



Proposed Planting Scheme

A report outlining proposals for replacement planting with details of specifications and management

British Museum
Great Russell Street,
London WC1B 3DG

Ref No: 211114

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DRAWING:

211114 – British Museum – Planting Plan – Silver Birch (Attached separately)

1 Introduction

1.1 Instruction:

Writtle Forest Consultancy Ltd has been instructed to provide a planting scheme for the replacement of trees to be removed due to deteriorated condition Ash T20 and Robinia T21 and Holm Oak T23, subject of reports referenced 210911, 210912a and 210912b. This document provides details of objectives, recommended tree species, specifications, outline planting and aftercare regimes.

1.2 Scope of this document

This report is concerned with providing consideration and recommendations for an appropriate scheme of planting suitable within the immediate area north of the Hirayama Studio on the east side of the British Museum as well as in keeping with the designated Conservation Area. Appropriate stock sizes and all necessary planting and staking recommendations are included. An appropriate management plan considering plant aftercare is also included. This Planting Scheme includes reference to the recommended planting distances from structures taken from B.S. 5837 (2012).

2 Background information

2.1 Objectives of planting scheme

The planting scheme has been developed to address the following objectives;

1. Replacement of early mature Robinia specimen.
2. Replacement of early mature Ash specimen.
3. Improved heterogeneity of current tree stock within the British Museum.
4. Sustaining/improvement to overall visual amenity of the area.

2.2 Existing trees at the site

The existing trees at the site have been surveyed and their details are documented in the Tree Survey and Report, referenced 210911. Subsequent to this report, further inspection and testing of Ash T20 and Robinia T21 was carried with their details documented in two separate reports, referenced 210912a and 210912b. The site currently contains a population of trees varying in age range and species which include London Plane, Lime and Robinia. Within the group several of the trees provide high amenity value in the area particularly the London Plane. The development as proposed provides opportunity for the planting of good quality young trees to enhance the general tree stock of the area.

2.3 Sub-soil data – British Geological Survey

The Geological Survey of Great Britain (BGS) at 1:50 000 scale indicates that the bedrock geology description is of a London Clay Formation - Clay and Silt. The superficial deposits description: Lynch Hill Gravel Member - Sand and Gravel.

(<https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer/> accessed 16.11.21)

3 Species Information of Recommended Trees for Planting

3.1 Trees.

All suggested tree species planting are listed below and shown on the Planting Plan. The recommended trees are native species.

Silver Birch is chosen for its stature, slender form and suitability within the environment. There is sufficient space for the development of the tree species within the landscape. The species provides suitable habitat and forage to encourage native biodiversity.

4. Details of Recommended Planting

4.1 Trees and hedging.

Number	Tree Species	Code	Size of Tree to plant	Typical container/ root ball size.	Considerations of planting
2	<i>Betula pendula</i>	Bp	12-14cm girth Heavy standard (either container grown or root-balled), Approx. height 3-4 metres	70 litres/ 40 x 30cm (50kg)	Double stake with support bar

5. Planting Specification and Aftercare

5.1 Pre-planting & Soil amelioration works

- Soil samples to be taken to allow laboratory testing for nutrient and pH levels prior to planting. Results should inform any additional amelioration required to address deficiencies at time of planting and to check for contaminants.
- In some areas it may be necessary to raise levels. It is suggested to use surplus soils from the on-site re-grading works, subject to laboratory testing. Imported topsoil should be of a suitable grade in accordance with BS3882.
- Where possible organic products should be used to ameliorate soil conditions.
- The addition of the macro nutrients such as slow release Nitrogen and Phosphorous (Bone meal) will improve growing conditions for the newly planted trees.
- Amendments such as biochar will improve general porosity of soils allowing greater space to improve biodiversity and ecological functioning of soils.
- Correct doses should be calculated and applied as directed by the manufacturer and informed by the pre-planting laboratory testing.

5.2 Generic tree planting specification

- Trees to be planted within the dormant season, between the beginning of November and the end of February.
- Do not plant when soil is frozen or waterlogged.
- The pit should be dug at least 2 times wider than the root ball and as a shallow bowl. Ensure sides and base of pit are forked to prevent glazing.
- Once excavated return some of the excavated soil back into the hole until it is the same depth as the container/ root-ball.
- Locate staking within pit ensuring that root ball is not damaged by the stakes. Drive in stakes until firm (peeled softwood stake with a top diameter suitable for the size of tree that is to be supported. Use a stake with a minimum diameter of 60mm for larger trees). When firm, ensure stakes are upright, at an equal height and parallel to kerb-line, fence line or prevalent wind.
- Height of stakes should be no more than 1/3 height of clear stem. (See Appendices).
- Underground root ball anchoring or over ground guying maybe required on larger tree stock. In confined areas root ball anchoring will be more appropriate. (See Appendices).
- If trees are purchased in a container remove entire container prior to placing tree in planting pit, taking care to avoid root loss/damage.
- Place tree in pit at the correct level, so that the nursery mark is level with the surrounding soil level.
- Back fill using excavated soils. To improve soil structure on heavy or sandy soils incorporate organic matter at 50/50 ratio with good quality topsoil (to BS 3882. Firm to remove air pockets.
- Ameliorate soils, based on the laboratory testing as of section 5.1
- Secure the tree to stakes using rubber belt/spacer as specified. Remove all plant labels/nursery tape, ties or string from tree. Attach and secure any recommended guards.
- Apply a 1m x 1m x 75mm deep layer of the agreed mulching material around rooting zone of the tree. It is important to avoid any build-up of mulch around stem.
- Add appropriate water to the root-zone of each tree.
- Remove all arisings and excess soil from site, leaving site safe and tidy.

5.3 Five Year Maintenance Schedule

Time	Health inspection/ Fluorimetry testing	Watering	Soils/ Mulch	Pruning	Staking	Replacement planting
Year 1: Spring/ Summer	Health check of all trees Fluorimetry testing of all Heavy Standard trees.	All trees and hedging	Addition of slow release fertiliser suitable for root growth is added as a top dressing to Heavy Standard trees.	-	-	-
Year 1: Autumn/Winter	-	-	Addition of mulch as required to all trees	-	Check all trees	All trees
Year 2: Spring/ Summer	Health check of all trees	All trees	-	-	-	-
Year 2: Autumn/Winter	-	-	Addition of mulch as required to all trees	-	Check all trees	All trees
Year 3: Spring/ Summer	Fluorimetry testing of Heavy Standard trees.	All trees	-	-	-	-
Year 3: Autumn/Winter	-	-	Addition of mulch as required to all trees.	Light formative pruning of all Heavy Standard trees.	Check all trees	All trees
Year 4: Spring/ Summer	Health check of all Heavy Standard trees.	All Heavy Standard, trees.	-		-	-
Year 4: Autumn/Winter	-	-	Addition of mulch as required to all trees		Check all trees. Remove support bar only from Heavy Standard	All Heavy Standard trees.
Year 5: Spring/ Summer	Health check of all trees	All Heavy Standard trees.	-		-	-
Year 5: Autumn/Winter	-	-	-	.	Check all trees.	All Heavy Standard trees.

5.5 Health Inspection of Trees

Fluorimetry testing is used to test the photosynthetic functioning of the tree. This should be carried out when the trees are received from the nursery or when the trees first come into full leaf. This should provide base line data as to the health of the trees. Trees that are not healthy when received from the nursery should be returned.

On-going health checks should be carried out to the trees to ensure that no pest or disease has been introduced from the nursery and that the trees are free from pest and disease generally in their formative years.

5.6 Watering

All trees should receive appropriate water according to their needs and with regard to moisture retention capacity of the soils and rainfall through the growing season.

All trees will require watering in the spring and summer months as a minimum on a weekly basis. The contractor will be required to use their judgement of the situation as well as meteorological information relating to rainfall to assess the rate of water application through the growing season. Water should be applied slowly, under low pressure, to ensure that the soil retains the water and the water is not lost to run off when applying.

The water must be evenly distributed within the rooting area to encourage even root development.

Requirements for watering of trees will be dependent upon tree species, climatic conditions as well as soil and environmental conditions. The diverse variables mean exact calculations for water requirements are not prescriptive. As a guide a Heavy Standard tree during summer months will require approximately 10 litres of water per day. Moisture meters can be used to ascertain water condition of soils. Soil testing will provide an understanding of soil porosity and water retention properties.

5.7 Soils and Mulching

In order to aid establishment, bark mulch will be applied at time of planting. The mulch will decrease water evaporation, prevent run off in heavy soils, control weed growth, buffer soil temperature gradients. Mulch will generally improve soil health by increasing microbial activity, nutrient- and water-holding capacity, soil pore space and air penetration as it decomposes.

The levels to the base of the tree and within the rooting zone will need to be checked to ensure that the main stem is not covered by the mulch but that there is a generally covering of mulch, approx. 75mm thick within the root zone. Mulch should be between 50 and 100mm deep and be kept at least 75 to 150mm from the trunk of the tree.

5.8 Formative pruning

Trees from a reputable supplier will have received formative pruning in the nursery, such that they should not require significant management immediately following planting. However, each tree should be inspected and subject to the following pruning within 3 years of planting, as required;

1. Remove any strongly upward-growing branches that threaten to dominate the canopy or overtake the central leader.
2. Remove any crossing or rubbing branches.
3. Lightly, shorten the canopy branches and side-shoots to balance the shape. Pruning cuts should be made to an outward facing bud to encourage open growth.
4. Clear the desired height of trunk of any growth. If new growth is stimulated from the trunk by this pruning, rub off the shoots as soon as they emerge.

5.9 Staking/ Guying

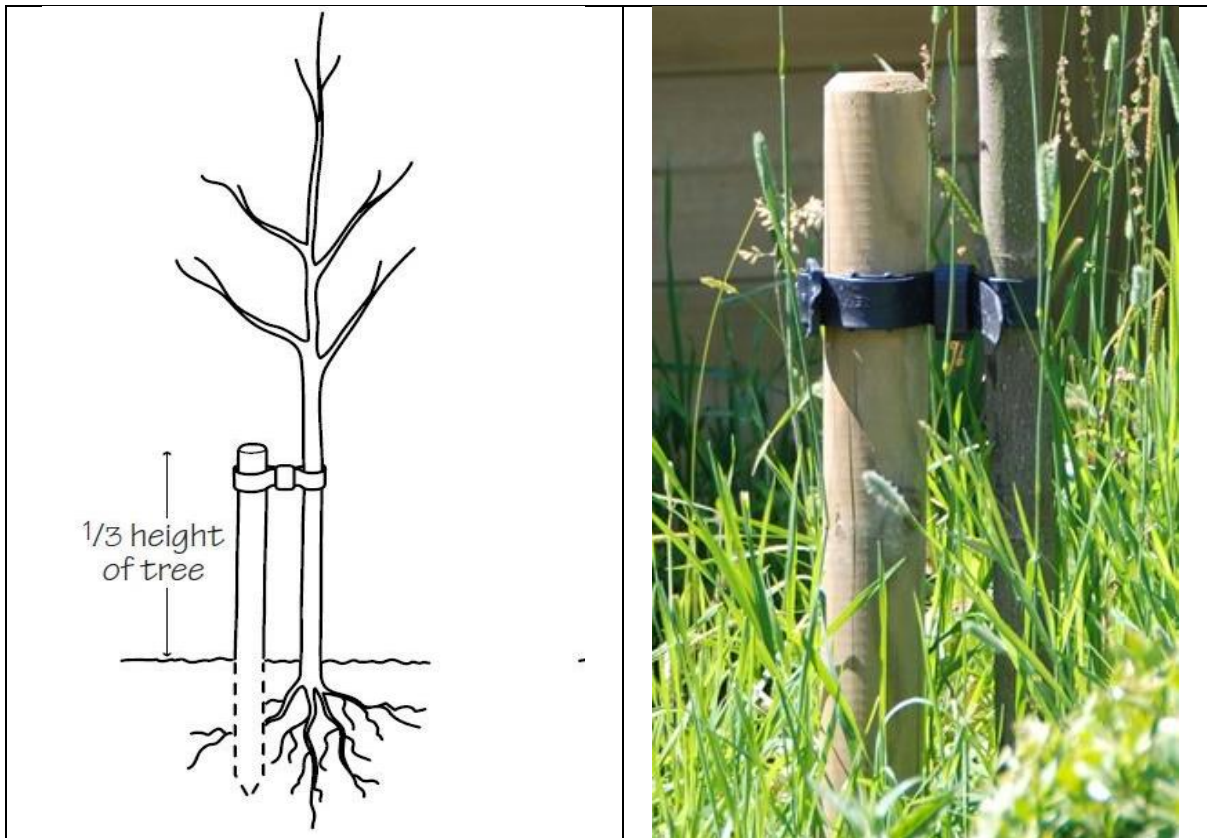
In conjunction with on-going maintenance it will be necessary to check and adjust all staking (and guying) annually, post planting. It is imperative that stakes and ties are removed once the tree has established and is wind-firm, which is generally 3-5 years post planting.

5.10 Replacement Planting

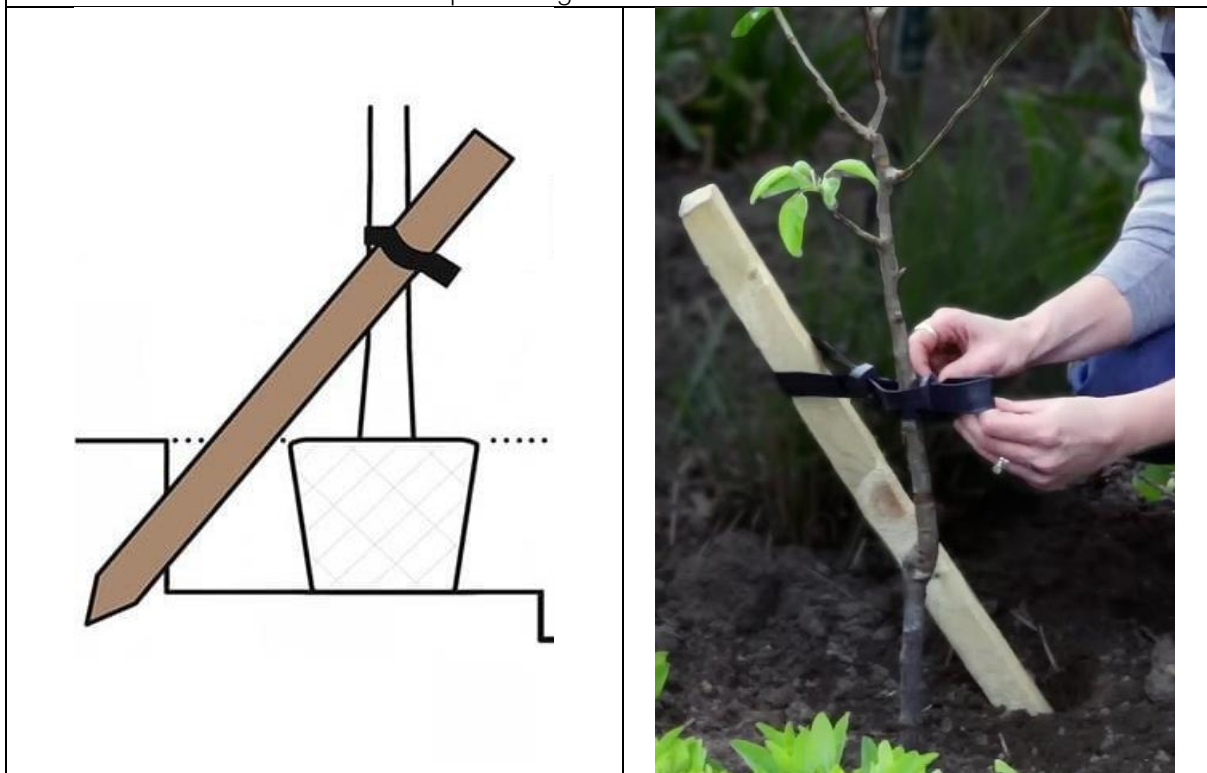
Any trees that fail within the first 3 years of planting must be replaced. It is also prudent to ascertain the cause of failure to ensure that the loss is not repeated.

If there are multiple failures of the same species it may be prudent to replace the species choice originally selected dependent upon the cause of failure and whether this is related to pest and disease or environmental conditions.

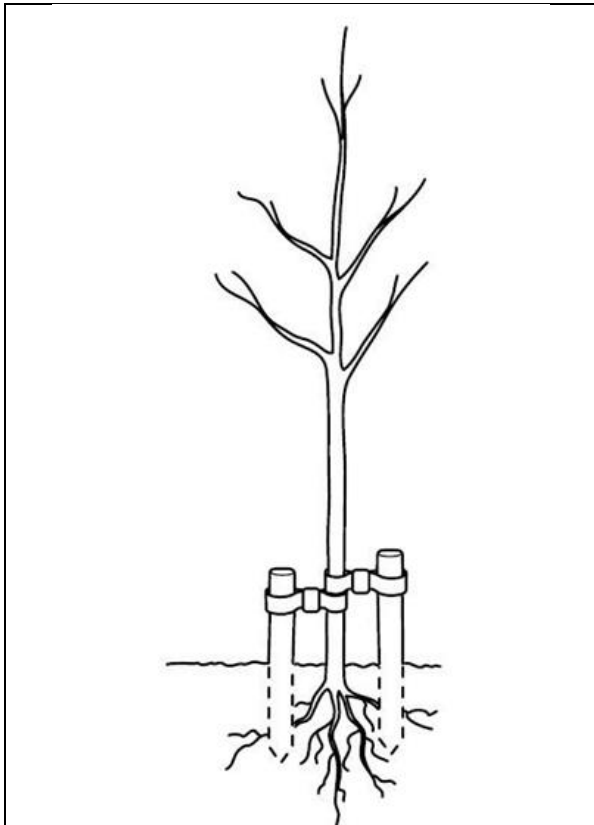
Appendix 1: Examples of Tree Planting Anchor Systems



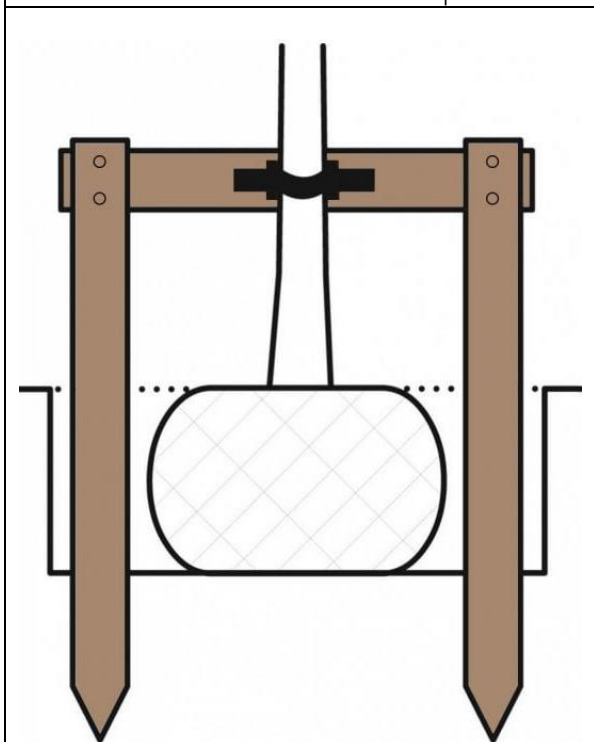
Example 1: Single stake anchor of tree



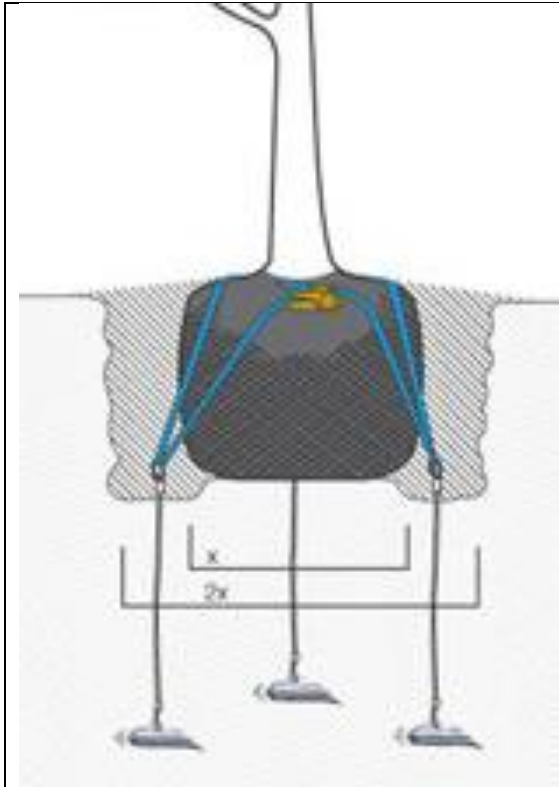
Example 2: Single stake anchor of tree - angled



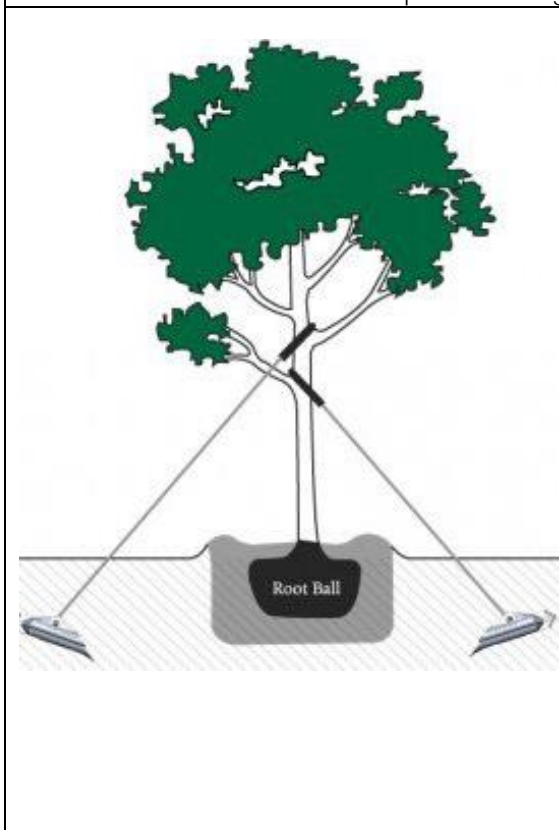
Example 3: Double stake anchor of tree



Example 4 Double stake anchor of tree with support bar



Example 5: Below ground cable anchor of tree



Example 6: Above ground cable anchor of tree

Appendix 2 Example images of tree species selection



Example of *Betula pendula*

Appendix 3: Tree size specifications

Tree sizes

British Standard BS 3936 Part 1, Nursery Stock Specification for Trees and Shrubs

The height deciduous trees attain with age varies between species and varieties. Consequently, trees for planting are generally specified by girth. The following table gives typical tree heights by girth size:

Description/specification	Tree Girth	Height
Light Standard (LS)	6-8cm	1.8-2.5m
Standard (S)	8-10cm	2.0-3.0m
Select Standard (SS)	10-12cm	2.5-3.5m
Heavy Standard (HS)	12-14cm	3.0-4.0m
Extra Heavy Standard (EHS)	14-16cm	3.5-4.5m
Advanced Heavy Standard (AHS)	16-18cm	4.0-4.5m
Semi mature	18-20cm	4.0-5.0m
Semi mature	20-25cm	4.5-5.5m
Semi mature	25-30cm	5.0-6.0m
Semi mature	30-35cm	5.5-6.5m
Semi mature	35-40cm	6.0-7.0m
Semi mature	40-45cm	6.5-7.5m
Semi mature	45-50	7.0-8.0m

Root ball estimated/ average weights and sizes

Stem Circumference in cm	root ball in cm	height root ball in cm	weight root ball in Kg
12 - 14	40	± 30	50
14 - 16	40 - 50	± 30/35	100
16 - 18	50	± 35/40	135
18 - 20	60	± 40/45	150
20 - 25	70	± 40/50	250
25 - 30	80	± 45/55	360
30 - 35	90	± 50/60	550
35 - 40	100	± 60/70	750
40 - 45	110	± 65/75	800
45 - 50	120	± 65/75	1000
50 - 55	120	± 70/80	1250
55 - 60	130	± 70/80	1500
60 - 70	140 - 150	± 70/100	1750 - 2000
70 - 80	160 - 170	± 70/100	3000 - 3500
80 - 90	180 - 200	± 70/100	3500 - 4500
90 - 100	200 +	± 70/100	4500 - 5500
100 - 120	200 +	± 70/100	5500 - 7500

Containerised tree pot sizes

Tree Sizes Girth/cm	Container Sizes Diameter x Depth cm	Approx. Litres	Weights Kg
14-16	60x50cm	140	100
16-18	60x50cm	140	175
18-20	70x60cm	230	250
20-25	80x60cm	300	350
25-30	90x60cm	380	500
30-35	100x60cm	470	650
35-40	110x70cm	665	850
40-45	135x70cm	1000	1100
45-50	145x70cm	1155	1600
50-60	160x80cm	1600	2500
60-70	180x80cm	2035	4000
70-80	200x80cm	2510	5500
80-90	225x100cm	3975	7500
90-100	250x100cm	4905	9000
100-120	275x100cm	5940	10000

Young Bare root plant specifications suitable for hedge planting

Generally specified in the following height ranges: 30-40cm, 40-60cm, 60-80cm, 80-100cm and 100-125cm.

The sapling is measured from soil level to the top of the plant, the roots are not included in the measurement.

Specification	Description
(0/1)	Year Old - Hardwood cutting was taken from a mature plant and grown for 1 year.
(1+0)	1 Year Old - 1-year seedling grown at wide spacing and undercut during the growing season. This is a cheaper specification suitable when planting where weed competition will be less intense, soil is shallow or on exposed windy sites.
(C+1)	1 Year Old - Plug plant is grown in the ground for 1 year.
(C+2)	2 Year Old - Plug plant is grown in the ground for 2 years.
(1+1)	2 Year Old - 1-year-old seedling grown in seed bed and then lined out for 1 year. Commonly range from 40-60cms or 60-80cms. Regularly used.
(1u1)	2 Year Old - 1-year-old seedlings undercut and grown in situ for 1 further year. The effect is to produce a slimmer, straighter plant.
(1+2)	3 Year Old - 1-year-old seedlings grown in seed beds and then lined out for 2 years. The effect of this gives a stocky, bushier plant.
(2+1)	3 Year Old - 2-year-old plant, lined out for a further year. Gives stockier, bushier plant.
(1+3)	4 Year Old - 1-year-old seedling grown in seed bed then lined out for 3 years.
(2+2)	4 Year Old - 2-year-old plant, lined out for 2 further years. Gives stocky, bushier plant.

Appendix 4: Planting Distances from Structures

B.S. 5837 (Sept. 2012) specifies the following minimum distances between young trees or new planting and structure to avoid direct damage to a structure from future tree growth. It is considered that the planting as recommended should have sufficient space to comply with these minimum distances. However, this must be checked by the Architect, Planner or Landscape Architect before implementing planting. Issues concerning in- direct damage from newly planted trees or woody vegetation are not dealt with within this planting proposal. This must be considered before the proposed planting is implemented referencing NHBC Chapter 4.2.

Type of Structure	Diameter of stem at 1.5 m above ground level at maturity		
	<30 cm	(30-60) cm	>60 cm
Buildings and heavily loaded structures	-	0.5	1.2
Lightly loaded structures such as garages, porches etc.	-	0.7	1.5
Drains and underground services			
<1 m deep	0.5	1.5	3.0
>1 m deep	-	1.0	2.0
Masonry boundary walls	-	1.0	2.0
In situ concrete paths and drives	0.5	1.0	2.5
Paths and drives with flexible surfaces or paving slabs	0.7	1.5	3.0

Appendix 5: Limitations of Tree planting suggestions

Species choice

The species are chosen as recognised plantings. I am not aware of any current pest and disease problems prevalent to these trees.

The species chosen should be acceptable to the Local Authority but it must be recognised that they may wish for other species of trees to be planted that are more in keeping with their policy statements.

The species are chosen on the basis of the initial site visit and the space presumed available after the proposed works.

Proposed areas of planting

Proposed areas of planting are based upon the site plans and proposed build line drawings as provided.

Measurements for exact location of plantings will need to consider the safe planting distances as given within this report.

Tree planting in relation to Subsidence and Direct damage

Tables from B.S.5837 are given to inform as to correct distances of planting. These distances are relevant for all structures within and without the boundaries of the property.

It is advised that a Structural Engineer is consulted and that NHBC chapter 4.2 is referenced before deciding upon the trees and their position to establish whether there is a threat of Subsidence to the proposed structure.

Weather Conditions and Watering:

The suggested watering regimes for the new plantings are not prescriptive and will be dependent on weather conditions. The appointed Contractor should consider if conditions warrant less or more watering than is currently advised.

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