MURRAY
TREE CONSULTANCY

ARBORICULTURAL REPORT
(BS 5837:2012)

PROPOSED DEVELOPMENT

AT

10 OLD LANSDOWNE ROAD
WEST DIDSBURY
MANCHESTER

November 2017

PM/FULL/29/11/17

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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 keep up to date with the latest research and best practice by attending relevant courses and seminars.

1.2 Tree Survey

1.2.1 I was recently instructed by Smashbox Architecture on behalf of their clients to carry out a site visit at 10 Old Lansdowne Road, West Didsbury, Manchester 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 Wednesday 22nd November 2017 and the weather was overcast but dry.

1.2.3 This report should be read in conjunction with the attached Arboricultural Data and Site Plans of Appendix B and E.

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 The Site

2.1.1 The site in question is the front garden of a residential dwelling that has several trees and shrubs present. The ground gradually slopes up from the highway.

2.1.2 The proposal is to extend the basement area into the front garden.

2.2 The Trees

2.2.1 A total of seven individual trees and one hedge were surveyed and plotted in order to assess their health and dimensions in accordance with the British Standard and the results are clearly detailed within the Appendices of this report.

2.2.2 In general the trees were found to be in reasonable condition for their age and species but mostly of low quality. Any works identified within the 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 (T5 & T6)
A – 0 trees
B – 2 trees/groups (T4 & H1)
C – 4 trees (T1, T2, T3 & T7)

3.3 Standard of Work

Any 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.

3.4 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.

3.5 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 Natural England for further advice. Natural England can be contacted on 0300 060 3900 or by e-mail to: enquiries@naturalengland.org.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 form a person qualified and experienced in handling such matters and fully conversant with the implications of the Act.

3.0 DISCUSSION

3.1 The majority of the root system, of a tree, is in the surface 600mm of the soil, extending radically for distances frequently in excess of the trees height. Beyond the main structural roots (close to the base of the trunk), the root system rapidly sub-divides into smaller diameter roots: off this main system, a mass of fine roots develops.

3.2 The shape of the main structural roots develops in response to the need for the tree to have physical stability. Beyond these major roots, root growth and development is influenced by the availability of water and nutrients. Unless conditions are uniform around the tree, which would be unusual, the extent of the root system will be very irregular and difficult to predict. It will not generally show the symmetry seen in the branch system.

3.3 The parts of the root system, which are active in water and nutrient uptake, are very fine, typically less than 0.5mm diameter. They are short lived, developing in response to the needs of the tree, with the majority dying each winter. It is *essential* that conditions in the soil remain conducive to the healthy growth of these fine roots so that the water and nutrients necessary for healthy tree growth can be absorbed.

3.4 All parts of the root system, but especially the fine roots, are vulnerable to damage. Once they are damaged, water and nutrient uptake will be restricted until new roots have regenerated. Vigorous young trees will be capable of rapid regeneration but over mature trees will respond slowly, *if at all*.

3.5 In order to live and grow, roots need oxygen from the soil. Respiration by the roots and other soil organisms depletes this oxygen and increases carbon dioxide levels in the soil; a correct balance of these gases is normally maintained by diffusion between the soil and the atmosphere. Anything, which disturbs this balance, will affect the condition of the root system.

3.6 The factors that most commonly affect this diffusion adversely, and therefore damage roots, are the following: -

a) Compaction of the ground, which reduces the space between soil particles. This is particularly important on clay soils. A single passage by heavy equipment on clay soils or storage of heavy materials can cause significant damage.
b) Changing soil levels, even for a few weeks.
c) Covering the root area with impervious surfaces.
d) A rise in the level of the water table. Roots can tolerate submersion for short periods. But a permanent rise will deplete the soil of oxygen.

3.7 Serious damage is often caused during preliminary site works by stripping the topsoil. For this reason, such works should be avoided until protective fencing has been erected.

3.8 Excavations in the rooting area can sever roots. As the majority of roots are in the surface 600mm, even shallow excavations can cause damage.

3.9 Excavations for foundations, landscaping or service trenches are usually sufficiently deep to sever most of the roots, and it should therefore be assumed that all parts of the root system beyond the excavation would no longer serve the tree.

3.10 Excavation or soil stripping which sever or damage the roots may impair the stability of the tree and make it dangerous.

4.0 ARBORICULTURAL IMPLICATIONS ASSESSMENT

4.1 The purpose of this section is to assess the implications, if any, the proposed development will have on the trees identified in the Tree Survey of 22nd November 2017 carried out by Murray Tree Consultancy (see Appendix B) and advise on arboricultural measures, which would be likely to mitigate any damage resulting from the proposed development

4.1 The Site Layout Plan within Appendix E identifies the trees in relation to the proposed development.

4.2 In order to fully assess the impact of the proposals an Implications Table has been created, which gives details of the proximity of the associated works to the trees.

4.3 The below Implications Table details the Root Protection Area (RPA) 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. This is also illustrated on the Site Plan of Appendix E.

4.4 This information can then be used in accordance with BS 5837:2012 to determine whether the development will have a detrimental impact on the health of the trees. Once this has been determined remedial measures can be detailed to reduce the impact the proposals will have.

4.5 Implications Table: -

Tree No.	Root Protection Area (m^2)	Circle Radius (m)	Distance to any proposed construction or surfacing (m)	Can the Tree be Successfully Retained
T1	10.18	1.80	Remove for development	
T2	191.13	7.80	6.0	Yes see 5.0
T3	7.65	1.56	3.6	Yes
T4	113.10	6.00	4.0	Yes see 5.0
T5	40.72	3.60	Remove for condition	
T6	2.22	0.84	Remove for condition	
T7	2.22	0.84	Remove for development	

Tree No.	Root Protection Area (m^2)	Circle Radius (m)	Distance to any proposed construction or surfacing (m)	Can the Tree be Successfully Retained
H1	1.13	0.60	5.0	Yes

4.6 To assess the implications of the proposed development each tree can be categorised in the following way: -

	Trees to be Retained		Trees to be removed	
	With No Impact	With detailed methodology	Due to Condition	Due to Development
Tree No.	T3 & H1	T2 & T4	T5 & T6	T1 & T7

5.0 MITIGATING PROPOSALS

5.1 Tree Losses

5.1.1 The loss of any tree is always regrettable although in this instance the trees to be removed are of poor quality with no significant amenity value. T5 (Berberis & Ash) and T6 (Rowan) would require removal despite any new development due to their condition and proximity to the property. T1 & T7 (Cypress) are too close to the property for their species and will likely get damaged during construction.

5.2 Development

5.2.1 As shown above, the Implications Table identifies the potential for the proposed development to have an impact on T2 & T4 due to the proximity of the proposed excavation being within their Root Protection Area's (RPA's) as shown on the plans.

5.2.2 However, with regards to T2 (Elderberry) this is a large multi-stemmed shrub and the RPA is exaggerated due to the requirements of the British Standard to add all stems together. In addition the development only affects a very small percentage of this area. Therefore, it is considered that the roots of this tree/shrub should not be adversely affected. It is also envisaged that this tree/shrub will be reduced in order provide more working room as well as to reduce stress on aging limbs.

5.2.3 T4 (Lawson Cypress) is the most significant tree of the front garden and has a reasonable girth but a concise crown spread. The proposed excavation for the basement extension is approx. 3.5m from the stem. Although this is within its RPA it is still considered far enough away from the tree not to cause any major damage to structural roots. This damage can be reduced by careful hand excavation within the top 600mm in order to carefully prune roots rather than excavate them with a machine. It is considered that the only roots found will be small in diameter and mostly fibrous. This type of root loss is usually quickly reproduced following completion of construction

5.2.4 A clear tree works specification and details of all tree protective measures can be found in the following Arboricultural Method Statement (Section 6.0).

6.0 METHOD STATEMENT

Before any form of development commences on the site the following works should be undertaken: -

6.1 Tree Works

Tree No.	Proposed Works
T1, T5, T6 & T7	Fell to ground level and grind out stumps.
T2	Reduce and re-shape by crown by approximately 1.5m.

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

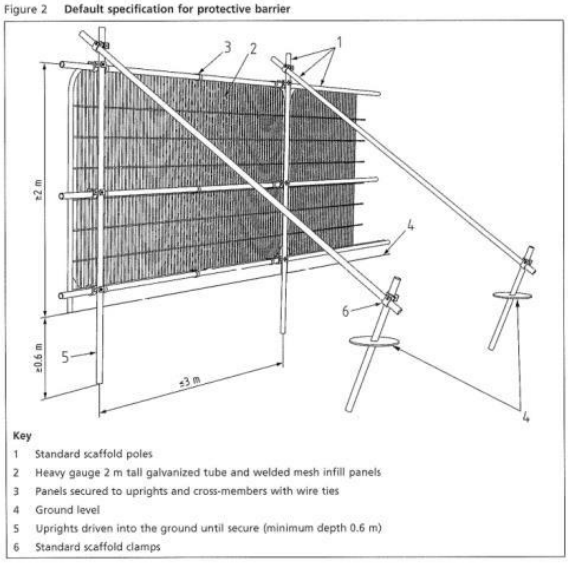
6.2 Protective Fencing

6.3.1 All fencing used on the site should fully comply with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

6.3.2 The fencing should be strong and suitable for local conditions. It should also take into account the degree of construction activity on the site.

6.3.3 In this circumstance the location for the protective fencing should be as shown on the Tree Protection Plan of Appendix E and of the following specification:

Figure 2 **Default specification for protective barrier**

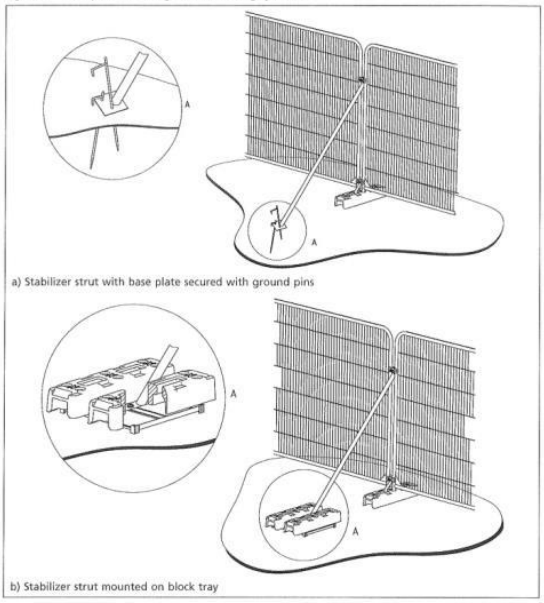


Key
1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Or

Heras type temporary fencing can sometimes be acceptable with the bases pinned to the ground securely. This needs be checked with the Local Planning Authority.

Figure 3 **Examples of above-ground stabilizing systems**



a) Stabilizer strut with base plate secured with ground pins

b) Stabilizer strut mounted on block tray

6.3.4 No storage of materials or any construction operations should occur within the fenced area. Additionally, when designing the site layout, account should be taken of the route/installation method of underground services/drains and, the route/construction method of new access roads/driveways in relation to the retained trees. It would be advisable to mark out the optimum position of the protective fencing on the ground prior to finalisation of any design proposal.

6.3.5 Notices should also be erected on the fencing stating 'Protected Area - No operations within fenced area'. An example can be found in Appendix D, which should be laminated and attached to the fencing at regular intervals.

6.3.6 The positioning of the protective fencing is also very important and should be erected in the proposed location identified on the site plan of Appendix E. Once the fence has been erected it should never be crossed and particular care should be taken not to store any materials or soil within the protected area.

6.4 Additional Precautions Outside Fenced Areas

6.4.1 Oil, bitumen, cement or other material likely to cause damage to the tree will not be stacked or discharged within 10m of the trees stem or within the protective area. Also materials in general will not be stacked or discharged within the exclusion zone.

6.4.2 Concrete mixing and washing will not be carried out within 10m of any retained trees.

6.4.3 Fires will not be lit beneath the foliage or in a position where the flames could extend to within 5m of the foliage, branches or trunk. If the fire is large then this may necessitate a distance of at least 20m.

6.4.4 Trees that are to be retained will not be used as anchorage for equipment.

6.4.5 Notice boards, telephone cables, or other services will not be attached to any part of the retained tree.

6.4.6 Care should be taken when using cranes or other equipment near the canopy of the retained trees. Also any trees to be felled in proximity to the retained trees should be done so with particular care.

6.5 Services

6.5.1 Where possible all service trenches should be dug outside of the Root Protection Area.

6.5.2 Should this not be possible then the guidelines within 'NJUG 10' *Guidelines for the Planning, Installation and Maintenance of Utility Services in Proximity to Trees* should be adopted, in particular Section 4.0, which is included within Appendix C of this report.

6.6 Methodology for Excavation within Root Protection Area's (to be carried out under supervision by a competent arborist)

6.6.1 The proposed new excavation for the basement extension is within the Root Protective Area (RPA) of T4. This is illustrated on the plan of Appendix E. In this area the following specification will be applied: ***Any excavations which have to be undertaken within the root protection area should be carried out carefully by hand and any roots encountered in those areas should be severed cleanly with a sharp tool avoiding ripping or snagging. Prior to backfilling any retained roots should be surrounded with sharp sand (builders sand should not be used because of its high salt content which is toxic to tree roots), or other loose granular fill, before soil or other material is replaced. This material should be free of contaminants and other foreign objects potentially injurious to tree roots.***

6.7 Summary of Methodology for the Protection Trees

1. **Remedial tree works done under the supervision of a competent arboriculturalist.**

2. **Erection of Protective Fencing in accordance with this Method Statement and plan of Appendix F and to be checked by a competent arboriculturalist before commencement of works.**

3. **The excavation for the top 600mm for the basement extension to be carried out in line with section 6.6 above and to be carried out under supervision by a competent arboriculturalist.**

4. **Construction of Development.**

5. **The removal of Protective Fencing is only to be done with the agreement of a competent arborist or the LPA.**

Signed

P. Murray

Peter Murray (HND. ARB, M, Arbor A)
Consulting Arborist

12th December 2017

APPENDIX A

Glossary of Terms
Table 1 of BS 5837:2012

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 below).

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 tumerous) - 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 is 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.

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** – *Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.*		
	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 B

Arboricultural Data

Arboricultural Data Sheet: 10 Old Lansdowne Rd, West Didsbury, Manchester **Date of Survey:** 22/11/17 **Surveyor:** PM

Crown C = Crown Clearance; Cond R = Condition Rating; ERC (Yrs) = Estimated Remaining Contribution; TQRA = Tree Quality Category Rating; RPA (m^2) = Root Protection Area (m^2)
Recommended works should be carried out to the *British Standard Recommendations for Tree Work, BS 3998:2010*

Tree No.	Species	Dbh (mm)	Height (m)	Age	Crown Spread				Crown C	Cond R	Comments and Preliminary Management Recommendations	ERC (Yrs)	TQCR	RPA (m^2)	RPA Circle Radius (m)
					N	E	S	W							
T1	2 x Cypress	150 comb	6	SM	1	1	1	1	0.5	B/C	Two ornamental specimens located within raised planter close to the property. Low potential.	10+	C2	10.18	1.80
T2	Elderberry	650 comb	6	M	4.5	4.5	4.5	4	2	B/C	A large multi-stemmed shrub with reasonable form but aging limbs liable to fail in the near future.	10+	C2	191.13	7.80
T3	Holly	130	7	SM	2	1	2	2	0.5	B	A slender specimen slight one sided. Striving for light within group.	10+	C2	7.65	1.56
T4	Blue Lawson Cypress	500	11	M	2	2	2	2	0.5	A	A dominant specimen with good form.	20+	B2	113.10	6.00
T5	Berberis & Ash	300 comb	5	EM	4	4	3	3	1.5	B/C	A large multi-stemmed shrub with a self-sown Ash growing through it that should be removed.	5-10	U	40.72	3.60
T6	Rowan	70	4	Y	1	1	2	1	2	B/C	A young specimen close to the house with poor form.	5-10	U	2.22	0.84
T7	3 x Cypress	70 comb	3	SM	1	1	1	1	0.5	B/C	Young multiple trees located within raised planting area with low potential.	10+	C2	2.22	0.84
H1	Hedge - Privet	50	2	M	0.5	0.5	0.5	0.5	0	A	A well maintained front boundary hedge.	20+	B2	1.13	0.60

APPENDIX C

NJUG 10 Section 4.0

Telecommunications Code (Schedule 2). Paragraph 19 of the Telecommunications Code enables operators to require the lopping of trees which overhang the street and obstruct or interfere with the working of their lines.

4. HOW TO AVOID DAMAGE TO TREES

This section gives general guidance on methods of work to minimise damage to trees. The local authority (or for privately owned trees, the owner or their agent), should be consulted at an early stage prior to the commencement of any works. This will reduce the potential for future conflict between trees and apparatus.

4.1 Below Ground

Wherever trees are present, precautions should be taken to minimise damage to their root systems. As the shape of the root system is unpredictable, there should be control and supervision of any works, particularly if this involves excavating through the surface 600mm, where the majority of roots develop.

4.1.1 **Fine Roots**

Fine roots are vulnerable to desiccation once they are exposed to the air. Larger roots have a bark layer which provides some protection against desiccation and temperature change. The greatest risk to these roots occurs when there are rapid fluctuations in air temperature around them e.g. frost and extremes of heat. It is therefore important to protect exposed roots where a trench is to be left open overnight where there is a risk of frost. In winter, before leaving the site at the end of the day, the exposed roots should be wrapped with dry sacking. This sacking must be removed before the trench is backfilled.

4.1.2 **Precautions**

The precautions referred to in this section are applicable to any excavations or other works occurring within the Prohibited or Precautionary Zones as illustrated in Figure 1 – ‘Tree Protection Zone’.

4.1.3 **Realignment**

Whenever possible apparatus should always be diverted or re-aligned outside the Prohibited or Precautionary Zones. Under no circumstances can machinery be used to excavate open trenches within the Prohibited Zone.

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The appropriate method of working within the Precautionary Zone should be determined in consultation with the local authority (or for privately owned trees the owner or their agent) and may depend on the following circumstances;

- the scope of the works (e.g. one-off repair or part of an extensive operation)
- degree of urgency (e.g. for restoration of supplies)
- knowledge of location of other apparatus
- soil conditions
- age, condition, quality and life expectancy of the tree

Where works are required for the laying or maintenance of any apparatus within the Prohibited or Precautionary Zones there are various techniques available to minimise damage.

Acceptable techniques in order of preference are;

a) Trenchless

Wherever possible trenchless techniques should be used. The launch and reception pits should be located outside the Prohibited or Precautionary Zones.
In order to avoid damage to roots by percussive boring techniques it is recommended that the depth of run should be below 600mm. Techniques involving external lubrication of the equipment with materials other than water (e.g. oil, bentonite, etc.) must not be used when working within the Prohibited Zone. Lubricating materials other than water may be used within the Precautionary Zone following consultation and by agreement.

b) Broken Trench - Hand-dug

This technique combines hand dug trench sections with trenchless techniques if excavation is unavoidable. Excavation should be limited to where there is clear access around and below the roots. The trench is excavated by hand with precautions taken as for continuous trenching as in (c) below. Open sections of the trench should only be long enough to allow access for linking to the next section. The length of sections will be determined by local conditions, especially soil texture and cohesiveness, as well as the practical needs for access. In all cases the open sections should be kept as short as possible and outside of the Prohibited Zone.

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c) Continuous Trench - Hand-dug

The use of this method must be considered only as a last resort if works are to be undertaken by agreement within the Prohibited Zone. The objective being to retain as many undamaged roots as possible.

Hand digging within the Prohibited or Precautionary zones must be undertaken with great care requiring closer supervision than normal operations.

After careful removal of the hard surface material digging must proceed with hand tools. Clumps of roots less than 25mm in diameter (including fibrous roots) should be retained in situ without damage. Throughout the excavation works great care should be taken to protect the bark around the roots.

All roots greater than 25mm diameter should be preserved and worked around. These roots must not be severed without first consulting the owner of the tree or the local authority tree officer / arboriculturist. If after consultation severance is unavoidable, roots must be cut back using a sharp tool to leave the smallest wound.

4.1.5 **Backfilling**

- Any reinstatement of street works in the United Kingdom must comply with the relevant national legislation (see: **Volume 6 – 'Legislation and Bibliography'**). In England this relates to the requirements of the code of practice – 'Specification for the Reinstatement of Openings in Highways' approved under the New Roads and Street Works Act 1991. Without prejudice to the requirements relating to the specification of materials and the standards of workmanship, backfilling should be carefully carried out to avoid direct damage to roots and excessive compaction of the soil around them.

- The backfill should, where possible, include the placement of an inert granular material mixed with top soil or sharp sand (not builder's sand) around the roots. This should allow the soil to be compacted for resurfacing without damage to the roots securing a local aerated zone enabling the root to survive in the longer term.

- Backfilling outside the constructed highway limits should be carried out using the excavated soil. This should not be compacted but lightly "tamped" and usually left slightly proud of the surrounding surface to allow natural settlement. Other materials should not be incorporated into the backfill.

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4.1.6 **Additional Precautions near Trees**

- Movement of heavy mechanical plant (excavators etc.) must not be undertaken within the Prohibited Zone and should be avoided within the Precautionary Zone, except on existing hard surfaces, in order to prevent unnecessary compaction of the soil. This is particularly important on soils with a high proportion of clay. Spoil or material must not be stored within the Prohibited Zone and should be avoided within the Precautionary Zone.

- Where it is absolutely necessary to use mechanical plant within the Precautionary Zone care should be taken to avoid impact damage to the trunk and branches. A tree must not be used as an end-stop for paving slabs or other materials nor for security chaining of mechanical plant. If the trunk or branches of a tree are damaged in any way advice should be sought from the local authority tree officer / arboriculturist.

See TABLE 1 –'Prevention of Damage to Trees Below Ground' below for summary details regarding causes and types of damage to trees and the implications of the damage and the necessary precautions to be taken to avoid damage.

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APPENDIX D

Site Notice for Protective Fencing



TREE PROTECTION AREA
KEEP OUT!

TREES ENCLOSED BY THIS FENCE ARE PROTECTED BY PLANNING CONDITIONS AND ARE SUBJECTS OF A TREE PRESERVATION ORDER
(TOWN & COUNTRY PLANNING ACT 1990)

CONTRAVENTION OF TREE PRESERVATION ORDER MAY LEAD TO **CRIMINAL PROSECUTION**

THE FOLLOWING **MUST** BE OBSERVED BY ALL PERSONS:-

- THE PROTECTIVE FENCING MUST NOT BE REMOVED
- NO PERSON SHALL ENTER THE PROTECTED AREA
- NO MACHINE OR PLANT SHALL ENTER THE PROTECTED AREA
- NO MATERIALS SHALL BE STORED IN THE PROTECTED AREA
- NO SPOIL SHALL BE DEPOSITED IN THE PROTECTED AREA
- NO EXCAVATION SHALL OCCUR IN THE PROTECTED AREA

ANY INCURSION INTO THE PROTECTED AREA MUST BE WITH THE WRITTEN PERMISSION OF THE LOCAL PLANNING AUTHORITY

APPENDIX E

Site Plans - Tree Constraints Plan
Development Layout Plan
Tree Protection Plan

T5
T4
T7
T3
T6
T2
H1
12
10
T1

KEY

TREE LOCATION AND CONDITION

GROUP/ HEDGE LOCATION AND CONDITION

ROOT PROTECTION AREA (RPA)

CROWN SPREADS

Key to Condition

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

NORTH

10 Lansdowne Road, Didsbury

TREE CONSTRAINTS PLAN

Scale: 1/200 @A3
Date: November 2017
Drawing: MY634/LRD/01 REV -

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T4
T3
T2
H1
T5
T7
T6
T1
12
10

KEY

TREE LOCATION AND CONDITION

GROUP/ HEDGE LOCATION AND CONDITION

ROOT PROTECTION AREA (RPA)

CROWN SPREADS

Key to Condition

Red – Trees of poor quality **Blue** – Trees of moderate quality
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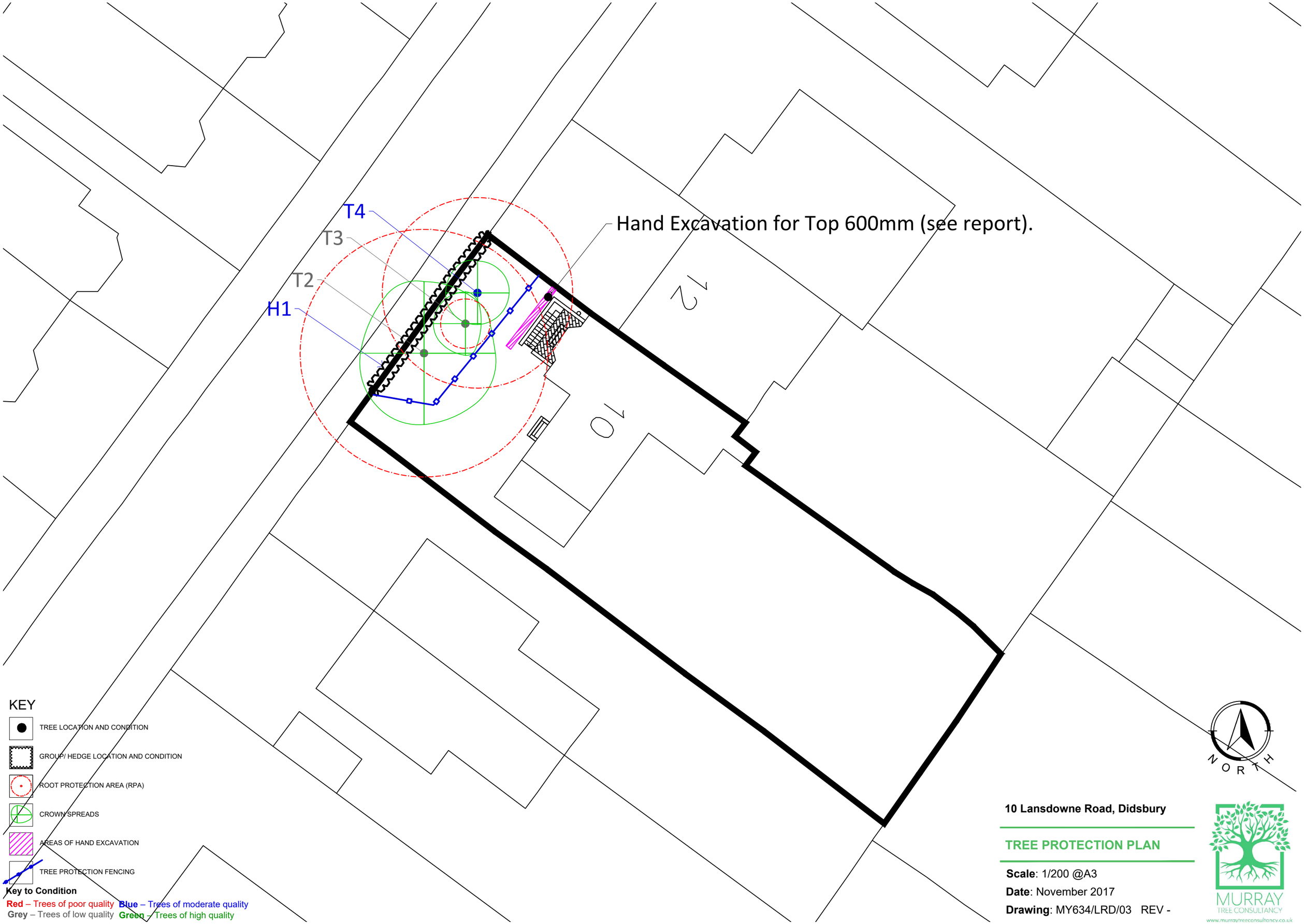
N O R T H

10 Lansdowne Road, Didsbury

DEVELOPMENT LAYOUT PLAN

Scale: 1/200 @A3
Date: November 2017
Drawing: MY634/LRD/02 REV -

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KEY

- TREE LOCATION AND CONDITION
- GROUP/ HEDGE LOCATION AND CONDITION
- ROOT PROTECTION AREA (RPA)
- CROWN SPREADS
- AREAS OF HAND EXCAVATION
- TREE PROTECTION FENCING

Key to Condition

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

NORTH

10 Lansdowne Road, Didsbury

TREE PROTECTION PLAN

Scale: 1/200 @A3
Date: November 2017
Drawing: MY634/LRD/03 REV -

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