THE ENVIRONMENT PARTNERSHIP

HARRAS MOOR

WHITEHAVEN

ARBORICULTURAL IMPACT ASSESSMENT (OUTLINE PLANNING)

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Executive Summary

1. TEP was commissioned by Homes England to undertake an arboricultural assessment of a site off Caldbeck Road, Harras Moor, Whitehaven, to inform an outline planning application for residential development.

2. The impacts detailed are the best estimates possible based on the Open Spaces Schedule (WYG drawing A090070-410_005) provided. The actual impacts will be dependent on the final development layout.

3. Based on an objective assessment made in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations, there are 1 Category A (approximately 2.9 hectares), 7 Category B (covering approximately 2.9 hectares), 8 Category C (covering 1.1 hectares) and no Category U groups and woods on or within influencing distance of the site. Four hedges were also recorded.

4. The site borders an area of Ancient and Semi-Natural Woodland, Midgey Wood (Woodland W1). Such woodland is described as irreplaceable habitat by the National Planning Policy Framework. The outline proposals show an ecological strip alongside the woods. A stand-off of 15 metres to the woods must be retained even if the final development layout changes.

5. Part of Woodland W1 is covered by a Tree Preservation Order (TPO) but no other trees are covered by TPOs or lie within a Conservation Area.

6. A bat ecologist has confirmed that no trees on site, including those indicated for removal to facilitate road construction, have any features that would be potential bat roosts (see report 5060.LRM.Harras.003). Trees in Woodland W1 which lies outside the site boundary do have potential bat roosts.

7. It is estimated that 0.66 hectares of low quality trees and 0.15 hectares of moderate quality trees would need to be removed to facilitate the proposed development. Approximately 160 of 325 linear metres of hedges may need to be removed to facilitate the proposed development. It will be possible to retain all other trees throughout the construction in accordance with BS5837:2012.

8. The proposed loss of moderate retention value trees is to provide access between the different areas of the site.

9. Protective fencing will be required to demarcate a Construction Exclusion Zone around retained trees prior to commencement. This will be detailed in the Arboricultural Impact Assessment to support detailed planning. The fencing will restrict site movements so should be considered early in the construction process.

10. A scheme of new planting has not been considered by this assessment. Mitigation planting for trees removed to facilitate development should be considered for detailed planning. The Open Spaces Schedule (WYG drawing A090070-410_005) indicates areas where mitigation planting for tree and hedge loss could be delivered.

11. This report constitutes a valid basis for the evaluation of impacts on trees resulting from the proposed development for a period not exceeding 2 years. After this, it may be necessary to review survey data and conclusions to ensure reliability. Where the

recommendations of this report have been followed, any future deterioration in tree condition may not be attributed to the development.

1.0 Introduction

1.1 TEP has been commissioned by Homes England to conduct an arboricultural survey of land at Harras Moor. This report details the anticipated arboricultural impact of developing the site, subsequent mitigation recommendations and protective measures.

1.2 The current application is for outline planning permission and as such this report assesses the impact (Drawing 2) of the design principles established by the Open Space Schedule (WYG reference A090070-410_005, 01/05/18) provided by the client and shown in association with the tree constraints (Drawing 1), rather than specific tree removal or retention.

1.3 The survey was carried out in May 2018 by means of inspection from ground level by a qualified Arboricultural Consultant. Trees were assessed in accordance with BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations.

1.4 Under the British Standard the assessment of trees is made objectively. The categorisation method identifies the quality and value of the existing tree stock.

1.5 A topographical survey was used to record the position of trees and vegetation (WYG drawing reference: A090070-410_T001). Where the age distribution and species mix of tree cover was relatively uniform, trees were plotted as groups. For the purposes of this report it is assumed that the detail on the drawing is accurate. A number of trees were not shown on the topographical surveys and their locations are estimated[1].

1.6 The nature of the soils on site was not assessed during the survey. The possibility of minor soil movement due to tree root activity cannot be discounted. Prior to the undertaking of foundation depth calculations tree locations should be confirmed using topographical information. Any apparent discrepancy in tree location or queries relating to the location of species within groups should be discussed with TEP prior to submission.

1.7 A total of 15 groups of trees (G1-G15), 1 woodland compartment (W1); and 4 hedges (H1-H4) were surveyed and mapped[2]. All arboricultural information recorded during the survey is presented at Appendix A.

1.8 This report provides the results of the survey and includes the following:

- A schedule of all trees located on, or within influencing distance of the proposed development site (Appendix A);
- An assessment based on BS 5837:2012, of trees in terms of their potential value within any future development. On the basis of this assessment trees have been categorised into one of four categories: A, B, C or U (Appendices A & B);
- An assessment, based on BS 5837:2012, of the requirement for protection of trees during the construction phase (Section 6);
- Advice on removal, retention and management of trees (Sections 5 & 7);

[1] Estimated feature locations are marked on Drawing 1
[2] See Drawing 1: Tree Constraints Plan

- A Tree Constraints Plan detailing tree quality categories, canopy spreads and Root Protection Areas (RPA) for all trees surveyed (Drawing 1); and
- An indicative Tree Removal Plan detailing the tree removals required to facilitate the proposed development alongside trees to be retained and removed, based on being the areas other than the proposed POS, ecological areas, ponds and roadway (Drawing 2).

2.0 The Site and Surroundings

2.1 The site is located to the east of Whitehaven town centre. It is an irregularly shaped site bounded to the west by Loop Road South, the east by Red Lonning, the north by the residential Laurel Bank and Spruce Grove, and to the area of Highfields to the south.

2.2 The location of the application site is shown in Figure 1, and the approximate central grid reference is NX986180. The site does not contain any buildings.

Figure 1 Site location and approximate boundary

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2.3 The survey area is undulating with variously sloped aspects. The site is comprised of fields and woodland belts. Some of the fields are being grazed whilst others are fallow/unmanaged with unauthorised public access. The field to the east adjacent to Red Lonning was previously used as a football pitch but can now become very water-logged.

2.4 Weather conditions during the survey were overcast.

2.5 Inspection of trees was restricted in some cases by dense vegetation. These trees were surveyed insofar as was possible from accessible areas of the site[3].

Development Proposals

2.6 The proposed development is for residential housing across the site, incorporating ecological areas, public open space, and ponds.

[3] Survey restrictions are noted in Appendix A

2.7 Detail of the outline proposals is shown on Drawing 2 and is based on the Open Space Schedule (drawing reference: A090070-410 005) supplied by WYG.

3.0 Statutory Protection and Guidance

National Planning Policy Framework (NPPF)

3.1 The NPPF assumes protection of all ancient woodland and veteran trees unless it can be clearly demonstrated that the need for, or benefits of, development outweigh the loss. In this respect ancient woodland is defined as an area which has been wooded continuously since at least 1600 AD and a veteran as a tree of exceptional value for wildlife, in the landscape, or culturally because of its great age, size or condition.

3.2 The southern two thirds of Midgey Wood (Woodland W1) is classed as Ancient and Semi-Natural Woodland (ASNW). NPPF describes ancient woodland as an 'irreplaceable habitat' and assumes that any proposal that would result in loss or deterioration would be refused unless those effects are 'clearly outweighed' by benefits. In this context, benefits include the need for development in that location and any planning justification for loss or deterioration of ancient woodland must include reasons why the location is unavoidable. Recent appeal judgements suggest that this test applies both to the allocation or suitability for development of the site but also to the arrangement of built form within the layout.

3.3 The government publishes Standing Advice on the subject of ancient woodland. It recommends that a minimum buffer of 15m between ASNW and any development should be provided. The Forestry Commission is a non-statutory consultee for any development within 500m of ancient woodland. It recommends the incorporation of a buffer around ancient woodland and publishes a framework for assessing effects on ancient woodland in the context of development.

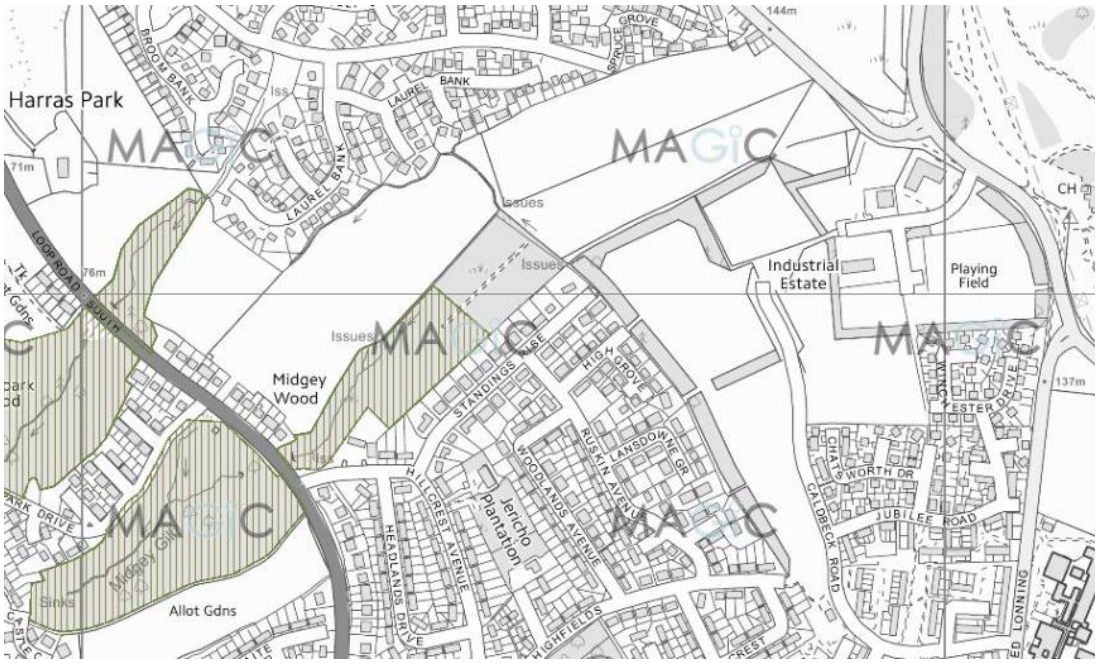


Figure 2 Map showing areas of ASNW adjacent to and near site

3.4 The Natural Environment and Rural Communities Act 2006 places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. Irreplaceable habitats such as ancient woodland as well as Habitats of Principal Importance (defined Section 41 of the Act) are widely regarded as metrics for this purpose. Woodland W1 adjacent to the site is mapped as a Habitat of Principal Importance.

Tree Preservation Orders & Conservation Area Designations

3.5 Where it is considered expedient to do so, local authorities can create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in force, lopping, topping, felling, uprooting or wilful damage caused to a tree is prohibited and such actions may be prosecuted and incur an unlimited fine. Works to TPO protected trees must only be undertaken with the written consent of the local authority.

3.6 Section 211 of The Town and Country Planning Act 1990 (TCPA) relates to the preservation of trees in Conservation Areas. Under Section 211 anyone proposing to remove, uproot or destroy any tree within a Conservation Area is required to give the local planning authority six weeks' prior notice (a "section 211 notice"). During this period the Council may consider serving a Tree Preservation Order to prevent the proposed work from being undertaken.

3.7 Exceptions from the requirement to give a Section 211 notice are set out in The Town and Country Planning (Tree Preservation) (England) Regulations 2012. A person does not have to give the local planning authority six weeks' prior notice for, amongst other reasons, work to trees so far as such work is necessary to implement a planning permission (other than an outline planning permission).

3.8 A check was undertaken with Copeland Borough Council on 10th May 2018 who confirmed that no trees within the site boundary are subject to a Tree Preservation Order (TPO) or lie within a Conservation Area. A small section of Midgey Wood (Woodland W1) which is adjacent to the site is subject to a TPO.

Protected Species – Bats

3.9 Mature trees often contain cavities, crevices and hollows, which are a potential habitat for roosting bats. Bats are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010, and as such causing damage to a bat roost constitutes an offence.

3.10 A preliminary ground level appraisal of the wildlife habitat value of each tree was undertaken by a trained layperson as part of the arboricultural survey and these have been confirmed by a bat ecologist (see report 5060.LRM.Harras.003). Where observations incidental to the primary purpose of tree surveying have a possible interest to bats they are recorded below.

Table 1 Features of possible interest to bats

Tree survey reference	Feature/s of note
Woodland W1	Various cavities and splits

3.11 If any works are to be carried out to trees identified in the table above, reference should be made to the results and recommendations of a competent bat assessment prior to commencement.

3.12 If the presence of a bat roost is suspected whilst undertaking works on any trees on site, operations must be halted until a licensed bat handler or ecologist can provide advice.

Protected Species - Birds

3.13 Trees are a potential habitat for nesting birds, which (as well as their nests and eggs) are protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally or recklessly, damage or destroy an active nest or any part thereof.

3.14 Due to the suitability of the trees within the survey boundary for nesting birds, all tree work should ideally be undertaken outside the bird nesting season (March to August, inclusive).

3.15 If this is not possible then a detailed inspection of each tree should be undertaken by a qualified ecologist immediately prior to the arboricultural works. Should an active nest be found (being built, containing eggs or chicks), any work likely to affect the nest must be halted until the nest becomes inactive.

4.0 Tree Population

4.1 Fifteen groups of trees (G1-G15), 1 woodland compartment (W1) and 4 hedges (H1-H4) were recorded within influencing distance of the site. A schedule of all trees and groups in terms of species, condition, age, management recommendations and BS 5837:2012 quality categories is provided at Appendix A.

4.2 Midgey Wood (Woodland W1) is mature woodland classified as Ancient and Semi-Natural Woodland (ASNW). This woodland is outside but adjacent the application boundary and poses a significant influence on the site. The wood is predominantly composed of oak, sycamore and birch with an understorey of yew and holly.

Figure 3 View south within Midgey Wood

4.3 There are a number of middle-aged shelter belts across the site (G3, G4, G8, G9 and G12). These groups have trees of mixed composition and quality but form significant features, with some screening residential areas and others more industrial areas.

Figure 4 View south-east of group G8 and G5 which screens an industrial unit

4.4 A number of groups (Groups G7, G10 and G13) could potentially provide a screening role in the future. However, these trees are of a smaller stature to the other shelter belts and are generally trees with poor vigour.

4.5 There are a few groups (eg G6, G14 and G15) comprised of unmanaged scrub and small self-seeded trees such as hawthorn.

4.6 Tree and group locations, their quality categories and canopy spreads are shown on Drawing 1.

Tree Quality Categorisation

4.7 Under BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations, trees and groups are objectively assigned a quality category to quantify their value within any future development. The table below contains a summary of the categories presented in the British Standard. The full table has been reproduced at Appendix B.

Table 2 Summary of BS 5837 tree quality categorisation criteria

Category A	Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value
Category B	Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value

Category C	Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits
Category U	Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infectious pathogens that threaten other trees

5.0 Impacts of the Proposed Development

5.1 This section gives an overview of the likely impact of residential development on existing trees. The outline development areas are those not covered by the proposed Public Open Space, ecology areas, ponds, or access roads shown in Drawing 1. The actual impact will be determined in any subsequent reserved matters/detailed planning application. It has been assumed that any future development will be broadly similar to the proposals shown in Drawing 1 but any significant changes will require re-assessment of the arboricultural impacts.

5.2 Hedgerows have not been afforded a quality value as they do not fall within the scope of BS 5837:2012.

Table 3 Arboricultural impacts by quality category[4]

	Category A	Category B	Category C	Category U	Hedge
Features that would be retained	-	G1, G3-G5, G8, G9, G12	G2, G11	-	H2, H3
Total	**1**	**7***	**2**	**0**	**2**
Features that would be removed	-	-	G6, G7, G10, G13-G15	-	H1, H4
Total	**0**	**0***	**6**	**0**	**2**
Features outside the application boundary	W1	-	-	-	-
Total	**0**	**0**	**0**	**0**	**0**

* Small parts (approximately 0.15 hectares) of Groups G5 and G9 will be removed to facilitate the construction of access roads.

5.3 The outline proposals indicate that **six** tree groups of low quality (totalling approximately **0.66** of 1.07 hectares) and small parts (totalling around **0.15** of 2.94 hectares) of two moderate quality groups would be removed.

5.4 Approximately **160** of 325 linear metres of hedgerow would be removed to facilitate the preliminary development proposals.

5.5 Most of the trees shown for removal are of low retention value that would otherwise encroach into the site and restrict the developable area.

[4] See Appendix 1, Arboricultural Survey Data for sub-categories

5.6 Although of moderate quality value, a gap will be required through group G9 and the south-east corner of G5 will need to be removed to allow the construction of road access across the site.

5.7 The southern part of W1 is an Ancient Semi-Natural Woodland. The proposed development is unlikely to necessitate pruning of edge trees along the boundary or the removal of marginal vegetation as an ecological area approximately 15 metres wide is proposed alongside the woodland edge. However, this would have to be re-evaluated if the proposals for full planning are different. Whilst this in itself may not be considered to necessarily constitute loss of ancient woodland, the imposition of new constraints to natural woodland function at the margins, especially if this involves the removal of otherwise viable trees and branches, and the change in adjacent land use will cause some local deterioration in woodland condition and prospects.

5.8 Where any development is proposed within 500m of an ancient woodland The Forestry Commission is a non-statutory consultee. The Standing Advice provided by Forestry Commission and Natural England includes a recommendation that a buffer should be incorporated within the layout around all ancient woodland. The proposed development includes a standoff of 15 metres as recommended by the Standing Advice.

5.9 A detailed assessment of effects on woodland W1 using the Forestry Commission assessment template has not been completed with this being an Outline Application. It is likely that such an assessment would agree with this report that individual trees could generally be retained and protected according to BS5837:2012 but that there would be some deterioration in woodland quality. The Forestry Commission assessment focusses on effects such as enclosure, loss of marginal vegetation, likely escape of non-native species from gardens, light spillage, noise and access, all of which are likely adverse effects of this development to varying degrees dependent on the exact details of the development. Mitigation measures to minimise deterioration arising as a result of these effects should be included in an updated Arboricultural Impact Assessment based on the detailed design where possible.

5.10 It should be noted that any compensation measures for loss or deterioration can only be considered after it has been judged that the wider benefits of the proposed development (including need) *clearly outweigh* the loss or deterioration of ancient woodland.

5.11 Where a detailed design allows for the retention of existing trees, there will be considerable scope to add arboricultural value to the site. This may be achieved through new and more diverse planting and will be particularly valuable where trees with a large ultimate size are incorporated.

6.0 Considerations at the Detailed Design Stage

6.1 The following information sets out the primary considerations in determining the requirement for tree protective measures and in the assessment of development impact.

Root Protection Areas

6.2 As per BS 5837:2012, the Root Protection Area (RPA) is calculated using each tree's diameter at 1.5 metres[5] and represents the minimum area around each tree that must be left undisturbed to ensure its survival.

6.3 Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present. The majority of tree roots are found in the top 600mm of soil and most of the fine roots that absorb water and nutrients are found close to the surface.

6.4 The morphology of roots is influenced by past and present site conditions (including roads, buried structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in extent and the RPA may not be a circular area centred on the tree stem.

6.5 The RPA has been adjusted or offset where appropriate to most accurately represent the likely spread of roots for each individual tree[6].

Underground Utility Issues

6.6 The installation of utilities can be very damaging to tree root systems and can affect a much larger area of roots than is directly affected by trench creation.

6.7 Where the installation of services within the RPA of retained trees is unavoidable, appropriate work methods will be required to ensure the safe long-term survival of those trees. This process will require additional consultation with a qualified Arboricultural Consultant and is likely to be more expensive than conventional trench installation.

Structural Stand-off

6.8 A minimum structural standoff will need to be considered for retained trees. The function of such a development standoff is to ensure adequate space is afforded for future growth, ultimate height and crown spread, and to minimise adverse interference with future site use.

[5] Refer to Appendix A for RPA area calculations
[6] See Drawing 1 for RPA shapes

Mature Individual Trees

6.9 Adequate structural stand-off for mature, open-grown and hedgerow trees can be inferred from respective Root Protection Areas. Due to their large stem girth (translating to an RPA radius that generally exceeds their canopy extents) and limited potential for further expansion, these trees are likely to require minimal future management to maintain existing crown dimensions. A 5m buffer from the canopy edge is recommended for low-loadbearing surfaces and a 15m buffer for houses and carriageways.

6.10 Human perception of large trees should also be a consideration when determining the level of structural stand-off. It is important to anticipate and prevent any residual pressure that may be placed on retained trees by future users of the development. The issue of light attenuation and unfounded fears of tree or branch failure can lead to the removal of trees that were subject to strict protection measures during development.

Young and Middle-aged Trees

6.11 Structural stand-off for self-set groups and individual developing trees will need to take account of species and future adjacent land use. Further advice should be sought at the detailed design stage from a qualified Arboricultural Consultant.

Ground Level Changes

6.12 A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment.

6.13 Existing ground levels within the RPA should be maintained. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

Drainage & Storm Water Run-off Issues

6.14 Drainage and storm water run-off requires due consideration to prevent excessive and/or polluted run-off into the rooting area of trees to be retained. Attenuation ponds have been considered on this site and are located outside of the RPA of trees along the north east and south east. A full assessment of impact on trees of all drainage aspects should be considered as part of the reserved matters process.

7.0 Recommendations

Tree Work

7.1 Currently no remedial tree works are needed as the land is largely in agricultural use with no formal public access near trees that may pose a risk to human safety. Additional management may be required in response to any change in land use that may result from development and will be assessed at the detailed design stage.

7.2 Any tree surgery work should be carried out by a qualified contractor in accordance with British Standard 3998:2010 Tree work – Recommendations.

Arboricultural Impact Assessment

7.3 A detailed Arboricultural Impact Assessment (AIA) will be required in support of a reserved matter/full application. This will identify, evaluate and possibly mitigate the impacts of developing land on the existing tree resource.

7.4 One function of the AIA process will be the consideration of trees alongside other project disciplines (layout, drainage, utilities etc.) in order to minimise future conflict and avoid unexpected expense or undesirable tree loss.

Protective Fencing and Exclusion Zones

7.5 Site-wide tree protection measures will be required during construction to deliver the tree retention schedule presented in this report. This will include temporary protective barrier fencing to demarcate a Construction Exclusion Zone (CEZ) around retained trees. This must be put in place prior to the commencement of any development works, including bringing machinery or materials onto site, the erection of site huts or demolition.

7.6 The CEZ should protect both tree roots and branches and should be designed to incorporate canopy spread where appropriate. All of the CEZ should be protected throughout the construction process by either an approved working methodology, ground protection, or protective fencing.

7.7 Protective fencing alignment will be detailed in the Arboricultural Impact Assessment that supports the detailed layout. Details of the fencing design and installation will also be detailed in that report.

Ground Protection

7.8 The Arboricultural Impact Assessment to support the detailed layout may require the use of ground protection in specific areas to allow pedestrian/plant/vehicle access within the CEZ.

7.9 An Arboricultural Method Statement will be required to detail a suitable specification which will be dictated by the size of machinery to be used. The final design must be agreed with the council's Arboricultural Officer prior to installation.

7.10 Ground protection should be installed at the same time as the tree protection fencing, prior to commencement.

Mitigation for the removal of trees

7.11 The National Planning Policy Framework (NPPF) is a material consideration in the planning process and promotes a presumption in favour of sustainable development. In terms of the natural environment, development should minimise impacts on biodiversity and provide a net gain in biodiversity where possible.

7.12 In respect of trees, a sustainable development will be one whereby the total number, value or function provided by trees is maintained or increased or where the long-term prospects of the existing tree stock can be substantially improved. Net gains in biodiversity may be demonstrated where the number of tree species, variety of tree ages or range of niche habitats can be increased. Native, old, large or dead trees are likely to have a relatively significant impact on a scheme's environmental credentials, as will the connectivity of trees, hedges and woodland.

7.13 Mitigation for the loss of amenity and associated habitat may be required in the form of replacement tree planting.

7.14 Species choice should be made with consideration to ultimate size, form, site exposure, unique soil types, fruit production, undesirable traits, local heritage and landscape continuity.

7.15 Aftercare is vital to the survival of newly planted trees. Provision should be made for a minimum of two years' maintenance of newly planted trees and include watering, formative pruning and the checking of tree ties and stakes.

7.16 A proposal for new landscaping and planting was not available for the production of this assessment and will be provided as a reserved matter.

7.17 The extent of mitigation planting will ultimately be determined in agreement with the Local Planning Authority.

Post Construction Tree Care

7.18 Hazard recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structure is constantly changing. Even those in good condition can suffer from damage or stress. Following site development, regular (annual or biennial) inspections of all retained trees should be undertaken by a qualified Arboricultural Consultant.

APPENDIX A: Arboricultural Survey Data

APPENDIX 1: Arboricultural Survey Data Sheets

Surveyor Thom Robinson
Date 14th March 2018
Town Whitehaven
Site Harras Moor
Dwg Ref D5060.Arb.Harras

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,U (1,2,3)	(m)	(m2)		Long, Medium, Short	Y/N
Groups																	
G1	Ash, alder, Scots pine	12.0	50 -200	>20	Refer to drawing				Middle Age	Good	Smaller group in open aspect. Some good examples throughout group. Good screening of industrial estate.	B,1,2,3	Refer to Drawing	n/a		Long	N
G2	Ash, alder, willow, English oak	9.0	50 - 250	>100	Refer to drawing				Middle Age	Varied	Boundary shelter belt. Poor trees throughout, form and vigour. Ash heavily infected with bacterial canker. Some screening value of road.	C,1,2,3	Refer to Drawing	n/a		Long	N
G3	Scots pine, ash, birch, larch, alder	14.0	50 - 250	>50	Refer to drawing				Middle Age	Varied	Some failed stems throughout group. Growing behind row of housing offering good screening of industrial estate and road beyond. General overcrowding and heavy bacterial canker infection iin ash throughout. Reduced vigour though some better examples exist.	B,1,2,3	Refer to Drawing	n/a	Selective thinning.	Long	N
G4	Scots pine, ash, birch, larch, alder	14.0	50 - 250	>40	Refer to drawing				Middle Age	Varied	Some failed stems throughout group. Growing behind row of housing offering good screening of industrial estate and road beyond. General overcrowding and heavy bacterial canker infection in ash throughout. Reduced vigour though some better examples exist.	B,1,2,3	Refer to Drawing	n/a	Selective thinning.	Long	N
G5	Ash, hawthorn, cherry, Scots pine	13.0	50 - 370	>100	Refer to drawing				Middle Age	Poor	Significant feature in the landscape. Ecological value. Large amount of deadwood throughout. Bacterial canker of ash throughout. Reduced vigour and poor form throughout. Where better trees exist they are overcrowded and suppressed. Good screening of industrial estate.	B,1,2,3	Refer to Drawing	n/a	Selective thinning.	Long	N
G6	Willow, hawthorn	6.0	50 - 150	10.0	Refer to drawing				Middle Age	Poor	Unmaintained scrub. Previously coppiced. Poor form. Normal vigour.	C,1	Refer to Drawing	n/a		Long	N
G7	Willow, hawthorn	6.0	50 - 150	>50	Refer to drawing				Middle Age	Poor	Scrub boundary feature. Overgrown and high levels of competition causing suppression. Poor form throughout.	C,1,2	Refer to Drawing	n/a		Long	N
G8	Ash, Scots pine, oak, sycamore, elder	11.0	150 - 260	>100	Refer to drawing				Middle Age	Varied	Ash bacterial canker throughout. Some trees have poor form. Some trees have reduced vigour. Good screening of industrial estate. Eco connectvity.	B,1,2,3	Refer to Drawing	n/a		Long	N
G9	Alder, ash, oak, hawthorn, sycamore	12.0	50 - 300	>100	Refer to drawing				Middle Age	Varied	Ash bacterial canker throughout. In field area significant browsing of tree bark. Dead stems throughout. Some trees with reduced vigour.	B,1,2,3	Refer to Drawing	n/a		Long	N

APPENDIX 1: Arboricultural Survey Data Sheets

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,U (1,2,3)	(m)	(m2)		Long, Medium, Short	Y/N
G10	Ash, Scots pine, elder, hawthorn.	10.0	50 - 250	>50	Refer to drawing				Middle Age	Poor	Ash bacterial canker throughout. Some ecology connectivity. Overall poor form with some trees pruned back under overhead lines. Reduced vigour throughout.	C,1	Refer to Drawing	n/a		Long	N
G11	Leyland cypress, silver birch	10.0	300 - 500	10.0	Refer to drawing				Middle Age	Fair	Trees in neighbouring property to field entrance at west of site. Generally poor form. Offer some level of screening but are more likely outgrown hedgerows.	C,1,2	Refer to Drawing	n/a		Long	N
G12	Sycamore, alder, ash, Scots pine, hawthorn, elder, oak	11.0	50 - 260	>300	Refer to drawing				Middle Age	Varied	Prominent shelter belt creating excellent screening of wider residential area. Good connectivity to woodland with ecology benefits. Large amounts of deadwood throughout. Very wet soils. Ash bacterial canker throughout. Reduced vigour in some trees throughout.	B,1,2,3	Refer to Drawing	n/a		Long	N
G13	Ash, Scots pine, hawthorn	10.0	50 - 250	>50	Refer to drawing				Middle Age	Poor	Ash bacterial canker throughout. Some connectivity. Overall poor form throughout and reduced vigour due to over crowding and suppression.	C,1,2,3	Refer to Drawing	n/a	Selective thinning.	Long	N
G14	Hawthorn	5.0	170	6.0	Refer to drawing				Middle Age	Fair	Self set hawthorn in centre of field. Normal vigour	C,1	Refer to Drawing	n/a		Long	N
G15	Willow, alder	5.0	50	5.0	Refer to drawing				Young	Poor	Small group at edge of field. Poor form throughout. Multi-stemmed examples.	C,1	Refer to Drawing	n/a		Long	N

APPENDIX 1: Arboricultural Survey Data Sheets

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,U (1,2,3)	(m)	(m2)		Long, Medium, Short	Y/N
Hedges																	
H1	Hawthorn	2.5	50 - 150	n/a	n/a				Mature	Fair	Unmanaged outgrown field boundary hedge.	n/a	Refer to Drawing	n/a	Manage as hedgerow		n/a
H2	Leylandii	2.0	100	n/a	n/a				Middle Age	Good	Well maintained garden hedge in neighbouring property.	n/a	Refer to Drawing	n/a	Manage as hedgerow		n/a
H3	Hawthorn, holly, oak	4.0	100	n/a	n/a				Mature	Fair	Outgrown hedge at edge of field.	n/a	Refer to Drawing	n/a	Manage as hedgerow		n/a
H4	Hawthorn, willow	6.0	50 -200	n/a	n/a				Mature	Fair	Outgrown hedge at edge of field. Some sections have received pruning and management from neighbouring properties.	n/a	Refer to Drawing	n/a	Manage as hedgerow		n/a
Woods																	
W1	Oak, yew, sycamore, holly, silver birch, rhodadendron	16.0	100 - 600	>300	Refer to drawing				Mature	Good	Mature woodland known as Midgey Wood. Southern 2/3 is classified as 'Ancient and Semi Natural woodland'. Important habitat and ecological value. Deadwood throughout. Normal vigour. Lies outside application boundary.	A,2,3	Refer to Drawing	n/a			Part of (see report)

APPENDIX B: Survey Method

APPENDIX B: SURVEY METHOD

The survey of trees is conducted from ground level only. The nature of the soils on site is not assessed.

Trees are dynamic living organisms with a constantly changing structure; even trees in good condition can suffer from damage or stress. The information recorded is presented as being correct at the time of survey.

The following features of each tree, group of trees or wood may have been recorded in the Arboricultural Survey Data Sheets at Appendix 1.

Species The common name is given. The Latin name may also be given if further clarification is required.

Height Top height of tree recorded in metres.

Stem Diameter For single-stemmed trees the measurement is taken at 1.5 metres above ground level and recorded in millimetres.
For multi-stemmed trees an average all stems measured at 1.5m above ground level is used.
For tree groups a range from minimum to maximum diameters is provided based on measurements taken using one of the aforementioned methods.

No. of Stems A count of stems arising below a height of 1.5 metres.

Crown Spread The N, S, E and W branch spreads are recorded in metres to provide a representative crown shape.

Height of Lowest Branch
Crown clearance above ground level recorded in metres.

Direction of Lowest Branch
The direction of growth of the first significant branch from the point of attachment.

Maturity

Young	Trees that can reasonably be relocated or replaced like for like, without undue cost;
Middle Age	Trees in the established growth stage of their life with the potential to continue increasing in size;
Mature	Trees that have reached their ultimate size, given their location and surroundings;

Condition **Good, Fair, Poor.** An overall assessment of a tree's physiological and structural state in which factors that may increase its susceptibility to the effects of development are taken into account.

Veteran. Trees that are in such a condition as to significantly increase their biological, cultural or aesthetic value. This is characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Comments A brief evaluation and description of the tree with comments on form, vitality, health and any significant defects or symptoms of ill-health.

BS 5837 Tree Quality Assessment
The tree quality assessment is based on Table 1 of BS 5837:2012 (See below). Four categories (A, B, C and U) are used to denote tree quality (A= High, B = Moderate, C = Low, U= Unsuitable for retention). Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category (the subcategories may be used in combination but do not accumulate collective weight).

Root Protection Area (RPA)
The RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m^2) and as the radius of a circle (m) typically plotted from the centre of the stem.

The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.6 and Table D.1) and is based on a trees stem diameter. In some cases the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion.

Recommendations
Recommendations for arboricultural works, etc. are based on the **current** land use, and take into account the tree or group attributes without bias to the proposed development.

Estimated Remaining Contribution
An estimation of the life expectancy as healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey.

Long	> 40 years
Medium	20 – 40 years
Short	less than 20 years

APPENDIX B: SURVEY METHOD

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 4.5.7.*			See Table 2
	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)	See Table 2
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	See Table 2
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	See Table 2

British Standards Institute (2012) *BS5837:2012 Trees in relation to design, demolition and construction – Recommendations.* p.9

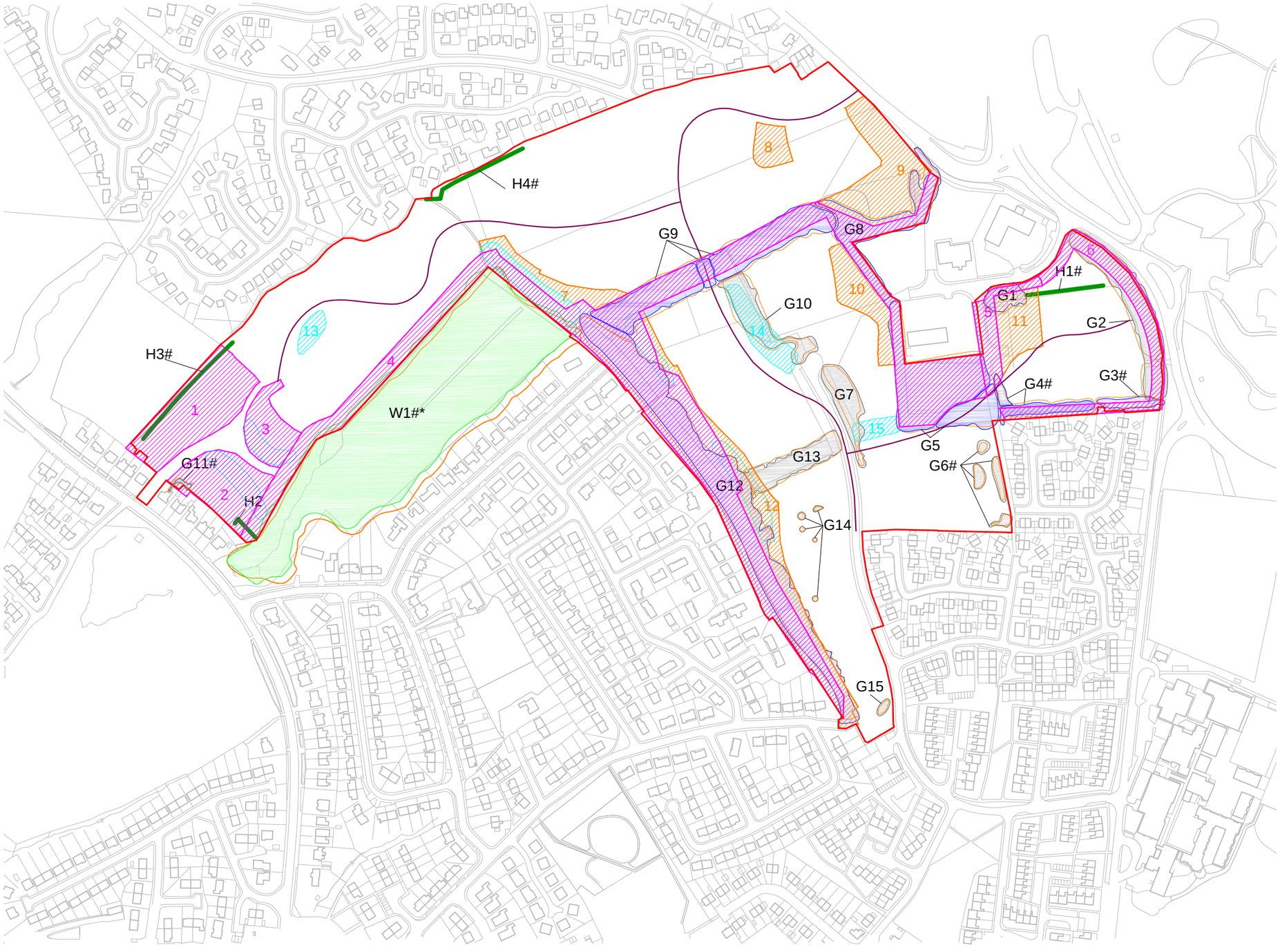
NOTES:

All young trees are assessed as quality category ‘C’ but this does not preclude their retention within a development.

For hedges the height, canopy spread and number of stems is recorded but they are not assigned a quality category.

DRAWINGS

Drawing 1 - Tree Constraints Plan with Proposed POS and Ecology Areas
Drawing 2 - Tree Removal Plan



KEY

[This drawing must be reproduced in colour]

- G1 Groups of trees
- W1 Woodland
- H1 Hedgerow
- Root Protection Area (RPA)
- Survey/Application Boundary
- # Approximate location (Feature not shown on topo)

Tree Quality Categorisation

(Based on BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Unsuitable for retention)
- Hedgerow (Not categorised)

NOTE: This drawing should be read in conjunction with the respective Arboricultural Survey Data (Appendix A).

Outline Area Proposals

(Based on WYG drawing)

- Public Open Space
- Ecological Area
- Pond
- Road

Rev	Description	Drawn	Approved	Date

TEP | THE ENVIRONMENT PARTNERSHIP

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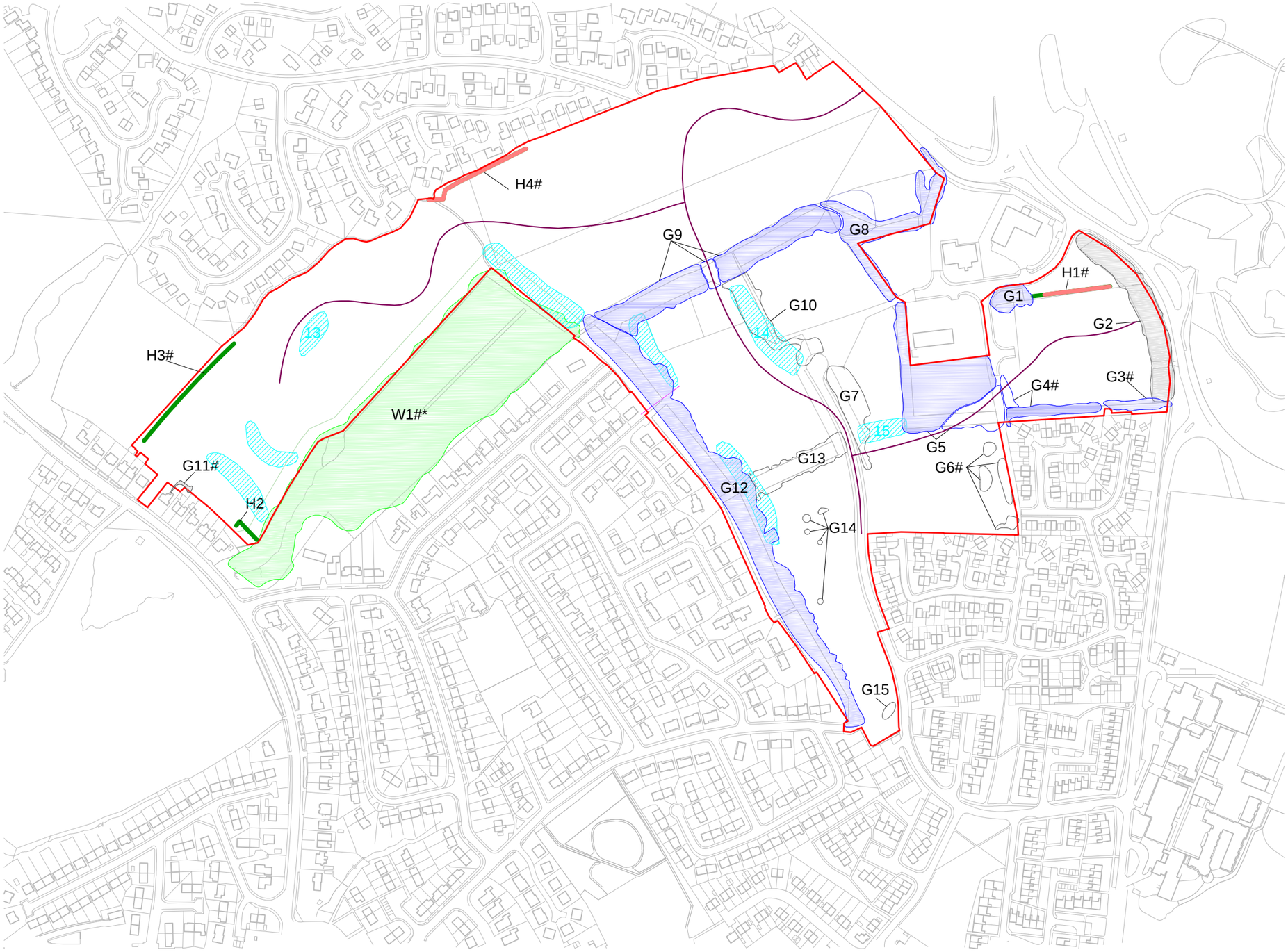
Project
Harras Moor

Title
Tree Constraints and Proposed POS/Ecology Area Plan

Drawing Number
D5060.Arb.Harras.001

Drawn	Checked	Approved	Scale	Date
AM	TR	JS	1:4000 @ A3	09/05/2018



KEY

[This drawing must be reproduced in colour]

- G1 Groups of trees
- W1 Woodland
- H1 Hedgerow
- Root Protection Area (RPA)
- Survey/Application Boundary
- # Approximate location (Feature not shown on topo)
- Pond (Proposed)
- Road

Trees to be Retained

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Unsuitable for retention)
- Hedgerow (Not categorised)

Trees to be Removed

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)
- Category U (Unsuitable for retention)
- Hedgerow (Not categorised)

NOTE: This drawing should be read in conjunction with the respective Arboricultural Survey Data (Appendix A).

Rev	Description	Drawn	Approved	Date

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Project
Harras Moor

Title
Tree Removal Plan (Indicative)

Drawing Number
D5060.Arb.Harras.002

Drawn	Checked	Approved	Scale	Date
AM	TR	JS	1:4000 @ A3	09/05/2018

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