Gustafson
Porter +
Bowman

Highgate Cemetery Landscape Masterplan

Design and Access Statement

Volume 2: Landscape Design and Access Statement

Part 4 of 6

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Contents

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5. Ecology, Sustainability, and Planting Strategy

5.1 Sustainability Summary

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A sustainable landscape, building, maintenance, and operations strategy is central to Highgate Cemetery's goals for the future of the Cemetery and its impact. A coordinated approach was taken with Gustafson Porter + Bowman, Hokpins Architects, Ashgrove Ecology, James Hitchmough, Max Fordham, and Useful Projects, to ensure that the proposals put in place meet sustainability planning requirements and push beyond the baselines. The following aspects of the project have been evaluated and many will be refined and explored further in future stages:

Habitat and species diversity: the masterplan aims to integrate a more diverse selection of plant species than currently found on site in order to encourage biodiversity and resilience. James Hitchmough has advised on species that are likely to be more resilient to the changing climate predicted in the UK in the coming decades

Drainage and water management: the drainage and water management strategy strives to manage as much water as possible on site amd reduce runoff through an improved drainage, attenuation, and infiltration system, as well as harvesting rainwater for irrigation and Cemetery maintenance needs. Please refer to Max Fordham's drainage and irrigation strategy for detailed information

Materials: the goal of the hardscape is to provide a durable and reliable path network that is also historically relevant; although concrete is suggested for the primary paths, it will be more durable and require less maintenance over time. Working with Max Fordham and Useful Projects, the concrete specification will also include details to reduce the carbon footprint of the material. These are as follows:

The final concrete mix design certificate should be accompanied by a specific EPD in accordance with iso 14025, or at a minimum, shall be accompanied by a specific embodied carbon value, with clarity on how it was calculated, including source information on material carbon values.

- The final concrete mix shall have an embodied carbon intensity not greater than 210kgCO2e/m3.
- The concrete should use limestone as part of the cement blend.
- GGBS should not be used in proportions greater than 40% of the total cement content.
- The Contractor shall submit the final mix designs, their embodied carbon intensity and confirm their compliance with the specified embodied carbon intensity target for approval prior to batching

Operations and Energy: Restoration of existing buildings and the new buildings have been designed to meet exemplary standards in energy efficiency. Analysis of operations and management strategies will also provide strategies to reduce operations impact.

Waste will be separated from green waste to be composted, which will be separated from recyclable materials. New buildings and restoration work will look to use reclaimed materials where feasible.

Social Impact: In addition to improving the accessibility of the site for visitors, Highgate Cemetery is also engaging local communities and groups in order to develop a strategy that improves inclusion, enhances volunteer and education programmes, and creates more opportunities for all to experience the natural and historical significance of the Cemetery

Further details of the sustainability strategy can be found in Useful Project's Sustainability Statement

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To support the planting and habitat proposals for Highgate Cemetery, it was important to carry out and incorporate in-depth environmental research. This included analyising Highgate Cemetery within the wider North London context and referencing the National Vegetation Classifications for creating woodlands in the UK. Additional research was done with advice from James Hitchmough on planting for climate change and biodiversity, and post-ash woodlands. The team additionally researched Species of Priority for conservation in Camden and near the site, such as various species of bats, and worked with Ashgrove Ecology and local Highgate community groups to identify the need for interventions such as hedgehog highways.

Highgate Cemetery falls within the landscape region in London known as the Hampstead Ridge - this landscape is characterised by its ancient woodland, scrub, acid grasslands, and ridge summits with panoramic views. The landscape masterplan proposes the maintenance of woodlands and the introduction of diverse grasslands, as well as the restoration of a historic view from the top of the Cemetery.

The National Vegetation Classification guide was referenced for its detailed descriptions on UK Woodland Plant Communities. In combination with examining existing planting on site and selecting climate resilient species, referencing this guide provided tree, understory, and groundcover planting lists that align with dominant species and specific plant communities.

In respect to the threat of Ash dieback disease (*Hymenoscyphus fraxineus*), Off-setting the loss of ash with 'alternative tree species' may be one 'solution' to the biodiversity threat. No single alternative tree species can act as host for all ash-associated species but *Quercus robur/petraea* can host 69%. In an assessment of ecosystem function, when compared to other European deciduous tree species, *F. excelsior* interacts with the environment in a unique way, particularly in relation to nutrient cycling.

Highgate Cemetery is located in Zone 7 of the Ash Regions of the UK. This means woodlands that have lost their Ash trees will likely develop into Hazel (*Corylus avellana*)and Sycamore (*Acer pseudoplatanus*) dominated woodlands in the first 10 years, and from there to a Beech(*Fagus sylvatica*), Sycamore (*Acer pseudoplatanus*), Field Maple (*Acer campestre*) forest from year 10-50 should they be allowed to develop without intervention (Ecological impacts of ash dieback and mitigation methods. Broome and Mitchell, 2017)The Forestry Commission has also published data on various species suitability for climate change for restocking a forest following loss of Ash. For example, a Pendunculate Oak (*Quercus robur*) is projected to be suitable for most climate projections, except within a W12 (*Fagus sylvatica* and *Mercurialis perennis*) community. While choosing species that are predicted to be suitable for the UK's changing climate is critical, the other species that make up the larger plant community are also highly influential to that species success.

Climate resilience and biodiversity in woodlands can also be increased by:

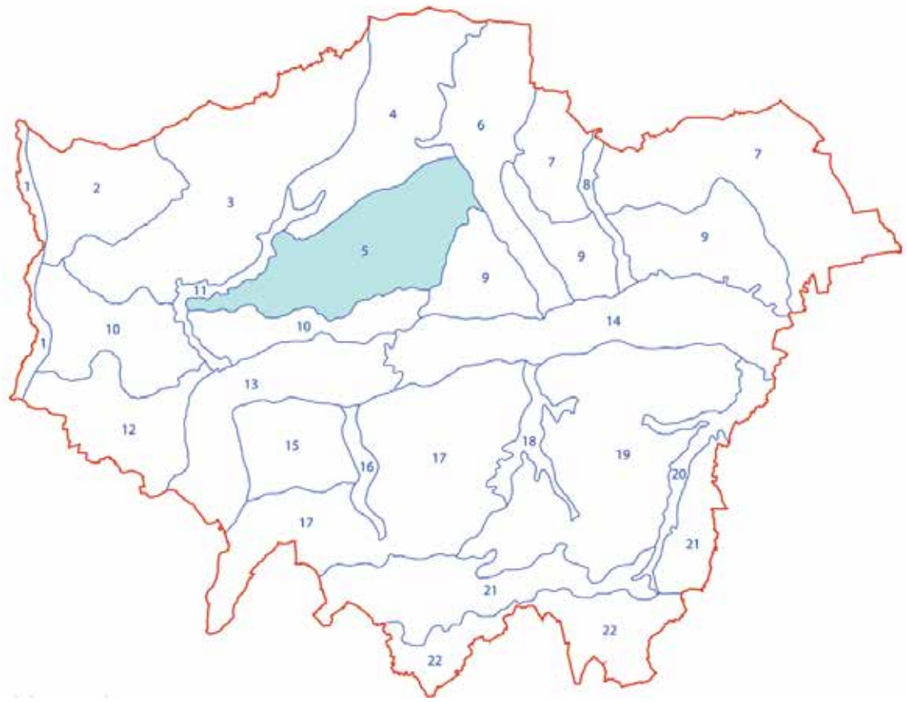
1. Encouraging regular cycles of regeneration that allow the next generation of trees to adapt to changing climate conditions and develop their own resistance to pests and diseases

2. Increasing diversity of species and diversityof structure - variety of tree heights, ages, open space, edge conditions (rides and glades). Thinning and regeneration encourage structural diversity. Leaving deadwood will also support biodiversity

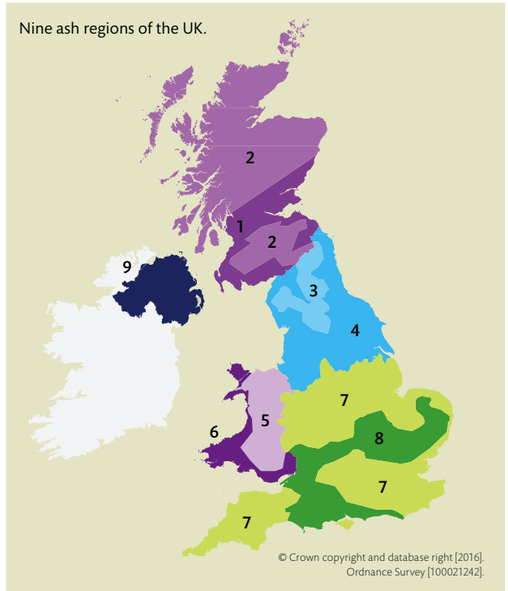
3. Managing and removing pests and diseases

(Forestry Commission, Why woodland management matters. Chris Watson, September 2023)

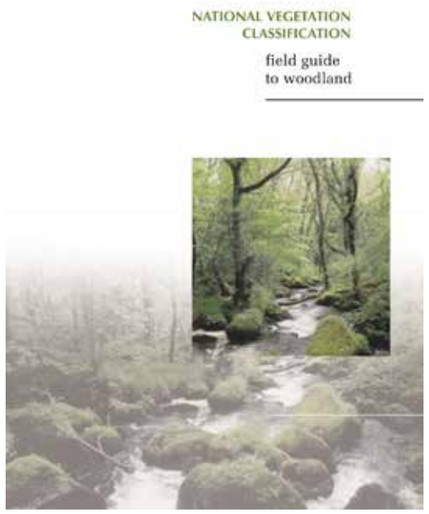
Forestry Commission, Restocking woodland following loss of ash due to ash dieback, April 2020)



Hampstead Ridge Landscape Area - Alan Baxter



Ash Regions of the UK



NVC Woodland Field Guide

5.3 Ecology Interventions and BNG

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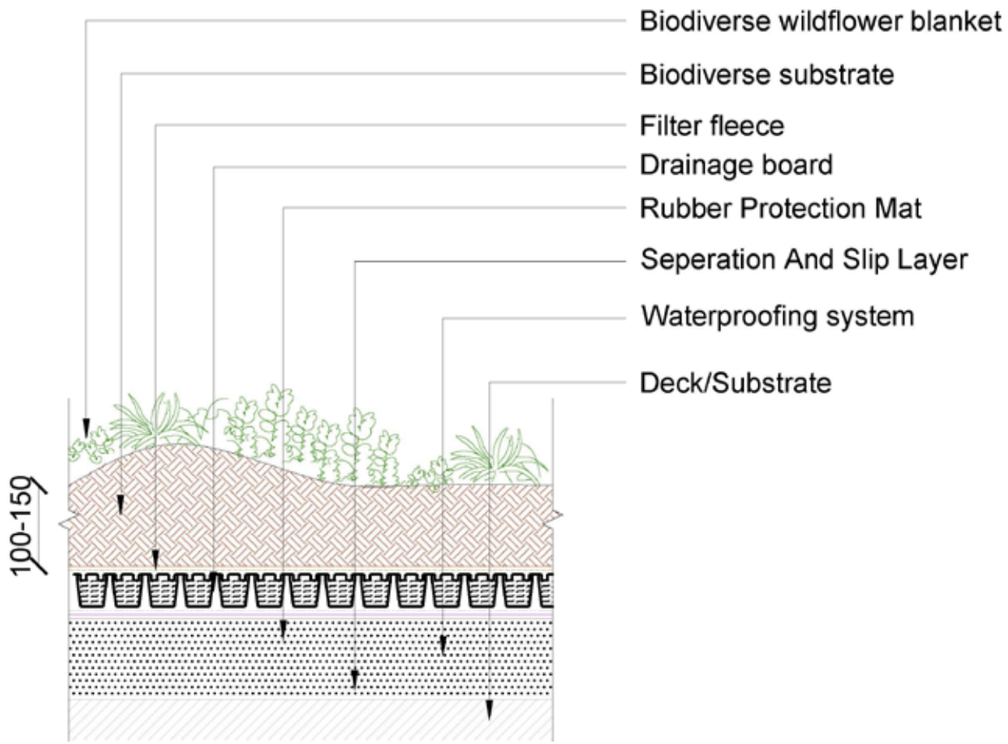
While Highgate Cemetery's primary use is as a historic and active burial site which offers significant opportunity for ecological enhancement through the removal of diseased ash trees (undertaken outside of the development application), the removal and management of invasive species listed in the Schedule 9 of the Wildlife and Countryside Act of 1981, and the planting of a wide palette of trees, understory, and groundcover beneficial to wildlife and chosen to increase the diversity of plant species. The new area habitats that will be created include:
9.4 ha of other mixed woodland (w1h)
2.1 ha of wet woodland (w1d)
1.2 of other neutral grassland (g3c)
Finally, new linear habitats will be created in the form of 0.7 km of native hedgerows (h2a), to provide corridors for wildlife.

In addition to the primary impacts of reduction of invasive species and increased diversity of plant species, smaller scale interventions are also proposed such as the integration of bat and bird boxes, openings along the boundaries to facilitate hedgehog movement, bee bricks and considered glazing treatments. No new lighting is proposed throughout either side of the cemetery in order to keep light levels as low as possible; however should new lighting be included in the future it will comply with the standards as set out by Ashgove Ecology's EclA. A green roof is proposed for the Cafe building that is planted with ferns and shade tolerant sedums, with a combination green roof and PV panel system proposed for the gardener's building.

The removal of invasive species, maintenance of the spring area in the west side, and improvement of woodland and grassland habitats across the cemetery have resulted in a Biodiversity Net Gain (BNG) of 10.7%

Further information can be found in the 2024 Biodiversity Net Gain and Ecological Impact Assessment by Ashgrove Ecology.



Typical Wildflower Roof Buildup

Shaded Green Roof (Cafe Building)

Wildflower Green Roof with PV (Gardener's Building)

5.4 Landscape Layers

WEST SIDE

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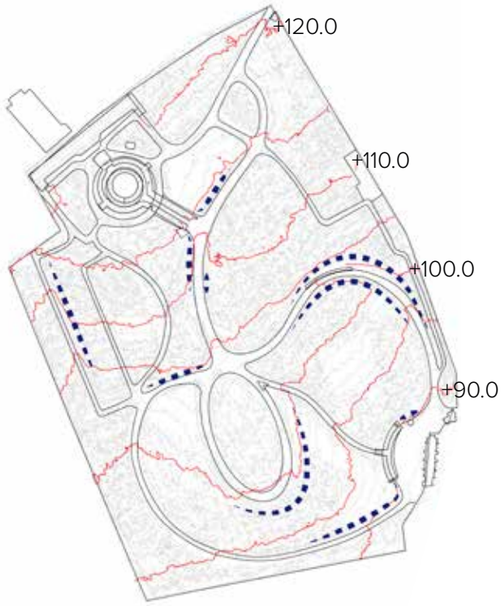
The following diagrams show the landscape as a series of layers that inform the preliminary zoning of the masterplan. While the west and east side share some commonalities, they are distinct in their character and environmental layers. Namely, the west side has a steeper topography, older trees, some sandier drier soils (particularly in the northern half), has significantly less meadow habitat, and has a more significant intentional planting history, as compared with the east side.

Topography - The existing topography plays a crucial role, particularly on the western side of the cemetery. The varied topography and natural contours inherent to this site are instrumental in achieving the characteristic picturesque quality, where the interplay of light, shadow, and perspective enhances the visual appeal and experiential richness of the landscape.

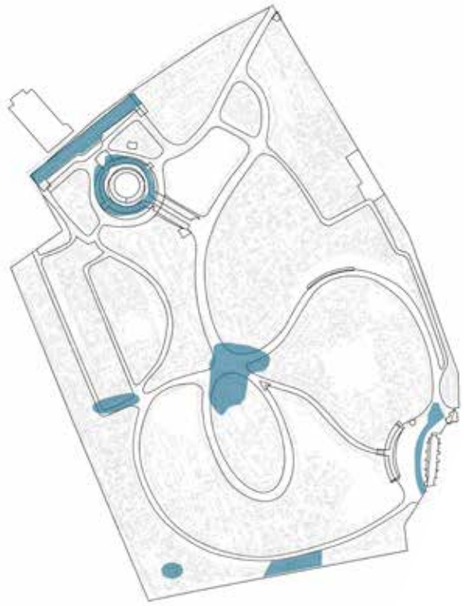
Drainage – This layer identifies zones where water tends to accumulate, either due to drainage system malfunctions or because they represent low points in the terrain. Understanding these areas is crucial for informing the selection of plant species and designing appropriate habitats. By carefully considering the unique conditions of these zones, they can be transformed into distinctive features within the masterplan, adding specific character and ecological value to the landscape.

Views: Historic views, which were a major attraction when the cemetery first opened. The masterplan proposes the reinstatement and preservation of these views for the future, ensuring that no large trees are planted along these critical sight-lines, thereby maintaining the visual integrity of these important axes.

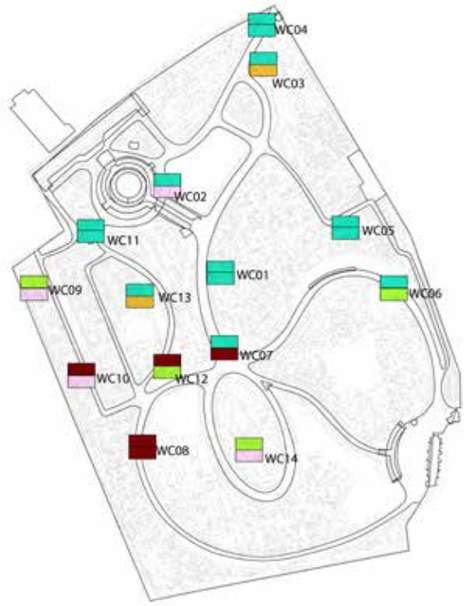
Historic Planting: The research aimed at identifying the cemetery's original planting scheme will significantly influence the proposed planting palette for various sections of the masterplan. One of the most valuable resources in this regard is the 1870 OS map, which accurately depicts the location of trees from that period. This historical planting structure will serve as a guide to reinforce the distinct character of both sides of the cemetery, ensuring that any new planting corresponds with the site's historical context.



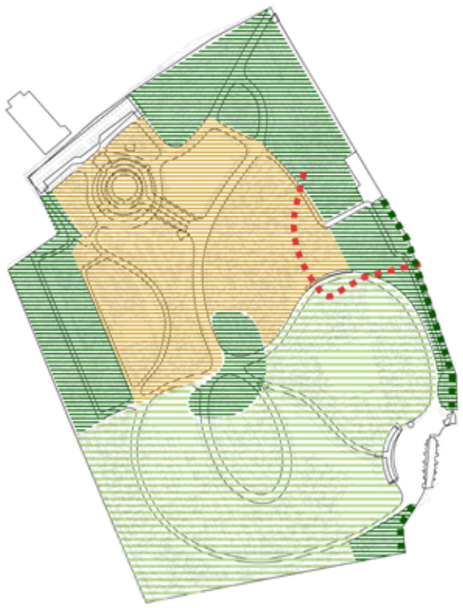
Embankments and existing contours



Flooding/Standing water



Soil texture



Historic planting

OS map 1870

Existing habitats

Landscape Layers

EAST SIDE

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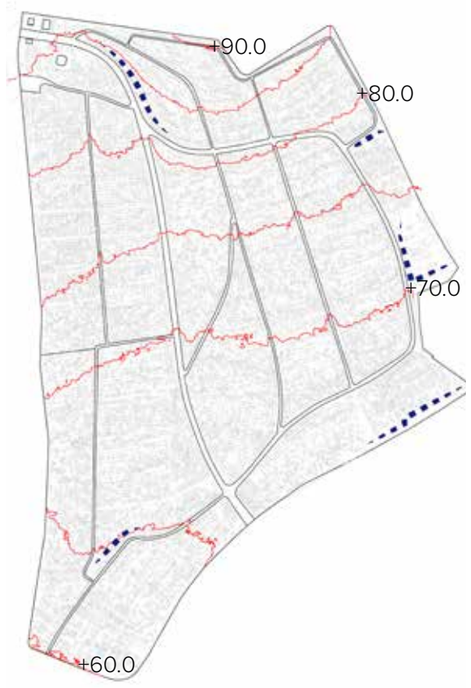
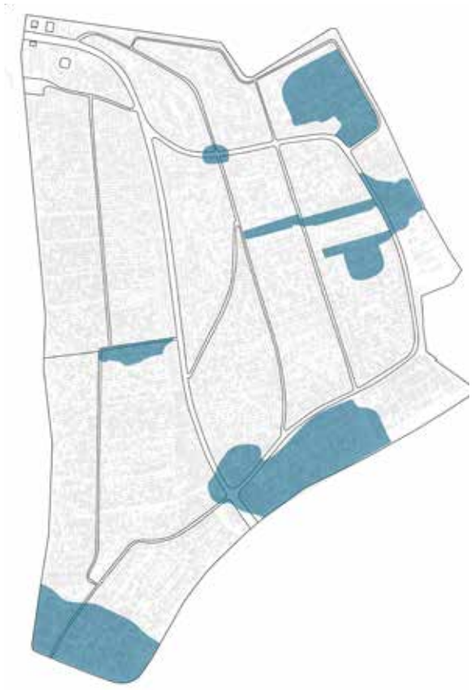
Ecology: Enhancing existing habitats and creating new ones will play a vital role in increasing the cemetery's biodiversity. The masterplan will focus on preserving and enriching the ecological balance of the site by introducing plant species that support local wildlife and contribute to a more resilient ecosystem.

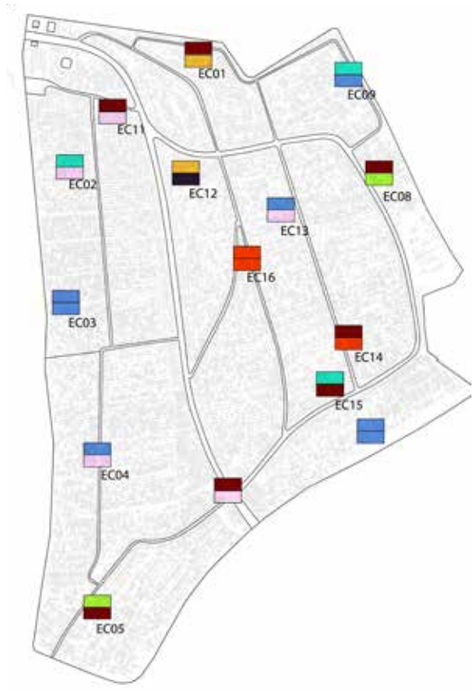
Soil: The results of the soil survey indicate that both sides of the cemetery exhibit a wide range of soil pH levels and textures. This information is crucial for the selection of appropriate plant species across the different areas outlined in the masterplan.



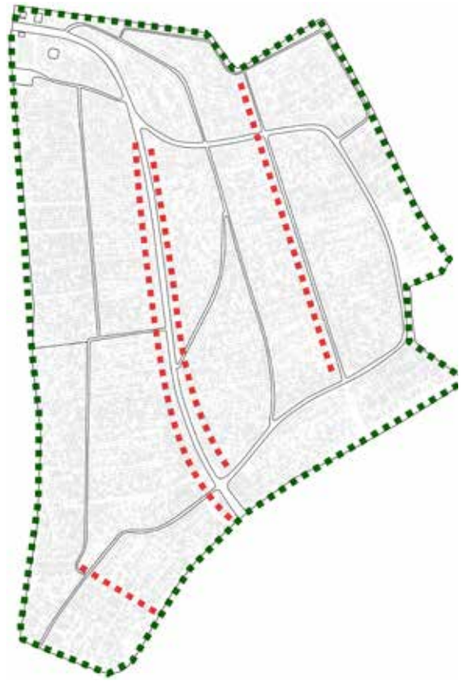
Embankments and existing contours



Flooding/Standing water



Soil texture



Historic planting

OS Map 1871

Existing habitats

5.5 Site-wide Planting Concept

TRANSITION FROM WEST TO EAST CEMETERY

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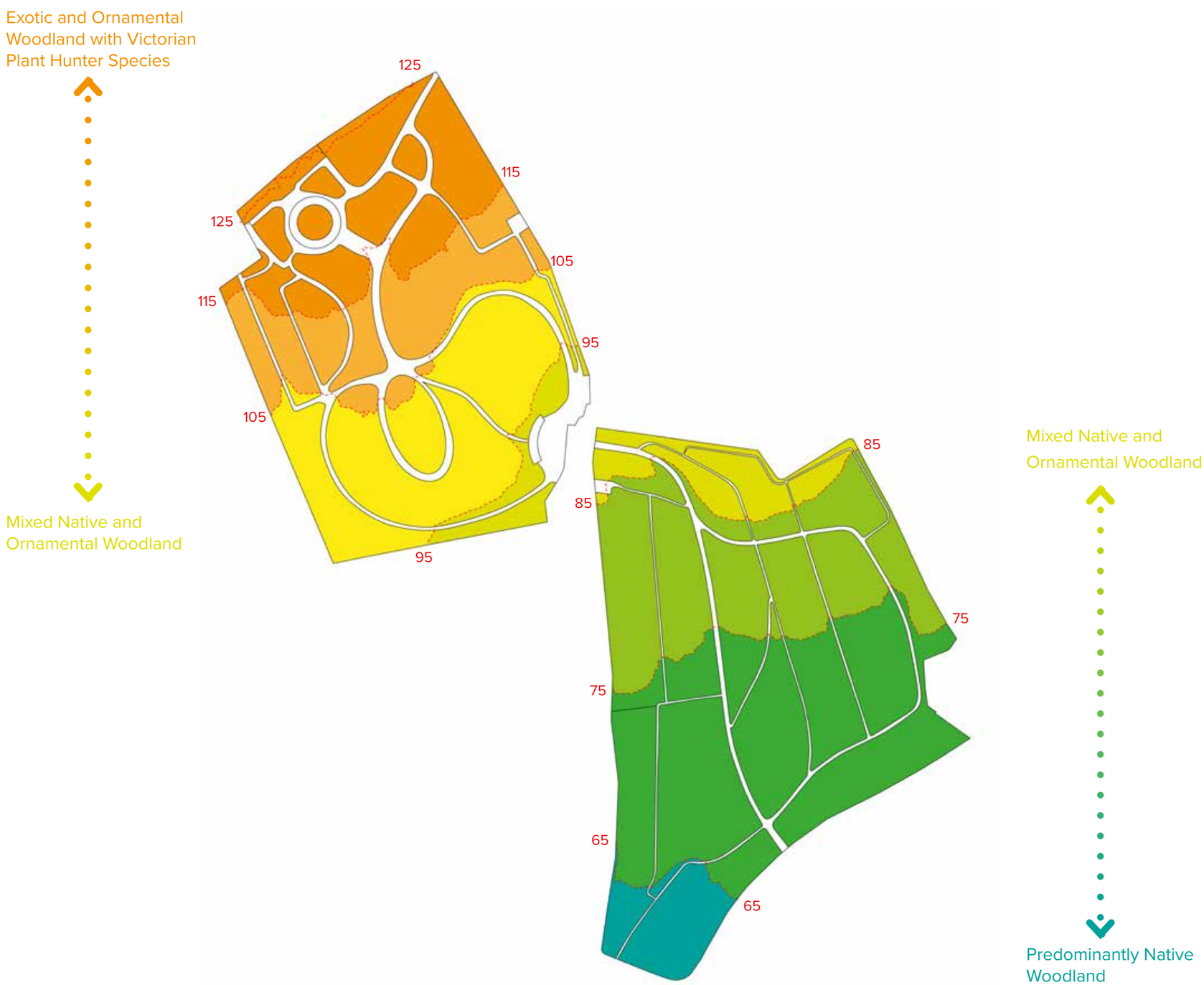
The walk up the hill on the West side of the Cemetery and the walk down the hill on the East side, provide a topographical experience. On the East side the gradient of the slope decreases as one moves down the hill; the curvilinear paths that negotiate the steeper hillside south of Waterlow Park transition to the grid of paths set out on a shallower slope as one travels south. On the West side the steeper and more complex topography is negotiated by a more flamboyant arabesque path layout typical of a Picturesque landscape, where one experiences a sequence of hollows and elevated routes before reaching the the top of the hill.

As one rises up the hill, the open meadows in the east are bordered by woodland, which becomes increasingly dense, punctuated by sunlit glades
in the west that then open up to long views at the top of the hill. The varied micro-climate transforms from damp conditions associated with clay soils at the base of the hill, to increasingly free draining soil conditions at the top of the hill. The design proposals will build upon these changing topographical conditions, with an ever changing diversity of plants that start with native species at the bottom of the hill, that become more exotic at the cemetery's northern summit, where plant choices are influenced by the language of 19th century plant hunter species.



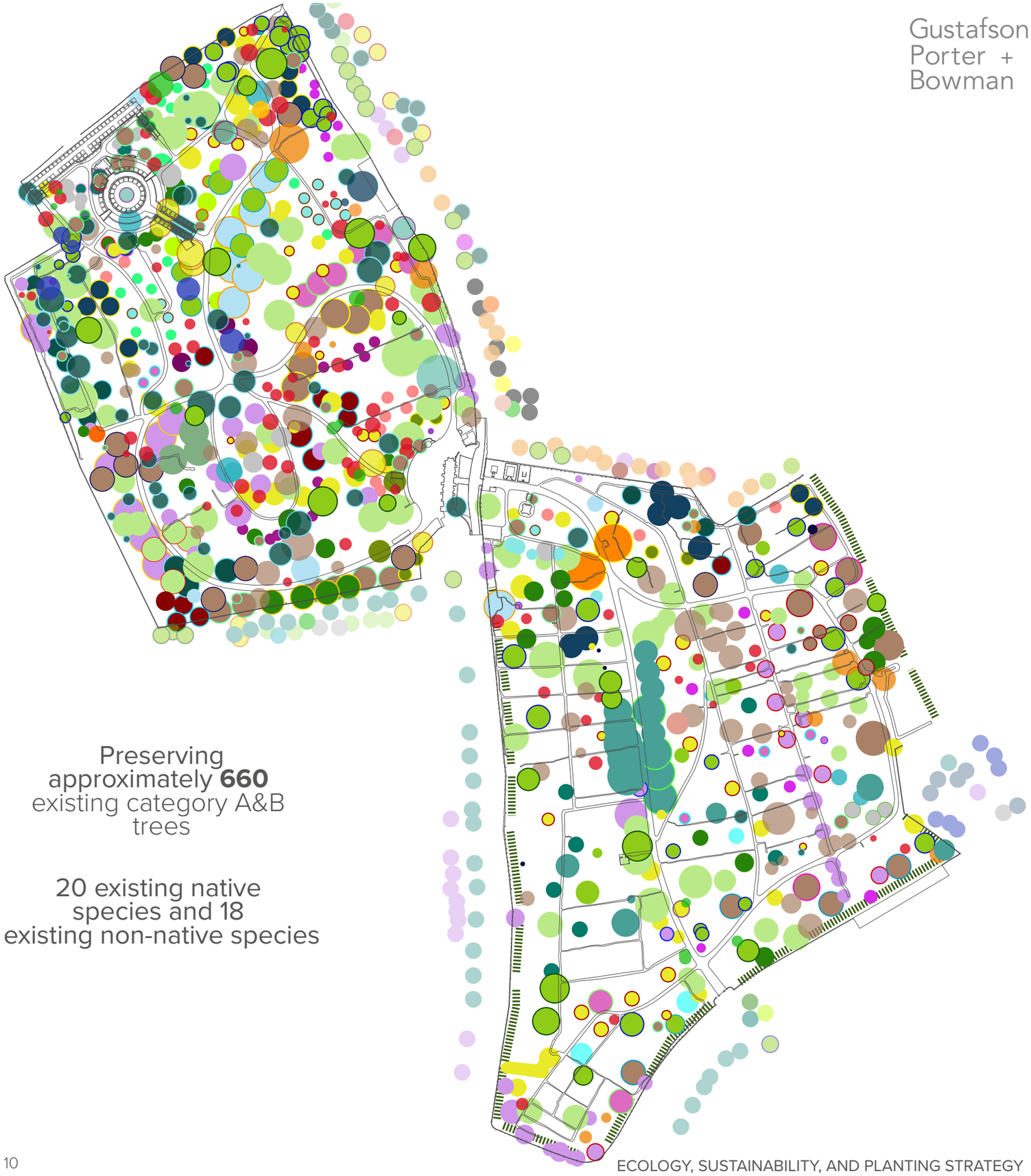
5.6 Tree Plan

EXISTING AND PROPOSED TREES

Gustafson Porter + Bowman

The tree planting strategy aims to meet the following goals:

- Increase the diversity of species with a balance of native and non-native/naturalised species to combat the impact of future tree diseases and decline.
- Align the historic context of the cemetery with a more varied planting character, using a greater proportion of non-native and evergreen species on the west side and native and deciduous trees on the east side.
- Restore the historic alignments of large trees along drives and primary paths following the 1st edition O.S maps.
- Maintain the predominant woodland and sunlit glade character of the west side with a more open sunnier meadow character edged by woodland on the east side.
- Establish native hedgerows along the perimeter of the east side boundaries with regard to screening views from existing development and some permeability from Swain's Lane.
- Encourage views from the Terrace Catacombs upper terrace and Comfort's Corner, by planting species with a smaller weeping form.
- Ensure planting strategy protects monuments, by researching grave locations that don't impact the existing memorials and monuments.
- Diagrams showing existing A&B category trees and diagrams showing estimated ages can be found in the appendix



Preserving approximately **660** existing category A&B trees

20 existing native species and 18 existing non-native species

5.7 Tree Planting

PROPOSED TREES

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Native

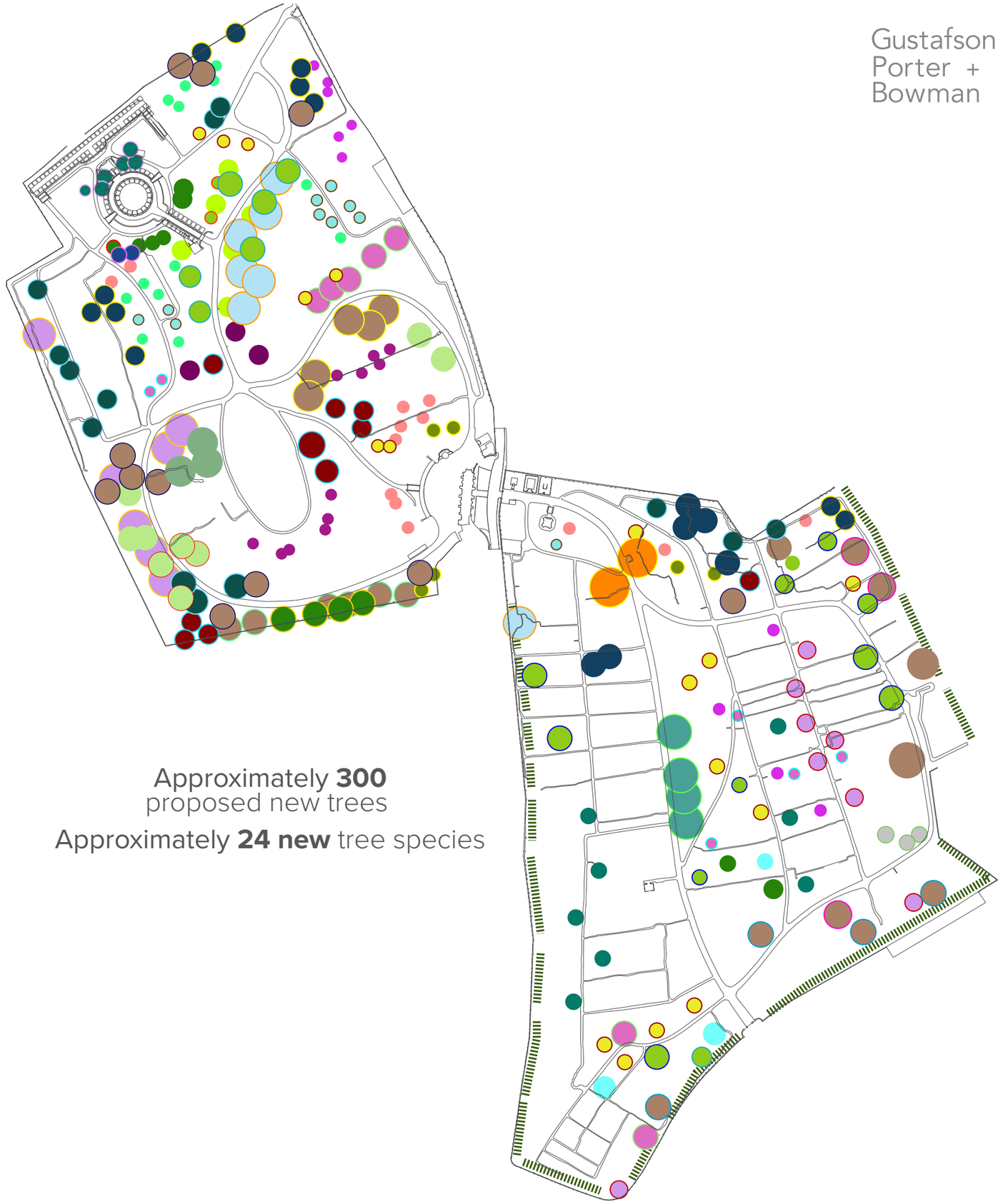
- Acer campestre (Field Maple)
- Alnus glutinosa (Black alder)
- Carpinus betulus (European hornbeam)
- Corylus avellana (Hazel)
- Crataegus monogyna (Hawthorn)
- Euonymus europaeus (European spindle)
- Malus sylvestris (European Crab Apple)
- Pinus sylvestris (Scots pine)
- Prunus avium (Wild Cherry)
- Q.robur (Pendunculate Oak)
- Quercus patraea (Sessile oak)
- Sorbus aria (whitebeam)
- Sorbus torminalis (Wild Service Tree)
- Taxus baccata (English Yew)
- Tilia cordata (Small-leaved lime)
- Native Hedgrow
  Crataegus monogyna
  Prunus spinosa

Non-native

- Acer opalus (Italian maple)
- Acer tataricum (Tatar maple)
- Acer monspessulanum (Montpellier maple)
- Amelanchier x lamarckii (Snowy mespilus)
- Alnus cordata (Italian alder)
- Betula utilis Jacquemontii (Himalayan birch)
- Carpinus betulus 'pendula' (Hornbeam 'Pendula')
- Celtis australis (European nettle tree)
- Fagus orientalis (Oriental beech)
- Fraxinus americana (White ash)
- Ginkgo biloba (ginkgo)
- Liquidambar orientalis (Oriental sweet gum)
- Malus sylvestris 'Louisa' (Crab apple 'Louisa')
- Nyssa sylvatica (Black tupelo)
- Ostrya carpinifolia (Hop hornbeam)
- Pinus nigra (Austrian pine)
- Platanus orientalis (Oriental plane)
- Pyrus salicifolia (willow-leaved pear)
- Quercus bicolor (Swamp white oak)
- Quercus canariensis (Algerian oak)
- Q. frainetto (Hungarian Oak)
- Tilia tomentosa (Silver Lime)
- Ulmus 'New Horizon' (Elm 'New Horizon')

Naturalised

- Arbutus unedo (Strawberry tree)
- Cornus mas (Cornelian cherry)
- Quercus cerris (Turkey Oak)
- Quercus ilex (Holm oak)



Approximately **300** proposed new trees

Approximately **24 new** tree species

Tree Planting

PROPOSED NATIVE/NON-NATIVE

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The tree species selected were all reviewed for their resilience to a changing climate or as trees that would support the transition from an ash dominant woodland. The proposal aims to balance natives with non-native species which have been recommended as predominantly European species that are resilient to climate change and will be able to tolerate drought periods and wet periods.

Native Trees

Maintaining balance
with **16** native species
and **23** non-native species

Non-Native & Naturalised Trees

Tree Planting

PROPOSED DECIDUOUS/EVERGREEN

Gustafson Porter + Bowman

The tree strategy also ensures a selection of evergreen and coniferous planting, especially on the west side, in order to maintain interest and character to certain parts of the cemetery. For example, in the northeast corner, and the northwest corner (known as The Yews) - these areas were historically planted with coniferous trees and still are today. The upper corner of the west side also has sandier soils which is conducive for certain species of pines. A series of evergreen trees borders the southern edge of the west side. Some evergreens and conifers are carried over to the top of the east side for continuity and due to the slightly lighter soil conditions

Deciduous Trees

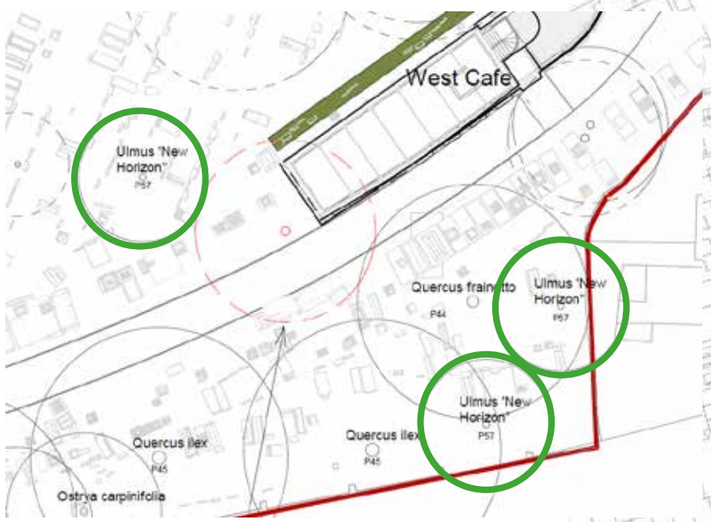
Evergreen Trees

5.8 Tree Removal

CATEGORY A & B TREES

As part of the landscape masterplan, two views were selected as key views. The view to St Michaels Church from comforts corner and the view towards the city and St Paul's Cathedral from the Terrace at the North edge of the site. Restoring these views involves the removal and replacement (with smaller species) of a small number of Category A&B trees (Group 1).

Other Category A&B trees on site will have to be removed to allow the architectural works to take place (Groups 2&4) and a small number of trees will be removed to prevent damage to existing Grade 2 listed Monuments on Cutting's Drive (Group 3).



The removal of the Ulmus procera to be replaced with three *Ulmus 'New Horizon'* - a Dutch Elm Resistant cultivar

Gustafson Porter + Bowman

Tree Removal

CUTTINGS PATH EMBANKMENT STABILISATION

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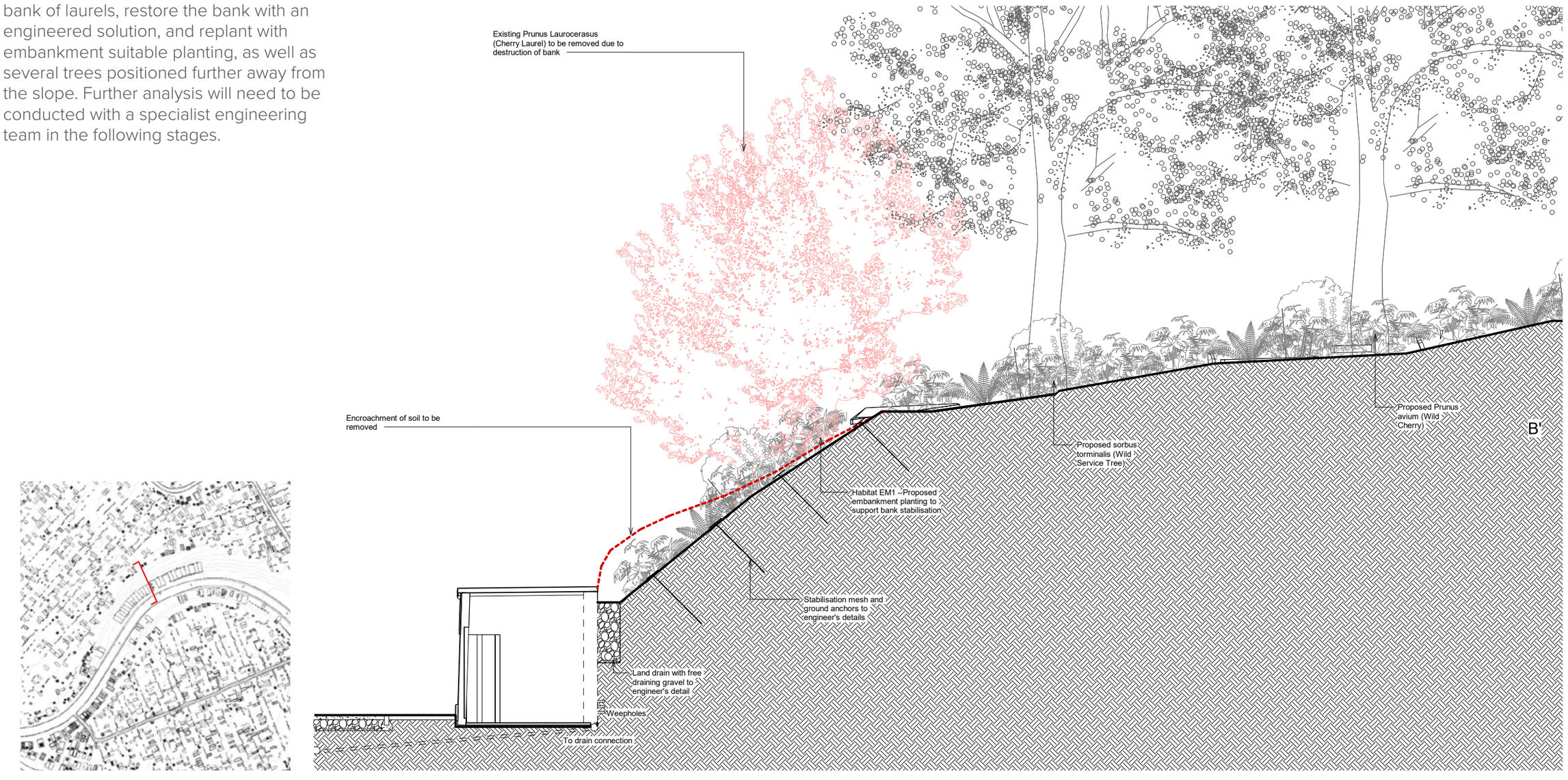
The steep embankment that runs along the Cuttings Path in the West side has been suffering from severe subsidence of the bank, likely due to the roots of the large Cherry Laurels (*Prunus laurocerasus*) pulling up the current stabilisation netting. This is causing damage to the monument below as well as preventing effective drainage. It is proposed to remove the bank of laurels, restore the bank with an engineered solution, and replant with embankment suitable planting, as well as several trees positioned further away from the slope. Further analysis will need to be conducted with a specialist engineering team in the following stages.



5.9 Planting Details

PROPOSED TREE SIZES

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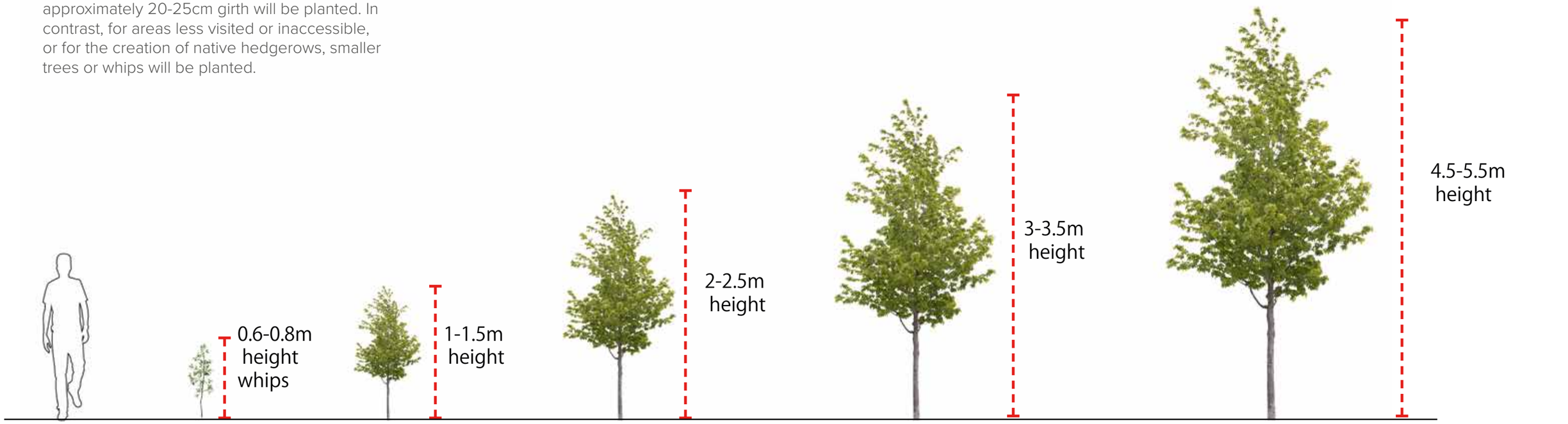
The strategy for tree planting makes use of a mix of tree sizes depending on the character area and proximity to the main paths. As a more immediate impact is desired for areas near the primary paths, larger trees approximately 20-25cm girth will be planted. In contrast, for areas less visited or inaccessible, or for the creation of native hedgerows, smaller trees or whips will be planted.



Low priority areas & Hedgerows

Medium priority areas & Hedgerows

High priority areas Tree avenues & Main Paths

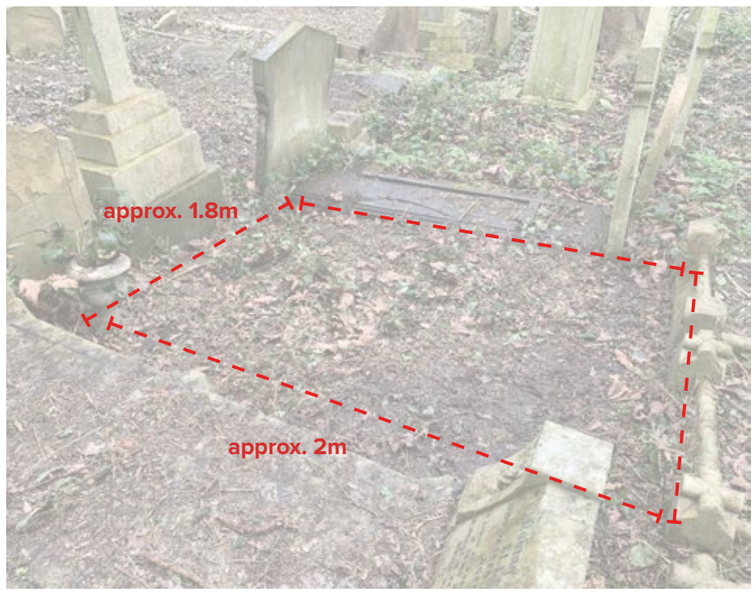
Planting Details

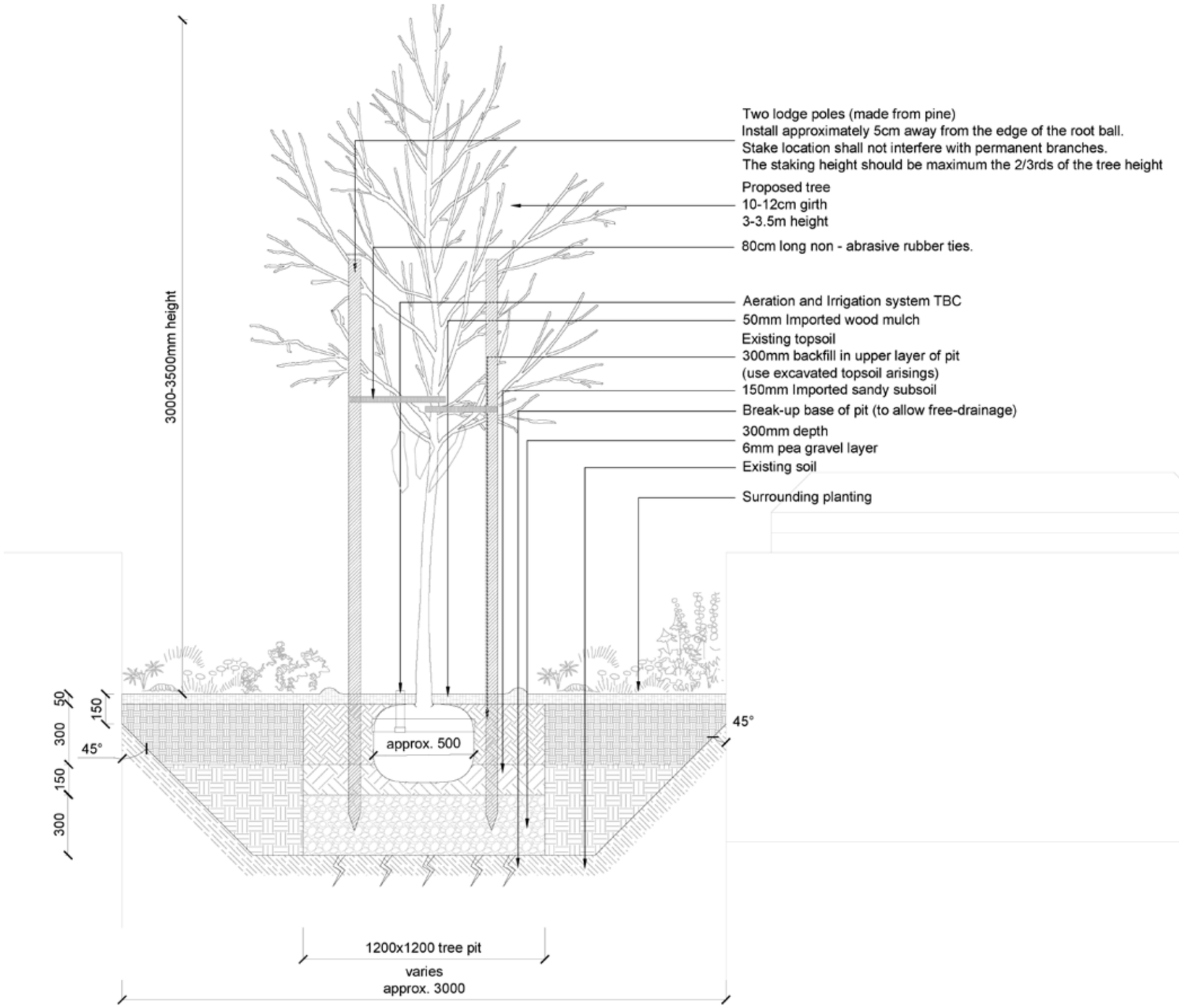
TREE PIT SIZES

Gustafson Porter + Bowman

To give a tree the space it needs to grow without damaging nearby monuments, it is recommended that the space of two graves is used for each tree pit. This equates to approximately 1.8m x 2m .

In coordination with West Scott Architects and Tim O'Hare Soil Specialists, it is also recommended that tree pits be dug at a 45 degree angle as opposed to straight. This will further protect monuments underground and maintain stabilised soils around the monument. Imported subsoil for the larger trees will also help support adequate drainage; however it is recommended to reuse the existing topsoil as much as possible in order to reduce the amount of soil taken off site.





5.10 Landscape Masterplan Habitats

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Proposed planting typologies/ habitats

- HP1 - High profile areas-edge of paths (sunny and shaded areas)
- EM1 - Embankments/Slopes (sunny and shaded areas)
- SP1 - Species rich lawn with sun on heavy soils areas)

- SA1 - Spring area with sun on heavy soils
- SU1 - SuDS

- GD1 - Dry grassland/meadow with sun on medium soils
- GW1 - Wet grassland/meadow with sun on heavy soils
- GG1 - Grassland/meadow with sun on heavy soils

- HR1 - Hedgerows

- YW1 - Yew woodland with shade on light soils
- BW1 - Broadleaved woodland with shade on light soils
- BW2 - Broadleaved woodland with sun on light soils
- BW3 - Broadleaved woodland with shade on medium to heavy soils
- BW4 - Broadleaved woodland with sun on medium to heavy soils
- BW5 - Broadleaved woodland with shade on heavy soils
- BW6 - Broadleaved woodland with sun on heavy soils
- WW1 - Wet woodland with shade on heavy soils
- WW2 - Wet woodland with sun on heavy soils

- Eliminate bramble and ivy
- Brambles for structural complexity/lower frequency cutting

High profile areas

- The aim is to achieve a long lived evergreen, semi-evergreen ground layer edges plus emergent species for spring-autumn flowers.

HP1 - High profile areas - edge of paths (sunny and shaded areas) - Indicative species

Actaea racemosa

Anemone x hybrida

Eurybia divaricata

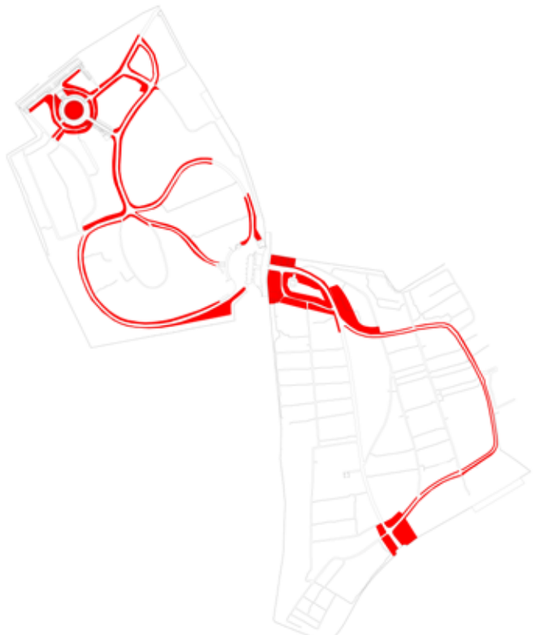
Geranium 'Rozanne'

Polystichum setiferum

Hakonenchloa macra

Liriope muscari

Tiarella cordifolia



HP1 - High profile areas - edge of paths (sunny and shaded areas)

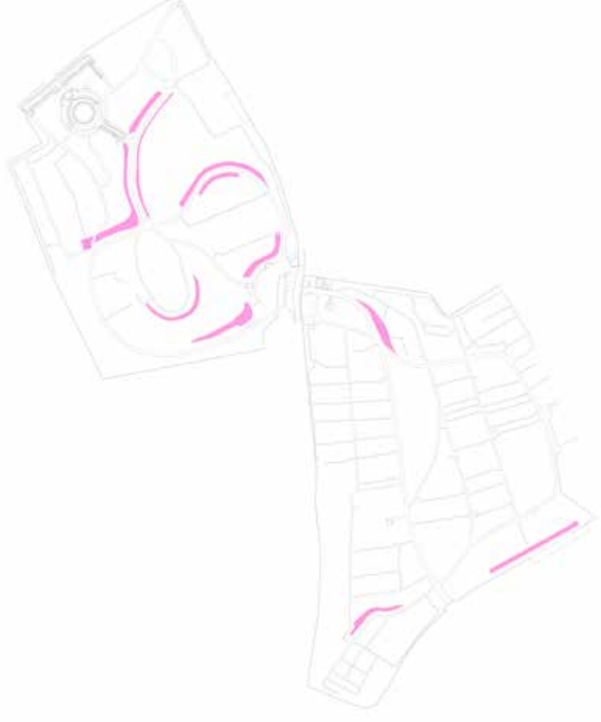
5.12 Embankments

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Embankments

• Retain the soil and avoid erosion using robust shrubs and groundcover plants



EM1 - Embankments/Slopes (sunny and shaded areas)

EM1 - Embankments - Indicative species

Sarcococca hookeriana var. humilis

Epimedium ‘Frohnleiten”

Eurybia divaricata

Helleborus x hybridus

Ceratostigma plumbaginoides

Geranium ‘Rozanne’

Ruscus hypoglossum

Vinca minor

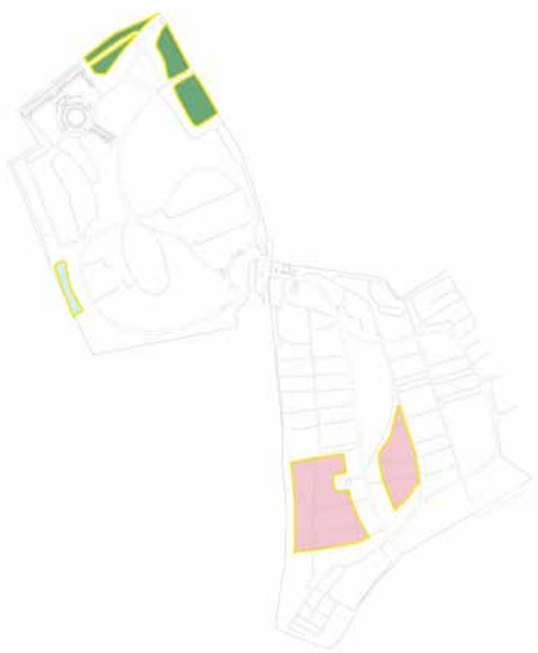
Magnolia ‘ Fairy White’

Viburnum tinus ‘Purpureum’

5.13 Habitat Type 1a/1b/1c

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

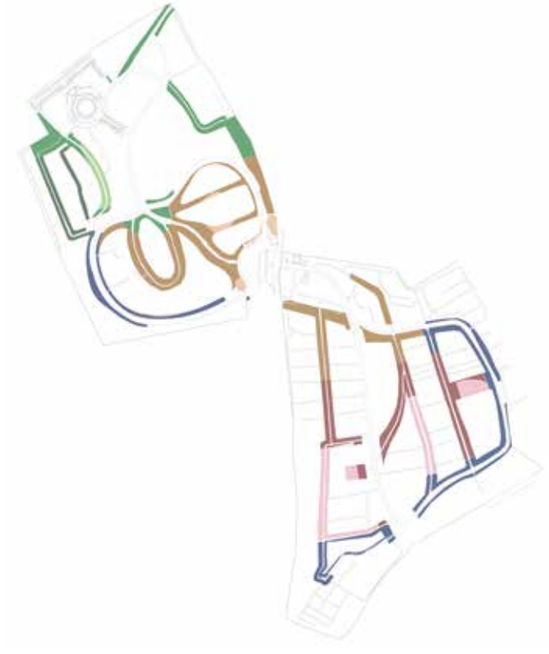


1a

- Brambles (*Rubus fructicosus*) for structural complexity/lower frequency cutting
- BW1-Broadleaved woodland with shade on light soils
- BW6-Broadleaved woodland with sun on heavy soils
- WW2-Wet woodland with sun on heavy soils

1b

- YW1-Yew woodland with shade on light soils
- BW1-Broadleaved woodland with shade on light soils
- BW2-Broadleaved woodland with sun on light soils
- BW3-Broadleaved woodland with shade on medium to heavy soils
- BW4-Broadleaved woodland with sun on medium to heavy soils
- BW5-Broadleaved woodland with shade on heavy soils
- BW6-Broadleaved woodland with sun on heavy soils
- WW1-Wet woodland with shade on heavy soils
- WW2-Wet woodland with sun on heavy soils



1C

- YW1-Yew woodland with shade on light soils
- BW1-Broadleaved woodland with shade on light soils
- BW2-Broadleaved woodland with sun on light soils
- BW3-Broadleaved woodland with shade on medium to heavy soils
- BW4-Broadleaved woodland with sun on medium to heavy soils
- BW5-Broadleaved woodland with shade on heavy soils
- BW6-Broadleaved woodland with sun on heavy soils
- WW1-Wet woodland with shade on heavy soils
- WW2-Wet woodland with sun on heavy soils

Habitat Type 1a/1b/1c

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Woodland species (1a, 1b, 1c)

1a

•This type of management increases structural complexity of brambles, which is valuable for wildlife but messier for people

• Lower frequency cutting of bramble (*Rubus fruticosus)* and Ivy (*Hedera helix*) biomass

1b

•Decreases structural complexity of brambles etc, less valuable for wildlife, less messy- improved access for people

•Suppress significant bramble and Ivy biomass and sow to increase diversity of low spp.

•To create low winter green basal layer with some autumn and spring flowers.

•Higher frequency cutting

1c

•Eliminate bramble-Ivy to allow detail and seasonal interest-diversity

•Skinny strips (sometimes only a few cm wide) between grave stones on edges of woodland-carriage drives in West Side, and more extensive in the East Side.

Woodland habitats (1a, 1b, 1c) - Indicative species

Aster (Eurybia) divaricatus

Eranthis hyemalis

Hyacinthoides non-scripta

Primula elatior

Convallaria majalis

Gillenia trifoliata

Aruncus dioicus

Polygonatum odoratum

Geranium macrorrhizum

Lunaria rediviva

Brunnera macrophylla

Aquilegia vulgaris

5.14 Grasslands/Meadows

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Grasslands./Meadows

•More diverse seasonal native meadow with Yellow rattle (*Rhinanthus minor)* and forbs

•Provide a range of wild flowers and grasses for many different beneficial insects

GD1-Dry grassland/meadow with sun on medium soils
GW1-Wet grassland/meadow with sun on heavy soils
GG1-Grassland/meadow with sun on heavy soils

GD1 - Dry grassland/meadow with sun on medium soils - Indicative species

Cruciata laevipes

Knautia arvensis

Malva moschata

Origanum vulgare

GW1 - Wet grassland/meadow with sun on heavy soils - Indicative species

Ranunculus acris

Silene flos-cuculi

Narcissus pseudonarcissus

Succisa pratensis

GG1 - Grassland/meadow with sun on heavy soils - Indicative species

Ajuga reptans

Primula elatior

Stachys officinalis

Succisa pratensis

5.15 Species Rich Lawn

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Species rich lawn

•It will a valuable source of pollen and nectar, whilst still being able to regularly mow and will tolerate wear.

•For areas adjacent to new/recent graves (West Side) and main paths (East side)

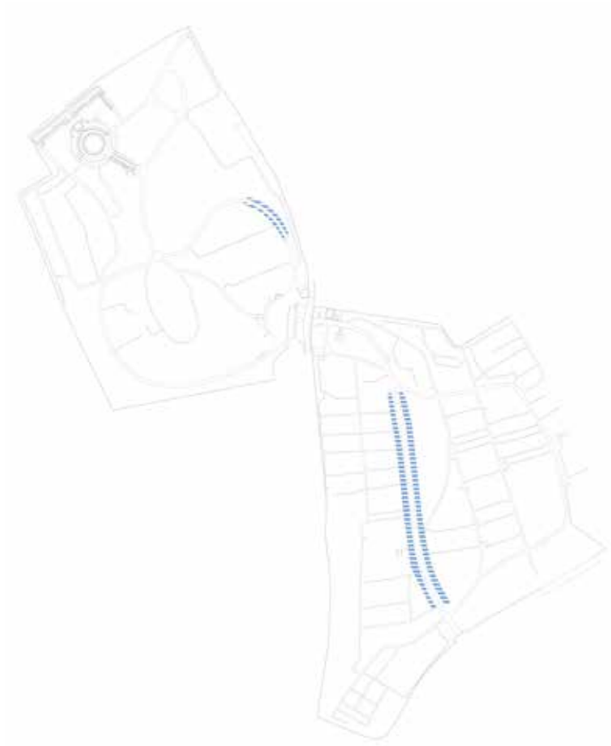
SP1 - Species rich lawn with sun on heavy soils - Indicative species

Bellis perennis

Lotus corniculatus

Primula vulgaris

Veronica chamaedrys



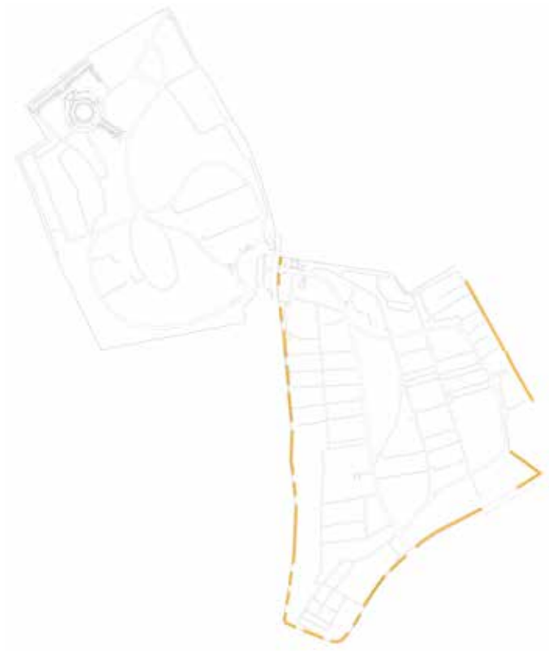
SP1 - Species rich lawn with sun on heavy soils

Gustafson Porter + Bowman

Hedgerow

• To address issues of growth interfering with pedestrians walking down the external side of the boundary wall, whilst maintaining nature conservation value a hybrid approach to cutting management is proposed.

• Once established the hedge to be maintained at the same height as the top of the railings



HR1 - Hedgerows

HR1 - Hedgerows - Drier Upper areas - Indicative species

Acer campestre

Ilex aquifolium

Prunus spinosa

Viburnum lantana

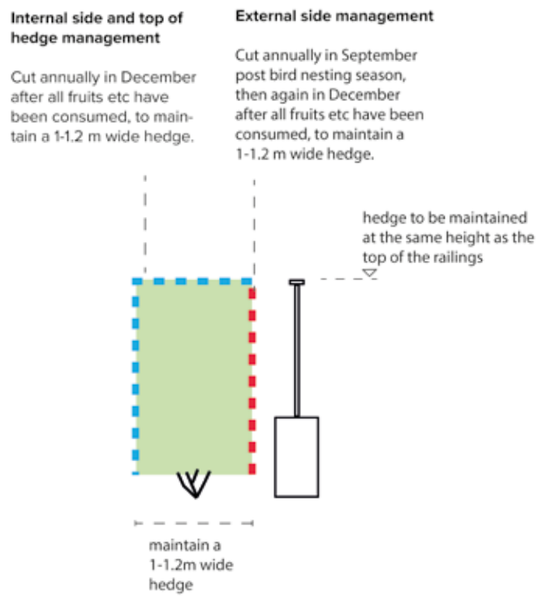
HR1 - Hedgerows - Moister low areas - Indicative species

Corylus avellana

Crataegus oxyacantha

Rhamnus cathartica

Viburnum opulus



Cutting Management

5.17 Spring Area

VEGETATION TYPOLOGIES

Gustafson Porter + Bowman

Spring area

• Retain the existing vegetation and plant in selected locations only to increase species diversity.

• Create planting holes in areas of least closed vegetation.

Eupatorium cannabinum

Caltha palustris

Iris pseudacorus

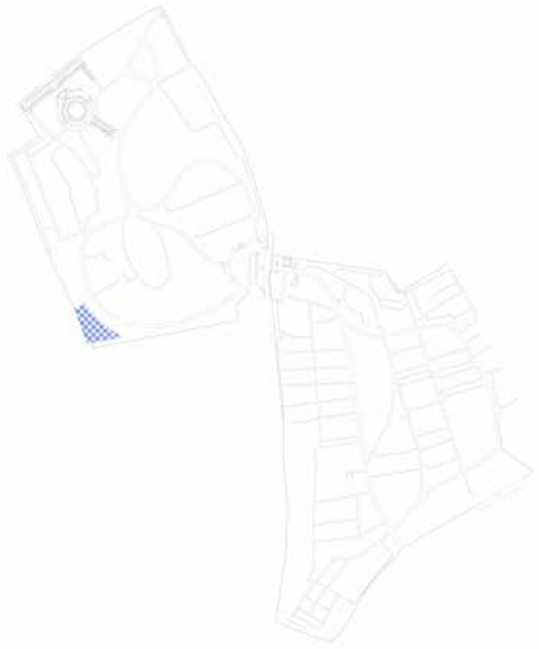
Juncus effusus

Lythrum salicaria

Osmunda regalis

Euphorbia palustris

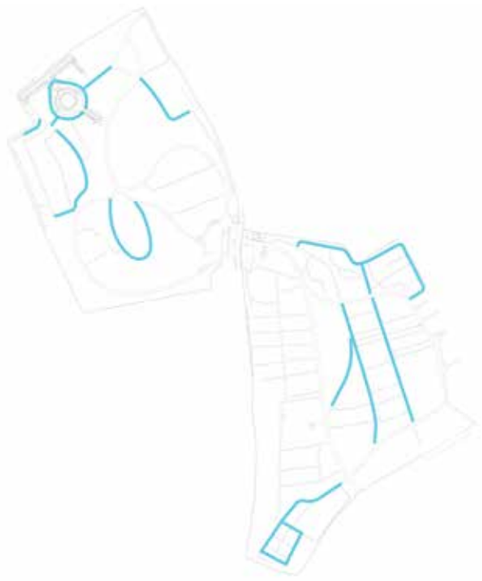
Iris sibirica



SA1- Spring area with sun on heavy soils

SuDS

- Rainwater run-off from surrounding soft and hard areas will be collected in swales and raingardens as part of the sustainable stormwater management system.
- The proposed SUDS systems will slow run-off whilst improving biodiversity.
- A diverse planting mix with localised shrubs and herbaceous plants that can cope with stormwater flood events is proposed for these areas.



SU1- SUDS

Eupatorium cannabinum

Deschampsia cespitosa

Libertia grandiflora

Juncus effusus

Succisa pratensis

Silene_flos-cuculi

Euphorbia palustris

Iris sibirica