

Grange Castle

A creative ecosystem
where business, people
and ideas can flourish



Landscape report

grangecastle.ie



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LOCATION:

The Grange Castle West area is located approximately 16km southwest of Dublin International Airport, 10km west of Dublin City Centre and 1.5 km west of Clondalkin Village centre, Nearby towns and villages include Lucan 2.5km to the north, Tallaght 3km to the south east, Saggart 4 km to the southwest and Newcastle 3km to the west; all these are population centres within South County Dublin, with Leixlip, Co. Kildare, located 6km to the northwest.

The area is located approximately 3km west of the M50 Dublin orbital motorway and is in very close proximity to the strategic road and mainline and commuter rail connections to the West, Southwest and South of Ireland.



IMAGE 1 – Grangecastle West Development location.

SOUTH DUBLIN COUNTY DEVELOPMENT PLAN:

DEVELOPMENT PLAN OBJECTIVES:

Land use in the study area is subject to the objectives and polices of the South Dublin County Development Plan 1998.

Objective E: To provide for Industrial and related uses;

Objective F: To preserve and provide for open space and recreational amenities.

The most significant land-use planning issues affecting the study area and surroundings include:

- The application of the principles of sustainable development;
- The close integration of development with existing and future public transportation;
- The protection of residential amenity;
- The balanced development of the area for a range of appropriate uses, including residential, business and amenity;
- The extent of development appropriate to areas now zoned for agricultural use;
- Conformance with the planning polices and standards relating to Casement Aerodrome.

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- Balance between work zones, people and wildlife and certain heritage aspects;
- Biodiversity - habitat conservation and creation, wildlife corridors;
 - Landscape improvements and amenity
 - Implementation of stormwater harvesting and Water Sensitive Urban Design elements at the micro-scale in the restoration of a more natural water balance, along with increased vegetation cover;
 - Main, secondary and discovery tertiary paths;
 - Central main road;
 - Landscape typologies that enrich the masterplan area;
 - Landscape boundaries that create natural connectivity and reduce / increase the visual contact with the surroundings.



IMAGE 3 – Grangecastle West Masterplan proposal.

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EXISTING LANDSCAPE INFRASTRUCTURE ON SITE:

The Grange Castle West site already has an existing landscape design implemented on site indicated on the image with blue colour codes including the following elements:

- 01 - The Main Entrance;
- 02 - Dual Carriageway Landscape proposal;
- 03 - Roundabouts;
- 04 - A lake with a surrounding recreation area;
- 05 - Integrated constructed wetland area;
- 06 - Boundary treatment berm planted with woodland 2m high;
- 07 - Boundary treatment berm planted with woodland 3m high;
- 08 - Wet woodland - planting on a 2m high berm;
- 09 - Proposed footpath;
- 10 - Lake access footpath;

The green colour codes are the pre-development existing hedgerow corridors that are retained within the campus for biodiversity reasons along with new woodland areas to add to the site:

- 11 - Tall existing hedge 8m tall x 6m wide;
- 12 - Small stream;
- 13 - New scrub woodland planting;



IMAGE 4 – Existing landscape infrastructure on site.

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EXISTING LANDSCAPE INFRASTRUCTURE ON SITE AND PROPOSED DESIGN:

The **business park Main Entrance** has limestone clad wing-walls that encapsulate an extensive reception area for people, cyclists and vehicles that serves as a distinctive land-mark with its distinctive design.

The pedestrian areas around the main road into the business park are surfaced with silver-grey granite resin bound pebbles. Raised corten steel planters (with different heights and planted with ornamental planting) and large specimen trees Silver Maple *Acer saccharinum* positioned in bespoke designed corten steel tree grilles are arranged organically within the resin bound paving and divide the space into smaller areas creating an interesting and dynamic visual aesthetic integrated with the circulatory aspects.

As a security limit to the footpath area the design also has concrete monospace spherical 500mm diameter bollards.

The **Dual Carriageway** has been designed as a distinctive landscape feature in itself and provides the main spine road into the site. The linear aspect of the road is reinforced with strong lines of avenue trees.

To the centre there are Oak trees with a groundcover of evergreen *Lonicera pileata* and to either side of the road there are lines of *Liquidambar styraciflua* and then outside the footpath/cycletrack an alignment of Dawn Redwood *Metasequoia glyptostroboides* trees.

The boundaries of the dual carriageway zone are created by *Fagus sylvatica* Beech hedging creating a formalised limit to the public roadway.

Between the footpath and the perimeter hedge the landscape space that is c. 10m in width shall include high pressure gas and district heating services that shall be protected from tree roots with root barriers.



IMAGE 5 to 7: 5 - Business Park Main Entrance; 6 - Design detail of raised planters; 7 - Dual Carriageway view;

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The masterplan incorporates new footpaths to link the dual carriageway with each new business that will be located perpendicular to the dual carriageway road giving direct access to each company. Within the development lands outside the dual carriageway zone i.e. beyond the Beech hedge, a 10m wide zone is allocated to landscape design for each venture e.g. for ornamental planting, low level grass or planted mounding, tree planting with the type of planting related to the level of privacy being sought. These zones shall also be used for SUD systems such as rain gardens, natural pool areas, swales etc..

The site **attenuation lake** is on a grand scale and has both engineering and important recreational and visual functions; it has 3 levels of water created by two stone weirs that were installed with a special stepped construction to create natural effects with the water; there are also large fountains installed to either end of the lake and a resin-bond path around the water feature creating a looped walk. To the lake edge there are habitat planting zones including aquatic planting near the border of the water, dry planting and wet woodland in some points. Part of the existing stream that connects with the other side of the dual carriageway road via a box culvert is also planted with riparian species. Wildflower meadow with perennial flowers, grass areas and parkland trees also help to create a bigger mosaic and biodiversity along with perimeter woodland planting. A grass mound is located to the east side of the lake, near the pump house station and the wetland area, which helps to create physical separation with adjoining areas as well as creating a nice element to be used for recreation. Further enhancements in the vicinity of the lake will include seating areas and a social space with a canopy structure.



IMAGE 8 and 9: 8 - Existing attenuation lake area; 9 - Existing roundabout view;

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The **existing roundabouts** have ornamental planting and a Silver Maple tree in the centre of each roundabout. The planting design for each roundabout uses corten steel edging to create patterns and division between selected natural stone, boulders or pea gravel and planted areas to create more texture.

Glow pebbles are used to create luminosity of the roundabouts at twilight.

Low level planting is employed to ensure that there is appropriate visibility over each roundabout.

The masterplan proposes additional roundabouts that will be treated with the same landscape design approach but with different designs.



The **perimeter of the business park is created with a specific boundary treatment** berm typically 2m high and c. 10m wide around the perimeter with a 3m high berm of c. 15m width used where additional early screening is required.

The berms are planted with high canopy woodland on the top and scrub planting to the edge to give a natural look to the planting.

The masterplan will retain the surfaced routes already constructed near the berms to the southern boundary and depending on the dimensions of the development sites the rest of the site perimeter will also include looped walks, biodiversity corridors, and other informal recreational spaces as well as biodiversity planting. Perimeter berms of 2m height will also be formed.



Along the **existing Tobermaglugg stream hedgerows** have been retained as Bat Corridors. This has been gapped up with new native hedgerow planting and native trees.

The rest of the stream corridor will be treated using the same strategy and planting mixes.

Where stream bank stabilisation is needed bioengineering methods will be employed.



IMAGE 10 to 12: 10 - Existing roundabouts landscape plan; 11 - Existing boundary treatment; 12 - Existing Tobermaglugg stream hedgerows view;

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A 10metre buffer zone will be created to both sides of the stream and other important wildlife corridors. These areas will be planted as riparian buffer zones.

Certain important **existing hedgerows have been retained** as wildlife corridors and these have been gapped up with new native hedgerow planting also.

Additional wildlife corridor hedgerows will be composed of 10m wide High Canopy Woodland planting with, to each side, 3 metre wide zones of groundcover, a pollinator friendly flower mix or meadow grass.

Scrub woodland planting has been planted to the rear of the entrance area and it also located at certain hedgerow junctions and additionally where there are existing areas of retained woodland or tree groups.

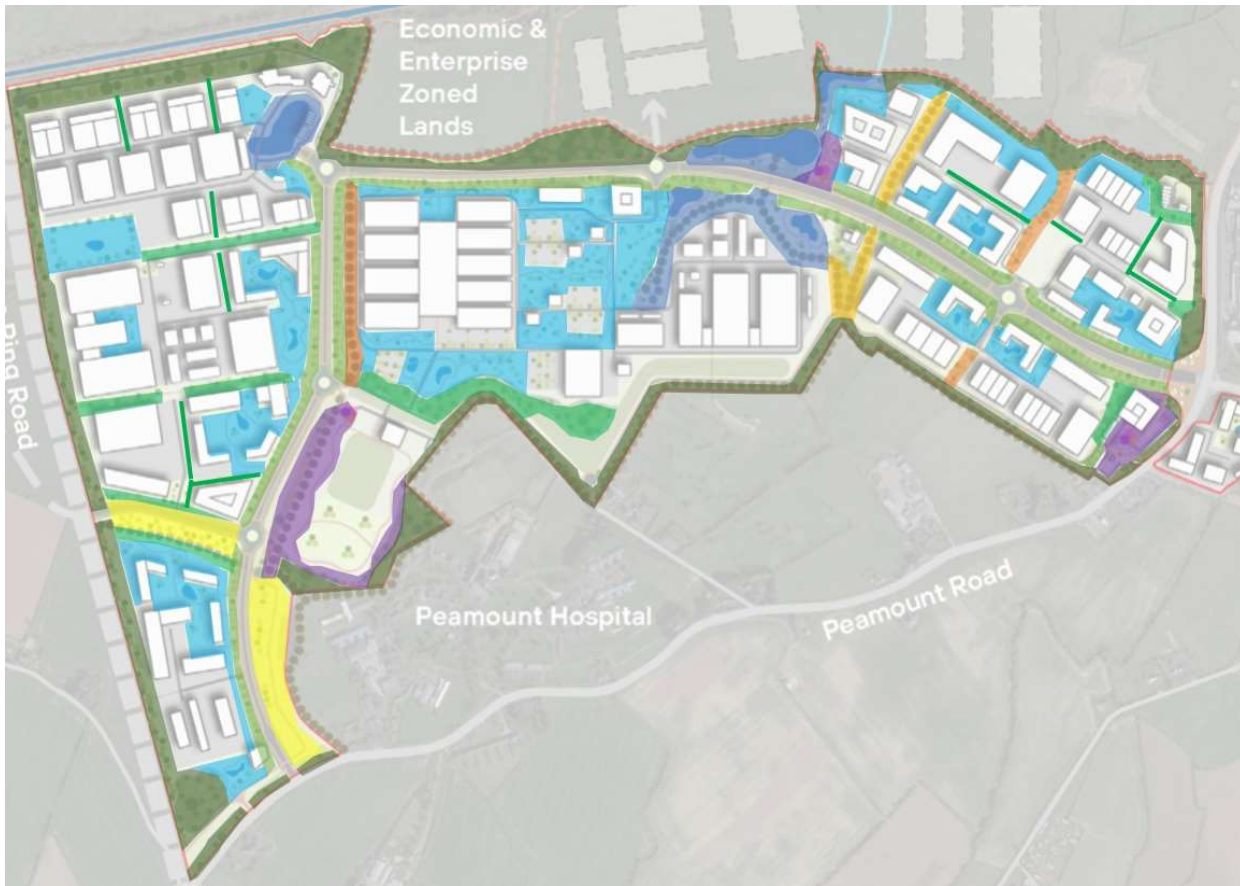
The masterplan proposes further woodland planting.













IMAGE 13 and 14: 13 - Existing hedgerow to be retained; 14 - Scrub woodland area;

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THE NEW PROPOSAL



-  New Boundary woodland areas to expand existing areas creating new woodland zones for biodiversity
 -  Stream area with riparian buffer and planting areas near water, wet areas, ditches, drainage zones...
 -  Existing hedgerows to be retained
 -  Proposed hedgerows
 -  Proposed screen planting for new businesses
 -  Existing and proposed Dual Carriageway 10 meters landscape zone + 10 meters zone to create landscape frontage to each adjoining business
 -  Proposed boundary hedge with possible fence 2m height to the rear
 -  Proposed landscape areas for each business with planting areas, SUDS system with capacity to reduce rain flow to the drainage system, seating areas, loop footpaths; using permeable paving, car parking swales or rain garden for water pollution treatment (all to be designed for each business)
 -  Amenity point with gym equipment and seating area and a beautiful view to the reservoir, and exercise loop circuit. Innovation Hub and Mobility Hub areas.
 -  Proposed wayleave areas
- IMAGE 15 – Masterplan landscape proposed typologies.

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MAIN LANDSCAPE TREATMENTS FOR ALL DEVELOPMENT SITES:

EXISTING HEDGEROWS AND PROPOSED

The hedgerows are important elements of the site's green infrastructure for biodiversity and to create a sense of naturalness.

- The existing hedgerows have been retained, maintained and gaps planted using the mix given in appendix 1.
- New hedgerows will use the same mix given in Appendix 1.
- The existing and new hedgerows will have protection zones of 12 metres allocating 6metres for the hedgerow itself and 3 metres to either side to plant meadow grass or pollinator friendly flower mixes;
- It will be prohibited to remove the existing hedgerow lines indicated on the landscape and ecological proposal.
- The new hedgerows may incorporate approved passages with a minimum usable space e.g. footpath 1.8m wide or road (6m) + footpath (1.8m). To each side of the passage taller trees shall be used to facilitate birds and bats passing over the road.

SCREEN PLANTING

Proposed screen woodland planting is to be used near secondary roads or between businesses. The mix to use will be given in Appendix 1;

EXISTING DUAL CARRIAGEWAY 10 METRES ZONE

Between the footpath and the perimeter hedge the landscape space that is c. 10m in width shall include high pressure gas and district heating services that shall be protected from tree roots with root barriers placed to locations specified by the landscape architect.

The new proposal will open new footpaths to each new business perpendicular to the road to give a main access to each company.

These areas will remain with grass and planting as per the overall masterplan design.

PROPOSED WAYLEAVE AREAS

The proposed way leaves will be planted only with any of: grass, pollinator friendly flowers, groundcover mixes, ornamental planting mixes or small shrubs, as per the mixes given in Appendix 1.

AMENITY POINT NEAR THE EXISTING LAKE

The existing lake will be an amenity area to engage with nature where will be includes:

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- Seating areas to different locations around the lake.
 - A picnic area with a canopy structure near the east mound.
- All the outdoor furniture should use the same or similar approved materials and RAL colours as the existing landscape project on site to give sense of unity to the overall business park design.



IMAGE 16 to 18: 16 and 17- Examples of seating areas; 18 - Example of canopy;

AMENITY POINT NEAR THE RESERVOIR

The road and Amenity point near the reservoir will include:

- Gym equipment to different locations.
- Seating areas to different locations.
- Looped exercise circuit.
- Shrubs, groundcover planting and, trees.
- The Reservoir will be landscaped with grass and has footpaths in its locality.
- All the outdoor furniture should use the same materials and RAL colours as the existing landscape project on site or similar approved to give a sense of unity to the design.
- Maintenance / health running track divided into four training difficulty levels, which consist of increased running times: the first level features a 100-metre run with intervals of 25 metres (identified in yellow) ; the second level features a 200-metre run with 50-metre intervals (identified by the blue colour); the third level shows a 400-metre run with a 100-metre range (identified by the red colour), and the last will be of 200 metre range. This track thus allows for interval training, resulting in the participants running 1km or more and providing for elimination training versus competitors.



IMAGE 19 to 22: 19 - Maintenance/ health running track diagram; 20 to 22: Examples of running tracks;

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BOUNDARY WOODLAND AREAS

The boundary corridors are important aspects of the green infrastructure for biodiversity.

- The outer perimeter is bounded by berms typically 2m in height, c. 10m wide with some areas having a 3m high berm c. 15m wide where additional screening is required earlier in the development.
- Existing perimeter hedgerows are to be retained
- The berms are planted with high canopy woodland on the top and scrub planting to the edge to give a natural look to the planting.
- The masterplan will retain the surfaced routes already constructed near the berms to the southern boundary and depending on the dimensions of the development sites the rest of the site perimeter will also include looped walks, biodiversity corridors, and other informal recreational spaces as well as biodiversity planting.
- In some areas the boundary woodland will be enhanced with scrub woodland planting.
- Scrub woodland copses are to be planted at the hedgerow junctions.
- Additional areas of scrub and main woodland are to be included.
- The boundary woodland areas identified in the masterplan will have minimum width of 30 metres, composed of 20 metres of woodland and then an edge zone of grass meadow or pollinator flower mix.
- The woodland and scrub mixes are given in Appendix 1.

STREAM CORRIDOR

The existing stream corridor is an important element of the green infrastructure for biodiversity.

- The existing stream is 1.5m depth and includes some existing riparian vegetation.
- All the stream corridor will be treated using the same strategy including tree planting and riparian vegetation mixes.
- To either side of the watercourse a 20metre wide riparian buffer is to be retained, 10metre to each side of the stream composed of 6metres of scrub vegetation and 4metres of a wetland grass meadow mix.
- The new businesses located near the stream shall give 10metres distance to either side of the stream for stream protection. This area will be planted as a riparian buffer zone, as described above.
- Where stream bank stabilisation is needed bioengineering methods will be employed.
- The mixes to be used are given in Appendix 1.

CARRIAGEWAY EXTENSION

The road extensions do not have a central median as per the main dual carriageway. The rest of the road section shall retain the same aspects as the main dual carriageway.

- On both sides of the road a line of *Liquidambar styraciflua* will be planted and to the outside of the footpath/cycleway an avenue of Dawn Redwood *Metasequoia glyptostroboides*.
- The boundaries to either side will be planted with Beech *Fagus sylvatica* hedging.

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- Between the footpath and the perimeter hedge the landscape space that is c. 10m in width shall include high pressure gas and district heating services that shall be protected from tree roots with root barriers.
- New footpaths will link the main roads to each new business that will be located perpendicular to the dual carriageway road giving direct access to each company.
- Within the development lands outside the dual carriageway zone i.e. beyond the Beech hedge, a 10m wide zone is allocated to landscape design for each venture e.g. for ornamental planting, low level grass or planted mounding, tree planting with the type of planting related to the level of privacy being sought. These zones shall also be used for SUD systems such as rain gardens, natural pool areas, swales etc..

DEVELOPMENT TYPE: BLOCK STRUCTURAL DIAGRAM:



- Proposed green roofs as part of the SUDS system to reduce runoff
- Possible vertical garden to enhance green buildings and to collect the rain water from the roof
- Existing and proposed Dual Carriageway and roads: 10 metre landscape zone
- Proposed 10 metre wide landscape zone for each business
- New Boundary woodland areas to expand existing areas creating new woodland zones for biodiversity (to be composed of high canopy woodland to the core, scrub woodland at the edges and marginal zones of pollinator flowers/grass meadow)
- Proposed screen planting for the new business
- Proposed rain gardens (SUDS system)
- Landscape design areas to include lawn areas, groundcover, ornamental planting, footpaths, seating areas etc.

IMAGE 23 – Development type: block structural diagram and landscape typologies.

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LANDSCAPE TREATMENT FOR DEVELOPMENT SITES:

LANDSCAPE ZONE TO ROAD:

The front landscape zone for each Business will have 10 metres minimum of landscape to include:

- Small or large grass or groundcover mounds to reduce visibility to the development building, which could be combined with trees or specimen shrubs.
- No fence or wall shall be located in the front area, all type of screening shall be completed with plants or topography such as grass mounds.
- This area can also incorporate some SUDS elements, such as rain gardens, swales or natural ponds.
- The paving areas should be reduced to a minimum and need to be permeable.
- No car parking should be proposed to the front zone. All the car parking will go to the rear of the buildings;
- The front could also have a vertical garden and lower planting with fewer trees or shrubs.
- The main footpath link to the Dual Carriageway or main road shall account for existing masterplan trees and vegetation.
- The paving of the main footpath should be concrete, 1.8m width and be entirely perpendicular to the main road.
- All the outdoor furniture should use the same materials and RAL colours as the existing landscape project on site or similar approved to give a sense of unity to the design.
- A list of trees and plant mixes is given in Appendix 1.

INTERIOR BLOCK TYPOLOGY

The interior block area should incorporate green spaces for recreation for each business or group of business:

- The design proposals shall include footpaths for recreation, seating and social use areas.
- The main footpaths should be of concrete, block paving or resin bound systems to colours and finishes as per the overall masterplan and have minimum of 1.8m width.
- All general paving or surfaced areas should be totally permeable;
- The interior block areas shall be composed of extensive green areas incorporating lawn, groundcover plants, ornamental shrubs, pollinator plants, and trees.
- Landscape design is to be unified and create a green environment for each business.
- SUDS elements, such as rain gardens, swales and natural pools shall be present in this area as part of the recreation area and/or as part of the car parking drainage system.
- Green roofs and vertical gardens, if proposed should also be used as part of the SUDS system.
- All the outdoor furniture should use the same materials and RAL colours as the existing landscape project on site or similar approved to give a sense of unity to the design.
- A list of trees and plant mixes is given in Appendix 1.

CAR PARKING

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- Car parking should be located within the interior block typology as part of the overall design but should not dominate the green infrastructure.
- The car park paving should be permeable and shall be integrated with the SUDS system.
- The rain gardens for the car parking SUDS systems will have a minimum size of 2.7m width to collect car park water.
- Permeable paving or green grass paving systems shall be employed as part of the SUDS system.
- A list of trees and plant mixes is given in Appendix 1.



IMAGE 24 – Example of permeable car parking with rain garden solution, footpaths and trees

SUDS SYSTEM

The SUDS system of each development or development group shall be developed to its maximum capacity to reduce the runoff.


The SUDS system shall include:

- Rain gardens, swales, natural pools, green roofs, vertical gardens use preferentially roof water for irrigation, Stockholm tree pits. In addition, car park permeable paving and permeable footpath paving.
- Engineering drainage shall include the nature based solutions as part of its capacity calculations.
- A list of trees and plant mixes is given in Appendix 1.

SECURITY FENCING

Where additional security is needed mesh fencing systems 2m in height, black in colour, may be employed coupled with screening hedgerows using Beech *Fagus sylvatica* to reduce the fence visibility from the outside.































APPENDIX 1 – LANDSCAPE PLANTING MIXES

 Pollinator plant









 Native Plant

FOR PLANTING TO CREATE NEW WOODLAND AREAS NEAR THE BOUNDARIES, TO EXPAND EXISTING AREAS, CREATE NEW WOODLAND ZONES, SCREEN PLANTING etc.

High Canopy Woodland Planting

Core: species planted @ 2m c/cs random planting	Qty / m ²	Size	%
Area (m ²)			
Alnus glutinosa 	0.25	1+1 60-90cm	7%
Betula pendula 	0.25	1+2 90-120cm fth	4%
Betula pendula 	0.25	1+1 60-90cm	7%
Corylus avellana 	0.2	1+1 60-90cm	5%
Crataegus monogyna  	0.25	1+1 60-90cm	7%
Ilex aquifolium  	0.25	CG 2L 40-60cm	9%
Pinus sylvestris 	0.25	CG 5L 60-90cm	9%
Prunus spinosa  	0.25	1+2 60-90cm	5%
Quercus petraea 	0.25	1+2 90-120cm fth	3%
Quercus petraea 	0.25	1+1 60-90cm	3%
Salix caprea  	0.25	0+1 60-120cm	2%
Quercus robur 	0.25	1+2 90-120cm	3%
Total Plant Numbers			64%
Edge: species planted @ 1.5m c/cs random planting to outer perimeter	Qty / m ²	Size	%
Crataegus monogyna  	0.44	1+1 60-90cm	3%
Corylus avellana 	0.3	1+1 60-90cm	3%
Euonymus europaeus  	0.44	1+1 60-90cm	3%
Ilex aquifolium 	0.44	CG 2L 40-50cm	3%
Prunus spinosa  	0.44	1+0 60-90cm	3%
Rosa canina  	0.44	1+1 40-60cm	3%
Salix caprea  	0.44	0+1 60-120cm	3%
Salix cinerea  	0.44	0+1 60-120cm	3%

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Sambucus nigra  	0.44	1+1 60-90cm	3%
Sorbus aucuparia  	0.44	1+1 60-90cm	3%
Viburnum opulus  	0.44	1+1 60-90cm	3%
Cornus sanguinea  	0.44	0+1 40-60cm	3%
Total Plant Numbers			36%
























FOR PLANTING IN BIODIVERSITY AREAS AND AT THE EDGES OF WOODLANDS OR WALKWAYS

Wildflower meadow with Perennial flowers (Pollinator friendly flowers)	
Plant Species, sow at 2 gms/m ²	
Area (m ²)	
Achillea millefolium - Yarrow  	
Agrimonia eupatoria, Yellow Agrimony  	
Angelica sylvestris - Wild Angelica  	
Anthyllis vulneraria- Kidney Vetch  	
Centaurea jacea - Lesser Knapweed	
Daucus carota - Wild carrot 	
Euphrasia, Eyebright 	
Galium verum - Lady's Bedstraw  	
Hypericum perforatum, St John's-wort  	
Knautia arvensis - Field scabious  	
Leontodon hispidus, Rough Hawksbit 	
Leucanthemum vulgare - Ox eye Daisy  	
Lotus corniculatus - Birdsfoot trefoil  	
Lotus pedunculatus, Greater Trefoil 	
Lychnis flos-cuculi, Ragged Robin  	
Medicago lupulina - Black Medick 	
Origanum majorana, Marjoram	
Plantago lanceolata - Ribwort Plantain  	
Primula veris - Cowslip 	
Prunella vulgaris - Selfheal  	
Ranunculus acris - Meadow Buttercup  	
Rhinanthus minor - Yellow rattle  	

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Sanguisorba minor, Salad Burnet 	
Silene dioica, Red Campion  	
Trifolium pratense, Red Clover  	
Verbascum thapsus - Mullein  	
Orchid seed from wild meadow harvests also included 	
Annuals included:	
Glebionis segetum - Corn Marigold  	
Papaver rhoeas - Corn Poppy  	
Agrostemma githago - Corncockle  	
Centaurea cyanus - Cornflower  	
Scented Mayweed  	
Total Kilograms of seeds	











FOR PLANTING NEAR WOODLAND AND HEDGES TO ESTABLISH BIODIVERSITY WOODLANDS THAT CONNECT TO OTHER WOODLANDS AND HEDGEROWS (MOZAIC HABITATS)

Scrub woodland corpses at hedgerow junctions			
Plant species planted @ 1.7m c/cs random planting	Qty /m ²	Size	%
Area (m ²)			
Alnus glutinosa 	0.35	1+1 90-120cm	6%
Betula pendula 	0.35	1+2 90-120cm feathered	8%
Corylus avellana 	0.35	1+1 60-90cm	10%
Crataegus monogyna  	0.35	1+1 60-90cm	10%
Sorbus aucuparia  	0.35	1+2 90-120cm	10%
Ilex aquifolium  	0.35	CG 2L 40-50cm	7%
Prunus spinosa  	0.35	1+0 60-90cm	6%
Quercus petraea  	0.35	1+1 60-90cm	3%
Salix caprea  	0.35	0+1 60-120cm	6%
Rosa Canina  	0.35	1+1 40-60cm	8%
Euonymus Europaeus  	0.35	1+1 60-90cm	8%
Viburnum opulus  	0.35	1+1 60-90cm	10%
Cornus sanguinea  	0.35	1+1 60-90cm	8%




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Total Plant Numbers	100%
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









FOR ENHANCING EXISTING HEDGEROWS OR CREATING NEW HEDGEROWS FOR BATS

Native hedgerow plant mix for the Bat Corridor			
Shrubs (99%) @ 0.25m c/cs	Qty /lin.m	Size	%
Length (lin.m)			
Crataegus monogyna 	4	1+1 60-90cm	45%
Corylus avellana 	4	1+1 60-90cm	10%
Euonymus europaeus 	4	1+1 60-90cm	5%
Ilex aquifolium 	4	CG 2L 40-60cm	10%
Prunus spinosa 	4	1+0 60-90cm	7%
Rosa canina 	4	1+1 40-60cm	5%
Salix caprea 	4	0+1 60-120cm	3%
Sambucus nigra 	4	1+1 60-90cm	3%
Viburnum opulus 	4	1+1 60-90cm	5%
Cornus sanguinea 	4	0+1 40-60cm	5%
Total Plant Numbers			98%
Tree species planted randomly along length @ approx. 1 per 5 linear metres with marker (Bat corridor zone)	Qty /lin.m	Size	%
Quercus robur	0.2	20-25cmg	1%
Quercus petraea	0.2	20-25cmg	1%
Total Plant Numbers			2%

FOR ENHANCING EXISTING HEDGEROWS OR CREATING NEW HEDGEROWS

Native hedgerow plant mix			
Shrubs (99%) @ 0.25m c/cs	Qty /lin.m	Size	%
Length (lin.m)			
Crataegus monogyna 	4	1+1 60-90cm	45%
Corylus avellana 	4	1+1 60-90cm	10%
Euonymus europaeus 	4	1+1 60-90cm	5%




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Ilex aquifolium  	4	CG 2L 40-60cm	10%
Prunus spinosa  	4	1+0 60-90cm	7%
Rosa canina  	4	1+1 40-60cm	5%
Salix caprea  	4	0+1 60-120cm	3%
Sambucus nigra  	4	1+1 60-90cm	3%
Viburnum opulus  	4	1+1 60-90cm	5%
Cornus sanguinea  	4	0+1 40-60cm	5%
Total Plant Numbers			98%

AREAS THAT NEED OTHER KINDS OF ORNAMENTAL HEDGEROWS

Hedgerow along road perimeters and for screening fences			
Plant Species	Qty/lin.m	Size	%
Length (linear meter)			
Fagus sylvatica, Beech hedgerow	4	b/r 1+2 90-120cm ht	100%






OTHER INDIVIDUAL TREES THAT MAY BE NEEDED AROUND BUILDINGS AND SPECIAL AREAS

Specimen Trees			
Trees	Size	%	
<i>Pinus sylvestris</i> 	rb, 5-9m tall	100%	
<i>Quercus rubra</i>	rb, 40-45cmg	100%	
<i>Fagus sylvatica</i> 'Purpurea'	rb, 30-35cmg	100%	
<i>Aesculus hippocastanum</i> 	rb, 35-40cmg	100%	
<i>Liriodendron tulipifera</i>	rb, 25-30cmg	100%	
<i>Betula albosinensis</i> Multistem	rb, 4-5m ht	100%	
<i>Acer platanoides</i> 	r/b 30-35cmg	100%	
<i>Platanus hispanica</i>	r/b 40-45cmg	100%	
<i>Magnolia grandiflora</i>	cg 190L	100%	




WAYLEAVE SCRUB MIX PLANTING

Scrub mix with less of 3m height						
AREA						
Species	%	Root	Specification	Form	Spacing	Qty (m2)
Salix purpurea (Purple Willow)	10.00%	BR	45-60cm 0+1	Transplant	1.5	0.44
Cytisus scoparius (Broom)	5.00%	CG	30-40cm P9	Shrub	0.9	1.23

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Rosa canina (Dog-rose)	5.00%	BR	30-45cm 1+1	Transplant	0.9	1.23
Salix aurita (Eared willow) 	25.00%	BR	30-45cm 0+1	Transplant	0.9	1.23
Viburnum opulus (Guelder rose) 	25.00%	BR	30-45cm 1+1	Transplant	0.9	1.23
Euonymus europaeus (Spindle) 	25.00%	BR	30-45cm 1+1	Transplant	0.9	1.23
Hedera helix (Ivy) 	2.50%	CG	30-40cm P9	Climber	0.9	1.23
Lonicera periclymenum (Honeysuckle) 	2.50%	CG	30-40cm P9	Climber	0.9	1.23
	100%					



ORNAMENTAL PLANTING NEAR BUILDINGS (SAMPLE MIX)

Plant Species Area (m ²)	Qty / m ²	Size	%
Miscanthus sinensis, Morning Light	3	CG 5L	16%
Carex comans, Sedge	4	CG 3L	16%
Sisyrinchium striatum, Pale yellow-eyed-grass 	4	CG 5L	16%
Bergenia cordifolia, Bergenia 	5	CG 3L	16%
Libertia grandiflora	2	CG 3L	16%
Hedera helix 	6	CG 2L	16%
Total Plant Numbers			100%

















ALL AMENITY GRASS AREAS

Amenity (Lawn) Grass	
Plant Species (30 gms/m ²)	%
Area (m ²)	
Festuca ovina, Hard Fescue	20%
Poa pratensis, Smooth Stalked Meadow Grass	10%
Festuca rubra, Strong Creeping Red Fescue	30%
Festuca rubra subsp. Commutata, Chewing's Fescue	20%
Agrostis capillaris, Browntop Bent	15%
Trifolium repens, White Clover	5%
Total Kilograms of seeds	100%










FOR PLANTING NEAR WATER CHANNELS, WET AREAS, DITCHES, DRAINAGE ZONES, Etc

Wet Woodland fringe planting			
Plant Species planted @ 1.7m c/cs random planting)	Qty / m ²	Size	%
Length (lin.m)			
Alnus glutinosa 	0.35	b/r 1+1 60-90cm	15%
Betula pendula 	0.35	b/r 1+1 60-90cm	5%


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Betula pubescens 	0.35	b/r 1+2 90-120cm fth	15%
Corylus avellana 	0.35	b/r 1+1 60-90cm	5%
Crataegus monogyna  	0.35	b/r 1+1 60-90cm	5%
Salix alba 	0.35	b/r 1+1 60-90cm	5%
Ilex aquifolium  	0.35	CG 2L 40-50cm	5%
Prunus spinosa  	0.35	b/r 1+0 60-90cm	10%
Quercus petraea 	0.35	b/r 1+1 60-90cm	5%
Salix caprea  	0.35	b/r 0+1 60-120cm	15%
Salix cinerea  	0.35	b/r 0+1 60-120cm	10%
Cornus sanguinea  	0.35	b/r 0+1 40-60cm	5%
Total Plant Numbers			100%





SUDS SYSTEM: RAIN GARDEN MIX, SWALE

Plant Species	Qty / m ²	Size	%
Area (m²)			
Rodgersia aedulifolium	3		7.5
Ligularia przewalskii 	3		7.5
Osmunda regalis	3		7.5
Iris sibirica  	3		10
Lythrum salicaria  	3		10
Ranunculus aconitifolius	4		7.5
Carex elata 'Aurea'	4		10
Camassia leichtlinii 	6		7.5
Primula bulleyana 	7		10
Geranium nodosum 	4		7.5
Persicaria bistorta 'Superba' 	4		5
Total Plant Numbers			100%

SUDS SYSTEM: LIST OF TREES TO USE ON RAIN GARDEN AND SWALES

Specimen Trees for SUD's			
Trees	Size	%	
Liquidambar styraciflua	b/r 10-12cmg	100%	
Betula pendula 	b/r 10-12cmg	100%	
Betula nigra	b/r 10-12cmg	100%	

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<i>Betula pubescens</i>	b/r 10-12cmg	100%	
<i>Alnus glutinosa</i> 	b/r 10-12cmg	100%	
<i>Sorbus aucuparia</i>  	b/r 10-12cmg	100%	
<i>Quercus petraea</i> 	b/r 10-12cmg	100%	

SUDS SYSTEM: MIX FOR ROOF GARDEN



Sedum mats for thin substrate areas or native flora mix for substrates of 75mm depth and over

Plant Species (30 gms/m²) , Sow @ 3 grams per m2.

Common Knapweed	
Greater Knapweed	
Wild Carrot	
Lady's Bedstraw	
Field Scabious	
Oxeye Daisy	
Common Toadflax	
Birdsfoot Trefoil	
Musk Mallow	
Hoary Plantain	
Cowslip	
Self Heal	

LINK: <https://connectingtonature.ie/collections/nativewildflowerseed/products/green-roof-native-wildflower-seed>

SUDS SYSTEM: VERTICAL GARDEN MIX

Vertical garden list	Size
<i>Polystichum setiferum</i>	cg P9
<i>Carex oshimensis</i> 'Ever color'	cg P9
<i>Carex oshimensis</i> 'Evergold'	cg P9
<i>Carex oshimensis</i> 'Everest'	cg P9
<i>Heuchera micrantha</i>	cg P9
<i>Athyrium niponicum</i> var. <i>pictum</i> 'Silver Falls'	cg P9
<i>Dryopteris dilata</i> 'Lepidota Cristata'	cg P9
<i>Heuchera</i> 'Green Spice'	cg P9
<i>Heuchera</i> 'Lime Marmalade'	cg P9
<i>Heuchera</i> 'Caramel'	cg P9
<i>Geranium</i> 'Anne Folkard'	cg P9
<i>Vinca minor</i> 	cg P9
<i>Ajuga reptans</i> 'Burgundy glow' 	cg P9
<i>Tiarella</i> 'Spring Sumphony'	cg P9
<i>Stachys byzantina</i>	cg P9

NOTE: 9 plants per m2 or planted as plugs to a higher density or as recommended by the vertical wall system manufacturer

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APPENDIX 2 – LANDSCAPE SECTIONS



IMAGE 1 – Masterplan landscape sections location

The Grange Castle West masterplan shall incorporate these landscape typology sections.

Section A - Section through the existing Dual Carriageway area showing 3 options for front landscape area landscaping of 10m width.

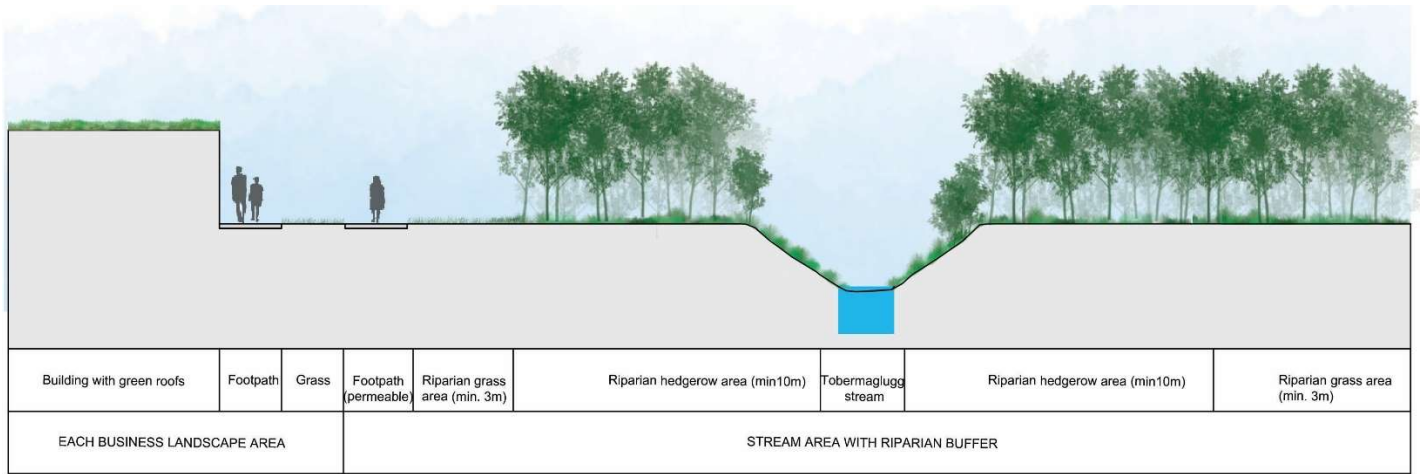
Section B - New Road and Amenity point with gym equipment and seating area and a beautiful view, looped exercise circuit;

Section C - Existing stream and riparian buffer with buildings and landscape areas for each business, the existing Dual Carriageway landscape area landscaping of 10m width and existing lake;

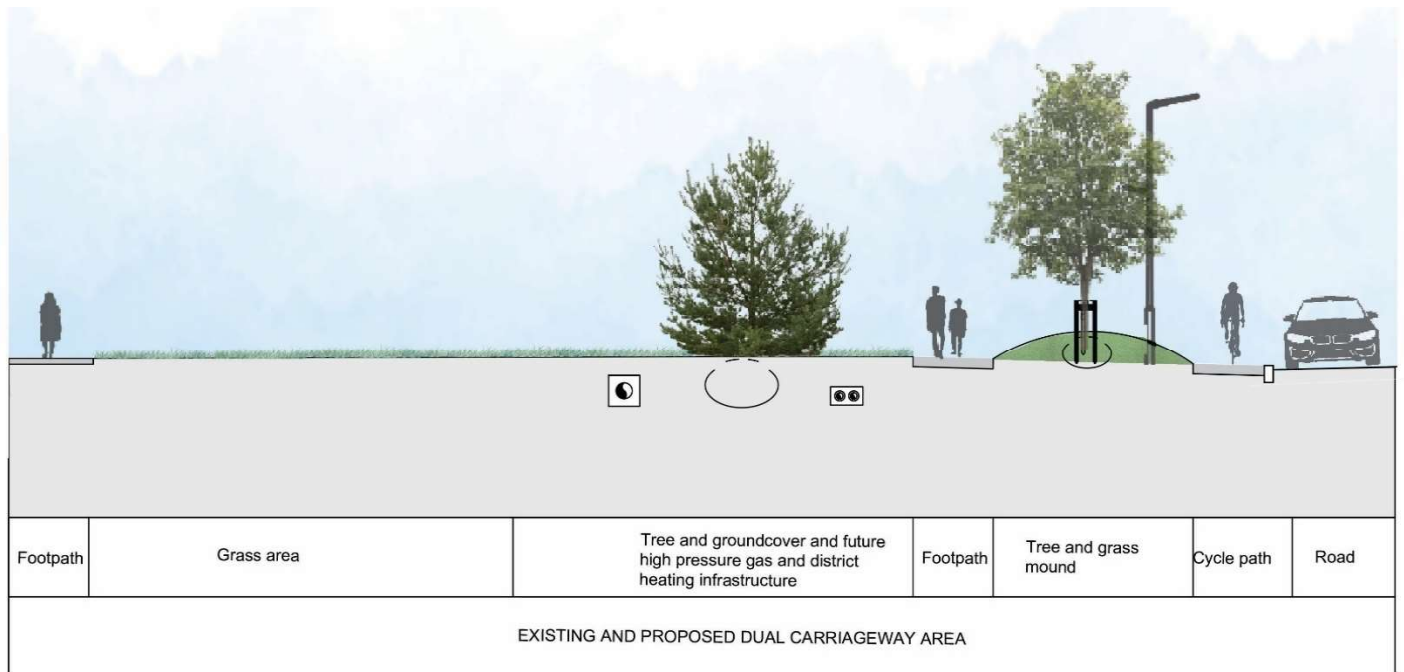
Section D - Section with existing hedgerows to be retained and adjacent building, roads landscape.

Section E - Section with boundary woodland zone and buildings and secondary roads.

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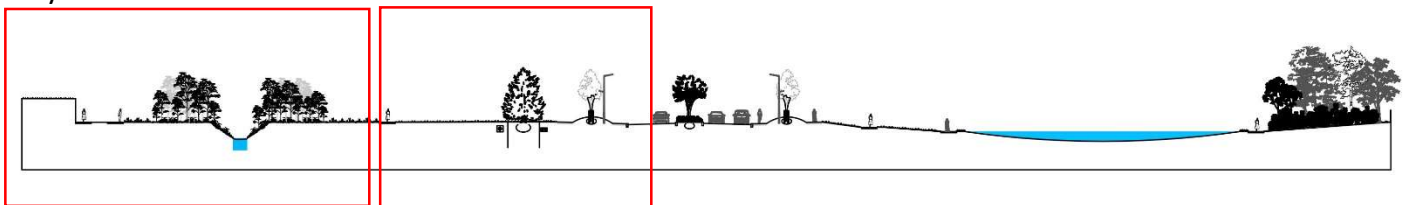


Section C1



Section C2

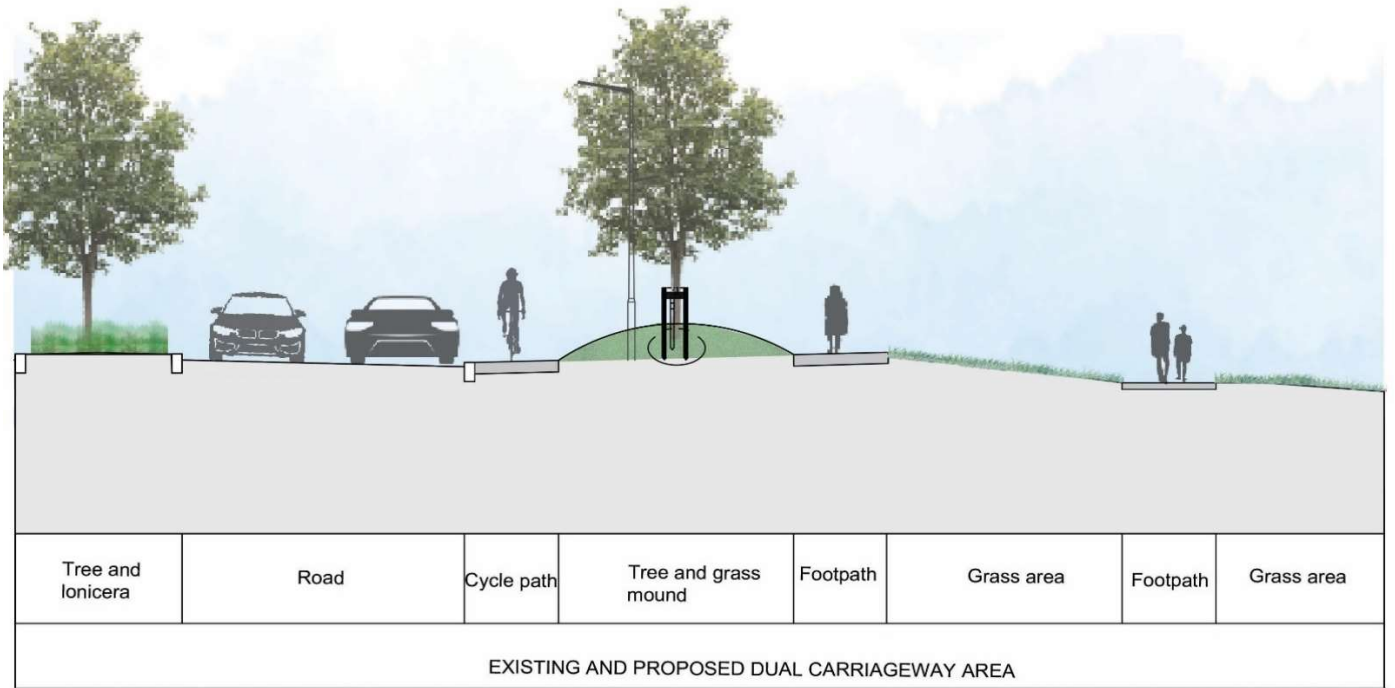
Key Section C



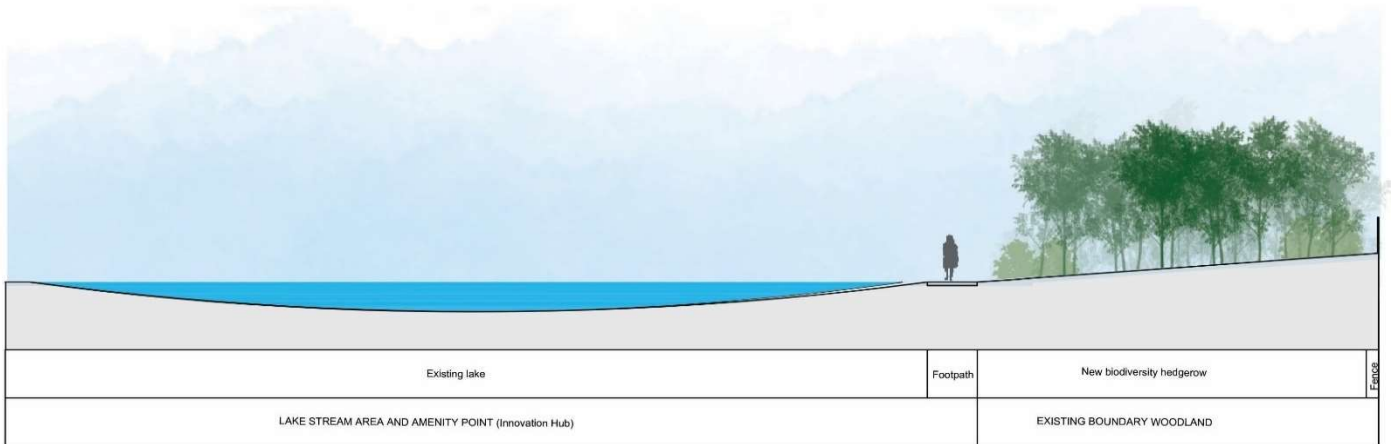
Section C 1

Section C 2

Managed by

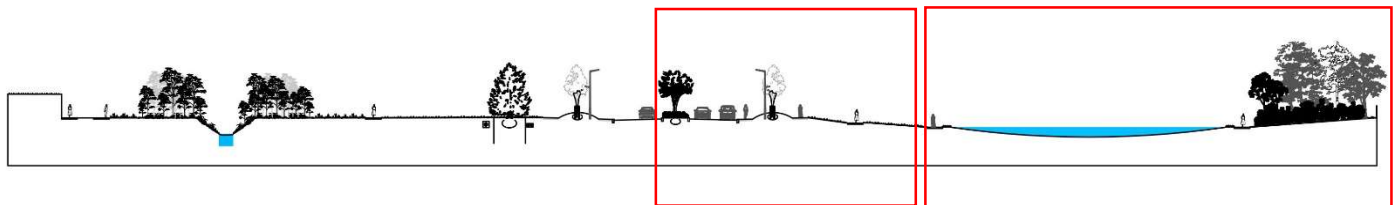


Section C3



Section C4

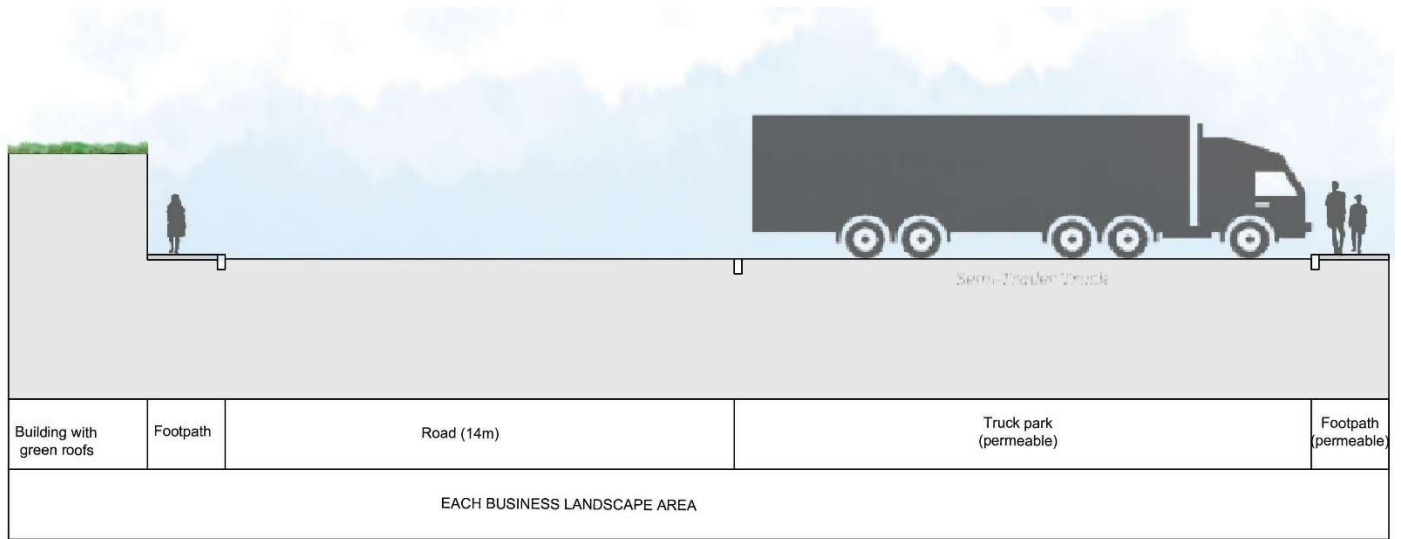
Key Section C



Section C3

Section C4

Managed by

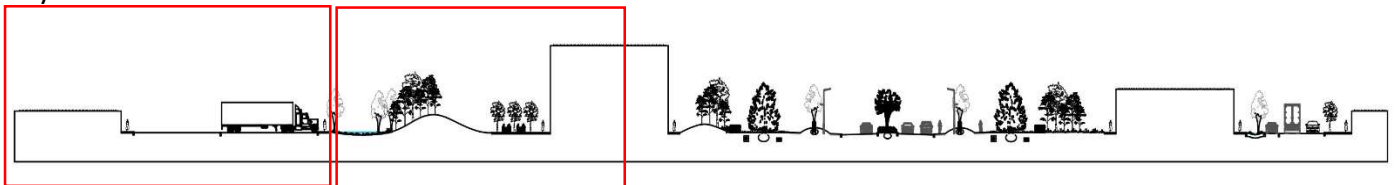


Section A1



Section A2

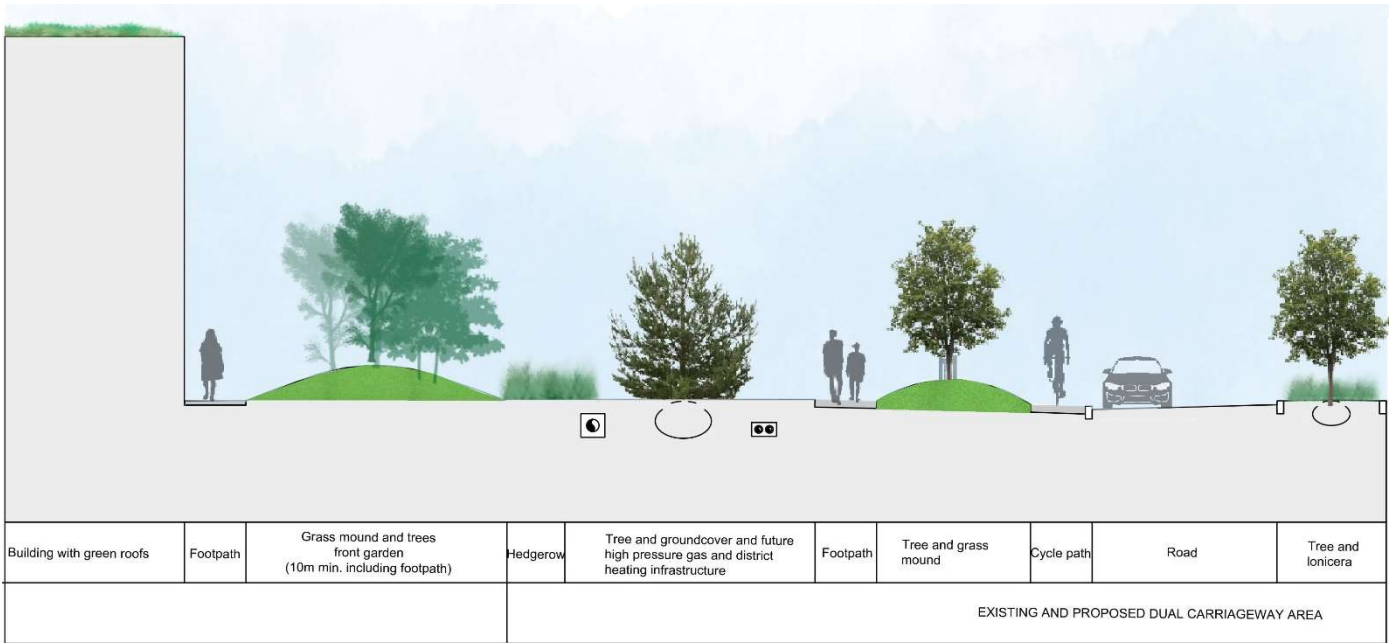
Key Section A



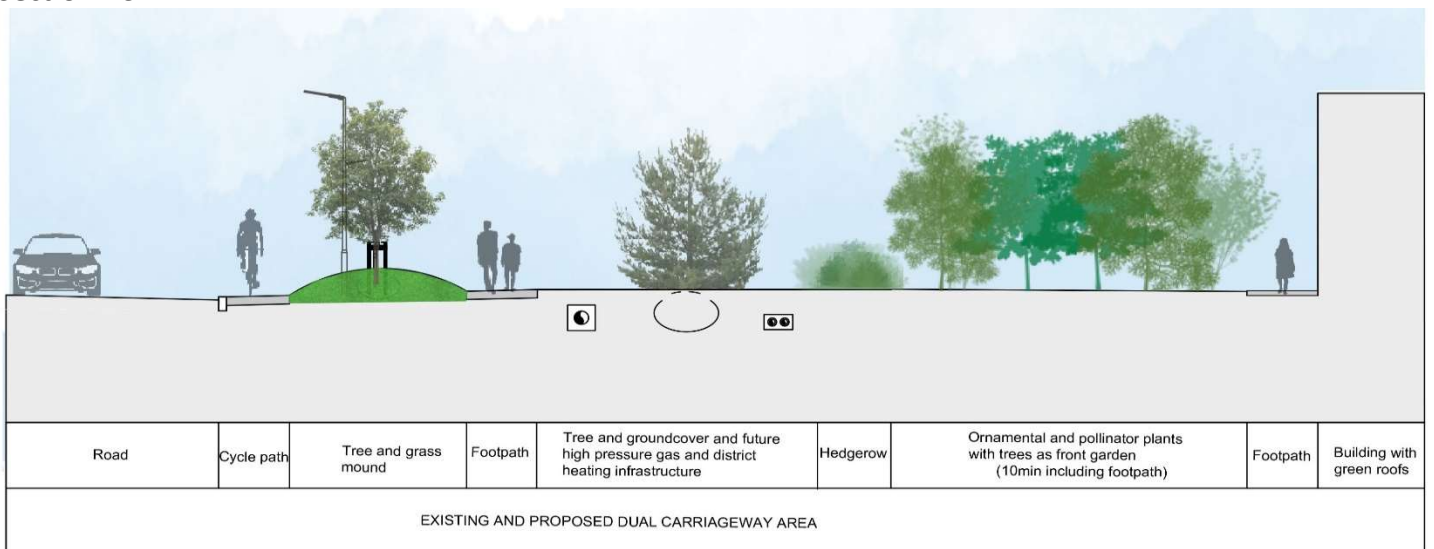
Section A1

Section A2

Managed by

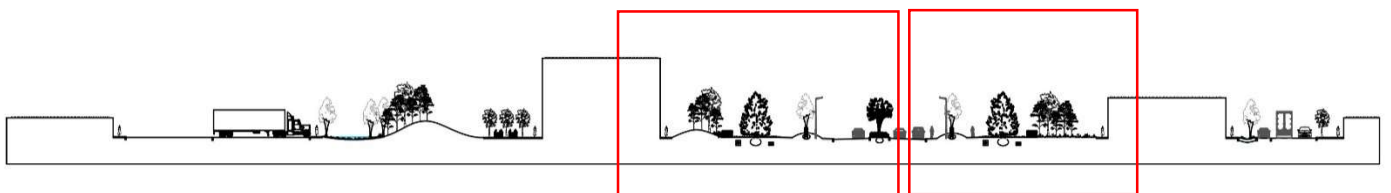


Section A3



Section A4

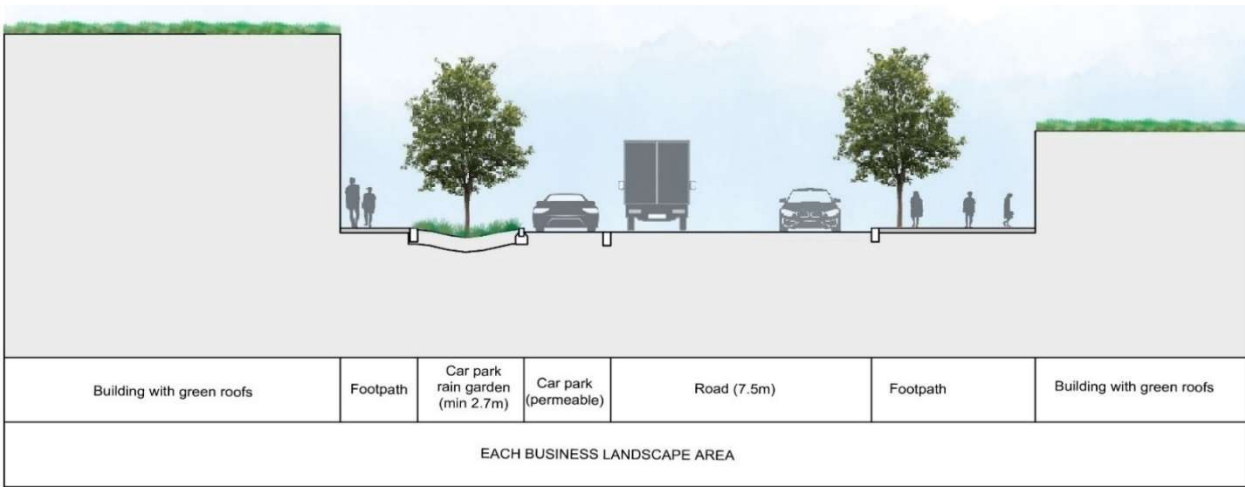
Key Section A



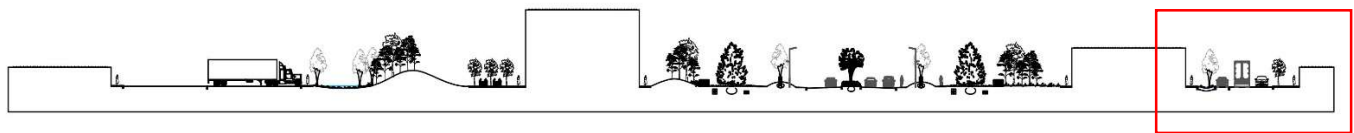
Section A3

Section A4

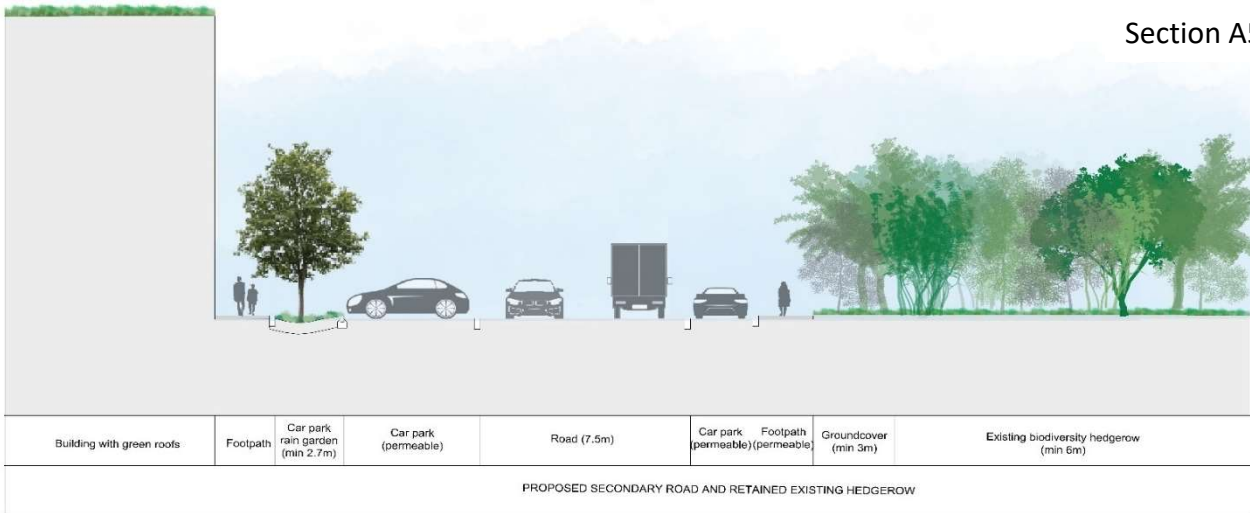
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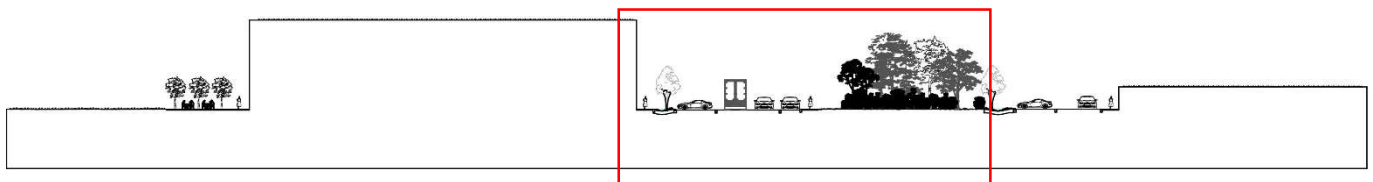
Section A5
 Key Section A



Section A5

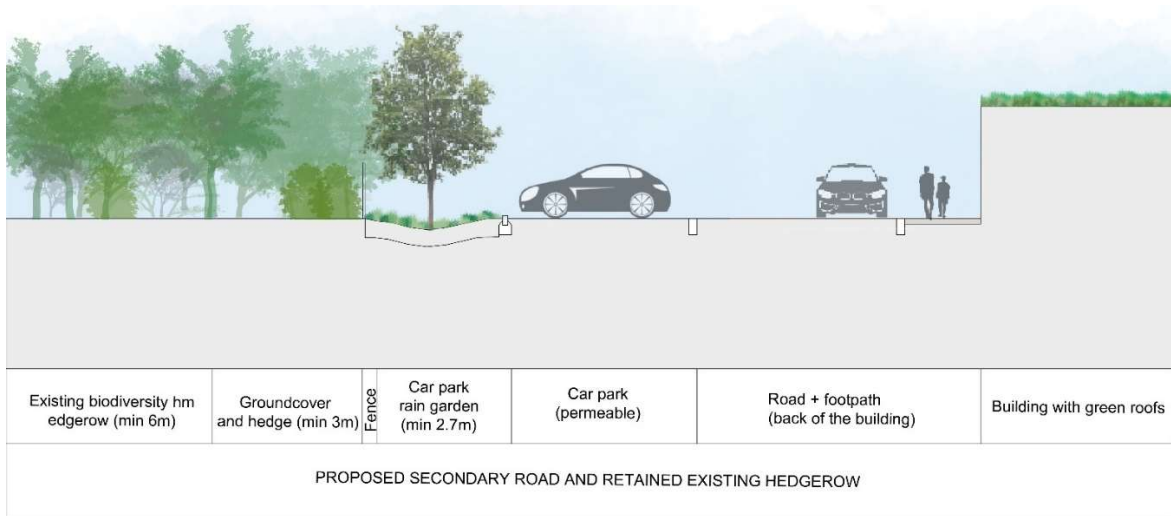


Section D1
 Key Section D

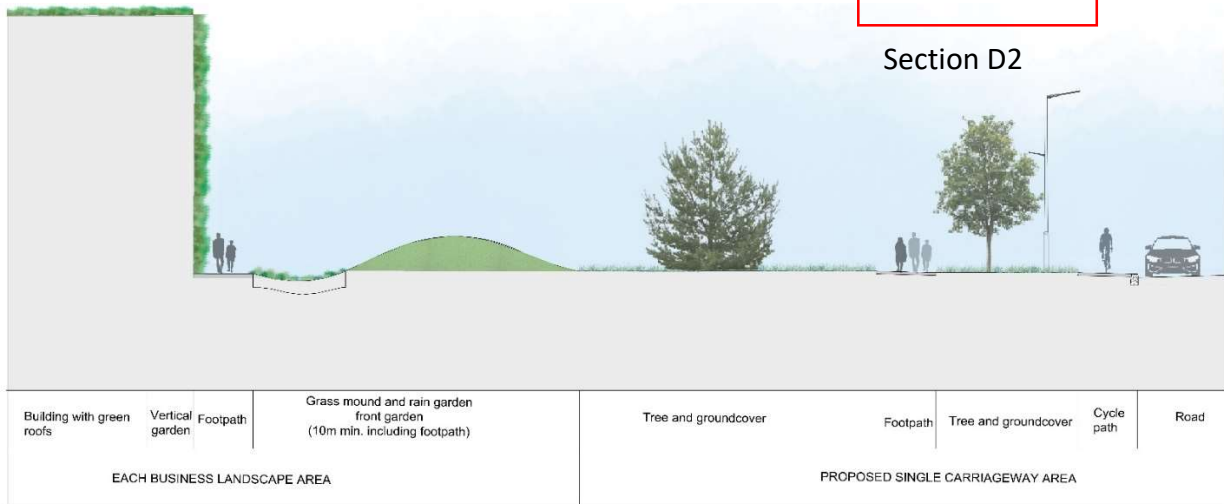
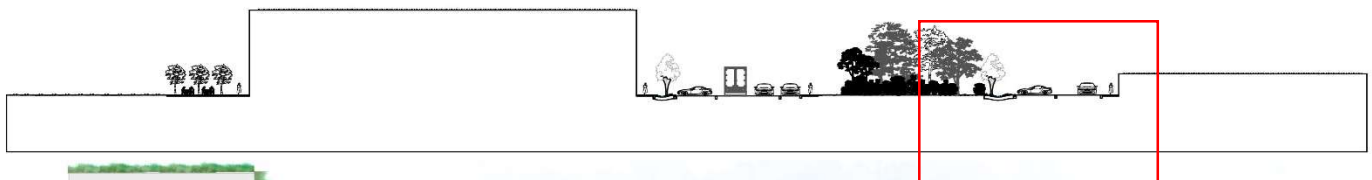


Section D1

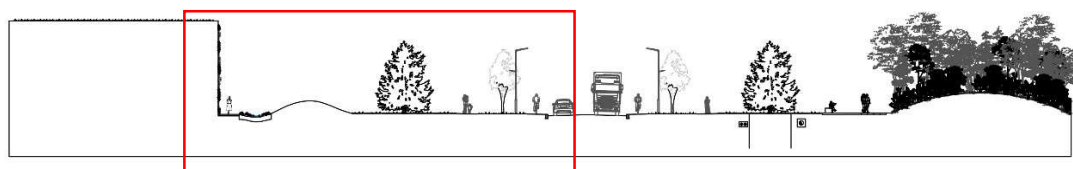
Managed by



Section D2
 Key Section D

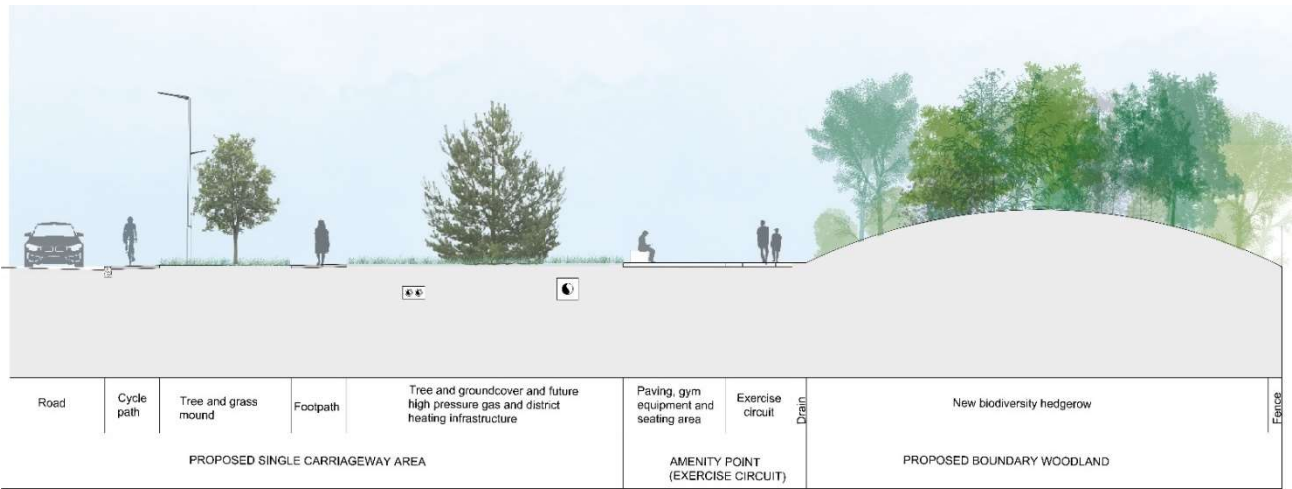


Section L
 Key Section B

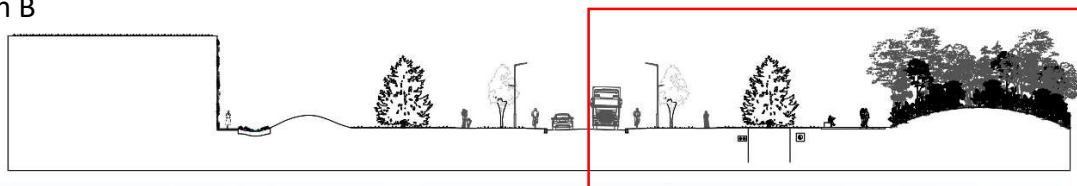


Section B1

Managed by



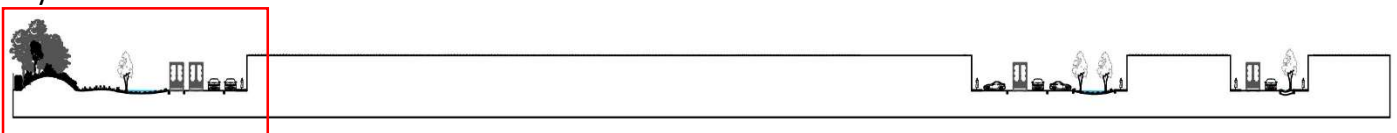
Section B2
 Key Section B



Section B2

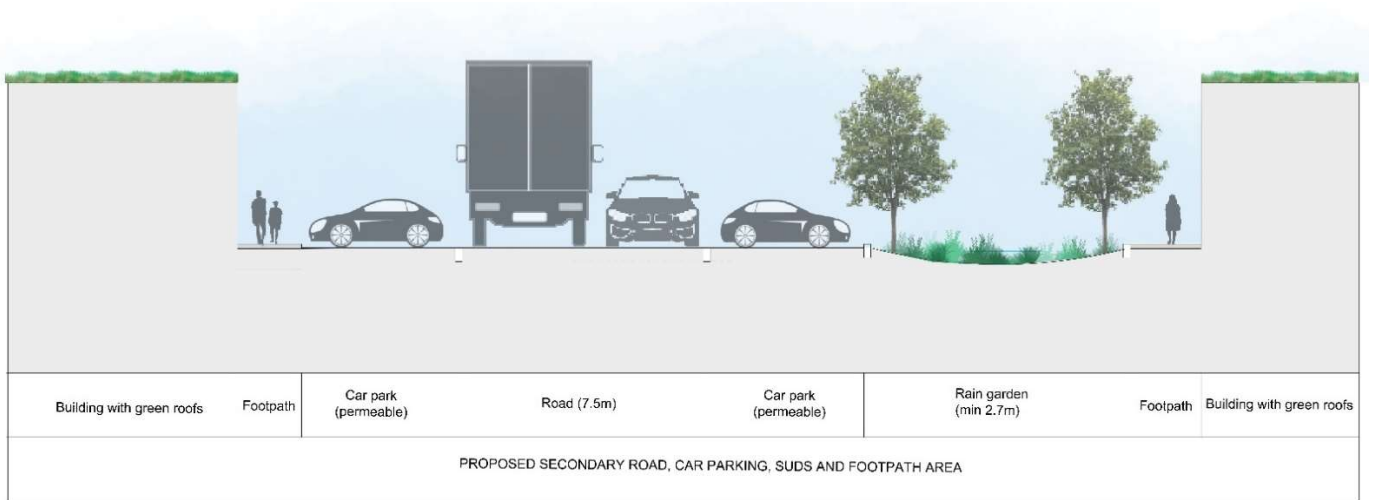


Section E1
 Key Section E

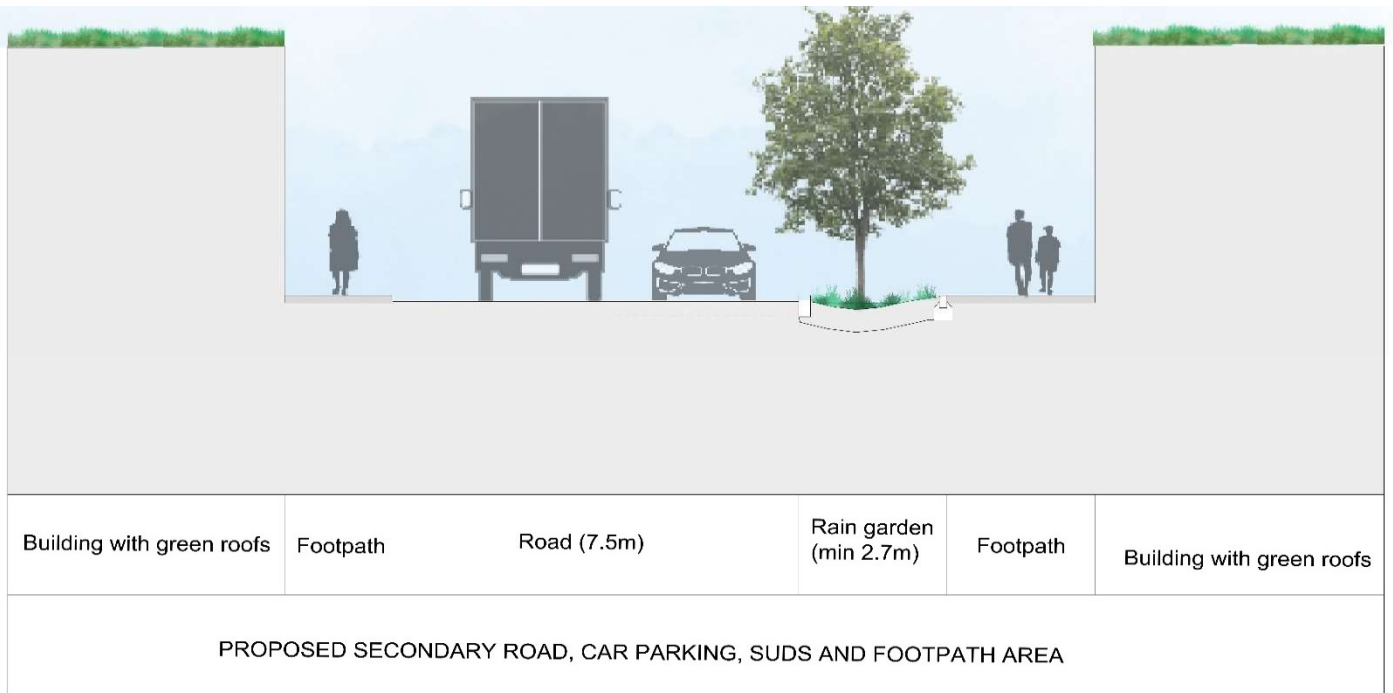


Section E1

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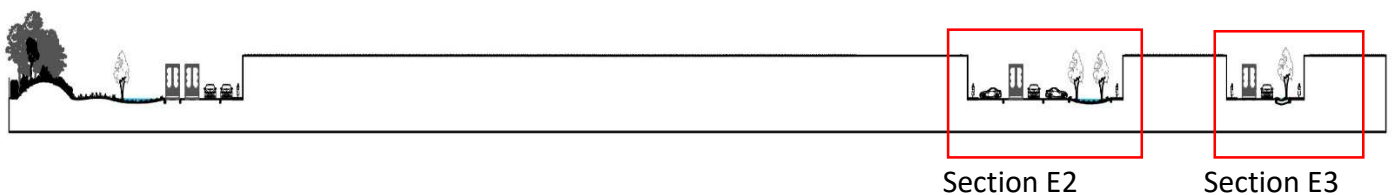


Section E2



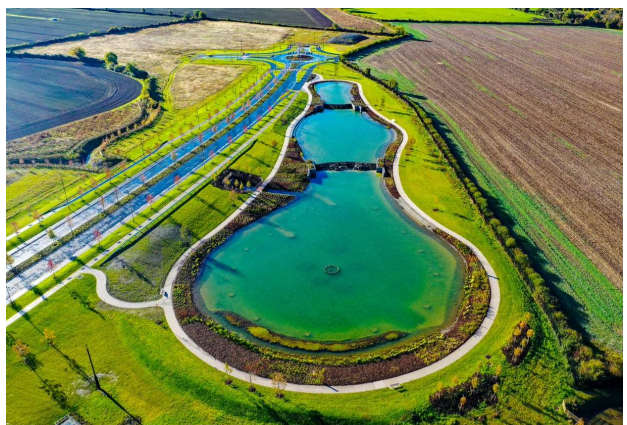
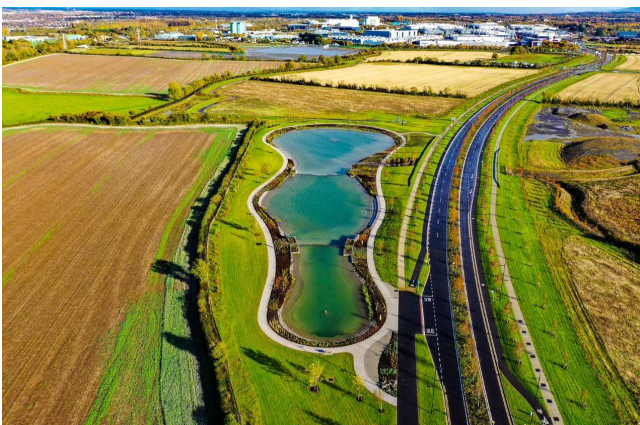
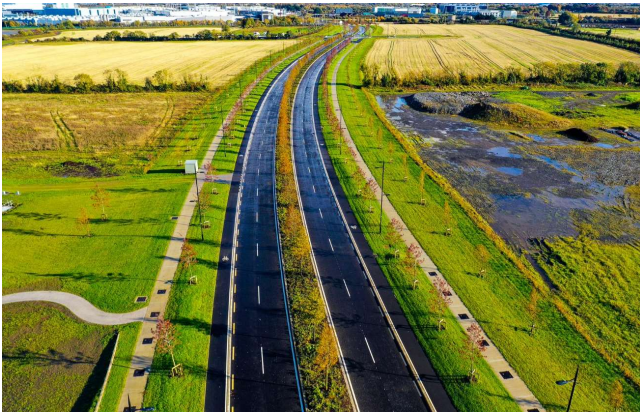
Section E3

Key Section E



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APPENDIX 3 – PHOTOS OF EXISTING LANDSCAPE PROJECT ON SITE



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