

C4.0 Infrastructure and Amenity Planting

Introduction

Humans have been using landscapes as clues for navigation for millennia, and still look to recognise river corridors, tree groupings as landmarks for destinations and now road routes, approaches and gateway spaces. This planting is important now for wayfinding and character enhancement.

Planting or woody vegetation will form an important part of the GI creating amenity spaces, influencing their character and, in some instances, defining them. It will integrate new development within its surroundings, acting as an important carbon store and habitat creation.

Planting will take many forms from small shrub to large trees, avenue plantations, woodland and scrub.



C4.1 Roads

Overview

- C4.1.1 Infrastructure planting will be used along roads to carefully integrate routes with their surroundings. In some cases, planting could frame views, aid wayfinding and improve setting, character and identity. The vegetation will help with roadside pollution and carbon storage.
- C4.1.2 This planting type will have in some locations a very simple structure of evenly spaced trees, in some locations a diverse structure of trees with understory shrubs to provide relatively dense blocks of vegetation.

Functions

- C4.1.3 Primary Functions:

- Identity and wayfinding

- C4.1.4 Secondary Functions:

- Wildlife corridor
- Biodiversity offsetting
- Visual amenity
- Character enhancement

Principles

- C4.1.5 Design principles may set out:

- Key design principles, considerations and drivers
- Appropriate species ranges (e.g. rate of growth, appropriate character, biodiversity value, bird strike risk, resilience to climate change)
- Appropriate arrangement, groupings and interaction with adjacent features
- Integration with local, regional and national strategies
- Management and maintenance principles



Figure C4.1.1: Examples of infrastructure tree planting to roads



Figure C4.1.2: Tree planting in paving - image courtesy of GreenBlue Urban

C4.2 Utilities

Overview

- C4.2.1 The Project will require replacing or redirecting important utilities such as power and water. The movement of these facilities is an important and necessary part of the Project, and Heathrow is committed to deliver such works while minimizing effects for communities and the environment.
- C4.2.2 Most utilities require linear easements above them, which are corridors for maintenance or replacement access. The building of new development and the planting of trees may be restricted within these corridors.
- C4.2.3 In some cases the Project offers opportunities for improvement to landscapes such as in the under-grounding of overhead powerlines, or the creation of green open leisure routes along utility easement corridors.



Figure C4.2.1: Overhead powerlines - some may be relaid underground

Functions

- C4.2.4 Primary Functions:
- Productive landscapes
- C4.2.5 Secondary Functions:
- Habitat creation
 - Biodiversity offsetting
 - Informal recreation
 - Re-provided Public Open Space
 - Visual amenity
 - Character enhancement

Principles

- C4.2.6 Design principles may set out:
- Key design principles, considerations and drivers
 - Easements
 - Safety measures
 - Appropriate arrangement of planting and recreational features such as footpaths, kick about spaces etc.
 - Appropriate species ranges (e.g. rate of growth, appropriate character, biodiversity value, bird strike risk, resilience to climate change)
 - Integration with local, regional and national strategies
 - Management and maintenance principles

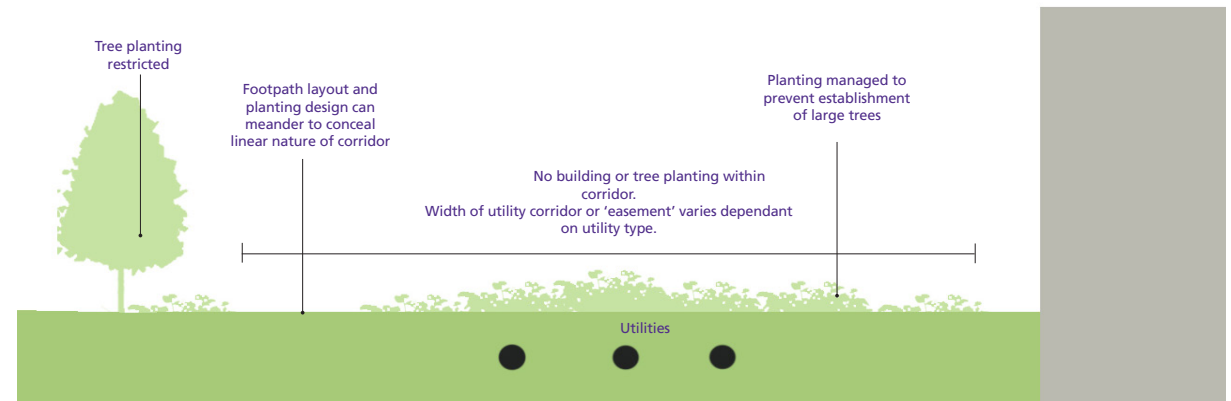


Figure C4.2.2: Diagram illustrating design considerations for utilities

C4.3 Buffer Planting to New Development

Overview

- C4.3.1 The Project requires a certain amount of new and relocated Airport Supporting Development (ASD) around the airport. This will require careful integration with surroundings, including though the use of appropriate landscape planting. This is referred to as 'buffer planting' within the Project proposals.
- C4.3.2 The width of the buffer planting surrounding ASD will respond to the sensitivity of adjacent land uses and communities. The character and species selection will respond to location and proximity to ecology corridors, airport boundaries and so on.

Functions

- C4.3.3 Primary Functions:
- To mitigate impacts on adjacent receptors
- C4.3.4 Secondary Functions:
- Visual amenity
 - Character enhancement
 - Wayfinding
 - Habitat creation and biodiversity offsetting
 - Water management

Principles

C4.3.5 Design principles may set out:

- Appropriate character (naturalistic or otherwise)
- Water treatment and management systems
- Appropriate species ranges (Species selection will take into account rate of growth, appropriateness to character, habitat and wildlife corridor creation, suitability regarding bird strike risks, resilience to climate change)
- Management and maintenance principles
- Existing trees and understory planting will be retained where possible and in accordance with BS 5837:2012.
- Where possible a range of maturities will be selected

C4.3.6 Buffer width varies dependant on ASD type and sensitivity of adjacent land uses and communities. ST1-ST4 are PEIR codes for different sorts of adjacent land uses with different levels of sensitivity:

- ST1 – 3m minimum maintenance buffer
- ST2 – 8m minimum landscape and maintenance buffer
- ST3 – 13m minimum landscape and maintenance buffer
- ST4 – 23m minimum landscape and maintenance buffer within the Project proposals

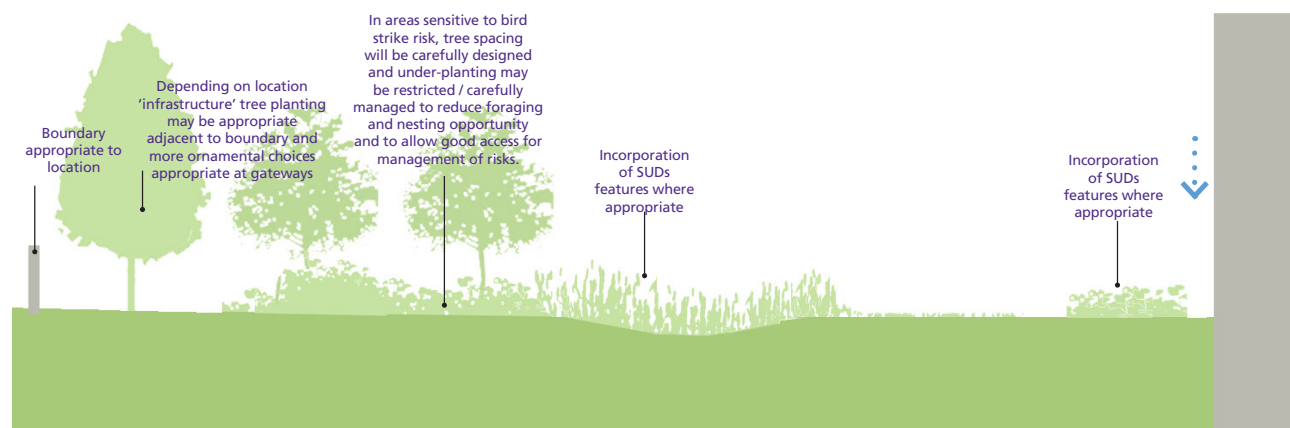


Figure C4.3.1: Diagram illustrating design considerations for buffer planting to new development

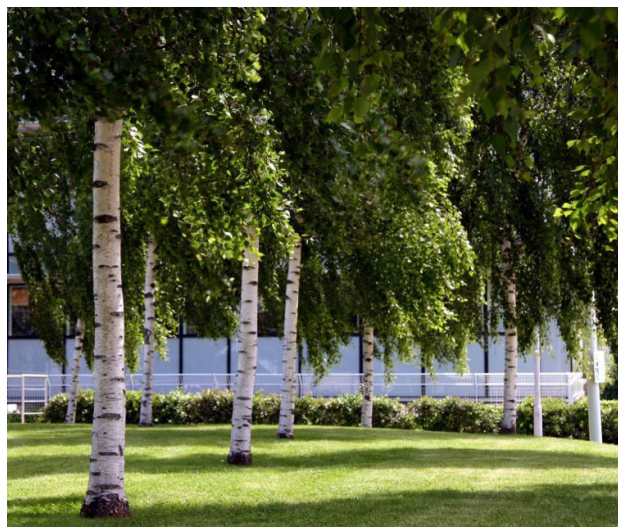


Figure C4.3.2: Examples of buffer planting

C4.4 Planting to Public Open Spaces

Overview

C4.4.1 This planting type will vary in character depending on location and application, and use a combination of tree and shrubs (and potentially perennials and herbaceous plants) to help create recreational and amenity landscapes and gardens.

C4.4.2 Important functions will be to enhance public amenity along with supporting biodiversity such as insect pollinators.

Functions

C4.4.3 Primary Functions:

- Re-provided Public Open Space

C4.4.4 Secondary Functions:

- Informal recreation
- Community events
- Visual amenity
- Character enhancement
- Habitat creation
- Biodiversity offsetting
- Water resource management
- Micro-climate / cooling effect, carbon sequestration

Principles

C4.4.5 Design principles may set out:

- Appropriate species ranges (e.g. rate of growth, appropriate character, biodiversity value, bird strike risk, resilience to climate change)
- Appropriate arrangement, groupings and interaction with recreational features such as footpaths, kick about spaces, etc., with consideration for safety and security
- Appropriate arrangement, groupings and interaction with adjacent features such as EPS corridors or land uses such as dwellings or Airport Supporting Development

- Sourcing of appropriate soils (the requirement to consult soil specialists and source soils locally where possible)
- Integration with local, regional and national strategies
- Management and maintenance principles

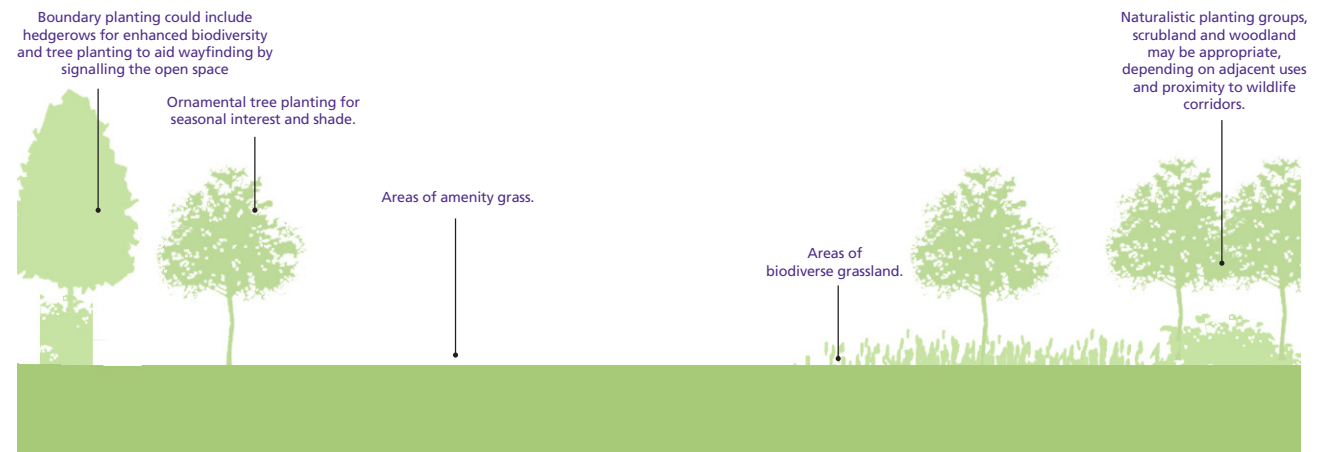


Figure C4.4.1: Diagram illustrating design considerations for planting to Public Open Space



Figure C4.4.2: Public Open Space is essential for human wellbeing and for wildlife

C4.5 Public Realm and Streetscapes

Overview

- C4.5.1 Planting to publicly accessible open space (public realm) will be important for the airport terminal areas and also for enhancements within the surrounding communities.
- C4.5.2 This formal planting type for areas of residential property and commercial activity (streetscape) will be largely dependent upon trees in paving areas with planting beds and areas of lawn.
- C4.5.3 Functions for this planting type include visual amenity, character enhancement or reinforcement, and helping biodiversity, along with air pollution and micro-climate benefits.

Functions

- C4.5.4 Primary Functions:
- Character enhancement

C4.5.5 Secondary Functions:

- Identity and wayfinding
- Community event
- Visual amenity
- Habitat creation
- Biodiversity offsetting
- SUDs and water resource management
- Micro-climate / cooling effect
- Carbon sequestration

Principles

C4.5.6 Design principles may set out:

- Appropriate species ranges (species selection will take into account rate of growth, appropriateness to character, habitat creation, suitability regarding bird strike risks, resilience to climate change)
- Appropriate arrangement, groupings and interaction with adjacent features such as buildings, roads, underground services and street furniture with consideration for safety and security
- Sourcing of appropriate soils (the requirement to consult soil specialists and source soils locally where possible)
- Integration with local, regional and national strategies
- Management and maintenance principles

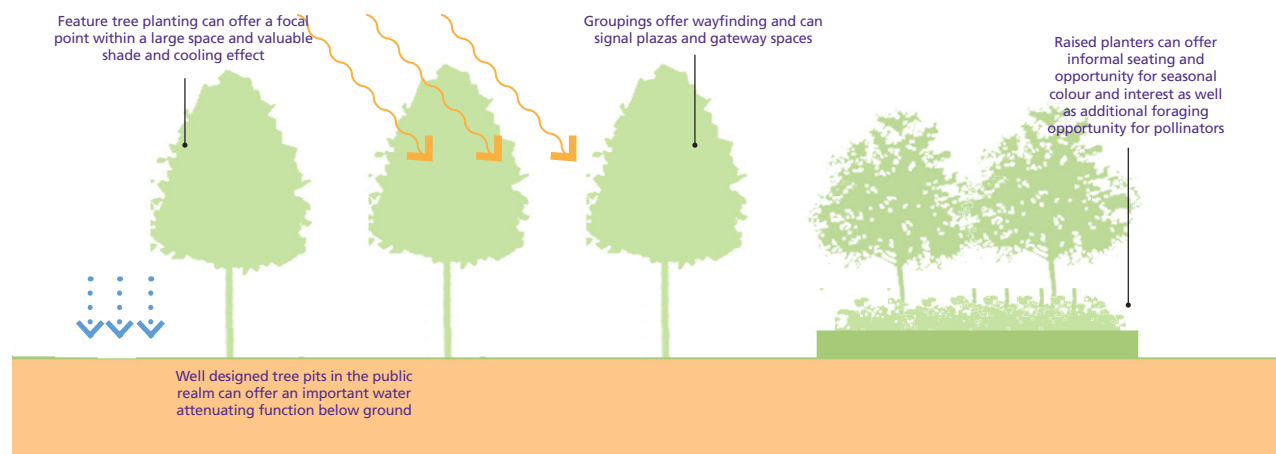


Figure C4.5.1: Diagram illustrating design considerations for public realm and streetscape



Figure C4.5.2: Appropriate tree planting is essential in establishing the right character

C4.6 Green and Blue Roofs

Overview

- C4.6.1 In some locations, the Project may be able to incorporate green and blue roofs.
- C4.6.2 Green roofs are roofs which incorporate special waterproofing, drainage and growing mediums such as lightweight aggregates and soils to support low and slow growing plant species such as sedums.
- C4.6.3 Green roofs are an excellent way to 'put back' spaces for wildlife where commercial and industrial uses are developed. They offer carbon sequestration and have a cooling effect for buildings and local micro-climate.
- C4.6.4 Consideration of bird strike risk will dictate potential locations and plant species, and will be an important factor in management and maintenance proposals.
- C4.6.5 Blue roofs are roofs with water attenuating properties and use water storing mediums such as lightweight aggregates or can incorporate a 'crate' system. Blue roofs are an important device in slowing the transport of water from rainfall to rivers, therefore helping with flood management and conservation of river corridors by managing flow rates. Blue roofs can also incorporate plants.

Function

C4.6.6 Primary Functions:

- SUDs and Water resource management

C4.6.7 Secondary Functions:

- Habitat creation

- Micro-climate / cooling effect
- Character enhancement (from the air)
- Visual amenity (from the air)
- Identity and wayfinding (from the air)
- Carbon storage

Principle

C4.6.8 Design principles may set out:

- Appropriate locations for application, taking into account bird strike risks and land uses
- Appropriate species ranges (species selection will take into account rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
- Sourcing of appropriate water management products with regard to sustainability and durability
- Sourcing of appropriate soils (the requirement to consult soil specialists and consideration for weight of soils)
- Integration with local, regional and national strategies
- Management and maintenance principles



Figure C4.6.1: Green roofs - growing medium and planting to roofs

C4.7 Greened Facades and Green Walls

Overview

- C4.7.1 In some locations it may be appropriate to incorporate planting to building facades which can provide a natural cooling system both for the building and surrounding landscape, reduce wind tunnel effects and soften the appearance of structures.
- C4.7.2 This Toolkit makes a distinction between green walls and greened facades. The term 'green walls' refers to the application of an artificial system of soil and water supply to a facade, requiring considerably greater maintenance but offering a greater range of species possibilities. Green walls may be more suitable to a limited number of gateway and/or terminal spaces.
- C4.7.3 The term 'greened facades' refers to the application of climbing plants to building facades and the choice of appropriate species is more limited but requires less maintenance.

Principles

- C 4.7.6 Design principles may set out:
- Appropriate locations for application, taking into account bird strike risks and land uses
 - Appropriate species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
 - Sourcing of appropriate water management products with regard to sustainability and durability
 - Sourcing of appropriate soils (the requirement to consult soil specialists and consideration for weight of soils)
 - Integration with local, regional and national strategies
 - Management and maintenance principles

Functions

- C4.7.4 Primary Functions:
- Visual amenity
- C4.7.5 Secondary Functions:
- Micro-climate / cooling effect
 - Carbon sequestration
 - Character enhancement
 - Identity and wayfinding



Figure C4.7.1: Green walls



Figure C4.7.2: Green facades

C4.8 Airfield / Trial Plots

Overview

- C4.8.1 Large areas of the new airfield will be covered by grassland to help with surface water drainage and reduce the heat island effect that large areas of hard landscape can generate in summer.
- C4.8.2 These grasslands will have well defined maintenance and management strategies to ensure they do not attract birds and play their part in the safe operation of the airport.
- C4.8.3 The Project is working with specialists to trial different grass types with improved carbon storage properties. This could increase the amount of carbon that is permanently locked up within the airfield grassland areas, thereby reducing carbon emissions from the Project. If successful, this smarter, brighter, greener technology could be used for all sorts of applications within the Project and beyond.

Functions

- C4.8.4 Primary Functions:
- Carbon storage
- C4.8.5 Secondary Functions:
- Education

Principles

- C4.8.6 Design principles may set out:
- Species ranges and potential applications
 - Integration with local, regional and national strategies
 - Management and maintenance principles



Figure C4.8.1: On-airport grasslands - safe for on-airport use

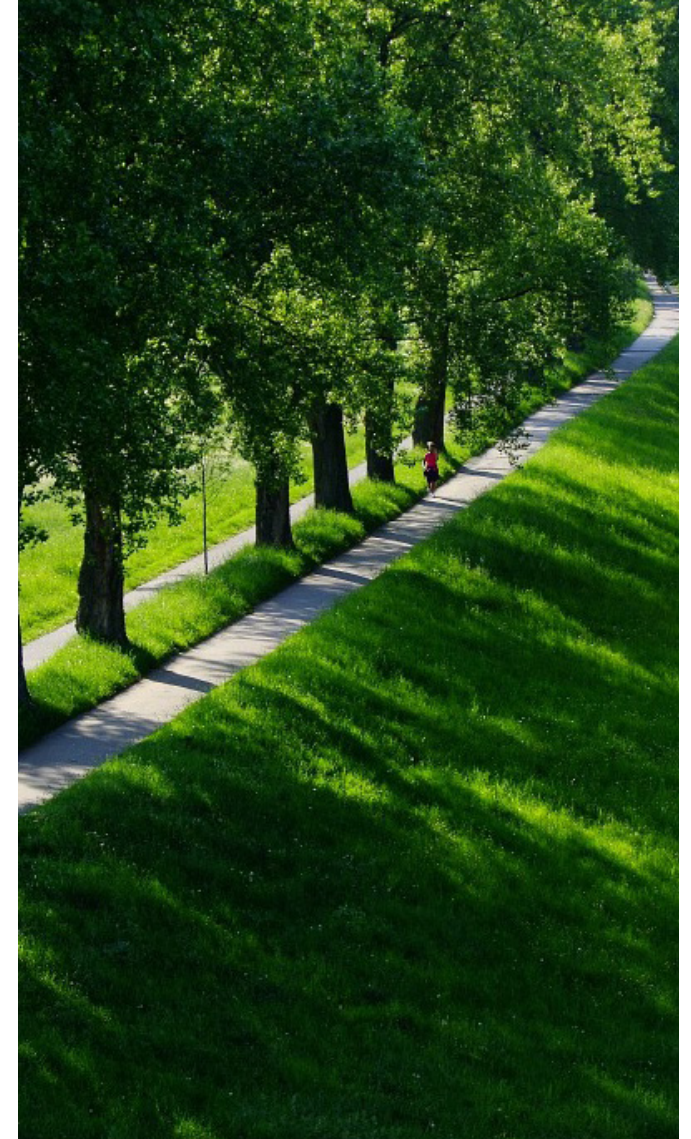
C5.0 Landforms

Introduction

The landscape around Heathrow is largely flat with man-made embankments and landfill being the most prominent permanent landforms. Gravel extraction has also made noticeable changes to this landscape.

The Project will require new landforms such as sloped embankments or linear bunds, most often formed with soil, in order to support structures, integrate different elements with their surroundings, and provide a buffer for noise.

Construction of the Project will also mean there are substantial temporary spoil mounds (stored soils and other materials) and borrow pits (created where the Project has extracted aggregates for construction).



C5.1 Interface with Engineered Structures / Features

Overview

- C5.1.1 Landforms will be used to support new structures, roads and the runway. These landforms will use natural ground profiles where space allows and reinforced steepened slopes where it is constrained. The reinforced earth slopes will be attractively finished and the natural slopes planted with species appropriate to location.

Functions

- C5.1.2 Primary Functions:

- Visual amenity

- C5.1.3 Secondary Functions:

- Micro-climate / cooling effect
- Carbon storage
- Habitat creation
- Identity and wayfinding

Principles

- C5.1.4 Design principles may set out:

- Appropriate species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
- Sourcing of appropriate soils (the requirement to consult soil specialists and consideration for weight of soils)
- Integration with local, regional and national strategies
- Management and maintenance principles



Figure C5.1.1: Landforms can 'blend' large structure into the landscape



Figure C5.1.2: Landforms can buffer biodiversity value



Figure C5.1.3: Landforms can take on a sculptural quality

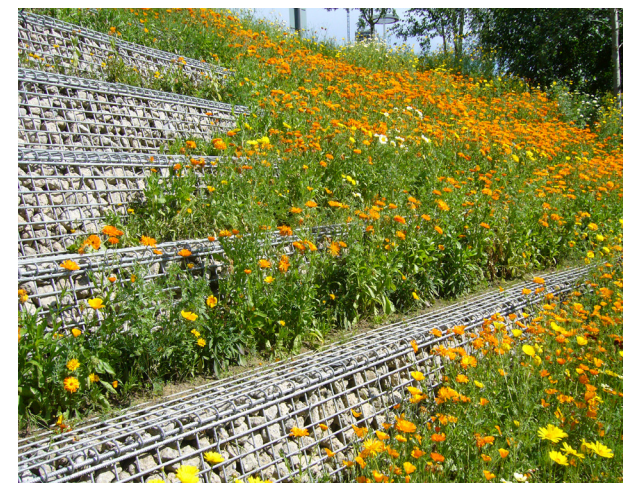


Figure C5.1.4: Retaining structures - gabion baskets

C5.2 Bunds (Noise and Visual)

Overview

- C5.2.1 Earth bunds (linear mounds of earth) will be used to provide noise attenuation and visual mitigation around the airport boundary and where space allows.
- C5.2.2 Noise bunds will be planted with airfield grass and managed in the same way to reduce risk of bird strike.

Functions

- C5.2.3 Where possible, visual mitigation bunds will be planted with other types of grassland including biodiverse grass and incorporate tree planting to integrate parts of the development with their surroundings and generate wildlife habitats.

Principles

- C5.2.4 Primary Functions:
- Noise attenuation, visual amenity
- C5.2.5 Secondary Functions:
- Character enhancement
 - Identity and wayfinding
- C5.2.6 Design principles may set out:
- Appropriate species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
 - Sourcing of appropriate soils (the requirement to consult soil specialists)
 - Integration with local, regional and national strategies
 - Management and maintenance principles

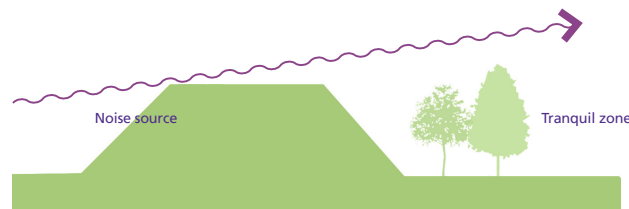


Figure C5.2.1: Diagram illustrating design considerations for noise bunds



Figure C5.2.2: Bunds for visual mitigation

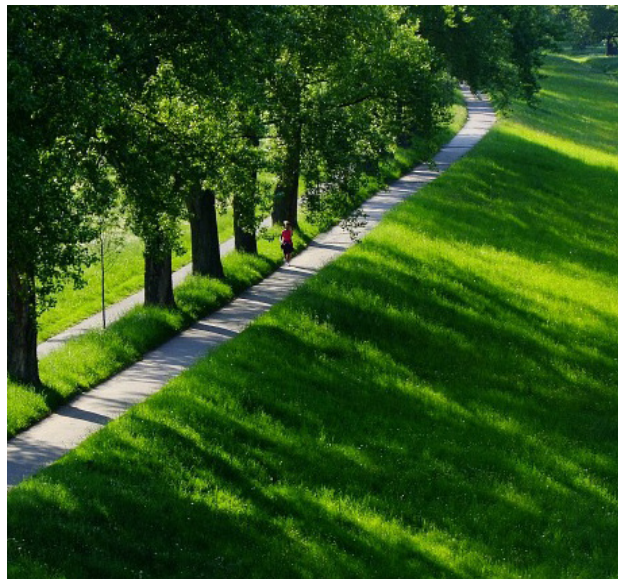


Figure C5.2.3: Noise bunds can take on a sculptural quality



Figure C5.2.4: Temporary bunds for visual mitigation

C5.3 Borrow Pits and Spoil Heaps / Soil Stores

Overview

- C5.3.1 These are temporary landscape features created during the construction phase of the works.
- C5.3.2 Borrow pits will be created where gravel deposits are excavated. This will happen to ensure aggregate reserves are not sterilised by construction, or in areas where flood alleviation basins are required.
- C5.3.3 Borrow pits will be in-filled after the construction process with either excavated materials (to create new landfills) or water.
- C5.3.4 Spoil heaps and soil stores will be temporary stockpiles of excavated material. They may be seeded with wild flowers where possible to improve their appearance during the construction works, whilst offering important temporary foraging sites for bees, butterflies and other pollinators.
- C5.3.5 The conservation of soils will be an important part of the Project including their longer term safeguarding and resilience to potential erosion. Good quality soils will be conserved and re-used within the Project, for example, to provide new landscaping or for displaced allotments.

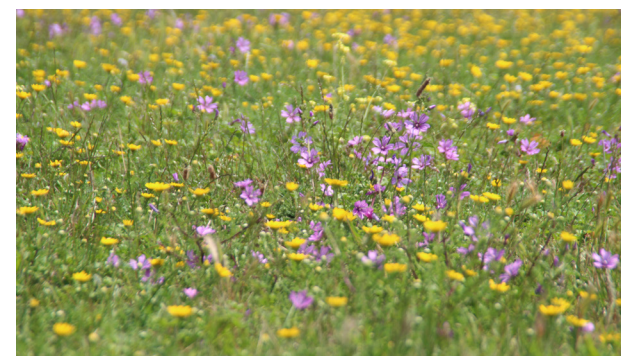


Figure C5.3.1: Seeded spoil heap can offer temporary habitat for pollinators

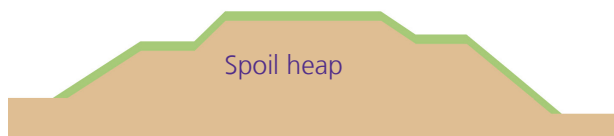


Figure C5.3.2: Borrow pits and spoil heaps

C6.0 Boundaries

Introduction

The boundary proposals for the Project will take a number of different forms depending upon the required function of each section. These include:

- Temporary boundaries during the construction phase
- Airside security fence
- Noise and blast barriers
- New walls and fences associated with re-provided Public Open Space and amenities

Some of the roads may also require acoustic fencing.



C6.1 Temporary / Construction Fence

Overview

- C6.1.1 These will be required during the construction phase to protect the public from access to work areas, but also to contain views of the construction and help reduce wind blown materials.
- C6.1.2 There will be opportunity to include viewing windows and interpretation boards on the temporary hoardings to facilitate communication with adjacent community groups.

Functions

- C6.1.3 Primary Functions:

- Visual amenity

- C6.1.4 Secondary Functions:

- Education

Principles

- C6.1.5 Design principles may set out:

- Appropriate graphic character
- Safety and security
- Location of viewing points



Figure C6.1.1: Graphics and greening



Figure C6.1.3: Viewing windows



Figure C6.1.2: Hoarding for sites



Figure C6.1.4: Interpretation of historic findings

C6.2 Security Fence

Overview

- C6.2.1 This is a requirement for the safe operation of the airport and will provide a continuous secure boundary. The design of this element is fixed, as is its location relative to the airport airfield and features outside of the airport boundary.
- C6.2.2 Where possible, buildings and landscape features will conceal the airport security boundaries.

Functions

- C6.2.3 Primary Functions:
- Airport security

Principles

- C6.2.4 Design principles may set out:
- Key design principles, considerations and drivers
 - Safety and security requirements
 - Appropriate adjacent species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
 - Management and maintenance



Figure C6.2.1: Examples of security fences

C6.3 Noise and Blast Barriers

Overview

- C6.3.1 Barriers will be required for noise and blast attenuation around the edges of the airfield. Blast attenuation barriers protect boundaries from jet engines. These locations will include taxiway turns and the ends of runways, particularly in close proximity to residential and public areas.

Functions

- C6.3.2 Primary Functions:

- Noise and blast attenuation

Principles

- C6.3.3 Design principles may set out:

- Safety and security requirements
- Appropriate materials, finishes and appearance
- Appropriate adjacent species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
- Management and maintenance



Figure C6.3.1: Planted blast walls along the Southern Perimeter Road



Figure C6.3.2: Noise wall with photovoltaics fitted



Figure C6.3.3: 5m high freestanding blast walls at T5



Figure C6.3.4: Noise wall with planting

C6.4 Acoustic Fence

Overview

C6.4.1 Acoustic fencing may be used along sections of roads in close proximity to housing and Public Open Space. Planting may be used where possible, to better integrate boundaries with their surroundings.

Functions

C6.4.2 Primary Functions:

- Noise attenuation

Principles

C6.4.3 Design principles may set out:

- Safety and security requirements
- Appropriate materials, finishes and appearance
- Appropriate adjacent species ranges (species selection will take into account desired effects, rate of growth, habitat creation, suitability regarding bird strike risks, resilience to climate change)
- Management and maintenance

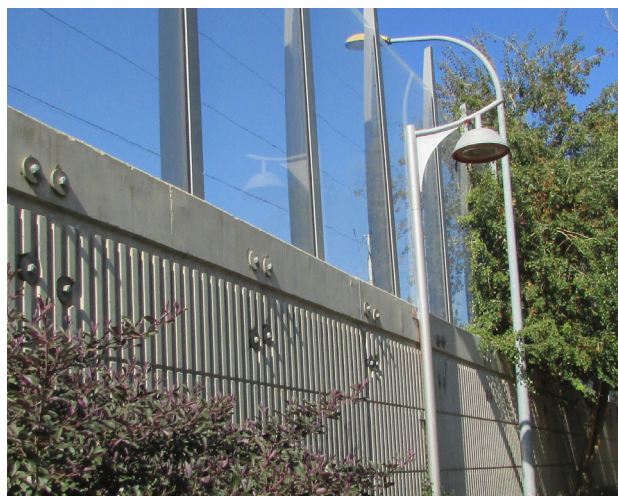


Figure C6.4.1: Examples of roadside acoustic fencing