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TREE REPORT (BS 5837:2012)

PROPOSED NEW CEMETERY

AT

BANGOR ON DEE
WREXHAM
NORTH WALES

Author: P Murray
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Ref: PM/BS/19/04/17

TABLE OF CONTENTS

Contents	Page No.
1.0 INTRODUCTION	3
1.1 Professional Details	3
1.2 Tree Survey	3
2.0 FINDINGS	4
2.1 Trees Surveyed	4
2.2 Arboricultural Glossary of Terms	4
2.3 Arboricultural Data Table	7
2.4 Digital Photographs	9
3.0 RECOMMENDATIONS	11
3.1 Tree Assessment	11
3.2 Development	11
3.3 Impact of Proposed Development	11
3.4 Proposed Works	11
3.5 Standard of Work	12
3.6 Statutory Controls	10
3.7 Wildlife	10

APPENDIX ONE - Table 1 of BS 5837:2012

APPENDIX TWO – Site Plans (Tree Constraints and Site Plan)

Disclaimer

The tree(s) referred to in this report are living entities and are therefore subject to natural processes. They will also be subject to changes to their environment caused by human's activities and to exceptional weather conditions. The inspection undertaken by our qualified staff relies on visual attributes of tree health and structure which can be assessed from a ground based inspection. Hidden defects which are not readily visible may not be detected. We therefore cannot wholly guarantee the condition and safety of the trees inspected beyond what can be reasonably assessed from the procedure used. We would recommend that the trees are regularly inspected and our staff will advise on the suitable frequency of these inspections.

1.0 INTRODUCTION

1.1 Professional Details

1.1.1 My name is Peter Murray and I have been working and studying in the Arboricultural Industry since 1989. I have many years practical and consulting experience as a Local Authority arboriculturalist and more recently as a private sector practitioner.

1.1.2 I so far hold the Higher National Diploma in Arboriculture and am a professional member of the Arboricultural Association. I regularly attend numerous conferences and seminars keeping up to date with latest research and best practices.

1.2 Tree Survey

1.2.1 I was recently instructed by the Bangor on Dee Community Council to carry out a site visit on land adjacent to the Community Garden off Friars Court, Bangor on Dee and survey all significant trees that may be affected by development proposals in accordance with *BS 5837:2012 trees in relation to design, demolition and construction – Recommendations*.

1.2.2 The survey on which the findings of this report are based was undertaken on Tuesday 11th April 2017 and weather was dry and sunny.

1.2.3 This report should be read in conjunction with the attached plan of Appendix Two.

1.2.4 The trees were inspected from ground level only and all comments and recommendations made have taken into account their location, surroundings and likely impact on persons or property.

1.2.5 The limitations of this report are restricted to the persons, time, information made available and purpose for which this report has been prepared. This report does not deal with any existing tree root/building conflicts and no information has been provided regarding soil type and no analysis undertaken by this company.

2.0 FINDINGS

2.1 Trees Surveyed

A total of one individual tree, three hedges and one group were surveyed and plotted in order to assess their health and dimensions. To give assistance in reading the findings the following glossary has been produced.

2.2 Arboricultural Glossary of Terms

The following terms are concurrent with best Arboricultural practice and within the guidelines set by the International Society of Arboriculture (ISA), the Arboricultural Association (AA) and the British Standards Institute (BSI).

Dbh: Diameter at Breast Height is measured at 1.5m and recorded in millimetres. Where a tree becomes multi-stemmed below 1.5m the diameter of each stem is measured at 1.5m and added together. Where a tree has low branching or has swelling the stem is measured at the narrowest point below.

Height: Height was estimated and recorded in metres.

Age Range: Age is site specific and categorised:

Young (Y)	Out-planted trees that have not yet established.
Semi-Mature (SM)	Established trees up to 1/3 of expected height and crown.
Early Mature (EM)	Between 1/3 and 2/3 of expected height and crown.
Mature (M)	Between 2/3 and full expected height and crown.
Fully Mature (FM)	Full expected height and crown.
Over Mature (OM)	Crown beginning to break-up and decrease in size.
Senescent (S)	Crown in advanced stage of break-up.

Crown Spread: Measured in metres at four cardinal points (N, E, S & W).

Crown Clearance: Measured in metres from the ground to the first branch tip on development side only.

Condition - Assessment of current physiological condition and structural morphology incorporating vigour and vitality and categorised:

- A - Tree needing little, if any attention
- B - Tree with minor, but rectifiable defects, or in the early stages of physiological stress
- C - Tree with significant structural and physiological flaws and/or extremely stressed
- D - Tree that is dead, biologically/physically moribund or dangerous

Desirability To Retain – As Outlined in Table 1 of BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations (see Appendix One).

Definition of Physiological & Morphological Terms

Adaptive Growth - The process whereby wood formation is influenced both in quantity and in quality by the action of gravitational force and mechanical stresses on the cambial zone.

Bifurcation – Forked or divided union.

Brown Rot - Form of decay where cellulose is degraded, while lignin is only modified.

Cankers (target or tumorous) - A localised area of dead bark and cambium on a stem or branch, caused by fungal or bacterial organisms, characterised by woundwood development on the periphery. This may be annual or perennial.

Cavity - An open wound, characterised by the presence of extensive decay and resulting in a hollow.

Chlorotic Leaf - Lacking in chlorophyll, typically yellow in colour.

Compartmentalisation - The physiological process that creates the chemical and mechanical boundaries that act to limit the spread of disease and decay organisms.

Coppicing - Is an ancient form of woodland management that involves repetitive felling on the same stump, near to ground level, and allowing the shoots to re-grow from that main stump. (Also known as the coppice stool).

Crack - Longitudinal spilt in stem or branch, involving bark and/or underlying wood. These may be vertically and horizontally orientated.

Decay - Process of degradation of woody tissues by fungi and bacteria through decomposition of cellulose and lignin.

Deadwood - Deadwood is often present within the crown or on the stems of trees. In some instances it may be an indication of ill health, however, it may also indicate natural growth processes. If a target is present beneath the tree, deadwood may fall and cause injury or damage and should be removed, otherwise deadwood can remain intact for conservation purposes (insects, fungi, birds etc.).

End Weight - The concentration of foliage at the distal ends of stems and deficient in secondary branches.

Girdling Root - Root which circles and constricts the stem or roots causing death of phloem and/or cambial tissue.

Hazard Beam - An upwardly curved branch in which strong internal stresses may occur without the compensatory formation of extra wood (longitudinal splitting may occur in some cases).

Included Bark Union - Pattern of development at branch junctions where bark is turned inward rather than pushed out. Potential weakness due to a lack of a woody union.

Ivy Growth - Ivy growth may ascend into the tree's crown, increasing wind resistance, concealing potential defects and reducing the tree's photosynthetic capacity. Ivy growth is often acceptable in woodland areas as a conservation benefit.

Live Crown Ratio - The relative proportion of photosynthetic mass (leaf area) to overall tree height.

Reaction Wood - Specialised secondary xylem, which develops in response to a lean or similar mechanical stress, attempting to restore the stem to the vertical.

Root Plate Lift - The physical movement of the rooting plate causing soils to shift and crack. May occur during adverse weather conditions. Trees may become unstable.

Structural Defect - Internal or external points of weakness, which reduce the stability of the tree.

Suppressed - Trees which are dominated by surrounding vegetation and whose crown development is restricted from above.

Topping - A highly disfiguring practise, likely to cause severe xylem dysfunction and decay in major structural parts of the wood.

White Rot - Form of decay where both cellulose and lignin are degraded.

Wound - Any injury, which induces a compartmentalisation response.

Woundwood - Wood with atypical anatomical features, formed in the vicinity of a wound and a term to describe the occluding tissues around a wound as opposed to the ambiguous term "callus."

Woodland Structure - The vertical and horizontal arrangement of trees within a group or woodland i.e. Dominant - trees with a crown above the upper layer of the canopy, Co-dominant trees that define the general upper edge of the canopy, Intermediate trees that have been largely overgrown by others, Suppressed trees that have been overgrown and occupy an under storey position and grow slowly, often severely asymmetrical.

Note: The definitions described above, may not necessarily be included within the Arboricultural Survey Data.

2.3 Arboricultural Data Tables

Arboricultural Data Sheet: New Cemetery, Bangor on Dee Community Garden, off Friars Court										Date of Survey: 11/04/17		Surveyor: PM			
Tree No.	Species	Dbh (mm)	Height (m)	Age	Crown Spread				Crown C	Cond R	Comments and Preliminary Management Recommendations	ERC (Yrs)	TQCR	RPA (m²)	RPA Circle Radius (m)
					N	E	S	W							
H1	Hedge - Thorn, Elder & Sycamore	300	<10	Y-M	7	3	5	3	0	B/C	An old overgrown Thorn hedge with several stems in decline and several breakouts present. Most of the group is swamped in Ivy. Several Elderberry present and 3 early-mature Sycamores with Squirrel damage. Some young plants have been planted in gaps but severely shaded out. - Consider coppicing all Thorn & Elderberry within the winter months and re-planting the gaps.	10+	C2	40.72	3.60
T1	Ash	1010	18	FM	11	12	9	12	3	B/C	A large individual specimen located within the adjacent field within an old ditch. The tree exhibits reasonable form but shows evidence of several limb failures and broken branch stubs throughout its crown. It is forked at 2.5m and has a cavity at approx. 3m with some decay present. This tree is obviously reaching the end of its safe useful life expectancy and if the area is to be used on a more regular basis then it would d be a hazard in its current state. - Reduce crown by approx. 30% to form pollard and remove deadwood.	10+	C2	461.48	12.12

Crown C = Crown Clearance; Cond R = Condition Rating; ERC (Yrs) = Estimated Remaining Contribution; TQRA = Tree Quality Category Rating; RPA (m²) = Root Protection Area (m²)

Recommended works should be carried out to the *British Standard Recommendations for Tree Work, BS 3998:2010*

Arboricultural Data Sheet: New Cemetery, Bangor on Dee Community Garden, off Friars Court										Date of Survey: 11/04/17		Surveyor: PM			
Tree No.	Species	Dbh (mm)	Height (m)	Age	Crown Spread				Crown C	Cond R	Comments and Preliminary Management Recommendations	ERC (Yrs)	TQCR	RPA (m²)	RPA Circle Radius (m)
					N	E	S	W							
H2	Hedge - Thorn	400	<10	FM	4	3	5	3	0	C	An old overgrown hedge within old ditch, ownership unclear. One stem recently snapped. Most of these stems are swamped in Ivy and have significant basal damage. - Consider coppicing all stems within the winter months and re-planting the gaps.	5-10	U	72.38	4.80
H3	Hedge - Thorn	300	<6	M	3	4	3	3	0	C	An old overgrown hedge exhibiting poor form with one failed stem present. All stems swamped in Ivy. - Consider coppicing all stems within the winter months and re-planting the gaps.	5-10	U	40.72	3.60
G1	Group - Cypress, Birch, Field Maple, Thorn & Elderberry	180	<10	SM-EM	4	4	4	4	0	B	A group of closely planted specimens within the adjacent garden.	20+	B2	14.66	2.16

Crown C = Crown Clearance; Cond R = Condition Rating; ERC (Yrs) = Estimated Remaining Contribution; TQCR = Tree Quality Category Rating; RPA (m²) = Root Protection Area (m²)

Recommended works should be carried out to the *British Standard Recommendations for Tree Work, BS 3998:2010*

2.4 Digital Photographs

H1 – Pre-dominantly Thorn



H2 – Mostly poor Thorn specimens



H3



G1



T1 – Ash



3.0 RECOMMENDATIONS

3.1 Tree Assessment

In general the trees surveyed were found to be in moderate condition for their age and species. Any works identified in the above data tables should take place regardless of development in line with best practice. The quality rating for the trees on or affecting this site can be summarised as follows:

U – 2 trees/groups
C – 2 trees/groups
B – 1 trees/groups
A – 0 trees/groups

3.2 Development

The above data table clearly details the condition of the trees and identifies their worthiness for retention. In addition the Tree Constraints Plan of Appendix Two illustrates their Root Protection Area's (RPA's) in accordance with the British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*. This is an area that should be left undisturbed in order to provide adequate rooting area for retained trees (see table below).

3.3 Impact of Proposed Cemetery

In this instance the main impact on these trees/hedges will be the excavation for new graves. Therefore, a set distance from the trees/hedges based on the RPA will be required in order to ensure their health and stability. However, as stated within the above data tables it is recommended that these hedges are Coppiced and planted up to improve them and encourage longevity. Some major pruning of the Ash tree has also been recommended due to its hazardous state and possible impact on users of the cemetery. In addition, as the development is on one side of the trees/hedges and they are pretty much open grown the British Standard suggests that some intrusion by approx. 20% into the RPA on one side would not be destructive, which would provide more room for the graves; the Site Plans within Appendix Two illustrates this.

3.4 Proposed Works

Therefore, to summarise it is recommended that prior to any excavation being carried out the works below should be undertaken and the cemetery can then be laid out past the exclusion zones as marked on the Site Plan of Appendix Two.

- H1 – Coppice all Thorn & Elderberry within the winter months and re-plant the gaps with Hawthorn whips. Retain the three Sycamore trees.
- T1 – Check ownership and reduce crown by approx. 30% to form a pollard.
- H2 – Check ownership and coppice all stems and plant up gaps with Hawthorn whips.
- H3 - Coppice all stems and plant up gaps with Hawthorn whips.

3.5 Standard of Work

All tree work undertaken should be done in accordance with British Standard 3998:2010 and by competent contractors insured with public liability cover of at least two million pounds.

3.6 Statutory Controls

If the trees on site are subject to any Tree Preservation Orders (TPO's) or are encompassed within a Conservation Area then statutory permission from the Local Planning Authority (LPA) will be required before any tree works take place.

3.7 Wildlife

All operations should take account of wildlife needs and be planned to take advantage of weather conditions and time of year for minimum damage and disturbance. If any protected species or nesting birds are present or discovered while the works are taking place all work should cease until contact has been made with Countryside Council for Wales for further advice. Countryside Council for Wales can be contacted on 01248 385500 or by e-mail to: Enquiries@ccw.gov.uk. Specific consideration should be given to the possible presence of roosting bats, which are protected by the Wildlife and Countryside Act 1981 (schedule 5) and included in schedule 2 of the Conservation Regulations 1994. Ideally, a survey should be carried out to identify any potential roost sites and if bats are found to be present advice should be sought from a person qualified and experienced in handling such matters and fully conversant with the implications of the Act.

APPENDIX

ONE

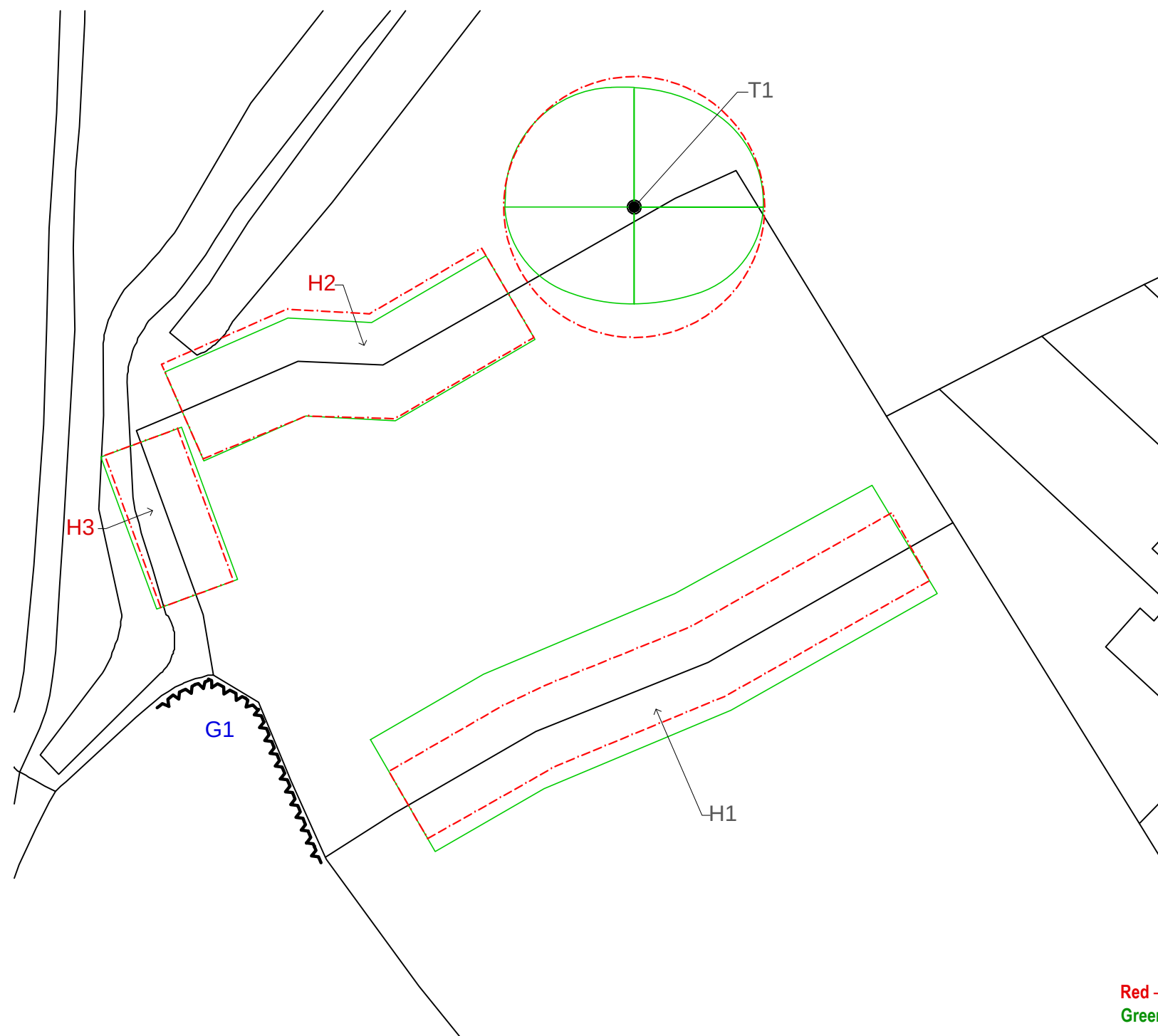
Table 1 of BS 5837

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 U category trees (i.e. 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 (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality Note – <i>Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>		
	1 Mainly arboriculture 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 arboriculture 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 minor 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 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	Tree with no material conservation or other cultural value	

APPENDIX TWO

Site Plans (Tree Constraints and Site Plan)



KEY

-  TREE LOCATION AND CONDITION
-  GROUP LOCATION AND CONDITION
-  ROOT PROTECTION AREA (RPA)
-  CROWN SPREADS

Red – Trees of poor quality Blue – Trees of moderate quality
Green – Trees of high quality Grey – Trees of low quality

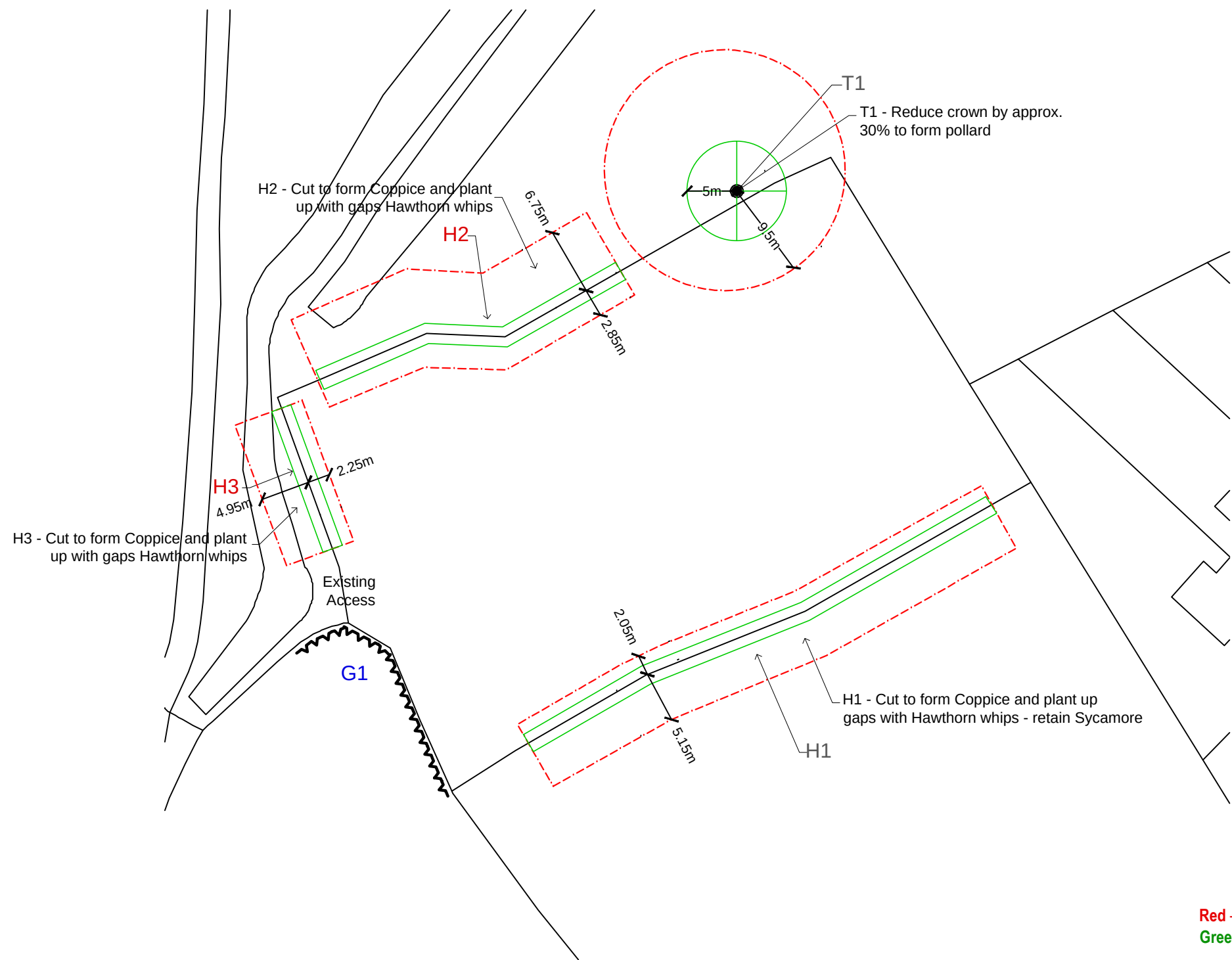
**BANGOR ON DEE-
NEW CEMETERY**

TREE CONSTRAINTS PLAN

SCALE: $\frac{1}{500}$ @A3 DATE: APRIL 17

DRAWING: MY589/BDC/TREE/01





KEY

-  TREE LOCATION AND CONDITION
-  GROUP LOCATION AND CONDITION
-  ROOT PROTECTION AREA (RPA)
-  CROWN SPREADS

Red – Trees of poor quality Blue – Trees of moderate quality
Green – Trees of high quality Grey – Trees of low quality

**BANGOR ON DEE-
NEW CEMETERY**

SITE PLAN

SCALE: 1/500 @A3 **DATE:** APRIL 17

DRAWING: MY589/BDC/TREE/02

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