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Project: 20 Stenner Lane, Didsbury, M20 2RQ

BS 5837:2012 Method Statement.

Inspection Record.

Date of Inspection	Surveyor
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Contents

1.0	Discussion	4
2.0	Method Statement	5
2.1	Tree Works.....	5
2.2	Protective Fencing	5
2.3	Additional Precautions Outside Fenced Areas	5
2.4	Installation of Cable To STP	6
2.5	Ground Protection (Special Measures)	7
2.6	Tree Guard	7
2.7	Summary of Methodology for the Protection of the Trees	8

Appendix One Tree Plan

Appendix Two Tree Protection Fencing

Appendix Three Special Measures Area

Appendix Four Tree Guard

1.0 Discussion

- 1.1 The majority of the root system of a tree is in the surface 600mm of the soil extending radially 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.
- 1.2 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.
- 1.3 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.
- 1.4 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*.
- 1.5 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.
- 1.6 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.
- 1.7 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.
- 1.8 Excavations in the rooting area can sever roots. As the majority of roots are in the surface 600mm, even shallow excavations can cause damage.

- 1.9 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.
- 1.10 Excavation or soil stripping which sever or damage the roots may impair the stability of the tree and make it dangerous.

2.0 Method Statement

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

2.1 Tree Works

Tree No.	Proposed Works
T1#	Crown lift to 3m on North West Side of Crown
T2#	Fell for Access
T3#	No Action
G4#	Fell for Access

All Pruning works to be carried out in line with BS3998:2010 Tree Work-Recommendations

2.2 Protective Fencing

- 2.2.1 All fencing used on the site should fully comply with BS 5837:2012 (Trees in Relation to Construction – Recommendations), however due to the small nature of the site it is felt that Plastic Fencing will be sufficient in this case (See Appendix)
- 2.2.2 The fencing should be strong and suitable for local conditions. It should also take into account the degree of construction activity on the site.
- 2.2.3 Notices should also be erected on the fencing stating, 'Protected Area - No operations within fenced area'.
- 2.2.4 The positioning of the protective fencing is also very important and should be erected in the proposed location identified in Appendix One. 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.

2.3 Additional Precautions Outside Fenced Areas

- 2.3.1 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.
- 2.3.2 Concrete mixing and washing will not be carried out within 10m of any retained trees.

- 2.3.3 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.
- 2.3.4 Trees that are to be retained will not be used as anchorage for equipment.
- 2.3.5 Notice boards, telephone cables, or other services will not be attached to any part of the retained tree.
- 2.3.6 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.

2.4 Installation of Cable To STP

- 2.4.1 The installation of the new duct of the electrical cable from 20 Stenner Lane to the STP will pass through the RPAs of T1#, T2#, T3# & G4#. T2 and G4 will require removal for access reasons, however, the installation of the cable will likely have adverse impacts on the retained trees (T1# and T3#)
- 2.4.2 To minimise the potential impacts of the retained trees the duct will be installed via a moling method. Moling is a trenchless method used to lay pipes. During the moling process, a pneumatically-driven machine known as a mole forces its way through the soil along the desired path of the pipe. Moling avoids the need to dig a trench.
- 2.4.3 Not all moling operations are a success but this method should be used first before any other methods are considered. If the moling operation does not work, then supervised excavation will be required.
- 2.4.4 In the case of the moling not working and to prevent damage to any tree roots within the RPAs of these trees a trench will be dug to install the duct for the electrical cable, all excavation will be supervised by an Arboricultural Consultant and any root pruning that is required will be undertaken by the Arboricultural Consultant.
- 2.4.5 If the following points are adhered to then the long-term health and retention of T1# and T3# will not be adversely affected.
 - Excavation must be carried out using hand tools to avoid direct damage to the bark of the roots. The use of specialised equipment such as high air pressure machinery to excavate the soil with minimal disturbance to roots will be utilised.
 - Exposed roots will be wrapped in moist, clean Hessian to prevent the roots from drying out in hot or dry weather. The hessian must be removed before backfilling.
 - Roots less than 25mm diameter may be pruned back, preferably to a growing point. A sharp cutting tool such as bypass secateurs or a handsaw should be used to leave the

smallest wound possible. Roots greater than 25mm in diameter should be retained wherever possible.

- Root pruning will be carried out under the supervision of the Arboricultural Consultant.
- Backfilling of any excavation must be carried out by hand to avoid direct root damage or compaction, where possible. Builder sand must not be used in the backfill material.

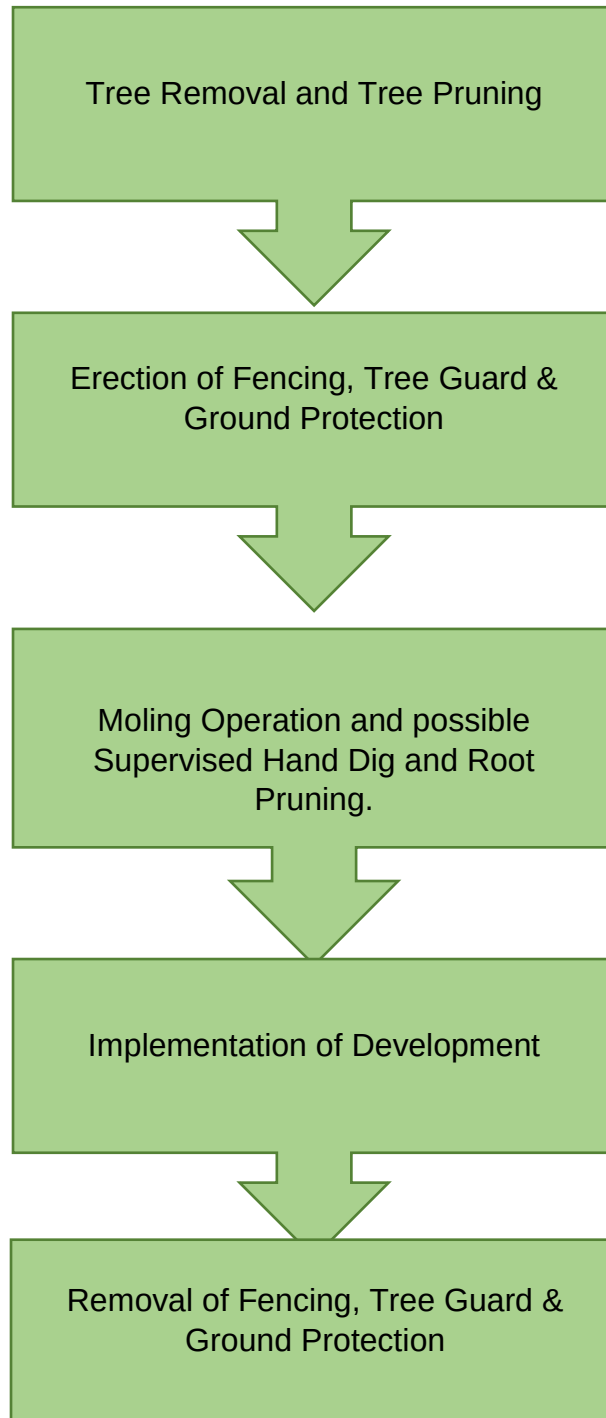
2.5 Ground Protection (Special Measures)

- 2.5.1 The dimensions of the ground protection is outlined in appendix 1, with a possible design shown in appendix 3 of this document.
- 2.5.2 For the use of pedestrian-operated plant up to a gross weight of 2 t, interlinked ground protection boards placed on top of a compression-resistant layer (e.g. 150 mm depth of woodchip), laid onto a geotextile membrane can be used as ground protection. Heavier plant will require an engineered design solution based on an arboriculturalist advice.
- 2.5.3 Due to the limited space available and some sloping of the ground it is recommended that the ground protection around T1# should be in the form of wood chipings with a minimum depth of 100mm.

2.6 Tree Guard

- 2.5.1 Due to the limited space and the inability to erect protective fencing around T1#, the use of a tree guard will be utilised to protect the stem and scaffold branches of T1#
- 2.5.2 An example of a tree guard can be found in appendix 4.

2.7 Summary of Methodology for the Protection of the Trees



Appendix One

Tree Plan

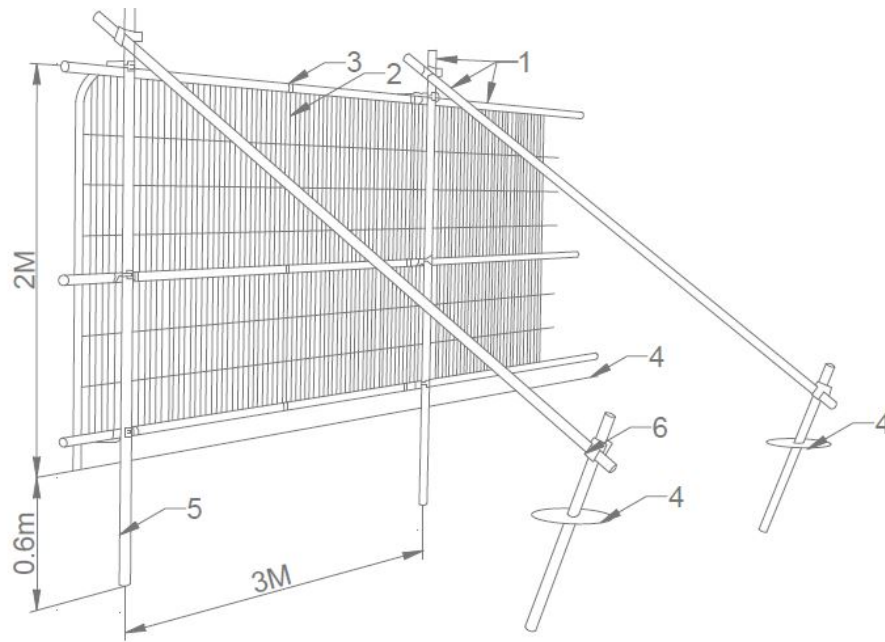


Appendix Two

Tree Protection Fencing



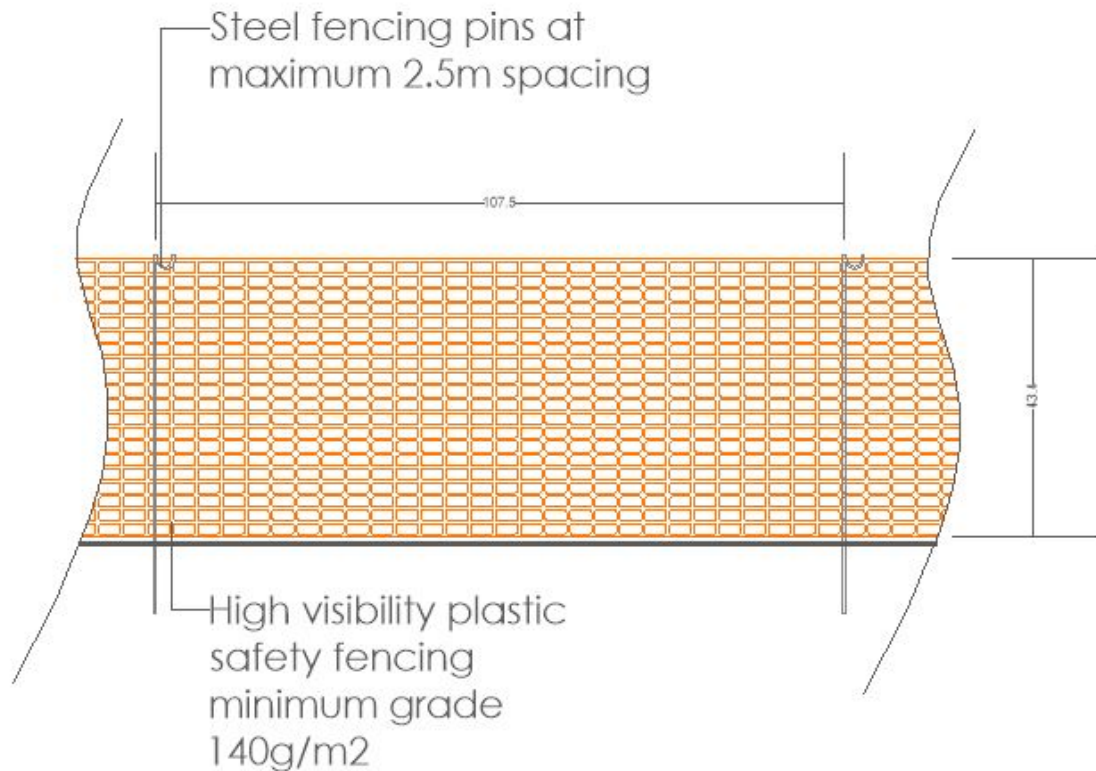
Tree Protection Fencing (BS5837: 2012).



Key

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

Protective Fencing Plastic



Protective fencing Notice to attached to fencing

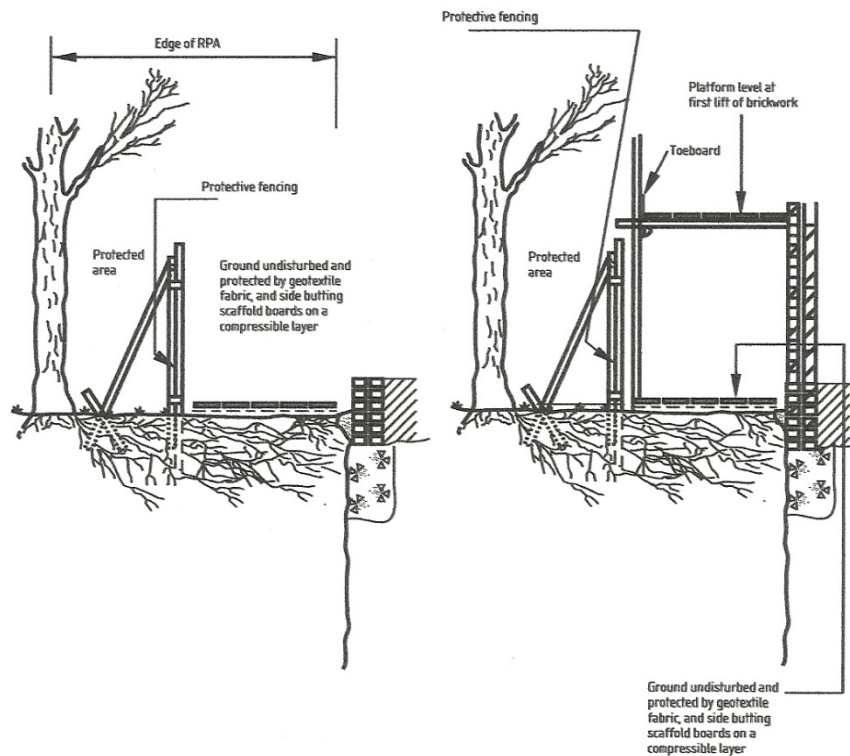


Appendix Three

Special Measures Area



Special Measures Area (pedestrian)



Ground protection and scaffolding within the RPA (taken from BS5837:2005)

Interlinked plastic boards with a layer of chip can be used as ground protection.

The below picture courtesy of Ground Guards (<http://www.ground-guards.co.uk/solutions/tree-root-protection/>) illustrates a possible method.



Appendix Four

Tree Guard



Tree Guard



The tree stem and major scaffold branches should be covered where it could be damaged by adjacent works