

ARBORICULTURAL REPORT TO BS5837:2012 SWANSEA NORTH ENERGY MANAGEMENT FACILITY

FOR STATKRAFT UK LTD

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1 INTRODUCTION

1.1 Instructions and Brief

The report is required in accordance with 'BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations', to provide detailed, independent, arboricultural advice on the trees present, in the context of potential development.

1.2 Survey Details

The survey took place during June 2020.

The trees were surveyed visually from the ground using "Visual Tree Assessment" techniques and in accordance with the quiding principles of British Standard 5837:2012.

Any additional off-site trees that could impact a new development design have been included in the tree survey parameters.

The tree positions were plotted on an Ordnance Survey map base-layer using enhanced GPS technology (1-2m accuracy) and laser distance measurer.

Explanatory details regarding the survey methodology are included within Appendix 1. A full explanation of the tree data can be found at Appendix 2. Full details of all the trees surveyed are found in Appendix 3. For tree locations please refer to the Tree Constraints Plan at Appendix 4.

2 THE SITE

2.1 Location and Description

The site is located off the B4489 near Felindre, Swansea, and comprises an area of farmland and woodland adjacent to an electricity substation

The approximate area of the survey is highlighted in the (2018 Google Earth) image below:





3 THE TREES

3.1 Legal

Due to the large potential penalties for illegally carrying out work to protected trees, before authorising any tree works a check should be made with the Local Planning Authority to see if the trees are covered by a Tree Preservation Order or if they are within a Conservation Area. If either applies, then statutory permission is required before any works can take place (unless such works are approved by planning permission).

When appointing a tree surgeon, only properly qualified and experienced companies should be used, who have adequate Public Liability and Employer's Liability Insurance.

All tree work should be carried out according to British Standard 3998:2010 Tree Work - Recommendations.

3.2 Tree Survey Results

The tree survey revealed 17 items of woody vegetation, comprised of 10 tree groups or hedges and 7 individual trees.

Of the surveyed trees: 4 tree groups and 7 individual trees are retention category 'B', and 6 tree groups or hedges are retention category 'C' (explanatory details regarding the retention categories are included at Appendix 2).

G1, G2 and G5 comprise wide spreading recently established groups of low value shrubby natural regeneration and recently planted trees, predominantly comprised of Willow and Alder, with occasional Birch, Field Maple, Poplar, Oak, Pine and Hazel. G5 is slightly older, taller and denser than G1 and G2 and separates G1 from woodland group G4.

G3 is a recently planted hedge comprised of Hawthorn, Hazel and Holly and is of very low value.

G4 forms a more significant woodland group comprised predominantly of semi mature Alder, Aspen, Birch, Oak, Rowan and Holly, with occasional larger early mature Oaks. The occasional larger early mature Oaks in the woodland are of moderate individual value while the semi mature trees which comprise the majority of the woodland are of tall slender woodland form and of low individual value. Access throughout the woodland was limited due to the dense shrubby undergrowth, brambles and uneven ground levels. Trees along the south eastern boundary of the woodland have been plotted individually but were not surveyed in detail.

G6 and G8 form linear groups of early mature trees bordering farmland boundary fence lines. Trees T11, T12, T13 and T14 are of moderate value and have been surveyed individually, while the remaining trees are of relatively low individual value. The larger lower value trees within the group have been plotted individually but were not surveyed in detail. Most of the trees in G8 have sparse crowns with significant deadwood and generally are of poor multiple stemmed form and were likely historically managed at around 1m to 2m from ground level. The trees were inaccessible due to the farmland boundary fence, and so were only given cursory inspections, with positions, measurements and conditions estimated.

G7 forms a dense linear group of young to semi mature trees bordering a farmland boundary fence. The group is slightly older, taller and more established than group G2 to the west but is of similarly low arboricultural value.

G9 and G10 form linear tree groups bordering a stream between farmland boundary fence lines. G9 borders the northern edge of the stream and is comprised predominantly of semi to early mature Oak with occasional Ash and Beech and a dense understorey of Holly and Hazel, while G10 borders the southern side of the stream and is predominantly comprised of semi to early mature Holly, Goat Willow and Rowan with occasional larger semi to early



mature Oak, Beech and Sycamore. The Beech T15 and T16 and Oak T17 are of moderate individual value and have been surveyed individually, while the other individual trees within both groups are of relatively low individual value. The larger lower value trees within the group have been plotted individually but were not surveyed in detail. The majority of the trees are growing from the edge of the stream banking and most are of poor multiple stemmed form and were likely historically manged at around 1m to 2m from ground level. The trees were inaccessible due to the farmland boundary fence and stream, and so were only given cursory inspections, with measurements and conditions estimated.

The tree Root Protection Area (RPA) detailed on the Tree Constraints Plan at Appendix 4 has been used as a layout design tool, to inform on the area around a tree where the protection of the roots and soil structure is treated as a priority.

Some lower value tree, hedge and shrub groups do not have RPAs detailed on tree plans. The detailed extent and spread of these low value groups, in conjunction with the tree schedule, is sufficient to assess the associated potential constraints.

The RPA for each tree has been plotted as a polygon centred on the base of the stem. Due to the presence of roads, structures, topography (and past tree management) the RPA is likely to be a simplified representation of the tree roots actual morphology and disposition. However, detailed modifications to the shape of the RPA would largely be based on conjecture and so have been avoided.

4 ARBORICULTURAL IMPACT ASSESSMENT

4.1 Proposed New Development

It is proposed to build a new access road at the site. The development proposals have been provided by my client and inform this arboricultural impact assessment and the Tree Impacts Plan at Appendix 5.

4.2 Direct Impacts

From assessing the new development proposals, the partial removal of 3 tree groups will be required as they are situated in the footprint of the development or their retention and protection throughout the development is not suitable.

The tree groups that require partial removal are G1, G2 and G7, they are comprised of low value young to semi mature natural regeneration or recent plantings and their partial removal will have little negative impact.

4.3 Indirect Impacts

The tree Root Protection Area (RPA) detailed on the Tree Plans at Appendix 4 and 5, has been used as a layout design tool, to inform on the area around a tree where the protection of the roots and soil structure is treated as a priority. As such, no significant negative indirect impacts have been identified.

4.4 Protection of the Retained Trees

The retained trees may require protection by fencing in accordance with BS 5837: 2012, during the construction phase.

If required by the Local Planning Authority, an associated Arboricultural Method Statement, detailing protective fencing specifications and construction methods close to the retained trees can be provided.



APPENDICES

- Appendix 1: Survey Methodology and LimitationsAppendix 2a: Explanation of Tree Descriptions
- Appendix 2b: Retention Categories
- Appendix 3: Tree Data
- Appendix 4: Tree Constraints Plan
- Appendix 5: Tree Impacts Plan



Appendix 1: Survey Methodology and Limitations of Report

The survey was undertaken in accordance with British Standard 5837:2012 Trees in relation to design, demolition and construction – Recommendations. The trees were assessed objectively and without reference to any proposed site layout. The trees were surveyed from the ground using 'Visual Tree Assessment' (VTA) methodology. VTA is appropriate and is endorsed by industry guidance. It is used by arboriculturists to evaluate the structural integrity of a tree, relying on observation of trees biomechanical and physiological features. Measurements are obtained using a diameter tape, clinometer, laser distometer and loggers tape. Where this is not practical measurements are estimated.

Tree groups have been identified in instances as defined in BS 5837:2012. Shrubs and insignificant trees may have been omitted from the survey. This report represents a BS5837 tree survey and should not be accepted as a detailed tree safety inspection report; however, tree related hazards are recorded and commented upon where observed, yet no guarantee can be given as to the absolute safety or otherwise of any individual tree. All recommended tree work must be to BS 3998:2010 - 'Tree Work: Recommendations'.

The findings and recommendations contained within this report are valid for a period of twelve months from the date of survey. The author shall not be responsible for events which happen after this time due to factors which were not apparent at the time, and the acceptance of this report constitutes an agreement with these guidelines and terms.



Appendix 2a: Explanation of Tree Descriptions

Tree Description	Explanation
HEIGHT	measured from the stem base in metres. Where the ground has a significant slope, the higher ground is selected.
CROWN HEIGHT	an indication of the average height at which the crown begins and includes information of the first significant branch and direction of growth
STEM DIAMETER	measured at 1.5 metres above (higher) ground level. Where the tree is multi- stemmed at this point; the diameter is measured close to ground level or else a combined stem diameter is calculated.
CROWN SPREAD	measured from the centre of the stem base to the tips of the branches in all four cardinal points.
AGE CLASS	described as young, semi-mature, early-mature, mature, or over-mature
PHYSIOLOGICAL CONDITION	classed as good, fair, poor, or dead. This is an indication of the health of the tree and takes into account vigour, presence of disease and dieback
STRUCTURAL CONDITION	classed as good, fair or poor. This is an indication of the structural integrity of the tree and takes into account significant wounds, decay and quality of branch junctions.
LIFE EXPECTANCY	classed as; less than 10 years, 10-20 years, 20-40 years, or more than 40 years. This is an indication of the number of years before removal of the tree is likely to be required

Appendix 2b: Retention Categories

Category	Description
A (marked green on Appendix 4)	retention most desirable. These trees are of very high quality and value with a good life expectancy.
B (marked in blue on Appendix 4)	retention desirable. These trees are of good quality and value with a significant life expectancy.
C (marked in grey on Appendix 4)	trees which could be retained. These trees are of low or average quality and value, and are in adequate condition to remain until new planting could be established
U (marked in red on Appendix 4)	trees for removal. These trees are in such a condition that any existing value would be lost within 10 years.



Appendix 3: Tree Data

	Tree S	pecies		Meas urements					Cr	own ((m)		Tree Condition				Va	lue	Management
TreeID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Ave Height	N	E	s	w	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
G1	Willow. Alder. Birch. Field Maple. Poplar. Oak. Hazel.	Salix sp. Alnus sp. Betula sp. Acer sp. Populus sp. Quercus sp. Corylus sp.	Young	5	10+	60	Yes	0.5		See	plan		Group of young recent natural regeneration and plantings with understorey shrubs. Predominantly Goat Willow and Alder with several Birch and occasional Field Maple, Poplar, Oak and Hazel. Dense in parts, sporadic in others. Most planted trees still have guards attached. Very low value.	Good	Good	>40 yrs	LOVO	0	Partial removal required to facilitate development
G2	Willow, Alder, Birch, Field Maple, Poplar, Oak, Hazel,	Salix sp. Alnus sp. Betula sp. Acer sp. Populus sp. Quercus sp. Corylus sp.	Young	5	10+	60	Yes	0.5	See plan				Group of dense young recent natural regeneration and plantings with understorey shrubs. Predominantly Goat Willow and Alder with several Birch and occasional Field Maple, Poplar, Oak and Hazel. Most planted trees still have guards attached. Very low value.	Good	Good	>40 yrs	Low	O	Partial removal required to facilitate development
G3	Hawthorn, Hazel, Holly,	Crataegus sp. Corylus sp. Ilex sp.	Young	3	10+	40	Yes	0		See	plan		Newly planted hedge. Predominantly Hawthorn and Hazel with occasional Holly. Guards still attached.	Good	Good	>40 yrs	LOW	O	No works required
G4	Oak: Alder. Aspen. Birch. Rowan. Holly. Hazel. Sycamore. Beech. Yew.	Quercus sp. Alnus sp. Betula sp. Sorbus sp. Ilex sp. Corylus sp. Acer sp. Fagus sp. Taxus sp.	Early- mature	15	10+	350	Yes	5		See	plan		Woodland group. Predominantly lower individual value semi mature Alder, Aspen, Birch, Oak, Rowan and Holly around 20cm to 40cm stem diameter, with occasional larger early mature moderate value Oak around 60cm to 70cm stem diameter. Understorey of shrubby Holly and Hazel and saplings. Largely inaccessible due to dense understorey and bramble. Semi mature trees are of tall, slender woodland form. Most trees are lvy covered. Deadwood, snapouts, dead standing and fallen dead stems throughout. Recent ditch along south eastern boundary. Trees close to south eastern fenceline plotted individually.	Fair	Fair	>40 yrs	Moderate	В	No works required
G5	Willow, Alder, Poplar, Hazel, Pine, Field Maple, Birch,	Salix sp. Alnus sp. Populus sp. Corylus sp. Pinus sp. Acer sp. Betula sp.	Semi- mature	8	10+	80	Yes	0.5		See	plan		Group of young to semi mature natural regeneration and plantings. Similar to G1 and G2 but taller, denser, and slightly older. Separates G1 from woodland G4.		Good	>40 yrs	Low	С	No works required

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	Tree S	Tree Species Measurements								own (r	n)		Tree Condition				Val	lue	Management
TreeID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Ave Height	N	Ε	s	W	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
G6	Oak, Alder, Birch, Holly,	Quercus sp. Alnus sp. Betula sp. Ilex sp.	Early- mature	15	10+	350	Yes	3		See	plan		Sporadic group of semi to early mature Oak, Alder Birch and Holly. Dense Holly along fenceline. Moderate collective value, but most trees of lower individual value. Moderate value trees close to fenceline surveyed individually (T11, T12 and T13). Larger lower value trees plotted individually. Recent ditch to south east. No access due to boundary fenceline, positions, measurements and condition values indicative only.	Fair	Fair	>40 yrs	Moderate	В	No works required
G7	Oak, Birch, Willow, Alder,	Quercus sp. Betula sp. Salix sp. Alnus sp.	Semi- mature	7	10+	80	Yes	9	See plan				Linear group of young to semi mature trees bordering farmland boundary fenceline. Slightly taller and older than G2 to west.	Good	Good	>40 yrs	Moderate	O	Partial removal required to facilitate development
G8	Oak. Holly. Sycamore. Rowan.	Quercus sp. Ilex sp. Acer sp. Sorbus sp.	Early- mature	15	10+	350	Yes	4		See	plan	Î	Linear group bordering farmland boundary fenceline. Semi to early mature Oaks with understorey of Holly, Oak, Sycamore, Rowan and Hazel saplings. Ditch to west and recent ditch to east with exposed roots. No access due to boundary fenceline. All of poor form, likely historically managed at 1m to 2m. Most trees have sparse crowns with dieback and deadwood. Moderate collective value, but most trees of lower individual value. Moderate value tree T14 surveyed individually. Larger lower value trees close to fenceline plotted individually.		Fair	>40 yrs	Moderate	В	No works required
G9	Oak, Beech, Ash. Holly, Hazel.	Quercus sp. Fagus sp. Fraxinus sp. Ilex sp. Corylus sp.	Early- mature	17	10+	300	Yes	2		See	plan		Linear group of trees bordering farmland boundary fenceline and northern side of stream. Predominantly semi to early mature Oak and occasional Ash and Beech with a dense understorey of young to semi mature Holly and occasional Hazel. All trees growing from edge of stream banking. Fence embedded in stems of numerous trees. No access due to boundary fenceline and stream. Most trees multiple stemmed and of poor form, likely historically managed at 1m to 2m. Moderate collective value, but most trees of lower individual value. Moderate value tree T15 surveyed individually. Larger lower value trees plotted individually.	Fair	Fair	>40 yrs	Moderate	В	No works required



	Tree S	∕leasu	rem ent	s		Cr	own (m)		Tree Condition	Value	Management			
Tree ID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Ave Height	N	Ε	S	w	Life Expectancy Structural Physiological	Amenity	Works
G10	Oak, Beech Sycamore, Rowan, Holly,	Quercus sp. Fagus sp. Acer sp. Sorbus sp. Ilex sp.	Semi- mature	15	10+	250	Yes	2		See plan			Linear group of trees bordering farmland boundary fenceline and southern side of stream. Predominantly dense semi to early mature Holly with occasional Rowan and Goat Willow and occasional larger semi to early mature Oak, Beech and Sycamore. Most trees growing from edge of stream banking. No access due to boundary fenceline and stream. Moderate value trees T16 and T17 surveyed individually. Larger lower value trees plotted individually.	Moderate	C No works required
T11	Oak	Quercus robur	Mature	18	1	1000	Yes	5	5	11	10	10	No access due to boundary fenceline. Exposed roots with bark damage at base. Fence embedded in exposed roots. Single stemmed and vertical with bark damage to stem. Multiple stemmed at 1.5m. Ivy covering stem. Epicormic growths to stem and throughout crown. Minor deadwood and snapouts throughout crown.	Moderate	3 No works required
T12	Oak	Quercus robur	Mature	16	1	800	Yes	5	7	9.5	9.5	8	No access due to boundary fenceline. Exposed roots and soil erosion at base. Single stemmed and vertical with large cavity with decay at base. Ivy covering stem. Old prunig wounds and stubs to stem and lower crown. Minor deadwood and snapouts throughout crown.	Moderate	3 No works required
T13	Oak	Quercus robur	Early- mature	12	1	600	Yes	7	1	5	4	3	No access due to boundary fenceline. Exposed roots and soil erosion at base. Single stemmed and vertical with large cavity with decay at base, lvy covering stem. Old prunig wounds and stubs to stem and lower crown. Minor deadwood and snapouts throughout crown.	Moderate	3 No works required
T14	Oak	Quercus robur	Early- mature	15	1	700	Yes	7	5	5.5	5	5	No access due to boundary fenceline. Growing from banking. Exposed roots and soil erosion at base. Single stemmed and vertical with stubs to stem. Minor deadwood and snapouts throughout crown. Solution 1	Moderate	3 No works required
T15	Beech	Fagus sylvatica	Early- mature	20	5	700, 400, 500, 500, 400	Yes	2	8	8.5	8	7	No access due to boundary fenceline and stream. Growing from northern side of stream banking. Numerous large exposed roots and soil erosion. Multiple stemmed at base with tight unions and included bark. Likely historically managed at 1m to 2m. Minor deadwood in crown.	Moderate	3 No works required

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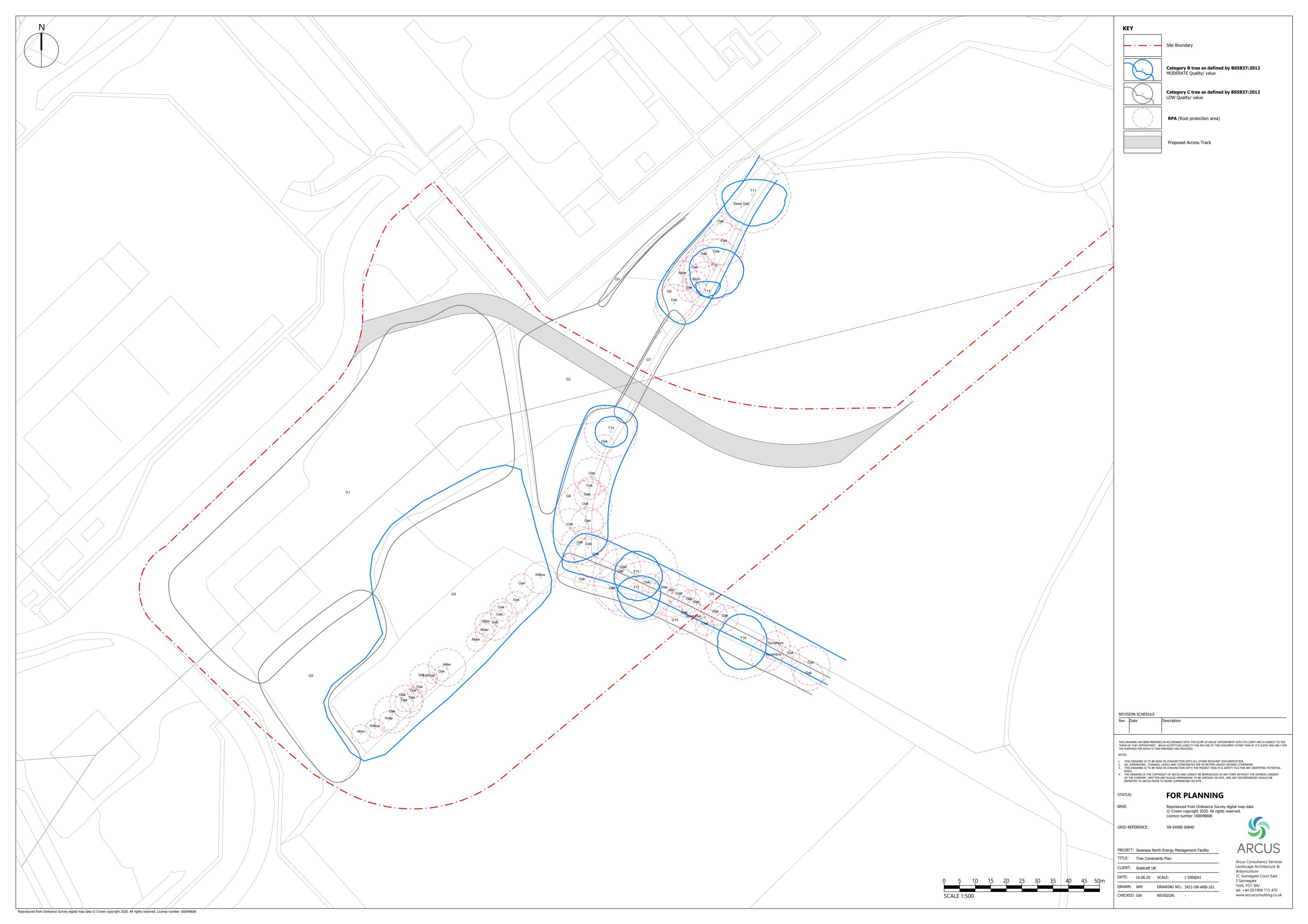
June 2020



	Tree S	/leasu	rem ent	ts		Cro	wn (m)		Tree Condition					lue	e Management			
TreeID	Common Name	Latin Name	Maturity	Height (m)	Stems	Stem Diameter (mm)	Estimated	Ave Height	N	E	s	w	Comments	Physiological	Structural	Life Expectancy	Amenity	Category	Works
T16	Beech	Fagus sylvatica	Mature	17	6	400	Yes	6	9	8	9	8	No access due to boundary fenceline and stream. Growing from edge of ditch banking. Stream to north. Exposed roots and soil erosion at base. Multiple stemmed at base with tight unions and included bark. Likely historically managed at 1m to 2m. Minor deadwood in crown.	Good	Fair	>40 yrs	Moderate	В	No works required
T17	Oak	Quercus robur	Early- mature	17	1	800	Yes	6	5	6	9	8	No access due to boundary fenceline and stream. Growing on banking. Stream to north. Single stemmed and vertical with Ivy covered stem. Old pruning wounds to stem and lower crown. Minor deadwood throughout crown.	Good	Good	>40 yrs	Moderate	В	No works required



Appendix 4: Tree Constraints Plan





Appendix 5: Tree Impacts Plan

