Survey Report

BLACKROCK VILLAGE,
BLACKROCK,
CO. LOUTH

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Executive Summary, Findings and Recommendations

Inspection and Evaluation Limitations and Disclaimers

The information set out in this report relates to the review of a tree population on the site in question. As such, the information provided is based on a general review of trees and does not constitute a detailed review of any one of the individual specimens. Such an evaluation (tree report) would require the gathering of substantially more information than that dealt with in this survey.

The survey is not a safety assessment and the parameters reviewed within this survey context would besubstantially deficient in extent to provide for a reliable safety assessment. The survey is intended to provide a general and qualitative review to assist in gauging the suitability of an individual tree for retention within a development context. All trees are subject to impromptu failure and damage and theassessment of risk as may be presented by a tree requires the review of numerous factors in excess of those noted herein and as such, remains outside the scope of this document and any attempt to use the information herein for such proposes will render the information invalid.

All inspection and tree assessment has been completed by a competent and experienced Arborist. Theinspection involves visual assessment only, which has been carried out from ground level. No below ground, internal, invasive or aerial (climbing) inspection has been carried out.

Trees are living organisms whose health, condition and safety can change rapidly. It is recommended that all trees should be re-evaluated regarding their condition on an annual basis or subsequent to substantial trauma such a storm event, other damage or injury. It is advised that the results and recommendations of this survey will require review and reassessment after one year from the date ofexecution. This survey does not constitute a review of tree or site safety. Attempts to use the contentsherein for such purposes will render the contents invalid.

This report was commissioned by:

Blackrock Tidy Towns

This survey has been prepared by:

Peter Grennan -Tree to Tree

Christopher Doyle - Flynn Furney Environmental Consultants

This information has been provided without any review of possible development works. This information does not include a full “Arboricultural Implication Assessment” and it does not provide an “Arboricultural Method Statement” or “Tree Protection Plan”. It does however provide the basic information that would assist in the compilation of such documentation, should it be requested in the future and with the provision of suitable information regarding the nature and extent of any proposed development works.

Management Recommendations

This report and recommendations relate to the condition of the tree and its relationship to the surroundings at the time of inspection only.

In respect of this and regardless of any possible site development, it is advised that all trees be reviewed according to the inspection frequency set out in the survey table, All trees inspected will require inspections on an 18m cycle, preferably not within the same yearly season as inspections during autumn may allow fungal fruiting bodies to be observed, whereas dieback will be more noticeable during the summer months The trees inspected will require inspections on an 18m cycle, preferably not within the same yearly season as inspections during autumn may allow fungal fruiting bodies to be observed, whereas dieback will be more noticeable during the summer months.

It should be appreciated that many of the concerns raised by the tree survey were founded on the basisof evidence suggesting ongoing decline or mechanical failure. Such deterioration may well continue into the future to a point where additional trees need to be removed.

Report Limitations

This report is based on the Arborist’s interpretation of information provided prior to report compilation and gained from the site during the undertaking of the site review. The site review data is subject to thelimitation as set out under “Inspection and Evaluation Limitations and Disclaimers” detailed at the beginning of the report. The findings and recommendations made within this report are based upon theknowledge and expertise of the inspecting Arborist. Peter Grennan is a Climbing Arbourist with 10+ years experience, having completed LANTRA Professional tree inspection course in 2017 based on this experience we are confident this report provides an accurate assessment of the inspected trees.

Tree Survey

Survey Intent and Context

Intention of this document is to highlight the extent and nature of material of arboricultural interest onthe site in question. This report was compiled with a view to ensuring the trees surveyed are at no higher than normal risk of failure and to preserve their health for biodiversity and amenity value.

Site Description

Blackrock village is situated on the East coast of Ireland, along the R172, East of the R132, approx. 8 minutes drive from Dundalk town.

All tree to be surveyed are those of significance within the limits of the 50km vehicle speed zones and of the areas identified by the Tidy Towns committee. Survey carried out from October ’21- February ’22. No inspection was made of the soil and no information is given in regards to soil condition.

Survey Data Collection and Methodology

The Survey

This survey is not an Implication Assessment but provided some of the basic information regarding its compilation. The survey has been compiled under the BS 3998: 2012.Treework – Recommendations, BS 8545:2014 Trees: from nursery to independence in the landscape. The survey relates to current site conditions, setting and context.

Identification

Each of the trees described within the text has been located on a digital map with a grid reference location to the individual tree or group of trees. Species and age classificsation.

Measurements

Measurements are metric and defined in meters and millimetres. All trees referred to in the survey text have been measured to provide information regarding canopy height.
Whilst efforts are made to maintain accuracy, visual obstruction, especially regarding trees in groups, has required that some tree dimensions are estimated only.

Seasonality

The survey was commenced during the winter period. Some of the signs, typically symptomatic of ill health or defect within a tree, may not have been available to view at the time of the survey or may have been obscured by seasonality related factors. Some of the fruiting bodies of various fungi, parasitic upon or causing decay or disease in trees, may have been out of season and unavailable to view. This survey can only comment upon symptoms of ill-health or defects visible at the time of the inspection. Inspection frequency is 18 months as standard.

General Recommendations

As standard it is suggested to follow the working practices in regards to trees as outlined in the BS 3998: 2012.Treework – Recommendations, BS 8545:2014 Trees: from nursery to independence in the landscape

This will outline best practices for issues raised by the findings of this report and how best to resolve them and in turn prevent reoccurrence.

PLANTING TREES CORRECTLY

When to Plant

Container-grown plants and balled and burlapped (B&B) plants with well-developed root systems can be planted throughout the year. However, most B&B plants are dug and planted during the cooler months after leaf drop.

As stated, container grown plants can be safely planted at any time of the year, but they are best planted in the fall to take advantage of the dormant season root growth. Unlike the tops of ornamental plants that go dormant and cease growth for the winter, roots of ornamental plants in the Southeast continue to grow throughout the warmer fall and winter months. Fall planting allows the carbohydrates produced during the previous growing season to be directed to root growth since there is little demand from the top. This additional root growth may lessen the dependency of the plant on supplemental irrigation the following summers.
Trees and shrubs must be planted at the right depth and receive the right amount of water if they are to establish themselves and flourish. Planting too deeply and under- or overwatering are among the most common and serious planting errors.

A 3-inch deep layer of double ground, hardwood bark mulch is used to cover the soil around the tree. This suppresses weed growth and reduces the loss of water by evaporation. Lastly, the tree is watered well to settle the soil. Be sure not to volcano mulch the tree by piling mulch against the trunk, as this will damage the bark. Always make sure the mulch never touches the trunk

Soil Preparation

While shaping the final grade of the planting beds, remember the importance of good drainage. Poorly drained soils are a leading cause of plant problems in the landscape. Therefore, before placing the first plant in the ground it is important to take steps to assure adequate drainage.
If a site is known to be poorly-drained, create raised beds. Often beds can be elevated 8 to 12 inches above the existing grade by using native soil on site, but sometimes it is necessary to bring in additional well-drained soil. In extreme cases, you may have to install a drain tile to help carry water off the site.
In shaping the final grade, avoid leaving dips or pockets where water is likely to stand. Shape beds so that excess water will be carried off the site and away from buildings. Water also can be directed to unplanted areas. Few ornamental plants, with the exception of pond plants, can tolerate long periods of standing water. Good drainage is critical for most ornamental plants.
If you are planting around new construction, remove any debris left on the site that may cause plant growth problems. Chunks of concrete, roofing shingles, globs of tar, oil spills and sheetrock are a few of the hazards of new construction sites. These can result in long-term growth problems. Soil compaction is also a problem near new construction. Tilling deeply and incorporating organic matter is often sufficient to loosen hard compacted soils.

Soil Test

In addition to examining the physical properties of the soil and taking corrective measures on poorly drained soils, a soil test will determine which nutrients need to be applied and whether you need to adjust the pH. A soil sample is best taken several weeks before planting so you will know how to treat the soil at planting time. However, if new soil is brought onto the site at planting time or if soil is moved around during the final grading, it is best to wait until all the soil is in place before sampling. You can adjust pH or surface-apply fertilizer at the recommended rate later, after plants are established.

The majority of ornamental plants prefer a soil pH from 5.8 to 6.5. Above or below this pH range, nutrient deficiencies often result. To raise the pH level of an acid soil, dolomitic lime is usually added, while the pH level of alkaline soils can be lowered with amendments like sulphur or aluminum sulphate. Adjusting soil pH without the benefit of a soil test can result in nutrition problems that are difficult to counteract and correct. Follow soil test results.

Organic Amendments

Organic amendments such as composted products are applied to soils to improve the nutrient and water-holding capacity of soils, or, in general terms, to improve soil tilth. Research has shown that when adding organic matter to a soil, it is best to incorporate it throughout the rooting zone as opposed to placing it in the planting hole. By incorporating an amendment uniformly in the soil, the entire rooting area becomes a uniform growing environment for roots.

On the other hand, when a planting hole alone is amended, the structure of the soil in the hole can differ significantly from that of the surrounding native soil, if an excessive amount or the wrong type is added. This can encourage the roots to stay within the confines of the hole and discourages them from entering the surrounding native soil, especially if a perfectly round planting hole is dug.

Some types of organic materials and quantities of them can also upset the water equilibrium between the surrounding native soil and the soil in the hole. Fine-textured organic matter such as peat moss, placed in the planting hole can act like a sponge in a bathtub, holding too much moisture after rain or irrigation. Coarser-textured material, such as composted pine bark, is less likely to hold excess moisture. In heavy clay soils, use a shovel or mattock to notch out the sides of the round planting hole. This will enable growing roots to more easily enter the surrounding soil.

Organic matter should comprise approximately 10 to 20 percent of the total soil volume. For example, preparing a bed 8 inches deep requires the addition of about 1 to 2 inches of organic matter such as compost, leaf mold, or composted pine bark. Drainage can be improved in clay soils by subsoiling or deep tilling prior to adding organic matter.

Composted materials immediately provide organic matter to the soil. Do not use uncomposted bark products as amendments. Freshly milled bark that has not been composted will slowly rob plants of nitrogen when used as an amendment. As microorganisms in the soil feed on bark and decompose it, they will use nitrogen in the soil. Also, the pH of the soil often drops dramatically below the desirable range when uncomposted materials are used as amendments.

Well-composted organic products have a rich, earthy smell, a crumbly appearance, and the original organic materials are no longer recognizable. For the best choices of composted material, choose either well decomposed material from your home compost pile, or purchase composted pine bark. The composted pine bark may still contain some small bark chips, but this can aid in improving the internal drainage in fine-textured clay soils. Additionally, composted pine bark may help suppress certain soil borne disease causing organisms.

How Deep to Plant

Trees and shrubs must be planted at the right depth and receive the right amount of water if they are to establish themselves and flourish. Planting too deeply and under- or overwatering are among the most common and serious planting errors.

In well-drained soil, the planting hole should never be dug any deeper than the height of the root ball. This means that the soil at the bottom of the hole is left undisturbed. Setting the root ball on loosened soil will cause the tree to settle and sink too deeply into the soil. Locate the topmost layers of roots in the root ball so that it will be level with the soil surface. Check to be sure that there is not an excess layer of soil (or container media) already covering the root ball. As little as a half-inch of excess soil over the root ball can inhibit or prevent water from entering the root ball, especially on trees planted from containers. Only mulch should be placed over the root ball. In well-drained soil, the planting hole should be at least twice and preferably five times wider than the root ball. Roots will grow more quickly into loosened soil, thus speeding up the tree's establishment time.

In poorly drained or compacted soil, the plant is best placed higher than its original planting depth at about 2 to 4 inches higher than the surrounding soil. Be sure to build the soil up beside the root ball so that the sides are not exposed, and do not place additional soil on top of the root ball. This will allow oxygen to reach the roots in the upper surface of soil. It will also cause excess water to drain away from the plant rather than collecting beneath it. Do not disturb the soil under the root ball to prevent any later settling, which will move the plant roots deeper into the soil. The top of the root ball may dry out quickly in the summer on some sites, so be prepared to irrigate accordingly.
Preparing & Setting the Root Ball

Trees and shrubs grown in plastic or other hard-sided containers can be removed from their containers and placed directly in the holes prepared for them. Cut any circling roots so they will not strangle the tree later on. If a tree or shrub is pot-bound, use pruning shears or a serrated knife to make slices 1 to 2 inches deep going from the top of the root ball to the bottom. Make these slices in three or four places around the root ball. Pull the roots growing along the outside of the root ball away from the root ball. Research has shown that although this kind of pruning does not increase root growth after planting, slicing root balls, whether pot-bound or not, enhances the distribution of regenerated roots in the surrounding landscape soil. New roots grow from behind the cut ends.

When preparing the hole for a bare-root tree, dig it wide enough so that roots can be spread out. Do not cut or break roots or bend them in order to fit the hole. Use a sharp pruning tool to cut or trim any roots that are obviously dead, injured or dried.

Spread the roots out and position the topmost root just under the soil surface. Shallow roots either may be parallel with the soil surface or angled slightly downwards. Some people spread the roots over a mound of firm soil in the planting hole and carefully place soil between groups of roots; others wash soil between the roots.

Natural or synthetic burlap is used on trees that are balled-and-burlapped (B&B). To determine which type has been used, hold a match to a small portion of the burlap. As a rule, natural burlap will burn and synthetic will melt. Synthetic burlap will not decompose in the soil and can cause roots to girdle the tree. Because this could ultimately strangle the tree, remove synthetic burlap entirely. After pulling burlap away from the sides of the root ball, tip the root ball to one side and push the burlap underneath it as far as possible. Then tip the root ball to the other side and slide the burlap out from under it. The tipping should be performed by handling the root ball; pushing on the trunk of the tree could crack the root ball. When a wire basket is holding synthetic burlap in place, cut away the basket to remove the synthetic burlap, or, if the lower portion of the basket must be left intact, cut an "X" in the burlap in each section of the basket.

Natural burlap is biodegradable and can be left along the sides and bottom of the root ball, but should always be

removed from the top of the root ball where it is subject to drying out. Dry burlap repels water, making it difficult to rewet the root ball. In poorly drained areas, remove the natural burlap entirely, if possible, to prevent it from holding too much moisture near the roots.
Wire baskets and wire wrapping are frequently used to help hold a B&B root ball intact during shipping and handling. Trees that are stored after being dug with a tree spade are also placed in wire baskets. This is an effective means of keeping roots in contact with soil until planting. Remove at least the top portion of the wire basket after the root ball is in place.

Filling the Planting Hole

The soil used to fill in around the root ball of the newly planted tree or shrub is called backfill. Your best backfill will be the loosened original soil from the planting hole mixed with 10 to 20 percent compost.
Loosen and break up any clods of soil before backfilling. Clods in the backfill create detrimental air pockets around the root ball and could hinder root growth and establishment. Place the plant into the planting area or hole at the correct depth, and then backfill the bottom half of the space around the root ball.
Tamp the soil lightly with your foot. If amendments are not used, do not tamp so heavily as to compact the soil. Finish filling the hole with loose, unamended soil, and gently tamp again.
Construct a 3-inch-high water ring around the edge of the root ball to hold irrigation water. Initially the root ball will need to be watered directly because roots have not yet spread into the surrounding soil.

Improving Rooting Zone/Area

Improper planting practices will in turn have an adverse effect on the long term health of a tree/s.
Improving the rooting area of trees that may have been planted incorrectly will strive to revert these mistakes and vastly increase the overall health of the tree/s.

This may be achieved in a number of ways and/or a combination of these depending on the problem or desired outcome which will be specific to the individual or group.

Root Flare

The root flare (or root collar) is the area at the base of a tree where the trunk transitions from trunk and bark tissues into root system tissues. Roots should be growing outward from the base of a tree at the same level as the surrounding soil or slightly above it. A tree with no root flare showing is cause for concern. The trunk and root flare of a tree is very important. This “flare” of roots that should always be exposed and never covered with soil or other materials. If the base of your tree looks like a telephone pole in the ground…you may have a problem. Excess soil or other materials around a root flare or trunk should be removed.

Trunk

The above-ground portions of the trunk and root flare may not function normally when they are placed in an underground condition for any length of time. The bark of a tree is designed to protect the inner tissues against natural forces, but it will not do well when the bark tissues cannot dry out. The lack of air and dry tissue over time can lead to a loss of bark tissue…not a good thing. Adding materials such as soil, brick, mulch, or rock that contact the trunk can encourage rot and decay, as well as increase the potential for pathogen entry. Trees should not be planted below the existing soil level for this reason. Excessive amounts of soil placed around the base of a tree may cause its loss

Roots

The absorbing roots of a tree are in the top 12 inches of the soil surface, and they can adapt to a minor amount of soil buildup over a few years' time- less than a half inch for most species. However, excessive amounts of soil added over an existing root system can cause the loss of a tree. Although roots are designed to operate underground, excessive soil (or other materials) over roots can prevent their normal biological function and lead to their decline. Trees in low-lying areas tend to gather a thin layer of soil from the water runoff each time there is a heavy rain. Trees in a floodplain will often receive a thin layer of soil (sometimes a thick layer) each time the area is flooded. Soil can naturally build up on the trunk and root system over a period of years. Most tree species can adapt to a minor amount of soil buildup. However, incorrect maintenance practices can and do have an adverce effect on a trees longevity, which we will dicuss further…

Please find attached below a hyperlink to a case study on the matter.

https://www.clemson.edu/cafls/vincent/articles/show_me_your_root_flare.pdf

Compacted Soil

Compacted soil that doesn't allow for much air space can suffocate tree roots. This can cause defoliation, weakened trees that attract pests and disease, decline and eventual death.

Mulching

Applying mulch to the rooting zone, taking great care to observe the root flare of the tree/s and avoiding buring of this in the process. Where trees are found to have had their roof flare corrupted efforts to revert this would be advantageous.

The improper technique of volcano mulching (pilling the mulch up the tree stem) is all too common, causing a numerous amount of health issues such as:

Girdling: When mulch is piled around the trunk of a tree, the tree roots will grow into it, push against the tree and eventually strangle it. Called "girdling," it happens when both the roots and the tree increase in size as they age. This chokes off the water and nutrients which flow between the roots and branches and also prevents the food produced in the leaves from reaching the roots. Girdling can also compress and weaken the trunk of a tree at ground level, causing it to lose stability and lean. Trees with girdling roots can suffer a slow decline in health and premature death.

Disease and decay: Excess mulch piled high against a tree trunk will trap excess moisture and decaying organic material against the bark. This often leads to the onset of disease and decay around base of tree, again preventing food and energy from traveling up and down the tree. It also creates an ideal environment for bacterial rot, fungal rot and canker development in the trunk, which can be serious and sometimes fatal.

Critters: Excess mulch is the perfect place for insects and small animals like voles and meadow mice to hide while they feed on your prized plants.

Crusting: The surface of a thick mantle of mulch can bind into an impervious layer that repels water, preventing moisture from reaching the soil and the roots.

Mulching

Mulching is important for keeping the soil cool and moist and helping to combat weed growth. Because it is organic matter, mulch attracts worms and other soil-dwelling invertebrates that help aerate and improve the soil. And mulch zones around trees are extremely helpful in protecting the plants from the man-made threat of mowers and string trimmers.

So how to avoid making mulch volcanoes? Firstly correctly identifying the root flare and observing its transition into the soil, Doughnut mulching is spreading a ring of mulch in a layer that is 1 – 3 inches thick at its outer edge and tapers gradually to nothing at the base of the tree. The tree stands happy and healthy in the "doughnut hole." (And you don't waste time and money over-mulching.)

Fertilizing

Trees in forests have continuous access to natural fertilizers provided by the abundance of decaying plant and animal matter. However, those in the more controlled environments of urbanized areas are planted in soil that may not have the proper amount of nutrients they need. This makes manual fertilizing necessary.

In addition to carbon, hydrogen, and oxygen found in air and water, trees need other nutrients found in the soil. For trees to thrive, the following nutrients should be present in the soil:

- **Macronutrients** – The following primary macronutrients should be available to trees in large doses:
- Nitrogen
- Phosphorous
- Potassium
- **Secondary Nutrients** – In smaller quantities, plants need:
- Calcium
- Magnesium
- Sulphur
- **Micronutrients** – Micronutrients are also necessary for healthy trees, but only in trace amounts. These include (but are not limited to):
- Boron
- Copper
- Chlorine
- Iron
- Manganese
- Molybdenum
- Zinc

It's vital for these nutrients to be in the soil in the right quantities. Too much or too little can both affect the pH levels of the dirt and cause discolouration of leaves and reduced growth. The amount needed for each substance depends on the current levels present in your soil.

Application of Fertilizer

The interval between each fertilization period largely depends on the age of the tree.

- **Saplings** are quite sensitive and can easily be burned by high nitrogen levels. These need only minimal amounts of quick-release fertilizer.
- **Young, developing trees** need fertilizer to facilitate rapid growth. They are less sensitive and can be given regular fertilizers twice a year.
- **Mature trees** have more complicated root systems spreading over a wider area, enabling them to gather nutrients more efficiently. Fertilizing once a year is enough to maintain their health without encouraging excess vegetative growth.

Fertilizing is best done in spring or autumn. With spring fertilization, younger trees can soak up more nitrogen and supplement the nutrients they had stored before the cold weather set in. Late fall fertilization, after the tree's active growth has slowed, can promote disease resistance and root development during the cold winter months while making nutrients immediately available when the spring returns.

Kinds of Fertilizers

- **Organic** – Organic fertilizer is made of non-composted materials from plants and animals. It has a slow nutrient release rate due to the amount of time needed for organic matter to decompose. It poses the least risk to both the tree and the environment.
- **Inorganic** – Inorganic fertilizer is an affordable means of fertilizing. Trees can absorb this type significantly faster than organic ones. Note that inorganic fertilizers do pose a few risks.
- **Compost** – Compost is comprised of plant matter allowed to decay over time and is the closest to the natural form of fertilizer available in forests. The decomposition process slows down the absorption rate, but (like organic fertilizers) compost is safe for trees.

Biochar

Biochar' is a catch-all term describing any organic material that has been carbonised under high temperatures (300-1000°C), in the presence of little, or no oxygen. This process (called 'pyrolysis') releases bio-oils plus gases and leaves a solid residue of at least 80% elemental carbon which is termed biochar.

Virtually any organic material can be pyrolysed to make biochar. Different biochar feedstocks result in biochar with different properties, which is why it is important to know what material your biochar has been made from. Examples include soft plant tissue, woody materials, and manures. The property all of these biochars share is that they are carbon rich and don't readily decompose.

The idea of using biochar in soils was born from observing the man-made 'Terra Preta' soils of the Amazon. The fertility of the poor, acid soils in this region is thought to have been improved through addition of charred organic material by the area's indigenous inhabitants: helping to sustain population expansion across the Amazon region.

Biochar retains much of the open capillary structure from the original wood, including xylem vessels. In soil these channels continue to function as conduits for air, water, nutrients and biology.

Compost Tea

Compost teas are liquid versions of the solid compost material. They contain soluble plant nutrients and a complex community of beneficial microorganisms. While there are an infinite number of ways to prepare compost teas, basically all teas begin by mixing compost in water in order to extract plant nutrients and microorganisms. Liquid teas can be applied as soil drenches, foliar sprays or incorporated into irrigation systems.

Plants require up to 17 micro- and macronutrients for growth and reproduction. When compost is placed in water, soluble nutrients are released into the solution and are readily available after the liquid is applied.

The liquid environment, containing organic matter and other nutrients, is perfect for encouraging microbial growth. Bacteria and other microbes are attracted to germinating seeds and developing roots. Plants release a variety of exudates into the soil that are consumed by microbes. In return, specific microorganisms will release metabolites and other by-products of growth and reproduction that benefit plant production by suppressing plant diseases and increase nutrient turnover.

Soil Aeration

While fertilizer adds the much-needed nutrients to the soil, aeration promotes nutrient absorption and root growth through the following means:

Increased pore area – In nature, the ground is comprised of at least 50% pore space compared to the 10% in urban areas. Aeration fixes this, giving tree roots more breathing room.

Improved nutrient levels – Compacted soil makes it difficult for beneficial microorganisms to thrive and for trees to get the nutrients they need from the air or water. Soil aeration solves this by creating air pockets (or macropores) in the soil. These air pockets allow the roots of trees to breathe and gain better access to nutrients and improve root growth.

Improved water supply – Your trees can be profoundly affected by drought. However, even in normal weather conditions, trees can have difficulty accessing groundwater. If the soil hardens, little to no water will penetrate to the roots of your trees. By breaking up the earth, aeration creates passageways for water to pass.

Enhanced resistance to pests and diseases – Trees with unhindered access to water and nutrients grow healthier and more vibrant. They can better resist pests and fend off diseases.

Methods of Aeration

Spike Aerator

This involves puncturing holes into the soil with a spiked roller, pitchfork, or tines to create holes in the soil.

Airspade Aeration

A process that allows for oxygen to be reintroduced into the soil. Creating air spaces not only helps re-oxygenate the tree's root zone, but also allows for water to percolate properly through the soil and stimulates beneficial microbial growth.

High pressure air to physically punch holes as deep as possible into the soil throughout the root zone. Next, the compacted soil is amended with a compound containing pea gravel, dried molasses,perlite, worm castings, lava sand and compost. These organic amendments provide a route for air and water to easily reach the feeder roots. The
amendments also create a beneficial environment for organisms like bacteria and earthworms, which play an important role in the uptake of nutrients from the soil.

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Glossary of Terms:

Abbreviations

BS - British standards
BSS - British standard specifications
CON - coniferous
DBH - diameter at breast height
DEC - deciduous
GD - *Ganoderma sp.*
HF - *Hymenoscyphus fraxineus*
HWH - hawthorn
KD - *Kretzschmaria deusta*
MXD - mixed PLT
- plantation SP -
Scots pine SS -
Sitka spruce
WLW - willow
WLN – woodland
CDS - Co-Dominant Stem
TU - Tension Union
CU - Compression Union
LDDW - Large Diameter Deadwood
SMDD - Small Diameter Deadwood
AB – As before
IRZ/A – Improve rooting
zone/area
FP - Footpath
OM – Over mature
N - North
S - South
E - East
W - West
NS - North Side
SS - South Side
ES - East Side
WS - West Side

Tree Genera/Species

Sp. - Species, used following generic terms when species is not immediately identifiable e.g. *Acer sp.* includes trees in the maple genus.
Acer sp. - Maple
Acer pseudoplatanus - Sycamore
Crataegus monogyna -
Hawthorn*Fagus sylvatica* -
Beech *Fraxinus excelsior* - Ash
Larix Decidua - European Larch
Malus sp. - Apple
Picea sitchensis - Sitka spruce
Pinus sp. - Pine
Pinus sylvestris - Scots pine
Populus sp. - Poplar
Prunus spinosa - Blackthorn
Quercus robur - *Englis*h oak
Salix sp. – Willow
C. A. Glauca - Blue Spruce
Sorbus – Mountain Ash
Prunus sp – Cherry
Quercus – Oak
Betula sp – Birch
Alnus glutinosa – Black alder
Abies – Fir
Tila sp – Lime
Salix sp – Willow
Eucalyptus sp – Eucalyptus
Juglans sp – Walnut
Euonymus europaeus - European spindle
Cotoneaster sp – Rose Tree
Crataegus sp – Hawthorn
Malus sp – Apple
Taxus baccata – English Yew
Carpinus sp – Hornbeam
Cupressus sp – Cypress
Castanea sativa – Sweet Chestnut
Picea abies – Norway spruce
Cedrus sp – Cedar
Pinus pineas – Stone pine
Sambucus nigra – Elderberry
Pinus Mugo – Mountain pine
Cupressus macrocarpa – Monterey Cypress

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Tree Categories

As per the recommendation of BS 5837:2012 4.5.5, it was initially determined whether a tree fell into category U, if not it was then considered for categories A, B and C respectively

Category U - those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.
Category A - trees of high quality with an estimated remaining life expectancy of at least 40 years.
Category B - trees of moderate quality with an estimated remaining life expectancy of at least 20 years
Category C - trees of low quality with an estimated remaining life expectancy 0f between 10 and 20 years.

The above categories can be further subdivided regarding the nature of their values or qualities:

Sub-category 1 - Arboricultural qualities: the trees influence as a good example of its species, it's health and structure
Sub-category 2 - Landscape qualities: the trees importance within and as landscape features
Sub-category 3 - Cultural qualities: trees of an age that have a significant conservation and historical value

Deadwood

Small diameter </= 25 mm

Large diameter >25 mm

Age Classification

Terms are relative to the lifespan of individual species for the geographic region surveyed.

Young - less than 10 years old
Semi-mature - within the first third of its life span
Mature - tree within the second two thirds of its life span
Veteran - tree beyond/at end of natural life span, in a state physical decline

Tree Grouping Key

G – green area where trees could be planted.
S – scattered trees, not dense enough to be a Woodland
W – woodland of some kind, either immature, Pocket, linear or semi-natural. Semi-natural Woodland was only found in the golf course
P – plantation
H – hedgerow
T – treeline

Appendix I: Tree Data Table

Map Number	Species	Total Number of trees	Comments/Recommendations	latitude	longitude
1	Sorbus sp. x1 Acer sp. x3 Prunus sp. x2	6	improve rooting zone on each tree, don't use herbicide around base	53.95202436	-6.384204626
1	Acer sp. x10	10	improve rooting zone	53.95468148	-6.381447315
1	Quercus sp. x23 one dead tree	23	improve rooting zone remove and replace dead tree	53.95340325	-6.383810006
2	Acer sp. x2	2	improve rooting zone	53.95667677	-6.382250637
2	Alnus glutinosa x3 Fagus sylvatica x1	4	improve rooting zone	53.95663475	-6.381809413
2	Cupressus x leylandii hedge	H		53.95573437	-6.381553262
2	Green spaces		plant trees	53.95492098	-6.382649615
3	Betula sp. x1 Acer sp. x7	8	improve rooting zone	53.95774875	-6.380845159
3	Fagus sylvatica x4 Betula sp. x 30	34	improve rooting zone remove stakes	53.95804465	-6.380324811
4	Prunus sp. x12 Acer sp. x2	14	improve rooting zone	53.95707112	-6.378622279
5	Tilia sp. x5	5	improve rooting zone remove stakes	53.95769746	-6.376866102
6	Betula sp. x14 Acer pseudoplatanus x5	19		53.95891736	-6.375826076
6	treeline approx. 20 spp. Abies sp. Pinus sylvestris Acer pseudoplatanus Fagus sylvatica	20		53.95913416	-6.375557184
6	Fagus sylvatica x38 Prunus sp. x6 Abies sp. x8	52		53.95953716	-6.375966892

7	Prunus sp.	1	improve rooting zone remove stake	53.95862068	-6.373857334
7	Tilia sp.	1	improve rooting zone	53.95864257	-6.373997144
7	Acer pseudoplatanus	1	improve rooting zone	53.95793221	-6.374061517
7	Acer sp. grp	S	have suffered from excessive pollards improve rooting zone may help	53.95851612	-6.374046765
7	Acer sp.s	S	improve rooting zone	53.95787836	-6.375238337
8	Acer pseudoplatanus x2	2	reduce lats over roadside	53.95724235	-6.374897696
8	Alnus glutinosa x3 Fraxinus excelsior Salix sp.	5		53.95739997	-6.3739435
8	Salix sp. grp + 1 Acer sp.	S	4 m height reduction on roadside to suitable growth points remove limb over road	53.95760908	-6.3722983
9	Fraxinus excelsior	1	9 monthly monitoring	53.9592466	-6.37027625
9	Betula sp.	1		53.9579762	-6.371420547
9	Populus sp.	1	remove hanging deadwood over roadside end weight by 2 m improve rooting zone	53.95785942	-6.371449716
9	Prunus sp.	6	several Prunus sp. some dying improve rooting zone	53.9580488	-6.371370256
9	Eucalyptus sp. grp	S	reduce height of northernmost tree back to seconiferdary canopy	53.95895307	-6.371654235
9	Prunus sp.	S	improve rooting zone	53.95890099	-6.371183172
10	Fagus sylvatica	1	reduce dead timber to suitable growth points	53.95764025	-6.370639689
10	Acer pseudoplatanus	1	Reduce laterals over road and reduce height by 2 m to suitable growth points improve rooting area	53.95835811	-6.368324272
10	Alnus glutinosa and Acer pseudoplatanus	2	improve rooting zone	53.95788783	-6.369677447
10	Pinus sp. x 4	4	improve rooting zone (improve rooting zone)	53.95789414	-6.369570494
10	Betula sp. x4	4	manage Hedera helix to height of 50%	53.95816833	-6.368366667
10	Acer pseudoplatanus x5	5	sick improve rooting zone	53.95780931	-6.370177343
10	Prunus sp. spp. x7	7	improve rooting zone	53.95780517	-6.370643042

10	Salix sp. grp	S		53.95891421	-6.367604434
11	Prunus sp.	1		53.95920813	-6.369472258
11	Juglans sp.	1	IRA	53.95920734	-6.369583905
11	Acer sp.	1		53.95889862	-6.368240118
11	Betula sp. and 2 Prunus sp.	3		53.95895267	-6.369343512
11	Cupressus x leylandii hedge	H	retain standing deadwood	53.95923693	-6.369494386
12	Prunus sp.	1	too big wall damage remove and replace	53.96159357	-6.370794587
12	Acer sp.	1	remove too big	53.96175847	-6.370547153
12	Prunus sp.	1	sick Prunus sp. too big for rooting area cankered remove	53.96113851	-6.368731633
12	Euonymus europaeus and Prunus sp.	2	biodiversity area improve rooting zone	53.96160667	-6.36842
12	Sorbus sp. x2 Prunus sp. x2 Malus sp. x2	6	improper pruning improve rooting zone	53.96023192	-6.368031912
12	Acer sp. treeline x8	8	on private property	53.96205415	-6.368568353
12	mixed spp. Prunus sp. Tilia sp. Fagus sylvatica Acer sp. x8	8	improve rooting zone improper pruning	53.9605708	-6.368517727
12	Acer sp. Prunus sp. Betula sp. x33	33	improper care pruning planting etc. improve rooting zone	53.96178273	-6.370061673
12	Green area	G	plant trees	53.96200089	-6.369084343
12	Cupressus x leylandii treeline	T	remove and replace	53.9623157	-6.368917376
12	leydandii treeline	T		53.96174526	-6.368280016
13	Acer sp.	1	basal cavity and signs of damage in crown. lean over road remove and replace	53.96338872	-6.367918588
13	Prunus sp.	1	aerial root damage raise/mound ground over to prevent further damage	53.96253011	-6.368993148
13	Betula sp.	1	Crown raise to above pedestrian height reduce end weight by 3 m to suitable growth points while trying to maintain a tree-like crown shape"	53.96229894	-6.371440999
13	Prunus sp.	1	cantered excessively pruned. remove and replace	53.96233937	-6.371107735

13	Pinus sp. x2	2	remove storm damage on larger tree reduce leaf capacity by 30% on NE stem with cuts no greater than 100 m OR discuss able bracing	53.96350608	-6.368554942
13	x2 Acer sp. x1 Prunus sp.	3	improve rooting zone improper pruning	53.96240091	-6.370152198
13	Acer sp. x11	11	improve rooting zone	53.96356861	-6.367938034
14	Salix sp.	1		53.96467946	-6.369057857
14	Populus sp.	1	Reduce height by 30% to previous cuts	53.96440964	-6.369082667
14	Acer pseudoplatanus	1	repollard to previous cuts to previous cuts	53.96400471	-6.36905551
14	Populus sp.s x2	2	Reduce to height of 5 m to suitable growth points	53.96447197	-6.367838122
15	Pinus sylvestris	1		53.96499051	-6.370702051
15	Acer sp.	1	improve rooting zone target prune limbs back from shed Crown lift above the path	53.96614728	-6.370000318
15	Cupressus x leylandii hedge	H		53.96611533	-6.371498667
15	line of Acer sp.s one Fraxinus excelsior	T		53.96468893	-6.369838379
16	Cupressus x leylandii	1	storm damage remove and replace	53.963998	-6.366253272
16	large Salix sp.	1	repollard to old cuts	53.96412463	-6.366600282
16	dying Prunus sp.	1	remove and replace	53.96431	-6.36689
16	Populus sp.	1	improve rooting zone	53.96486167	-6.367803333
16	Prunus sp. x2	2	improve rooting zone remove stakes	53.96547432	-6.366613694
16	Fraxinus excelsior x2 Prunus sp. x1	3	improve rooting zone	53.96536565	-6.367673837
16	Prunus sp. x2 Betula sp. x1	3	fungal infection in middle Prunus sp. improve rooting zone	53.96414909	-6.366819888
16	Acer sp. x3 Betula sp. x2	5	improve rooting zone	53.96628968	-6.367479376
16	Acer sp. Prunus sp. mix x13	13	improve rooting zone remove stakes	53.966245	-6.368811667
16	open space	G	plant more trees	53.96563053	-6.365947835
16	Cupressus x leylandii hedgerows	H		53.96481023	-6.368373893
16	Cupressus x leylandii trees	T		53.96485027	-6.369188614

17	Cotoneaster sp. x3 Salix sp. x2 Acer pseudoplatanus x2	7	improve rooting zone of large cotoneaster liaise with resident about reducing limbs over adjacent property	53.96649657	-6.366491653
17	Acer sp. x2 Populus sp. x5	7		53.96661886	-6.368919387
17	Green spaces	G	plant more trees	53.96763674	-6.366151683
17	Green spaces	G	plant more trees	53.9665585	-6.366270706
17	green spaces	G	plat more trees	53.96645535	-6.368682012
18	Acer sp.	1	improve rooting zone	53.96408913	-6.365247443
18	Acer sp. x5	5	excessively pruned remove and replace with more suitable species	53.96419	-6.364981667
18	line of Acer sp.s	T	Improve rooting area (IRA)	53.96270487	-6.366090663
19	Fraxinus excelsior	1	Some dead improper cutting manage regrowth pollard to prev cuts improve rooting zone	53.96601612	-6.364769675
19	Acer pseudoplatanus	1	prf	53.965905	-6.364355
19	Acer pseudoplatanus	1	end weight limbs over road by 3 m to suitable growth points	53.96570833	-6.363541667
19	Acer sp. x5 Tilia sp. x1	6	improve rooting zone	53.96594039	-6.364468262
19	Acer sp. x10 Tilia sp. x3	13	Meripelus gigantaeus and Abortiporus biennis present may indicate likely root failure surface height has been raised in recent years six trees adjacent to carpark reduce to 3 m leave as standing deadwood	53.96636621	-6.363928467
19	line of 13 Acer sp.	14		53.96618771	-6.364673451
19	~25 Acer sp.	25	remove deadwood over path end weight by 2 m manage Hedera helix to 5 m	53.96542245	-6.363832578
19			stop putting herbicide around base of tree	53.96618042	-6.363236457
20	Fagus sylvatica x1 Crataegus monogyna x1 Prunus sp. x2 Betula sp. x3 Acer sp. x1	8	Acer sp. excess. pruned improve rooting zone	53.96892301	-6.364943348
21	Green with Betula sp. and Pinus sylvestris suremove and replaceounded by 38 Acer pseudoplatanus	S	trees have been improperly managed (poorly pollarded) improve rooting zone	53.97318644	-6.364724413

22	Fraxinus excelsior x7	7	rotting zone compromised further pavement cracks likely	53.974033	-6.365733929
22	Prunus sp. x9	9	improve rooting zone	53.97410832	-6.365354732
23	Salix sp.	1	consider further investigation No immediate action required but consult with adjacent property owner re reduction	53.97447806	-6.364673786
23	Crataegus monogyna x3	3	improve rooting zone plant more	53.95624158	-6.385352276
23	Fagus sylvatica SM x3	3	improve rooting zone	53.95747849	-6.380764693
23	Alnus glutinosa x5	5	improve rooting zone and remove stakes	53.97587612	-6.364956088
23	Quercus sp. x10	10	improve rooting zone	53.95798962	-6.380788162
23	Abies sp. x16	16		53.95757929	-6.380777098
23	Sorbus sp. x1 Prunus sp. x39	40	improve rooting zone and remove stakes	53.97515521	-6.364613101
24	Tilia sp. x3	3	remove stakes	53.97200667	-6.367441667
24	Acer sp. x10 Tilia sp. x5	15	improve rooting zone	53.97167667	-6.367069669
24	Acer sp. x12 Betula sp. x1 Prunus sp. x1 Ilex aquifolium x1	15	improve rooting zone	53.97184804	-6.366608329
24	Acer sp. x20 Tilia sp. x4 Betula sp. x1 Fagus sylvatica x1	26	improve rooting zone	53.9723726	-6.36578992
25	Acer sp. x3	3	improve rooting zone and remove stakes	53.97241953	-6.371113099
25	Betula sp. x5	5	improve rooting zone and remove stakes	53.97255833	-6.367931667
25	Acer sp. x2 Tilia sp. x1 Fagus sylvatica x2	5	improve rooting zone and remove stakes	53.97131667	-6.370641667
25	Fagus sylvatica x6	6	improve rooting zone and remove stakes	53.97247667	-6.367833333
25	Betula sp. x3 Acer sp. x5	8	improve rooting zone remove stakes	53.97280167	-6.366676667
25	Quercus sp. x10	10	improve rooting zone	53.97361179	-6.366067193
25	Prunus sp. x1 Acer sp. x6 Tilia sp. x5	12	improve rooting zone	53.9730482	-6.365853958

25	Fagus sylvatica x5 Tilia sp. x9 Betula sp. x2	16	improve rooting zone and remove stakes	53.97142129	-6.369361281
25	Prunus sp. x5 Acer sp. x13	18	improve rooting zone and remove stakes	53.97198805	-6.371362545
25	treeline	T	conserve	53.97344378	-6.367654391
26	Sorbus sp. x13 Fraxinus excelsior x2 Acer pseudoplatanus x2	17	improve rooting zone	53.96887489	-6.370734908
26	Acer sp. x18	18	improve rooting zone	53.96924704	-6.370705403
26	x39 Prunus sp. Betula sp. Sorbus sp.	39	improve rooting zone	53.96934348	-6.371572763
26	Betula sp. x46 Acer sp. x6	52	improve rooting zone	53.96987	-6.370211667
26	Fraxinus excelsior treeline	T		53.9694342	-6.371422559
27	Betula sp. x5 Fraxinus excelsior x3	8	improve rooting zone	53.96813216	-6.36955943
28	Fraxinus excelsior x2 Sorbus sp. x2	4	improve rooting zone	53.96853449	-6.37080498
28	Fraxinus excelsior treeline	T		53.96822604	-6.370995082
29	Fagus sylvatica x3 Salix sp. x1 Betula sp. x1 Acer sp. x1	3	improve rooting zone	53.96839663	-6.371560358
29	Betula sp. x2 Salix sp. x1	3	improve rooting zone and remove stakes	53.96810652	-6.372114904
29	approx. 100 Tilia sp.	100	improve rooting zone	53.96775054	-6.372884028
29	mixed treeline	T		53.96755627	-6.372325458
30	Prunus sp. x4 Sorbus sp. x2	6	improve rooting zone	53.96637667	-6.374308333
31	Tilia sp. x3	3	improve rooting zone	53.96524672	-6.376195215
31	Acer sp. x6	6	improve rooting zone	53.96613466	-6.376484223
31	Betula sp. x9 Salix sp. x1	10	improve rooting zone and remove stakes	53.96561633	-6.374848075
31	Acer sp. Tilia sp. treeline x10	10	improve rooting zone	53.96543	-6.375003333
31	Malus sp. x7 Acer sp. x11	18	improve rooting zone and remove stakes	53.96535303	-6.375534385
31	Fraxinus excelsior x3 Prunus sp. x2 Acer sp. x14 Sorbus sp. x2 Alnus glutinosa x3	24	improve rooting zone and remove stakes	53.96535993	-6.376632415

32	Acer pseudoplatanus x2	2		53.96656107	-6.37824811
32	Taxus baccata x7	7		53.96629833	-6.377941667
33	Fagus sylvatica	1		53.96591356	-6.373042949
33	Fagus sylvatica	1	improve rooting zone	53.96581317	-6.373182423
33	Betula sp.	1		53.96594709	-6.373374872
33	Acer pseudoplatanus x2	2	improve rooting zone	53.96479167	-6.376638333
33	Tilia sp. and Fagus sylvatica	2	improve rooting zone	53.965	-6.372043333
33	Acer pseudoplatanus x3	3	improve rooting zone	53.96492818	-6.375976279
33	Betula sp. x3	3	improve rooting zone	53.96482503	-6.375852227
33	Acer pseudoplatanus x3	3	improve rooting zone	53.96471418	-6.374942623
33	Acer pseudoplatanus x3	3	improve rooting zone	53.96452779	-6.374780685
33	Acer pseudoplatanus x3	3		53.964835	-6.374545
33	Tilia sp. x4	4	improve rooting zone	53.96543488	-6.374051794
33	Tilia sp. x4	4	improve rooting zone	53.96463607	-6.373819448
33	row of Tilia sp. x5	5	improve rooting zone	53.96522719	-6.372310705
33	Acer pseudoplatanus x3 Carpinus betulus x2 Acer sp. x1	6	improve rooting zone	53.96585735	-6.373557597
33	Sorbus sp. x5 Acer sp. x1	6	improve rooting zone	53.96517039	-6.372668445
33	Acer sp. x6	6	improve rooting zone remove volcano much	53.96487059	-6.372213475
33	Sorbus sp. x 8	8	improve rooting zone	53.96499189	-6.373258866
33	Fagus sylvatica x3 and Tilia sp. x7	10	improve rooting zone	53.96582461	-6.3729598
33	pocket woodland	W	manage as with others	53.96461102	-6.373385936
34	Prunus sp.	1	improve rooting zone	53.96446833	-6.379486667
34	Alnus glutinosa x3 Prunus sp. x1	4	improve rooting zone	53.96413333	-6.378955
34	Prunus sp.? x6	6	improve rooting zone	53.96427414	-6.378584728
34	Betula sp. x5 Populus sp. x3	8	improve rooting zone dont cut like that	53.96427333	-6.379211667
34	Prunus sp. x9	9	improve rooting zone	53.96467927	-6.378428489
34	conifer treeline	T		53.96479167	-6.378208333
34	mixed decid treeline	T	remove stakes from standards	53.96501333	-6.379556667
34	Salix sp. treeline	T		53.96439248	-6.379638836
35	Sorbus sp. x6	6		53.96361595	-6.373025514
35	row of Tilia sp. x14	14	improve rooting zone	53.96457079	-6.372902803
35	pocket woodland	W	manage as with others	53.96385954	-6.372517571

35	mixed mini woodland area	W	remove stakes on established standards (5 years) improve rooting zone on semimature (5 year + old tree)	53.96395284	-6.372016668
35	mixed native area	W		53.96442187	-6.372029409
36	Carpinus sp. and Malus sp.	2		53.96111602	-6.374084651
36	Acer sp. and Fagus sylvatica x13	13	improve rooting zone	53.96091541	-6.376035623
36	Cotoneaster sp. and Malus sp. x14	14	improve rooting zone	53.96085643	-6.375033483
36	Acer sp. Fagus sylvatica grp x18	18	improve rooting zone	53.96045166	-6.375751309
36	mixed decid ~ 150	150	improve rooting zone	53.96352285	-6.37565978
37	Quercus sp.	1	improve rooting zone to dripline	53.96101404	-6.379693486
37	Prunus sp.	1	path damage basal canker remove and replace	53.96173667	-6.378175
37	Fagus sylvatica x2	2	remove overhanging limb	53.96101108	-6.378503926
37	Betula sp. x1 Prunus sp. x1 Sorbus sp. x1	3		53.96125962	-6.380180977
37	Prunus sp. x3	3	root compacted too big for area caising struct damage- lifting path/curb. remove and replace with smaller tree	53.96155215	-6.378394291
37	Cupressus x leylandii treeline Betula sp. x6	6		53.96130045	-6.378241405
37	Betula sp. x3 Prunus sp. x3 by roadside	6		53.96110576	-6.38021417
37	Prunus sp. x4 Acer sp. x1 Betula sp. x1	6		53.96157089	-6.380056255
37	Prunus sp. by entrance Acer sp. x2 Prunus sp. x 4	6	(Prunus sp. by entrance) fungal pathogen remove and replace	53.9620796	-6.377639249
37	Acer sp. x7	7		53.96096177	-6.378623955
37	15x Prunus sp. 1x Acer sp.	16	too big for planting area tripping hazards remove and replace	53.96167878	-6.379285455

37	Prunus sp. x7 Acer sp. x8 Betula sp. x1 Sorbus sp. x2	18	remove and replace trees are too big for the area they are planted in	53.96191903	-6.380473673
37	small park ~20 dec trees	20	room to plant more	53.96054437	-6.379730031
37	mixed dec x24	24		53.9608369	-6.38114389
37	Populus sp. x48	48	reduce to a height of 20 m to suitable growth points	53.960528	-6.378932744
37	mixed species approx. 89 predom Prunus sp. with occ. Betula sp. Sorbus sp. and Malus sp.	89		53.96015597	-6.380063966
38	Prunus sp. x3	3	improve rooting zone remove stakes	53.96250506	-6.384884566
38	5 Prunus sp.	5	Crown lift above pedestrian height remove stakes	53.962955	-6.385691667
38	Prunus sp. x7	7	replant trees less deep	53.96102883	-6.38227243
38	Prunus sp. x10	10	remove stakes improve rooting zone	53.96175078	-6.384527497
38	10 Prunus sp.	10	improve rooting zone remove stakes	53.96235851	-6.385711022
38	Green spaces	G	plant trees	53.96123398	-6.383586042
39	Sorbus sp. x3	3	improve rooting zone remove stakes plant more trees	53.96400648	-6.384829581
39	Betula sp. x4	4	improve rooting zone remove stakes	53.96402167	-6.385327466
39	Sorbus sp. x4	4	improve rooting zone remove stakes	53.96370806	-6.385280862
39	Prunus sp. x4 Sorbus sp. x1	5	bark damage remove and replace improve rooting zone remove stakes	53.96463548	-6.386170685
39	Crataegus monogyna x6 and Carpinus betulus x6	12	remove stakes improve rooting zone plant more	53.96453333	-6.387098333
39	Prunus sp. x8 Betula sp. x3 Cupressus sp. x3	14	remove stakes improve rooting zone	53.96341476	-6.384826563
39	Cupressus x leylandii hedge and ~10 Fagus sylvatica	H	cut back Cupressus x leylandii to boundary line smothering Fagus sylvatica	53.96411	-6.38703
40	Sorbus sp.	1	improve rooting zone	53.96934111	-6.386561953
40	Quercus sp. x3	3	improve rooting zone plant more	53.96921	-6.386166667

40	Fraxinus excelsior x2 Prunus sp. x3 Tilia sp. x3	8	improve rooting zone	53.96915967	-6.386065744
40	Tilia sp. x8 Fraxinus excelsior x5	13	improve rooting zone remove and replace Fraxinus excelsior	53.96914804	-6.385383122
40	59 spp. Quercus sp. Fraxinus excelsior Betula sp. Fagus sylvatica Populus sp. Sorbus sp. Prunus sp.	59	improve rooting zone remove and replace Fraxinus excelsior some trees rootbound	53.96816766	-6.385185979
41	Tilia sp. x4	4	improve rooting zone	53.96892333	-6.387383333
41	Betula sp. x 4 Tilia sp. x10	14	improve rooting zone	53.9695543	-6.386913992
42	Betula sp.	1		53.97040192	-6.387918815
42	Tilia sp. x3	3	remove supports improve rooting zone	53.97089376	-6.386855654
42	Prunus sp. x3	3	improve rooting zone	53.97097678	-6.386546195
42	Prunus sp. x3 Crataegus monogyna x2	5	improve rooting zone	53.96984833	-6.386818333
42	Tilia sp. x5	5	remove and replace	53.97170667	-6.38754
42	Betula sp. x4 Crataegus monogyna x1	5		53.97028616	-6.387576833
42	Prunus sp. x3 Crataegus monogyna x3	6	improve rooting zone	53.97000257	-6.387268044
42	Prunus sp. x6	6	improve rooting zone remove and replace wtwp	53.97083874	-6.386813745
42	Tilia sp. x6	6	improve rooting zone	53.97126766	-6.386762448
42	x3 Crataegus monogyna x3 chy	6	remove and replace rootbound WTWP	53.97135542	-6.386655159
42	Quercus sp. x4 Fagus sylvatica x1 Castanea sativa x1 Acer sp. x2	8		53.97043643	-6.387974471
42	Crataegus monogyna x5 Sorbus sp. x5	10	remove and replant on other side of pavement trees flagging	53.97044787	-6.387506761
42	Crataegus monogyna x10 chry x10	20	remove and replace rootbound	53.97079259	-6.386633702
42	native hedgerow with Fraxinus excelsior and Crataegus monogyna	H	improve	53.97173662	-6.387817562
42	Cupressus sp. treeline	T		53.97210874	-6.385866255

43	Sorbus sp. x2	2	improve rooting zone	53.96873763	-6.383440532
43	Prunus sp. x4	4	improve rooting zone	53.96857748	-6.382688507
43	green	G	create woodland	53.96868379	-6.382031031
44	Prunus sp.	1		53.96924901	-6.376636773
44	Picea abies	1	thin and brash otherwise trees will start to die facilitate regen	53.9743278	-6.380250044
44	Prunus sp.	1		53.97261673	-6.378226317
44	Tilia sp.	1		53.97709	-6.378733333
44	Cupressus macrocarpa with storm damage	1		53.97817681	-6.378715485
44	Acer sp.	1	canker on N side of trunk could be phyophtera poor rooting zone improve rooting zone may improve health	53.97695964	-6.377684847
44	Laryx sp.	1		53.97203459	-6.37852069
44	Cupressus macrocarpa	1		53.97060998	-6.378128752
44	Pinus mugo	1		53.97375831	-6.376382634
44	Acer sp.	1		53.97459499	-6.376449354
44	Acer sp.	1		53.97424	-6.376015
44	Acer sp.	1	standing deadwood retain	53.97434732	-6.374962069
44	Cupressus x leylandii	1		53.97399257	-6.374609023
44	Acer pseudoplatanus	1		53.97385552	-6.375543438
44	Acer pseudoplatanus	1		53.97366622	-6.375226937
44	Pinus mugo	1	DW improve rooting zone	53.97354573	-6.375026442
44	Fagus sylvatica	1	improve rooting zone	53.97261667	-6.374993333
44	Fagus sylvatica	1	improve rooting zone	53.97263487	-6.374883614
44	Quercus sp.	1		53.97276739	-6.374409199
44	Cupressus x leylandii	1		53.97259583	-6.374444067
44	Quercus sp.	1	remove stakes	53.97246333	-6.374531667
44	Cupressus x leylandii	1		53.9726682	-6.373937465
44	Sorbus sp.	1		53.97299535	-6.373552568
44	Pinus sp. x1 Fagus sylvatica x1	2		53.9694413	-6.377691887
44	Fraxinus excelsior x2	2	remove overhanging dead limbs leave as standing deadwood	53.975135	-6.381758333
44	Fraxinus excelsior x2	2		53.97540603	-6.381906979

44	Cupressus x leylandii Cupressus macrocarpa	2		53.9767944	-6.378466375
44	Prunus sp. x1 Fraxinus excelsior x1	2		53.97034833	-6.377141667
44	Betula sp. x1 Prunus sp. x1	2		53.97084682	-6.378844231
44	Fagus sylvatica x2	2		53.97488743	-6.37585558
44	Picea abies x1 Acer sp. x1	2		53.97398508	-6.375747621
44	Acer sp. x2	2		53.97439721	-6.375028789
44	Alnus glutinosa x3	3		53.97058769	-6.381147243
44	Acer sp. x3	3		53.97631545	-6.378034875
44	Acer pseudoplatanus x3	3		53.97765252	-6.378097571
44	Abies sp. x3 Abies sp.	3		53.9741454	-6.373736635
44	Cedrus sp. x2 Laryx sp. x1	3		53.969965	-6.37824
44	Pinus sp. x3	3		53.97211525	-6.378207542
44	Cupressus x leylandii x 2 Crataegus monogyna x1	3		53.97031239	-6.377891041
44	Fraxinus excelsior x3	3	improve rooting zone	53.97543833	-6.376406667
44	Fagus sylvatica x1 Acer sp. x1 Tilia sp. x1	3		53.97471833	-6.375605
44	Cupressus macrocarpa x1 standing deadwood Pinus mugo x2	3		53.97436901	-6.376202591
44	Prunus sp. x1 Sorbus sp. x2	3		53.9730622	-6.373430863
44	Fraxinus excelsior Quercus sp. Tilia sp.	4		53.9717307	-6.373964623
44	Salix sp. x1 Populus sp. x1 Alnus glutinosa x2	4		53.97561833	-6.379225
44	Cupressus x leylandii x2 Cupressus macrocarpa x1 Prunus sp. x1	4	one Cupressus x leylandii with storm damage	53.97624288	-6.37991745
44	Fraxinus excelsior x2 Prunus sp. x2	4		53.97556167	-6.37809

44	Acer sp. x1 Fraxinus excelsior x1 Laryx sp. x2	4		53.97583333	-6.37773
44	Cupressus x leylandii x4	4		53.97047508	-6.378933415
44	Pinus pineas x4	4		53.97181826	-6.378761753
44	Pinus sylvestris Pinus nigra Cupressus x leylandii Sambucus nigra	4		53.97490596	-6.377605051
44	Pinus sp. x5	5	manage Hedera helix to height of 5m	53.96919399	-6.379545629
44	Betula sp. x4 Sorbus sp. x1	5		53.97685631	-6.381333992
44	Acer sp. x1 Laryx sp. x1 Prunus sp. x2 Cupressus x leylandii x1	5		53.97604333	-6.378808333
44	Picea abies x5	5		53.97558823	-6.377459541
44	Pinus sylvestris Fraxinus excelsior Prunus sp. Acer sp. Quercus sp.	5		53.97735202	-6.376832239
44	Cupressus macrocarpa x5	5		53.97128876	-6.375957504
44	Pinus mugo x2 Pinus sylvestris x 2 Pinus pinea x1	5		53.9730269	-6.377699263
44	Pinus mugo x 4 Acer sp. x1	5		53.97355007	-6.377665401
44	Tilia sp. x3 Alnus glutinosa x1 Sambucus nigra x1	5		53.97347454	-6.376555637
44	Acer sp. treeline x5	5		53.97244379	-6.374771968
44	Fraxinus excelsior x1 Prunus sp. x1 Laryx sp. x4	6		53.97650928	-6.380200759
44	Pinus sp. x1 Fraxinus excelsior x1 Tilia sp. x1 Cupressus x leylandii x3	6		53.97701833	-6.377533333

44	Betula sp. x1 Acer sp. x2 Tilia sp. x2 Fraxinus excelsior x1	6		53.97167193	-6.375878714
44	Cupressus x leylandii x6	6		53.97073974	-6.37886133
44	Acer sp. x5 Pinus sylvestris x1	6		53.97547347	-6.377017647
44	Sorbus sp. x1 Prunus sp. x2 Acer sp. x2 Alnus glutinosa x1 Crataegus monogyna x1	7		53.97675333	-6.379583333
44	Fraxinus excelsior x2 Prunus sp. Sorbus sp. x3 Pinus sylvestris x1	7		53.97236491	-6.37726441
44	Pinus sylvestris x1 Betula sp. x3 Acer sp. x1 Tilia sp. x1 Fraxinus excelsior x1	7		53.97203833	-6.377556667
44	Tilia sp. x4 Cupressus x leylandii x4	8		53.97680229	-6.377329119
44	Cupressus macrocarpa and Pinus sp. x8	8		53.97624333	-6.376698333
44	Acer sp. x2 Tilia sp. x5 Cupressus x leylandii x1	8		53.97279796	-6.375591047
44	Cupressus macrocarpa x8	8	remove storm damage on east side	53.97443152	-6.375288293
44	Laryx sp. x9	9		53.97518794	-6.37487255
44	scattered Quercus sp. line x9	9		53.9748545	-6.374723688
44	Acer sp. x2 Fagus sylvatica x1 Quercus sp. x3 Sorbus sp. x1 Carpinus betulus x1 Betula sp. x1	9		53.97020234	-6.378805675
44	Cupressus x leylandii x9	9		53.97552257	-6.376728974

44	Populus sp. x1 Tilia sp. x4 Betula sp. x5	10		53.96978898	-6.376892589
44	Acer sp. x8 Fraxinus excelsior x2	10		53.97574559	-6.37952216
44	Abies sp. Abies sp. and Fagus sylvatica treeline x10	10		53.97497813	-6.37474414
44	Carpinus betulus x1 Alnus glutinosa x5 Prunus sp. x4	10		53.97155637	-6.377789788
44	Cupressus x leylandii x4 Cupressus macrocarpa x1 Sorbus sp. x2 Laryx sp. x3	10		53.97437651	-6.376555637
44	Cotoneaster sp. Prunus sp. Platanus x hispanica Sorbus sp. Tilia sp. Populus sp. Juglans sp. Acer sp.	11	Crown raise the Prunus sp. branches over path remove and replace the Juglans sp. as it has a large canker improve rooting zone	53.97338127	-6.368542872
44	Pinus nigra x2 Acer sp. x1 Laryx sp. x3 Picea abies x5	11		53.97506095	-6.376083568
44	Prunus sp. x1 Sorbus sp. x2 Sorbus sp. x1 Acer sp. x4 Cupressus sp. x1 Cupressus x leylandii x2	11		53.97383541	-6.374394447
44	Betula sp. x11 Cupressus x leylandii x1	12		53.9709194	-6.380438134
44	Cupressus x leylandii x2 Acer sp. x4 Pinus sp. x5 Populus sp. x1	12	storm damage to northernmost Cupressus x leylandii	53.97642333	-6.379275

44	x2 treeline x10 Fraxinus excelsior Quercus sp.	12		53.97139	-6.378803333
44	Cupressus x leylandii x14	14	storm damage in crown of Central trees	53.97198431	-6.38058532
44	Picea abies x1 Cupressus macrocarpa x12 Tilia sp. x1	14		53.97716174	-6.377757601
44	Quercus sp. x5 Fraxinus excelsior x1 Fagus sylvatica x1 Laryx sp. x1 Betula sp. x6	14		53.97369323	-6.377295591
44	Acer pseudoplatanus x 14	14		53.97402314	-6.374763586
44	small woodland x15 Acer sp. Tilia sp.	15		53.97322864	-6.375198103
44	Betula sp. Acer sp. Betula sp. Prunus sp.	16		53.97568604	-6.378298402
44	Fagus sylvatica Betula sp. x8 Fagus sylvatica x6 Salix sp. x1 Fraxinus excelsior x1 Acer sp. x1 Laryx sp. x1 Prunus sp. x1	20		53.97766672	-6.378301084
44	scattered trees x20 Abies sp. Pinus sp. Prunus sp. Quercus sp. Pinus sp. Picea abies	20		53.97563063	-6.375725158
44	scattered trees x24 Acer sp. Fraxinus excelsior Fagus sylvatica Crataegus monogyna Tilia sp. Betula sp.	24		53.97087088	-6.376467459

44	woodland cleared to single treeline of Populus sp. x25 ish	25	53.97805614	-6.377651654
44	Betula sp. x13 Prunus sp. x2 Laryx sp. x12	27	53.97698271	-6.379982829
44	Populus sp.s x41	41	53.972978	-6.370742619
44	Quercus sp. x5 Betula sp. x2 Fraxinus excelsior x7 Prunus sp. x16 Laryx sp. x14 Alnus glutinosa x1 Pinus sylvestris x1	46	53.9746577	-6.37731906
44	mixed hedgerow Cupressus sp. Prunus sp. Pinus sp. Hedera helix	H	53.97577398	-6.375298016
44	Picea abies plantation	P	53.96831577	-6.379774287
44	conifer plantation Picea abies Pinus sp.	P	53.96927563	-6.380193383
44	Pinus sp. plantation	P	53.96966375	-6.380783468
44	Picea abies plantation	P	53.9704031	-6.382057853
44	Scattered trees Tilia sp. Betula sp. Prunus sp.	S	53.97024947	-6.375968568
44	Scattered trees Fagus sylvatica Cupressus x leylandii Prunus sp. Tilia sp. Laryx sp.	S	53.96937937	-6.378392279

	Scattered trees shape of mowed pattern			
44	Pinus sp. Alnus glutinosa Betula sp. Prunus sp.	S	53.96881434	-6.378176697
	Scattered trees			
44	Prunus sp. Acer sp. Betula sp.	S	53.96980496	-6.379281096
	Scattered trees			
44	Cupressus x leylandii Laryx sp. Alnus glutinosa Acer sp. Pinus sp. Populus sp. Prunus sp.	S	53.97124617	-6.380600743
	Scattered trees			
44	Fraxinus excelsior Betula sp. Pinus sp. Acer sp. Tilia sp. Fagus sylvatica	S	53.97301251	-6.380969547
	Scattered trees			
44	Quercus sp. Picea abies	S	53.97454175	-6.381845288
	Scattered trees			
44	Fraxinus excelsior x4 Acer sp. x2	S	53.97278139	-6.380018704

	mixed conifer Scattered trees			
44	Cupressus macrocarpa Cupressus x leylandii some Fraxinus excelsior	S	53.97459667	-6.37845
44	Scattered trees Betula sp. Acer sp. Prunus sp. Quercus sp. Populus sp.	S	53.97550088	-6.378904246
44	Scattered trees Cupressus x leylandii x8 Tilia sp. x1 Acer sp. x1	S	53.97692316	-6.379786693
44	Scattered trees Laryx sp. Fagus sylvatica Cupressus macrocarpa Cupressus x leylandii	S	53.9784771	-6.380248033
44	Fagus sylvatica Sambucus nigra Cupressus x leylandii treeline	T	53.97133452	-6.373527087
44	Cupressus macrocarpa Cupressus x leylandii treeline with Acer sp. Pinus sp. Betula sp. and Sambucus nigra	T	53.97037806	-6.374456137
44	Abies sp. Prunus sp. treeline with Fagus sylvatica Quercus sp. and Cupressus x leylandii	T	53.96919773	-6.376207285
44	Prunus sp. Abies sp. treeline	T	53.96896423	-6.377017312
44	Prunus sp. Abies sp.	T	53.96816313	-6.378717162
44	Cupressus x leylandii treeline	T	53.96852325	-6.378028169
44	Salix sp. treeline	T	53.96859464	-6.379586533
44	Alnus glutinosa border on side of plantation	T	53.96975802	-6.380339228

44	Cupressus x leylandii Cupressus macrocarpa treeline	T		53.97164058	-6.381953582
44	end of Fraxinus excelsior/Quercus sp. treeline	T		53.9727037	-6.381466426
44	Quercus sp. Fraxinus excelsior treeline	T		53.97356643	-6.382009573
44	x3 treeline x2 Acer sp. x1 Crataegus monogyna/Fraxinus excelsior	T		53.97398	-6.381761667
44	Acer sp. treeline with Prunus sp. and Crataegus monogyna	T		53.97567854	-6.381841935
44	Cupressus x leylandii treeline	T		53.97535338	-6.380351968
44	Cupressus x leylandii treeline one Cupressus macrocarpa	T		53.97297682	-6.379749812
44	mixed treeline Cupressus x leylandii Prunus sp. Crataegus monogyna Laryx sp. Fraxinus excelsior Betula sp.	T	storm damage in Cupressus x leylandii	53.97402167	-6.378501667
44	Alnus glutinosa Populus sp. treeline	T		53.97504478	-6.378488168
44	Cupressus x leylandii treeline	T		53.97843392	-6.380976923
44	end of treeline/conifers Pinus sp. Acer sp.	T		53.97734985	-6.379072554
44	Crataegus monogyna Fraxinus excelsior Sambucus nigra treeline with scrub understory	T	some storm damage	53.97851	-6.379503333
44	mixed conifer treeline with x2 Acer sp.	T		53.97843708	-6.378416754
44	end of treeline	T		53.97767657	-6.377119236
44	hedgerow becomes treeline	T		53.97617663	-6.375723481
44	Pinus sylvestris (end of treeline)	T		53.97542674	-6.375046223
44	Pinus sp. treeline	T		53.97472336	-6.374282129

44	Cupressus macrocarpa treeline occasional broadleaves and Pinus sp.s	T		53.9743069	-6.373706795
44	line of coniferifers Pinus sylvestris	T		53.97185159	-6.374625117
44	Cupressus macrocarpa treeline x7 Cupressus x leylandii and Cupressus macrocarpa	T		53.97518163	-6.377302632
44	treeline Betula sp. x1 Cupressus macrocarpa x3	T		53.97293225	-6.374905743
44	small treeline Acer sp. x2 Fraxinus excelsior x1 Betula sp. x1	T	improve rooting zone	53.97276305	-6.374855451
44	Acer sp. treeline x23	T	improve rooting zone remove stakes	53.97266169	-6.375143453
44	Acer sp. Alnus glutinosa Salix sp. woodland	W		53.96890132	-6.379633136
44	pocket woodland Betula sp. Cupressus x leylandii Pinus sp.	W		53.97023942	-6.379657611
44	mixed pocket woodland Cupressus x leylandii Betula sp. Crataegus monogyna	W		53.97063916	-6.38003815

44	mixed woodland Alnus glutinosa Cupressus x leylandii Tilia sp. Betula sp. Fagus sylvatica Abies sp. Sambucus nigra Laryx sp.	W	53.9710247	-6.381673962
44	pocket woodland Fagus sylvatica Fraxinus excelsior Tilia sp. bordered by Cupressus x leylandii and Laryx sp.	W	53.97234006	-6.38089411
44	linear woodland Tilia sp. Fagus sylvatica Picea abies Fraxinus excelsior Betula sp. Laryx sp. Acer sp.	W	53.97514772	-6.381801702
44	linear woodland Tilia sp. Quercus sp. Fagus sylvatica Fraxinus excelsior Pinus sp. Abies sp. Picea abies	W	53.97605576	-6.380868964

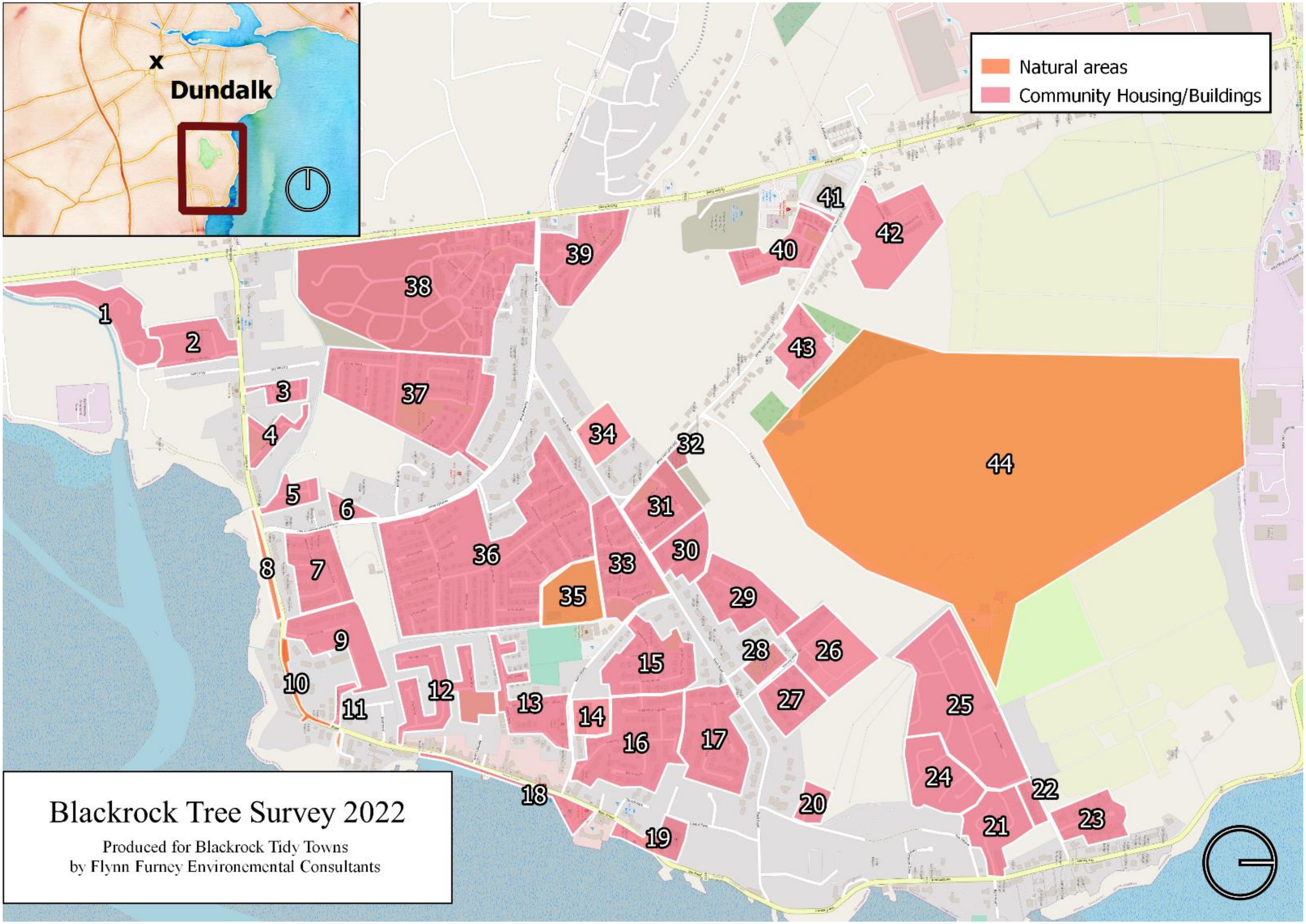
44	proto woodland Fraxinus excelsior Fagus sylvatica Prunus sp. Betula sp.	W	53.97484333	-6.380485
44	mixed pocket woodland Laryx sp. Picea abies Fraxinus excelsior Cupressus x leylandii Sambucus nigra	W	53.97241105	-6.379354857
44	pocket woodland Pinus sp. Sambucus nigra Picea abies Fraxinus excelsior	W	53.97233667	-6.378591667
44	mixed pocket woodland Laryx sp. Fraxinus excelsior Salix sp. Crataegus monogyna Prunus sp. Betula sp.	W	53.97508915	-6.378756389
44	linear woodland Fraxinus excelsior Fagus sylvatica Cupressus x leylandii Crataegus monogyna Prunus sp. Quercus sp.	W	53.97805673	-6.381701455
44	mixed conifer woodland Cupressus x leylandii Cupressus macrocarpa	W	53.9778006	-6.380889751

44	mixed pocket woodland Picea abies Betula sp. Laryx sp. Acer sp. Fagus sylvatica Quercus sp. Prunus sp. Pinus sp.	W		53.97734906	-6.380507201
44	linear pocket mixed woodland Betula sp. Prunus sp. Acer sp. Laryx sp. Picea abies	W		53.97525992	-6.3779011
44	mixed conifer pocket woodland some scattered broadleaf trees	W	large hanger over tee	53.97820333	-6.378993333
44	mixed conifer pocket x11 Pinus sp. Picea abies Abies sp.	W		53.97663666	-6.377254017
44	conifer woodland Pinus sylvestris Cupressus x leylandii Cupressus macrocarpa	W		53.97238403	-6.374067217
44	Dec woodland pocket Fraxinus excelsior Quercus sp. Crataegus monogyna Sambucus nigra	W		53.97125031	-6.379054785

44	pocket woodland Prunus sp. laurocerasus Prunus sp. Fraxinus excelsior Alnus glutinosa Crataegus monogyna Pinus sp.	W	53.97247356	-6.378230341
44	pocket woodland Fagus sylvatica Prunus sp. Quercus sp. Laryx sp. Betula sp.	W	53.97053366	-6.377825998
44	pocket woodland Fagus sylvatica Betula sp. Tilia sp. Quercus sp. Alnus glutinosa Laryx sp. Abies sp. row of Chamaecyparis lawsoniana on East side	W	53.97181846	-6.377176568
44	plantation woodland Sambucus nigra Pinus sp. Cupressus sp. Alnus glutinosa	W	53.97231068	-6.376891583
44	woodland Quercus sp. Fagus sylvatica Betula sp. Ilex aquifolium Prunus sp.	W	53.97301685	-6.376707517
44	Cupressus x leylandii Cupressus macrocarpa Pinus nigra Sambucus nigra woodland	W	53.97212314	-6.375088468
44	Acer sp. woodland	W	53.97217145	-6.375621222

44	woodland mixed Betula sp. Laryx sp. Sorbus sp. Abies sp. Quercus sp. Betula sp.	W		53.97398173	-6.376241818
44	mixed woodland Pinus sylvestris Pinus nigra Sambucus nigra Acer sp.	W		53.97353469	-6.375387199
44	pocket woodland Betula sp. Acer sp. Ilex aquifolium Sorbus sp. Prunus sp.	W		53.97253833	-6.37506
44	coniferifer pocket woodland Pinus sylvestris and Cupressus x leylandii 47 indiv.	W	remove deadwood over path	53.97241006	-6.374062859

Appendix II **Blackrock Area Map**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Natural areas
Community Housing/Buildings
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Blackrock Tree Survey 2022
Produced for Blackrock Tidy Towns
by Flynn Furney Environmental Consultants