



# Hampton Quay

## Arboricultural Impact Assessment

### Report for Stolon Studio Ltd

|                   |                                |                                         |             |
|-------------------|--------------------------------|-----------------------------------------|-------------|
| <b>Job Number</b> | <b>ART2002</b>                 |                                         |             |
| <b>Author</b>     | James Potts BSc (Hons) MArborA |                                         |             |
| <b>Version</b>    | <b>Checked by</b>              | <b>Approved by</b>                      | <b>Date</b> |
| V4.0              | Jane Kendall                   | Mark Cannon BA (Hons)<br>Dip.LA MArborA | 04/08/20    |

# Contents

|                                             |    |
|---------------------------------------------|----|
| Executive Summary                           | 1  |
| 1 Introduction                              | 2  |
| 2 Methodology                               | 4  |
| 3 Results                                   | 6  |
| 4 Recommendations                           | 12 |
| References                                  | 15 |
| Appendix 1: Schedule of Trees               | 16 |
| Appendix 2: Tree Constraints Plan           | 23 |
| Appendix 3: Tree Retention and Removal Plan | 27 |
| Appendix 4: Glossary of Terms               | 30 |

## LIABILITY

Arbeco has prepared this report for the sole use of the commissioning party in accordance with the agreement under which our services were performed. No warranty, express or implied, is made as to the advice in this report or any other service provided by us. This report may not be relied upon by any other party without the prior written permission of Arbeco. The content of this report is, at least in part, based upon information provided by others and on the assumption that all relevant information has been provided by those parties from whom it has been requested. Information obtained from any third party has not been independently verified by Arbeco, unless otherwise stated in the report.

## COPYRIGHT

© This report is the copyright of Arbeco. Any unauthorised reproduction or usage by any person is prohibited. Arbeco is part of the Temple Group Management group of companies.

# Executive Summary

Arbeco Ltd was commissioned by Stolon Studio Ltd to undertake a ground level survey and produce an Arboricultural Impact Assessment for future works associated with the development of land at Hampton Quay. A qualitative assessment of each tree was carried out according to British Standard BS 5837:2012, Trees in Relation to Design, Demolition and Construction– Recommendations, focusing on arboricultural values (categories A1, B1, C1)<sup>1</sup> and landscape values (categories A2, B2, C3)<sup>2</sup>.

The main findings of the survey are as follows:

- ❖ There was a total of 16 individual trees and seven groups<sup>3</sup> in and adjacent to the proposed development site each described in Appendix 1 of this report.
- ❖ Of the trees surveyed, six individuals and five groups were attributed Category B status, and ten individuals and two groups were attributed Category C status.
- ❖ A tree constraints check was carried out with Arun District Council and it was confirmed that no trees located adjacent to or in the proposed development site were subject to Tree Preservation Order or Conservation Area restrictions.
- ❖ Root protection areas were calculated in accordance with BS 5837:2012 for each of the surveyed trees and ranged from 2.2m<sup>2</sup> for T1 to 158.3m<sup>2</sup> for T2 and T12.
- ❖ Of the trees surveyed, a total of nine individuals and two groups will require removal to facilitate development.
- ❖ Any work to trees should consider the potential presence of protected species, including breeding birds and roosting bats. Any existing ecological reports pertaining to the site should be consulted prior to the commencement of works.

---

<sup>1</sup> Categorisation grading in accordance with BS 5837 2012. Trees suitable for retention: - Category A. Trees of high quality with an estimated remaining life expectancy of at least 40 years.  
Category B. Trees of moderate quality with an estimated life expectancy of at least 20 years.  
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 150mm.  
Category U. Trees of very low quality normally with a life expectancy of less than 10 years or requiring immediate removal due to health and safety concerns.

<sup>2</sup> British Standard BS 5837 2012 recommends that these categories may be further broken down into sub categories A1 A2 A3 pertaining to Arboricultural, Landscape or Cultural values respectively.

<sup>3</sup> The term “group” is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g. trees that provide companion shelter), visually (e.g. avenues or screens) or culturally, including for biodiversity (e.g. parkland or wood pasture).

# 1 Introduction

## BACKGROUND

- 1.1 Arbeco Ltd was commissioned on 1 July 2019 by Stolon Studio Ltd to carry out an arboricultural survey of trees at Hampton Quay, Littlehampton and provide a report to inform future design proposals and tree protection. The survey is required to assess the condition of trees that could be affected by future development of the site and provide sufficient information for the development of site layouts and construction exclusion zones to enable the protection of existing trees.

## SCOPE OF REPORT

- 1.2 This report has been produced in accordance with British Standard BS 5837:2012 Trees in Relation to Design, Demolition and Construction – Recommendations (hereafter referred to as BS 5837:2012). It provides information on the current condition of trees at the site, their suitability for retention, and the above and below ground constraints to development.
- 1.3 Any clear flaws or hazards have been identified in the Schedule of Trees provided in Appendix 1. Preliminary recommendations for the management of retained trees are provided, but a full hazard risk assessment comprising a more comprehensive analysis of tree condition and potential risk to target areas is beyond the scope of this report. Any recommendations relating to the management of potentially hazardous trees should be carried out as soon as possible<sup>4</sup>.

## SITE CONTEXT AND STATUS

- 1.4 The site is situated in Littlehampton, on the eastern bank of the River Arun and 1km north-west of Littlehampton Rail Station. The site comprises the western verge of the A259, earth bunding and estuary of the River Arun and measures 2.7ha in extent. The northern boundary of the site is formed by river estuary and highways verge, with the

---

<sup>4</sup> All tree works should be undertaken by a suitably qualified Arboricultural Contractor. No arboricultural works to trees subject to planning constraints shall be carried out without the written consent of the relevant Local Planning Authority (LPA). Any proposed tree works should be undertaken in accordance with British Standard BS 3998:2010 Treework - Recommendations. Works to trees that are the subject of a Tree Preservation Order or within a Conservation Area which are deemed to be dangerous under Regulation 14 of the Town and Country Planning (England) (Regulations) 2012 may under certain circumstances be undertaken without needing to seek the prior written consent of the LPA.

River Arun to the west and the A259 to the south and east. The Ordnance Survey National Grid reference for the centre of the site is TQ 01538 02702.

#### DESCRIPTION OF THE PROPOSALS

- 1.5 The proposal will see the site re-developed to provide 105 residential units, 300-400sqm of retail/commercial space and 32 leisure moorings, with the provision of amenity spaces, hard and soft landscaping and parking.

## 2 Methodology

### TREE SURVEY

- 2.1 The tree survey was conducted in accordance with BS 5837:2012 the results of which are presented in the Schedule of Trees (Appendix 1) and include a sequential numbering of each tree, species listed by common name; tree dimensions including overall height, canopy spreads measured against the cardinal compass points; crown height; age class; physiological condition; structural condition, life expectancy; root protection areas and preliminary management advice.
- 2.2 Each tree has been assigned a category grade in accordance with BS 5837:2012 categories A, B, C and U ranging from high to low quality. Definitions of tree quality are provided in Table 2 Appendix 1.
- 2.3 For the purposes of this report, arboricultural as well as landscape sub-categories have been used in the Schedule of Trees. BS 5837:2012 points out that each sub-category should be given equal weighting when grading trees against these criteria.
- 2.4 A tree constraints plan is presented in Appendix 2 showing the recommended root protection areas (RPA) for all surveyed trees and highlighting each grading category using the colour key system as described in BS 5837:2012.
- 2.5 The site was visited on 12 July 2019, weather conditions were dry and sunny.
- 2.6 All trees likely to be affected by works inside the red line boundary of the site were visually assessed using the Visual Tree Assessment Method (VTA) (Mattheck and Beloer, 1994).
- 2.7 Stem diameters were measured using diameter tape. Canopy spreads were estimated by pacing and where possible, verified using a laser range finder. Height measurements were taken using a laser clinometer.
- 2.8 Formal assessments of topography, drainage, service conduits and soil conditions including specific laboratory investigations of soil properties (i.e. plasticity index, moisture content, suction pressure) were not undertaken and are beyond the scope of this report.

## DESK STUDY

- 2.9 A tree constraints check was undertaken using the Arun District Council online mapping system to search for Tree Preservation Order and Conservation Area restrictions to tree works in and adjacent to the site.

## SUPPORTING DOCUMENTS

- 2.10 Drawings Ref: *202\_07\_19\_A Topographical Survey* (Se Surveying, 2019) and *030-2-SK007-Hampton Quay Proposal Masterplan* (Stolon Studio Ltd, 2019) were provided for the purposes of compiling this report. They include the layout of existing site features, along with a footprint overlay of the proposed development.

## PERSONNEL

- 2.11 The tree survey was carried out by Chris Agnew FdSc TechArborA an Arboricultural Consultant with over 16 years' experience within the sector, working as both a contractor and private consultant.
- 2.12 This report was produced by James Potts BSc (Hons), MArborA, an Arboricultural Consultant with over 5 years' experience as a private consultant.

## LIMITATIONS

- 2.13 Only preliminary recommendations for tree management are provided. A full hazard risk assessment comprising a more comprehensive analysis of the condition and potential risk to target areas is beyond the scope of this report.
- 2.14 The trees were inspected at ground level and no decay detection equipment was used. There is therefore a risk that any internal decay that may be present has gone undetected.
- 2.15 Trees are living organisms and their health and condition change with time. Therefore, this assessment remains valid for 12 months from the date of inspection, or until a severe storm is experienced, after which time a new inspection is required. For the purpose of this report, a severe storm is defined as a period of violent weather, involving rain, hail, wind, snow, lightning or any combination of these, likely to cause damage to trees.

## 3 Results

### TREE SURVEY

- 3.1 The results of the tree survey are provided in the Schedule of Trees in Appendix 1. A Tree Constraints Plan illustrating the BS 5837:2012 categories of each tree, their crown spread and RPA is presented in Appendix 2.
- 3.2 The survey recorded 16 individual trees and seven groups which could potentially be affected by future development. These comprised: common ash *Fraxinus excelsior*, common hawthorn *Crataegus monogyna*, field maple *Acer campestre*, goat willow *Salix caprea*, pedunculate oak *Quercus robur* and wild cherry *Prunus avium*.
- 3.3 Of the tree groups surveyed, four comprised mixed species including: aspen *Populus tremula*, black poplar *Populus nigra*, common ash, common hawthorn, crack willow *Salix fragilis*, field maple, pedunculate oak and wild cherry.
- 3.4 The numbers of each species are provided in Table 1 below.

Table 1: Species key and site frequency for trees potentially affected by development

| Species         | Frequency |       |
|-----------------|-----------|-------|
|                 | Tree      | Group |
| Common ash      | 4         | -     |
| Common hawthorn | 7         | 1     |
| Field maple     | -         | 2     |
| Goat willow     | 1         | -     |
| Mixed species   | -         | 4     |
| Pedunculate oak | 3         | -     |
| Wild cherry     | 1         | -     |

- 3.5 Physiological and structural condition<sup>5</sup> of the majority of surveyed trees was consistent with Category C status (ten individuals and two groups), with the remaining six individuals and five groups attributed Category B status.
- 3.6 Of the trees surveyed, six individuals and four groups individuals were classified to be at an early mature life stage<sup>6</sup>, two individuals were classified as young and eight individuals and three groups were classified as semi mature. No trees were found to be in the mature or over mature classifications.
- 3.7 A summary of the number of trees surveyed corresponding to BS 5837:2012 tree quality assessment definitions is provided below in Table 2 below.

Table 2: Grade Classifications

| BS 5837:2012<br>Grades A to U | Trees attributed to each grade                      | Frequency |   |
|-------------------------------|-----------------------------------------------------|-----------|---|
|                               |                                                     | T         | G |
| B                             | T2, T3, T4, T6, T13, T14, G1, G2, G3, G5, G7        | 6         | 5 |
| C                             | T1, T5, T7, T8, T9, T10, T11, T12, T15, T16, G4, G6 | 10        | 2 |

- 3.8 All Category B trees and groups as described in Table 2 should be given priority consideration for retention during any future development which should take full account of above and below ground constraints, as shown on the Tree Constraints Plan (Appendix 2).
- 3.9 A summary of the condition and value of the most noteworthy trees is provided below, based on information presented in Appendix 1.

- ✱ Common ash T2, was situated adjacent to the south-west corner of the site, 30m west of Bridge Road. The tree was early mature, was 11m in height, had five main

<sup>5</sup> Physiological and structural condition are terms used to differentiate between a trees physiological condition i.e. annual growth, vigour, presence of disease etc. as opposed to structural condition relating to branch formation, mechanical strength and integrity.

<sup>6</sup> Young. Establishing; usually with good vigour, but as of limited significance within the landscape.  
Semi-Mature. Established; normally vigorous and increasing in height. Of increasing landscape significance.  
Early Mature. Fully established trees around the middle half of their life span retaining good vigour. Not yet achieved full height and retaining apical dominance.  
Mature. Fully established trees retaining moderate vigour. Apical dominance lost but crown still spreading.  
Over Mature. Fully mature trees in the last quarter of their usual life expectancy; vigour declining.

stems with an average diameter of 260mm and a maximum canopy radius extending 6m to the north. The tree appeared to be in fair structural and physiological condition with retained deadwood in its canopy.

- ❖ Common ash T3, was situated 10m north of T2 and 25m west of Bridge Road. The tree was early mature, was 12m in height, had a single stem with a diameter of 400mm and a maximum canopy radius extending 8m to the north. The tree appeared to be in fair structural and physiological condition with retained deadwood in its canopy.
- ❖ Common ash T6, was situated on the western verge of Bridge Road, 50m north-east of T4. The tree was early mature, was 11m in height, had a five main stems with an average diameter of 260mm and a canopy radius extending 6m in all directions. The tree appeared to be in fair structural and physiological condition requiring no immediate remedial works.
- ❖ Pedunculate oak T13, was situated adjacent to the eastern boundary of the site, 70m north-east of the A259 roundabout. The tree was early mature, was 9m in height, had a single stem with a diameter of 400mm and a maximum canopy radius extending 8m to the south. The tree appeared to be in good structural and physiological condition requiring no immediate remedial works.
- ❖ Group G1, was situated on the eastern boundary of the site and extended 90m along the western edge of the A259. The group comprised semi mature mixed species as described in the Schedule of Trees, with an average height of 10m and an estimated average stem diameter of 350mm. The group appeared to be in fair structural and good physiological condition, requiring no immediate remedial works.
- ❖ Group G7, was situated adjacent to the south-east boundary of the site and extended from the River Arun road bridge to the A259 roundabout. The group comprised early mature mixed species as described in the Schedule of Trees, with an average height of 12m and an estimated average stem diameter of 400mm. The group appeared to be in fair structural and physiological condition, requiring no immediate remedial works.

## DESK STUDY

- 3.10 It was confirmed that no trees situated in or adjacent to the site were subject to Tree Preservation Order or Conservation Area restrictions.

## ARBORICULTURAL IMPACT ASSESSMENT

- 3.11 Based on Drawing Reference: *030-2-SK007-Hampton Quay Proposal Masterplan* (Stolon Studio Ltd, 2019) received from the client on the 23 August 2019, the impact of the proposal on the existing trees has been assessed and all trees that will potentially be affected by the development are listed below in Table 3. Tree numbers in the table correspond to the Schedule of Trees in Appendix 1 and Tree Constraints Plan described in Appendix 2.

Table 3: Summary of trees possibly affected by the development

| Impact                                                    | Reason                                              | B5 Cat B                             | B5 Cat C                         |
|-----------------------------------------------------------|-----------------------------------------------------|--------------------------------------|----------------------------------|
| <b>Trees to be removed</b>                                | Located within development footprint.               | T2, T3, T4, G2, G5, G3(12%), G7(16%) | T5, T7, T8, T9, T15, T16, G4, G6 |
| <b>Trees which could sustain damage to RPA</b>            | Installation of hardstanding.                       | T14                                  | -                                |
|                                                           | Soil compaction through construction traffic access | T14, G3, G7                          | -                                |
| <b>Trees which could sustain damage to stem or canopy</b> | Impact by construction traffic.                     | T14, G3, G7                          | -                                |
| <b>Trees to be pruned</b>                                 | Access facilitation                                 | G3, G7                               | -                                |

### Tree removal and pruning

- 3.12 Based on the design proposal, a total of nine individual trees and four groups will require removal to facilitate development works.
- 3.13 Of the trees to be removed, three individuals and two groups attributed Category B status, and six individuals and two groups were attributed Category C status.
- 3.14 The proposed construction footprint will encroach into the canopy extents of a further two groups G3 and G7, both attributed Category B status. These groups will require the pruning back/partial removal of 12% and 16% their canopy extents respectively in order

to facilitate access for development. Indicative canopy extents to be pruned are displayed in the Tree Retention and Removal Plan provided in Appendix 3.

Trees which could potentially sustain damage to stem, canopy or RPA.

- 3.15 Development proposals have the potential to indirectly impact the stem, canopy or RPAs of one tree, T14 and two groups G3 and G7, as displayed in Table 3. In order to ensure that these features are successfully retained during the proposed works, the drafting of specialist tree protection measures as part of an Arboricultural Method Statement and Tree Protection Plan will be required.

Incursions into RPA of trees effected by the development proposal.

- 3.16 The proposed development will encroach into the RPA of one tree to be retained, T14. As displayed in Table 4 below.

Table 4: Proposed incursions in RPAs of trees to be retained.

| Tree ID | Stem Diameter | Total RPA (m <sup>2</sup> ) | Area of Incursion (m <sup>2</sup> ) | Area of Incursion (%) |
|---------|---------------|-----------------------------|-------------------------------------|-----------------------|
| T14     | 320           | 46.3                        | 12.5                                | 26.9                  |

- 3.17 Proposals include the construction of a new shared public footpath extending around the southern extents of G3, which will incur into 26.9% of the total RPA of T14. The existing surface currently comprises open ground, fenced off from general public use and as such, the existing soil structure is likely uncompacted. Standard methods of construction for a new hardstanding footpath inside the RPA of T14 would likely result in a significant impact to its structural and physiological condition. In order to successfully retain this tree, specialist methods of excavation and construction will be required as part of a full Arboricultural Method Statement.

Impact on visual amenity and local character

- 3.18 Trees T5, T7, T8, T9, T15 and T16 and groups G4 and G6 were all attributed Category C status for their small size and/or low overall quality. All were situated in locations of low public visibility when viewed from the A259. As such, their removal in order to facilitate access for construction is not considered to represent a significant impact to visual public amenity.

- 3.19 Trees T2, T3 and T4 were all attributed Category B status for their moderate size and quality. All three trees were situated directly adjacent to the southern extents of G7 and are partially screened from public visibility when viewed from the A259. As such, the visual impact of their removal would be partially mitigated by the screening properties of G7, however, without appropriate mitigation as described in Section 4, the removal of these trees is still considered to represent a significant impact to visual public amenity.
- 3.20 The removal/pruning back of approximately 12% and 16% of tree groups G3 and G7 respectively is required in order to facilitate access for demolition and construction works. Both groups were attributed Category B status for their large size and moderate value as landscape features.
- 3.21 The proposed pruning works to G3 will be concentrated around its southern extents and will only extend into the group by approximately 3.5m, retaining a significant portion of its southern canopy area and leaving its northern extents untouched. As a result, the pruning back of G3 to facilitate access is not considered to represent a significant impact to visual public amenity.
- 3.22 The proposed works to G7 will require the removal of approximately 500m<sup>2</sup> of its northern canopy extents in order to facilitate construction of the proposed site access roads and footpath. The section of G7 to be removed is situated in an area of relatively low public visibility and is screened by the furthest extents of G7 to the south and G3 to the north. As such, potential visual impact of removing approximately 16% of the group is partially mitigated. Despite this, without appropriate replacement planting as detailed in Section 4 of this report, its removal would still represent a significant loss in canopy cover and visual public amenity.

## 4 Recommendations

### TREE WORKS

- 4.1 The following tree pruning, and removal operations should be undertaken prior to the commencement of demolition works in order to facilitate access for development.
- ❖ Trees T2, T3, T4, T5, T7, T8, T9, T15 and T16 and groups G4 and G6 require removal.
  - ❖ Tree groups G3 and G7 will require the removal/pruning back of 12% and 16% of their total canopy areas respectively. Indicative locations for pruning/removal are displayed in the Tree Retention and Removal Plan.
- 4.2 All tree works should give due consideration to the potential presence of protected species, including breeding birds and roosting bats. Any existing ecological reports pertaining to the site should be consulted prior to the commencement of works.
- 4.3 Arisings from tree works (e.g. wood piles and standing dead trunks) can provide valuable habitats for wildlife. As such, consideration should be given to their retention on site in areas unlikely to cause issues to public health and safety.
- 4.4 All tree pruning should be carefully planned and undertaken in accordance with *BS 3998: 2010 Recommendation for Tree Works*.
- 4.5 Any recommendations highlighting the management of potentially hazardous trees should be reviewed as soon as is practically possible.

### MITIGATION

- 4.6 The proposed site masterplan (Stolon Studio Ltd, 2019) displays proposed replacement tree planting details, addressing the potential loss of visual public amenity where tree removal has been deemed unavoidable.
- 4.7 It is recommended that the tree selection is appropriate to the site and chosen from a species palette in accordance with local tree planting policies and should be included as part of a full Tree Planting Plan and Tree Planting Specification which should provide a tree replacement ratio of at least 2:1.

- 4.8 The design of any new planting and landscaping proposals should be based upon a soil analysis which considers pH and any nutrient deficiencies or imbalances.
- 4.9 Often the need for future remedial pruning or tree removal can be avoided through careful species selection and planning during the design of the mitigation planting scheme.
- 4.10 The positioning of mitigation planting in relation to new or existing buildings should take full account of the final canopy height and spread of all trees included in the planting scheme. Buildings should ideally be located a sufficient distance from the predicted canopy line and RPA to avoid future pressure to undertake remedial pruning or tree removal.
- 4.11 It is recommended that specifications on aftercare and maintenance, including irrigation, as well as protection and formative pruning during establishment are included as part of the finalised tree planting strategy. Recommendations should be appropriate to the proposed planting and should be in compliance with Section 11 of *BS 8545:2014 Trees from nursery to establishment in the landscape- Recommendations*.

#### ISSUES FOR THE ARBORICULTURAL METHOD STATEMENT

- 4.12 In order to minimise disturbance in the RPAs of retained trees, excavation into the soil or soil regrading should not be a requirement of finalised construction layouts, existing levels should remain intact and should be protected from overloading to prevent soil compaction.
- 4.13 Protective fencing should be installed in accordance with figure 2 of BS 5837:2012 to enable the safe retention of trees to be retained. The positioning of tree protection and the establishment of construction exclusion zones (CEZ) should initially be based upon the root protection areas as described in Appendix 1 and should be in place prior to the commencement of works.
- 4.14 All works should be undertaken from outside the RPA wherever possible. Where working in an RPA is unavoidable, ground protective measures fully compliant with section 6.2 of BS 5837: 2012 and agreed by the consulting arboriculturalist should be used.

- 4.15 Where construction of new buildings or hardstanding inside RPAs is likely to significantly impact a tree's physiological or structural condition, specialist methods of construction should be developed and specified as part of the Arboricultural Method Statement.

# References

British Standard Institute (BSI) (2012). *BS 5837:2012 Trees in Relation to Design Demolition and Construction-Recommendations*. BSI, London.

British Standard Institute (BSI) (2010). *BS 3998:2010 Recommendation for Tree Works*. BSI, London.

British Standard Institute (BSI) (2014). *BS 8545:2014 Trees: from nursery to independence in the landscape - Recommendations*. BSI, London.

Department for Communities and Local Government (2014). *Planning Practice Guidance on Tree Preservation Orders and trees in conservation areas*.

Lonsdale, D. (1999). *Research for Amenity Trees No.7: Principles of Tree Hazard Assessment and Management*. HMSO

Mattheck and Beloer (1994). HMSO London. Research for Amenity Trees No 4; *The Body Language of Trees*.

Se Surveying, (2019). *202\_07\_19\_A Topographical Survey*.

Stolon Studio Ltd, (2019). *030-2-SK007-Hampton Quay Proposal Masterplan*.

Town and Country Planning Act 1990 (as amended).

Town and Country Planning (Tree Preservation) (England) Regulations 2012.

## Appendix 1: Schedule of Trees

Table 1: Schedule of Trees and Tree Quality Assessment\*

\* See Table 3 for key to terms

\*\* See Table 2 for definitions of categories

| No | Species         | Ht. | S | St.<br>1.5<br>m                     | Canopy Spread |     |     |     | Cr.<br>Cl | La | SG   | PG   | Comments<br>/Observation                                                   | Preliminary<br>Management<br>Advice | LE    | Cal.<br>m | RPAm<br>% | RPA<br>% |
|----|-----------------|-----|---|-------------------------------------|---------------|-----|-----|-----|-----------|----|------|------|----------------------------------------------------------------------------|-------------------------------------|-------|-----------|-----------|----------|
|    |                 |     |   |                                     | N             | S   | E   | W   |           |    |      |      |                                                                            |                                     |       |           |           |          |
| T1 | Common hawthorn | 5   | 1 | 70                                  | 2             | 1.5 | 1.5 | 1.5 | 0.5       | SM | Good | Good | -                                                                          | No immediate works required         | 10-20 | C1        | 2.2       | 0.8      |
| T2 | Common ash      | 11  | 5 | 350;<br>250;<br>250;<br>250;<br>200 | 6             | 5   | 5   | 5   | 1         | EM | Fair | Fair | Deadwood in canopy, part of woodland group.                                | Fell.                               | 20-40 | B2        | 158.3     | 7.1      |
| T3 | Common ash      | 12  | 1 | 400                                 | 8             | 7   | 7   | 6   | 1         | EM | Fair | Fair | Deadwood in canopy, part of woodland group                                 | Fell.                               | 20-40 | B2        | 72.4      | 4.8      |
| T4 | Common ash      | 12  | 2 | 350;<br>250                         | 4             | 6   | 5   | 6   | 2         | EM | Fair | Fair | Compression fork at base, deadwood in canopy and evidence of nesting birds | Fell.                               | 20-40 | B2        | 83.7      | 5.2      |
| T5 | Common hawthorn | 5   | 1 | 200                                 | 1.5           | 2   | 1.5 | 1.5 | 0.2       | SM | Good | Good | -                                                                          | Fell.                               | 0-10  | C1        | 18.1      | 2.4      |
| T6 | Common ash      | 11  | 5 | 300;<br>250;<br>250;<br>250;<br>200 | 6             | 6   | 6   | 6   | 3.5       | EM | Fair | Fair | -                                                                          | No immediate works required         | 20-40 | B2        | 143.6     | 6.8      |
| T7 | Common hawthorn | 5   | 4 | 150;<br>90;<br>90;<br>80            | 3             | 3   | 1.5 | 1.5 | 0.2       | SM | Good | Good | -                                                                          | Fell.                               | 0-10  | C1        | 20.4      | 2.5      |
| T8 | Common hawthorn | 6   | 5 | 150;<br>100;<br>90;<br>90;<br>80    | 4             | 4   | 4   | 4   | 0.5       | SM | Good | Good | -                                                                          | Fell.                               | 0-10  | C1        | 24.9      | 2.8      |

Table 1: Schedule of Trees and Tree Quality Assessment\*

\* See Table 3 for key to terms

\*\* See Table 2 for definitions of categories

| No  | Species         | Ht. | S | St.<br>1.5<br>m                     | Canopy Spread |     |     |     | Cr.<br>Cl | La | SG   | PG   | Comments<br>/Observation                                                                           | Preliminary<br>Management<br>Advice | LE    | Cal.<br>m | RPAm<br>% | RPA<br>% |
|-----|-----------------|-----|---|-------------------------------------|---------------|-----|-----|-----|-----------|----|------|------|----------------------------------------------------------------------------------------------------|-------------------------------------|-------|-----------|-----------|----------|
|     |                 |     |   |                                     | N             | S   | E   | W   |           |    |      |      |                                                                                                    |                                     |       |           |           |          |
| T9  | Common hawthorn | 4   | 4 | 150;<br>100;<br>70;<br>90           | 1.5           | 1.5 | 1.5 | 1.5 | 0         | Y  | Fair | Poor | -                                                                                                  | Fell.                               | 10-20 | C1        | 20.6      | 2.6      |
| T10 | Pedunculate oak | 6   | 1 | 250                                 | 4             | 1   | 4   | 2   | 1         | Y  | Good | Good | Situated in woodland group                                                                         | No immediate works required         | 10_20 | C1        | 28.3      | 3.0      |
| T11 | Wild cherry     | 7   | 1 | 250                                 | 1             | 3   | 2   | 2   | 1         | SM | Good | Good | Situated in woodland group                                                                         | No immediate works required         | 10-20 | C1        | 28.3      | 3.0      |
| T12 | Goat willow     | 12  | 5 | 350;<br>250;<br>250;<br>250;<br>200 | 8             | 7   | 5   | 7   | 0.2       | SM | Fair | Good | Failed stem                                                                                        | No immediate works required         | 10-20 | C1        | 158.3     | 7.1      |
| T13 | Pedunculate oak | 9   | 1 | 400                                 | 7             | 8   | 5   | 5   | 1         | EM | Good | Good | -                                                                                                  | No immediate works required         | 20-40 | B1        | 72.4      | 4.8      |
| T14 | Pedunculate oak | 8   | 1 | 320                                 | 5             | 4   | 4   | 4   | 1         | EM | Good | Good | -                                                                                                  | Fell.                               | 20-40 | B1        | 46.3      | 3.8      |
| T15 | Common hawthorn | 5   | 1 | 200                                 | 1.5           | 1.5 | 1.5 | 1.5 | 0         | SM | Good | Good | -                                                                                                  | Fell.                               | 10_20 | C1        | 18.1      | 2.4      |
| T16 | Common hawthorn | 4   | 1 | 180                                 | 2             | 2   | 2   | 2   | 0         | SM | Fair | Good | -                                                                                                  | No immediate works required         | 10_20 | C1        | 14.7      | 2.2      |
| G1  | Mixed species   | 10  | 1 | 350                                 | 3             | 3   | 3   | 3   | 1         | SM | Fair | Good | Semi mature highway plantation comprising ash, sycamore, field maple, aspen, cherry and blackthorn | No immediate works required         | 20-40 | B2        | 55.4      | 4.2      |

Table 1: Schedule of Trees and Tree Quality Assessment\*

\* See Table 3 for key to terms

\*\* See Table 2 for definitions of categories

| No | Species            | Ht. | S | St.<br>1.5<br>m     | Canopy Spread |     |     |     | Cr.<br>Cl | La | SG   | PG   | Comments<br>/Observation                                                                                                                                                                  | Preliminary<br>Management<br>Advice | LE    | Cal.<br>m | RPAm<br>% | RPA<br>% |
|----|--------------------|-----|---|---------------------|---------------|-----|-----|-----|-----------|----|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------|-----------|-----------|----------|
|    |                    |     |   |                     | N             | S   | E   | W   |           |    |      |      |                                                                                                                                                                                           |                                     |       |           |           |          |
| G2 | Field maple        | 8   | 3 | 350;<br>200;<br>100 | 3             | 3   | 3   | 3   | 1         | EM | Fair | Good | Hedgerow plantation<br>adjacent to culvert                                                                                                                                                | No immediate<br>works required      | 20-40 | B2        | 78.0      | 5.0      |
| G3 | Mixed<br>species   | 6.1 | 1 | 250                 | 2             | 2   | 2   | 2   | 1         | SM | Fair | Good | Highways planting<br>group comprising ash,<br>oak, field maple,<br>cherry and hawthorn                                                                                                    | No immediate<br>works required      | 20-40 | B2        | 28.3      | 3.0      |
| G4 | Mixed<br>species   | 7   | 1 | 200                 | 1.5           | 1.5 | 1.5 | 1.5 | 1         | SM | Fair | Good | Small group<br>comprising mainly<br>field maple and<br>hawthorn                                                                                                                           | Fell.                               | 10_20 | C2        | 18.1      | 2.4      |
| G5 | Field maple        | 10  | 1 | 300                 | 2.5           | 2.5 | 2.5 | 2.5 | 0.5       | EM | Fair | Good | Hedgerow boundary<br>group                                                                                                                                                                | No immediate<br>works required      | 20-40 | B2        | 40.7      | 3.6      |
| G6 | Common<br>hawthorn | 8   | 1 | 150                 | 1             | 1   | 1   | 1   | 0         | EM | Fair | Good | Hedgerow group                                                                                                                                                                            | Fell.                               | 10_20 | C2        | 10.2      | 1.8      |
| G7 | Mixed<br>species   | 12  | 1 | 400                 | 4             | 4   | 4   | 4   | 1         | EM | Fair | Fair | Large group extending<br>along west and south<br>side of road,<br>comprising ash, oak,<br>sycamore, poplar,<br>crack willow, field<br>maple, wild cherry<br>with hawthorn<br>understorey. | No immediate<br>works required      | 20-40 | B2        | 72.4      | 4.8      |

Table 2: BS: 5837 2012 Tree Quality Assessment Definitions

| TREES FOR REMOVAL                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Category & Definition                                                                                                                                                       | Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Identification on Plan |
| <b>Category U</b><br>Those in such a condition that they cannot realistically be retained as a living tree in the context of the current land use for longer than 10 years. | <ul style="list-style-type: none"> <li>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)</li> <li>Trees that are dead or are showing signs of significant immediate or irreversible overall decline.</li> <li>Trees infected with pathogens of significance to the health and or safety of other trees nearby by or very low quality trees suppressing adjacent trees of better quality.</li> </ul> | RED                    |

| TREES TO BE CONSIDERED FOR RETENTION                                                                             |                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                           |                                                                                                                                    |                        |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Category & Identification                                                                                        | 1 Mainly arboricultural values                                                                                                                                                                                                           | 2 Mainly landscape values                                                                                                                                                                                                                                 | 3 Mainly cultural values including conservation                                                                                    | Identification on plan |
| <b>Category A</b><br>Trees of High Quality with an estimated remaining life expectancy of at least 40 years      | Trees that are a particularly good example of their species, especially if rare or unusual, or essential components of groups or of formal or semi-formal arboricultural features e.g. the dominant and/or principal trees in an avenue) | Tree groups or woodlands of particular visual importance as arboricultural and/or landscape features.                                                                                                                                                     | Tree groups or woodlands of significant conservation historical, commemorative or other value (e.g. veteran trees or wood pasture) | GREEN                  |
| <b>Category B</b><br>Trees of moderate quality with an estimated remaining life expectancy of at least 20 years. | Trees that might be included in the high category but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage).                                 | 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 benefits.                                                                       | BLUE                   |

TREES TO BE CONSIDERED FOR RETENTION

| Category & Identification                                                                                                                                    | 1 Mainly arboricultural values                                                                                     | 2 Mainly landscape values                                                                                                                                                                | 3 Mainly cultural values including conservation                 | Identification on plan |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------|
| <b>Category C</b><br>Trees of a low quality with an estimated remaining life expectancy of at least 10 years or young trees with a stem diameter below 150mm | 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 landscape value and/or trees offering low or only temporary/transient landscape benefits. | Trees with no material conservation or other cultural benefits. | GREY                   |

Table 3: Key Schedule of Trees

| Column Heading                   | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tree No</b>                   | Sequential number corresponding to number on plan.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Species</b>                   | English names.                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Ht.</b>                       | Height in metres.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>S</b>                         | Number of main stems.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>St. 1.5 (Stem Diameter)</b>   | Stem diameter when measured in accordance with Annex C of BS 5837:2012.                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>NSEW</b>                      | Crown radius in metres to cardinal points of the compass.                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Cr. Cl. (Crown Clearance)</b> | Height in metres between the ground and underside of canopy.                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>LS.</b>                       | Life stage definitions. Y= Young. SM = Semi-mature. EM = Early mature. M = Mature. OM = Over mature.                                                                                                                                                                                                                                                                                                                                                                        |
| <b>SC</b>                        | Brief description of structural condition.                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>PC</b>                        | Brief description of physiological condition.                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Preliminary Advice</b>        | Preliminary tree works advice and recommendations.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>LE</b>                        | Estimated remaining useful life contribution in years. <10, 10+, 20+ and 40+ yr.                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Cat. (Category)</b>           | <p>Categorisation grading in accordance with BS 5837 2012.</p> <p>Trees suitable for retention: - Category A trees of high quality and amenity value. Category B trees of moderate quality and amenity value. Category C trees of low quality or amenity value.</p> <p>British Standards BS 5837:2012 recommends that these categories may be further broken down into sub-categories A1 A2 A3 pertaining to Arboricultural, Landscape or Cultural values respectively.</p> |
| <b>RPA m<sup>2</sup></b>         | Root Protection Area (RPA). Indicative area around a tree measured in m <sup>2</sup> and calculated in accordance with Annex C of BS 5837:2012 deemed to contain sufficient rooting volume to maintain the viability of a tree and where the protection of roots and soil structure is treated as a priority.                                                                                                                                                               |
| <b>RPA r</b>                     | Root Protection Area (RPA) radius calculation centred on the base of the tree and calculated in accordance with Annex C of BS 5837:2012                                                                                                                                                                                                                                                                                                                                     |

## Appendix 2: Tree Constraints Plan





Ecology, Tree & Habitat Services

Job title  
**Hampton Quay**  
Job no. ARB2002

Client  
**Stolon Studio Ltd**

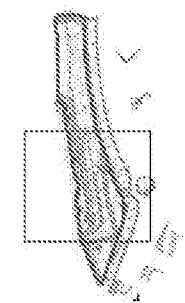
Map title  
**Tree Constraints Plan**

Section: 2/3 Scale: (at A3) 1:750

Date of survey  
12/07/2019

Surveyor  
Chris Agnew

|             |                |                    |
|-------------|----------------|--------------------|
| Drawn<br>JP | Approved<br>CA | Date<br>02/09/2019 |
|-------------|----------------|--------------------|



- Legend**
- Crown spread of category C - Trees with low quality and value
  - Crown spread of category B - Trees with moderate quality and value
  - Crown spread of Category B groups
  - Crown spread of Category C groups
  - Root Protection Area (RPA)



This plan is provided solely for the purpose of supporting the description of the arboricultural features of the site as contained in the accompanying report.



Ecology, Tree & Habitat Services

Job title  
**Hampton Quay**  
Job no. ARB2002

Client  
**Stolon Studio Ltd**

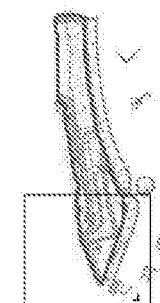
Map title  
**Tree Constraints Plan**

Section: 3/3 Scale (at A3) 1:750

Date of survey  
**12/07/2019**

Surveyor  
**Chris Agnew**

|             |                |                    |
|-------------|----------------|--------------------|
| Drawn<br>JP | Approved<br>CA | Date<br>02/09/2019 |
|-------------|----------------|--------------------|



- Legend**
- Crown spread of category C - Trees with low quality and value
  - Crown spread of category B - Trees with moderate quality and value
  - ▨ Crown spread of Category B groups
  - ▩ Crown spread of Category C groups
  - ▧ Root Protection Area (RPA)

This plan is provided solely for the purpose of supporting the description of the arboricultural features of the site as contained in the accompanying report.

## Appendix 3: Tree Retention and Removal Plan





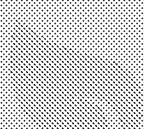
## Appendix 4: Glossary of Terms

## Glossary of Terms

| Term                                          | Explanation                                                                                                                                                                           |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Arboricultural Impact Assessment (AIA)</b> | Evaluation of direct and indirect effects of a proposed design and/or construction.                                                                                                   |
| <b>Arboricultural Method Statement (AMS)</b>  | Methodology for the implementation of any aspect of development that is in the root protection area or has the potential to result in the loss of or damage to a tree to be retained. |
| <b>Branch structure</b>                       | Qualitative description of formation of main framework of limbs and branches.                                                                                                         |
| <b>Canopy face</b>                            | Orientation of canopy relative to cardinal points of the compass                                                                                                                      |
| <b>Canopy radius</b>                          | A measurement taken from the centre of a tree to the furthest radial extension of tree canopy relative to the cardinal points of the compass.                                         |
| <b>Competent Person</b>                       | Person who has training and experience relevant to the matter being addressed and an understanding of the requirements of the particular task being approached.                       |
| <b>Conservation Area</b>                      | Local Planning Authority special designation generally prohibiting tree works without 6 weeks prior written notification.                                                             |
| <b>Construction Exclusion Zone (CEZ)</b>      | Area based upon the calculated root protection area prohibiting access.                                                                                                               |
| <b>Cavity</b>                                 | Open and exposed aperture where wood tissue has internally degraded.                                                                                                                  |
| <b>Constraints check</b>                      | Formal search of local authority records to determine legal and statutory constraints on tree works.                                                                                  |
| <b>Crown lifting</b>                          | Removal of lower branches to achieve a stated vertical clearance above ground level or other surface.                                                                                 |
| <b>Crown reduction</b>                        | Pruning of a trees canopy in both height and width.                                                                                                                                   |
| <b>Decay</b>                                  | Deterioration and breakdown of tree wood fibres resulting in structural and/or physiological dysfunction of a tree.                                                                   |
| <b>Dieback</b>                                | Continual decline and death of wood tissue including twigs and branches.                                                                                                              |
| <b>Failure</b>                                | Description of structural failure or wood fibres including fracture of branches, limbs and main stems.                                                                                |
| <b>Fork</b>                                   | Area or point of union between one or more limbs or branches.                                                                                                                         |
| <b>Hazard Risk Assessment</b>                 | Qualitative and quantitative appraisal of the potential for tree failure and the possible risk of harm or damage to persons or property.                                              |
| <b>Local Planning Authority</b>               | Body responsible for the administration of Statutory duties relating to Development Management.                                                                                       |
| <b>Multi-stem</b>                             | A single tree formed from 2 or more codominant main stems                                                                                                                             |
| <b>Occlusion</b>                              | Wood development enclosing an extant wound or pruning cut.                                                                                                                            |
| <b>Pruning</b>                                | The targeted removal of branches or limbs using saws or other tools.                                                                                                                  |

## Glossary of Terms

| Term                                | Explanation                                                                                                                                                                                    |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Physiological Condition</b>      | Observation relating to a trees physiology for example vigour, leaf area, growth rate, the presence of pests or disease.                                                                       |
| <b>Root Protection Area</b>         | Root Protection Area (RPA). Indicative area around a tree deemed to contain sufficient rooting volume to maintain the viability of a tree.                                                     |
| <b>Shelter belt</b>                 | A wind break normally made up of one or more trees planted in such a way to provide cover from the wind.                                                                                       |
| <b>Structural Condition</b>         | Observation relating to a tree's structural integrity and the presence of any physical defects.                                                                                                |
| <b>Suppressed</b>                   | Where a trees development has been influenced or effected by the presence of competing vegetation.                                                                                             |
| <b>Tree Constraints Plan</b>        | A scaled plan indicating above and below ground constraints relating to the protection of trees                                                                                                |
| <b>Tree Preservation Order</b>      | A legal order made by the local planning authority protecting specific trees in the interests of amenity.                                                                                      |
| <b>Visual Tree Assessment (VTA)</b> | A method of assessment based upon the research developed to recognise dynamic responses of a tree to its surroundings.                                                                         |
| <b>'V' Shaped Branch Union</b>      | The union point between two branches that have grown at a tight angle, forming the 'V' shape. This structure is inherently weaker than the 'U' shaped union.                                   |
| <b>'U' Shaped Branch Union</b>      | The union point between two branches that have grown at a wider angle, forming the 'U' shape. This structure is considered to be the strongest and most optimised shape that a union can form. |



**arbeco**  
Ecology, Tree & Habitat Services

