Tree Constraints Survey and Arboricultural Impact Assessment

Dewsbury & District Hospital

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1 INTRODUCTION

1.1 INSTRUCTION

1.1.1 Crestwood Environmental Ltd. have been commissioned to produce a Tree Constraints Assessment by Darwin Group ('the Client') in relation to proposed development at Dewsbury & District Hospital, Halifax Rd, Dewsbury WF13 4HS, ('the Site').

1.1.2 The instruction is to produce a Tree Constraints Survey Report, and to include an Arboricultural Impact Assessment (AIA). All works will accord with the methodologies and guidance of BS5837:2012 *Trees in Relation to design, demolition and construction: recommendations*, to inform layout design.

1.2 BRIEF

1.2.1 The purpose of the Tree Constraints Assessment is to provide an objective assessment of the retention value of the trees located within the site. It is often appropriate to also provide guidance in relation to required setbacks from adjacent tree cover which may be located outside the Site and which may not be within the ownership of the developer. Such tree cover requires to be safely retained-during development of the site.

1.2.2 The purpose of this assessment is also to provide critical tree data to aid in the design process and form the basis of a workable Tree Protection Plan for the Proposed Development, where this is required.

1.2.3 The purpose of the AIA is to provide an objective assessment of the impact of the Proposed Development on existing tree cover at the Site. The assessment will include evaluation of any special engineering measures proposed to mitigate tree impacts and will acknowledge the scope and likely mitigatory or positive effects of any planting proposals.

1.2.4 A further purpose of this assessment is to provide an associated Tree Protection Plan which can be implemented on Site as a primary tree protection measure.

1.3 DOCUMENTS AND INFORMATION PROVIDED

1.3.1 Plans showing the location of the proposed Site were provided by the Client to facilitate the Tree Constraints Survey and production of this report. These drawings are identified as follows:

- 180598-DGL-01-00-DR-A-1135_Site Constraints Plan;
- 180598-DGL-01-00-DR-A-1150_Existing Site Plan;
- 180598-DGL-01-00-DR-A-1160_Proposed Site Plan; and
- 180598-DGL-01-00-DR-A-1170_Site Logistics Plan.

1.3.2 In advance of the Site Survey visit, the location to be surveyed was provided in digital format (CAD) as a topographical survey overlain with the Proposed Site Plan. This enables a more accurate understanding of any surveyed trees locations against the proposed development.

1.4 TREE SURVEY

1.4.1 A Tree Constraints Survey was undertaken by David Woodhouse, Arboricultural Consultant, during February 2023.

1.4.2 The survey was used to identify and categorise on-site trees, evaluating those which are most suitable for retention.

1.4.3 Each tree was given a sequential (T) number and tagged where appropriate. Each tree was recorded with the common and botanical names. Where groups or woodlands formed a cohesive assemblage, they were recorded as (G) Groups and (W) Woodlands, with largest trees recorded to reflect RPA's and crown spreads. Where trees appear exceptional to the existing group or woodland they were recorded as individuals.

1.4.4 All trees were measured using a standard DBH girthing tape.

- Stem diameters were measured at 1.5m above ground level with a girthing tape to enable calculation of root protection areas; where trees were inaccessible, stem diameters and/or RPA values were estimated by the arboriculturalist.
- Heights and crown spreads at 4 cardinal points are estimated to enable crown representation on tree protection plans.

1.4.5 Each life stage for each tree was assessed using the criteria in the table below:

Table 1 Tree Life Stages

Stage	Description
Young	Newly planted or self-set trees
Semi-mature	Large nursery stock or self-set trees in their early life stages.
Early-mature	Trees that are in their third life cycle with significant increases in size.
Mature	Trees in their second third life cycle reaching full size potential and slowing growth rates.
Late-mature	Trees in their final third their life cycle showing signs of decline.
Veteran	Trees showing signs of retrenchment and deadwood habitat irrespective of their age.

1.4.6 General observations were recorded for physiological and structural condition of the trees, with preliminary management recommendations-supplied if required.

1.4.7 Each individual tree, tree group and woodland has been categorised in accordance with the criteria provided in BS5837:2012, reproduced in Appendix T2 .

1.4.8 It was noted that tree presence within and across the Site was extremely limited, consisting of a single early-mature Horse Chestnut, isolated within the existing car park area, and a group of three trees consisting of a mature Silver Birch and two early-mature Bird Cherry's located within a small open space between existing buildings.

1.5 SCOPE OF THE REPORT

1.5.1 The Tree Constraints Plan and AIA aim to provide detailed advice on the protection of retained trees and an evaluation of the impact on tree cover which will be delivered by the development of the Site as currently proposed. The AIA includes a Tree Constraints Plan, drawing 'CE-DH2247-ADW-01-Figure 1' and a Tree Protection Plan, drawing 'CE-DH2247-ADW-02-Figure 2', annotated with specific tree data collected on site and known as the TCP and TPP. Both drawings have been produced using a base

topographical survey supplied to Crestwood Environmental by the Client.

1.5.2 The TPP uses the Tree Constraints Data applicable to the Site and has been informed by the Client's layout design and other engineering work provided by the Client and their consultants. This has been overlaid with the Site's tree constraints to arrive at a finalized Tree Removal List and to identify all trees which will require to be safely retained and protected during construction works. Location of the tree protection fencing which will ensure their successful retention for the long term has also been shown on the TPP. This exercise has been collaborative, requiring input from the Development's Project Management team and civil engineering.

1.5.3 Under the UK planning system, Local Planning Authorities (LPA) have a statutory duty to consider the protection and planting of trees when granting planning permission for proposed development. The potential effect of development on trees, whether statutorily protected (e.g. by a Tree Preservation Order or by their inclusion within Conservation Area) or not, is a material consideration within the Planning System.

1.5.4 The nature and level of detail of information required for the LPA to properly consider the impacts and effects of development proposals varies between stages and in relation to what is being proposed. 1.5.5 below contains an extract from BS5837:2012 which provides advice to both developers and LPA's on the level of information required at varying stages of planning and development processes. This is the minimum detail that LPA's are expected to seek.

1.5.5 Extract from BS5837:2012 – Tree Information Detail

Table B.1 **Delivery of tree-related information into the planning system**

Stage of process	Minimum detail	Additional information
Pre-application	Tree survey	Tree retention/removal plan (draft)
Planning application	Tree survey (in the absence of pre-application discussions)	Existing and proposed finished levels
	Tree retention/removal plan (finalized)	Tree protection plan
	Retained trees and RPAs shown on proposed layout	Arboricultural method statement – heads of terms
	Strategic hard and soft landscape design, including species and location of new tree planting	Details for all special engineering within the RPA and other relevant construction details
	Arboricultural impact assessment	
Reserved matters/ planning conditions	Alignment of utility apparatus (including drainage), where outside the RPA or where installed using a trenchless method	Arboricultural site monitoring schedule
	Dimensioned tree protection plan	Tree and landscape management plan
	Arboricultural method statement – detailed	Post-construction remedial works
	Schedule of works to retained trees, e.g. access facilitation pruning	Landscape maintenance schedule
	Detailed hard and soft landscape design	

1.6 LIMITATION AND COPYRIGHT

1.6.1 This report is solely for the purpose of assessment of development proposals and not to assess any risk the trees may pose to people and/or property. However, details on the structural and physiological condition of trees will be noted, and should an unacceptable risk be identified then this will be brought to the attention of the client, but the report and its contents do not represent a tree risk management report and should not be treated as such.

1.6.2 This report does not refer to protected species (e.g. Bats, breeding birds etc), this being outside the

scope of this report, and being covered by separate ecology studies; however, this report should be read in conjunction with related reports provided by others.

1.6.3 The inspection was undertaken from ground level using visual inspection techniques. Equipment used was a sounding mallet and a metal probe and no inspection was undertaken above head height.

1.6.4 The evaluation of the trees has been undertaken in accordance with British Standard BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

1.6.5 No samples of any description were taken from the Site for laboratory analysis or other purpose.

1.6.6 No survey for Japanese Knotweed or other invasive species was undertaken as part of the Tree Constraints Survey.

1.6.7 The survey did not include soil sampling for the assessment of shrinkable soil types. Analysis of this type should be carried out by a specialist to ensure building foundations are adequate and in accordance with current National House Building Council Guidelines NHBC.

1.6.8 Tree locations were not plotted on site by Crestwood Environmental, but reliance was based on the topographical survey as supplied by the client.

1.6.9 Trees are influenced by a variety of biotic and abiotic activities (e.g. construction activities, pathogens or climatic events) which can affect their biomechanical and physiological condition of trees. The author cannot take responsibility for changes in condition once the fieldwork has been completed. This report is considered to be valid for 1 year from date of the fieldwork.

1.6.10 Trees can be protected by a Tree Preservation Order under the Town and Country Planning Act 1990 (as amended) or located within a Conservation Area Planning listed buildings and Conservation Area Act 1990 (as amended). For the purposes of this report, Stoke City Council's interactive Planning Constraints Map was searched for TPO and Conservation Area designations. None were found at the Discovery Academy location, or within its grounds.

1.6.11 It should also be noted that felling of trees prior to receiving full planning permission may require a felling license from the Forestry Commission under the Forestry Act 1967. The felling of trees of more 5m³ within any three-month period requires a felling license from the Forestry Commission unless an exemption applies.

1.6.12 Any management recommendations have been made in accordance with *BS3998: 2010 Tree Works – Recommendations* and industry best practice.

1.6.13 Should any part of the report be altered or tampered, with in any way, after being issued to the Client then this will invalidate the entire document.

2 THE SITE AND PROPOSALS

2.1 LOCATION AND SURROUNDINGS

2.1.1 The site is situated in the northern part of the town of Dewsbury, in a mature urban area. It is a small part of the larger hospital site with urban and internal highways and footways located adjacent.

2.2 CURRENT USE

2.2.1 The site is currently comprising of a surfaced car park with small shrub beds (some of these have been surfaced or gravelled) with existing buildings to the four compass points. In the western part of the site is an existing footway that leads from the car parking area to an entrance in Boothroyd Centre.

2.2.2 There are trees located adjacent to the footway and a single tree in a gravelled shrub bed in the centre of the car park.

2.3 ACCESS

2.3.1 The existing access to the site is from Healds Road to the south.

2.4 LEVELS

2.4.1 The site is considered level with a slight gradual slope upwards from the existing car parking area to the Boothroyd Centre via the slabbed footway, from east to west.

2.5 GEOLOGY

4.1.1. We have not been provided with any information on soil type or modified plasticity index at this time.

2.6 THE PROPOSALS

2.6.1 The proposals involve the construction of a new detached building on the hard surfaced car parking area and creating associated access points including a covered walkway / ramp to the west.

3 RESULTS

3.1 TREE SURVEY

3.1.1 A total of 4 individual trees have been scheduled as the basis of this AIA. Full details of the vegetation / trees identified can be found in Appendix T1 - Tree Data Schedule.

3.1.2 A tabular summary of the vegetation recorded and the tree retention categories applied are listed below:

Tree Retention Category:	A	B	C	U
Tree ID Reference:		T2	T1, T3, T4	
Total No:	**0**	**1**	**3**	**0**

3.1.3 Following an online search of Tree Preservation Order information via Kirklees Council website (accessed 11/02/23) it is confirmed that none of the trees subject to the survey are protected. The site does not lie within a Conservation Area.

3.2 EVALUATION

3.2.1 In relation to the Proposed Development, there are:

- 0 individual trees considered to belong in the highest 'A category';
- 1 individual tree is considered to belong in the medium quality 'B category';
- 3 individual trees considered to belong in the low retention priority 'C category'; and
- 0 individual trees considered as 'U category', not a retention priority due to limited future lifespan.

3.2.2 Appendix T2 defines the 'Retention Categories' as per BS5837:2012.

3.2.3 There is currently some scope for tree planting and it is understood that full replanting and landscaping proposals will accompany the Proposed Development.

4 TREE CONSTRAINTS

4.1 GENERAL

4.1.1 Trees impose below-ground constraints represented by their Root Protection Areas (RPAs), and above ground constraints by their current and future size, i.e. height and spread and species characteristics, particularly their foliage density, branch and fruit drop, production of honey dew etc.

Root Protection Areas (RPAs)

4.1.2 The RPA is the **minimum** area of roots which must be left undisturbed around each tree to avoid damaging the rooting area and causing harm to the retained trees. It may be possible to encroach within this area by up to 20% if it is possible to create an additional and equal rooting area adjacent to another part of the RPA. The root protection areas are a ground level constraint in which there should be no ground modification or disturbance

4.1.3 The RPA is calculated using the tree's stem diameter measured at 1.5 m height and represents the minimum area which should be protected and left undisturbed around each retained tree, during and following development.

4.1.4 An assessment should be made at the design stages of development for any incompatibilities between the design and tree retention, the effects on amenity value provided by existing trees, working space required during construction, infrastructure requirements for underground and or above ground apparatus and highway visibility requirements.

4.1.5 The morphology and distribution of tree roots is influenced by past land use or existing land use (e.g. the presence of roads, structures and underground services, topography, drainage, soil type and structure). The likely tolerance of a tree, to root disturbance or damage, will depend on factors such as species, age, structural and physiological condition, and past management. Any of these factors may result in non-uniform root growth. This issue can be dealt with in greater detail at the Tree Protection Planning stage.

4.1.6 Any alterations made within the trees' rooting environment that cause damage can lead to visible progressive abnormalities in the crown of the trees affected, including reduced vigour, or increased deadwood production. Trees may decline acutely or become hazardous within a short period of time.

4.1.7 Tree protection fencing should be installed around the RPA of retained trees or extended to the edge of the crown spread, whichever is greatest, to ensure no alterations to soil levels or damage occurs to their roots or overhanging branches are damaged by construction activity.

4.1.8 No traditional construction methods should be used within the RPA of retained trees, unless overriding circumstances dictate. In such circumstances, appropriate construction methods and materials should be used in accordance with a specification from appropriately qualified and competent person, to prevent damage and ensure tree retention.

Existing Tree Canopies

4.1.9 The above ground attributes can also have a significant effect on land use and living conditions, particularly the effect of trees on sunlight. Sunlight or shade maybe desirable depending on the particular site but unreasonable light obstruction should be avoided at the design stages.

4.1.10 The existing canopy spreads of trees are a constraint as they are a physical barrier to construction or can prevent access. Causing impact damage to a branch or having to remove large sections of a tree's live crown can lead to significant detrimental problems to the tree as well as causing disfigurement. As such these can be vulnerable when considering developing a site. Trees T003 & T004 have relatively broad crowns existing canopies are very close to an existing building and overhang an existing footway.

4.1.11 Where aerial parts of the tree crowns extend beyond the edge of the RPA, it may be appropriate to consider pruning for construction purposes and/or to abate future nuisance, in accordance with a project arboriculturist and the Local Planning Authority.

Future Growth

4.1.12 Most of the trees are considered mature or early mature so future the existing crown spreads are likely to only ever slowly change. It is important to take account of the existing crown spreads to ensure that proposed buildings are sustainable in terms of liveability.

Shading

4.1.13 Trees restrict daylight and therefore the location of the proposed buildings in relation to retained or newly planted trees must be considered as it can render a development unliveable if trees are located too close to or cast significant shadows over to the windows for the buildings.

Species Characteristics

4.1.14 The species of tree on the site vary. In this instance none are particularly problematic species. T001 will have numerous amounts of large seed as it matures, that can become problematic to parked vehicles. The remaining trees have little or no fruit or tiny seed and no issues with honeydew.

Tree Detritus

4.1.15 All trees produce waster material throughout the year and this can be problematic when development occurs too close to trees. It is a valid consideration when locating inaccessible roofing and associated guttering close to trees as this can create a difficult maintenance problem for property owners.

Legal Constraints

4.1.16 All trees produce waster material throughout the year and this can be problematic when development occurs too close to trees. It is a valid consideration when locating inaccessible roofing and associated guttering close to trees as this can create a difficult maintenance problem for property owners.

4.1.17 There are no additional specific constraints on the site identified.

4.1.18 More general protection includes restrictions imposed by the Forestry Act 1967 regarding the removal of trees and by the Wildlife & Countryside Act, and related legislation, regarding protected species and habitats. The tree survey has not identified any trees that would be expected to offer habitats for protected species including birds and bats.

Soil Constraints

4.1.19 In this instance there is no knowledge of the soil types and no evidence of past tree removal. Sites with shrinkable clays can require special foundation construction to prevent future building movement through either soil desiccation or rehydration. As there is no evidence of recent tree removal or any shrinkable clays being present this is currently not considered an existing constraint at this stage.

Future Planting

4.1.20 When prescribing tree planting for the site it is important that account of eventual size is made. All the physical constraints identified regarding future canopy growth and issues regarding light loss and general detritus need to be considered and new trees located with these future issues in mind.

4.2 GENERAL RECOMMENDATIONS

4.2.1 It is recommended that development should seek to avoid all unnecessary tree loss and impacts on trees. Trees should be prioritised for retention based on their assessed retention category status. In addition to recommendations at Appendix T1, in general, development should be designed such that:

- Where possible, category A trees are treated as priority retentions during the design stages of the development. An appropriate amount of protected rooting area (expressed in the data schedule as RPA radius) will need to be robustly fenced to afford adequate protection. It is advisable to apply the general principles of successful tree retention (as expressed in a General Arboricultural Method Statement) at an early stage in the design of the development.

- Wherever possible, Category B trees should be similarly retained and protected. Some tree management works to enable retention alongside required construction operations may be possible. This level of detail would need to be submitted to the Local Authority as part of a detailed Tree Protection Plan. Where unavoidable impacts or losses arise, compensatory tree planting will be required in line with local planning policy or guidance; and

- Where unavoidable impacts/losses arise in relation to the Category C trees, it would be assumed that an appropriate compensatory tree planting and landscaping scheme could be implemented in line with local planning policy to adequately make up for this. Some category C trees may have enhanced ecological value due to structural features such as cracks, cavities and fissures. The ecological appraisal of the site, including its tree cover, should be read in conjunction with this report.

5 IMPACT ASSESSMENT

5.1 TREE REMOVALS

5.1.1 Three of the trees identified in the survey have been identified for removal. A summary of these is listed below.

Category:	A	B	C	U
Tree ID Reference:	0	0	T1, T3 and T4	0
Total No:	**0**	**0**	**3**	**0**

5.2 FOUNDATION FOR STRUCTURES

5.2.1 The existing walkway that currently lies within the RPA's of trees T2, T3 and T4 is to be removed and the ground reinstated along its length through the inclusion of lightly compacted topsoil and appropriate shade tolerant grass seed mix. A new footpath, c. 3m in width is to be constructed to the north, which will require excavation into the RPA of Trees T3 (Bird Cherry) and T4 (Bird Cherry). This will result in the significant harm to the roots of these trees making retention inappropriate.

5.2.2 Under the proposals, T2 (Silver Birch) will be retained, with a minor encroachment into the RPA of this tree along its northern edge, estimated to be less than 10% of its overall area.

5.2.3 T2 may require a more robust Tree Protection fencing solution. A site setting-out exercise is recommended in order to properly understand the relationship between proposed ground level changes and construction requirements in the vicinity of this tree, prior to commencement of any groundworks. RPA values recorded in the Tree data spreadsheet accompanying this report must be used when finalizing any effective Tree Protection solution.

5.3 SERVICE INSTALLATION

5.3.1 We have not been provided with any information on the required installation of any services for any of the proposed building / development. Amy new services will be located outside of any defined RPA and the installation of root barriers / deflectors will be considered where new services and existing tree planting are adjacent.

5.4 TREE PRUNING

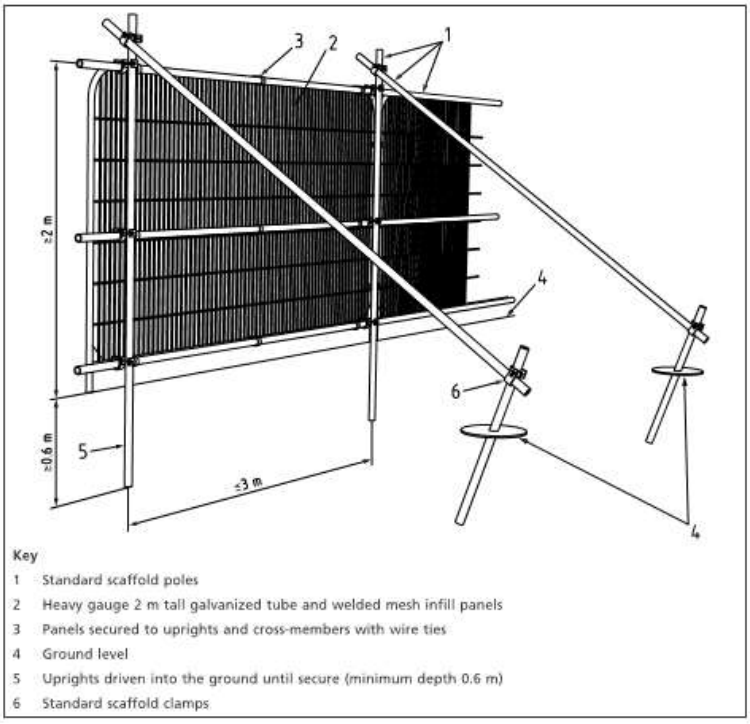
5.4.1 It is not anticipated that there are any tree pruning requirements to tree T2 to facilitate development.

5.5 TREE PROTECTION FENCING

5.5.1 Prior to commencement of any construction related groundworks, and in order to protect the roots and canopies of retained trees, tree protective fencing will be erected as shown on the TPP Drawing.

5.5.2 The default Tree Protection Fencing specification recommended by BS 5837:2012 is as shown in Diagram 1, below:

Diagram 1 Extract from BS 5837 specifying tree protective barrier.



5.5.3 Fencing must be fixed into position, at the locations shown on the TPP Drawing, prior to commencement of any groundworks, including soil stripping. The project's supervising Arboricultural Consultant may be required to verify, on site, that the fencing is correctly located and fit-for-purpose. Such verification, in the form of an Arboricultural Certificate of Compliance, can be provided for the LPA Tree Officer, if required.

5.6 TREE IMPACTS UPON THE DEVELOPMENT

5.6.1 There will be some leaf fall onto the new building from the retained tree (T2) but will be at a level lower than currently experienced as a result of the tree removal. As such, this is deemed to be at tolerable levels.

6 CONCLUSIONS

6.1 GENERAL

6.1.1 The proposed building and associated covered walkway are to be located in an area where there is relatively low tree cover within the overall hospital site.

6.1.2 Tree T001, a young Horse Chestnut (*Aesculus hippocastanum*) will have to be removed due to direct conflict with the building position. Trees T003 and T004 are both early mature Bird Cherry (*Prunus padus*) trees that will need to be removed to facilitate a walkway access to the new building.

6.1.3 Tree T002 is a mature Silver Birch (*Betula pendula*) tree rated category B in terms of retention and is the largest of the four trees identified. An existing footpath is located immediately adjacent the northern edge of the tree stem. This tree is to be retained as part of these proposals, with the existing footpath to be removed manually and the area reinstated with topsoil and suitable grass seed. This tree can be adequately protected by means of protective barriers, placed and fixed at RPA extents, prior to

commencement of any construction or ground preparation works. Any works to be conducted within the defined RPA of this tree is to be undertaken with appropriate supervision in place by a qualified arboriculturalist.

6.1.4 The loss of the trees T001, T003 and T004 whilst of detriment to the immediate area will be of less impact to the wider area. It is recognised that this loss is unfortunate and there is proposed mitigation in terms of proposed new tree planting. This will offer longer-term tree cover to the site and balance any loss caused initially by the proposals.

REFERENCES:

- BS5837:2012. Trees in Relation to Design, Demolition, and Construction – Recommendations. British Standards Institute. London, UK.
- BS 3998:2010. Tree work. Recommendations. British Standards Institute. London, UK

ABBREVIATIONS:

For the avoidance of confusion, abbreviations used have the meanings given below:

AGL	Above Ground Level
AIA	Arboricultural Implications Assessment
AMS	Arboricultural Method Statement
AOD	Above Ordnance Datum
c.	Circa
CA	Conservation Area
DEM	Digital Elevation Model
DSM	Digital Surface Model
DTM	Digital Terrain Model
GEA	Gross External Area
GIS	Geographical Information System
LPA	Local Planning Authority
NGR	National Grid Reference
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
OS	Ordnance Survey
POS	Public Open Space
TCP	Tree Constraints Plan
TPO	Tree Preservation Order
TPP	Tree Protection Plan
VTA	Visual Tree Assessment

GLOSSARY:

For the avoidance of confusion, the terms used in this report follow the definitions given below:

Abscission	The shedding of a leaf or other short-lived part of a woody plant.
Abiotic	Pertaining to non-living agents e.g. environmental factors.
Absorptive Roots	Non-woody short-lived roots, generally having a diameter less than one millimetre, the primary function of which is the uptake of water and nutrients.
Access facilitation pruning	One off pruning operation to provide access for development operation. Pruning that will not be detrimental to trees health or amenity.
Arboricultural Method Statement	A methodology for the implementation of development where encroachment within the RPA has the potential to cause damage or loss of retained trees.
Arboriculturist	Someone who through relevant training and experience has gained knowledge in the expertise of trees.
Adaptive Growth	The process by where wood formation rates increasing in the cambial zone, as well as wood quality, responds to gravity and other forces acting on the cambium.
Adaptive Roots	The adaptation of existing roots; or a production of new roots in response to damage or decay.
Adventitious buds, roots, shoots	Which grow in other than primary apical control.
Anchorage	The process in which a tree uses its roots system to support itself within the soil structure.
Arisings	Parts of the tree that has been removed for disposal, branches, leaves, roots etc.
Bacteria	Microscopic single-celled organisms, many species of which break down dead organic matter, and some of which cause diseases in other organisms

Bark	A term usually applied to all the tissues of a woody plant lying outside the vascular cambium, thus including the phloem, cortex and periderm; occasionally applied only to the periderm or the phellem.
Basidiomycotina (Basidiomycetes)	One of the major taxonomic groups of fungi; their spores are borne on microscopic peg-like structures (basidia), which in many types are in turn borne on or within conspicuous fruit bodies, such as brackets or toadstools. Most of the principal decay fungi in standing trees are basidiomycetes.
Boiling	A term sometimes used to describe pollard heads.
Bottle-butt	A broadening of the stem base and buttresses of a tree, in excess of normal and sometimes denoting a growth response to weakening in that region, especially due to decay involving selective delignification.
Bracing	The use of rods or cables to restrain the movement between parts of a tree.
Branch (Primary)	A first order branch arising from a stem
Branch (Lateral)	A second order branch, subordinate to a primary branch or stem and bearing sub-lateral branches.
Branch (Sub-lateral)	A third order branch, subordinate to a lateral or primary branch, or stem and usually bearing only twigs.
Branch bark ridge	The raised arc of bark tissues that forms within the acute angle between a branch and its parent stem.
Branch collar	A visible swelling formed at the base of a branch whose diameter growth has been disproportionately slow compared to that of the parent stem; a term sometimes applied also to the pattern of growth of the cells of the parent stem around the branch base.
Brown-rot	A type of wood decay in which cellulose is degraded, while lignin is only modified
Buckling	An irreversible deformation of a structure subjected to a bending load.
Buttress zone	The region at the base of a tree where the major lateral roots join the stem, with buttress-like formations on the upper side of the junctions
Canker	Area of dead cambium killed by overlying pathogenic tissues.
Cavity	A hole in the woody structure of the tree; often caused through decay.
Cleaning out	The removal of dead, diseased crossing branches, damaged branches and alien structures.
Competent Person	Person with training and experience in accordance with the proposed matter being addressed, having an understanding of a particular matter being approached.
Condition	An indication of the physiological vitality of a tree, but not the stability of a tree.
Construction	A site-based operation that has the potential to affect retained trees.
Construction Exclusion Zone	An area based on the RPA from which construction activity is prohibited.
Coppicing	Removal of all aerial parts of the tree leaving a stump for regeneration of new shoot.
Crown/canopy	The parts of the tree that supports the leaves.
Crown lifting	The removal of limbs and small branches to a specified height above ground level.
Crown thinning	The removal of a proportion of secondary branch growth throughout the crown to produce an even density well balanced crown structure.
Crown reduction	Removal in the height to a specified description to maintain a flowing crown structure.
Deadwood	Non – functional branches which no longer support natural growing conditions of the tree but may be beneficial for the support of habitats.
Decurrent Growth	Tree growth habit with a rounded or spreading growth in the crown (see excurrent).
Defect	Any area of the tree that longer has an optimal mechanical uniformity of stress, making the tree unsuitable for its location.
Dieback	Death of woody parts of the tree starting at distal ends of the tree.
Disease	Damage occurring to living organisms as a result of pathogenic micro-organisms.
Distal	Furthest distance away from the main body of the tree.
Dysfunction	In woody tissues, the loss of physiological function, especially water conduction, in sapwood.
Epicormical	Growth from dormant or adventitious buds, not developing from the first shoot.

growth	
Excurrent Growth	Tree growth habit with a pyramid shaped crown and dominant central leader (see decurrent).
Girdling roots	A circling root which constricts the stem or roots, with the potential to cause death and the restriction of flow within the phloem.
Heartwood	Dysfunctional xylem which no longer has conductive properties, but which has become an integral structural part of the tree.
Heave	The swelling of shrinkable clay soils, often when vegetation has been removed allowing soil rehydration to develop, with the potential to affect supported structures, e.g. walls.
Included bark/acute forks	Face to face contact of bark usually at fork unions, or branch unions.
Lopping/Topping	A term used to describe the removal of large sized branches.
Monolith	Description of resultant standing dead/decaying tree upon reduction in height and spread, undertaken to make tree safe and provide habitat for species reliant on decaying wood.
Mulch	Material lay down over the rooting area of trees to suppress weed competition, increase moisture retention and increase some cases organic material and nutrients.
No-dig Techniques	Methods that do not involve ground disturbance, excavation or ground compaction
Pathogen	A micro-organism that causes disease within another organism.
Phytotoxic	Toxic to plants
Pollarding	The removal of the tree canopy to produce knuckles where new growth develops and is removed cyclically usually performed on young trees.
Pruning	Selective removal of parts of the tree to achieve a desired outcome.
Root protection area	An area around a tree identified by multiplying the stem diameter at 1.5 by 12 to produce a radial area or rooting volume around a tree to be protected. BS 5837 2012.
Service	Any above and below ground structure or apparatus for utility provision.
Size of part	Relating to risk assessments, identifying the size of the hazard, or parts of a tree which may cause harm if failure occurs.
Stem(s)	The main structure from the ground up supporting the crown
Stress	In plants, the physiological depletion as a result of environmental influences.
Structure	A manufactured object, such as building, roads, path, wall or excavated structures.
Structural roots	The primary larger diameter roots which hold and support the aerial parts of the tree.
Subsidence	The shrinkage of soil through the absorption of water via vegetation and the sinking effects on surrounding architectural structures.
Targets	In risk assessment, persons or property at risk of harm as a result of a hazard (falling tree, branch etc.).
Tree Protection Plan	A scaled drawing informed by descriptive text where necessary, based upon finalised site proposals, showing trees for retention and illustrating the tree and landscape protection measures.
Veteran Tree	Tree that, by recognised criteria, shows features of biological, cultural or aesthetic characteristics of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
Windthrow	The blowing over a tree at its roots.

APPENDICES:

APPENDIX T1 TREE DATA SCHEDULE
APPENDIX T2 TREE CATEGORISATION TABLE (EXTRACT FROM BS5837:2012)
APPENDIX T3 TREE CONSTRAINTS PLAN AND TREE PROTECTION PLAN

APPENDIX T1 TREE DATA SCHEDULE

Tree No.	Species (Common name)	Height (m)	Stem diam @1.5 m (mm)	Crown spread (m)	Crown clearance (m) & direction of	Maturity	Vigour	Est remaining contribution (yrs)	Condition/ Comments	Preliminary Management recommendations	RPA radius (m)	RPA area (m^2)	BS5837 quality ref
T1	Horse Chestnut *(Aesculus hippocastanum)*	6.0	170	N:4 E:3 S:3 W:3	1.5 1.5(S)	Y	G	20+ Years	Healthy tree, open crown form	No work required	2.0	13	**C1**
T2	Silver Birch *(Betula pendula)*	16.0	550	N:5 E:6 S:5 W:5	2.0 4(E)	M	G	20+ Years	Well formed feature tree, well located in terms of existing buildings	No work required	6.6	139	**B1**
T3	Bird Cherry *(Prunus padus)*	9.0	300	N:5 E:3 S:4 W:6	2.0 4(SW)	EM	G	10+ Years	Branch tips close to building, crown suppressed towards Birch	No work required	3.6	41	**C2**
T4	Bird Cherry *(Prunus padus)*	9.0	350	N:6 E:6 S:3 W:5	2.0 2(SW)	EM	G	10+ Years	Branch tips close to building, crown suppressed towards Birch	No work required	4.2	55	**C2**

Key:

Maturity – This is a categorisation of the age class or life stage of a tree. There are 5 categories as follows:

Young (Y) – a tree less than one third of its normal life expectancy for the species and usually showing monopodial growth; **Young/Mature (Y/M)** – a tree between one and two thirds of its optimum life expectancy for the species normally showing sympodial growth form; **Early-mature (E/M)** – a tree between two thirds and its optimum life expectancy for the species but that has a naturally smaller crown size and shape for than would be expected for the species; **Mature (M)** – a tree between two thirds and its optimum life expectancy generally that has reached peak crown size and shape for the species; **Late-mature (M)** – in excess of its optimum life expectancy for the species usually with signs of crown decline. Veteran trees fall into this category and they offer numerous ecological habitats due to e.g. crown cavities, dead branches, loose bark etc and can have historic & cultural attributes.

Vigour – An assessment of the biological function of the tree by visually observing the leaf colour, size, crown density, general shoot extension and live crown. There are 4 categories as follows:

Good – attributes considered normal for species and variety; **Fair** -minor reductions within the tree crown of any of the categories listed from that of a normal example; **Poor** - significant reductions within the tree crown of at least two categories listed accompanied by extensive crown dieback (in excess of 33% of crown volume); **None** - this is when a tree is dead

Est remaining contribution (yrs) - This is an estimation of how long the particular trees is likely to survive in a similar form, size, shape etc in the current location, measured in years. Issues such as reduced vigour, pathogen infection or a likelihood of structural failure are major factors reducing this value (categories are **40+, 20-40, 10-20, <10**).

RPA radius (m) – This is the radius, in metres, of the root protection area (RPA) being expressed as a circle around each tree.

RPA area (m^2) – This is the equivalent cross-sectional area of the root protection area (in square metres) which is deemed large enough to contain sufficient volume of roots to maintain the tree's viability.

BS5837 quality ref: This is a grading based on Table 1 within the standard and has 4 categories and 3 subcategories. The 4 main categories are:
A - trees of high quality with an estimated remaining life expectancy of at least 40 years.
B - trees of moderate quality with an estimated remaining life expectancy of at least 20 years.
C - trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.
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

APPENDIX T2 TREE CATEGORISATION TABLE (EXTRACT FROM BS5837:2012)

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)		
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 **4.5.7**.*		
	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)
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value

APPENDIX T3 TREE CONSTRAINTS PLAN AND TREE PROTECTION PLAN



Tree No.	Species (Common name)	Height (m)	Stem diam @1.5m (mm)	Crown spread (m)	Crown clearance (m) & direction of lowest growth	Maturity	Vigour	Est remaining contribution (yrs)	Condition/ Comments	Preliminary Management recommendations	RPA radius (m)	RPA area (m^2)	BS5837 quality ref
T001	Horse Chestnut *(Aesculus hippocastanum)*	6.0	170	N:4 E:3 S:3 W:3	1.5 1.5(S)	Y	G	20+ Years	Healthy tree, open crown form	No work required	2.0	13	**C1**
T002	Silver Birch *(Betula pendula)*	16.0	550	N:5 E:6 S:5 W:5	2.0 4(E)	M	G	20+ Years	Well formed feature tree, well located in terms of existing buildings	No work required	6.6	139	**B1**
T003	Bird Cherry *(Prunus padus)*	9.0	300	N:5 E:3 S:4 W:6	2.0 4(SW)	EM	G	10+ Years	Branch tips close to building, crown suppressed towards Birch	No work required	3.6	41	**C2**
T004	Bird Cherry *(Prunus padus)*	9.0	350	N:6 E:6 S:3 W:5	2.0 2(SW)	EM	G	10+ Years	Branch tips close to building, crown suppressed towards Birch	No work required	4.2	55	**C2**

Key:

Maturity – This is a categorisation of the age class or life stage of a tree. There are 5 categories as follows:

Young (Y) – a tree less than one third of its normal life expectancy for the species and usually showing monopodial growth; **Young/Mature (Y/M) –** a tree between one and two thirds of its optimum life expectancy for the species normally showing sympodial growth form; **Early-mature (E/M) –** a tree between two thirds and its optimum life expectancy for the species but that has a naturally smaller crown size and shape for than would be expected for the species; **Mature (M) –** a tree between two thirds and its optimum life expectancy generally that has reached peak crown size and shape for the species; **Late-mature (M) –** in excess of its optimum life expectancy for the species usually with signs of crown decline. Veteran trees fall into this category and they offer numerous ecological habitats due to e.g. crown cavities, dead branches, loose bark etc and can have historic & cultural attributes.

Legend:

- T1 — Tree/ Group Identification Number
- Root Protection Area shown as a radius, individual trees
- Tree canopy extent

	Tree	Tree group	Hedge native	Hedge ornamental
Category A	T1-A1	G1	H1	H1
Category B	T2-B1	G1	H1	H1
Category C	T3-C1	G1	H1	H1
Category U		G1	H1	H1

NOTES:

This drawing is to be read in conjunction with report CE-DH2247-RP01-FINAl 'Tree Constraints Survey and Arboricultural Impact Assessment' dated March 2023.

This drawing is not for construction but for planning purposes only.

All dimensions to be checked on site and not scaled from this drawing.

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Client:
DarwinGroup
Construction Has Evolved

Site: **Dewsbury District Hospital**

Drawing Title: **Tree Constraints Plan (TCP)**

Drawn By:	Checked By:	Date:	Scale:	Paper Size:
IS	IS	11 / 04 / 2023	1:200	A1 (841×594 mm)

Status:	Final Revision:	CAD Ref:	Drawing No: / Client Ref:
FINAL	-	CE-DH2247-ADW01-Draft v1.0 TCP	**Figure 1**



Legend:

- Area of Proposed Building
- T1 — Tree Identification Number
- Approximate locations of protective fencing (BS 5837:2012 'Heras' style)
- Trees to be removed
  - Canopy spread
  - Root protection area
- Trees to be retained (Refer to Fig 1 for tree categories)
  - Tree Category
  - Canopy spread
  - Root protection area

0m 4m 10m

1:200

NOTES:

- This drawing to be read in conjunction with the Arboricultural Impact Assessment report produced by Crestwood Environmental.
- For details on individual trees, refer to Tree Constraints Data dated 07/02/2023.
- Three trees are identified for removal, T1, T3 and T4

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Client: DarwinGroup Construction Has Evolved

Site: **Dewsbury District Hospital**

Drawing Title: **Tree Protection Plan (TPP)**

Drawn By:	Checked By:	Date:	Scale:	Paper Size:
IS	IS	11 / 04 / 2023	1:200	A1 (841×594 mm)

Status:	Final Revision:	CAD Ref:	Drawing No: / Client Ref:
FINAL	-	CE-DH2247-ADW01-Draft v1.0 TCP	**Figure 2**