



HULME PRIMARY SUBSTATION
ARBORICULTURAL IMPACT ASSESSMENT
AUGUST 2024

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Document Control

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Prepared by	The Environment Partnership (TEP) Ltd
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Arboricultural Impact Assessment

1.0 Scope

- 1.1.

TEP has been commissioned by ENWL to conduct an arboricultural survey of land to the east of Birchall Way in Manchester and to make an assessment in accordance with BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations.
- 1.2.

This report has been produced to support a planning application. It describes the findings of field and desktop surveys; the effects that granting planning permission would have on arboriculture; and measures that are and/or should be incorporated in the proposed development.
- 1.3.

A judgement has been made in consideration of the survey findings, desktop search results and the nature of the proposed development that a full report style Arboricultural Impact Assessment (AIA) would not be proportionate. This document presents the content of an AIA in a condensed format, which is considered appropriate for relatively simple sites and/or development in relation to trees.
- Survey
- 1.4.

The survey was undertaken in August 2024 in accordance with BS 5837 by a qualified arboriculturist. The survey method is included at Appendix B.
- 1.5.

A topographical survey was used to record the position of trees and vegetation (drawing reference: SSL:15108:200:1:1). Where trees were not shown on the topographical survey, their locations were estimated. The topographical survey is dated February 2013 and shows some trees that are no longer present, as well as notes on ground cover vegetation and records of bore holes and trial pits that are not a contemporary record.
- 1.6.

Trees on private land outside the application boundary, and at inaccessible locations were surveyed insofar as was practicable. Whilst reasonable effort has been made to ensure the accuracy and comprehensiveness of such records, it cannot be guaranteed.
- Limitation
- 1.7.

This report relates to a specific development proposal and should not be interpreted as advice in any other circumstance.
- 1.8.

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 would be necessary to review baseline data and conclusions to ensure reliability.
- 1.9.

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

Arboricultural Impact Assessment

2.0 Baseline

2.1. This drawing presents an overview of the existing trees within influencing distance of the proposed development. It also summarises the results of desktop searches for any designations, legal and regulatory restrictions or special status of relevance to arboriculture.

Application Site

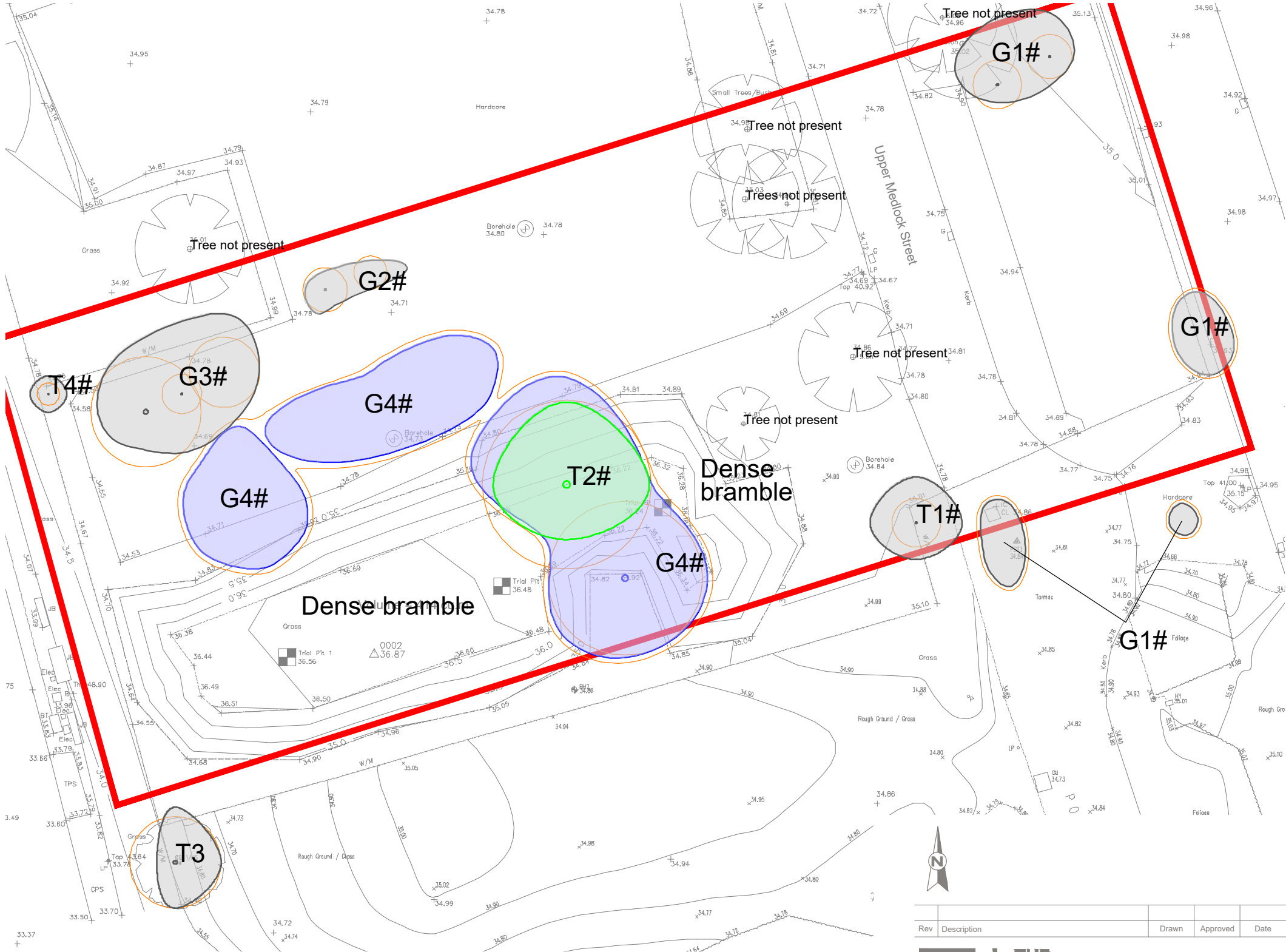
2.2. The site is a small fenced off area of mostly scrub vegetation with some larger trees present, it is bordered to the east and west by Upper Medlock Street and Birchall Way. Immediately north of the site lies a large concrete foundation that appears to be the remnants of an old structure or car park whilst to the south is an area of hardstanding and scrub with an access from the adjacent road.

Survey results

- 2.3. 3 individual trees and 4 groups of trees were recorded within influencing distance of the application site.
- 2.4. Vegetation on the site mainly consists of scrub-like vegetation with portions of the site being covered by almost impenetrable bramble. There are small self-set trees and bushes along fence lines, and a small number of larger trees on and around a raised bund.
- 2.5. Trees along the northern, eastern and southern boundaries of the site consist mainly of scrubby low quality (Category C) willow and buddleia, with a slightly larger cherry to the south (T1). T4 is a very small tree of heaven that has self-set from a larger specimen in the adjacent highway verge to the north.
- 2.6. In the centre of site there is a large and apparently long-established mound of earth. It is surrounded and covered by dense brambles, willow trees and buddleia (G4). These are prominent from adjacent residential properties, and the highway, and whilst they are unremarkable trees, they make some collective contribution to visual amenity within the landscape, as well as habitat quality.
- 2.7. On top of the mound is a high quality (Category A) elder tree. It is mature but still vigorous, and of unusually large size for the species. It has evidence of burrowing by animals within the root plate, and habitat interest generally as a function of its maturity and native species.
- 2.8. Trees have been categorised in accordance with BS 5837 to describe their arboricultural, landscape or cultural qualities: A (high quality), B (moderate quality) C (low quality) and U (unsuitable for retention). The categorisation of tree quality allows a weighting to be given to each tree within the context of proposed development but is not prescriptive. Hedgerows are not categorised.
- 2.9. A Root Protection Area (RPA) has been calculated in accordance with BS 5837. This is based on each tree's stem diameter at 1.5 metres and has been adjusted where necessary to most accurately represent the likely spread of roots in consideration of prevailing conditions. The RPA represents the minimum area around each tree that must be left undisturbed to ensure its survival.
- 2.10. Feature locations, their quality categories, canopy spreads and root protection areas are shown opposite. All arboricultural information recorded during the survey is presented at Appendix A.

Desktop Searches

- 2.11. Manchester City Council confirmed that no trees on or adjacent to the site are protected by Tree Preservation Order or within a Conservation Area.
- 2.12. Natural England's Ancient Woodland Inventory (Provisional) for England contains no records for the site.
- 2.13. There are no veteran trees which could be affected by development of the site.
- 2.14. The site is within a Community Forest.
- 2.15. There are no mapped Habitats of Principal Importance (Hedgerow, Deciduous Woodland, Wood Pasture and Parkland, and Traditional Orchard) on the site. Observations made during the site survey support this.
- 2.16. No assessment of the presence of protected species has been made during the production of this report. Features of possible interest that were observed incidentally during the tree survey are recorded in Appendix A.
- 2.17. Works to and around trees have the capacity to affect protected species, particularly including birds, bats, great crested newts, badgers, dormice, otters and water voles. Contractors should be familiar with the locations and sensitivities of any protected species that are present and take reasonable avoidance measures or comply with the requirements of any licence agreement in accordance with the advice of an ecologist.



KEY

[This drawing must be reproduced in colour]

- T1/G1/W1 Trees
- Root Protection Area (RPA)
- Survey Boundary
- # Approximate location
(Feature not shown on supplied topographical survey)

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)

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
Hulme Primary Substation

Title
Arboricultural Impact Assessment [BASELINE]

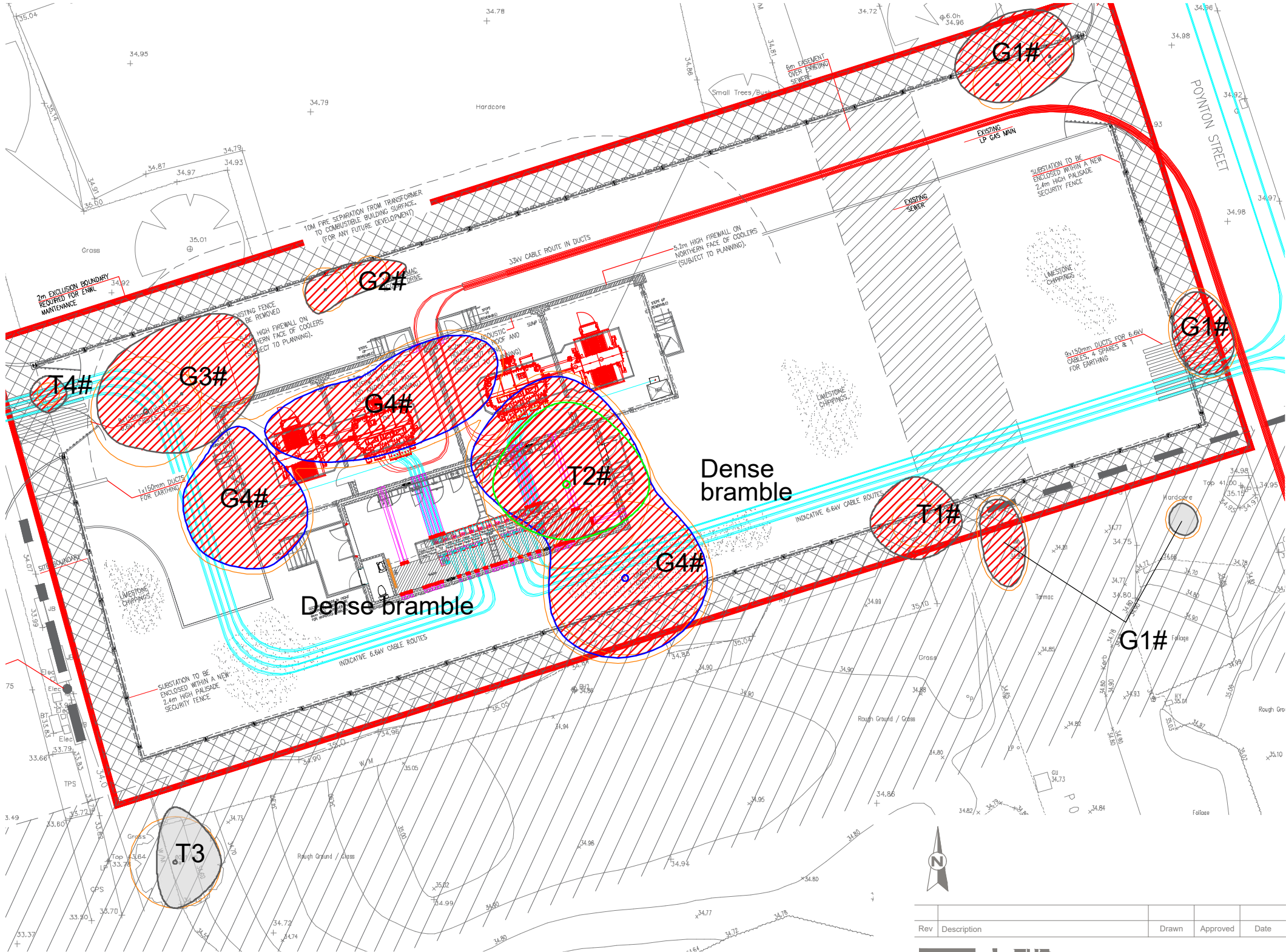
Drawing Number
D10454.0001

Drawn	Checked	Approved	Scale	Date
MM	TDP	TDP	1:250 @ A3	07/08/2024

Arboricultural Impact Assessment

3.0 Effects

- 3.1. In simple terms, the effects on arboriculture comprises an account of which existing trees would not be retained within the proposed development; what significance they have; and whether adverse effects would or can be mitigated or offset.
- 3.2. This drawing presents the results of an assessment in accordance with BS 5837, including a definitive account of which trees would be removed or pruned.
- 3.3. The proposed development comprises the construction of a new substation with associated access road, compound and fence infrastructure and below ground cables. The proposed layout is shown opposite and is based on drawing 101045-00004-002.
- 3.4. A reasonable worst case assessment of the requirement to prune or remove trees has been made on the basis of BS 5837, the proposed construction methods, and professional judgement. The works listed below and illustrated opposite form part of the proposed development, and would be permitted by the grant of planning consent:
- 3.4.1. Removal of T1, T2 and T4
- 3.4.2. G1 removal of compartments as shown.
- 3.4.3. Removal of G2, G3 and G4.
- 3.5. Every tree within the red line boundary would be removed in order to implement the proposals.
- 3.6. Most removals are necessary to make way for the substation itself and associated earthworks. G2, G3, T4 and G1 are outside of the footprint but would be removed to facilitate the construction of access, compound fencing and gates, and underground cables. An easement around the perimeter is also required for safety and security.
- 3.7. Many of the trees that would be removed are of low quality. G4 is of moderate quality for reasons of collective landscape and habitat quality, and T2 is of high quality because of its maturity and size.
- 3.8. Trees are a material consideration and the quality of trees, planning policies, and the presence of any special status or designation is likely to be considered by consenting authorities when determining a planning application.
- 3.9. The removal of trees, without mitigation, constitutes an adverse effect that is likely to be regarded by consenting authorities as contrary to the overarching environmental objective within national planning policy to protect and enhance the natural environment and biodiversity.
- 3.10. In consideration of the desktop search results described previously, there are no adverse effects that cannot be mitigated or offset and which therefore lead to potential grounds for a refusal of planning permission.
- 3.11. There is no practical way to accommodate the trees within a development of this kind because of safety considerations as well as operational and maintenance requirements. It is noted that the wider area is relatively well planted, and land to the immediate north contains a number of large mature specimens.
- 3.12. It will be for the consenting authority to evaluate the proposed development, including mitigation measures, in consideration of all relevant local and national planning policies and guidance.



KEY

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- T1/G1/W1

Trees
- Root Protection Area (RPA)
- Survey Boundary
- Approximate location
(Feature not shown on supplied topographical survey)

Trees and hedgerow to be retained and protected

- Category A
(High quality)
- Category B
(Moderate quality)
- Category C
(Low quality)

Proposed tree and hedgerow works

- Trees to be removed
(Canopy outline denotes tree quality category)

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
Hulme Primary Substation

Title
Arboricultural Impact Assessment [EFFECTS]

Drawing Number
D10454.002

Drawn	Checked	Approved	Scale	Date
MM	TDP	TDP	1:250 @ A3	08/08/2024

Arboricultural Impact Assessment

4.0 Mitigation

4.1. This drawing describes mitigation measures that are incorporated within the proposed development and would be secured by the grant of planning permission. It also outlines recommended measures, which are not proposed but which could be secured by planning condition or agreement and therefore relied upon to draw conclusions regarding overall effects in planning terms.

4.2. This information is presented in the format of a method statement, which describes actions to be completed by the site manager in chronological order.

Proposed measures

4.3. The site manager and all contractors must observe and implement everything in this section to avoid a breach of planning.

Pre-start

4.4. The site manager will read, understand and retain responsibility for implementing this document.

4.5. A copy of this document in colour and at A3 will be made available for inspection on site and introduced to all relevant contractors.

4.6. TEP can be contacted on 01925 844 004 if required to assist with the correct interpretation of this document and/or inspect tree works and tree protection measures.

4.7. An Arboricultural Contractor will be appointed to undertake tree works.

4.8. Tree works shown on drawing D10454.002 will be completed in accordance with BS3998: 2010 Tree work - Recommendations.

4.9. Tree protection measures are not required because there are no trees that would be retained that are at risk of damage by the proposed works.

4.10. Tree protection measures should be designed if any temporary compounds, parking, material storage or access routes are proposed or used during construction that are on soft ground outside the red line boundary. Based on the layout opposite, there are no trees that would be affected by the points of access and egress from the site.

Recommended measures

4.11. The client, site manager and/or contractors should implement everything in this section; compliance may be specifically required by planning condition.

Planting

4.12. A scheme of tree planting should be produced and implemented to offset adverse effects associated with the proposed development and tree loss.

4.13. The planting should aim to maintain or enhance the benefits provided by trees overall,

4.14. In particular, new planting should reinstate or provide:

4.14.1. Screening of the development for residents to the north and east, and for pedestrians along Birchall Way

4.14.2. Visual amenity consistent with the treescape of the local area, especially along Princess Road

4.14.3. Habitats, including native trees and scrub, nesting opportunities, and areas of low intervention and disturbance.

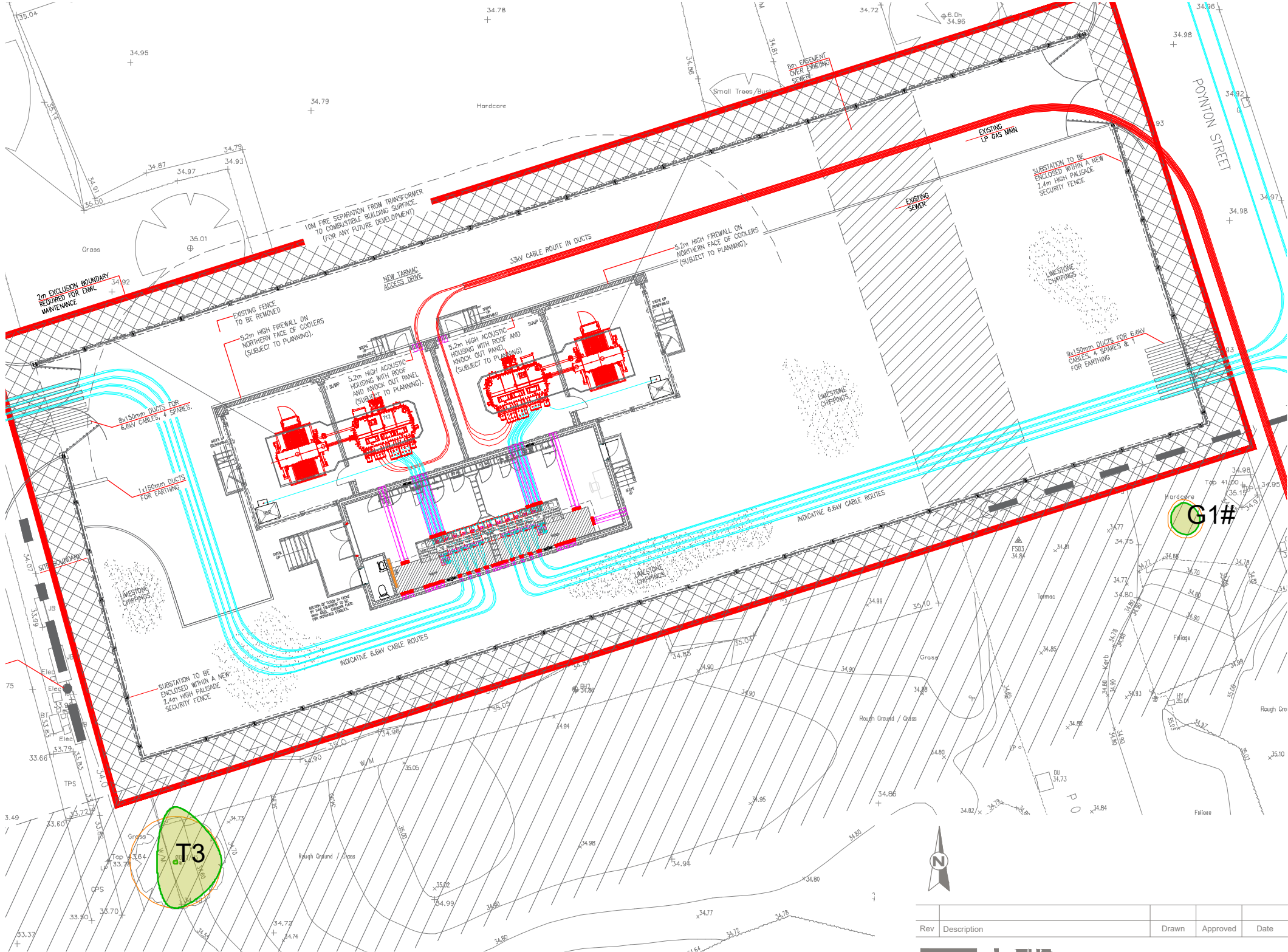
4.15. Elder trees should be included, and planted in locations where they can reach mature size with a full canopy.

4.16. Overall, trees providing at least the same canopy area as those that would be removed should be planted, to maintain environmental benefits.

4.17. A planting plan should be produced that incorporates the above objectives. Planting should preferably be in the local area, as close to the site as possible.

4.18. There are a number of local parks, green spaces and highway verges within the area immediately local to the site that could be potential sites for mitigation planting, however the permission of the relevant landowner would be required before any planting can take place.

4.19. Provision should be made for the maintenance of new planting in accordance with BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations, and replacement of failures for a period of at least 5 years.



KEY

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T1/G1/W1 Retained trees, groups and woodland

Root Protection Area (RPA)

Survey Boundary

Approximate location
(Feature not shown on supplied topographical survey)

Rev	Description	Drawn	Approved	Date
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TEP

THE ENVIRONMENT PARTNERSHIP

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Project
Hulme Primary Substation

Title
Arboricultural Impact Assessment [MITIGATION]

Drawing Number
D10454.003

Drawn	Checked	Approved	Scale	Date
MM	TDP	TDP	1:250 @ A3	08/08/2024



THE
ENVIRONMENT
PARTNERSHIP

APPENDIX A: Arboricultural Data Sheets



Surveyor Tom Popplewell
Survey Date 07/08/2024
Site Hulme Primary Substation
Drawing Ref D10454.001

Italicised Feature Ref: Inspection of this feature was restricted
Italicised Values: Feature value was estimated

APPENDIX A: Arboricultural Survey Data Sheets

Ref	Species	Height	Canopy Ground Clearance	Stem Diameter (or range)	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Lowest Branch Height	Lowest Branch Direction	Maturity	Condition	Comments on form, condition, health and significant defects	Management recommendations in current context	BS 5837 Quality Category	Estimated Remaining Contribution
		(m)	(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(N,S,E,W)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran			A,B,C,U (1,2,3)	Long, Medium, Short, Very Short
Trees																	
T1	Wild cherry	4.0	1.0	110	2	2.5	2.0	2.5	2.5	1.0	NW	Young	Good	Small tree in bramble near to fence line. Twin stem from 0.5m		C ,1	Long
T2	Elder	6.0	0.0	383	5	4.5	3.0	4.5	4.0	0.5	N	Mature	Good	Magnificent mature elder with full domed canopy enclosing interior space full of dead wood and dense vertical epicormics shoots. Growing on top of old bund with burrowing activity in root area. Multistemmed from the base and branching low. Surrounded by dense bramble making access difficult around the south. High habitat value and unusual size and age for species. Potential future veteran tree, although currently lacking the qualities. A very fine mature specimen.		A ,1, 3	Long
T3	Common ash	7.0	0.0	208	12	3.0	2.5	2.5	1.0	0.0	N	Middle Age	Fair	Healthy ash tree growing through mesh fence in places. Low multistemmed union.		C ,2	Medium
T4	Tree of heaven	2.0	1.0	50	1	1.0	1.0	1.0	1.0	1.5	N	Young	Good	Small self set tree from the neighbouring mature street tree. Ornamental species with the potential to grow and contribute to the street scene. Currently very small.		C ,1	Long
Groups																	
G1	Butterfly bush species, Goat willow, Crack willow	2 to 5	0.0	25 to 75	20							Young	Good	Self set bushes at fence line. Mostly buddleia. Two crack willow in northernmost grouping which will grow, but still very small.		C ,3	Long
G2	Grey willow	3 to 4	0.0	20 to 40	11							Young	Good	Two small multistemmed trees at fence line.		C ,3	Long
G3	Goat willow	4 to 6	0.0	50 to 110	10							Young to Middle Age	Fair	Three trees with multistemmed form. Growing in rubble at toe of bund. Easternmost tree has poor form and wounding at base.		C ,2, 3	Long
G4	Butterfly bush species, Goat willow	4 to 6	0.0	25 to 100	30							Young to Middle Age	Good	Dense bramble, impenetrable in places, around goat willow and around and beneath one large elder (T2). On bund of rubble and soil. Trees without noteworthy characteristics but comprising a useful screen and good habitat for birds. Evidence of burrowing on top of bund. Largest individual is a multistemmed goat willow to the south, at the bottom of the bank.		B ,2, 3	Long

APPENDIX B: Survey Method

Limitation

Trees are dynamic living organisms with a constantly changing structure; even healthy trees can change or decline. Survey information is presented as being correct at the time of survey. Limitations to the reliability of the survey data are noted within Appendix A and the main report text.

Scope

All woody vegetation with a stem diameter exceeding 75mm is recorded. Below this threshold, vegetation may also be recorded at the discretion of the surveyor. The survey includes woody vegetation within a defined boundary, and on adjacent land where the characteristics, location or context of the tree mean that activity within the boundary could affect the tree, or be influenced by it. This is typically up to 15m outside the boundary.

Resolution

Vegetation is recorded as either an individual *Tree*, *Group* of trees, *Woodland*, or *Hedgerow*. This is done at the discretion of the surveyor to provide a useful resolution to the survey data, to differentiate between features with varying attributes and group those with common attributes, and collective value or function.

Typically, *Trees* are recorded where they are arranged separately; different from adjacent trees; or where the assessment would benefit from greater detail. *Groups* are coherent arboricultural features comprising trees with a collective form, function, history or management opportunities. *Woodland* is recorded where areas of tree cover have the qualities of a woodland habitat, including age and species structure, natural regeneration, and associated non-arboreal features. *Hedgerow* describes linear features largely comprising woody vegetation that are under, or could be returned to, regular hedgerow management. It should be noted that these terms are also used in other assessment types, sometimes with different definitions.

Tree locations

The location of trees is based on stem locations and canopy spreads taken from a topographical survey, where available. Where this information is not available, this is noted in Appendix A and locations should be regarded as approximate. Approximate locations are based on one or more of: GPS data captured during the survey; aerial photographs; and measurement from known points of reference. Approximate stem locations are typically accurate to within a few metres. Stem locations are shown for all *Trees*.

Groups, *Woodland* and *Hedges* are principally described in terms of their canopy outline, although stem locations may also be shown. Individual tree canopy outlines are projected on Drawings based on measurements taken as described below (see Crown Spread). *Groups*, *Woodland* and *Hedges* canopy outlines are projected based on the same hierarchy of source data as stem locations.

Tree survey

The survey is conducted from ground level by an arboriculturist, taking account of the tree, and its context. The nature of the soil is not assessed. Non-invasive assessment tools may be used as appropriate, including hypsometer, measuring tape, probe and nylon mallet.

The following attributes are recorded for each feature (see Arboricultural Survey Data Sheets at Appendix A):

Reference Number	A unique code per feature, typically but not necessarily a chronological sequence, in the form <i>Tn</i> for <i>Trees</i> ; <i>Gn</i> for <i>Groups</i> ; <i>Wn</i> for <i>Woodlands</i> ; and <i>Hn</i> for <i>Hedgerows</i>
Species	The common name is given. All species are listed for <i>Groups</i> , <i>Woodland</i> and <i>Hedgerows</i> . The Latin name may also be given if further clarification is required.
Height	Top height recorded in metres, or the range for <i>Groups</i> , <i>Woodland</i> and <i>Hedgerows</i>
Canopy Ground Clearance	The height of the canopy above ground level in metres
Stem Diameter	A measurement taken at 1.5 metres above ground level, or the nearest representative point below, in millimetres. For multi-stemmed trees a single figure is calculated according to BS5837 4.6. For <i>Groups</i> , <i>Woodland</i> and <i>Hedgerows</i> , the range of diameters

No. of Stems / Individuals	The number of stems arising below a height of 1.5 metres, or for <i>Groups</i> , <i>Woodland</i> and <i>Hedgerows</i> an estimate or count of the number of trees
Crown Spread	Radial branch spread in metres at cardinal points (N, S, E, W) from the location of the <i>Tree</i> stem at ground level (for <i>Groups</i> , <i>Woodland</i> and <i>Hedgerows</i> , see <i>Tree Locations</i>)
Lowest Branch Height	The height of the first significant branch at the point of attachment (<i>Trees</i> only)
Lowest Branch Direction	The direction of growth of the first significant branch from the point of attachment (<i>Trees</i> only)
Maturity	Classification describing age relative to the species, and size and growth potential, in order to inform management decisions • Young means small and/or recently planted and could be relocated, or replaced on a like for like basis • Middle Age means established and independent, within the growth stage of life, and with potential to continue increasing in height and/or spread • Mature means having reached ultimate height and/or spread, given the location and surroundings; further increases will be slow or limited • Mixed Age (<i>Groups</i>, <i>Woodland</i> and <i>Hedgerows</i> only) means comprising all three maturity classes
Condition	An overall assessment of a feature's physiological and structural state, informing longevity and quality categorisation, and supported by <i>Comments</i> • Good condition means with vitality and resilience commensurate with species and age, and without significant defects or pathogens • Fair condition means with tolerable reduction of vitality and resilience, and/or remediable or tolerable defects and/or pathogens • Poor condition means with declining or significant loss of vitality and resilience, and/or significant and irreparable defects and/or pathogens • Dead condition means without photosynthetic or metabolic capacity, or moribund and in imminent terminal decline • Mixed (<i>Groups</i> and <i>Woodland</i>) means comprising more than one condition class • Veteran means trees of exceptional value, meeting recognised criteria including age, size and characteristics. Classification is partly informed by the sustained presence of structural defects, physiological decline, and pathogens, and their contribution to biodiversity. Undesirable characteristics in ordinary trees may be desirable in veteran trees, therefore <i>Veteran</i> can be understood as a superlative <i>Condition</i> that supersedes other categories (excluding <i>Dead</i>).
Comments	A description of all significant characteristics of the feature and its context that are not described by other attribute fields; including observations to support the classification of <i>Condition</i> , <i>Quality Category</i> and <i>Estimated Remaining Contribution</i> as appropriate
Management Recommendations	Recommendations for arboricultural works based on the current land use, in the interests of good arboricultural practice. These are incidental to the primary survey purpose, and not a comprehensive schedule in pursuit of any particular objective.
BS 5837 Quality Category	Tree quality assessment based on Table 1 of BS 5837:2012 (see below) comprising quality categories A , B , C and U and sub-categories 1 , 2 and 3
Estimated Remaining Contribution	A forecast of the durability of the feature in its current form and context, and therefore the reliance that can be placed on any benefits or functions it provides. This is influenced by <i>Species</i> and <i>Condition</i>, and is not necessarily a forecast of life expectancy. • Long means more than 40 years • Medium means 20 to 40 years • Short means 10 to 20 years • Very Short means less than 10 years

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 <i>NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.</i>			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

Table 1: Extract from **British Standards Institution (2012) BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations**, page 9

Note on Root Protection Areas:

Data is captured during the survey to inform the design of Root Protection Areas (RPA). These are a design tool, representing the area around a tree in which restrictions to some activities may be required to avoid significant harm, particularly to roots and soil. The RPA is a function of *Stem Diameter*, and additional considerations including management history, barriers to root growth, topography, ground conditions and tree characteristics. These factors are combined by an arboriculturist to produce a buffer zone for each feature from which the exclusion of construction activities would ensure the continued reliability of the survey data at Appendix A, including *Condition*, *BS 5837 Quality Category* and *Estimated Remaining Contribution*.

For *Trees*, RPA is defined as a circle with a radius 12 times the *Stem Diameter*, which may be modified to reflect the considerations above.

For *Groups* and *Woodland* RPA is based on the size and location of peripheral constituent trees, and presented as an offset from the canopy edge giving equivalent or greater protection to all trees of any size, or modified to reflect significant variation in constituent tree sizes and/or the considerations above.

For *Hedgerow*, no RPA is shown. Typically, hedgerow requires a smaller stand-off than trees due to reduced crown dimensions. Any stand-off should include sufficient space for access and ongoing management and should therefore normally be based on the canopy spread rather than root spread.

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