Arboricultural Impact Assessment

in Relation to Proposed B2/B8 Facility at



Land South of Bryn Lane, Holt, Wrexham, Denbighshire, L13 9UT

Prepared by:

Bowland Tree Consultancy Ltd

December 2024 (rev. A)

Control Sheet

Project No.:	BTC2998
Site:	Land South of Bryn Lane, Holt, Wrexham, LL13 9UT
Client:	Mauna Kea Ltd
Council:	Wrexham Council
Survey Date:	05 January 2024
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DISCLAIMER

Survey Limitations: Unless otherwise stated all trees are surveyed from ground level using non-invasive techniques. The disclosure of hidden crown and stem defects, in particular where they may be above a reachable height or where trees are ivy clad or in areas of ground vegetation, cannot therefore be expected. All obvious defects, however, are reported. Detailed tree safety appraisals are only carried out under specific written instructions. Comments upon evident tree safety relate to the condition of said tree at the time of the survey only.

Unless otherwise stated all trees should be re-inspected annually in order to appraise their on-going mechanical integrity and physiological condition. It should, however, be recognised that tree condition is subject to change, for example due to the effects of disease, decay, high winds, development works, etc. Changes in land use or site conditions (e.g. development that increases access frequency) and the occurrence of severe weather incidents are also significant considerations with regards tree structural integrity and trees should therefore be re-assessed in the context of such changes and/or incidents and inspected at intervals relative to identified and varying site conditions and associated risks.

Where trees are located wholly or partially on neighbouring private third-party land then said land is not accessed and our inspection is therefore restricted to what can reasonably be seen from within the site. Stem diameters of trees located on such land are estimated. Any subsequent comments and judgments made in respect of such trees are based on these restrictions and are our preliminary opinion only. Recommendations for works to neighbouring third-party trees are only made where a potentially unacceptable risk to persons and/or property has been identified during our survey. Where significant structural defects of third-party trees are identified and associated management works are considered essential to negate any risk of harm and/or damage then we will first attempt to inform the site occupier of the issues and, if not possible, then inform the relevant Council. Where a more detailed assessment is considered necessary then appropriate recommendations are set out in the Tree Survey Schedule.

Where tree stem locations are not included on the plan(s) provided then they are plotted at the time of the survey using, where appropriate and/or practicable, a combination of measurement triangulation and GPS co-ordination. Where this is not possible then locations are estimated. Restrictions in these respects are detailed in the report.

The tree survey and any report information provided is intended as a guide to identify key tree related constraints to site development only. As such, the potential influence of trees upon existing or proposed buildings or other structures resulting from the effects of their roots abstracting water from shrinkable load-bearing soils is not considered herein. The tree survey information in its current form should not therefore be considered sufficient to determine appropriate foundation depths for new buildings. Accordingly, an updated survey, with reference to the current NHBC Standards Chapter 4.2 - Building Near Trees, must therefore be prepared for the specific purpose of informing suitable foundation depths subsequent to planning approval being granted. The advice of a structural engineer must also be sought with regard to appropriate foundation depths for new buildings.

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Validity: The findings and recommendations contained within this report are, providing its recommendations are observed and the site conditions are retained as per the date(s) of the survey, valid for a period of twelve months from the last survey date. This period of validity may be reduced should there be any changes in factors affecting both the surrounding environment and/or built structures in relative proximity to the trees. The condition of trees should be re-appraised directly, through a site survey, following major weather events such as storms, changes undertaken to the site's conditions, inclusive of demolition and/or ground works, or the removal of existing site vegetation, including trees.

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1.0 INTRODUCTION

Terms of Reference

1.1 Bowland Tree Consultancy Ltd were instructed to:

a) Survey, as individuals or by group, all trees having reasonable potential to affect or to be adversely affected by the proposed development of the site under consideration;
b) Annotate the existing and proposed site plans to produce a Tree Constraints Plan and a Tree Impact Plan;
c) Prepare a tabulated Tree Survey Schedule based on guidance specified BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations;
d) Evaluate the potential tree related impacts and design conflicts of the proposals, based on the supplied development proposal plan(s);
e) Advise on removal, retention and management options for the trees in the current context and in the context of the proposed development;
f) Advise on suitable retained tree protection measures required during development;
g) Offer guidance on compensation for projected tree losses; and
h) Produce an Arboricultural Impact Assessment report detailing the above.

Scope and Purpose of Report

1.2 By detailing foreseeable tree related issues this report is intended to assist the Local Planning Authority (LPA), in this case Wrexham Council in their review of the proposed development, and should be supplied to them in support of the planning application to which it pertains. Essentially, it provides an initial analysis of the impacts that the proposed development is projected to have on trees within the site and, where practicable, on land immediately adjacent to its boundaries. It also offers guidance on suitable retained tree management and compensation for projected losses, along with advice on appropriate tree protection measures in accordance with current guidance in the context of the proposals.

Site Visit, Data Collection and Tree Plans

1.3 Further to the instruction it is confirmed that a tree survey was undertaken on 05 January 2024, in accordance with the preceding disclaimer, and all tree data collected on site is set out in the attached tabulated Tree Survey Schedule (TSS) at Appendix One which, for ease of interpretation, should be read alongside the appended BS5837:2012 Table 1.

1.4 The survey identified 12 individual trees (prefixed ‘T’) and eight groups of trees (prefixed ‘G’), which have been numbered accordingly on the Tree Constraints Plan (TCP) and Tree Impact Plan (TIP), as appended. The plans are based on the existing topographical survey plan and the proposed site plan, which were provided in electronic format by PACE Architecture. In turn, for the purpose of this report, it is presumed that the provided plans’ details are accurate and up to date.

1.5 The TCP details the existing site with the readily definable tree constraints, whilst the purpose of the TIP is to give an initial indication of the impacts that the proposed development is projected to have on trees. In turn, this information should subsequently be used by the LPA’s tree specialist to preliminarily assess if the proposed development can potentially be constructed in accordance with BS5837:2012 and, along with the information provided in this report, as a basis for the LPA to request further details regarding specific matters relating to trees at suitable stages in the planning process.

2.0 STATUTORY PROTECTION IN RESPECT OF TREES AND ASSOCIATED WILDLIFE

Tree Preservation Orders and Conservation Area Designations

2.1 The Town and Country Planning Act (1990) (the Act) and associated Regulations empower Local Planning Authorities (LPAs) to protect trees in the interests of amenity by making Tree Preservation Orders (TPOs). The Act also affords protection for trees of over 75 mm diameter that stand within the curtilage of a Conservation Area (CA). Subject to certain exemptions, an application must be made to the LPA in question to carry out works upon or to remove trees that are subject to a TPO, whilst six weeks' notice of intention must be given to carry out works upon or to remove trees within a CA that are not protected by a TPO.

2.2 Wrexham Council's interactive mapping service, accessed on 17 October 2024, showed that the site is not within the boundaries of a CA and the council's planning department was contacted by the project arboriculturist on 18 December 2024, which confirmed there were no TPOs present on site at the time of checking. It is still advised that the LPA be contacted directly to confirm the continued absence of any statutory tree protection measures at the site immediately prior to scheduling or carrying out any tree works that are not directly related to the implementation of a detailed (i.e. full) planning permission, particularly if a substantial period of time has elapsed since the issue of this report and any subsequent tree works.

Protected Species

2.3 Nesting birds are afforded statutory protection under the Wildlife & Countryside Act (1981) (as amended) and their potential presence should therefore be considered when clipping hedges, removing climbing plants and pruning and removing trees. The breeding period for woodlands runs from March to August inclusive. Hedges provide valuable nesting sites for many birds and clipping should therefore be avoided during March to July. Trees, hedges and ivy should be inspected for nests prior to pruning or removal and any work likely to destroy or disturb active nests should be avoided until the young have fledged.

2.4 All bat species and their roosts are protected under Schedule 5 of the Wildlife & Countryside Act (1981) (as amended) and under Schedule 2 of the Conservation of Habitats & Species Regulations 2017 (as amended). In this respect it should be noted that it is possible that unidentified bat habitat features may be located high up in tree crowns and all personnel carrying out tree works at the site should therefore be vigilant and mindful of the possibility that roosting bats may be present in trees with such features. If any bat roosts are subsequently identified then it is essential that works are halted immediately and that a suitably qualified and experienced ecologist investigates and advises on appropriate actions prior to works continuing.

2.5 In turn, any subsequent works carried out in relation to any protected species must be carried out under guidance from a suitably qualified and experienced ecologist and in strict accordance with the guidance provided in BS42020:2013 - Biodiversity – Code of Practice for Planning and Development and with BS8596:2015 - Surveying for Bats in Trees and Woodlands.

Felling Licences

2.6 Subject to certain exemptions the Forestry Act (1967) requires that a 'Felling Licence' be obtained to remove growing trees amounting to more than five cubic metres of timber in a calendar quarter. Felling Licences are administered by the Forestry Commission and contravention of the associated controls can incur substantial penalties. A felling licence is, however, not required for the felling of trees immediately required for the purpose of carrying out development authorised by a full planning permission granted under the Town and Country Planning Act 1990.

3.0 THE SITE AND THE SURROUNDINGS

3.1 The site under consideration is located to the east of the town of Wrexham, within a wider commercial/industrial area. It is approximately 3.72ha in size, and consists of an agricultural field with various hedges, and trees, the majority of which are located within the site's northern area. There is a single existing vehicular access point into the site, off Bryn Lane to the north.

3.2 The site is bordered to the north by Bryn Lane, to the south-east by a wooded area, and to the remaining boundaries by commercial/industrial units forming past of the wider commercial/industrial site.

3.3 As indicated on the TCP, the topographical survey plan provided shows that the ground levels vary by approximately 5 metres across the site, with the highest points being to its north and the lowest points to its south.

4.0 THE TREE POPULATION

4.1 As noted previously, a total of 12 individual trees and eight groups of trees were surveyed for the purpose of this appraisal. Detailed tree dimensions and other pertinent information, such as structural defects and physiological deficiencies, are included in the Tree Survey Schedule (TSS) at Appendix One.

4.2 In respect of the survey it should be noted that tree quality is categorised within the existing context without taking any development proposals into account. However, recommendations for works included in the TSS take both current site usage and the proposed development into consideration where there are definable issues with regard to specific trees.

4.3 Under the UK's planning system trees are a material consideration in the planning and development process. Nonetheless, only trees of a suitable quality and value should be considered a material constraint to development. In this respect the TSS includes a column ('Cat. Grade') listing the trees' respective retention values, where they are rated either 'A', 'B', 'C' or 'U', as per BS5837:2012 Table 1 (Appendix One). 'A' category trees are those considered to be of 'high quality' and, accordingly, the most suitable for retention, whilst 'B' category trees are those considered to be of 'moderate quality', and 'C' category trees are those considered to be of 'low quality' with a correlated low retention value. In turn, 'U' category trees are those that are considered to be 'unsuitable for retention'.

4.4 As detailed in Table A (below), one tree was categorised as high quality (i.e. 'A' category), three trees were categorised as moderate quality (i.e. 'B' category), and eight trees and six groups of trees were categorised as low quality (i.e. 'C' category). It was not possible to ascertain accurate estimates of numbers of trees within the surveyed groups due to the dense nature of the groups and occluding vegetation, and omission of individual stem locations on the provided topographical survey.

Table A: BS5837-2012 Retention Categories of the Surveyed Trees and Groups

	Ret. Cats.	Tree/Group Numbers	Totals
Those of a moderate or high quality that should be afforded appropriate consideration in the context of development	**'A'**	T1	*1 Trees*
	'B'	T2, T11, T12 G1, G6*	*3 Trees* *2 Groups*
Those of a low quality that should not be considered a significant constraint to development	**'C'**	T3, T4, T5, T6, T7, T8, T9, T10 G2, G3, G4*, G5, G7, G8	*8 Trees* *6 Groups*
Those that should be removed for sound management reasons regardless of site proposals	**'U'**	-	-
			= 12 Trees & 8 Groups in total

*Note: Trees/groups denoted with an asterisk are located on, or partially located on, areas of neighbouring third-party owned land

5.0 THE DEVELOPMENT PROPOSAL AND ITS PROJECTED ARBORICULTURAL IMPACTS

The Development Proposal

5.1 As indicated on the proposed site plan, and on the appended TIP, the proposal is for a B2/B8 commercial development, inclusive of a warehouse building with associated vehicular and pedestrian access, car-parking, vehicular turning and loading facilities and landscaping.

5.2 Vehicular access is proposed off Bryn Lane to the north of the site, slightly west of the existing gated field access, and an additional pedestrian access point is proposed from Bryn Lane to the site's north-west (see TIP).

Projected Arboricultural Losses Relating to the Proposal

5.3 As detailed in Table B, below, it is projected that construction of the development as proposed, is projected to require the removal of one tree of moderate quality (i.e. 'B' category), two low quality (i.e. category 'C') trees, and the partial removal of one low quality group. Additionally, some minor pruning to the edges of groups G4 and G5 may be required to facilitate the development (See TIP).

Table B: Projected Arboricultural Impacts of Proposed Development & Other Tree Removal Proposals

	Ret. Cats.	Removals necessary to implement development	Removals recommended regardless of development	Total no. of removals
Those of a high quality that should be afforded appropriate consideration in the context of development	**'A'**	-	-	-
Those of a moderate quality that should be afforded appropriate consideration in the context of development	**'B'**	T2	-	*1 Tree*
Those of a low quality that should be afforded appropriate consideration in the context of development	**'C'**	T3,T10 G8	-	*2 Trees* *1 part Group*
Those that should be removed for sound management reasons regardless of plans	**'U'**	-	-	-
Totals		*3 Trees* *1 part Group*	-	***= 3 Trees &*** ***1 part Group in Total***

Compensation for Projected Arboricultural Losses as Part of the Scheme's Landscaping

5.4 As detailed on the landscape proposal plan, as produced by Nicholsons GB, to be submitted in support of the planning application under consideration, it is understood that the provision of extensive new tree, hedge, and shrub planting is proposed as a component of the development's landscaping.

5.5 In turn, it also is understood, from information provided by Nicholsons GB, that the proposed landscape component of the scheme is projected to meet an appropriate uplift in biodiversity under the Net Benefit for Biodiversity (NBB) requirements. In this regard it is noted that NBB is an approach to development to ensure that the development does not cause any significant loss of habitats or populations of species and must provide a net benefit for biodiversity, and is mandatory in Wales under Planning Policy Wales (as inserted by the 2016 Environment (Wales) Act).

5.6 Consequently, it is projected that adequate compensation, under current government requirements, can be achieved for the identified necessary tree losses identified as necessary to construct the development as proposed. In turn, the delivery of the proposed new tree planting can be assured through the imposition of a suitably worded condition attached to a planning approval.

Special Design, Construction and Protection Considerations in Relation to Retained Trees

5.7 It is understood, from information provided, that the existing hard surfaced field access within the RPA of tree T1 is to be removed and relocated further east to avoid the RPA of this retained tree. As such, removal of surfacing within the existing access will be required. Nonetheless, it is emphasised that these works can be implemented in accordance with current industry guidance (i.e. BS5837:2012).

5.8 As such, it will subsequently be necessary to ensure that the identified tree is suitably protected in strict accordance with BS5837:2012 through the use of special working procedures, construction methods, and protection measures, the aspects of which are given in Table C, below. In turn, as also detailed in Table C, it will be necessary for the responsible applicable professional(s) to provide further detailed information regarding the proposed works and the special measures to be utilised, the provision of which can be assured through the imposition of a suitably worded condition attached to a planning approval.

Table C: Elements of Proposal with Potential to Impact Upon Trees and Subsequent Special Measures Required

Element of Proposal with Potential to Impact Upon Retained Trees	Applicable Tree(s)	Proposed Special Measures	Relevant BS5837 Section(s) to be Adhered to	Information Required for Provision and Relevant Specialist(s)*
Removal of Existing Hard surfacing and reinstatement of	T1	▪ Existing hard standing access to be retained in situ until new access is formed and in operation to afford generic RPA adequate ground protection ▪ Hard surfacing to be removed from closest point to tree working backwards with all plant and machinery positioned onto existing hard standing or outside generic RPA ▪ Areas of removed hard standing to be backfilled with good quality top soil to pre works levels	7	Contractor responsible for removal of existing hard standing access and reinstatement to provide: 1. Details of proposed finished levels in comparison to existing levels; and 2. Method statements for works

*All documentation and information supplied by the stated professional(s) should afford a suitable level of protection for the tree(s) under consideration in accordance with BS5837:2012

5.9 Consequently, in order to ensure adequate protection of the retained trees throughout the development, specific details regarding the timing, procedures, working methods and protective measures to be used in relation to the proposed construction works within and in close proximity to Root Protection Areas (RPAs – see paragraph 6.1), as detailed in Table C, should be included on a Tree Protection Plan (TPP) and in an Arboricultural Method Statement (AMS), as discussed at paragraph 6.7, and based on information provided from the applicable specialist(s) detailed at Table C, above.

6.0 RECOMMENDATIONS FOR SUCCESSFUL TREE RETENTION IN THE CONTEXT OF DEVELOPMENT

Root Protection Areas and Construction Exclusion Zones

6.1 Adequate protection of the Root Protection Areas (RPAs) of retained trees during construction is essential if their long-term viability is to be assured. RPAs, which are calculated through a method provided in BS5837:2012, are ground areas that should be protected by temporary protective fencing as Construction Exclusion Zones (CEZs) throughout the development process, thereby keeping the trees' root zones free from disturbance.

6.2 Consequently, the RPA distances, as detailed in the TSS and on the TCP and the TIP, give an idea of the on-site below-ground constraints in respect of tree roots and assist in planning for appropriate tree retention in relation to feasible development.

6.3 The TSS includes two columns listing the RPAs of the individually surveyed trees and, where applicable, the largest of the trees in any surveyed groups as overall areas in square metres and as radial distances, with the radial RPAs indicated as magenta-coloured circles on the TCP and TIP.

6.4 With regard to CEZs the design, materials and construction of the fencing should be appropriate for the intensity and type of site construction works, should conform to at least section 6.2 of BS5837:2012, and should be secured by the imposition of a suitably worded planning condition. A Temporary Protective Fencing Specification is included at Appendix Two.

Underground Utilities and Drainage

6.5 The installation of underground utilities in close proximity to trees can cause serious damage to their roots. As such, it is essential that utilities be routed outside RPAs unless there is no other available option. Where RPAs cannot be avoided then guidelines set out in the National Joint Utilities Group publication 'Volume 4: NJUG Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2) – Operatives Handbook' should be followed (e.g. trenches of a very limited width to be hand dug or the use of directional drilling).

6.6 To date, no service plan showing proposed service and/or drainage runs has been provided in respect of the development under consideration. Nonetheless, the proposal plan provided indicates that, if correctly planned, there should be sufficient space to run the necessary services and drainage outside the RPAs of the trees proposed for retention. In turn, the supply of a service plan, detailing the proposed service runs outside the RPAs of retained trees, can be conditioned to a planning approval if deemed necessary by the LPA.

Arboricultural Method Statement and Tree Protection Plan

6.7 Government guidance recommends that, where considered necessary by the LPA, an Arboricultural Method Statement (AMS) and a Tree Protection Plan (TPP) be prepared detailing special mitigation construction issues in relation to the development under consideration. Essentially, the AMS and TPP describe and detail the procedures, working methods and protective measures to be used in relation to retained trees in order to ensure that they are adequately protected during the construction process.

6.8 In turn, the production of and adherence to an AMS and a TPP can be conditioned to a planning approval if deemed necessary by the LPA.

7.0 OTHER RECOMMENDATIONS

Non-Development Related Tree Works and Recommendations

7.1 Any general management pruning works for retained trees that are stated to be non-development related, as detailed in the TSS, are recommended in accordance with prudent arboricultural management and should therefore be carried out regardless of any site development proposals and potential changes in land usage. All tree works should be carried out in accordance with BS3998:2010 - Tree Work – Recommendations.

Tree Work Related Consents

7.2 No tree pruning or removal works should commence on site until necessary consents have been obtained from the LPA as part of a planning approval or in respect of any statutory tree protection.

Arboricultural Contractors

7.3 All tree works should be carried out by suitably qualified and experienced arboricultural contractors carrying appropriate public liability insurance cover and be implemented to the minimum current CE and UK industry standards and in accordance with industry codes of practice. Only certificated personnel should, in accordance with The Control of Pesticides Regulations, apply any pesticides.

Contractors and Subsequently Identified Tree Defects

7.4 Tree contractors should be made aware that, should any significant tree defects become apparent during operations that would not have been immediately obvious to the surveyor, then such defects should be notified immediately to the client and subsequently confirmed to the consultant within five working days.

New Tree Planting

7.5 All new tree planting at the site should be carried out in accordance with BS8545:2014 Trees: from nursery to independence in the landscape – Recommendations, and in accordance with the guidance detailed in section 5.6 and Table A.1 of BS5837:2012.

Landscaping Within and Close to Retained Trees' RPAs

7.6 Any landscaping carried out within and close to retained trees' RPAs should be carried out in strict accordance with the guidance detailed in section 8 of BS5837:2012. As is the case with 7.5, above, a requirement for these works to conform with the current guidance detailed in BS5837:2012 can be conditioned to a planning approval.

Retained Tree Management

7.7 Any tree risk management appraisals and subsequent recommendations made in this report were based on observations and site circumstances at the time of the survey. Trees are dynamic living organisms whose structure is constantly changing and even those evidently in good condition can succumb to damage and/or stress. In this respect, it should be noted that, under the Occupiers' Liability Act (1957 & 1984), site occupants have a duty of care to take reasonable steps to prevent or minimise the risk of personal injury and/or damage to property from any tree located within the curtilage of the land they occupy.

7.8 In turn, it is accepted that these steps should normally include commissioning a qualified and experienced arboriculturist to survey their trees in order to identify any risk of harm to persons or damage to property that they may present and, where unacceptable risks are identified, taking suitable remedial action to negate those risks.

8.0 SUMMARY AND CONCLUSIONS

8.1 Twelve individual trees and eight groups of trees were surveyed in respect of a B2/B8 commercial development proposal at the site under consideration.

8.2 One tree was categorised as high quality, three trees were categorised as moderate quality, and eight trees and six groups of trees were categorised as low quality.

8.3 An appraisal of the proposal plan provided identified that construction of the development as proposed will require the removal of one tree of moderate quality and two low quality trees, and the partial removal of one low quality group.

8.4 Nonetheless, it is noted that, although it will be necessary to remove a number of trees in order to develop the site as proposed, the landscape proposal plans to be submitted in support of the planning application under consideration, indicate that the provision of extensive new tree, hedge, and shrub planting is proposed as a component of the development's landscaping.

8.5 In turn, it is understood that these elements meet the necessary uplift under the NBB requirements, and it is therefore projected that adequate compensation can be achieved for the identified necessary tree losses required to construct the development as proposed.

8.6 Consequently, the delivery of the proposed new tree, shrub and hedge planting can be assured through the imposition of a suitably worded condition attached to a planning approval, if deemed necessary by the LPA.

8.7 Subsequently, any new tree planting or other landscaping works subsequently carried out within and close to retained trees' RPAs, should be carried out in strict accordance with current government guidance.

8.8 In addition to the above it is also concluded that, in order to ensure successful existing tree preservation over the long-term, it is essential that any retained trees are protected in strict accordance with current Government guidance and the recommendations included herein.

8.9 In this respect, works to remove the existing hard standing field access are within the indicated RPA of tree T1 and, as such, specialist working methods are given to demonstrate this can be feasibly achieved with projected impacts to the retained tree's RPA as low as practicable.

8.10 Accordingly, in order to ensure adequate protection of retained trees, including details of any special working methods, the provision of and adherence to a site and development specific AMS and TPP can be conditioned to a planning approval, if deemed necessary by the LPA.

8.11 Finally, it is emphasised that all site works must be carried out in strict accordance with any advice and recommendations made by the project ecologist where applicable and, in turn, in accordance with current government guidance relating to biodiversity, wildlife and development, and it may therefore be necessary for the project arboriculturist and ecologist to converse on these matters as part of the planning process.

REFERENCES

BS42020:2013 - Biodiversity – Code of Practice for Planning and Development. BSI British Standards, London.
BS8596:2015 - Surveying for Bats in Trees and Woodlands. BSI British Standards, London.
BS8545:2014 - Trees: From Nursery to Independence in the Landscape – Recommendations. BSI British Standards, London.
BS3998:2010 - Tree Work - Recommendations. BSI British Standards, London.
BS5837:2012 - Trees in Relation to Design, Demolition and Construction – Recommendations. BSI British Standards, London.
National House Building Council (2017). NHBC Standards Chapter 4.2 - Building Near Trees. NHBC, Amersham.
National Joint Utilities Group (2007). Volume 4: NJUG Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2) – Operatives Handbook

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT ASSESSMENT			
Site:	Land South of Bryn Lane, Holt, Wrexham, Denbighshire, LL13 9UT	**Job Reference:**	BTC2830
Client:	Mauna Kea Ltd		

Surveyor:	Ryan Wilson BSc(Hons) FdSc MArborA
Survey Date:	5 January 2024
Job Reference:	BTC2830

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m²)	RPA Radius (m)
T1	Common Oak	9	810#	N E S W	6 6.5 7 6	2-W 5	PM	M	▪ Located within shrubs close to main entrance to site. ▪ Full view of basal area obstructed by fence and ivy, with stem diameter subsequently estimated. ▪ Deadwood throughout crown, varying in size with signs of retrenchment in upper canopy. ▪ Evident hollowing within main stem.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's Root Protection Area (RPA) through formation of Construction Exclusion Zone (CEZ) in accordance with appended specification.	40+	A1/2	297	9.72
T2	Weeping Willow	10	800#	N E S W	5 4 5 6	3-N 3	M	G	▪ Located behind fencing with 'Danger' warning sign, and subsequently not accessed to inspect in detail. ▪ Diameter estimated due to lack of access.	▪ Remove tree in order to remove and demolish existing bunker structure.	20+	B1	290	9.6
T3	Alder	6	200#	N E S W	1 2 3 1	1-N 1	EM	G	▪ Growing out of old bunker behind fenced off area and subsequently not accessed to view or inspect in detail, with all details subsequently estimated. ▪ Ivy clad, which further impeded inspection.	▪ Remove tree in order to remove and demolish existing bunker structure.	10+	C1	18	2.4
T4	Common Hawthorn	2	90	N E S W	1.5 1.5 1.5 1.5	0 0	Y	G	▪ No notable features.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	4	1.8
T5	Common Hawthorn	3	2x80 (ts)	N E S W	1.5 1.5 1.5 1.5	0 0	EM	G	▪ Multiple stems from ground level, typical of species. ▪ Stem diameter taken from a stem average.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	3	0.96
T6	Common Hawthorn	3	3x80 (ms)	N E S W	2 2 2 2	0 0	EM	G	▪ Multiple stems from 0.5m above ground level. ▪ Stem diameter taken from a stem average.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	4	1.8
T7	Common Hawthorn	4.5	2x90 (ts)	N E S W	2 2 2 2	0 0	EM	G	▪ Located south of fence, with ownership unknown and subsequently not accessed to inspect in detail. ▪ Multiple stems from 2m above ground level.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	10	1.8

Headings and Abbreviations:

No. Allocated sequential reference number - Tree ('T'), Group ('G'), Woodland ('W') or Hedge ('H') reference number - refer to plan and to numbered tags where applicable
Species: Common name
Height: In metres, to half nearest metre – where possible approximately 80% are measured using an electronic clinometer and the remainder estimated against the measured trees. In the case of Groups and Woodlands the measurement listed is that of the highest tree
Stem Diam.: Stem diameter in millimetres, to nearest 10mm - measured and calculated as per Annex C of BS5837:2012. MS = multi-stemmed, TS = twin-stemmed
Branch Spread: Crown radius measured (or estimated where considered appropriate) from the four cardinal points (north, east, south and west) to give an accurate visual representation of the crown
Branch & Canopy Clearances: Existing height above ground level, in metres, of first significant branch and direction of growth (e.g. 2.5-N) and of canopy at lowest point – to inform on crown to height ratio, potential for shading, etc.
Life Stage: Estimated age class - Y = young, SM = semi-mature, EM = early-mature, M = mature, PM = post-mature
PC: Physiological Condition - a measure of the tree's)' overall vitality, i.e. D = Dead, MD = Moribund, P = Poor, M = Moderate, G = Good
General Observations and Comments: Comments relating to the tree's)' overall condition and any other pertinent factors including structural defects, current and potential direct structural damage, physiological decline, poor form, etc.
Management Recommendations: Either Preliminary or In Consideration of the Proposal - In the case of Arboricultural Constraints Surveys the recommended management works only take exiting site and tree circumstances and conditions into account and not proposed developments. Arboricultural Impact Assessment and Method Statement related Surveys take the proposed development into consideration with recommendations made accordingly. More than one option may be given if considered appropriate
ERC: Estimated Remaining Contribution - in years as per BS5837:2012 (i.e. <10, 10+, 20+, 40+)
Cat. Grade: Category Grading - tree retention value listed as U, A, B or C - in accordance with BS5837:2012 Table 1
RPA m²: Root Protection Area in m² - calculated area around the tree that must be appropriately protected throughout the development process in order avoid root damage
RPA Radius (m): Root Protection Area Radius - in metres measured from the centre of the stem to the line of tree protection
 # (Estimated Dimensions): Where trees are located off-site, or are inaccessible for any other reason, and accurate measurements or other information cannot be taken then the information provided is estimated and is duly suffixed with a "#" symbol

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT ASSESSMENT			
Site:	Land South of Bryn Lane, Holt, Wrexham, Denbighshire, LL13 9UT	**Job Reference:**	BTC2830
Client:	Mauna Kea Ltd		

Surveyor:	Ryan Wilson BSc(Hons) FdSc MArborA
Survey Date:	5 January 2024
Job Reference:	BTC2830

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m²)	RPA Radius (m)
T8	Common Hawthorn	4.5	150	N E S W	2 2 2 2	0 0	EM	G	▪ Located south of fence, with ownership unknown and subsequently not accessed to inspect in detail. ▪ Multiple stems from 2m above ground level.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	10	1.8
T9	Common Hawthorn	4.5	150	N E S W	2 2 2 2	0 0	EM	G	▪ Located south of fence, with ownership unknown and subsequently not accessed to inspect in detail. ▪ Multiple stems from 2m above ground level.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	10+	C1	10	1.8
T10	Common Hawthorn	3	3x90 (ms)	N E S W	2 2 2 2	0 0	EM	G	▪ Located south of fence, with ownership unknown and subsequently not accessed to inspect in detail. ▪ Multiple stems, with measurements taken from stem average.	▪ Remove tree in order to construct car park as proposed.	10+	C1	4	1.8
T11	Common Hawthorn	5	400#	N E S W	4 4 4 4	0 0	M	G	▪ Located in section of vegetation, which impeded access. ▪ Measurements estimated.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	20+	B1	72	4.8
T12	Common Oak	7	310#	N E S W	4.5 4.5 4.5 4.5	2-N 2	EM	G	▪ Located in section of vegetation, which impeded access. ▪ Measurements estimated.	▪ Retain tree in context of proposed development. ▪ Ensure protection of tree's RPA through formation of CEZ in accordance with appended specification.	20+	B1	43	3.72
G1	Sycamore, Hawthorn	≤ 10	≤ 250#	N E S W	≤ 4.5 ≤ 4.5 ≤ 4.5 ≤ 4.5	0 0	EM	G	▪ Tree group containing other shrub understory species. ▪ Group evidently provides screening from road. ▪ Trees moderately clad with ivy obstructing view.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification.	20+	B1/2	≤ 28	≤ 3
G2	Sycamore, Hawthorn	≤ 6	≤ 230	N E S W	≤ 3.5 ≤ 3.5 ≤ 3.5 ≤ 3.5	1-E 1	EM	G	▪ Group forms boundary with neighbouring land. ▪ Measurements taken from largest tree within group.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification.	10+	C1	≤ 24	≤ 2.76
G3	Common Ash, Hawthorn, Blackthorn, Cherry	≤ 5.5	≤ 290	N E S W	≤ 4.5 ≤ 4.5 ≤ 4.5 ≤ 4.5	2-W 0	SM	D-G	▪ Group of measurements taken from largest tree. ▪ Moderate stem damage on majority of trees. ▪ Cherry within group is evidently dead.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification.	10+	C1	≤ 38	≤ 3.48
G4	Common Ash, Hawthorn, Blackthorn, Common Oak	≤ 5.5	≤ 290	N E S W	≤ 4.5 ≤ 4.5 ≤ 4.5 ≤ 4.5	2-W 0	SM	G	▪ Group evidently partially located on neighbouring land. ▪ Measurements taken from largest tree. ▪ Moderate stem damage on majority of trees.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification. ▪ Undertake minor pruning to group's western edge where applicable to facilitate proposals.	10+	C1	≤ 38	≤ 3.48

TREE SURVEY SCHEDULE FOR ARBORICULTURAL IMPACT ASSESSMENT		Surveyor:	Ryan Wilson BSc(Hons) FdSc MArborA	Page: 3 of 3
Site:	Land South of Bryn Lane, Holt, Wrexham, Denbighshire, LL13 9UT	Survey Date:	5 January 2024	
Client:	Mauna Kea Ltd	Job Reference:	BTC2830	

No.	Species	Height	Stem Diam.	Branch Spread		Branch & Canopy Clearances	Life Stage	PC	General Observations and Comments	Management Recommendations	ERC	Cat. Grade	RPA (m²)	RPA Radius (m)
G5	Common Ash, Hawthorn, Blackthorn, Common Oak	≤ 6	≤ 280	N E S W	≤ 3.5 ≤ 3.5 ≤ 3.5 ≤ 3.5	0 0	SM	G	▪ Measurements taken from largest tree. ▪ Moderate stem damage on majority of trees. ▪ Larger trees positioned to southern extents of group.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification. ▪ Undertake minor pruning to group's north western edge where applicable to facilitate proposals.	10+	C1	≤ 35	≤ 3.36
G6	Common Ash, Sycamore and Common Oak	≤ 9	≤ 300#	N E S W	≤ 4.5 ≤ 4.5 ≤ 4.5 ≤ 4.5	2-N 1	EM	G	▪ Located south of fence and partially located on neighbouring land, and not subsequently accessed to inspect in detail. ▪ All trees evenly spaced and of even age, indicating group is likely a man made copse.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification.	20+	B1	≤ 41	≤ 3.6
G7	Hawthorn	≤ 4	≤ 130#	N E S W	≤ 2 ≤ 2 ≤ 2 ≤ 2	0 0	EM	G	▪ Located south of fence, and not subsequently accessed to inspect in detail. ▪ Trees all even aged and evenly distributed within group. ▪ Group measurements estimated from largest stem.	▪ Retain group in context of proposed development. ▪ Ensure protection of group's RPA through formation of CEZ in accordance with appended specification.	10+	C1	≤ 8	≤ 1.56
G8	Ash, Hawthorn, Sycamore, Wild Cherry, Common Oak, Weeping Willow, Horse Chestnut	≤ 6	≤ 380	N E S W	≤ 4 ≤ 4 ≤ 4 ≤ 4	0 0	Y-EM	G	▪ Mixed species group predominantly shrub and young to semi mature tree group, with some larger trees interspersed throughout. ▪ Group measurements taken from largest accessible stem. ▪ Numerous trees showing moderate to significant reductions in vitality. ▪ Group would benefit from silvicultural management. ▪ Dense bramble throughout many parts of group, suppressing some tree canopies. ▪ Some larger gaps between tree cover.	▪ Remove sufficient area of group to construct proposed substation, access road, footpath, cycle store and car park (See Tree Impact Plan (TIP)). ▪ Retain remainder of group in context of proposed development. ▪ Ensure protection of remainder of group's RPA through formation of CEZ in accordance with appended specification.	20+	C1/2	≤ 65	≤ 4.56

BS5837:2012 Table 1 – Cascade Chart for Tree Quality Assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
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	▪ Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) ▪ Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline ▪ Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *Note: Category U trees can have existing or potential conservation value which it might be desirable to preserve; see BS5837:2012 paragraph 4.5.7.*			Red
	1. Mainly arboricultural qualities	**2. Mainly landscape qualities**	**3. Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	Green
Category B Those of moderate quality and value: those in such a condition as to make a significant contribution. A minimum of 20 years is suggested.	Trees that might be included in the high category, but are downgraded because of impaired condition. Examples include the presence of remediable defects including unsympathetic past management and minor storm damage	Trees present in numbers, usually as groups or woodlands, so they form distinct landscape features which attract a higher collective rating than they might as individuals. But which are not, individually, essential components of formal or semi-formal arboricultural features. For example, trees of moderate quality within an avenue that includes better, A category specimens. Or trees which are internal to the site, therefore individually having little visual impact on the wider locality	Trees with clearly identifiable conservation or other cultural benefits	Blue
Category C Those trees of low quality and value: currently in adequate condition to remain until new planting could be established - a minimum of 10 years is suggested - or young trees with a stem diameter below 150 mm	Trees not qualifying in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit	Trees with very limited conservation or other cultural benefits	Grey
	Note – Whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150mm should be considered for relocation			

- TEMPORARY PROTECTIVE FENCING SPECIFICATION -

Construction Exclusion Zones (CEZs), enclosed by **Temporary Protective Fencing**, as detailed below and to be agreed with the Local Planning Authority (LPA), shall:

1. be retained in place throughout the development process, as specified in the 'Temporary Protective Fencing Construction' section below and detailed in BS5837:2012 Figure 2 (overleaf);
2. be sited in the area(s) defined by the Root Protection Areas or, if applicable, the Construction Exclusion Zones, as detailed on the associated Tree Plan;
3. be erected prior to any construction, demolition or excavation works and remain in place for the duration of the project;
4. preclude any delivery of site accommodation and/or materials and/or plant machinery;
5. preclude all construction related activity, with the sole exception of specified arboricultural works and any other works to be carried out under supervision that have been agreed by all parties; and
6. preclude the storage of all development related materials and substances including fuels, oils, additives, cement and/or any other deleterious substance.

Any incursion into CEZs must be by prior arrangement, following consultation with the LPA.

Temporary Protective Fencing Construction

1. Temporary protective fencing panels shall be weldmesh "Heras" panels of at least 2.0 metres in height.
2. The panels shall butt together and be securely fixed to a scaffold framework, as per 3 to 5 below.
3. The scaffold framework shall comprise of upright poles of at least 3.0 metres in length driven no less than 0.6 metres into the ground at maximum 3.0 metre centres with horizontal and diagonal poles fixed to the uprights, as per 4 to 5 below.
4. The two horizontal rail poles shall be attached to the uprights at heights of 0.6 and 1.8 metres with 3 no. clamps to each joint.
5. The diagonal scaffold pole struts be clamped to the top rail of the scaffold framework at a 45º angle and extend back into the CEZ and clamped to a 0.7 metre length of scaffold tube that shall be driven no less than 0.5m into the ground.
6. No fixing shall be made to any tree and all possible precautions shall be taken to prevent damage to tree roots when locating posts.
7. A 600mm x 300mm warning sign reading "TREE PROTECTION AREA KEEP OUT" (see Figure 1, below) shall be fixed to every 10.0 metre length of protective fencing.
8. On completion and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the LPA shall inspect and approve the Temporary Protective Fencing.

Figure 1: CEZ Warning Sign

– TREE PROTECTION AREA –
KEEP OUT!

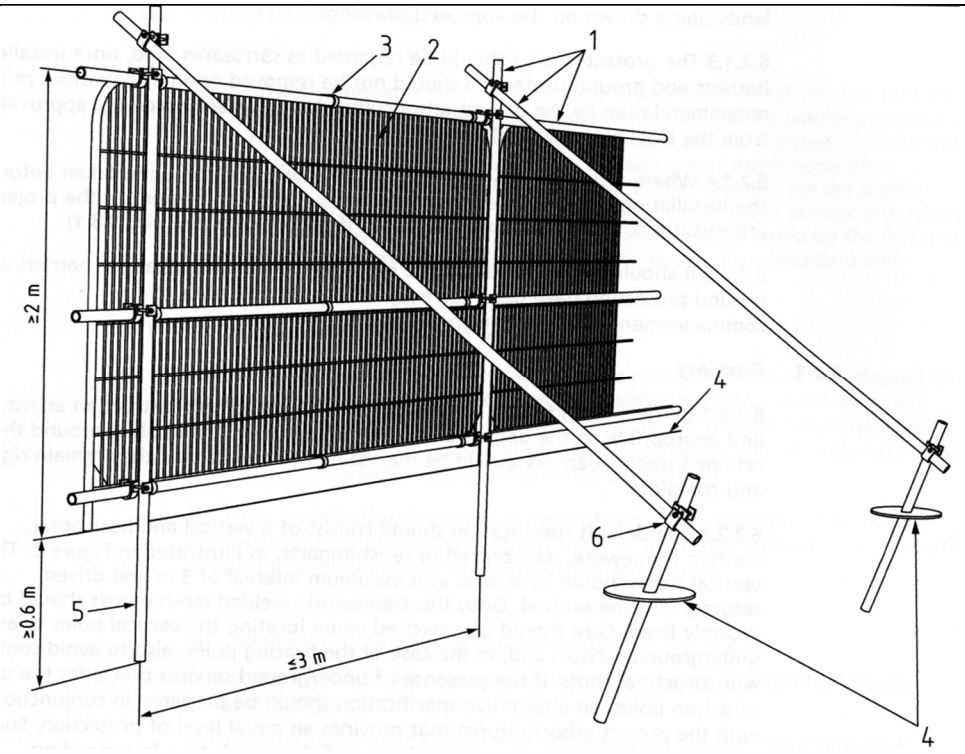
(TOWN & COUNTRY PLANNING ACT 1990)
THE TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND/OR SUBJECTS OF A 'TREE PRESERVATION ORDER', THE CONTRAVENTION OF WHICH MAY LEAD TO CRIMINAL PROSECUTION

THE FOLLOWING MUST BE OBSERVED BY ALL PERSONNEL:

- **THE PROTECTIVE FENCING MUST NOT BE MOVED**
- **NO PERSON SHALL ENTER THE CONSTRUCTION EXCLUSION ZONE**
- **NO MACHINE, PLANT OR VEHICLES SHALL ENTER THE EXCLUSION ZONE**
- **NO MATERIALS SHALL BE STORED IN THE EXCLUSION ZONE**
- **NO SPOIL SHALL BE DEPOSITED IN THE EXCLUSION ZONE**
- **NO EXCAVATION SHALL OCCUR IN THE EXCLUSION ZONE**
- **NO FIRES SHALL BE LIT IN THE EXCLUSION ZONE**

ANY INCURSION INTO THE EXCLUSION ZONE MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

Figure 2: BS5837:2012 Default specification for protective barrier



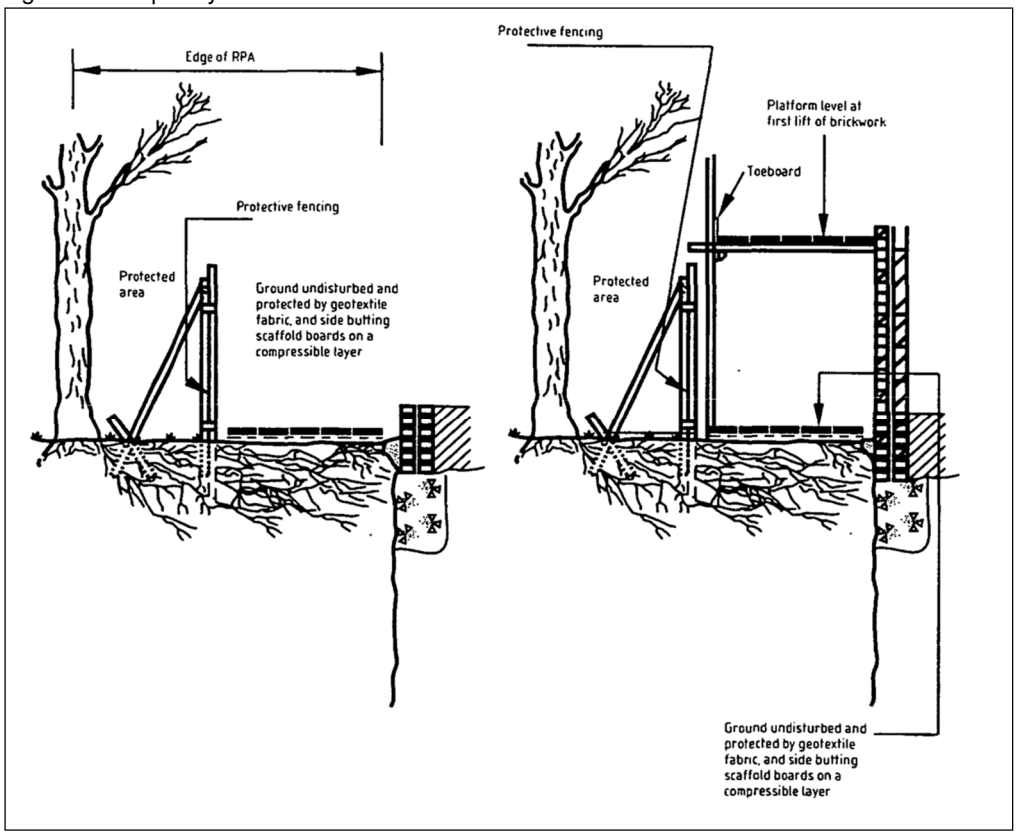
Key

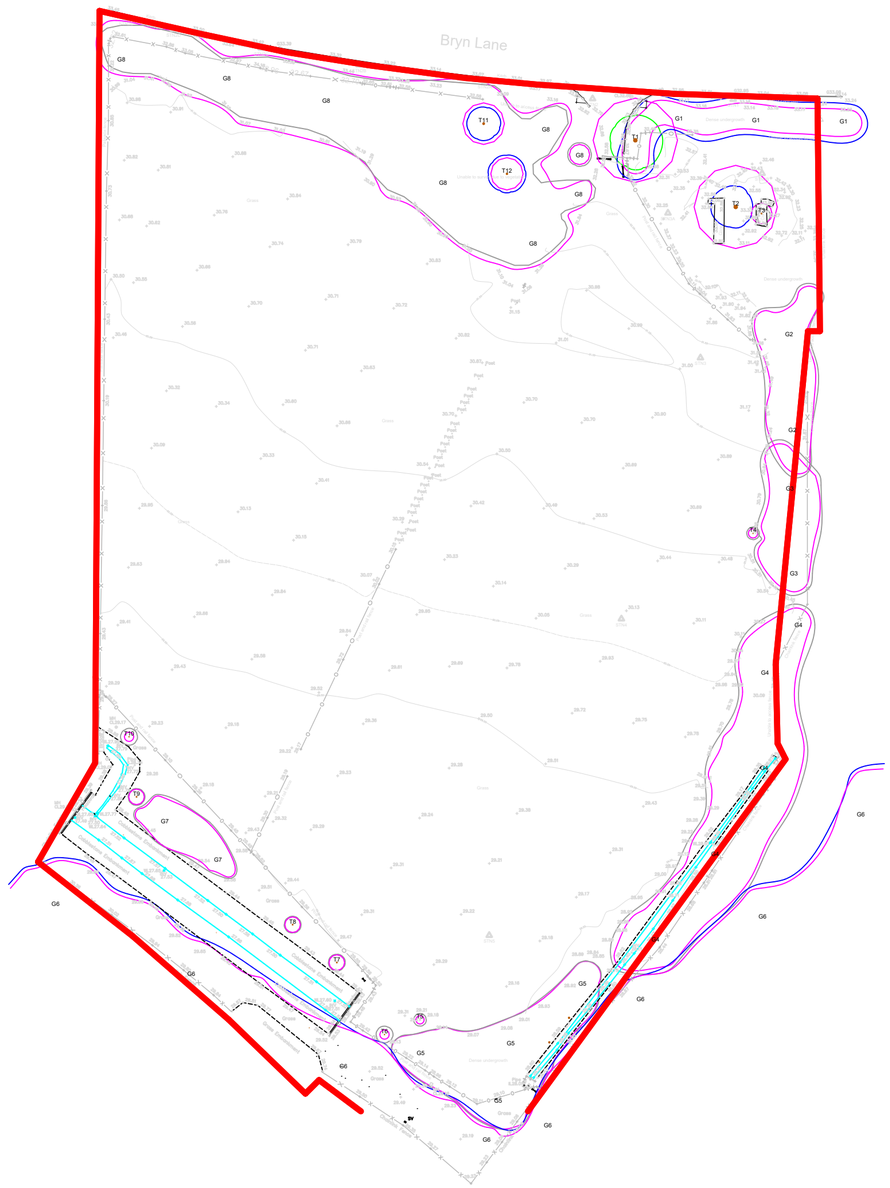
1. Standard scaffold poles.
2. Heavy gauge 2 metre tall galvanised tube and welded mesh infill panels
3. Panels secured to uprights and cross members with wires ties
4. Ground level
5. Uprights driven into the ground until secure (minimum depth 0.6 metres)
6. Standard scaffold clamps

Temporary Ground Protection

1. Any necessary Temporary Ground Protection areas shall conform to Figure 3, below, unless otherwise agreed with the LPA.
2. The Ground Protection Area shall be left undisturbed and covered by a semi-permeable geotextile membrane which shall, in turn, be covered by a compressible layer consisting of a material such as woodchip.
3. Side-butting scaffold boards shall then be fitted to cover the Ground Protection Area.
4. On completion of installation, and prior to any demolition or construction works, site preparation, excavation or delivery of plant and materials, the Consulting Arboriculturist or the LPA Tree Officer, as agreed, shall inspect the Temporary Ground Protection.
5. The Temporary Ground Protection shall remain in place until completion of the project and only removed following receipt of written permission from the LPA.

Figure 3: Temporary Ground Protection – Recommended Construction





Important: The original version of this plan was produced in colour, which is essential to the plan's interpretation and usability. As such, a monochrome copy should not be relied upon

KEY

T = Individual Tree
G = Group of Trees

Please refer to associated Tree Survey Schedule and appendices for specific details in respect of items below:

Tree Categorisations:

Those to be Considered for Retention:

Category 'A' Tree/Group
Those of a High Quality with an Estimated Remaining Life Expectancy of at Least 40 Years

Category 'B' Tree/Group
Those of a Moderate Quality with an Estimated Remaining Life Expectancy of at Least 20 Years

Category 'C' Tree/Group
Those of Low Quality with an Estimated Remaining Life Expectancy of at Least 10 Years, or Young Trees

Those Considered Unsuitable for Retention:

Category 'U' Tree/Group
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

Note: The locations of trees T3 to T10 and T12, and the locations and extents of the groups, were not included on the topographical survey plan provided, and were subsequently plotted by the arboriculturist at the time of the survey using GPS and, where possible, measurement from existing site features or, where not possible, by estimation. As such, the locations of these trees and the locations and extents of these groups cannot therefore be considered to be entirely accurate

Root Protection Areas (RPAs):

RPAs
Area(s) of Ground Around Trees that Should be Protected Throughout Development Works with Protective Fencing to form a Construction Exclusion Zone - see Temporary Protective Fencing Specification

Project:
LAND SOUTH OF BRYN LANE
HOLT
WREXHAM
DENBIGHSHIRE
LL13 9UT

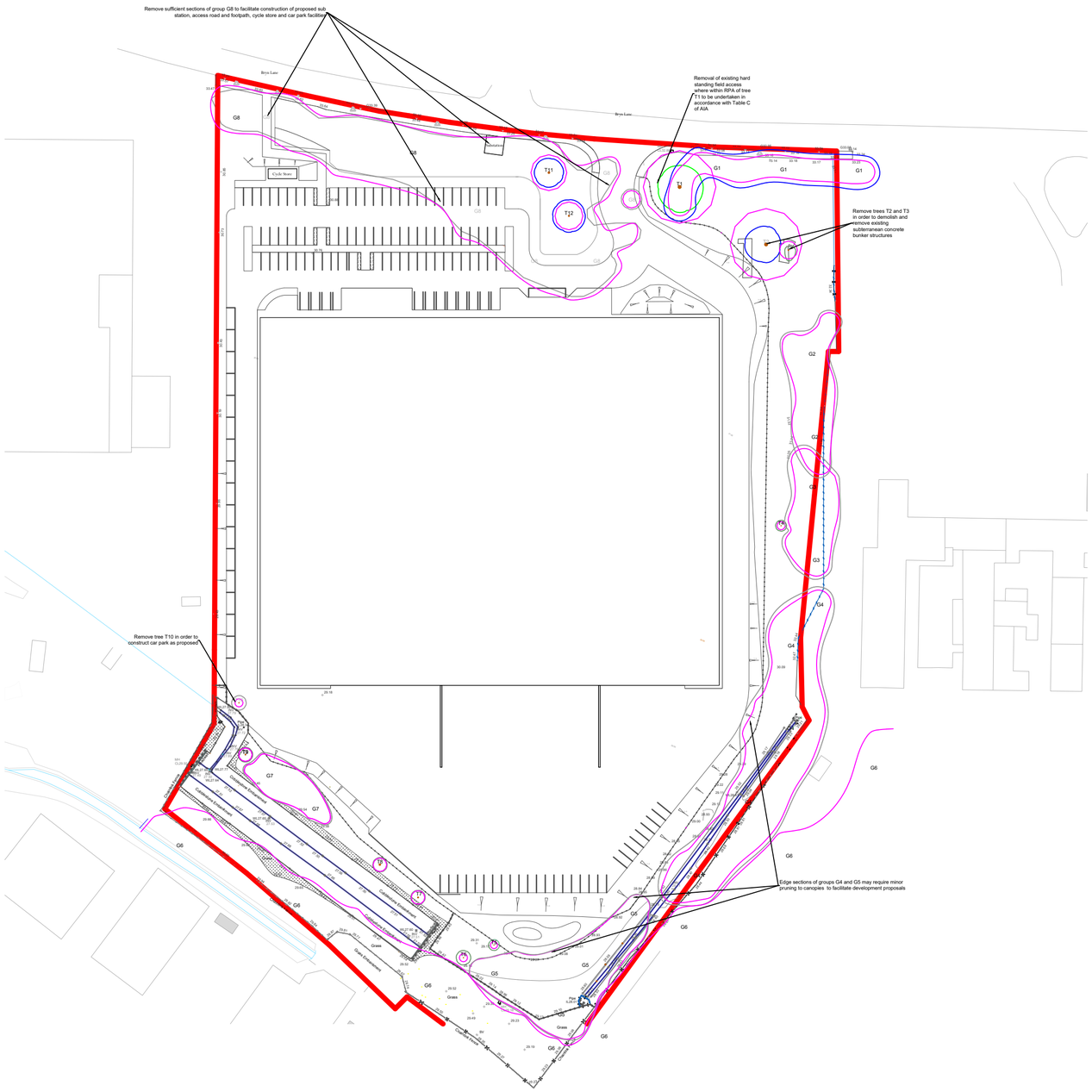
Client:
MAUNA KEA LTD

Title:
TREE CONSTRAINTS PLAN
in Relation to Proposed Construction of B2/B8 Facility

Scale:	1:1000@A2
Date:	October 2024
Drawn by:	RW & JT
Checked by:	JL & PH

Bowland Tree Consultancy Ltd
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Ref: BTC2830-TCP Rev: B



Important: The original version of this plan was produced in colour, which is essential to the plan's interpretation and usability. As such, a monochrome copy should not be relied upon

KEY

T = Individual Tree
G = Group of Trees

Please refer to associated Tree Survey Schedule and appendices for specific details in respect of items below:

Tree Categorisations:

Those to be Considered for Retention:

Category 'A' Tree/Group
Those of a High Quality with an Estimated Remaining Life Expectancy of at Least 40 Years

Category 'B' Tree/Group
Those of a Moderate Quality with an Estimated Remaining Life Expectancy of at Least 20 Years

Category 'C' Tree/Group
Those of Low Quality with an Estimated Remaining Life Expectancy of at Least 10 Years, or Young Trees

Those Considered Unsuitable for Retention:

Category 'U' Tree/Group
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

Note: The locations of trees T3 to T10 and T12, and the locations and extents of the groups, were not included on the topographical survey plan provided, and were subsequently plotted by the arboriculturist at the time of the survey using GPS and, where possible, measurement from existing site features or, where not possible, by estimation. As such, the locations of these trees and the locations and extents of these groups cannot therefore be considered to be entirely accurate
Note 2: Trees with their identifiers noted in grey are those required or recommended for removal within the context of the proposed development

Root Protection Areas (RPAs):

RPAs
Area(s) of Ground Around Trees that Should be Protected Throughout Development Works with Protective Fencing to form a Construction Exclusion Zone - see Temporary Protective Fencing Specification

Project:
LAND SOUTH OF BRYN LANE
HOLT
WREXHAM
DENBIGHSHIRE
LL13 9UT

Client:
MAUNA KEA LTD

Title:
TREE IMPACT PLAN
in Relation to Proposed Construction of B2/B8 Facility

Scale:	1:1000@A2
Date:	November 2024
Drawn by:	MH
Checked by:	PH

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Ref: BTC2830-TIP Rev: A