the tree bureau

Arboricultural consultancy, design and management

Arboricultural Impact Assessment

5 Albert Terrace

Primrose Hill, London NW1 7SU

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by
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CONTENTS

1 Introduction

1.1 This impact assessment, commissioned by Lawrence Salem, deals with the proposed development of 5 Albert Terrace, Primrose Hill, London NW1 7SU.

1.2 It assesses the trees that might influence or be influenced by the application development, outlines the key likely tree- and soil-related constraints and identifies issues that would need to be addressed if planning approval were granted.

1.3 The proposal is to refurbish the exterior and interior, including changing soil levels at the front of the house and to the lower ground floor; creating a rear balcony; demolishing and replacing two retaining walls in the back garden; lowering the existing ground level in part of the back garden; building new boundary walls around the rear garden; and paving the rear garden and building steps.

1.4 Please read this report in conjunction with the:

- *Tree Constraints Plan* (drawing TCP 7628 rev a)
- architect's drawings
- outline landscaping drawings.

1.5 The framework for the report and its associated drawings is the British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations* because this is the Standard used by local planning authority officers when considering trees affected by development proposals.

1.6 Section 2 of the report deals with the site's current status. Section 3 deals with the tree condition and quality inspection, with the details of my findings shown in Appendix A. Section 4 considers the impact of the proposed development and Section 5 summarises my conclusions.

Background

1.7 I visited the application site on 13 April 2021 when I assessed the site and inspected the trees.

1.8 Since my site visit, the following authorised tree removals have been carried out:

- four trees removed from the back garden (2021/3039/T confirmed 06 August 2021)
- one neighbouring tree at 6 Albert Terrace and its offshoots removed (2021/3819/T confirmed 15 September 2021).

2 The site in context

Access and levels

2.1 The property has pedestrian access from Albert Terrace, a public highway, and there is a side passageway to the rear garden.

2.2 Soil levels vary across the site, generally dropping from the north to the south and from the east to the west.

Soil

2.3 The 1:50,000 map of the British Geological Survey on-line *Geology of Britain* viewer indicates the local bedrock geology to be London Clay Formation — clay, silt and sand — with no recorded superficial deposits.

2.4 The on-line *Soilscape Viewer* by LandIS (The National Soil Resources Institute at Cranfield University) identifies slowly permeable, seasonally wet, sightly acid but base-rich loamy and clayey soils of moderate fertility.

2.5 The shrink-swell potential of the soil is rated as 'significant' in a British Geological Survey *Natural Subsidence Report* (see Appendix C) for the 100m around the application site. The report assesses the local soil to have predominantly high plasticity and rates the shrink-swell potential as Category D on a scale from A (very minor) to E (very significant).

Visual amenity

2.6 Trees visible from a public place are considered to provide local 'public visual amenity' – effectively 'borrowed' or 'shared' landscape features that contribute to the particular character and pleasantness of the neighbourhood – and there is a preliminary presumption for retaining them, if they are in safe condition.

2.7 No tree on the site has public visual amenity

Statutory protection

2.8 The site is within the Primrose Hill Conservation Area.

2.9 Proposed work to most trees in a conservation area, other than the removal of dead wood, must first be notified to the local planning authority (London Borough of Camden). If the council objects to the proposal, it must make the tree the subject of a preservation order if the tree meets the criteria for preservation. Damage to protected trees is a criminal offence with steep penalties on conviction.

3 Tree inspection and tree constraints plan

Tree inspection and site assessment

3.1 My inspection was a visual tree assessment (VTA) of the above-ground parts of trees from ground level, following industry-standard procedures (see Appendix B). It was independent and impartial, and was not influenced by consideration of any development.

3.2 The results of the inspection are presented in two ways – a:

- schedule of my findings, shown in Appendix A of this report
- *Tree Constraints Plan* — (TCP 7628 rev a).

3.3 The inspection schedule includes preliminary recommendations for the management of the trees regardless of the future use of the site. (These recommendations do not bind a tree owner.) Any additional or alternative management options needed because of the proposed development are discussed in Section 4 of this report.

Quality/retention categories and their significance for the design

3.4 The inspection schedule and tree constraints plan shows 'quality/retention categories' based on criteria in the British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction – Recommendations*.

3.5 The categories (and their Standard colours) are:

- U – unsuitable for retention beyond ten years, and possibly less, in relation to the current land use, irrespective of the planning application (shown in dark red)
- A – high quality (shown in light green), with an estimated typical remaining life expectancy of at least 40 years
- B – moderate quality (shown in mid blue), with an estimated remaining life expectancy of at least 20 years
- C – low quality (shown in grey), with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.

3.5.1 The British Standard also suggests numerical subcategories to explain the reasons behind the quality/retention grading. They are:

1) mainly arboricultural qualities
2) mainly landscape qualities
3) mainly cultural/conservation values.

3.5.2 In practice the subcategories often overlap and some trees might warrant all three, but I have noted only one subcategory for each tree to indicate the main reason for my category grading.

3.6 These categories provide rule-of-thumb guidance on a local planning authority's (LPA's) likely priorities when considering safe trees in relation to development proposals.

- It is unlikely that the LPA would countenance the removal of a category A tree.
- There is a presumption that category B trees will be retained wherever possible.
- The retention or removal of category C trees is not usually considered to be a significant constraint on development. Trees with a small stem diameter – below 150mm – could be considered for relocation within a site, if desired.
- Category U trees are graded as unsuitable because of safety considerations or other sound arboricultural reasons, irrespective of any development proposal, and are anticipated to live in a safe condition for only up to ten years.

My grading

3.7 I graded the trees:

- Category U – none.
- Category A – none.
- Category B – T5, provisional as off site and not inspected at close quarters.
- Category C – H4.

Tree constraints plans

3.8 The *Tree Constraints Plan* (TCP 7628 rev a) shows most of the information derived from the tree inspection, together with other relevant matters:

- quality/retention category, given as a coloured circle representing the category grading in the position of the tree trunk
- indicative crown spread, shown in dark green
- minimum root protection area, shown in dark blue
- basic shading, based on BS5837:2012 criteria
- proposed development and landscaping — see architectural and landscape design drawings for detail.

Crown spread

3.9 The crown spread is a general indication of the current length of the branches based on estimates in four cardinal directions. Trees often grow unevenly, so the actual position of branches should always be taken into account when designing structures. The vertical constraint of the lowest significant branch is shown in the inspection schedule in Appendix A.

Root protection areas

3.10 A circular root protection area (RPA), calculated from formulae in BS5837:2012, indicates the area around a tree containing theoretically sufficient roots and soil volume to keep the tree alive, healthy and upright: it is the area where the protection of roots and soil is treated as a priority.

3.11 Root protection areas shown on a tree constraints plan indicate the minimum area that should be left undisturbed and protected during demolition and construction. Even so, an RPA is a guideline and does not predict exactly where roots are growing. The actual pattern, depth and extent of root growth varies as a result of a wide range of factors, including the species and age of the tree, soil type, the presence of buildings and other structures and the surrounding environment. This means that a root protection area may be shown as a circle or polygon, depending on an arboricultural assessment of the circumstances.

4 Arboricultural impact of the proposed development

Tree removal

4.1 The privet hedge H4 would need to be removed to permit the proposed garden redesign and new boundary walls. The hedge has no public visual amenity and is not a significant landscape feature, so its removal would have no, or negligible, local impact.

Tree replacement

4.2 No replacement is proposed for the privet hedge H4, so there would be a small loss of habitat and understorey cover.

4.3 Two trees are proposed for the rear garden of the application site. The species, size, root treatment and planting pit size would need to be specified and adequate rooting space provided for the trees as they mature. Full account would need to be taken of planting in an area of three-dimensional cellular confinement sub base (see also paragraph 4.10) and the impact of likely increased heat and light reflection from a large area of wall and ground paving. The selection and planting requirements could be covered by a planning condition.

4.4 A new tree is also proposed for the neighbouring back garden of 6 Albert Terrace (see also paragraph 4.6).

Pruning

For development

4.5 Some overhanging branches of the neighbouring magnolia T5 in the garden of a property in Albert Terrace Mews would need to be lifted to permit the construction of a new rear boundary wall 2.5m high. Some pruning of overhanging branches would be desirable irrespective of this planning application and would need to be specified to be within arboricultural tolerance. The tying back of some branches might be feasible during construction.

Future pruning requirements

4.6 If the replacement trees for No 5 and No 6 Albert Terrace were chosen well and planted appropriately — away from the proposed new balcony, for example — the proposed development should not create pressure to significantly increase the frequency or the extent of pruning as a result of the development.

Below-ground impact

Change to part of rear garden's soil level

4.7 The proposed change in ground level would be to the edge of the minimum root protection area of the neighbouring magnolia T5, with steps up to the eastern end of the garden where soil levels would remain the same. The steps would intrude on about 4.6m^2 — some 3.8 per cent of the tree's total root protection area. This would be a minor incursion into the edge of the theoretical circular root protection area where roots, if present at all, are likely to be small so that their loss, if necessary, could be tolerated.

4.8 Full details of construction methods and materials would be needed, and it might be necessary to open trial pits to ascertain the presence, size and position of any roots of the magnolia T5 and to provide at the outset for alternative construction methods if needed to avoid damage to roots.

Surfacing and root requirements

4.9 Tree roots need rain water and gases to move freely through soil. It is proposed to cover the whole back garden with hard surfacing, so it will be crucial to provide a suitable

rooting environment for the retained tree and for those to be planted, and to ensure suitable and adequate sustainable urban drainage that helps to mitigate flash flooding from hard surfaces.

4.10 This means that the hard surfacing proposed for the whole of the back garden would need to use a 'tree-friendly' no-dig method of installation and permeable materials. A three-dimensional cellular confinement sub base system design for tree protection, such as ArborRaft (which would not need to be backfilled), would be required and the paving would need to be permeable, perhaps sand-bedded and sand-pointed. The details should be specified and could be made the subject of a planning condition. (See also paragraph 4.14 dealing with the combined used of the sub base as temporary ground protection during construction.)

New boundary walls

4.11 New boundary walls some 2.5m high are proposed around the back garden. The line of the eastern wall would be within 1.5m of the tree. Some kind of boundary treatment, other than the current temporary hoarding, is necessary here for the obvious reasons of privacy and security, so that some intrusion into the root protection of this tree would be necessary regardless of this planning application.

4.12 Trial trenches would need to be opened and the position, level and size of roots determined so that suitable foundations could be designed.

Temporary ground protection during development

4.13 Access would be needed to the eastern end of the garden to construct the steps, boundary wall and the paving so that temporary ground protection would be needed to prevent soil compaction that could harm the roots of the magnolia T5.

4.14 For operational efficiency and to prevent wasted materials, the best way to provide temporary ground protection would be to combine it with the use of the permanent sub base, such as ArborRaft. A temporary upper layer of aggregate would need to be installed over the sub base for the period of construction, then removed to allow the laying of the permanent wearing course. Details could be specified in a protection methodology.

General protective measures

4.15 Standard precautionary, preventive and protective measures would be needed during construction.

Services

4.16 So far as I am aware at this stage, any services could be installed from existing provision. Details of any cables or ducting would need to be designed in combination with ground protection measures to ensure that there were no new service trenches in root protection areas.

Tree- and soil-related foundation design

4.17 The specification of foundations for the house and garden walls would need to take account of the soil type and plasticity and the impact of retained, removed and replacement trees within 'influencing distance' of the property.

4.17.1 Influencing distance is defined as the distance given in the Kew Tree Root Survey in *Tree Roots and Buildings* (Cutler & Richardson, second edition 1989) at which 75% of all cases of damage for a given genus or species have been recorded. In the case of large forest types, the 90% distances can be used. Where a species is not listed in *Tree Roots and Buildings*, the influencing distance should

be estimated using the Kew Tree Root Survey data for a similar species of similar mature size. Influencing distance may be wider than the NHBC Chapter 4.2 criteria.

Shading by trees

4.18 There are no shading issues that would constrain development.

5 Conclusions

5.1 A privet hedge without public visual amenity would need to be removed to permit development. New planting could help to mitigate the loss of vegetation.

5.2 It is proposed to plant some trees to replace those already removed, but no specific details are yet available for species, size and root treatment. The selection should include tolerance of being surrounded by hard surfaces.

5.3 The overhanging branches of one neighbouring tree would need to be pruned to enable a new boundary wall to be built. Some pruning of this tree would be desirable regardless of the planning proposal.

5.4 A proposed change in ground level and associated new steps in part of the back garden would intrude on about 4.6m^2 (some 3.8 per cent) of a neighbouring tree's root protection area. This would be a minor incursion into an area where roots, if present at all, are likely to be small so that their loss, if necessary, could be tolerated.

5.5 Trial trenches are likely to be necessary to determine the type and position of the proposed garden steps and a new rear boundary wall within the root protection area of a neighbouring tree.

5.6 A permanent tree root protection system would be needed for the proposed paving of the entire rear garden and could be adapted for use for temporary protection during construction.

5.7 Proposed paving for the rear garden would need to be permeable to protect existing tree roots, to provide a suitable rooting environment for new trees and to provide adequate sustainable drainage.

5.8 The design of foundations would need to take full account of the presence, removal and planting of trees on a clay soil.

5.9 Standard precautionary, preventive and protective measures would be needed during construction to protect trees from harm.

APPENDIX A — TREE INSPECTION

Key to inspection schedule

Number on plan

T1, T2 etc – individual tree
G1, G2 etc – group of trees
H1 etc hedge

Stem

The measurement is the stem diameter at 1.5m above ground level for single-stemmed trees, unless stated otherwise, or the equivalent calculated stem diameter for multi-stemmed trees based on one of the two formulae for multi-stemmed trees in the British Standard BS5837:2012.

First significant branch

The height above ground level and direction of the first significant branch, which might be higher or lower than the main canopy.

Life stage

New – Sapling or newly established tree, growing vigorously if healthy. Usually easy to transplant and re-establish.
Y – Young: still in the first third of typical life expectancy for the species and conditions. Growing vigorously, if healthy, but not necessarily yet producing seed. Possibly some scope for transplanting and re-establishing.
EM – Early-mature: producing seed, but not necessarily at full height or spread.
Mat – Mature: at or approaching full size and in the second to third of typical life expectancy for the species and conditions. Annual growth possibly reducing.
OM – Old-mature: old for the species and/or conditions and probably showing low annual growth and possible decline. Might also be described as a veteran tree, and may have special biological/ecological conservation value.
Vet – Veteran: a tree of special biological/ecological conservation, cultural or aesthetic value (or all three). Often, but not necessarily, older than the typical age range for the species. Younger trees might also qualify as a veteran because of features, such as a trunk cavity, that provide high wildlife/conservation value.
Anc – Ancient: an especially old tree with features of old mature and veteran trees, which is likely to be of high biological/ecological conservation, cultural and aesthetic value.

Remaining years, in age bands

<10, 10-20, 20-40, or more than 40

Physiological or structural condition

Normal (physiological) or Good (structural) – no significant health problems or structural problems.
Fair – Some symptoms of ill health, or currently insignificant or remediable structural problems.
Poor – Significant symptoms of ill health, or significant structural problems.
Senescent – Negligible annual growth.
Moribund – In serious and irreversible decline.
Dead – No physiological function.

BS 5837:2012 Category of quality/retention

U – Tree unsuitable for retention irrespective of the planning proposal.
A – High quality and value, to be considered for retention.
B – Moderate quality and value, to be considered for retention.
C – Low quality and value, or a young tree, which might be considered for retention.

BS 5837:2012 Criteria for category of retention

1. – Mainly arboricultural value.
2. – Mainly landscape value.
3. – Mainly cultural value, including conservation.

Other abbreviations

e – estimated.
hcv – high conservation value
oi – measurement taken over ivy or other climber, or over basal shoots.
rf – root flare (base of the tree).
ms – multi-stemmed.
prov – provisional.
N – north.
E – east.
S – south.
W – west.

Inspection schedule

Tree ident on plan	Species	Approx height in m	Stem diam-eter or equiv-alent in mm	Approx branch radius in m				Canopy height	First signif-icant branch height in m & direct-ion	Life stage	Physiological condition	Structural condition	Preliminary recommendations	Est. remain-ing contrib-ution in years	Category grading	Min RPA radius in m²
				N	E	S	W									
H4	*Ligustrum ovalifolium* privet hedge	2.6	80-110	1	1	1	1	2.6	0.5 S	Mat	Normal	Good.	Maintain pruning cycle.	10 -20	C	1.3
T5 off site	*Magnolia* sp. magnolia	10.5	517 e	2.8 e	1.5 e	3.1	3.4	2.2	2.2 W	OM	Normal, so far as visible.	Twin stemmed. Good, so far as visible.	Oversails garden. Crown growing close to neighbouring house. Consider applying to lift the crown over the garden.	20-40	B, boderline A	6.2

APPENDIX B — SCOPE

1 This report and its associated *Tree Constraints Plan* are based on arboricultural criteria only. Comments and drawings relating to non-arboricultural matters must be viewed as provisional and referred to appropriate specialists for confirmation and specification.

2 The tree condition survey was a visual tree assessment (VTA) from ground level, following industry-standard procedures, based largely on the principles described in *The body language of trees – A handbook for failure analysis*, by Claus Mattheck and Helge Breloer, and *Principles of Tree Hazard Assessment and Management*, by David Lonsdale. This was an independent and impartial assessment of the condition of the trees and was not influenced by consideration of any proposed scheme.

3 There was no invasive investigation, such as test-boring of a tree, and no branch, leaf, fruit or root samples were collected for analysis. No survey was made of water bodies, drains or drainage systems.

4 The information from the British Geological Survey and LandIS provide a general indication of soils in the area, but no reliance should be placed on them for the application site, as actual soil composition can vary over short distances.

5 Trees are dynamic and sometimes unpredictable organisms. They change as they mature and decline, change in response to changing conditions around them (including weather), or change for reasons that research has not yet fully explained. The tree inspection schedule deals with the tree condition observed on the day the inspection was carried out.

6 Tree work is subject to planning permission. All tree work must take full account of wildlife and habitat protection legislation and tree phenology (natural cycle). Tree work should be carried out to modern arboricultural standards, as recommended in British Standard BS3998:2010 *Tree Work – Recommendations*.

APPENDIX C — NATURAL SUBSIDENCE REPORT

British Geological Survey

Natural Subsidence Report

Introduction

This report provides an indication of the potential for any significant natural ground instability to occur within a circle measuring 100m in diameter centred on the grid reference or point supplied. It has been generated automatically from BGS' GeoSure dataset, which is based on 1:50 000 scale digital data.

Ratings range from A (very minor) to E (very significant).

This report is designed for use by professionals involved in conveyancing or development of low-rise domestic properties, but it may also be useful for private individuals to help them judge whether or not further professional advice should be sought.

We recommend that members of the public should consult a qualified professional about the search results in this report before making any major decisions based on it.

For more information about the A-E ratings and the implications for your property please see the GeoSure web pages.

Location

528078, 183734 (British National Grid)

08/07/2021 12:38:26 GMT

Location Map

Collapsible Deposits

Definition: Ground that is liable to undergo a rapid reduction in volume when the ground is saturated with water after a critical load has been placed on it.

B - Minor potential

Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

Compressible Ground

Definition: Ground that is liable to undergo a slow reduction in volume, especially after a load has been placed on it.

A - Very minor potential

No indicators for compressible ground identified. No special actions required to avoid problems due to compressible ground. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible ground.

Landslides

Definition: Large-scale outward and downward movement of rock or soil on a slope.

B - Minor potential

Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

Running Sand

Definition: Movement of water-saturated sand or silt into an underground void, or into an excavation or onto the surface.

A - Very minor potential

No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

Shrink Swell

Definition: Significant changes in the volume of clay-rich deposits that accompany changes in moisture content.

D - Significant potential

Ground conditions predominantly high plasticity. Do not plant or remove trees or shrubs near to buildings without expert advice about their effect and management. For new build, consideration should be given to advice published by the National House Building Council (NHBC) and the Building Research Establishment (BRE). There is a probable increase in construction cost to reduce potential shrink swell problems. For existing property, there is a probable increase in insurance risk during droughts or where vegetation with high moisture demands is present.

Soluble Rocks

Definition: The formation of underground voids in limestone, gypsum or halite .

A - Very minor potential

Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

Definitions

For more information about each hazard please refer to the GeoSure pages on the BGS website

Natural Geological Hazards are shrink-swell, landslides (slope instability), soluble rocks (dissolution), compressible ground, collapsible deposits and running sand. This does not include mining related subsidence. Note that these geological hazards may occur in either natural or man-made deposits.

Natural Subsidence refers to the propensity for upward, lateral or downward movement of the ground that can be caused by a number of natural geological hazards. Some movements associated with particular hazards may be gradual and of millimetre or centimetre scale, whilst others may be sudden and of metre or tens of metres scale.

Significant natural ground instability has the potential to cause damage to some weaker buildings and structures. It should be noted, however, that many buildings, particularly more modern ones, are built to such a standard that they can remain unaffected in areas of significant ground movement.

Superficial deposits

Superficial deposits (formerly known as 'drift' by BGS) are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 2.6 million years from the present. They rest on older deposits or rocks referred to as bedrock.

Bedrock

Bedrock geology (formerly known as 'solid' geology by BGS) is a term used for the main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water. The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 2.6 million years ago.

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This report provides an indication of potential near-surface ground instability related to particular natural geological hazards. These are shrink-swell clay, landslides, soluble rocks (ground dissolution), compressible ground, collapsible deposits, and

running sand. They do not give an indication of potential hazards at depth as might be encountered in a borehole, for example.
The search does not cover any man-made hazards, such as contaminated land or mining. Searches of coal mining should be carried out via The Coal Authority Mine Reports Service: www.coalminingreports.co.uk.
The results in this report are generated automatically from BGS'GeoSure dataset, based on 1:50 000 digital geological maps and the interpretation of other records in the possession of BGS at the time. Their scope and accuracy is limited by the methods used to create the dataset and they may differ from a geologist's interpretation of a wider array of geological information. The answer given should therefore only be treated as indicative for the search area.
Other more specific and detailed information may be held by BGS for the site, and an assessment of this could result in a modified assessment of ground stability potential. This more detailed assessment is available via other BGS GeoReports.
The search in this report is carried out for a circle 100m in diameter centred on the grid reference or point supplied, which takes into account the spatial accuracy of the geological hazards data described above.
The information is intended for use by suitably-qualified professionals involved in conveyancing or development of low-rise domestic properties. If in doubt users should consult a suitably-qualified professional about the search results in this report before making any major decisions based upon it.
An indication of natural ground instability does not necessarily mean that a building will be affected by subsidence. Such an assessment can be made only by inspection of the building itself by a suitably-qualified professional. This will take into accounta variety of other contributing factors, such as building type and build quality, and nearby vegetation (in particular, the proximity and type of trees).
The topography shown on any map extracts is based on the latest OS mapping and is not necessarily the same as that used in the original compilation of the BGS geological map, and to which the geological linework available at that time was fitted.
Note that for some sites, the latest available records may be quite historical in nature, and while every effort is made to place the analysis in a modern geological context, it is possible in some cases that the detailed geology at a site may differ from that described.

Report issued by: **BGS iGeology**
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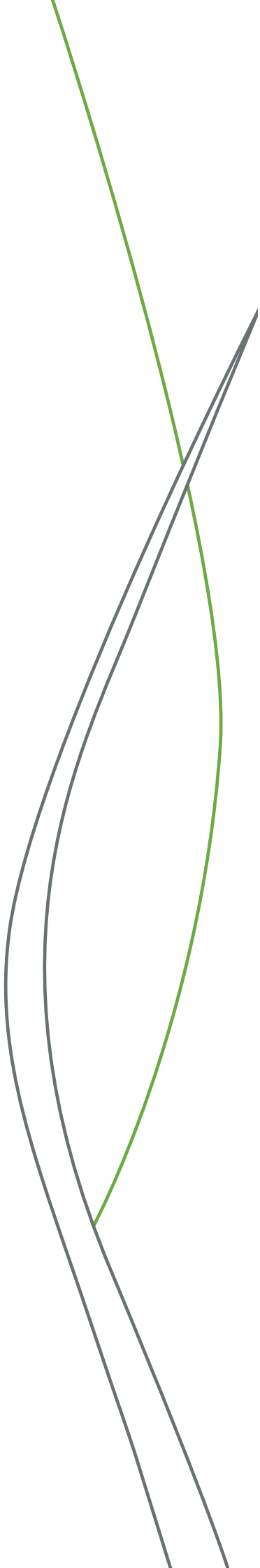

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