic tiles which sit on a bench formed in the soil around the tree pit
- 8.37** Both are designed to spread the load of pavements but there is limited implementation history and they may not be sufficiently load bearing without a compacted substrate beneath. However,

they are easy to install in a retrofit situation around large existing trees, inexpensive and offer a no dig solution which allows water infiltration to the root zone and informal paving.

Surfacing the tree pit

- 8.38** Surfacing immediately around trees needs to be permeable and non-compacted to allow water and oxygen to reach the root zone but consider the situation, the budget and maintenance implications carefully.

- **Porous self-binding Gravel** is not susceptible to displacement if properly laid and rolled and is suitable as a walkable pedestrian surface but requires maintenance to top up and roll and alleviate compaction otherwise it can present trip hazards and/ or become impervious. Should not be laid up to the tree allow for bark mulch to the tree hole. Ensure use of PH neutral products. Laying in large wide continuous strips provides more even wear and is used extensively in Paris. There are a wide range of products available which affect cost and aesthetic effect.
- **Porous Resin Bound Gravel** is aggregate bound together with a polymer and is sold as a proprietary product by manufacturers specifically for tree pits. Obtain technical advice from supplier to ensure specification of the right gauge of aggregate, permeability qualities and laying depth as well as preparation of substrate. There are concerns with durability and early cracking and the ability of the surface to remain permeable. Using the correct product and specification as well as a qualified contractor greatly reduces the risk of early deterioration of the surface. This is a comparatively expensive surface.

8 Urban Tree Planting



Figure 8.3 Porous resin bound gravel surfacing to tree pit of newly planted trees

- **Porous Wet Pour Rubber surface** is a relatively new product for this application and expensive but flexible and durable but it can be prone to vandalism and requires specialist repair or replacement once damaged. Use colours which fit in with the existing paving such as greys and buff colours to avoid drawing attention to the surface.



Figure 8.4 Porous wet pour rubber surface retrofitted around existing mature trees removes a trip hazard and allows rainwater to percolate to the roots

- **Tree Grates and Grilles** fitted around the tree can be sourced in steel, ductile iron or wood. In areas used by vehicles cast iron grilles are suitable for loads in excess of 400Kn. Steel grilles with inset paving to match adjacent surfaces may also be suitable for vehicular traffic. In pedestrian areas wood planking on a steel frame is more flexible and cost effective and can be modified or adapted more readily than other types. The wood needs to be treated

with an anti-slip coating and the timber is susceptible to bending and impact resistance as well as durability. Poor detailing may cause the pavement to lift causing trip hazards and larger trees will outgrow grilles and require removal and replacement with a new surface. Open grilles require regular maintenance to remove litter.



Figure 8.5 Tree grilles often present maintenance problems causing trip hazards, filling with soil or rubbish and require removal when the tree outgrows them

8.39 Tree roots can present a nuisance to services. To minimise conflict follow recommendations in *Streetworks UK Volume 4: Guides for the Planning, Installation and Maintenance of Utility Apparatus in*

Proximity to Trees. Choose tree species and rooting environment carefully using root deflectors and, as a pre-requisite on green field sites for planning consent, choose common enclosures for utilities adjacent to the properties under the footway.

Trees and Underground Services

8.40 Where there are existing service trenches, share the trenches where possible. In areas at high risk of subsidence use flexible pipes with elastomeric joints which will resist pressure from roots. Where there are older pipes in-situ provide a good growing environment for trees and choose trees with slower root growth

Tree Support and Protection

8.41 Newly planted street trees require support until roots have become established.

8.42 In soft areas such as swales and wide verges larger nursery stock trees must be supported and double stakes with a flexible bridge are acceptable. The checking and removal of stakes and ties must be included in the maintenance schedule.

8.43 In hard surfaces trees shall be supported with underground guying to remove the need for stakes which may impede movement, clutter the public realm and attract vandalism. Underground guys do not require checking and may remain in place.

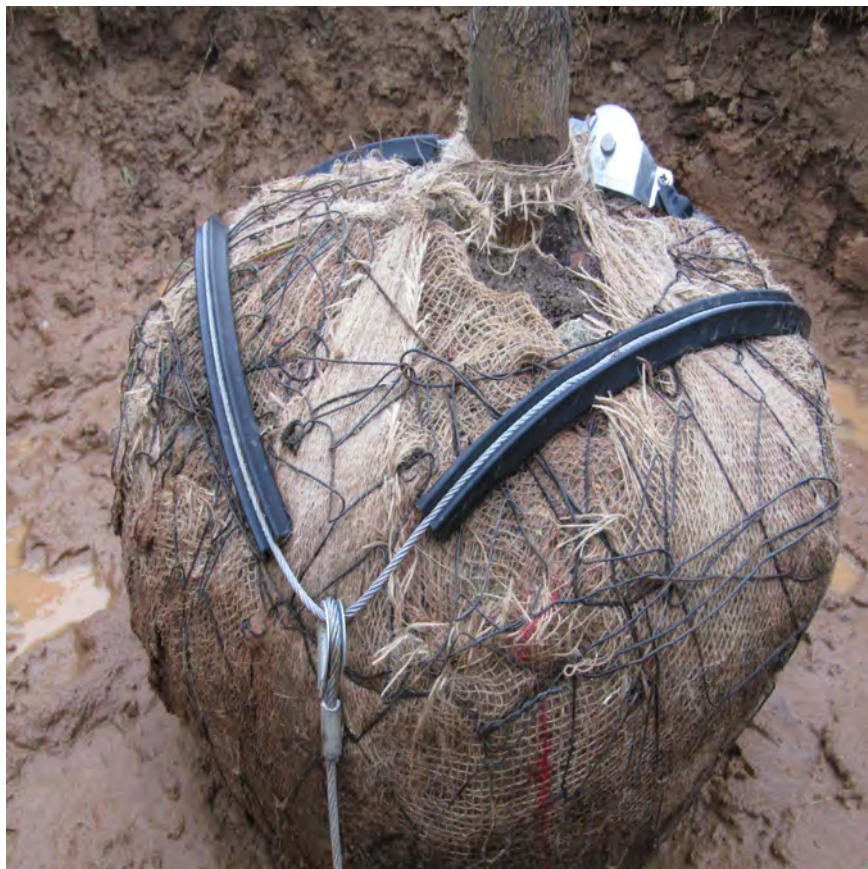


Figure 8.6 Below Ground 'Tree Anchor' Rootball Fixing System

- 8.44** Cast iron or steel tree guards must only be specified in locations where the tree may be damaged by vehicle movement otherwise omit from scheme. Guards are expensive to install and maintain -require regular checking, often attract vandalism and need removal when the tree outgrows them.

- 8.45** Water is essential for trees to survive and opportunities to enhance the permeability of the hardscape around them or to direct surface water to drain into the tree pit helps avoid wastage by returning water to the soil for infiltration by trees.

Irrigation and Drainage

- 8.46** Young trees are particularly dependent on water provision during establishment and a below ground irrigation system such as Rootrain-Urban is required in all hard surfaces.

[Green Blue Root Rain Urban](#)

- 8.47** Another option are Barcham Tree Irrigation Bags which are zipped around the tree, hold up to 70 litres of water and release slowly over 3-5 hours reducing the frequency of watering.

[Barcham Tree Hydration Bag](#)

- 8.48** In soft areas large nursery stock (14-16 cm girth +) must allow for irrigation with a perforated flexible pipe wrapped around the rootball and hinged cap or similar.
- 8.49** All trees shall be watered immediately after planting and regular watering must be included in the Urban Tree Maintenance schedule.

Water Management

- 8.50** Whilst it is important that the tree pit soil volume is retentive, tree pits also need to avoid filling up with water as this will displace oxygen preventing microbial activity and roots from absorbing nutrients leading to decline and premature death. Where tree pits are part of storm water management or where pavements are taking surface water run-off ensure that the tree pit has adequate drainage.

8.51 Tree pit irrigation can be integrated with water management but implementation requires the expertise of a drainage engineer to design a system based on attenuation calculations and controls on input and output to deliver functionality.

- **Linear swales** incorporated into the street are shallow vegetated channels for the conveyance and treatment of surface water run-off suited to linear landscape strips in hard landscapes such as continuous verges, central reservations or islands. Trees can enhance effectiveness with planting on the upper part of the channel and they can increase the scale and impact of the swale as a feature. Large trees and dense canopies manage the most surface water through infiltration.
- **Water Sensitive urban Design principles** present a fully integrated approach to tree planting with water management which allows drainage of the hard areas, filtering of contaminants and increased amenity through richer planting at ground level to enhance streets.
- **Rain gardens** use bio-retentive planters in the tree pit set below ground level to remove pollutants from surface water and irrigate the tree before water is discharged to the local waterway or re-used. Water from adjacent paved surfaces enters the pit through a break in the kerb is filtered through the soil media and collected via perforated pipes. Any surface water which exceeds capacity continues down road channels to gullies and conventional discharge. The pit is below the level of a surrounding kerb and requires dense ground cover plantings for filtration.

8.52 For further information on water management and trees see information in '*Large Species Trees in Urban Landscapes – a Design and Management Guide*' [CIRIA2010](#)



Figure 8.7 A Rain Garden on a Suburban Street

Contamination

8.53 Salt damage to trees is well documented and is caused by the high concentration of de-icing salts in water run-off. High salt concentrations alter the osmotic pressure of soil solution which means that the tree has to use more energy to absorb water. Salts also clog up pores in the soil which reduces aeration and promotes compaction. Many species show some resistance to salt pollution

and there are additional precautions and solutions which may be taken to reduce the impact on tree health which include soil flushing.

Species Selection

8.54 The right tree must be planted in the right place as poor species selection can lead to decline and early death, nuisance in the form of disruption to pavements or walls or unanticipated effects on public health. Selecting the right species can also bring benefits such as greater absorption of pollution, the fixing of nitrogen or improvement of soils.

8.55 Species selection especially in urban areas is a complex and highly specialised process and shall be informed by a site specific assessment with the support of expert tree knowledge. The following provides an over view of the parameters which should inform choice, resources from publicly available manuals and an indicative species list can be referred to in Appendix 1.

Considerations

- *Soil characteristics*, PH, water availability, temperature sunlight and shade – not just now but in the future. Indications are that Mid-century there will be warmer/ drier summers and milder wetter winters and a higher incidence of major weather events such as droughts and floods. Species may need to drought or water-logging tolerant or both depending on position, soil and design intent
- *Pollutants*– urban places often have air pollution and are polluted with de-icing salts. Trees with a natural tolerance of these conditions are more likely to thrive
- *Microclimate* – urban places tend to be warmer and drier as a result of reflected light and some places can be windy or shady as a result of the position of high buildings
- *Site constraints* – the available space both below ground for roots and above ground considering the mature canopy

spread and ultimate height of trees. There shall be a preference for suitable Large Canopy Trees unless space is restricted or there is a particular design purpose or intent which justifies smaller or columnar trees. Larger canopy trees make the greatest landscape impact, contribute more to the urban environment and can often be pollarded when mature to reduce size.

- *Street Lighting* – tree planting must be co-ordinated with street lighting design to ensure that canopies do not obstruct lighting or clash with the positioning along the road.
- *Resistance to disease* – consider the diversity of the tree population as a whole. Many avenues planted in the Victorian era used a single species such as London Planes or Limes which makes them vulnerable to disease. Unless there are strong design or historic reasons to do so aim to use a diverse species selection to support resilience. Consult HBC Tree officer and use the 10-20-30 rule – no more than 10% same species; no more than 20% same Genus; No more than 30% same family.
- *Rosacea* family includes: Sorbus, Malus, Prunus and Pyrus
- In urban areas tree selection should feature both native and non-native species. Use cultivars to remove characteristics such as thorns or fruiting or to provide a more reliable tree form for streets and urban places.
- *Age spread/ growing speed* – combine young specimens with old to maximise and sustain canopy over time. Combine slower growing long lived species with fast growing shorter lived species.
- *Tree characteristics* – some species will have characteristics that make them unsuitable choices in certain locations such as shallow roots, brittle or unstable branches, producing fruit, basal suckering or water demanding which can lead to subsidence. Others may have effects on public health producing substances which make them highly allergenic.

- *Ensure compliance with invasive/ non- native planting restrictions.* Check the list of banned species – [Non-native species index](#)
- *Long term maintenance* – plant trees which after a 3 year maintenance regime can be self-sufficient
- *Draw up a short list of species* and check availability with nurseries and consult with Highways/ maintenance staff before confirming choice
- *Match all of the above with aesthetic benefits* to design with shape, form and colour for a successful outcome and choose deciduous/ evergreen mix for ecological resilience and year round interest
- *Allergens* the amount of pollen produced by some trees especially in relation to care homes, hospitals and schools needs to be controlled. Reference *Low Allergen Planting Planner* [Olivia Clark 2021](#).

8.56 The indicative species list in Appendix 1 is by no means exhaustive and reliance on a few ‘safe’ species should be avoided in the interests of species diversity. Seek expert tree advice based on site assessment to mix in appropriate species which are under-utilised.

Tree Quality at the Nursery:

8.57 Further resources on species selection can be found at www.righttrees4cc.org.uk which provides a database and up to date information on selecting the right tree and *Tree Species Selection for Green Infrastructure: A Guide for Specifiers* [A Hiron, H Sjoman 2019](#), [Trees and Design Action Group](#) provides guidance on selecting the right species for Green Infrastructure.

8.58 The quality of the Tree stock is of paramount importance. Make sure trees selected comply with BS 8545: 2014 which gives comprehensive guidance covering production handling and storage, planting, aftercare and maintenance. In addition, inspect trees at the Nursery and make checks for:

- Morphological and physiological conditions;
- Production methods and bio-security
- Adherence to good growing practices – ie number of times trees have been transplanted
- Inspect roots of a sample to check condition
- Select and tag trees for delivery

Reception, handling and storage:

8.59 Inspect the trees again on delivery and reject any trees that have defects or damage from lifting and transportation.

8.60 Supervise to ensure trees are handled carefully, stored in an upright position, supported and irrigated. Ensure delivery to site occurs in a timely fashion so that trees are kept in storage for as short a time as possible.

Planting:

8.61 Plant in accordance with BS 8545: 2014 when the trees are dormant which for most species is mid- November to Early March but do not plant into frozen ground. Water trees immediately after planting with a minimum of 25 litres of water.

8.62 Plan for post planting care. Develop a maintenance programme from Nursery to Independence in accordance with BS 8545: 2014 and agree who is responsible for maintenance. Consult the Council’s Tree Officer and Highways department.

Maintenance:

A commuted sum will be required for future maintenance of tree pits within carriageway maintained at public expense.

8.63 Regular irrigation in the early stages delivered to the root ball is essential to survival. Other maintenance tasks which must be carried out include checking and adjusting ties and stakes, removing or replacing support and protective devices, replenishing any mulch and most importantly undertaking formative pruning.

8.64 Planting Design with Urban Trees

8.65 This section covers planting for diversity and resilience and planting for a purpose including some examples.

Planting for Diversity and Resilience

8.66 Tree selection should be based on site assessment and should be diverse. There are a wider selection of species than commonly thought consider the following:

- use cultivars to increase diversity and exclude undesirable characteristics in an urban context such as low hanging branches, basal suckers, thorns, excessive fruiting or for a more reliable/ regular habit
- Use native and non-native species and a mix of deciduous and evergreen species
- Consider species selection in relation to climate change – resilience to heat, drought or water-logging
- Consider the site characteristics and the purpose of planting – some examples below
- Plant in repeated patterns of short blocks using two or three species and avoid planting with a single species except

where necessary Conservation purposes for example in listed parks and gardens

- Inter-plant along avenues with contrasting species- except where there is a requirement to replicate an existing single species avenue for example in historic designed landscapes or Conservation Areas
- Use individual Specimen trees where suitable
- Under-plant existing or newly planted avenues with a selection of species
- Use swales and soft verges to incorporate a variety of tree species along corridors
- Plant long-lived and slow growing species with short-lived fast growing species to provide for a fuller tree canopy over time

Planting for a Purpose

8.67 The following examples give some ideas of how urban tree species can be selected for purpose in schemes to increase diversity.

Main link Road incorporating SUD's, vehicles pedestrians and cars, dense housing and Office uses

8.68 On a broad city street incorporating a linear swale for drainage the example might include the following:

8.69 Where space is limited on the narrow footpath adjacent to four story offices plant trees to give shade and cool offices with a more fastigate shape or trees which can be pollarded and managed. Appropriate tree species might also prefer warmer drier conditions due to the reflected light from the building. On the opposite side of the street the linear swale gives an opportunity for combining under-story trees and smaller multi-stem trees adjacent to

footpaths and with larger canopy trees on the carriageway side, inter-planted with faster growing medium size trees to achieve a quicker effect and more consistent canopy over time.

Main Transport Corridor with Existing Avenue planting and Deep verges

- 8.70** A double carriageway distributor road with buses, cycle lanes on carriageway and footpaths alongside the road. The road was planted with Limes (*Tilia platyphyllos*) as a single species avenue in the early 20th century.
- 8.71** As a bus route the canopy of mature trees needs to be high and Limes can be pollarded regularly to maintain this and are deep rooted so don't tend to affect surfaces unduly. The deep verges along this route give the opportunity to under-plant with a broader selection of species including blossoming and fruiting varieties and multi-stem trees which retain visibility but provide a human scale for pedestrians and cyclists. The inclusion of evergreen species such as Pines which have a greater surface area due to their needles will absorb pollution and provide shelter and interest in the winter months.



Figure 8.8 Transport Corridor Example

Traffic Calming an Urban Lane

- 8.72** A narrow street of mid- Victorian housing where there is an ambition to provide a shared surface and calm traffic with 20 mph speed limit and one way traffic. Before refurbishment the street was very hard with no planting and the built form at the back edge of the pavement.
- 8.73** Trees can be positioned to slow down cars and provide a more sinuous route along the street. creating chicanes. Select species with a single clear stem of at least 2 m, a medium height with a fastigate form and select 2 - 4 species for the street. Plant in build outs into the carriageway and integrate with bio-retentive rain gardens and rich ground cover planting to provide drainage, clean the surface water run-off and offer residents amenity benefits. If planted in rain gardens, select species which are salt tolerant and resilient to regular waterlogging and drought. For further information on rain gardens see [SUD's manual](#)
- 8.74** Development Sites with existing trees
- 8.75** Mature trees help to structure a space and anchor new buildings into the townscape and care needs to be taken to preserve existing trees on development sites and within the highway especially when trees are protected or of high quality and amenity value. An early tree survey will determine the condition and overall quality of trees.
- 8.76** The following examples cover common problems when designing with existing mature trees on sites and within the highway.

Existing trees occupy a substantial part of the development site

- 8.77** The decision to retain a number of existing mature trees on site can have a major influence on the layout and use of the site. Consider the following alongside the quality of the trees:

- Tree roots to the drip line of the tree need to be retained in-situ
- Protected status of existing trees
- The maturity of the tree – if young specimens is there space for trees to mature
- Consider the water demands of the tree species in relation to soil type position of any proposed buildings and any new hard standing or changes in level – this can have an effect on the site hydrology leading to tree mortality and/or building subsidence
- Consider the appropriateness of species to the intended function, site conditions and sense of place
- Consider tree work to existing trees before removal such as raising the crown, pollarding, crown pruning, thinning etc
- Consider the risk of indirect conflicts with trees in the future for example the potential for overshadowing as the tree continues to grow

Housing Site and Existing Trees

8.78 In the following example there are a number of trees across the site – allocated for housing development. The age profile varies from a Veteran tree to young woodland planting and includes the remnants of an avenue of Black Poplars and Ash trees which once lined the driveway of a large house now demolished. The veteran tree is protected with a TPO and the tree survey showed it had no significant defects which would make it structurally unsound. The Ash trees had suffered from Dieback and were in decline. The Black Poplars had an unstable form with lower limbs which were liable to split and drop. The Young woodland covered a large area to the south of the site and had been planted approximately 10 years ago. No maintenance had been undertaken and the woodland now needed to be thinned out to enable trees to mature. The position, condition, age and protected status of the trees was considered and influenced the design.



Figure 8.9 Pollarded Street Trees

8.79 The proposals incorporated the veteran tree as a feature within the central public open space on the site at 20 meters from new development. The Ash trees were removed and so was one of the Black Poplars due to its condition and form. Two other Black Poplars were retained with some tree work and incorporated into public open space. Retention of all of the young woodland plantation would have had a significant effect on the development of the site due its location and extent. The design proposals showed that it could be thinned out successfully to secure the

long term contribution that the trees could make and around 50% were proposed for removal. As mitigation it was proposed that additional woodland trees were planted as structure planting along boundaries.

Existing Damage to Pavement by Roots

- 8.80** Roots have damaged an existing pavement and the root zone is completely encased in impervious tarmac surfacing. Shallow roots have caused heave in the search for better growing volume in the sub base because the rooting soil volume for the tree is insufficient and the surface has cracked.
- 8.81** As a temporary measure resurfacing around the roots using a flexible porous surface in a no-dig method such as loose gravel in an expanded mesh stretched over the surface, wet pour rubber, resin bound aggregate or a self-binding aggregate will alleviate the trip hazard and also allow oxygen and water to reach the root zone.
- 8.82** A more permanent solution, however, is advised such as retrofitting with a skeletal soil around the roots to create rooting volume and to the surface of the tree pit or a raft system to bridge the foot-way over the root zone supported by concrete piers. All excavations must be conducted by trained operatives using non-invasive excavation tools such as vacuum or pressurised air powered excavators. Avoid raising or lowering soil levels around roots.

9 Wildflower Meadows

Introduction

- 9.1** Wildflower meadows are culturally important in the landscape as they are a reminder of a time before intensive farming methods were introduced and are one of the best loved British habitats. Hay meadows have been lost in much of the most fertile agricultural land in the lowlands but a few remain as distinctive feature of the Pennine Dales. Nidderdale supports rare upland hay meadows in parts of the valley sides. Almost all lowland hay meadows, which were often fertilised by flooding of wash lands, have largely been lost to agricultural improvement. Exceptions include Aubert Ings SSSI near Cattal.



Figure 9.1 Example of a hay meadow

- 9.2** In the twentieth century there was a sharp decline in the variety of wildflower species and 97% of meadows were lost due to changes in agricultural practices, especially re-seeding, use of

artificial fertilisers and herbicides and increased field drainage. Restoration of traditional low input agricultural hay meadows, a UK priority habitat, for high value nature farming may be supported by agri-environment schemes to balance productivity with biodiversity and other environmental benefits.

- 9.3** Information on the establishment and management of such meadows is available through many sources, such as the PlantLife Meadow Hub but specialist advice is likely to be required, such as that available from DEFRA or the Nidderdale AONB team in the AONB.

[Meadows Plantlife](#)

Meadow restoration has been a successful and widespread feature of Nidderdale AONB's work for nearly a decade. The AONB use experienced ecologists to carry out their site assessment. Any proposals for wildflower restoration or establishment in the AONB must seek guidance from the AONB office on species and methods of establishment rather than reference to this guidance.

- 9.4** There are many other situations from road-verges to churchyards, where valuable long-standing native species-rich grasslands occur. There may be opportunities to echo the recreation of some of these habitats and their plant communities in establishment and management of amenity grasslands and in association with development.
- 9.5** In the past twenty years there has been renewed interest in wildflower habitats due to concerns for biodiversity and for their aesthetic qualities and cultural associations.
- 9.6** There are many reasons why designers should consider incorporating wildflower planting and meadows into schemes. Wildflower meadows are species diverse, attract pollinators such

as bees and butterflies, offer cover for birds and invertebrates and connections to wildlife corridors, can be exceptionally attractive and can offer a taste of wilderness in an otherwise hard urban setting such as school sites or housing estates. What's more, meadows score highly in the Biodiversity Net Gain metric but the functional requirements of a site and the appropriateness of different planting types also needs to be considered and a balance may need to be struck between amenity and biodiversity.

Wildflower Meadows and Biodiversity Net Gain

- 9.7** *Where wildflower meadows are being established in order to achieve credits for biodiversity net gain, it must be borne in mind that such habitats will require to be maintained under legal binding planning obligations, to the quality standards of the target condition for at least 30 years. This is likely to be very difficult to achieve for very high scoring grasslands in situations where recreational and amenity use will be high, so developers are advised not to aim too highly e.g. by seeking to create priority habitat quality wildflower meadows on intensively used areas of public open space.*
- 9.8** *The Biodiversity Metric uses the UK Habitats Classification, which broadly categorises grasslands into either 'Modified Grassland' – essentially species poor amenity grassland, and more species-rich 'Other Neutral Grassland' which will apply to most urban and other amenity wildflower areas. These are the two categories which will apply in most development situations.*
- 9.9** *A further category 'Lowland Hay Meadows' is for priority habitat quality type species-rich grasslands of 'high distinctiveness'. This is very high scoring but will rarely be appropriate for grasslands which are also used for recreational amenity. Exceptions may include larger areas of Semi-Natural Green space or dedicated biodiversity offsetting sites, such as on 'habitat banks'*

9.10 Consider the following opportunities to incorporate Wildflower Meadows into a scheme:

- **School sites** – the outfield areas around pitches especially where there is a connection with existing woodland or hedgerows and pond dipping areas, small patches or pockets of wildflower meadow in and around the harder areas of play grounds and raised beds or boxes can all offer colour, soft relief and opportunity to observe wildlife such as bees and butterflies close up.



Figure 9.2 Meadow incorporated at school grounds margin

- **Housing Schemes** – along margins of recreational grounds, woodlands, hedgerows and more informal green space such as semi-natural greenspace especially adjacent to open

countryside and farmland; and along swales and SUDs schemes (where a marginal mix would be most suitable)



Figure 9.3 Meadows along the edges of amenity green space within a housing development

- **Rural Development** – farmsteads, agri – industry, plant wildflower meadows to soften and as a transition to woodland planting to anchor buildings into the landscape and at the margins of water bodies including attenuation ponds and ditches;
- **Urban landscapes/ Public Realm** – use with caution in less formal areas and consider the maintenance regime carefully to ensure areas have a neat and tidy appearance during the winter.
- **Existing Parks and Gardens** – avoid more formal/ ornamental/ heritage areas but consider stretches beneath avenues and the more informal boundaries and edges for softness but make sure paths are edged with amenity lawn and wildflower meadows are sustained with an active maintenance regime.
- **Semi-Natural Green Space** – some areas of grassland can be treated less formally in certain situations, occasionally in urban areas (such as Rossett Nature Reserve) or more usually on the urban fringe, or as part of more ‘natural’ areas

of green infrastructure provision on larger developments. Wood-Meadows are also an option for semi-natural green space see:

[Wood Meadow Trust](#)

Considerations before you Start:

- **The fertility of the soil** – often semi-natural grasslands including wildflower meadows exist on nutrient poor seasonally waterlogged (however lowland traditional ‘water-meadows’ were deliberately flooded to provide nutrients and warm the soil in winter) substrates. On rich fertile soils, wildflowers are rapidly smothered by stronger faster growing grasses, arable weeds and woody plants. Where soil fertility is high consider whether it can be reduced for example through ceasing fertiliser inputs and removing arisings to reduce fertility over time in situations with existing moderately fertile grasslands where it may not be appropriate to start from scratch. On urban sites fertility can be reduced more immediately (for example school sites currently laid to amenity lawn) through soil inversion or stripping. Alternatively another planting treatment may be more appropriate such as amenity lawn, annual wildflower meadows or herbaceous mass planting.
- **The formality of the space**- despite the floral diversity and aesthetic benefits, wildflower meadows can be shunned by local communities because there is a perception of waste ground or abandonment due to untidiness or physical height in comparison with mown grass. It is essential, in more formal situations, that the meadow is mown and left in a tidy condition over winter and consideration of whether wildflower planting is suitable at all is necessary if it is in close proximity to housing for example.
- **The maintenance regime** – wildflower meadows require significant preparation to support successful establishment

and a strong and adaptive maintenance regime to ensure they continue to thrive in the long term. It is a common misconception that wildflower meadows are low maintenance or maintenance free. Establish a maintenance plan at the outset and consider who will maintain the meadow in the long term. Is there an appetite for active community involvement in maintenance? See the following for guidance:

[Meadows Plantlife](#), [National Wildflower Centre](#), [Forest Research](#), [Wildflower Meadows Habitats](#)

- **The long term goal** - desired wildflower habitats may be managed as either Spring or Summer meadow but rarely both

Sowing Wildflower Meadows

Ground Preparation:

- 9.11** Consider the current ground conditions and suitability for wildflower meadows and carry out a soil survey before attempting establishment. The site needs to be appropriate for wildflowers in terms of soil depth and nutrient status or appropriate measures may need to be taken to reduce fertility. Traditional perennial wildflowers thrive on nutrient poor soils where they do not have to compete with more aggressive grass species.
- 9.12** The council require details on ground preparation before seeding and/or planting operations, seed mixes, turf, wildflower plugs and supplier. This information can be included on the planting plan or in the specification and plant schedules.
- 9.13** Resources for further advice on planting and maintaining wildflower meadows to establishment can be found at Plantlife; The National Wildflower Centre and Forest Research at the above links.

On fertile soils

- 9.14** Where there is existing amenity grass lawn or ornamental planting there are various alternatives which can be explored to reduce soil fertility which includes mowing and removal of arisings, stripping of soil and soil inversion. In urban situations an alternative to perennial wildflower such as an annual mix such could also be considered as they generally prefer a more fertile soil.

Degraded Soils

- 9.15** Brownfield sites can be valuable habitats in their own right and occasionally are classed as the priority habitat 'Open Mosaic Habitats' on Previously Developed Land. Professional ecological advice should be sought before seeking to redevelop such sites but degraded soils such as Brownfield Sites may offer a unique opportunity for establishing wildflower meadows on these 'Meanwhile' spaces because the soils are often without topsoil, nutrient poor and contain rubble or stones. As above carry out soil testing to check for contamination and confirm soil structure and fertility. If compacted alleviate with deep tine ripping, remove any large stones or demolition waste that would prevent rotivation.

Selecting Wildflower Seed Mixes

- 9.16** Unlike the supply of amenity grass and agricultural seeds, wildflower seed isn't certified by DEFRA. Consider whether it may be possible to source seed locally through seed collection or the use of green hay:
- 9.17** [Meadows Plantlife Sowing Seed](#)
- 9.18** Gather accurate information on conditions through soil and site survey as this will influence the selection of Wildflower Mix. Of particular importance is the following information:

- Soil fertility (NPK ratio)
- PH value- Acidic/ Neutral/ Alkaline
- Soil structure and underlying Geology
- Position – open or in shade
- Drainage and location in relation to existing watercourses and aspect
- The desired effect of the meadow planting
- Native wildflower species in meadows nearby with the same site/ and soil characteristics

9.19 Most seed merchants will offer advice on the suitability of mixes for a particular site based on soil analysis and there are specialists in research and conservation who can provide detailed independent advice including the Plantlife Hub.

9.20 Typically, merchants will provide mixes which are either 100% Wildflower seed to give a dense colourful display once seeds have germinated without grass seed or 20:80 (wildflower/ grass seed) to create grass meadow which is rich in wildflowers.

9.21 Mixes can vary by purpose as much as the above site and soil characteristics but most merchants provide mixes for the following situations:

- Calcareous meadows over chalk/ Limestone
- Dry/ Sandy/ Loam Soils
- Loam and Alluvial Wet Soils
- Heavy Clay/ Wet Soils
- Hedgerow and Shade tolerant
- Acidic Soils
- Marginal/ waterside
- Conservation (although all should aim for this)

9.22 Native species have developed alongside non-native over hundreds of years but non-native species should be used with care. They can pose a risk to native wildflowers introducing

diseases and out-competing native species. Crossbreeding can also occur which interferes leading to adaptations which dilute the benefits of native wildflowers.

9.23 Garden ‘Wildflower’ mixes or plants which may contain non-natives of unknown provenance shall not be sown in the wider countryside or environmentally sensitive areas. Seek advice from merchants and specialists on any non-native content in mixes and use merchants that supply British Wildflower seed.

Turfing, Plugs and Bulbs

9.24 There are alternatives to seeding which have grown in popularity in recent years and in certain situations they provide an alternative to seeding or can be used in conjunction with seed to boost the effect or supplement a meadow.

9.25 **Wildflower turf** is relatively new to the market but is now being supplied by an increasing number of companies. The turf comes in short rolls and can be supplied with a plastic-free felt base which can be pinned in place. It is useful on ground which is high in weed seeds as laying will immediately suppress and kill any germinating seed and if laid well it can give immediate establishment. Use is generally restricted to small areas due to cost. Examples of situations where it may be appropriate is in small pockets in the public realm, housing estates, parks or schools where an immediate ornamental effect is desirable or green roofs and elevated slopes and mounds where seeding is impractical.

9.26 The choice of wildflower mix is more limited than seed and the grasses in the mix can be very vigorous and out-compete flowers but this can be reduced by introducing semi-parasitic plants such as Yellow Rattle in late summer. Yellow Rattle is an annual and can be eliminated the following year through cutting to prevent seeding.

9.27 Transplanting young plants such as **wildflower plugs** into grassland can enable the re-creation of a rich flora in an existing meadow or to augment the establishment of a new meadow from the sowing of seed mixtures. The main advantage of plugs is that species which are absent or have died out can be re-introduced as plants which have a far better chance of survival and establishment than seed. The best time to transplant into established grassland is in the Autumn or Spring.

9.28 **Bulbs** may be suitable for naturalising in conditions close to their native habitat and will thrive in some places where seeding is more difficult to undertake or establish such as heavily wooded areas and boggy ground or water's edge locations. Trees roots and boggy ground near water make cultivation difficult but bulbs can be planted directly by hand into existing turf or soil without cultivation.

9.29 Bulbs should be planted when dormant in late summer/ autumn. Plant in large drifts in close mown grass under trees and at pond margins. The grass must be weed-free and cut very short.

9.30 Advice on density can be obtained from the supplier or from:

[Bulb Planting Advice](#)

Establishment, Aftercare and Maintenance

9.31 Treatment and maintenance regime will very much depend on the fertility of soil, the wildflower mix sown and the long term objectives and aspirations. The management of wildflower meadows needs to be adaptive to support establishment and long term management but there are some generally accepted approaches.

9.32 Management Plans set out the long term goals of the Wildflower Meadow ie what it will achieve and what it should contain and look like and this should cover aesthetic qualities as well as

species diversity and biodiversity objectives. Maintenance tasks should be scheduled and referenced to the management objectives with a split between the first year and on-going yearly maintenance tasks to include the following information:

First Year

- Timing of first cut, method, height of cut
- Any subsequent cuts, timing and requirement
- Approach to setting seed and removal of arisings
- Any remedial requirements and operations – referenced to the management plan

On-going Yearly Maintenance

- Cutting – timing, method and number of cuts
- Approach to setting seed and removal of arisings
- Any remedial requirements and operations – referenced to the management plan

Alternative Grassland Management Regimes

9.33 There are a spectrum of potential management regimes between an amenity wildflower area cut 3-4 times a year to very light management. The lightest approach to meadow management is to accept that if not mown the grassland may become rough and tussocky in character. It will not be as diverse as grass species will out-compete wildflowers and it may be less attractive to look at and to pollinators. However, it requires minimal maintenance and will still provide a useful refuge for wildlife at the edge of a site. The grassland will require cutting every 2-3 years to control unwanted weeds and the development of brambles.

9.34 Consider the site carefully before adopting this regime, it is unlikely to be acceptable in close proximity to housing, in general amenity areas, in the hard areas around school sites or in the Public Realm.

10 Woodland Planting

General Principles

- 10.1** Woodland planting is a practical and multi-functional style of planting employed in landscape design to structure spaces, focus views and divide uses for example at the edge of housing estates, adjoining an industrial site or road corridor. It is naturalistic, and in combination with hedgerows, particularly suited to rural landscapes where copses of woodland, hedgerows and hedgerow trees divide fields punctuated by farmsteads.
- 10.2** At the edge of settlement, it can be used to provide screening or partial screening, visual containment, space shaping and a naturalistic soft edge to secure cohesion with open countryside. It can also be planted and managed to create shelterbelts, provide cover and food for wildlife, a strategic and linking element in green infrastructure and as a buffer to sites of interest for nature conservation making a significant contribution to the biodiversity of a site.

Biodiversity Net Gain and Woodland Replacement and Creation

It is relatively rare that development is permitted that involves the loss of woodland, but where this may occur, it is important to note that habitat created to compensate for loss of natural or semi-natural habitat should be of the same broad habitat type e.g. new woodland to replace lost woodland or else new woodland planting on existing habitats of low distinctiveness. Significantly more new woodland planting will be required to replace lost woodland, due to the time-factor involved in its effective replacement.

Woodland Creation is a long-term project and the target time allowed to achieve 'good' condition under the biodiversity metric is 30+ years for all woodland habitat types, as woodland habitats take a long time

to achieve structural complexity. This 'discounting' for time limits the scores that can realistically be achieved for woodland creation in comparison with some other habitats, although there may also be other strong reasons (ecological, amenity, landscaping, carbon offsetting etc.) which favour woodland creation at a site.

Most newly created woodland associated with developments would be classified as 'other woodland' (either broad-leaved or mixed) as opposed to UK priority woodland habitats of high distinctiveness, which are difficult to create and unlikely to reach good condition within the time-frame of the metric. 'Other woodland' has a low level of difficulty associated with its creation, which allows it to reach 'good' condition within 30 years.

Uses	Character
Structure Planting	Naturalistic
Privacy and containment	Inaccessible/ impenetrable
Screening	Productive
Shelter-belt/ Micro-climate modification	Seasonally ornamental
Edge of Settlement	Prevents inter-visibility
Rural Landscapes	Space Shaping
Habitat creation and biodiversity	Densely wooded
Road corridors	Large scale
Carbon sink	
Intercepting rainwater	

Uses	Character
Reduces nuisance- noise, pollution	

Woodland planting characteristics

Native Species

- 10.3** In countryside locations, areas of new development which relate strongly to the countryside and in locations adjacent to sites of interest for nature conservation use a native species palette. The selection of native species in these locations supports the existing landscape character and is environmentally mindful practice.

Check Wildlife and Countryside Act 1981 Section 14 Schedule 9 part 2 list of controlled species. Certain plant species have become established in the wild and represent a threat to natural flora.

- 10.4** In urban areas, a mix of native with some non-native species (max 20%) may be used to provide ecological diversity and resistance to disease as well as to perform a particular function– such as fast growth, tolerance to pollution, year round screening or for ornamental qualities. In all situations, maximise structural diversity by planting in a range of nursery stock sizes and/or species with differing rates of growth and make provision for pollinators.
- 10.5** Consider planting ground flora with woodland native species seed mixes or plugs or bulbs in some urban situations where there may be no local source for natural spread and some woodland species are very slow to spread naturally. The species mix would need to be appropriate to soil type and conditions.

Disease Resistance Climate Change and Bio-security

- 10.6** Plant species are becoming increasingly prone to pests and diseases due to climate change and the movement and importation of plants. Trees are particularly at risk from disease and due to their longevity and eventual dominance in the landscape the impact of losses can be dramatic. Disease can wipe out entire woodlands but this can be prevented by avoiding over reliance on a narrow range of species.
- 10.7** By intermixing a diverse range of species and sticking to locally grown stock, woods will be more genetically diverse, more resilient to pests and diseases and more likely to establish quickly.
- 10.8** Native species are not immune to pests and diseases and advice on this is constantly being updated. Diseases such as Dutch Elm disease and more recently Ash die back have impacted native woodlands and hedgerows and left a legacy on the British Countryside.
- 10.9** Check for current or likely plant movement restrictions [Importing Trees and Plants from the EU](#)
- 10.10** Check Forestry Commission for Specific Restrictions [Pests and Diseases](#)

Elm and Dutch Elm disease

- 10.11** Wych Elm (*Ulmus glabra*) is a component of many woodlands in the district. It is known to be more tolerant of Dutch Elm Disease than English Elm (*U. procera*) and still thrives in many woodlands in the North of England. *Ulmus glabra* regenerates from seed which gives it a better range of genetic diversity and resistance to DED and it also flourishes on exposed hillsides where exposure inhibits the disease. UK grown Wych Elm transplants and cell grown plugs are widely available, can still be planted and should grow to healthy maturity. Further disease resistant varieties such as *Ulmus lutece* and *Ulmus 'New Horizon'* are also available and can be considered for inclusion in mixes at a low percentage.

Ash and Ash Dieback

10.12 Ash Dieback (*Hymenoscyphus fraxineus*) entered the UK in 2012 and is now well established and widely distributed, being present in every county. The British countryside will very likely lose the majority of its Ash trees as a consequence of Dieback. Moving Ash trees around the UK is currently prohibited, imported Ash is not currently a sustainable planting choice and imports from Non-EU countries are banned. However, Ash woodlands are an important characteristic on steeper and higher slopes within the district.

10.13 There is no one tree that can replace Ash but Aspen, Sycamore (non-native but naturalised) and disease resistant Elm are the closest match. Alder, Lime, Field Maple and Oak may also provide good substitutes depending on local factors such as soil type, hydrology, exposure and management requirements. Choose a rich variety of species to better fit the ecological void left by Ash. This will also provide for a more resilient and viable landscape in the future.

Oak Processionary Moth

10.14 At the time of writing, the Oak Processionary Moth is established in most of Greater London and in some surrounding counties. The remainder of the UK is currently designated as pest free with special restrictions on the movement of Oak to minimise the risk of spreading this disease to new areas. The importation of most Oak species is currently banned to protect the UK from further introductions. Oak can still be planted in the UK, if locally grown. Local sources of stock tends to be small nursery stock and/or bare rooted which is suitable for woodland applications.

Carbon sequestration:

10.15 Native broadleaved woodlands are reliable carbon sinks and managed with minimum intervention can be an effective climate change mitigation measure. Broadleaved species can ultimately lock in more carbon than fast growing commercial coniferous plantations of Sitka Spruce for example. Woodland mixes should maintain a high percentage of native broadleaved trees in all locations. Further information can be obtained from the below resource:

[Carbon Calculator Top Trunks Guide](#)

Forest carbon sequestration is the process of increasing the carbon content of forests through processes that remove CO₂ from the atmosphere and a forest carbon sink describes the natural reservoir that accumulates and stores carbon.

Design Considerations before you start

- Consider landform, soil type and permeability. Most native species will grow well in any conditions but some will not tolerate water-logging, exposure or acidic soils
- Choose native woodland types specific to the location with reference to the National Vegetation Classification (the Conservation volunteers have provided useful tables of species based on the NVC included in **Appendix 2**
- Consider what you want the planting to achieve and the suitability of this type of planting to the design function
- Use to extend the features of the surrounding landscape into and through the development eg woodland copses and hedges
- Consider the space shaping ability of this type of planting and how it can be used with existing topography to achieve certain design effects in the landscape

- Masterplans for large new development such as housing should provide for a spatial framework of new tree and woodland planting as part of a Landscape Led approach to development
- Plant Woodland as structure as soon as possible and ideally in advance of development to allow for early establishment and provide a setting before occupancy.



Figure 10.1 Example of woodland planting used for structure within housing development

Density

- 10.16** Woodland mixes are often planted at a higher density so that the plants protect each other and are forced to grow quickly and form a dense thicket. It is usual and most economical to plant transplants or whips which are very young plants but consider planting a variety of sizes incorporating feathers and even

Standards in certain key locations to act as a focal point, for variety, to give some immediate effect and for a more naturalistic feel.

- 10.17** Plants will be small bare rooted nursery stock such as transplants, feathers and whips or grown in cells as plugs. Bare rooted nursery stock must be planted in the dormant winter months and are delivered to site wrapped in hessian to prevent the roots from drying out. Plugs grown in very small cells may be planted at any time of the year.

Planting a Woodland

- 10.18** Plants do better in small groups of 3-9 of the same species rather than random mixes but avoid large groups of the same species to maintain disease resilience.

- 10.19** Consider an edge mix of smaller trees or shrubs. The benefits of incorporating this feature include:

- seasonal interest at a more human scale for example adjoining a footpath,
- a blending feature which will bring the eye down visually to a meadow edge once woodland matures
- to support cover for wildlife
- to increase the shelter potential of planting and reduce energy loss
- Low level screening

- 10.20** An edge mix can also be planted on its own or with accents of trees as structure planting. Shrubs and smaller trees are more effective than large canopy trees at screening ground level features such as car parking, roads, bin stores or rear fencing. Edge mixes soften hard edges where buildings meet the ground and are less likely to cause future nuisance through root growth or height.

Species selection

- 10.21** Woodlands composed of a single species were popular in the past especially in commercial forestry but natural woodland is never composed of a single species and the approach also has a negative effect on biodiversity and increases vulnerability to pests and diseases.
- 10.22** When selecting species for a given site in a rural or edge of settlement position – look at the neighbouring woodland and see what combinations of species grow well and how they are grouped. Planting that respects the local character and specific site conditions is more likely to thrive (soil PH, drainage, exposure and altitude) and fit in well with its surroundings.
- 10.23** Reference can be made to the National Character Area profiles which give a broad overview of the types of woodland that can be found in each of 59 Landscape Character Areas.

[National Character Areas](#)

- 10.24** The three character areas which cover most of the district and the summarised advice on woodland types are included in Appendix 2(plan NCA's):
- 10.25** The Conservation Volunteers have produced tables detailing major and minor tree and shrub species suitable for creating new native woodlands based on the NVC woodland types. The lists produced from these tables of woodland types specifically found within the district which can broadly be divided between Upland and Lowland deciduous woodland are included in **Appendix 2**. Further information can be obtained by following the below links to resources.

[NVC Field Guide to Woodland](#)

[TCV Practical Conservation Handbooks](#)

- 10.26** The species lists are a starting point from which to develop your own proposals but since natural communities of tree species tend to be narrow and often include *Fraxinus excelsior* (not available to plant due to dieback) the designer is encouraged to broaden and diversify the range of native species used within a given mix. On urban sites mixes may be more targeted at a specific purpose such as quick screen/ space shaper or ornamental edge and may include some suitable non-native species, cultivars and naturalised species. The following table gives a typical native mix.

Core Woodland Mix	Edge Mix
20% <i>Quercus robur</i>	20% <i>Crataegus monogyna</i>
10% <i>Quercus petraea</i>	20% <i>Corylus avellana</i>
10% <i>Acer pseudoplatanus</i>	10% <i>Ilex aquifolium</i>
10% <i>Acer campestre</i>	10% <i>Sambucus nigra</i>
10% <i>Crataegus monogyna</i>	10% <i>Cornus sanguinea</i>
10% <i>Malus sylvestris</i>	10% <i>Prunus avium</i>
5% <i>Ilex aquifolium</i>	10% <i>Viburnum opulus</i>
5% <i>Corylus avellana</i>	5% <i>Prunus spinosa</i>
5% <i>Ulmus glabra</i>	5% <i>Salix caprea</i>

Indicative lowland native woodland mix with percentages

- 10.27** Where the desired result is a structured woodland use vigorous nurse species like Alder, Willow or Aspen which can be removed or coppiced later to allow naturally dominant species such as Oak or Sycamore to succeed. Note 5% *Ulmus glabra* is included in this mix.

10.28 Quick Establishment on Urban/ Disturbed sites

Woodland Core Mix	Edge Mix
20% <i>Acer pseudoplatanus</i>	30% <i>Salix alba</i> 'Vittelina'
20% <i>Populus tremula</i>	20% <i>Salix caprea</i>
20% <i>Alnus glutinosa</i>	10% <i>Cornus sanguinea</i> 'Midwinter Fire'
10% <i>Salix caprea</i>	10% <i>Cornus sericea</i> 'Flaviramea'
10% <i>Betula pubescens</i>	10% <i>Symphoricarpos x chenaultii</i>
5% <i>Corylus avellana</i>	10% <i>Sambucus nigra</i> 'Aurea'
5% <i>Sorbus aucuparia</i>	10% <i>Ribes sanguineum</i>
5% <i>Salix alba</i> 'Vittelina'	5% <i>Rosa canina</i>
5% <i>Prunus avium</i>	

Indicative woodland quick establishment mix with percentages

- 10.29** Species such as Poplar, Alder, Willow and Birch are fast growing and establish well in difficult conditions such as poor soil, exposed sites and even contaminated ground.

What to include on plans and schedules

- 10.30** Show the areas of woodland planting and differentiate between different types of mix on a plan – a scale of 1:200/ 1:500 or even 1:1250 maybe sufficient due to the large scale of this type of planting but it must be readable and clear at the selected scale. In the schedule, give the species list for each mix with percentages as shown in the example.

- 10.31** Give the density of planting and the area to be covered by the mix in m² and/ or the number of plants of each species to be planted in a matrix. Give the size and type of nursery stock and how it has been grown ie bare rooted, containerised etc

- 10.32** Give information on how the ground has been prepared and how the trees are to be planted together with any accessories such as tree guards, stakes and ties or fencing. Provide a schedule to show how the woodland is to be managed and confirm provenance of stock.

Specific Guidance on Shelterbelt design is given in Chapter 11.

Woodland Planting as Structure Planting

- 10.33** The term Structure planting is used to describe significant areas of tree and shrub planting which will provide a framework for new development. Structure planting, due to its scale and mass, is a powerful design tool and can be used to dramatic effect as well as serving a number of important environmental and practical functions and it is where the landscape strategy must be focused to extend and link areas of existing habitats through and beyond the site. It needs to form part of the design philosophy at the earliest possible stage as a 'landscape led' approach to site planning which aims to retain and enhance existing landscape and wildlife features and create a scheme of real distinctiveness.

- 10.34** Structure planting has many practical uses which include screening from incompatible neighbours and providing shelter from prevailing wind but should not be used to mitigate poorly sited or designed development or to hide what is inherently an unacceptable scheme.

Checklist:

- Use traditional methods and plant bare rooted stock
- Plant in advance of development to give an established setting before occupation
- Use to enhance and strengthen landscape character – linking existing natural features
- Place structure planting at the heart of the Landscape Strategy
- Structure planting must be achievable – consider requirements for services, drainage and infrastructure at an early stage. It is not acceptable to change a planting scheme because service requirements were not integrated at the design development stage.

Case Study 1: West Harrogate Extension Edge of Settlement



Figure 10.2 Example of landscape buffer to SINC

The adopted Harrogate District Local Plan allocates several sites which will form a new urban extension on the western edge of town. The Landscape is attractive with rolling undulating land-form regular patterns of small to medium size pastoral fields typically with overgrown hedges and individual trees to the field boundaries. There are several woodlands associated with the urban edge including the Cardale Woodland Site of

Interest for Nature Conservation with linear belts of woodland along some boundaries within the site and there are a number of trees protected by TPO's. By contrast the southern parts adjoining countryside along Lady Lane are more open and characterised by dry stone walling, hedgerows and hedgerow trees.

10.35 The site has a strong existing landscape character and structure planting in accordance with the West Harrogate Parameters Plan should aim to:

- Retain, link and extend existing landscape features such as hedgerows, trees, woodlands, ditches and dry stone walls into and through the new development
- Create a backdrop for development to sit comfortably within the landscape and give spatial enclosure to a hierarchy of new public open spaces
- Provide the setting for informal recreation and active modes of transport by containing footpaths and cycle routes
- Frame key views including panoramic ones such as Almscliffe Crag and the surrounding landscape. Development and Planting must not block or obscure key views from vantage points but may help to frame them. From the public right of way at the highest point of the site - the view is panoramic and should be kept open but planting down slope will help to frame the view and give foreground screening of housing. Elsewhere within the development the view may be seen through a gap in development as a focal point to give a visual connection to the wider landscape and promote distinctiveness and a sense of place.
- Relate buildings to site, to each other and to existing built form at urban edges and from key viewpoints using structure planting to create visual continuity adding the new to the existing patterns of built form.
- Provide a landscape buffer where development adjoins open countryside. Ideally this should be around 10-15m in width. In the lower parts of H51 on Lady Lane, for example, a buffer

will ease the transition to open countryside when viewed from a distance. It will also help to soften the hard edges of the development along rural lanes where seen in relation to open countryside. Dense screening should be avoided in favour of filtered views. Consider a mix of tree species with less dense foliage such as Birch or Alder or a raised crown which allows inter-visibility beneath the canopy without an edge mix or shrub mix and plant in conjunction with groundcover. Alternatively plant woodland in groups with some gaps to frame views of housing.

- Provide a landscape buffer where the site borders a Site of Interest for Nature Conservation (SINC) for example Cardale Woodland. The buffer should be around 20m in width and structure planting here should be substantial and provide a setting for pedestrian and cycle routes to reduce pressure on the SINC. Planting should not create a dense screen between the footpath and housing which should front onto this open space to retain surveillance and a feeling of safety for pedestrians. Structure planting between the footpath and the woodland may be denser.

Case Study 2: Sites along the A1(M) Corridor

10.36 This case study is not in relation to any specific development but merely serves to show how proposals which come forward should approach the structure planting element in relation to the A1(m) corridor.

10.37 Linear road corridors such as the A1(M) have had an adverse effect on the landscape character through the disturbance and severing of existing field patterns and physically separating existing green corridors and historic parks from their rural setting – in this case Allerton Park. Embankments and strongly linear planting along the roadside have resulted in an over emphasis of the routes linearity and exacerbated the truncating of the existing landscape character.

10.38 In fact, planting along roads is best sited to relate to the landscape, its topography and the existing grain of field patterns, hedges, trees and woodlands and not always to hide roads. There will be places where planting would disturb the appearance of the landscape which acquires its natural beauty from the topography alone.

10.39 Woodland planting associated with any new development along the A1(M) corridor should aim to:

- Reduce the linearity of the road corridor through woodland planting which breaks it up and responds to the wider landscape
- Make physical connections to the wider landscape through woodland planting which connects existing field boundaries to the network of woodlands in the landscape
- Repair the landscape character by restoring links to historic designed features
- Making visual connections to the wider landscape for example through the protection, enhancement or revealing of views from important viewpoints (such as bridleways and Public Rights of Way) to historic features in the landscape ie. Temple of Victory, Allerton Park
- Retain the rural character of the site

10.40 Further design considerations:

- It is important to study the behaviour of the wind around roads. Gaps in heavily wooded margins may produce wind funnelling but dispersed smaller groups of trees or narrow tree belts with limited tree cover may reduce wind speed. Tree belts should be set back 25-30m and in this position can also help to reduce snow drifts



Figure 10.3 The reinforcement of green infrastructure can break up the dominance of the A1(M) corridor and restore landscape features

- Small plantations add variety to the road and landscape and can often be accommodated in isolated triangles of land left over from severed field patterns
- Plantations at right angles to the road and linking with existing woodlands or isolated buildings well back from the road help to break up the linearity
- The surrounding landscape should determine the landscape design and not mitigation

Case Study 3: Rural Farm

10.41 This case study is not in relation to any specific development but merely serves to show how farm buildings can be integrated into the landscape with woodland planting.

10.42 HBC's Farm Buildings Design Guide states that '*Wherever possible new buildings should form part of a group rather than stand in isolation and should have a respectful relationship of size, style and finish to the rest of the group*'. An existing agricultural building isolated from the farmstead cannot currently be considered within the context of the farm grouping within the Landscape. The integrating role of woodland planting therefore becomes of great significance in relating the buildings to each other and to the wide landscape.

10.43 In this instance a barn is proposed at 300 m distance from the original farmstead which has evolved around a courtyard over many years. A single farm track which also forms part of a Public right of way links the two. The barn is in a prominent elevated position on the valley side in relation to the farm which is on the valley bottom and the two buildings are not well linked visually. However, there is a backdrop of deciduous woodland to the barn which helps to mitigate the effects on the skyline and there is a hedgerow to one side of the farm track and further blocks of woodland planting within the existing field pattern in the countryside beyond.

10.44 Woodland planting in this situation should aim to:

- Create a visual link between the buildings
- Provide a setting for the new barn working with existing topography to reduce visual impact on this elevated site from key vantage points along the public right of way
- Link with the existing broad-leaved and commercial plantations in the wider landscape
- The track is also a field boundary and might also be improved with hedgerow and hedgerow tree planting. Mark or protect saplings and/or offset them slightly from the hedge to avoid

their inadvertent destruction by mechanised hedgerow cutting.

The AONB's Woodland Opportunity Plan (WOP) identifies appropriate locations for native woodland planting using a multi-variant GIS model to discourage planting on sites that would conflict with breeding wader habitat preferences or species-rich grassland for example. Applications for planting schemes within the AONB which do not comply with the WOP will not be supported.

- 10.45** Woodland planting into cultivated ground can have a significant visual impact on the landscape and is best avoided. Use traditional approaches to woodland establishment that do not require extensive ground preparation or disturbance wherever practicable such as notch planting. There may also be the opportunity in some situations for natural regeneration from rough grassland/ open scrub to woodland through self-seeding which may be appropriate in large scale semi-natural green space with a suitable management regime.

Ground preparation and protection

- 10.46** Plant trees in groups that will appear random and avoid geometric layouts.
- 10.47** On more urban sites a weed free area of 1 m in diameter should be maintained around each plant until establishment using bark mulch or bio-degradable mulch mats pinned to the soil. In rural areas, this treatment is visually intrusive and should be omitted from the scheme in favour of lower survival rates or occasional cutting to reduce weed growth.
- 10.48** Plants will require protection from wildlife and livestock. In large scale plantations, stock proof fencing may be the most economical choice but it will prevent access and in the long run requires

removal which needs to be considered at the design stage. Make sure that the fencing is rabbit proof and deer proof (if required) as well as robust enough to prevent damage/ ingress by livestock and position fencing 3m away from the plantation. Consider the line of the fencing in relation to existing topography and landscape features as this can have an adverse visual impact on the landscape. Fencing creates a strong shape in the landscape and if poorly sited can introduce an additional unnatural feature. Site fences to relate to the lie of the land, following the breaks of slope and avoiding new lines across unbroken slopes or upland plateau. Avoid lines that cross slopes at right angles or in a discordant manner and avoid disturbance of historic sites.

- 10.49** In smaller plantations, spiral guards or tree shelters fixed to individual plants may be more economical. Biodegradable spiral types may avoid aftercare visits for removal but are less robust than plastic tree guards. Consider removal once they have served their purpose in the management and maintenance plan. Tree guards can also be visually intrusive especially in exposed or remote unspoilt locations, close to the setting of landmark features or viewpoints. Make sure trees are planted in random groups and use coloured guards to blend in with the landscape for example muted pale brown.
- 10.50** Although woodland planting is relatively low maintenance, it will require thinning out or coppicing at around 15 years to allow large trees to reach maturity. Dense planting forces trees and shrubs to grow fast but they will not ultimately thrive if they are too close together. Nurse species may be removed altogether at this time to allow large canopy trees such as Oak, Sycamore and Limes to grow on. Alternatively, plant at lower densities with rides and glades to reduce or remove the need to thin out.

11 Shelterbelts

- 11.1** Tree belts are efficient in microclimate modification to shelter buildings, crops and animals from wind, sun, rain and snow. Trees can reduce heat loss from buildings and improve the yield of agricultural production. The area that a shelterbelt takes up can be little more than an extended hedge. A width of 5m is sufficient to plant and manage an effective windbreak if it is well designed.

Basics of Shelterbelt design

- 11.2** Shelterbelts alter the direction and speed of wind thus modifying the microclimate by increasing daytime temperatures. The faster colder wind is deflected upwards while the porosity of the shelterbelt allows adequate airflow of the slower and warmer wind which in turn holds up the faster cold wind racing above it giving an extended area of shelter. The potential to adapt the microclimate in this way can be optimised by applying the following basic rules and attention to detail.

Shelterbelts and climate change: Shelterbelts improve infiltration rates to guard against flooding or waterlogging and evidence suggests that shelterbelts could help to manage drought by enabling UK crops to use water more efficiently

Porosity and height determines the level of shelter from the wind

- 11.3** Shelterbelts should incorporate open spaces around and between trees and shrubs and between leaves and branches at around 50%. Densely planted woodland and/or species with dense foliage and branches such as types of conifers can cause turbulence.



Figure 11.1 Shelterbelt and wind dynamics

Shelterbelts with a porosity of less than 40% can protect an area of land by up to 10 times the height of the trees but shelterbelts with a porosity of 40-60% can protect an area by up to 30 times the height of the trees.

Length of the Shelterbelt is important in the design

- 11.4** Whilst the width of a shelterbelt can be as narrow as 5 m and still be effective, the length of a shelterbelt is important to ensure the wind doesn't reduce the sheltered area to a triangle being forced around the edges. Aim for 25 times the height of the tallest trees.
- 11.5** *If Oaks or Sycamores are the tallest species planted the mature height is likely to be at least 15 m – so ideally the shelterbelt should be 375 m in length.*

Design and Structure of Shelterbelts

- 11.6** Unlike the planting of woodland for amenity or screen planting, the density and structure of planting within Shelterbelts is very important to its performance. Plant in four rows of closely spaced trees and shrubs at 90 degrees to the prevailing wind. The

shelterbelt should be graded on the windward side so the first row is an edge mix of shrubs followed by minor broadleaves in rows 2 and 3 and finally Major Broadleaves in row 4.

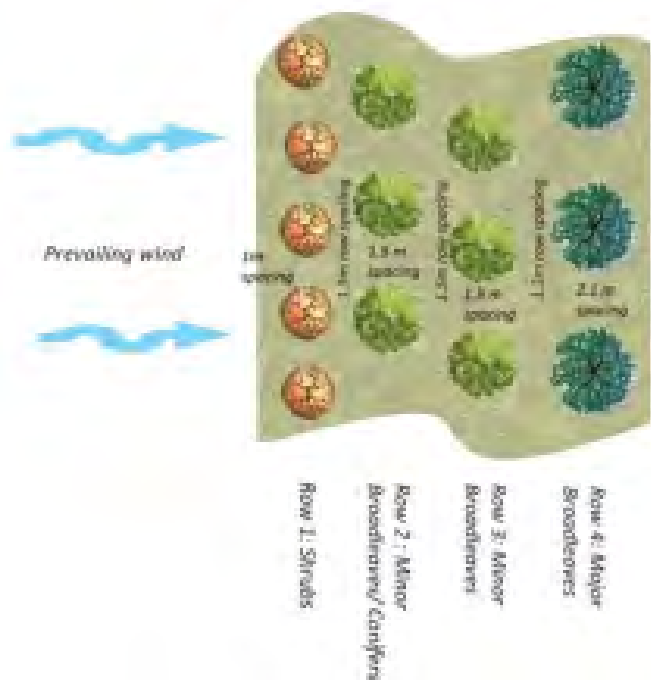


Figure 11.2 Essentials of shelterbelt design

- 11.7 Reduce the planting density at the ends and round off all corners. If possible introduce a short leg to act as further edge protection.
- 11.8 If possible, do not introduce gaps in the shelterbelt – the planting belt needs to be continuous in order to be effective. However, if gaps are unavoidable for example to accommodate public rights of way – try to design them so that they are oblique to the wind direction or introduce a further feature such as an avenue of trees.

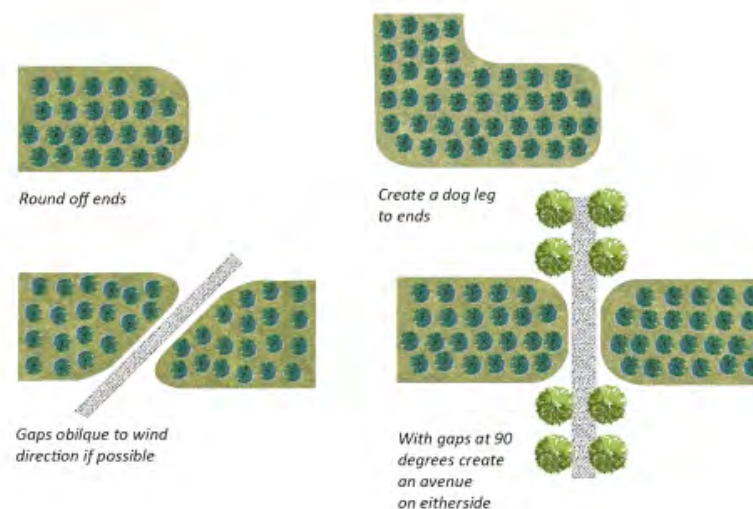


Figure 11.3 Shelterbelt ends and gaps

Species Selection and how to plant

- 11.9 Whilst fast growing species are often selected for shelterbelts it is beneficial to select based on varied speeds of growth. Planting species which will grow to different heights at different rates will look more natural in the landscape and improve the structural diversity of the woodland for wildlife.
- 11.10 Maximise species diversity to increase resistance to disease and improve the ecological potential of the woodland. Avoid a single row of just one species – which will look unnatural and could aid the spread of disease. A palette of 2-5 species should be selected for each row with a greater range of 3-5 species in rows 1-3 and perhaps just 2 species in row 4. Plant in small groups of 3-7 of the same species in staggered rows.

11.11 It is a common misconception that shelterbelts must include some coniferous tree planting but this is not necessary. The Woodland Trust has found that native deciduous trees are a good choice as they are well adapted to local conditions and have a leafless period which allows pastures in particular to recover in the winter from the adverse effects of shading. However, if suited to local conditions, a small element of coniferous tree planting may be incorporated in row 3 for diversity using native or naturalised species.

11.12 The selection of species will be dependent on soil type and conditions and trees found growing naturally in the locality, however, the following provides a worked example of a species mix and how it may be applied to shelterbelt design.

Row 1 Shrubs: *Crataegus monogyna* (Hawthorn) *Prunus spinosa* (Blackthorn), *Viburnum opulus* (Guelder Rose) *Sambucus nigra* (Elder) *Rhamnus cathartica* (Common Buckthorn)

Row 2 Minor Broadleaves: *Malus sylvestris* (Crab Apple) *Corylus avellana* (Hazel) *Betula pubescens* (Birch) *Sorbus acuparia* (Mountain Ash) *Ilex aquifolium* (Holly) *Salix caprea* (Goat Willow)

Row 3 Minor Broadleaves/ Conifers: *Alnus glutinosa* (Alder) *Prunus avium* (Wild Cherry) *Quercus ilex* (Holm Oak) *Alnus glutinosus* (Alder) *Pinus sylvestris* (Scots Pine)

Row 4 Major Broadleaves: *Populus tremula* (Aspen) *Acer pseudoplatanus* (Sycamore) *Quercus robur* (Oak)

11.13 As porosity is important to the performance of the shelterbelt the trees will need to be thinned out at occasional intervals to prevent the belt becoming overly dense. Further guidance is available from the Woodland Trust who also offer a shelterbelt tree pack which is part funded by their partners.

[Woodland Trust](#)

Shelterbelts in the landscape

11.14 Design shelterbelts to sit naturally and avoid introducing unnatural or additional features which will look incongruous within the landscape character. Where possible introduce shelterbelt along existing hedge boundaries or to reinstate a hedge line that was once there. Respect the topography of the landscape, planting along natural breaks in slope and follow the shape and pattern of existing hedgerows in the landscape which are not always linear and may curve and flow with the shape of the land.



Figure 11.4 Before Planting a Shelterbelt

11.15 If design of a deeper woodland belt is being considered look at the existing grain of the landscape and how woodland has been incorporated. The following diagrams give an example for guidance.



Figure 11.5 After planting a shelterbelt

- 11.16** Planting linear tree belts has the potential to improve connectivity with the wider network of green infrastructure linking green assets and landscape features. Make reference to Harrogate Borough Council's Green Infrastructure Strategy for further guidance.

[Green Infrastructure SPD 2014](#)

12 Hedges Climbing Plants and Roof Gardens

Hedges

12.1 Hedgerows have a huge visual and aesthetic impact and are a distinctive and highly valued feature of the farmed English landscape as well as embodying cultural significance by charting the historical evolution of land management over hundreds of years. In open countryside, mixed native hedgerows are diverse and efficient linear wildlife corridors taking up little space while providing effective barriers, windbreaks, screens and enclosures. It is unsurprising, therefore, that the art of hedge creation has been adapted to a wide range of uses in designed landscapes such as Historic Parks, Public Parks and Gardens, domestic gardens, the public realm and car parks. The maintained compact habit of the hedge means an attractive soft edge can be achieved in very tight spaces of as little as 1 metre in width provided the growing conditions are conducive.

Uses:

- *Field boundaries in farmed landscapes and open countryside*
- *Shelter both as part of a shelterbelt and on their own in smaller settings*
- *Designed Landscapes*
- *Domestic boundary treatment*
- *Public Realm*
- *Car Parks*
- *Road corridors*
- *Screening*



Figure 12.1 Hedges in the North Yorkshire countryside as viewed from Armscliff Crag

Existing hedgerows:

- 12.2** In site development, the landscape strategy must identify features that will support and strengthen biodiversity interest. Hedgerows provide unique wildlife corridors and the Green Infrastructure strategy must be based on the retention of existing hedges within the public realm rather than private spaces to retain control of long term maintenance and management. The continuity of existing hedges should be maintained and strengthened wherever possible as green links need to be fairly continuous to be of value as wildlife corridors.
- 12.3** Where existing hedgerows have been neglected leading to gaps or complete loss and replacement with fencing, the landscape strategy should seek to restore and repair by replanting or

traditional management techniques such as hedge laying or coppicing. The retention or reintroduction of features such as ditches and long grass verges along hedgerows is also encouraged to support interdependent plant and wildlife communities.

farming methods resulting in larger fields. The maintenance, and repair of hedgerows is positively encouraged to strength landscape character, restore traditional field patterns and for biodiversity.



Figure 12.2 Neglected hedges become gappy and need management to restore vigour from the base

Linear planting solutions and the innovative resurrection of podium landscapes such as green roofs offer great potential for softening, screening and increasing the aesthetic appeal and biodiversity of a site in confined or otherwise unused spaces.

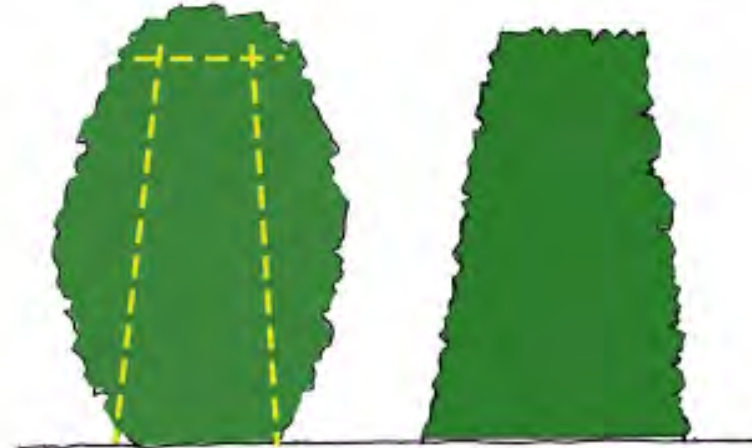


Figure 12.3 Trimming hedges to an 'A' shape

Management of existing hedgerows:

12.4 Many agricultural hedgerows across the district are in a poor state of repair or are dying out as a result of neglect and poor management brought about by changes in agricultural practices from pasture to arable farming and the move to more mechanised

Management tasks include:

- Removal of poor or inappropriate hedging plants
- Trimming to an 'A' shape to allow sunlight to reach the base of the hedge, stimulate regrowth and reduce the tendency for thinning at the base

- Traditional practices such as hedge laying and coppicing
- Planting up gaps

12.5 Hedgerows can be managed either through traditional practices aimed at regeneration of the existing hedge such as laying or coppicing or by replanting where there are significant gaps or a mixture of both.

Hedge laying:

12.6 This traditional method of management is essentially undertaken to allow existing hedge plants to regenerate and keep the hedge functioning as a boundary for much longer. Hedges can be kept functional by trimming but ultimately they will get thin at the base, mature plants will die off and gaps will appear in the hedge.



Figure 12.4 Regeneration of a hedge from the base following laying

12.7 Hedge laying is labour intensive and experienced hedge layers should be employed to undertake this task successfully. The following provides an overview of the basic technique:

- Cut out dead wood and all growth that is out of line and select youngest and strongest stems (pleachers) as they are better for regrowth and lay out to one side
- Consider the traditional techniques to be used based on local practice. The Midland style is preferable (if there is no evidence of local practice) as it makes for a denser overall hedge and there is little disruption to the wildlife corridor and landscape value.



Figure 12.5 Hedge laying technique

- Trim excess brush from nearside of hedge cutting back to the line of the hedge
- Select pleachers that are reasonably evenly spaced and cut into the stem of each pleacher at around 30-100mm from ground level but do not cut right through leave just sufficient

cambium and sapwood for the plant to survive while maximising it's flexibility

- Drive in stakes at regular intervals along the line of the hedge to allow pleachers to be woven inbetween stakes as you lay them at 45 degrees or less. Gappy hedges will often need to be laid to the ground to fill the gaps.
- Bind the top of the hedge with 3m long x 25mm diameter binders (Hazel is preferred) to strengthen the newly laid hedge

Coppicing:

12.8 Older hedges can be laid successfully but require more skill and time and it may be better to coppice if the wood is very brittle. Coppicing is best undertaken in March or April when the sap is rising but consider the nesting season and where possible avoid the later months as birds rely heavily on Hawthorn berries. Coppicing is a much more drastic form of management than laying and requires plants to be cut back at ankle height resulting in regeneration through new growth from the base.

12.9 Unlike the Midland style of Hedge laying but in common with harder laying techniques such as the Cumberland method, coppicing can have a negative impact on Landscape value as well as wildlife in the short term if all done at once. It is preferable to carry out coppicing on a rotational basis to retain value and to leave individual plants every 10-20m at regular intervals. With rotational coppicing there is an advantage to be gained from hedges being at various stages of management as it provides a wider range of habitats.

Planting Native Hedges

12.10 Where hedgerows have been lost altogether or there are significant gaps then the hedge will need to be replanted partially or completely.

12.11 Newly planted hedges must be composed of mixed native species in rural/ edge of settlement locations. In no circumstances will quick growing evergreens such Lawson's Cypress (*Chamaecyparis lawsoniana*), Leylandii (*Cupressocyparis x leylandii*) or Portuguese Cherry Laurel (*Prunus laurocerasus*) be acceptable in open countryside and should not be planted in domestic or urban situations either as they make poor neighbours but in urban situations suitable ornamental species may be permitted.

12.12 When selecting species it is advisable to use those already found in the existing hedgerows of the area. However, some nurseries provide packs of bare-rooted plants for creating native hedgerows which can be specified (use local nurseries and locally provenanced plants) if suited to species mix found locally. Examples include:

Blackthorn Based (heavy soils)	Hawthorn Based (most except heavy soils)
50% <i>Prunus spinosa</i>	50% <i>Crataegus monogyna</i>
10% <i>Prunus padus</i>	10% <i>Prunus padus</i>
10% <i>Alnus glutinosa</i>	10% <i>Acer campestre</i>
10% <i>Acer campestre</i>	10% <i>Carpinus betulus</i>
10% <i>Carpinus betulus</i>	10% <i>Alnus glutinosa</i>
5% <i>Corylus avellana</i>	5% <i>Corylus avellana</i>
5% <i>Crataegus monogyna</i>	5% <i>Prunus spinosa</i>

Typical native hedge mixes

12.13 Hedges do take a little while to establish but planting inexpensive bare rooted stock such as whips and transplants is preferable as plants will establish more quickly than larger nursery stock. Where

a more instant effect is required larger bare rooted feathers may be planted. At this stage consider whether hedgerow trees, which are often a distinctive feature of the landscape, should be incorporated. Hedgerow trees should be larger native deciduous trees such as Oak and should be planted with a clear stem as Light Standards or Standard nursery stock and not Feathers a little inside the hedge line to protect them from hedge trimming.

- 12.14** Plant the hedge in a double staggered row at 400-600 mm centres in small groups of 5-9 of the same species rather than inter-mixing to reduce the competition between species. Protect the small plants with plastic or spiral biodegradable rabbit guards. Where larger animals such as deer or stock or pedestrian traffic may prevent establishment, post and wire fencing along the fence line can be considered. Assume that the fencing will be sacrificial as it will be difficult to remove once the hedge has established.
- 12.15** Connecting new hedges to existing green infrastructure requires planting to be undertaken in close proximity to existing hedges and trees which must be undertaken sympathetically. When planting within the root protection area avoid trench planting and excavate small planting holes by hand and select smaller plants to reduce the size of the excavation.

Ornamental hedges

- 12.16** Mixed native hedges provide visual interest throughout the year as well as providing shelter and food for wildlife. However, they are not suitable for all situations for example formal designed landscapes, domestic boundaries and the public realm where the absence of thorns, more uniformity or ornamental qualities are required. Generally, ornamental hedges require more trimming than native hedges especially in a formal setting.



Figure 12.6 Uneven management of Photinia to front boundaries

Domestic Garden Boundaries:

- 12.17** Hedges planted as boundary treatments to the front or rear of properties, create uniformity and integrate buildings as well as softening, greening and screening private spaces from the public realm. In an urban or suburban context evergreen hedges of a single species may be appropriate to ensure privacy. Hedges are cheaper, easier to install and outlive other traditional boundary treatments such as fences, railings and walls. However, they do take a while to establish and become effective boundaries and will need some maintenance. Fast growing coniferous hedges such as *Cupressocyparis Leylandii*, *Chamaecyparis lawsoniana* and *Prunus laurocerasus* may establish quickly but

make poor neighbours, can look incongruous and are therefore best avoided. There are plenty of alternatives and some of them evergreen and relatively quick to establish.

- 12.18** Typically front gardens were planted with Californian Privet (*Ligustrum ovalifolium*) or Privet (*Lonicera pileata*) but native alternatives such as Beech (*Fagus sylvatica*) or Hornbeam (*Carpinus betulus*) retain their leaves and offer some degree of screening into the winter months. Some ornamental species provide attractive evergreen screening as well as shelter for wildlife. The use of *Prunus laurocerasus*, *Prunus lusitanica*, *Griselinia littoralis* and *Photinia 'Red Robin'*, however, is discouraged even in urban/ suburban locations around residential properties due to difficulty of maintenance, fast growth and the fact that they don't reflect the wider landscape character.

Designed Landscapes – Parks and Gardens:

- 12.19** Traditionally, hedging is used in historic parks and gardens to define spaces, create focal points and as a backdrop or foil to more ornamental planting such as herbaceous borders, rose gardens or knot gardens. Hedges were used as the structural element and were typically evergreen of a single species and the range was very limited. Planting strategies for Historic gardens and landscapes must be informed by original planting designs and prepared Conservation Management Plans where they exist.
- 12.20** Yew (*Taxus baccata*) a native evergreen, was commonly used for its compact needle like dark green foliage with bright green new growth in spring. It is versatile, being resilient, easy to grow, shade tolerant and adaptable to any soil type (except waterlogged soils). It provides a good dense screen and filters noise, wind and pollution effectively due to the large surface area of the needles. Most importantly, it responds very well to trimming into striking sharp forms as well as topiary and was for this reason a well-loved classic of stately homes and historic gardens. Yew hedging

is adaptable to a wide range of other applications including edges to nature gardens where it can provide winter cover but is best as a single species hedge.

- 12.21** Beech (*Fagus sylvatica*), like Yew, was commonly grown in historic designed landscapes to define gardens and as a structural element as it trims well into a formal shape, can be easily maintained at heights from 1-5 metres and retains its leaves well into the winter. Beech offers ornamental features such as fresh green spring growth and coppery autumn colour and is good for shelter on exposed sites growing well in sun or shade and most soils except heavy clay. Beech is often grown as a single species hedge in a formal situation but also makes a good addition to a native mixed hedge where it can be used at the less formal boundaries of historic parks and gardens adjoining open countryside.



Figure 12.7 Beech hedging creates enclosure and forms garden rooms at Newby Hall

- 12.22** Box (*Buxus sempervirens*) is often grown as a dwarf hedge in parterres and knot gardens where it can be grown as a foil for ornamental beds and trimmed into intricate shapes. The foliage

is dense and evergreen and it provides a structural element in gardens when herbaceous planting, roses and grasses have died off or been cut back for the winter. In recent years, Box has suffered from Box Blight – a fungal disease which can live in the soil for up to 6 years – affected plants must be removed immediately. Alternatives include *Ilex crenata* or *Euonymus* ‘Jean Hughes’.

Public Realm:



Figure 12.8 Eleagnus hedge creates effective low level screening in a car park

12.23 Hedging is increasingly being used in the public realm for its formal qualities, ability to divide spaces and to provide low level screening. Hedges are also long lasting in comparison with shrubs, can act as an attractive neutral backdrop to herbaceous planting and are easy to maintain. Use around the perimeter of car parks is encouraged as it effectively screens and softens the edges and requires much less rooting area than trees. Avoid species with thorns or a more informal habit in the public realm.

12.24 A list of species suitable for hedging in various situations which includes evergreens for privacy, anti- intruder species with thorns, seasonal interest, dwarf hedging, edge of settlement and historic landscapes is included in **Appendix 3**. The list should not be taken as necessarily suitable for a given site – species selected need to be appropriate to purpose and selected based on existing soils, hydrology and aspect. The list is not exhaustive and the designer is encouraged to consider a diversity of species based on environmental factors and purpose.

Fedges

12.25 Fedges are best described as a cross between fences and hedges and are a living Willow boundary treatment which can be supplied as a kit. Suppliers provide 10 Willow rods (*Salix viminalis*) per metre length with canes ties and instructions. The rods are planted into the ground and woven to create a living fence- short whips can then be woven into the top and bottom for instant impact and to make it more rigid and robust. The best variety for producing good rods is *Salix viminalis* but there are many other varieties to choose from. Fedges require annual spring maintenance- cutting back to the original height to allow it to bush out and become denser. Kits for arches, domes and tunnels can also be purchased to create natural play spaces and shelters.



Figure 12.9 A willow fedge

- 12.26** The benefits of fedges are that they are very quick to establish, provide an instant barrier unlike traditional hedges and are a living structure unlike fences. This treatment is ideal for dividing and shaping spaces, for shelter and is popular in schools and play areas where they provide a range of opportunities for play such as mazes, arbors and tunnels.

Climbing Plants

- 12.27** The use of climbing plants, as a linear planting solution, can be considered to enhance the appearance of boundary walls and fences. Like hedges, climbers take up very little space and can provide striking visual impact at relatively low cost. Considerations include the robustness of the boundary treatment to take the

weight of the specified climber, the micro-climate around the boundary treatment and the availability of a suitable rooting area for plants.

- 12.28** Climbing plants will soften the junction between the vertical and horizontal plane giving a more settled and established feel to buildings in the landscape or townscape and can link spaces together providing extra screening and shade. Some plants will prefer warm south facing walls while others will brighten up a north facing wall very successfully. Certain self-clinging climbers should be avoided on older brick walls as they tend to get inside the joints and cause damage.
- 12.29** Evergreens can help to insulate north/ east facing walls and keep south/ west facing walls cool in the summer, they offer shelter and nesting sites for birds and flowering species are great pollinators for insects. Most climbers are supplied container grown and should be planted in Spring or Autumn at around 300-600 mm centres depending on species and size of nursery stock. Plant angled towards the wall and chose and fix the supports if required.
- 12.30** Only a few climbers are self-clinging and can attach themselves directly to vertical surfaces everything else will require support. Alternative forms of support include trellis, mesh or hook and wire. For best results the soil needs to be water retentive but free draining and fertile- improve as required. Annual maintenance tasks will include – watering regularly till establishment and in dry weather, annual pruning, maintaining a weed free area around the plant and treating with an annual high potassium fertiliser to boost flowering. Some plants have special requirements – refer to the following for more information:

[RHS Plantfinder](#)

- 12.31** Consider inter-planting evergreen climbers with flowering species such as roses, honeysuckle or clematis for year round interest. The following list is composed of the most popular climbing plants but it should not be taken that the species listed are necessarily suitable for any given site. There is a wide choice to suit every situation and purpose and the designer needs to select species which are suited to the local conditions.

Self-Clinging (do not require support)	Twining (require supports)
<i>Hedera helix</i>	<i>Clematis ssp</i>
<i>Hydrangea petiolaris</i>	<i>Lonicera periclymenum</i>
<i>Parthenocissus tricuspidata</i>	<i>Rosa ssp</i>
<i>Euonymus fortunei</i>	<i>Vitis cognettiae</i>
<i>Humulus lupulus 'aureus'</i>	<i>Pyracantha ssp</i>
<i>Hedera colchica</i>	<i>Ceanothus thysiflorus 'repens'</i>
	<i>Garrya elliptica</i>

Clinging and self-clinging species of climbing plants

Green Walls

- 12.32** A living wall is a large structure made of plants that have been grown vertically to provide an instant effect. The walls can be attached internally or externally as a design feature. Companies that supply these features can select and grow plants to suit clients' preference. On all but the most prestigious and intensively managed schemes, where there is a large budget for on-going maintenance, green walls should be avoided. A quick effect can

also be achieved using larger nursery stock for hedging and climbing plants although establishment and growth may be slower than for smaller nursery stock.



Figure 12.10 Example of a green wall

Green Roofs

- 12.33** The revival of green roofs, originally to compensate for the vegetation footprint lost to construction in densely populated cities, are now also valued for the contribution to the environment and quality of life they make in many additional ways including:
- **Insulation** keeping property cool in the summer and warm in winter
 - **Managing rainwater** – rainwater infiltration reduces the amount entering the sewage system, reducing peak load and risk of flooding

- **Reducing air pollution** by trapping gas pollutants in vegetation which is absorbed by plants or washed away by rainwater
- **Noise absorption**
- **Extending the lifespan of roof** as it is protected from the weathering effects of sun, rain, wind and changes in temperature
- **Improving energy efficiency** of solar panels
- **Providing habitat for wildlife**
- **Aesthetics and well being**
- **Providing a fire resistant layer**

12.34 However, the above advantages have to be considered alongside the initial cost and the cost of on-going maintenance. There are two types of green roofs – ‘Intensive’ and ‘Extensive’. Intensive roofs are flat and are what we generally refer to as roof gardens providing amenity with or without access. Intensive green roofs are generally formal and irrigated with deep substrates of 200 mm or more.

12.35 Extensive green roofs are vegetated roofs with low growing drought tolerant species such as *Sedum* or other succulents or hay meadows. The substrate is shallow at 40-150 mm and they are generally low maintenance and may or may not be irrigated. Extensive roofs should be on roofs with a slope of less than 35 degrees and will require a waterproof and root resistant liner or membrane, with drainage layer and filter fleece.

12.36 Nurseries can provide collections for different conditions and effects for example for Succulents or for herbs. Biodiverse roofs can be designed for a particular habitat or species of wildlife and may include wider plant types including shrubs. Typically, biodiverse roofs, will need a deeper substrate and may combine characteristics of both extensive and intensive roofs.



Figure 12.11 An extensive green roof planted with ornamental grasses

12.37 The inclusion of green roofs in development is encouraged wherever it can be supported and especially on tight urban sites where there are few opportunities for the inclusion of planting.

12.38 Further resources and information can be found at [Living Roofs](#)

13 Appendix 1

13 Appendix 1

Species	Origin	Size and Suitability	Other Characteristics
<i>Acer campestre</i> 'Elsrijk'	N	LC MH SI ST TC P	DT P/S WI
<i>Acer campestre</i> 'Elizabeth'	N	LC MH SI ST TC P	DT P/S WI
<i>Acer cappadocicum</i> 'Rubrum'	NN	LC LH SI ST P	DT WT WI
<i>Acer cappadocicum</i> 'Lobelii'	NN	LC LH SI ST P	DT WT WI
<i>Acer x freemanii</i> 'Armstrong'	NN	F/C LH SI ST SD P	DT WT FG
<i>Acer negundo</i>	NN	LC LH MS SI SD P	DT WT FG
<i>Acer platanoides</i> 'Emerald Queen'	NN	LC LH SI ST P	DT
<i>Acer platanoides</i> 'Columnare'	NN	LCF/C LH SI ST P	DT
<i>Acer platanoides</i> 'Crimson King'	NN	LC F/C LH ST P	DT
<i>Acer platanoides</i> 'Debra'	NN	LC F/C LH ST P	DT
<i>Acer pseudoplatanus</i> 'Negenia'	NN	LC LH P	P/S FG

Species	Origin	Size and Suitability	Other Characteristics
<i>Acer pseudoplatanus</i> 'Spaethii'	NN	LC LH SI P	P/S FG
<i>Acer rubrum</i> 'Bowhall'	NN	LC LH SI ST SD TC P	DT WT
<i>Acer rubrum</i> 'Autumn Flame'	NN	LC LH SI ST SD TC P	DT WT
<i>Acer rubrum</i> 'October Glory'	NN	LC LH SI ST SD TC P	DT WT
<i>Acer tataricum</i>	NN	MH MS SI ST TC P	DT PS
<i>Alnus cordata</i>	NN	LH SI ST SD P	DT WT PS
<i>Alnus glutinosa</i> 'Lanciniata'	N	LC LH SI SD TC P	WT PS
<i>Alnus glutinosa</i>	N	LC LH SI SD TC P	WT PS
<i>Alnus incana</i>	N	LC LH SI SD TC P	WT PS
<i>Alnus x spaethii</i>	NN	LH SI ST SD TC P	DT WT PS FG
<i>Amelanchier arborea</i> 'Robin Hill'	NN	FC LH SI ST TC P	PS WI
<i>Betula nigra</i>	NN	LH MS SI TC P	WT PS
<i>Betula pendula</i> 'Pendula'	N	FC LH MS SI TC P	PS

Species	Origin	Size and Suitability	Other Characteristics
<i>Carpinus betulus</i>	N	LC LH SI ST P	DT
<i>Carpinus betulus</i> 'Frans Fontaine'	NN	FC LH SI ST P	DT
<i>Cedrus atlantica</i> 'Fastigiata'	NN	FC LH SI ST P	DT E
<i>Cedrus deodara</i>	NN	LC LH SI ST P	DT E
<i>Celtis australis</i>	NN	LH SI ST P	DT PS
<i>Corylus avellana</i>	N	MH MS SI P	
<i>Corylus colurna</i>	NN	LC MH SI ST P	DT
<i>Crataegus laevigata</i> 'Plena'	NN	SH MS SI TC P	DT WI
<i>Crataegus x lavalleyi</i>	NN	SH SI TC P	DT WI
<i>Crataegus monogyna</i> 'Stricta'	N	FC SH SI TC P	DT WI
<i>Crataegus x prunifolia</i>	N	FC SH SI TC P	DT WI
<i>Ginkgo biloba</i> 'Fastigiata'	NN	FC MH SI ST TC P	DT PS
<i>Hippophae salicifolia</i> 'Streetwise'	NN	FC SH ST TC	DT WI

Species	Origin	Size and Suitability	Other Characteristics
<i>Liquidambar styraciflua</i> 'Slender Silhouette'	NN	FC MH SI ST SD TC P	DT WT PS
<i>Liquidambar styraciflua</i> 'Worplesdon'	NN	MH SI ST SD TC P	DT WT PS
<i>Liriodendron tulipifera</i>	NN	LC MH SI P	WI FG
<i>Liriodendron tulipifera</i> 'Aureomarginatum'	NN	LC MH SI P	WI FG
<i>Liriodendron tulipifera</i> 'Fastigiatum'	NN	FC MH SI ST P	WI FG
<i>Malus 'Evereste'</i>	NN	FC MH SI ST P	WI FG
<i>Malus 'Rudolph'</i>	NN	FC MH SI ST P	WI FG
<i>Malus sylvestris</i>	N	SH SI P	WI
<i>Malus trilobata</i>	NN	MH SI ST P	DT WI
<i>Parrotia persica</i> 'Vanessa'	NN	MH SI ST P	DT
<i>Paulownia tomentosa</i>	NN	LH SI ST P	DT FG
<i>Pinus nigra</i> 'Pyramidalis'	NN	LC FC LH ST TC P	DT PS E FG
<i>Pinus sylvestris</i>	N	LC LH SI ST P	DT PS E

13 Appendix 1

Species	Origin	Size and Suitability	Other Characteristics
<i>Populus alba</i>	NN	FC MH MS SI TC P	PS FG
<i>Populus tremula</i>	NN	FC LH SI TC P	PS FG
<i>Populus nigra</i>	NN	LC FC LH SI TC P	PS WI FG
<i>Prunus avium</i>	NN	LC FC LH SI TC	PS WI FG
<i>Prunus cerasifera</i> 'Nigra'	NN	SH SI ST TC P	DT PS WI
<i>Prunus padus</i> 'Wateri'	N	MH SI P	WT WI
<i>Prunus sargentii</i> 'Charles Sargeant'	NN	MH SI ST P	DT PS WI
<i>Prunus x schimitti</i> 'Charles Sargeant'	NN	MH SI ST P	DT PS WI
<i>Quercus robur</i>	N	LC LH SI ST P	DT PS WI
<i>Quercus robur</i> 'Regal Prince'	N	FC MH SI ST SD TC P	DT WT PS
<i>Quercus ilex</i>	NN	LC LH SI ST TC P	DT PS E
<i>Quercus robur</i> 'Fastigiata Koster'	N	FC LH SI ST TC P	PS
<i>Salix caprea</i>	N	LC SH SI P	WI FG
<i>Sorbus aucuparia</i> 'Streetwise'	N	FC MH SI ST P	WI

Species	Origin	Size and Suitability	Other Characteristics
<i>Sorbus latifolia</i> 'Henk Vink'	NN	FC MH SI ST TC P	DT PS WI
<i>Sorbus x thuringiaca</i>	N	MH SI ST TC P	DT PS WI
<i>Sorbus torminalis</i>	N	LC LH SI ST TC P	DT PS WI
<i>Tilia cordata</i> 'Greenspire'	N	LC LH ST TC P	PS WI
<i>Tilia x europaea</i> 'Pallida'	NN	LC LH P	PS WI
<i>Tilia platyphyllos</i> 'Princes Street'	N	LC LH SI P	PS WI
<i>Tilia platyphyllos</i> 'Streetwise'	N	LC LH ST TC	PS WI
<i>Ulmus 'Dodoens'</i>	N	LC LH ST TC P	PS WI
<i>Ulmus 'Lobel'</i>	NN	LC LH SI ST TC P	DT PS FG
<i>Ulmus 'Lutece'</i>	NN	LC LH SI ST TC P	DT PS FG
<i>Ulmus 'New Horizon'</i>	NN	LC LH SI ST TC P	DT PS FG

Appendix 1: Urban Tree List

N Native; NN Non Native; LC Large Canopy; FC Fastigate/ Columnar; LH Large Height; MH Medium Height; SH Small Height; MS Multi-Stem; SI Seasonal Interest; ST Street Tree; SD SUD's/ Drainage; TC Transport

Corridor; P Parkland; DT Drought Tolerant; WT Waterlogging Tolerant;
PS Pollution/ Salt tolerance; WI Wildlife Interest; E Evergreen; FG Fast
Growth

14 Appendix 2

National Character Area Trees and Woodland.

NCA30: Southern Magnesium Limestone:

Lowland Mixed Deciduous Woodland (steeper/higher slopes)

Quercus robur -dominant

Quercus petraea

Fraxinus excelsior monogyna

Tilia ssp

Taxus bacata europaeus

- Large leaved Limes are locally very distinctive within this NCA and there is a particular abundance of this naturally scarce species
- Wet Woodland on wetter valley bottoms and flushed gullies such as Birkham Wood SSSI – *Alnus glutinosa* forms the canopy with a wet grassland ground flora.

NCA 28: Vale of York

Quercus Bracken/ Bramble Woodland

In many places this has been replanted with Conifers.

Betula woodland is common in areas of acidic soils and developing naturally on unmanaged heathland.

Upland Mixed Ashwoods

Fraxinus excelsior

Corylus avellana

Crateagus

Cornus sanguinea

Euonymous

NCA 22: Pennine Dales Fringe

Lowland Mixed Deciduous Woodland

Wet Woodland – *Alnus glutinosa* dominant

Upland Ash/ Oak Woodland – very small areas

For more detailed information The Joint Nature Conservation Committee undertook The National Vegetation Classification which culminated in ‘A Field Guide to Woodlands’ 2004 which due to the scale of the sampling makes the classification most representative of British Woodland with 18 main types. **The following tables give representative examples for both Lowland and Upland zones relevant to North Yorkshire.**

W8 Lowland Mixed Broadleaved Woodlands with Dogs Mercury	W10 Lowland Mixed Broadleaved Woodlands with Bluebell	W16 Lowland Oak-Birch Woodland with Bilberry
Soil: Rendzinas and calcareous brown earths	Soil: Base-rich brown earths	Soil: Podzolic and Ironpan soils
Trees:	Trees:	Trees:
<i>Fraxinus excelsior</i>	<i>Fraxinus excelsior</i>	<i>Populus tremula</i>
<i>Populus Tremula</i>	<i>Populus tremula</i>	<i>Betula pubescens</i>
<i>Betula pubescens</i>	<i>Betula pubescens</i>	<i>Betula pendula</i>
<i>Betula pendula</i>	<i>Betula pendula</i>	<i>Ilex aquifolium</i>
<i>Malus sylvestris</i>	<i>Malus sylvestris</i>	<i>Quercus robur</i>
<i>Ulmus glabra</i>	<i>Ulmus glabra</i>	<i>Quercus petraea</i>
<i>Acer campestre</i>	<i>Prunus avium</i>	<i>Sorbus aucuparia</i>
<i>Prunus avium</i>	<i>Ilex aquifolium</i>	<i>Sorbus aria</i>
<i>Ilex aquifolium</i>	<i>Carpinus betulus</i>	

W8 Lowland Mixed Broadleaved Woodlands with Dogs Mercury	W10 Lowland Mixed Broadleaved Woodlands with Bluebell	W16 Lowland Oak- Birch Woodland with Bilberry
<i>Carpinus betulus</i>	<i>Quercus robur</i>	
<i>Quercus robur</i>	<i>Quercus petraea</i>	
<i>Quercus petraea</i>	<i>Sorbus aucuparia</i>	
<i>Sorbus aucuparia</i>		
<i>Sorbus aria</i>		
<i>Salix caprea</i>		
Shrubs	Shrubs	Shrubs
<i>Prunus spinosa</i>	<i>Prunus spinosa</i>	<i>Rhamnus frangula</i>
<i>Rhamnus cathartica</i>	<i>Cytisus scoparius</i>	<i>Sambucus nigra</i>
<i>Cornus sanguineum</i>	<i>Sambucus nigra</i>	<i>Ulex europaeus</i>
<i>Sambucus nigra</i>	<i>Ulex europaeus</i>	
<i>Viburnum opulus</i>	<i>Viburnum opulus</i>	
<i>Crataegus monogyna</i>	<i>Crataegus monogyna</i>	
<i>Corylus avellana</i>	<i>Corylus avellana</i>	
<i>Ligustrum vulgare</i>	<i>Viburnum lantana</i>	
<i>Euonymus europaeus</i>	<i>Salix pentandra</i>	
<i>Viburnum lantana</i>		
<i>Salix pentandra</i>		

Lowland Zone of Britain

W4 Birch Woodland with Purple Moor Grass	W7 Alder–Ash Woodland with Yellow Pimpernel	W9 Upland Mixed Broadleaved Woodland with Dogs Mercury	W11 Upland Oak-Birch Woodland with Bluebell	W17 Upland Oak-Birch Woodland with Dogs Mercury
Soil: Wet Peat	Soil: Wet Gleys and brown earths	Soil: Rendzinas and calcareous brown earths	Soil: Base poor brown earths	Soil: Podzolic and Ironpan soils
Trees:	Trees:	Trees:	Trees:	Trees:
<i>Alnus glutinosa</i>	<i>Alnus glutinosa</i>	<i>Alnus glutinosa</i>	<i>Populus tremula</i>	<i>Betula pubescens</i>
<i>Betula pubescens</i>	<i>Fraxinus excelsior</i>	<i>Fraxinus excelsior</i>	<i>Betula pubescens</i>	<i>Betula pendula</i>
<i>Salix caprea</i>	<i>Betula pubescens</i>	<i>Populus tremula</i>	<i>Betula pendula</i>	<i>Ilex aquifolium</i>
	<i>Prunus padus</i>	<i>Betula pubescens</i>	<i>Ilex aquifolium</i>	<i>Quercus robur</i>
	<i>Ilex aquifolium</i>	<i>Ulmus glabra</i>	<i>Quercus robur</i>	<i>Quercus petraea</i>
	<i>Quercus robur</i>	<i>Prunus avium</i>	<i>Quercus petraea</i>	<i>Sorbus aucuparia</i>
	<i>Quercus petraea</i>	<i>Ilex aquifolium</i>	<i>Sorbus aucuparia</i>	
	<i>Sorbus aucuparia</i>	<i>Quercus robur</i>		
	<i>Salix caprea</i>	<i>Quercus petraea</i>		
		<i>Sorbus aucuparia</i>		
Shrubs:	Shrubs:	Shrubs:	Shrubs:	Shrubs:
<i>Salix pentandra</i>	<i>Prunus spinosa</i>	<i>Sambucus nigra</i>	<i>Crataegus monogyna</i>	<i>Crataegus monogyna</i>
<i>Salix cinerea</i>	<i>Sambucus nigra</i>			

14 Appendix 2

W4 Birch Woodland with Purple Moor Grass	W7 Alder –Ash Woodland with Yellow Pimpernel	W9 Upland Mixed Broadleaved Woodland with Dogs Mercury	W11 Upland Oak-Birch Woodland with Bluebell	W17 Upland Oak-Birch Woodland with Dogs Mercury
	<i>Viburnum opulus</i>	<i>Crataegus monogyna</i>	<i>Corylus avellana</i>	<i>Corylus avellana</i>
	<i>Crataegus monogyna</i>	<i>Corylus avellana</i>	<i>Juniperus communis</i>	<i>Juniperus communis</i>
	<i>Corylus avellana</i>	<i>Salix cinerea</i>		
	<i>Salix pentandra</i>			
	<i>Salix cinerea</i>			

Upland Zone of Britain

15 Appendix 3

Species	Origin	Characteristics	Suitability/ Purpose
<i>Acuba japonica</i>	NN	YI SI E	FG
<i>Acer campestre</i>	N	YI SI	ES
<i>Alnus glutinosa</i>	N	YI SI	ES
<i>Berberis thunbergii</i> + cultivars	NN	YI DF	AI FG
<i>Buxus sempervirens</i> + cultivars	NN	DF E	HL FB
<i>Carpinus betulus</i>	N	YI SI	ES FB FG
<i>Corylus avellana</i>	N	YI SI	ES AI
<i>Crataegus monogyna</i>	N	SI	AI ES FG
<i>Eleagnus x ebbingei</i>	NN	YI DF E	FB FG
<i>Escallonia</i> ssp + cultivars	NN	YI SI E DF	AI FB FG
<i>Euonymus fortunei</i> + cultivars	NN	YI SI DF E	FB
<i>Fagus sylvatica</i>	N	YI	ES HL FB
<i>Fagus sylvatica</i> 'Purpureum'	NN	YI	FB

Species	Origin	Characteristics	Suitability/ Purpose
<i>Forsythia x Intermedia</i> 'Lynwood Variety'	NN	SI DF	FB
<i>Hypericum patulum</i> 'Hidcote'	NN	SI DF E	FB
<i>Ilex aquifolium</i> + cultivars	N	YI E	AI ES
<i>Lavandula angustifolia</i> + cultivars	NN	SI DF	HL FB
<i>Ligustrum ovalifolium</i> + cultivars	NN	YI E	FB
<i>Lonicera nitida</i> + cultivars	NN	YI DF E	FB
<i>Prunus x cistena</i>	NN	SI	AI FB
<i>Prunus padus</i>	N	YI SI	ES FB
<i>Prunus spinosa</i>	N	SI E	AI ES FG
<i>Pyracantha</i> ssp + cultivars	NN	SI E	AI FG
<i>Rosmarinus officinalis</i>	NN	SI E DF	HL FB
<i>Rosa canina</i>	N	SI	AI ES FG
<i>Santolina chamaecypariss</i>	NN	YI SI DF E	FB

15 Appendix 3

Species	Origin	Characteristics	Suitability/ Purpose
<i>Taxus baccata</i>	N	YI E	HL FB FG
<i>Viburnum opulus</i>	N	SI	ES FG

Appendix 3: Ornamental Hedge List

