

CAVAT analysis report

Trees to be removed for development purposes

**Twickenham Rediscovered Programme
Riverside,
Twickenham,
London TW1 3DU**

for

London Borough of Richmond-upon-Thames

Skerratt

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document revision: A

date: 14.02.18

1. Introduction

- 1.1 This report contains a detailed appraisal of 18 individual or groups of trees that are to be removed for development purposes in the course of the construction of the Twickenham Rediscovered Programme.
- 1.2 The report considers the health and safety of the trees under their current growing conditions and assigns a monetary value to them using the London Tree Officers' Association CAVAT evaluation method as the basis of calculation.
- 1.3 The site inspection on which this report is based took place on the early afternoon of Wednesday 14 February 2018 in overcast but dry conditions.
- 1.4 This report was commissioned by Darren Jacob of Validus LM on behalf of the client
- 1.5 The **Tree survey plan** in **Appendix a** show the locations of the trees that are included in this evaluation – Tree and Tree groups 008, 009.01 to 009.14, 014, 015 and 034. The locations of Trees 009.01 to 009.14 are based on on-site measurement. Their species and dimensions are set out in the **Tree survey schedule** in the same appendix

2. Background information

- 2.1 The Arboricultural Impact Analysis (AIA) accompanying the planning application for the Twickenham Rediscovered Programme refers to the removal of one tree group (009) and 4 individual trees (008, 014, 015 and 034).
- 2.2 Group 009 has since been surveyed in detail. The 14 individual trees, multi-stemmed clumps and closely spaced sub-groups which stand within its boundary are listed in the **Tree survey schedule** in **Appendix a** of this evaluation.
- 2.3 The Group 009 trees stand within the boundary of a roughly rectangular parcel of land abutting the rear elevation of a derelict public building on Water Lane.
- 2.4 The northern half of the parcel of land is a level terrace running parallel and immediately adjacent to the rear elevation of the derelict building. The southern half is at the same level as the Diamond Jubilee Gardens approximately 1000mm below terrace level.
- 2.5 The difference in levels is contained by a decrepit retaining wall with railings above and with a flight of steps close to its mid-point. The **Tree survey plan** in **Appendix a** shows the approximate alignment of the retaining wall and the flight of steps.
- 2.6 Both halves of the parcel of land appear to be level but the terrain is difficult to interpret in places because it is obscured by tree and shrub regeneration and stored materials and equipment that have been in their current locations for many years.
- 2.7 The rear elevation of the derelict building on Water Lane makes up the northern boundary of the parcel of land. A 2500mm high, plywood panel site hoarding with an access gate from the Diamond Jubilee Gardens runs along the southern and eastern boundaries and a decrepit 2500mm high, close boarded fence above a low brick wall, runs along the northern (public highway) side of the parcel.
- 2.8 It is obvious from the spatial distribution of the tree resource and its species composition that it has developed exclusively from uncontrolled natural regeneration since the use of the Water Lane building was discontinued (see **Photographs** in **Appendix b**).
- 2.9 Naturally regenerated stems with a diameter of 100mm or less have been excluded from this evaluation
- 2.10 The stem diameter of the largest trees (009.08 – 310mm) suggest a maximum average annual increase in stem diameter of about 15mm per annum.

3. Evaluation

- 3.1 This evaluation quantifies the monetary value of the existing tree resource listed in the **Tree survey schedule** in **Appendix a**, using the Capital Asset Value for Amenity Trees (CAVAT) evaluation method developed by The London Tree Officers' Association
- 3.2 The CAVAT method is based on the sum of the cross-sectional areas of the stems of the trees that make up the tree resource multiplied by a notional replacement cost per unit area (the Unit Value Factor), based on the current cost of a newly planted tree divided by its stem area.
- 3.3 The total value of the calculation may be increased or decreased by taking account of future life expectancy, community benefit (population density and accessibility), functionality (tree form and condition) and amenity (visual prominence, national or local designation, historical significance and rarity value) factors.
- 3.4 For the purposes of this analysis the following adjustment factors have been used in the CAVAT worksheets in **Appendix c**

| Attribute | Value | Note |
|-----------------------------------|--|---|
| Unit Value Factor | £15.88 | Current recommended value (14.02.18) |
| Community Benefit Index (CTI) | 125 | Recommended CTI Factor for London Borough of Richmond-upon-Thames |
| Community Benefit - Accessibility | 40-60% (008, 009.01-009.13 and 034) 100% (014 and 015) | Reflects inaccessibility of Trees 008 and 009.01-009.14 |
| Functionality | Variable | Based on tree-by-tree descriptions in the Tree survey schedule |
| Amenity factors | 10% - Appropriateness for Location reduction - (honeydew drip from Sycamores) applied to 008, 009.01-009.14 and 034 | |
| Future safe life | Based on the future safe life value listed for each tree or tree group in the Tree survey schedule in Appendix a | Trees growing on the top edges of decrepit retaining walls and other unstable locations have been assigned short future safe life spans |

Table 1: Values used in CAVAT worksheets (see Appendix c)

- 3.5 Applying the moderating factors listed in **Table 1**, the current value of the tree resource referred to in this evaluation is summarised in **Table 2** overleaf. The CAVAT worksheets from which these monetary values have been derived are included in **Appendix b**.

| Tree No. | Species | CAVAT Value (£) | Notes |
|----------|--|-----------------|---|
| 008 | Sycamore (<i>Acer pseudoplatanus</i>) | 7,529.00 | Multi-stemmed: stands close to aged retaining wall |
| 009.01 | Sycamore (<i>Acer pseudoplatanus</i>) | 2,716.00 | |
| 009.02 | Sycamore (<i>Acer pseudoplatanus</i>) | 2,947.00 | |
| 009.03 | Sycamore (<i>Acer pseudoplatanus</i>) | 1,557.00 | Multi-stemmed |
| 009.04 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 1,643.00 | |
| 009.05 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 3,190.00 | |
| 009.06 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 3,373.00 | |
| 009.07 | Goat Willow (<i>Salix caprea</i>) | 909.00 | |
| 009.08 | Sycamore (<i>Acer pseudoplatanus</i>) | 1,456.00 | |
| 009.09 | 4 x Sycamore (<i>Acer pseudoplatanus</i>)/ Silver Birch (<i>Betula pendula</i>) | 2,896.00 | Standing on the top edge of a decrepit retaining wall |
| 009.10 | Sycamore (<i>Acer pseudoplatanus</i>) | 947.00 | |
| 009.11 | Sycamore (<i>Acer pseudoplatanus</i>) | 947.00 | |
| 009.12 | Sycamore (<i>Acer pseudoplatanus</i>) | 1,894.00 | |
| 009.13 | Sycamore (<i>Acer pseudoplatanus</i>) | 2,559.00 | |
| 09.14 | Sycamore (<i>Acer pseudoplatanus</i>) | 5,758.00 | |
| 014 | Himalayan Birch (<i>Betula utilis</i> 'Jacquemontii') | 1,792.00 | |
| 015 | Himalayan Birch (<i>Betula utilis</i> 'Jacquemontii') | 1,200.00 | |
| 034 | Sycamore (<i>Acer pseudoplatanus</i>) | 1,894.00 | |
| | Total | 45,208.00 | |

Table 2: CAVAT values – trees to be removed for development purposes

- 3.6 It is proposed to plant a total of 12 new trees, all robust species with similar rates of growth, at least to middle age. The planting proposals are detailed on LUC Drawing No. LUC-LD PLN201 Issue 5, a copy of which is included in **Appendix d**.
- 3.7 **Table 3** below summarises the value of the replacement resource at time of planting using the assumptions set out in **Table 1** for Unit Value Factor and CTI but assuming 100% accessibility and form factors, no reductions or additions for amenity factors and an estimated future safe life of 80+ years.

| Number of trees | Species | CAVAT Value per tree (£) | Total CAVAT Value (£) | Notes |
|-----------------|---|--------------------------|-----------------------|----------------|
| 3 | <i>Alnus glutinosa</i> 'Laciniata' | 3,508.00 | 10,524.00 | 45-50 cm girth |
| 2 | <i>Salix alba</i> 'Tristis resistentia' | 4,774.00 | 9,548.00 | 50-60cm girth |
| 4 | <i>Betula pendula</i> | 1,559.00 | 6,236.00 | 30-35cm girth |
| 3 | <i>Betula pubescens</i> | 1,559.00 | 4,677.00 | 30-35cm girth |
| | | Total | £30,985.00 | |

- 3.8 To achieve a value equivalent to the present-day value of the existing tree resource the average stem diameter for each of the newly planted trees would have to be a little over 155mm (average at time of planting = 125mm), giving an average CAVAT value per tree of £3746.00 and a total resource value of £44,952.00.
- 3.9 Assuming an annual average increase in stem diameter of 10mm per annum, equivalent CAVAT value will be reached 3 – 5 years after planting and will increase significantly beyond the present-day value of the existing tree resource thereafter.
- 3.10 My annual stem diameter increment rate of 10mm per annum, which has been derived from personal experience and informal discussions with colleagues, compares reasonably well with the predicted growth rates set out in the Forestry Commission Forest Yield Tables for Yield Class 8 Silver Birch – an increase in average stem diameter of 8cm at 10 years to 16cm at 25 years for Birch grown in woodland conditions. Yield Class 8 is roughly the mid-point in the range of different Yield Classes included in the Forest Yield Tables (4-12: the higher the Yield Class the more rapid the growth).
- 3.11 It also compares well with the rates of growth of Trees 009.01 to 009.14 (see 2.10 above).

- 3.13 However, given the condition and limited future safe life of some of the larger trees (007, 008, 011 and 012 in particular), it is a reasonable assumption that overall, the rate of increase in value of the existing resource will be significantly slower than it will be for the replacement trees, subject to their regular maintenance.

4. Conclusions

- 4.1 Subject to regular maintenance, replacement planting will take between 3 and 5 years to equal the amenity value of the existing resource, using the CAVAT evaluation method as the basis of comparison.
- 4.2 In drawing this conclusion I have assumed that, were the existing tree resource to be retained in its entirety, it would increase in value but that the rate of increase would be significantly slower than that of proposed tree planting.
- 4.3 All monetary values are based on the current CAVAT Unit Value Factor and have not been discounted.
- 4.4 The new trees will be more accessible and, given that at the date of equivalent value they are likely to have 70+ years safe life remaining, will have a greater potential for a further increase in amenity value than would the existing trees.
- 4.5 In my opinion this analysis is a fair assessment of the impact on short-term public visual amenity that should be weighed against the benefits of the proposed development.

Appendix a

Trees survey schedule
Tree survey plans

Explanatory notes

For general information on any entry in the detailed survey text, refer to the notes below which are organised on a column by column basis.

Tree number

All trees have been numbered in the survey text to correspond to the location numbers shown on the accompanying Tree survey plan. No trees have been marked on site.

Species

Common English names have been used wherever possible and Latin names are listed (in brackets in *italics*) in all cases.

Dimensions

Height - are recorded in m.

Stem diameter – recorded in mm at breast height (1.5m) wherever possible. Where measurement at 1.5m is not possible, one of the alternative methods set out in *Annex C of BS5837:2012* has been used.

If the diameter has been measured at a different height, this has been recorded, e.g. 60 @ 1m = 60mm diameter at 1m height.

Other abbreviations used:

av - average

est/e - estimated

ms - multi-stemmed

max – maximum

gl - ground level

Crown spread - radial crown spreads in metres have been recorded at four points on the circumference of the crown (north, east, south and west). The accompanying Tree survey plan shows approximate crown shapes based on these measurements

Crown height - the height of the first major branch and the height of the lowest point of the crown are recorded in metres eg 3/3

Explanatory notes

Age

| | | | |
|----|--------------|----|-------------|
| Y | Young | SM | Semi-mature |
| EM | Early mature | M | Mature |
| OM | Over-mature | | |

Where the precise age of a tree is known, it has been recorded in brackets adjacent to the general classification i.e. M(7).

Condition

Physiological condition

Gives a measure of biological vigour and of the presence or absence of disease, insect attack or other debilitating factors.

| | |
|---|------|
| G | Good |
| F | Fair |
| P | Poor |

Structural condition

Gives a measure of each tree's physical form and mechanical stability.

| | |
|---|------|
| G | Good |
| F | Fair |
| P | Poor |

Comments

Descriptive notes on the tree's shape, local environment and condition.

Recommendations

Management recommendations under existing conditions.

Separation distance (existing and proposed)

The distance between centre stem and the nearest point of existing or proposed built structures

Explanatory notes

RPA radius

The radius of each tree's Root Protection Area (RPA) as defined in *BS5837:2012 – Trees in relation to design, demolition and construction - Recommendations*

Life expectancy

An approximate estimate for each tree's anticipated future safe life in the following ranges:

- <10 years
- 10-20 years
- 20-40 years
- 40+ years

Retention category

This grading is based on the recommendations set out in *BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations*. The categories are summarised in the standard as follows:

- A Trees of high quality with an estimated remaining safe life of at least 40 years
- B Trees of moderate quality with an estimated remaining safe life of at least 20 years
- C Trees of low quality with an estimated remaining safe life of at least 10 years, or young trees with a stem diameter below 150mm
- U Trees 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

In addition the British Standard requires one or more subcategories to be applied to the main Retention Category. In summary these are as follows:

1. Mainly arboricultural qualities (that is individual aesthetic characteristics)
2. Mainly landscape qualities
3. Mainly cultural values, including conservation

| Tree No. | Species | Height (m) | Diam (mm) | Crown Spread (m) | | | | Crown Height (m) | Age | Physiological Condition | Structural Condition | Comments | Recommendations | Life Expectancy | Retention Category | Retention Sub-category |
|----------|--|------------|-------------|------------------|-----|-----|-----|------------------|-----|-------------------------|----------------------|--|------------------------------------|-----------------|--------------------|------------------------|
| | | | | N | E | S | W | | | | | | | | | |
| 008 | Sycamore (<i>Acer pseudoplatanus</i>) | 15 | 340/ 210 | 6 | 5 | 6 | 5 | 2/3 | SM | G | G | 2 single upright stems within a cluster of small stems: of natural seedling origin: growing close to a decrepit boundary retaining wall: the terrace on which these trees stand is approximately 1000mm above the general site level: light ivy growth on main stems | No immediate action required | 20-40 | B | 1/2 |
| 009.01 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 240 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | G | A single stemmed tree of natural seedling origin growing at general site level and standing close to a timber boundary hoarding | No immediate action required | 40+ | B | 1/2 |
| 009.02 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 250 | 4 | 4 | 4 | 4 | 3/3 | SM | G | G | Single leaning naturally regenerated stem close to decrepit boundary retaining wall: narrow ascending crown: the terrace on which this tree stands is approximately 1000mm above the general site level | No immediate action required | 20-40 | B | 1/2 |
| 009.03 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 210/ 220 | 3 | 3 | 3 | 3 | 2/2 | SM | G | F | Naturally regenerated stems at general site level: ivy covered to 5m+ | No immediate action required | 40+ | C | 1/2 |
| 009.04 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 210 | 4 | 4 | 4 | 4 | 2/2 | SM | F | F | The largest stem in a ragged group of small naturally regenerated Sycamores at general site level: ivy covered | No immediate action required | 20-40 | C | 2 |
| 009.05 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 200/ 280 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | F | F | Naturally regenerated Sycamores at general site level: ivy covered | No immediate action required | 20-40 | C | 2 |
| 009.06 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 240/ 260 | 3.5 | 3.5 | 3.5 | 3.5 | 1/1 | SM | F | F | Naturally regenerated Sycamores at general site level: ivy covered | No immediate action required | 20-40 | C | 2 |
| 009.07 | Goat Willow (<i>Salix caprea</i>) | 13 | 300 | 4 | 4 | 4 | 4 | 1/1 | M | G | P | Single stemmed willow of natural origin with a loose spreading crown | No immediate action required | 10-20 | C | 2 |
| 009.08 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 310 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | A single stemmed, naturally regenerated tree standing on the edge of a derelict terrace, 1000mm above general site level: light ivy growth on main stem | Review (future physical stability) | 10-20 | C | 1/2 |

Client: London Borough of Richmond-upon-Thames
 Location: Twickenham Rediscovered Programme - Riverside, Twickenham, TW1 3DU
 Date: 14.02.18
 Job No.: 557A (Trees to be removed for development purposes)

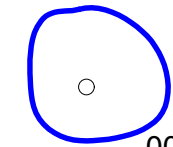
Tree survey schedule

| Tree No. | Species | Height (m) | Diam (mm) | Crown Spread (m) | | | | Crown Height (m) | Age | Physiological Condition | Structural Condition | Comments | Recommendations | Life Expectancy | Retention Category | Retention Sub-category |
|----------|---|------------|---------------------|------------------|-----|-----|-----|------------------|-----|-------------------------|----------------------|--|------------------------------------|-----------------|--------------------|------------------------|
| | | | | N | E | S | W | | | | | | | | | |
| 009.09 | 4 x Sycamore (<i>Acer pseudoplatanus</i>)/ Silver Birch (<i>Betula pendula</i>) | 13 | 140/160/170/210/270 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | A line of single stemmed, naturally regenerated trees standing on the edge of a derelict terrace, 1000mm above general site level: light ivy growth on several stems | Review (future physical stability) | 10-20 | C | 1/2 |
| 009.10 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 250 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | A naturally regenerated tree standing at the top of a retaining wall about 1000mm above general site level | Review (future physical stability) | 10-20 | C | 1/2 |
| 009.11 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 250 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | A single stemmed, naturally regenerated tree standing at the top of a retaining wall about 1000mm above general site level | Review (future physical stability) | 10-20 | C | 1/2 |
| 009.12 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 250 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | G | A single stemmed, naturally regenerated tree standing at general site level: dense ivy cover to 5m+ | Remove ivy | 40+ | B | 1/2 |
| 009.13 | 2 x Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 200 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | 1 of the 2 largest trees in a closely spaced line of naturally regenerated Sycamores at general site level: | No immediate action required | 40+ | C | 1/2 |
| 009.14 | Sycamore (<i>Acer pseudoplatanus</i>) | 13 | 300 | 3.5 | 3.5 | 3.5 | 3.5 | 2/2 | SM | G | P | The largest trees in a closely spaced line of naturally regenerated Sycamores at general site level: | No immediate action required | 40+ | B | 1/2 |
| 014 | Himalayan Birch (<i>Betula jacquemontii</i>) | 6 | 110 | 2 | 2 | 2 | 2 | 1/2 | Y | G | G | Single upright stem: well proportioned spreading ascending crown: forms a group with 014 | No immediate action required | 40+ | C | 1 |
| 015 | Himalayan Birch (<i>Betula jacquemontii</i>) | 6 | 90 | 2 | 1 | 2 | 2 | 1/2 | Y | G | G | Single upright stem: well proportioned spreading ascending crown: see 013 | No immediate action required | 40+ | C | 1 |
| 034 | Sycamore (<i>Acer pseudoplatanus</i>) | 8 | 250 est | 4 | 4 | 4 | 4 | 1/2 | SM | G | G | Single main stem plus one subsidiary: main stem forks at 2m: quite well proportioned crown overall: of natural seedling origin | No immediate action required | 20-40 | C | 2 |

Client: London Borough of Richmond-upon-Thames
 Location: Twickenham Rediscovered Programme - Riverside, Twickenham, TW1 3DU
 Date: 14.02.18
 Job No.: 557A (Trees to be removed for development purposes)



KEY



EXISTING TREE

001

Trees are coloured on plan to correspond with the Retention Categories specified in BS5837:2012 Trees in relation to design, demolition and construction - Recommendations as follows:

- Category A - GREEN
- Category B - BLUE
- Category C - GREY
- Category U - RED

| | | | |
|--|--|--|--|
| | | | |
| | | | |

| REVISION | CHK'D | APP'D | DATE |
|----------|-------|-------|------|
| | | | |

Client:
LONDON BOROUGH OF RICHMOND-UPON-THAMES

Job Title:
TWICKENHAM REDISCOVERED PROGRAMME
RIVERSIDE
TWICKENHAM
TW1 3DU

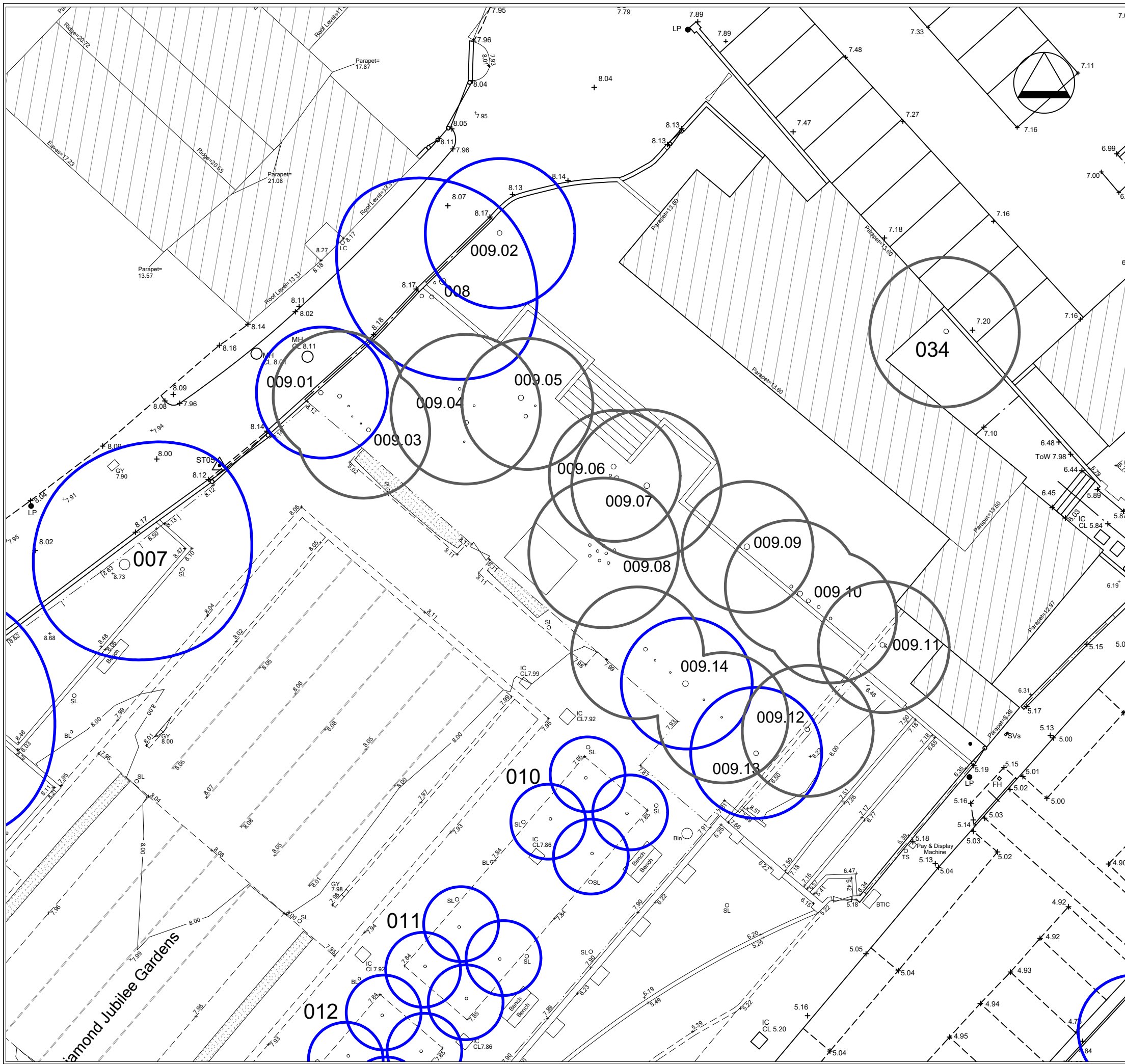
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TREE SURVEY PLAN
FULL SITE

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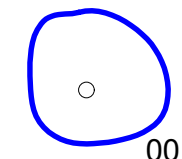
| | |
|-------------------|-----------------|
| Date: 14.02.18 | Drawn by: RS |
|-------------------|-----------------|

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arboricultural advice

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KEY



EXISTING TREE

001

Trees are coloured on plan to correspond with the Retention Categories specified in BS5837:2012 Trees in relation to design, demolition and construction - Recommendations as follows:

- Category A - GREEN
- Category B - BLUE
- Category C - GREY
- Category U - RED

| REVISION | CHK'D | APP'D | DATE |
|----------|-------|-------|------|
| | | | |

Client:
LONDON BOROUGH OF RICHMOND-UPON-THAMES

Job Title:
TWICKENHAM REDISCOVERED PROGRAMME
RIVERSIDE
TWICKENHAM
TW1 3DU

Drawing Title:
TREE SURVEY PLAN
DETAIL (008 and 009.01- 009.14)

Drawing Number:
557.01.04

Scale:
1:200 (A3)

Date:
14.02.18

Drawn by:
RS

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Appendix b

Photographs



Photograph 1 008& 009.02 in foreground



Photograph 2 Derelict terrace



Photograph 3 009.01, 03 & 04



Photograph 4 009.04, 05 and 08 in background

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Photograph 5 009.05 on RHS and 009.06 on LHS



Photograph 6 009.10 & 011 in background



Photograph 7 009.11



Photograph 8 009.12



Photograph 9 009.13 and 009.14

Appendix c

CAVAT analysis worksheets

Project:
Name of Surveyor:

Twickenham Rediscovered Programme
Raphael Skerratt BSc (For) M Arbor A

CAVAT

CTI Factor (Please select): 125%

CALCULATE VALUE OF TREE STOCK

Date: # 14/02/2018

Cumulative Total: £ 45,208

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Created by Alexandra Sleet

| Tree Information | | | Step 1: Basic Value | | Step 2: CTI Value | | Step 3: Functional Value | | Step 4: Adjusted Value | | | | Step 5: Final Value | FINAL VALUE |
|------------------|---------------------|-----------------------------------|------------------------------|-------------|-------------------------------|-----------|---|------------------|---------------------------------|---------------------------------|----------------|------------------|-------------------------------------|-------------|
| Tree No. | Species ID | Location (i.e near tree no. 1) | Stem Diameter (Manual entry) | Basic Value | Accessibility (Please select) | CTI Value | Functional Value Factor (Please select) | Functional Value | Amenity Factors (Please select) | Appropriateness (Please select) | Adjusted Value | Calculated Total | Life Expect. Factor (Please select) | |
| 008 | Acer pseudoplatanus | Multistemmed (see separate sheet) | | £ 0 | 60% | £ 0 | 70% | £ 0 | No Change | 1 | 90% | £ 0 | 20 - 40 | £ 7,529 |
| 009.01 | Acer pseudoplatanus | | 24 | £ 7,184 | 60% | £ 5,388 | 70% | £ 3,772 | No Change | 1 | 90% | £ 3,394 | 20 - 40 | £ 2,716 |
| 009.02 | Acer pseudoplatanus | | 25 | £ 7,795 | 60% | £ 5,846 | 70% | £ 4,092 | No Change | 1 | 90% | £ 3,683 | 20 - 40 | £ 2,947 |
| 009.03 | Acer pseudoplatanus | Multistemmed (see separate sheet) | | £ 0 | 60% | £ 0 | 70% | £ 0 | No Change | 1 | 90% | £ 0 | 20 - 40 | £ 1,557 |
| 009.04 | Acer pseudoplatanus | | 13 | £ 2,108 | 40% | £ 1,054 | 60% | £ 632 | No Change | 1 | 90% | £ 569 | 20 - 40 | £ 455 |
| | Acer pseudoplatanus | | 21 | £ 5,500 | 40% | £ 2,750 | 60% | £ 1,650 | No Change | 1 | 90% | £ 1,485 | 20 - 40 | £ 1,188 |
| 009.05 | Acer pseudoplatanus | | 20 | £ 4,989 | 40% | £ 2,494 | 60% | £ 1,497 | No Change | 1 | 90% | £ 1,347 | 20 - 40 | £ 1,078 |
| | Acer pseudoplatanus | | 28 | £ 9,778 | 40% | £ 4,889 | 60% | £ 2,933 | No Change | 1 | 90% | £ 2,640 | 20 - 40 | £ 2,112 |
| 009.06 | Acer pseudoplatanus | | 24 | £ 7,184 | 40% | £ 3,592 | 60% | £ 2,155 | No Change | 1 | 90% | £ 1,940 | 20 - 40 | £ 1,552 |
| | Acer pseudoplatanus | | 26 | £ 8,431 | 40% | £ 4,216 | 60% | £ 2,529 | No Change | 1 | 90% | £ 2,276 | 20 - 40 | £ 1,821 |
| 009.07 | Salix caprea | | 30 | £ 11,225 | 40% | £ 5,612 | 40% | £ 2,245 | No Change | 1 | 90% | £ 2,020 | 10 - 20 | £ 909 |
| 009.08 | Acer pseudoplatanus | | 31 | £ 11,986 | 40% | £ 5,993 | 60% | £ 3,596 | No Change | 1 | 90% | £ 3,236 | 10 - 20 | £ 1,456 |
| 009.09 | Acer pseudoplatanus | | 14 | £ 2,445 | 40% | £ 1,222 | 60% | £ 733 | No Change | 1 | 90% | £ 660 | 10 - 20 | £ 297 |
| | Acer pseudoplatanus | | 16 | £ 3,193 | 40% | £ 1,596 | 60% | £ 958 | No Change | 1 | 90% | £ 862 | 10 - 20 | £ 388 |
| | Acer pseudoplatanus | | 17 | £ 3,604 | 40% | £ 1,802 | 60% | £ 1,081 | No Change | 1 | 90% | £ 973 | 10 - 20 | £ 438 |
| | Acer pseudoplatanus | | 21 | £ 5,500 | 40% | £ 2,750 | 60% | £ 1,650 | No Change | 1 | 90% | £ 1,485 | 10 - 20 | £ 668 |
| | Betula pendula | | 27 | £ 9,092 | 40% | £ 4,546 | 60% | £ 2,728 | No Change | 1 | 90% | £ 2,455 | 10 - 20 | £ 1,105 |
| 009.10 | Acer pseudoplatanus | | 25 | £ 7,795 | 40% | £ 3,898 | 60% | £ 2,339 | No Change | 1 | 90% | £ 2,105 | 10 - 20 | £ 947 |
| 009.11 | Acer pseudoplatanus | | 25 | £ 7,795 | 40% | £ 3,898 | 60% | £ 2,339 | No Change | 1 | 90% | £ 2,105 | 10 - 20 | £ 947 |
| 009.12 | Acer pseudoplatanus | | 25 | £ 7,795 | 60% | £ 5,846 | 80% | £ 4,677 | No Change | 1 | 90% | £ 4,209 | 10 - 20 | £ 1,894 |
| 009.13 | Acer pseudoplatanus | | 20 | £ 4,989 | 60% | £ 3,742 | 80% | £ 2,993 | No Change | 1 | 90% | £ 2,694 | 40 - 80 | £ 2,559 |
| 009.14 | Acer pseudoplatanus | | 30 | £ 11,225 | 60% | £ 8,419 | 80% | £ 6,735 | No Change | 1 | 90% | £ 6,061 | 40 - 80 | £ 5,758 |
| 014 | Betula jacquemontii | | 11 | £ 1,509 | 100% | £ 1,886 | 100% | £ 1,886 | No Change | No Change | 100% | £ 1,886 | 40 - 80 | £ 1,792 |
| 015 | Betula jacquemontii | | 9 | £ 1,010 | 100% | £ 1,263 | 100% | £ 1,263 | No Change | No Change | 100% | £ 1,263 | 40 - 80 | £ 1,200 |
| 034 | Acer pseudoplatanus | | 25 | £ 7,795 | 80% | £ 7,795 | 60% | £ 4,677 | No Change | 1 | 90% | £ 4,209 | 10 - 20 | £ 1,894 |

CAVAT

SPREADSHEET TO CALCULATE VALUE OF MULTI-STEMMED TREE STOCK (FULL)

© Christopher Neilan

Created by Alexandra Sleet

Only enter data in the green boxes

| CAVAT | Quantities you measure / look up | Calculated Values |
|--|----------------------------------|-------------------|
| <u>Step 1: Basic Value</u> | | |
| Stem Diameter (1) | 21 | |
| Stem Diameter (2) | 34 | |
| Stem Diameter (3) | | |
| Stem Diameter (4) | | |
| Stem Diameter (5) | | |
| Stem Diameter (6) | | |
| Stem Diameter (7) | | |
| Stem Diameter (8) | | |
| Stem Diameter (9) | | |
| Stem Diameter (10) | | |
| Unit Value Factor | 15.88 | |
| Basic Value | | £19,918 |
| <u>Step 2: CTI Value</u> | | |
| CTI Factor | 125% | |
| Accessibility | 60% | |
| CTI Value | | £14,938 |
| <u>Step 3: Functional Value</u> | | |
| Functional Value Factor | 70% | |
| Functional Value | | £10,457 |
| <u>Step 4: Adjusted Value</u> | | |
| Amenity Factors | No Change | |
| Appropriateness | 1 | |
| Adjusted Value | 90% | £9,411 |
| <u>Step 5: Final Value</u> | | |
| Life Expect. Factor | 20 - 40 | |
| FINAL VALUE | | £7,529 |

CAVAT

SPREADSHEET TO CALCULATE VALUE OF MULTI-STEMMED TREE STOCK (FULL)

© Christopher Neilan

Created by Alexandra Sleet

Only enter data in the green boxes

| CAVAT | Quantities you measure / look up | Calculated Values |
|--|----------------------------------|-------------------|
| <u>Step 1: Basic Value</u> | | |
| Stem Diameter (1) | 21 | |
| Stem Diameter (2) | 22 | |
| Stem Diameter (3) | | |
| Stem Diameter (4) | | |
| Stem Diameter (5) | | |
| Stem Diameter (6) | | |
| Stem Diameter (7) | | |
| Stem Diameter (8) | | |
| Stem Diameter (9) | | |
| Stem Diameter (10) | | |
| Unit Value Factor | 15.88 | |
| Basic Value | | £11,537 |
| <u>Step 2: CTI Value</u> | | |
| CTI Factor | 125% | |
| Accessibility | 60% | |
| CTI Value | | £8,653 |
| <u>Step 3: Functional Value</u> | | |
| Functional Value Factor | 40% | |
| Functional Value | | £3,461 |
| <u>Step 4: Adjusted Value</u> | | |
| Amenity Factors | No Change | |
| Appropriateness | No Change | |
| Adjusted Value | 100% | £3,461 |
| <u>Step 5: Final Value</u> | | |
| Life Expect. Factor | 10 - 20 | |
| FINAL VALUE | | £1,557 |

Project:
Name of Surveyor:

Twickenham Rediscovered Programme
R Skerratt BSc (For) M Arbor A

CAVAT

CTI Factor (Please select): 125%

CALCULATE VALUE OF TREE STOCK

Date: # 14.02.18

Cumulative Total: £ 30,985

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| Tree Information | | | Step 1: Basic Value | | Step 2: CTI Value | | Step 3: Functional Value | | Step 4: Adjusted Value | | | | Step 5: Final Value | FINAL VALUE |
|------------------|-----------------------------|--------------------------------|------------------------------|-------------|-------------------------------|-----------|---|------------------|---------------------------------|---------------------------------|----------------|------------------|-------------------------------------|-------------|
| Tree No. | Species ID | Location (I.e near tree no. 1) | Stem Diameter (Manual entry) | Basic Value | Accessibility (Please select) | CTI Value | Functional Value Factor (Please select) | Functional Value | Amenity Factors (Please select) | Appropriateness (Please select) | Adjusted Value | Calculated Total | Life Expect. Factor (Please select) | |
| 1 | Alnus glutinosa 'Laciniata' | | 15 | £ 2,806 | 100% | £ 3,508 | 100% | £ 3,508 | No Change | No Change | 100% | £ 3,508 | 80+ | £ 3,508 |
| 3 | Alnus glutinosa 'Laciniata' | | 15 | £ 2,806 | 100% | £ 3,508 | 100% | £ 3,508 | No Change | No Change | 100% | £ 3,508 | 80+ | £ 3,508 |
| 4 | Alnus glutinosa 'Laciniata' | | 15 | £ 2,806 | 100% | £ 3,508 | 100% | £ 3,508 | No Change | No Change | 100% | £ 3,508 | 80+ | £ 3,508 |
| 5 | Salix 'Tristis resistente' | | 17.5 | £ 3,820 | 100% | £ 4,774 | 100% | £ 4,774 | No Change | No Change | 100% | £ 4,774 | 80+ | £ 4,774 |
| 6 | Salix 'Tristis resistente' | | 17.5 | £ 3,820 | 100% | £ 4,774 | 100% | £ 4,774 | No Change | No Change | 100% | £ 4,774 | 80+ | £ 4,774 |
| 7 | Betula pendula | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 8 | Betula pendula | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 9 | Betula pendula | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 10 | Betula pendula | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 11 | Betula pubescens | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 12 | Betula pubescens | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |
| 13 | Betula pubescens | | 10 | £ 1,247 | 100% | £ 1,559 | 100% | £ 1,559 | No Change | No Change | 100% | £ 1,559 | 80+ | £ 1,559 |

Appendix d

**LUC Drawing No.
LUC-LD PLN 201 Issue 5**



| Iss | Date | Description | Drm | Chk |
|-----|--------|--|-----|-----|
| 5 | 180215 | Salix alba revised to Betula pendula + pubescens | JB | EP |
| 4 | 180207 | for Planning, incorporating planning feedback | JB | EP |
| 3 | 171207 | for Stage 3 | JB | EP |
| 2 | 171121 | for Planning | JB | EP |
| 1 | 171112 | First Issue | JB | EP |

Notes
 Do not scale from this drawing
 All dimensions are drawn in millimeters
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Tree Specification References

| | | | | | | | | | |
|-----|-----------------------------|-------|-----------|---|-----|-----------------------------|-------|-----------|----|
| Mx | Malus sylvestris | m/s | 350-400cm | 4 | Bpu | Betula pubescens | 30/35 | 500-700cm | 3 |
| Mg | Magnolia grandiflora | m/s | 450-500cm | 3 | STR | Salix 'Tristis resistanza' | 50/60 | 600-900cm | 2 |
| Md | Magnolia x loebneri | m/s | 450-500cm | 2 | | | | | |
| Aq | Alnus glutinosa 'Laciniata' | 40/50 | 600-900cm | 3 | Tj | Trachelospermum jasminoides | | | 14 |
| Bpe | Betula pendula | 30/35 | 500-700cm | 4 | | | | | |

Ornamental Planting Mixes

| | |
|-----|------------------------------------|
| PL1 | Water Lane - Foliage & texture mix |
| PL2 | Colour mix |
| PL3 | Embankment Boulder Garden mix |
| PL4 | Container mix |