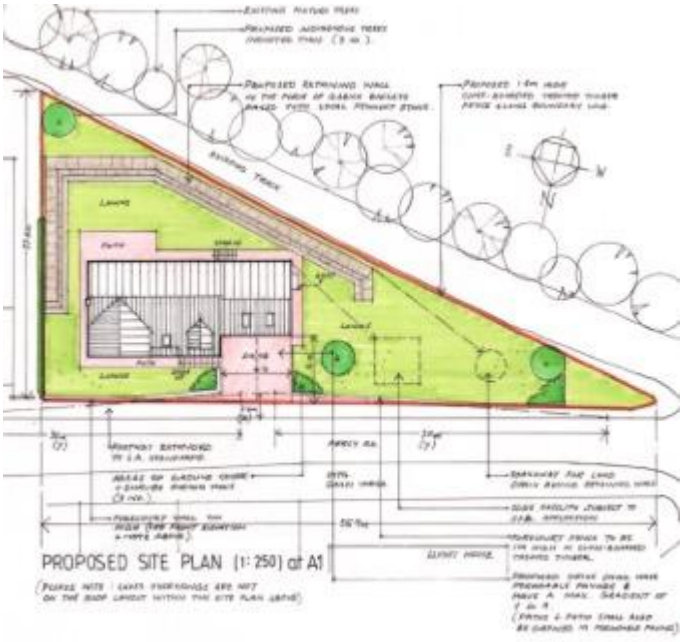
Green infrastructure & Biodiversity Statement

Proposed Detached Dwelling



Percy Road, Cynnonville, Port Talbot, SA13 3HL

Contents

1. Introduction

2. Legislative Context

3. Green infrastructure Design

4. Benefit Analysis

5. Conclusion

1. Introduction

This green infrastructure (GI) statement the planning application for a single dwelling at Percy Road; a thoughtful addition that embraces sustainable living. The dwelling proposed for Percy Road is intended to enhance the valleys natural beauty, whilst also addressing the need for new housing within the area.

Site Drawing; Application Document

This development isn't simply about space; it's about responsible growth. It acknowledges the deep connection between human well-being and environmental health. The design strikes a harmonious balance: expanding living space while minimising environmental impact. This statement details the measures woven into the design, measures that tell a story of sustainability.

Beyond fulfilling immediate needs, the dwelling fosters a deeper connection with the environment. It envisions a haven for the homeowner and wildlife alike, where built and natural environments blend together, fostering a sense of shared existence. This statement is the roadmap for achieving this vision, detailing the design choices that prioritise ecological health and showcases how thoughtful design and a commitment to GI principles can pave the way for progress that doesn't come at the expense of the natural world, but rather, thrives alongside it. This statement demonstrates that environmental well-being and human comfort can co-exist in harmony.

2. Legislative Context

The integration of Green Infrastructure (GI) into planning and development has become a cornerstone of sustainable, resilient, and healthy communities in Wales. Underpinning this approach is a robust framework of legislation and policy, guiding the creation of Green Infrastructure Statements (GIS) that ensure effective planning and delivery of GI benefits. This document delves into the key elements of this framework, drawing upon Planning Policy Wales (PPW), Natural Resources Wales (NRW), and The Environment (Wales) Act 2016.

PPW is the basis spatial planning in Wales; significant emphasis on GI has been placed here. Policy PPW10 specifically addresses GI, advocating for

its proactive and integrated approach into planning decisions. This policy requires planning authorities to:

- Identify, protect, and enhance: Existing GI networks and assets, including parks, woodlands, rivers, and green corridors.
- Provide and deliver: New GI provision proportionate to the scale and impacts of development.
- Deliver measurable: Net environmental gains through GI interventions.
- Prepare and consider: GIS alongside planning applications, particularly for developments with significant impacts.

PPW further strengthens GI's role through policies like PPW7 (sustainable development), PPW9 (sustainable transport), and PPW11 (natural resources and waste). These policies emphasise GI's contribution to biodiversity protection, climate change mitigation and adaptation, flood risk management, and public health and well-being.

NRW plays a crucial role in supporting and guiding GI implementation. Their "Building with Nature" framework provides practical guidance for incorporating GI into development projects. Additionally, NRW's Green Infrastructure Assessment (GIA) methodology offers a valuable tool for developers and planning authorities to assess the existing GI provision, potential impacts of development, and opportunities for GI enhancement. NRW also contributes to GI policy through its Area Statements, which set out regional priorities for environmental management and identify key GI corridors and opportunities. Furthermore, NRW's role in managing and protecting designated landscapes and habitats adds another layer to the GI framework, ensuring consistency and coherence with wider environmental objectives.

The Environment (Wales) Act 2016 is landmark legislation introduces a set of principles and duties that further elevate the importance of GI. The "Sustainable Management of Natural Resources" principle requires public authorities to take actions that contribute to the improvement of the state of the environment, with GI serving as a key tool for achieving this. Furthermore, the Act's duty on public bodies to "promote biodiversity" places additional emphasis on GI's role in

enhancing and protecting habitats and species. These principles and duties, alongside the Act's focus on long-term planning and ecosystem resilience, provide a robust legal framework for embedding GI into all aspects of decision- making.

The combined force of PPW, NRW's guidance and tools, and The Environment (Wales) Act 2016 creates a comprehensive and dynamic framework for GI in Wales. Green Infrastructure Statements, informed by this framework, play a crucial role in ensuring that GI is effectively planned, delivered, and monitored, contributing to the creation of vibrant, healthy, and resilient communities for future generations.

3. Green Infrastructure Design

Green infrastructure design in architecture is a sustainable approach that enhances buildings and their surroundings through the incorporation of natural elements. This can lead to numerous benefits, including improved energy efficiency, reduced stormwater runoff, and enhanced occupant well-being. The project will delve into the aspects of GI and biodiversity enhancement and as such, demonstrate how the philosophy of a greener, sustainable future has been at the core of the design

03.1 // Green Space

Background: Traditionally, hard standing is specified which act as impervious surfaces, accelerating rainwater runoff and increasing pressure on drainage systems. This can contribute to flooding, water quality issues, and urban heat island effects

Justification: A mixture of lawned gardens offers a sustainable solution creating natural ecosystems. The vegetation absorbs rainwater, slowing down runoff and replenishing groundwater. It also filters pollutants, improves air quality, and provides valuable habitat for pollinators and other wildlife. This aligns with PPW TAN 6's emphasis on sustainable drainage and NRW's objectives for promoting biodiversity and healthy ecosystems.

03.2// Permeable Paving:

Background: Conventional paving prevents rainwater infiltration, leading to increased surface water runoff and reduced groundwater recharge. This can exacerbate flood risks and strain drainage systems.

Justification: Permeable Paving allows rainwater to permeate the ground, replenishing groundwater reserves and alleviating pressure on drainage infrastructure. This aligns with PPW TAN 6's focus on managing surface water and NRW's guidance on mitigating flood risks. Additionally, permeable surfaces contribute to cooler urban environments by allowing for better heat dissipation, addressing the urban heat island effect as outlined in PPW TAN 6. More specifically, PPW Policy 5.8 encourages developments to "implement sustainable drainage systems", while Policy 8 emphasises the need for "managing and reducing the risk of flooding". This coupled with guidance from Wales Sustainable Drainage Systems Design Manual (2019): advocates permeable paving in new developments to manage surface water runoff sustainably.

03.4// Native Species Planting:

Background: Non-native plant species can disrupt local ecosystems and displace native flora and fauna.

Justification: Providing green spaces and nature corridors with native species creates a biodiverse environment that supports local wildlife populations. These plants are adapted to the local climate and soil conditions, requiring less maintenance, and promoting healthy soil development. This aligns with the Wales Act 2016's emphasis on biodiversity and NRW's guidance on habitat creation and ecosystem services.

03.5// Wildlife Features:

Background: A development can fragment habitats and reduce opportunities for wildlife populations to thrive.

Justification: Installing bird boxes, bird feeders, and hedgehog houses provides vital recourses and shelter for these species, encouraging them to utilise the site and contributing to a balanced ecosystem. This aligns with the Wales Act 2016's duty to maintain and enhance biodiversity and promotes public awareness about wildlife conservation. The proposal will facilitate 'Bee Bricks' and Bird Boxes. Bee Bricks provide a safe nesting place for non-swarming solitary bees like red masons and leafcutters. These measures align with PPW Policy 11 which encourages developments to "protect and enhance biodiversity and geodiversity", while Policy 5.4 advocates for "supporting the resilience of ecosystems and natural recourses.". The Wales Biodiversity Strategy 2020-2030 underscores the importance of providing nesting sites for birds and encourages actions that support bird populations.

4. Benefit Analysis

The proposed Green Infrastructure (GI) measures for this project will offer a multitude of advantages for both the project and the surrounding community. These features will demonstrably contribute to a healthier environment and a more vibrant local area.

Effective Stormwater Management:
The green areas and permeable paving will work together to efficiently manage rainwater. By reducing surface runoff and allowing for infiltration, they will alleviate pressure on drainage infrastructure and mitigate flood risks. This not only protects the immediate property but also benefits the wider community by ensuring a safer and more resilient environment. Additionally, the vegetation on the green roof will improve air quality by filtering pollutants and releasing oxygen.

Enhanced Biodiversity and Educational Value:
The areas for native planting will provide a valuable habitat for pollinators, birds, and insects, promoting biodiversity within the built environment. The strategically planted native species around the extension will further contribute to a thriving ecosystem by offering food and shelter for local wildlife. This not only enriches the natural world but also serves as an educational resource, raising awareness about the importance of native species and environmental stewardship.

Sustainable Water Management and Resilience:
The rainwater harvesting system will capture and store rainwater for later use, reducing reliance on mains water resources. This not only benefits the environment by lessening the strain on treatment infrastructure but also provides a reliable backup during periods of drought or water restrictions.

Commitment to Sustainable Materials and Local Economy:
The project's use of reclaimed or locally sourced building materials will minimise its environmental footprint by reducing transportation emissions and conserving recourses. This approach not only benefits the planet but also supports the local economy by strengthening the community's fabric.

Lasting Benefits for All:
The positive impacts of these GI measures will extend far beyond the immediate project. Improved air quality, enhanced biodiversity, and reduced flood risks will contribute to a healthier and more liveable environment for residents and the wider community. Additionally, the focus on sustainable materials sets a positive precedent for future developments, ensuring a more sustainable future for generations to come.

5. Conclusion

In conclusion, the proposed Green Infrastructure (GI) provides a commitment to building a sustainable and environmentally responsible development. By meticulously integrating these features, the project will contribute to a healthier planet, a more vibrant local environment, and a resilient community. Local authorities have a duty (known as a biodiversity and resilience of ecosystems duty) under the environment (Wales) Act 2016 to seek to maintain and enhance biodiversity in the exercise of their functions. Section 6.4.12 of planning policy Wales states that *'where biodiversity enhancement proportionate to the scale and nature of the development is not proposed as part of the application, significant weight will be given to its absence, and unless other significant material considerations indicate otherwise it will be necessary to refuse permission'*. Where possible, the existing on-site habitat will be retained to ensure that species are not affected by the development. Native species of local provenance grown in the UK will be used for any new planting on the

site. A soft and hard landscaping plan will need to be provided to inform the green infrastructure statement and demonstrate net biodiversity benefit (NBB) and includes:

- **Appendix A -** Detailed planting/sowing specifications include species, size, density spacing, cultivation protection (fencing staking, guards) and methods of weed control
- **Appendix B -** Details of surfacing, boundary treatments and landscaping structures including design, location, hedgehog accessibility, size, colour, material and openings.
- **Appendix C -** Details of planting of rainwater gardens and other sustainable urban features.
- **Appendix D -** Details of the immediate and ongoing management of the site.
- **Appendix E -** Details of the funding mechanisms in place to plan can be successfully implemented.

From the areas from native planting and permeable paving managing stormwater, rainwater harvesting system promoting water conservation and the native species plantings fostering biodiversity, each measure showcases a dedication to environmental stewardship. Furthermore, the focus on sustainable building materials minimises the project's footprint and supports the local economy, setting a positive precedent for future development. The measures extend far beyond the immediate project. Reduced flood risks, improved air quality, and enhanced biodiversity will create a healthier and more liveable environment for residents and the wider community. Moreover, the educational value of the landscaped area and the focus on sustainable materials serve to raise awareness about environmental responsibility and inspire future generations to adopt similar practices.

The development transcends its physical form to become a beacon of sustainability. By demonstrating a holistic approach to environmental responsibility, it showcases how development can coexist harmoniously with nature and contribute positively to the local community. This project sets a compelling example for future developments, paving the way towards a more sustainable and resilient future for all.

Appendix A

This appendix details the proposed list of appropriate planting and sowing for the development. The aim is to enhance biodiversity, create an attractive environment using native species, and contribute to the local green infrastructure network. The objective is as follows:

- Enhance visual amenity and create a sense of place rooted in the local landscape.
- Provide habitat for native wildlife (birds, insects, small mammals).
- Improve air quality and reduce noise pollution.
- Manage surface water runoff.
- Provide shade and cooling in summer.
- Integrate the development seamlessly into the surrounding Welsh landscape.

Feature	Species (Common & Latin name)	Size/ Age	Density/ Spacing	Cultivation & Protection	Weed Control	Maintenance
Hedging (Boundary)	Crataegus monogyna (Hawthorn)	60-80cm high, feathered	3 plants per metre	Plant in well-drained soil amended with compost. Stake for the first year. Protect from rabbits with netting.	Mulch with bark chips. Hand weed regularly.	Trim annually in late summer.
Hedging (Internal/ Smaller)	Ilex aquifolium (Holly) as a native alternative, but it grows slower.	20-30cm high, bushy	5 plants per metre	Plant in well-drained soil. Trim regularly to maintain shape.	Hand weed regularly.	Trim twice a year, in spring and late summer.

Trees (Specimen)	Corylus Avellana (Hazel)	2-3m high, feathered	1 tree per garden	Plant in a large pit amended with compost. Stake securely. Protect with a tree guard.	Mulch around the base. Hand weed regularly.	Prune as needed to maintain shape and remove deadwood. Be mindful of its eventual large size.
Trees (Smaller/ Ornamental)	Sorbus aucuparia (Rowan)	1.5-2m high, multi-stem	1 tree per garden	Plant in a pit amended with compost. Stake for the first year.	Mulch around the base. Hand weed regularly.	Prune lightly as needed.
Shrubs (Foundation Planting)	Viburnum opulus (Guelder Rose)	40-60cm high, container grown	3 plants per square metre	Plant in well-drained soil.	Mulch with bark chips. Hand weed regularly.	Prune after flowering.
Shrubs (Flowering)	Cornus sanguinea (Dogwood)	40-60cm high, container grown	3 plants per square metre	Plant in well-drained soil.	Mulch with bark chips. Hand weed regularly.	Prune as needed. Provides good winter colour.
Groundcover	Hedera helix (Ivy)	Established plants in trays	5 plants per square metre	Plant in well-drained soil.	Hand weed until established.	Minimal maintenance required.
Lawn	Festuca rubra (Red Fescue) / Poa pratensis (Smooth Meadow grass)	N/A	Sow at a rate of 30g per square metre	Prepare the ground thoroughly. Rake in seed and water regularly.	Control weeds before sowing.	Mow regularly

	seed mix - Choose a mix specifically for UK conditions.					
Wildflower Meadow (Highly Recommended)	Native wildflower seed mix suitable for South Wales (e.g., Centaurea cyanus (Cornflower), Papaver rhoeas (Poppy), Leucanthem um vulgare (Ox-eye Daisy), Silene dioica (Red Campion), Prunella vulgaris (Selfheal))	N/A	Sow at a rate recommende d by the seed supplier	Prepare the ground by removing topsoil. Sow seed in autumn or spring.	Minimal maintena nce required after establish ment. Cut once a year in late summer.	Allow natural regeneration.

Appendix B

This appendix details the proposed surfacing, boundary treatments, and landscaping structures for the development of two dwellings. The proposal prioritises functionality, aesthetics, and ecological considerations, including hedgehog accessibility.

1. Surfacing

- Driveway: Material: Permeable block paving (e.g., concrete block pavers with gaps for drainage) or gravel. This allows rainwater to infiltrate the ground, reducing runoff and supporting groundwater recharge.
- Colour: Natural, muted tones (e.g., grey, buff) to complement the house exteriors and surrounding landscape.

- Design: A simple, functional layout with clearly defined edges. Consider incorporating a permeable paving grid system within the gravel driveway for stability and to prevent rutting.

Paths:

- Material: Compacted gravel, permeable paving (as above).
- Colour: Natural, earthy tones to blend with the surroundings.
- Design: Curved and straight paths as appropriate, connecting different areas of the garden.

Patios/Terraces:

- Material: Permeable paving on compacted gravel (as above).
- Colour: Natural tones that complement the house and garden.
- Design: Sized appropriately for outdoor seating and dining areas.

2. Boundary Treatments

Front Boundary:

- Material: Low level natural stone wall (+ close board fencing to the eastern portion of the frontage of the site).
- Height: No more than 1 metre to maintain visibility.

Side and Rear Boundaries:

- Material: Close board fencing (treated timber), maintain existing hedge to western boundary.
- Height: Up to 1.8m meters for privacy. Additional consideration for incorporating climbing plants (e.g., native honeysuckle, ivy) to soften the fence line and provide habitat.

Hedgehog Access: Crucially, ensure gaps of at least 13cm x 13cm are created at the base of all solid boundaries (fences, walls) to allow hedgehogs to roam freely. These "hedgehog highways" are essential for their survival. Multiple openings are preferable. Don't rely on gaps under gates, as these may be blocked.

3. Landscaping Structures

Retaining Walls (if needed):

- Material: Local Natural Stone
- Design: Built to appropriate engineering standards. Consideration for incorporating planting pockets within the wall to soften its appearance and provide habitat, including bee bricks.

Shed/Outbuilding (if provided later by occupiers):

- Material: Timber or other materials that blend with the surroundings.
- Colour: Natural or muted tones.

Compost Bin/Area: A designated area for composting garden waste, ideally located discreetly.

4. Design Considerations

- **Style:** The overall design should complement the architectural style of the houses and the character of the surrounding landscape.
- **Sustainability:** Prioritise the use of sustainable materials (e.g., locally sourced stone, reclaimed timber, permeable paving).
- **Accessibility:** Ensure that paths and surfaces are accessible for all users.
- **Maintenance:** Choose materials that are easy to maintain.

5. Hedgehog Accessibility – Specific Details

- **Location of Openings:** Distribute hedgehog access points along all boundaries. Ideally, aim for a connection to neighbouring gardens or green spaces.
- **Signage:** Consider adding small signs near the openings to raise awareness among residents and prevent accidental blocking.
- **Clearance:** Ensure that there is clear space on either side of the openings to allow hedgehogs to pass through easily.

Appendix C

This appendix details the soakaway as the sustainable urban feature for managing surface water. Details on this are provided below.

SUDS/SAB Facility

- **Location:** The facility should be located in a sustainable area of the garden, away from buildings and boundaries. It should be designed to receive overflow from the rainwater gardens and other drainage systems. (see site plan).
- **Design:** The facility should be sized appropriately to handle the expected rainfall runoff from the development. It typically consists of a series of buried plastic crates designed by an engineer.
- **Construction:** Excavate a pit of the required size and line it with a geotextile membrane to prevent soil from clogging the facility.

In addition to this the other features have been included such as:

- **Permeable Paving:** As mentioned previously, permeable paving should be used for driveways, paths, and patios to allow rainwater to infiltrate the ground.
- **Wildlife-Friendly Planting:** Choose native plants that provide food and shelter for wildlife. Avoid using pesticides and herbicides.
- A soakaway to cater for the land drain behind the retaining walls.

These landscape features should be integrated into a comprehensive SUDS proposal (Design and approval to be provided separately) for the development. The system should be designed to effectively manage rainwater runoff, reduce the risk of flooding, and improve water quality. To maintain these features the following should be considered:

- Planted areas/ Rainwater Gardens: Regularly remove debris from the gardens and ensure that the inlet and outlet are clear. Prune plants as needed.
- Soakaway/SUDS Facility: Periodically inspect the soakaway to ensure that it is functioning properly.
- Permeable Paving: Sweep permeable paving regularly to prevent it from becoming clogged with dirt and debris.

The maintenance of the systems will have the following positive outcomes:

- Reduced rainwater runoff and flooding risk.
- Improved water quality through filtration.
- Enhanced biodiversity.
- Increased groundwater recharge.
- Aesthetically pleasing landscapes.
- Reduced reliance on traditional drainage systems.

Appendix D

Immediate Management (Post-Construction)

Planting and Establishment:

- **Watering:** Newly planted trees, shrubs, and other plants will require regular watering, especially during dry periods, for the first two years after planting. A watering schedule will be established and followed.
- **Weed Control:** A thorough initial weeding will be carried out after planting. Mulching will help to suppress weed growth. Regular hand-weeding will be necessary.
- **Protection:** Tree guards and other protective measures will remain in place until plants are established and no longer vulnerable to damage.
- **Inspections:** Regular inspections will be carried out to monitor plant health and identify any issues (e.g., pests, diseases).

Surfacing and Structures:

- **Cleaning:** Any debris or construction materials will be removed from paved areas and other surfaces.
- **Inspection:** Surfaces and structures will be inspected for any damage or defects.

Rainwater Gardens and SUDS:

- **Initial Inspection:** Rainwater gardens and the soakaway will be inspected to ensure they are functioning correctly.
- **Debris Removal:** Any debris or sediment will be removed from the rainwater gardens.

Ongoing Management

Plant Maintenance:

- **Watering:** Watering will be provided as needed, especially during prolonged dry periods. Established plants will require less frequent watering.
- **Weed Control:** Ongoing weed control will be carried out through a combination of mulching, hand-weeding, and occasional spot application of herbicides if necessary (using environmentally friendly options).
- **Pruning:** Trees and shrubs will be pruned as needed to maintain their shape, health, and vigor. Pruning schedules will be developed for each species.
- **Fertilising**: Fertilisers will be applied sparingly and only as needed. Slow-release organic fertilisers are preferred.
- **Pest and Disease Management:** Plants will be monitored for pests and diseases. Integrated pest management strategies will be used, prioritising non-chemical methods.
- **Lawn Care:** The lawn will be mown regularly during the growing season. Fertilising and weed control will be carried out as needed.
- **Hedge Maintenance:** Hedges will be trimmed annually to maintain shape and density.

Surfacing and Structures:

- **Cleaning:** Paved areas will be cleaned regularly to remove dirt and debris.
- **Maintenance:** Surfaces and structures will be inspected regularly for damage and repaired as needed.

Rainwater Gardens and SUDS:

- **Regular Inspection:** Rainwater gardens and the soakaway will be inspected regularly to ensure they are functioning correctly.
- **Debris Removal:** Debris and sediment will be removed from the rainwater gardens as needed.
- **Plant Maintenance:** Plants in the rainwater gardens will be maintained as described above.
- **Soakaway Maintenance:** The soakaway will be inspected periodically to ensure it is draining effectively.

Hedgehog Habitat Management:

- **Hedgehog Highways:** Ensure that hedgehog access points are kept clear and unobstructed.
- **Leaf Litter:** Leave some leaf litter in undisturbed areas to provide habitat for hedgehogs and other wildlife.
- **Avoid Pesticides:** Avoid using pesticides and other chemicals that could harm hedgehogs.

3. Responsibilities

- **Initial Establishment:** The landscape contractor will be responsible for the initial establishment of the green infrastructure elements, including planting, watering, and weed control.
- **Ongoing Maintenance:** The homeowners will be responsible for the ongoing maintenance of the green infrastructure. A landscape maintenance plan will be provided to the homeowners. Alternatively, homeowners might choose to contract a landscape maintenance company.

Appendix E

This appendix details the funding mechanisms in place to ensure the successful implementation of the green infrastructure plan for the development of two dwellings.

1. **Development Costs**

The primary funding source for the green infrastructure elements will be integrated within the overall development costs. This includes:

- **Initial Installation**: The costs associated with the initial installation of all green infrastructure components (planting, surfacing, boundary treatments, rainwater gardens, soakaway, etc.) will be included in the construction budget. This will be managed by the main contractor.
- **Professional Fees:** Fees for landscape architects, arborists, or other consultants involved in the design and implementation of the green infrastructure will also be covered within the development budget.

2. **Potential Grant Funding (Exploration Stage)**

While not guaranteed, the possibility of securing external grant funding to supplement the green infrastructure budget will be explored. Potential sources include:

- **Local Authority Grants:** Check with the local council for any grants or funding schemes related to green infrastructure, biodiversity enhancement, or sustainable drainage systems.
- **Welsh Government Grants:** The Welsh Government may offer grants related to environmental improvements or sustainable development. It's worth researching current programs.
- **Environmental Charities and Organisations:** Some environmental charities or organisations may offer small grants for community projects or initiatives that enhance biodiversity. Examples might include local Wildlife Trusts.
- **Community Funds:** If the development is part of a larger community initiative, there might be access to community funds that could be used to support the green infrastructure.

Note: Securing grant funding can be a competitive process and often requires detailed applications and project proposals. The likelihood of success and the timeline for

funding should be carefully considered. The project should be viable even without securing external grants.

3. Long-Term Maintenance Funding

The long-term maintenance of the green infrastructure will be the responsibility of the homeowners. This should be clearly communicated to the purchasers of the properties. Potential funding mechanisms for ongoing maintenance include:

- **Individual Homeowner Budgets:** Each homeowner will be responsible for budgeting for the maintenance of the green infrastructure within their own property. The landscape maintenance plan will provide guidance on the estimated costs involved.
- **Landscape Maintenance Contracts:** Homeowners may choose to contract a landscape maintenance company to carry out the necessary work.

4. Monitoring and Evaluation

The effectiveness of the green infrastructure will be monitored and evaluated over time. This will help to identify any maintenance needs or areas for improvement. The costs associated with monitoring and evaluation should be factored into the long-term maintenance budget.

6. Transparency and Communication

The funding mechanisms for the green infrastructure should be transparent and clearly communicated to all stakeholders, including the planning authority, the developers, and the future homeowners.