



Platform for Prosperity Road Improvement

Arboricultural Report

August 2012
Southampton City Council










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Executive Summary

S1 Overview and Terms of Reference

Mott MacDonald Ltd has been commissioned by Southampton City Council (SCC) to undertake an Arboricultural Survey to inform the proposed Platform for Prosperity Road Improvement Scheme. The works will create a two way dual carriageway along Platform Road, with the existing road widened and extended towards the port by up to 8 to 10 metres.

The survey and associated report has been undertaken in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*. This British Standard is intended to assist decision making with regard to existing and proposed trees in the context of design, demolition and construction.

This survey is not, nor should be taken to be, a full or thorough assessment of the health and safety of trees on or adjacent to the site, and therefore it recommended that detailed tree inspections are undertaken on a regular basis with the express purpose of complying with the land owners' duty of care and satisfying health and safety requirements.

S2 Designations

Southampton City Council has confirmed that there are a number of Conservation Areas that the scheme falls within or is adjacent to including Canute Road; Oxford Street, Old Town South and Old Town West Conservation Areas. Conservation Area status requires notification of proposed tree works to be issued to the Local Authority for approval. No trees affected by the Scheme are subject to Tree Preservation Orders (TPOs).

S3 Trees affected by scheme

The trees likely to be affected by the proposed Scheme have been assessed for their physiological and structural condition, and given a retention category in accordance with Table 1 – Cascade Chart for Tree Quality Assessment, *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

Twelve individual trees were surveyed in relation to the Scheme. Of these trees:

- 3 trees have been assessed as Grade A i.e. trees of high quality and value;
- 4 individual trees as Grade B i.e. trees of moderate quality and value;
- 4 individual trees as Grade C i.e. trees of low quality and value; and,

- 1 individual tree as Grade U i.e. trees for removal on the basis of sound arboricultural management.

Eight trees (T5, T6, T7, T8, T9, T10, T11 and T12) will need to be removed to facilitate construction of the scheme. The trees for removal comprise three category B trees, four category C trees and one category U tree. There is also a possibility that T4 will be removed on Cultural Heritage grounds. This is yet to be confirmed Southampton City Council.

Three trees (T1, T2 and T3) will require minor pruning works to provide the appropriate vertical clearance of 5.2m over the carriageway.

S4 Protected Species

There is potential for nesting birds and bats in the vegetation on site, and appropriate checks should be carried out prior to commencement of works. All tree works must be undertaken in accordance with the Platform Road Bat Survey report (Mott MacDonald, June 2012).

S5 Protective Barriers

No recommendations have been made to install protective barriers during the construction works. However, all works must proceed in accordance with Section 4 of this report.

S6 Completion of Construction

Directly following the completion of the Scheme, an Arboriculturalist should be commissioned to look for any accidental damage and/or signs of intolerance to the change in conditions relating to retained trees within the site as a result of this development.

S7 Tree Planting

Initial recommendations for mitigation tree planting have been detailed within Section 3.5.

1. Introduction

1.1 Terms of Reference

Mott MacDonald has been commissioned to undertake an Arboricultural Survey to support the Platform for Prosperity Road Improvement Scheme as outlined below. The survey and associated report has been undertaken in accordance with *BS 5837:2012 Trees in Relation to design, demolition and construction – Recommendations*.

The Scheme comprises two elements, Platform for Prosperity and Town Quay (refer to Appendix A Figure 1.1 for location plan).

1.1.1 Platform for Prosperity

The Scheme primarily aims to reduce congestion along Town Quay, Platform Road and the surrounding network for the benefit of local businesses, residents and visitors. Its implementation provides the additional benefit of improved connectivity and public use of Queen's Park.

The proposed Scheme entails removing the eastbound gyratory around Queen's Park, which is adjacent to Dock Gate 4 and extending the two way section of dual carriageway at Town Quay, opposite the Platform Tavern Public House, and eastwards along Platform Road to the Terminus Terrace junction. The access from the east end of Queen's Terrace to Terminus Terrace would be closed at this intersection, with three new signalised junctions created at the Platform Road junctions with Queen's Terrace, Dock Gate 4 and Terminus Terrace / Canute Road.

To permit the formation of a two way dual carriageway along Platform Road, its southern kerb line would be moved closer to the adjacent port by up to 8 to 10 metres. The northern kerb line running along the boundary with Queen's Park would move slightly south to enable the footway to be widened at this location.

Works to Terminal Terrace would include carriageway resurfacing, curb realignment, new traffic islands and a signalised junction. The signalised junction would allow traffic to access Central Bridge from Terminus Terrace, providing an alternative route to the Itchen Bridge for eastbound traffic. Low key improvement works would be undertaken along Town Quay to include the review of traffic islands and kerb alignments, all to be contained within the carriageway.

The southern end of Latimer Street, which currently cuts through Queens Park, would be re-established as park land, with the paved area narrowed into a shared footway and cycleway. Once the access from Queens Terrace to Terminus Terrace has been closed, additional public realm improvements would be undertaken within this area to improve the connectivity between Queens Park and the area to the north such as Oxford Street.

New parking spaces would be provided along the south side of Queen's Terrace to replace spaces that would be removed as part of the Scheme to the south of Platform Road, and from within the car park to the east of Queen's Park.

1.2 Scope of Work and Methodology

The survey was carried out by a Mott MacDonald qualified Arboriculturalist, on Wednesday 9th May 2012 to assess the quality and value of the principal trees in or adjacent to the proposed Scheme footprint. The tree data contained within the Tree Survey Schedule (Appendix C), was recorded by a visual survey from ground level and no invasive tree inspection measures were employed.

The objective of this report is to provide a balanced judgement of the site to allow the development to be integrated with the trees in this location. The assessment process categorises the trees onsite to select the trees appropriate for retention, reviews the options for incorporating these trees within the developed landscape, and provides a methodology for tree protection during construction. The survey provides comment on the general quality of the trees but does not constitute a full or thorough assessment of the health and safety of trees on or adjacent to the site.

The recommended actions for the existing trees have been stated in Section 3 with the full Tree Survey Schedule and categorisation of the trees in their existing context stated in Appendix C. The Root Protection Area (RPA) calculations are contained in Appendix D.

In accordance with BS 5837:2012, the following information was recorded for each tree:

- a) Sequential reference number (to be recorded on the tree survey plan).
- b) Species listed by common, with key provided to scientific name.
- c) Height (metres).
- d) Stem diameter (millimetres) in accordance with annex C of *BS 5837:2012 (Trees in Relation to design, demolition and construction - Recommendations)*. The stem diameters of single stemmed trees were measured at 1.5 metres above ground level and multi-stemmed trees measured in accordance with Annex C.
- e) Branch spread (metres), taken as a minimum at the four cardinal points, to derive an accurate representation of the crown (plotted on the tree survey plan).
- f) Existing height (metres) above ground level of:
 1. First significant branch; and
 2. Canopy.
- g) Life stage is recorded as:
 - I. Y: Young trees or newly planted trees;
 - II. SM: Semi-mature trees within 1st third of their life expectancy;
 - III. EM: Early mature trees within 2nd third of their life expectancy;
 - IV. M: Mature trees aged within final third of their life expectancy;
 - V. OM: Over-mature - declining or moribund trees of low vigour; and,

- VI. V: Veteran trees - specimens exhibiting features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.
- h) General observations, particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations.
- i) Estimated remaining contribution, in years (<10, 10+, 20+, 40+).
- j) Retention category has been recorded as A, B, C or U in accordance with Section 4.5 and Table 1 and Table 2 of BS 5837:2012 (Appendix B), to be recorded on the tree survey plan. This gives an indication as to each tree's arboricultural, landscape and cultural value and significance, and also its suitability for retention in the context of the proposed redevelopment of the site. The sub-categories [1 - Arboricultural values; 2 - Landscape values and 3 - Cultural values, including conservation] are included where considered necessary to clarify why a tree has been assigned to a particular retention category. These categorisation criteria are summarised below:
- i. A: Trees of high quality and value whose retention is most desirable (suggested minimum contribution 40 years);
 - ii. B: Trees of moderate quality and value whose retention is desirable if practicable (suggested minimum contribution 20 years);
 - iii. C: Trees of low quality and value or limited long-term potential, which could be retained if not in conflict with development proposals or young trees with a stem diameter of less than 150 millimetres (suggested minimum contribution 10 years); and,
 - iv. U: Trees requiring removal irrespective of any development proposals due to significant structural defects, irreversible decline or with a very short-term life expectancy of less than 10 years.

The Root Protection Area has been calculated in accordance with Section 4.6 of BS 5837:2012. The two measurements provided are a 'Root Protection Radius (m)' (circle centre on the tree) and an overall 'root protection area (m²)'.

1.3 Limitations of Survey

The survey only encompassed the trees likely to be affected by the proposed Scheme (refer to Appendix A Figure 1.1 for extent of site).

This report has been prepared in accordance with BS5837:2012. It is not, nor should it be taken to be, a full or thorough assessment of the health and safety of trees on or adjacent to the site. It is recommended that a full tree survey should be undertaken on a regular basis to satisfy health and safety requirements.

2. Tree Summary

2.1 Site Description

The principal area affected by the Scheme design is the south side of Platform Road. This area currently consists of pavements, a large verge approximately 20+m wide (maintained grass with a number of trees present) and a maintained hedge forming the boundary with an adjacent car parking area. The north side of Platform Road forms a boundary with Queen's Park, a triangular area of parkland bordered on all sides by mature trees (predominately London plane). While this area falls within the extent of the Scheme these trees would remain unaffected by the construction works.

2.2 Tree Overview

The trees on site are mainly of young to semi mature age and are well established within the local landscape. The western end of the Scheme commences adjacent to a line of young London plane (*Platanus x hispanica*) trees (10+) located to the rear (southside) of the footpath (refer to photos 2.1 and 2.2). To the east of this point a group of 3 middle aged trees (T5, T6 and T7) are located within an area of maintained grassland (refer to photo 2.4). T4 (refer to photo 2.3) is located to the north west of T4. Further east, four young Rowan trees (*Sorbus aucuparia*) are contained within a maintained hedge (photos 2.5 and 2.6) which provides a boundary between the road and car parks associated with the dock area. One multi-stemmed sycamore (middle aged) is also present at the start of the hedgeline which commences at Central Road (refer to photos 2.7 and 2.8).

Of the trees surveyed, the following categories were assigned in accordance with BS 5837:2012 (Tables 1 & 2 – Cascade chart for tree quality assessment):

Table 2.1: Summary of BS 5837:2012 tree categories assigned to the surveyed trees

Tree Category	Description	Number surveyed
Category A	Trees of high quality and value	3 individual trees
Category B	Trees of moderate quality and value	4 individual trees
Category C	Trees of low quality and value	4 individual trees
Category U	Trees for removal	1 individual tree

Photo 2.1: Avenue of plane trees including T1 to T3



Photo 2.2: T1 to T3



Photo 2.3: tree T4 (north side of road)



Photo 2.4: Tree T5 (foreground) to T7



Photo 2.5: T10 (foreground), T11 and T12



Photo 2.6: T10 (foreground) to T8



Photo 2.7: T12 viewed from west



Photo 2.8: Structural weakness in T12



3. Implications for Proposal

3.1 Risk to trees from general construction activities

Trees can be easily damaged by construction processes, with both the tree roots and the main structure of a tree susceptible to a range of impacts. Root damage can affect the anchorage and stability of the tree, as well as preventing or inhibiting the absorption of water and nutrients. Damage to the trunk and branches leaves the tree more exposed to disease and decay.

Activities that can cause damage to tree roots include:

- trenches
- alterations in soil level
- non-porous surfaces
- compaction of soil
- changes in soil hydrology
- root exposure
- soil pollution (i.e. oil spill, incorrect application of herbicide and/or other chemicals)
- fires

Activities that can cause damage to tree trunks and branches include:

- pressure from materials stored against trunks
- physical impact from plant and equipment
- incorrect pruning
- exposure of bark or leaves to chemicals
- damage to bark from mowers and strimmer

3.2 Protection of Root Protection Area (RPA)

Working anywhere in the vicinity of trees is likely to cause some root damage due to the fact that in the order of 80% of the roots of any tree will occur within the upper 600mm of the soil. Roots will spread out for a considerable distance from a tree and may be encountered at a distance beyond the canopy spread of a tree. Where construction activities are proposed within the rooting zone of trees, the potential for significant damage exists.

Section 4.6 of BS 5837:2012 prescribes a methodology for the calculation of a Root Protection Area (RPA). The RPA represents the minimum area that should be retained undisturbed around a tree or trees for the avoidance of an unacceptable degree of root disturbance. The required RPA of any tree is calculated, and plotted as a circle centred on the base of the stem. Where pre-existing site conditions or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area should be produced. Modifications to the shape of the RPA should reflect a soundly based arboricultural assessment of likely root distribution.

RPA calculations for this site are provided in Appendix D.

3.3 Tree Protection Orders (TPO) and Conservation Areas (CA)

Southampton City Council has confirmed that the principal roads associated with the Scheme fall within the following Conservations Areas:

Road associated with the scheme	Conservation Area (CA)
Platform Road	Canute Road CA
Queen's Terrace and Terminus Terrace	Oxford Street CA
Town Quay	Old Town West CA
Orchard Place	Orchard Place CA

Conservation Area status requires notification of proposed tree works to be issued to the Local Authority for approval. No trees affected by the Scheme are subject to Tree Preservation Orders (TPOs).

3.4 Proposed actions for the trees associated with the scheme

In considering the proposed Scheme in the context of the existing site, the following table details the recommended actions to ensure effective integration between the natural and built environment.

Table 3.1: Proposed actions to be taken for trees likely to impacted by the Scheme

Tree Ref	Species	TPO	CA	Recommended Action
T1	London Plane	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T2	London Plane	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T3	London Plane	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T4	Silver Birch	No	Yes	No impact from Scheme. However, the tree may be removed on Cultural heritage grounds. SCC to confirm.
T5	Acer spp.	No	Yes	Fell: trees fall within immediate Scheme footprint for the new widened section of carriageway.
T6	Purple sycamore	No	Yes	Fell: trees fall within immediate Scheme footprint for the new widened section of carriageway.
T7	Sycamore	No	Yes	Fell: trees fall within immediate Scheme footprint for the new widened section of carriageway.
T8 to T11	Rowan (plus existing hedge)	No	Yes	Fell: trees fall within immediate Scheme footprint (hedge to be removed to install footway and open up verge area).
T12	Sycamore	No	Yes	Fell: tree falls within immediate Scheme footprint (re-alignment of corner with Central Road).

NOTE: The north side of Platform Road forms a boundary with Queen's Park, a triangular area of parkland bordered on all sides by mature trees (predominately London plane). While this area falls within the extent of the Scheme, these trees would remain unaffected by the design and subsequent construction of the Scheme.

3.5 Mitigation for Tree Loss

The trees for removal are of mixed condition and quality, however they do provide some landscape value within an urban setting. It is recommended that mitigation planting is undertaken to the south of Platform Road to help integrate the Scheme within the current setting, visually separate the carriageways from the land associated with the dock (primarily a car parking area) and increase the amenity and arboricultural value in line with the trees within Queen's Park (north side of Platform Road). It is proposed that the loss of trees would be mitigated on a ratio of 2:1 or greater.

Depending on the final planting space available on the south side of Platform Road it is recommended that a similar linear feature could be achieved through planting individually spaced broadleaved trees. A line of London Plane (*Platanus x hispanica*) trees would tie in with the existing avenue on the south side of Town Quay (western end of the Scheme) and echo the existing boundary planting associated with Queen's Park (north side of Platform Road). Similarly, introduction of native oak trees (*Quercus robur*) within the verge would provide similar landscape impact and also ecological benefits.

4. Recommendations – preventing damage to retained trees.

4.1 Tree protection during construction

Due to the fact all trees within the existing verge area to the south of Platform Road will be removed, no recommendation has been made to protect trees during construction by means of installing temporary protective barriers. The Scheme design associated with other roads (i.e. Orchard Place, Queen's Terrace and Terminus Terrace) would not affect any other trees.

4.2 Tree Works

All tree works would comply with any restrictions imposed by the Local Planning Authority and any covenants or by-laws relevant to this site.

All tree work should be carried out during the dormant season between October and March and in accordance with BS 3998:2010 Recommendations for Tree Work and current best arboricultural practice.

It should be noted that the Contractor will be responsible under the Wildlife and Countryside Act 1981, the Conservation of Habitats and Species Regulations 2010, and the Countryside Rights of Way Act 2000, to take all reasonable action to identify the presence of protected species including nesting birds, bats, dormice and reptiles in the works area/surroundings, and comply fully with the law in relation to impacts associated with any instructed works.

4.3 Storage of Materials

Storage of materials is to be accommodated away from all trees either on an appropriate area of hard standing or delivered on a "just in time basis" i.e. for same day use.

4.4 Contractor's Compliance

The proximity of the trees for retention in relation to the work area will require the Contractor's strict compliance and cooperation with all aspects of this methodology to enable satisfactory long term coexistence of trees and the development.

4.5 Arboricultural Inspection

On completion of the development, an Arboriculturalist should look for signs of intolerance to the change in conditions and the effect of the development. This inspection should identify any accidental damage to retained trees and identify any resulting additional tree works as appropriate.

5. Conclusion

The trees likely to be affected by the Scheme have been assessed for their physiological and structural condition, and given a retention category in accordance with Table 1 – Cascade Chart for Tree Quality Assessment, *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*.

Twelve individual trees were surveyed in relation to the Scheme. Of these trees:

- 3 trees have been assessed as Grade A (i.e. trees of high quality and value);
- 4 individual trees as Grade B (i.e. trees of moderate quality and value);
- 4 individual trees as Grade C (i.e. trees of low quality and value); and,
- 1 individual tree as Grade U (i.e. trees for removal on the basis of sound arboricultural management).

A total of eight individual trees (T5, T6, T7, T8, T9, T10, T11 and T12) will need to be removed to facilitate construction of the Scheme. The trees for removal comprise three category B trees (T5, T6 and T7), three category C trees (T8, T9, T11 and T12) and one category U tree (T10). There is also a possibility that T4 will be removed on Cultural Heritage grounds. This is yet to be confirmed Southampton City Council.

Three trees (T1, T2 and T3) will require minor pruning works to provide the appropriate vertical clearance of 5.2m over the carriageway.

There are a number of Conservation Areas that the scheme falls within or is located adjacent to. Conservation Area status requires notification of proposed tree works to be issued to the Local Authority for approval.

Appendices

Appendix A. Drawings _____

Appendix B. Key to Tree Survey Schedule _____

Appendix C. Tree Survey Schedule _____

Appendix D. Root Protection Area _____

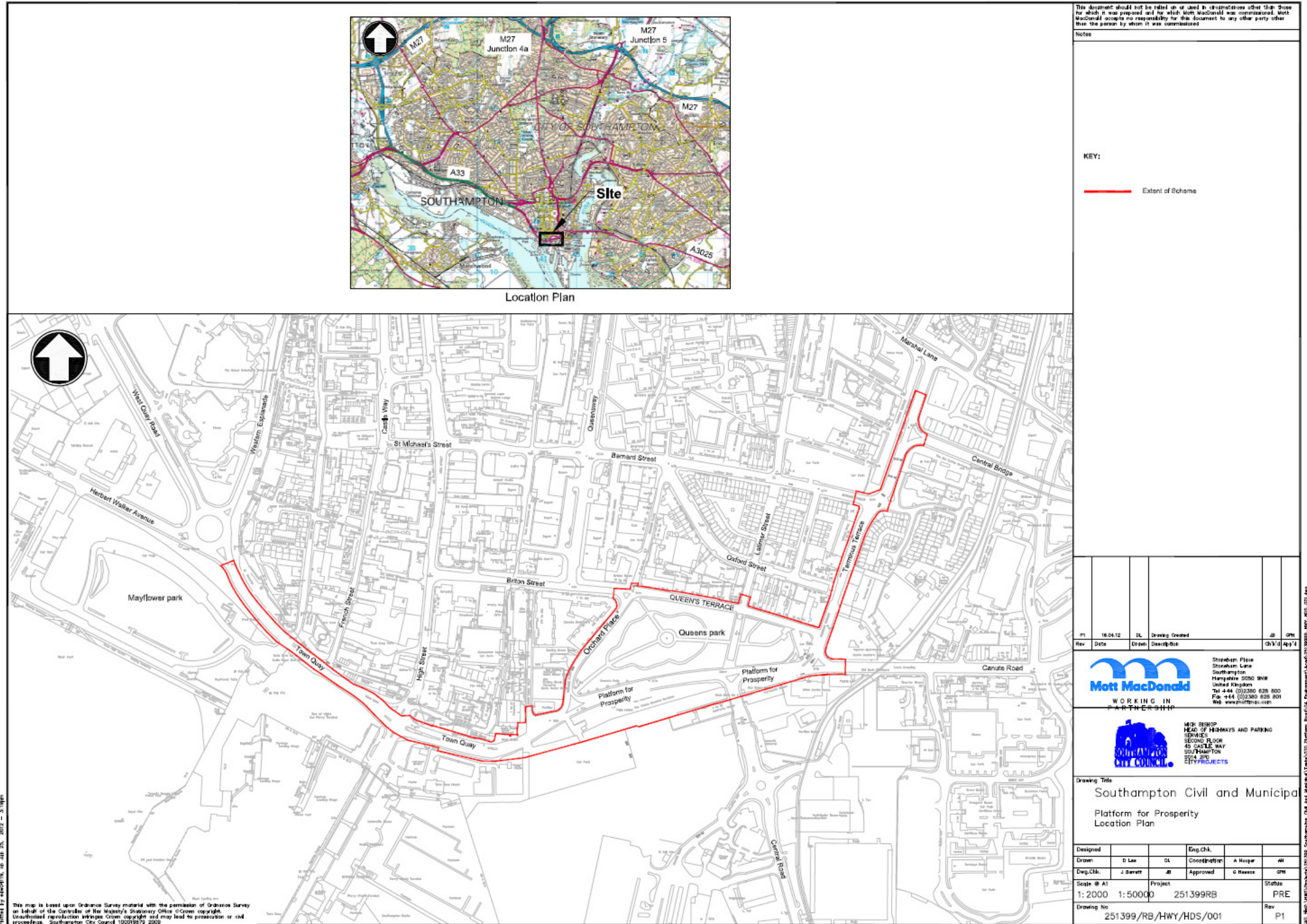
Appendix E. TPO and CA information _____

Appendix F. Glossary _____

Appendix G. References _____

Appendix A. Drawings

A.1. Scheme Extents Location Plan











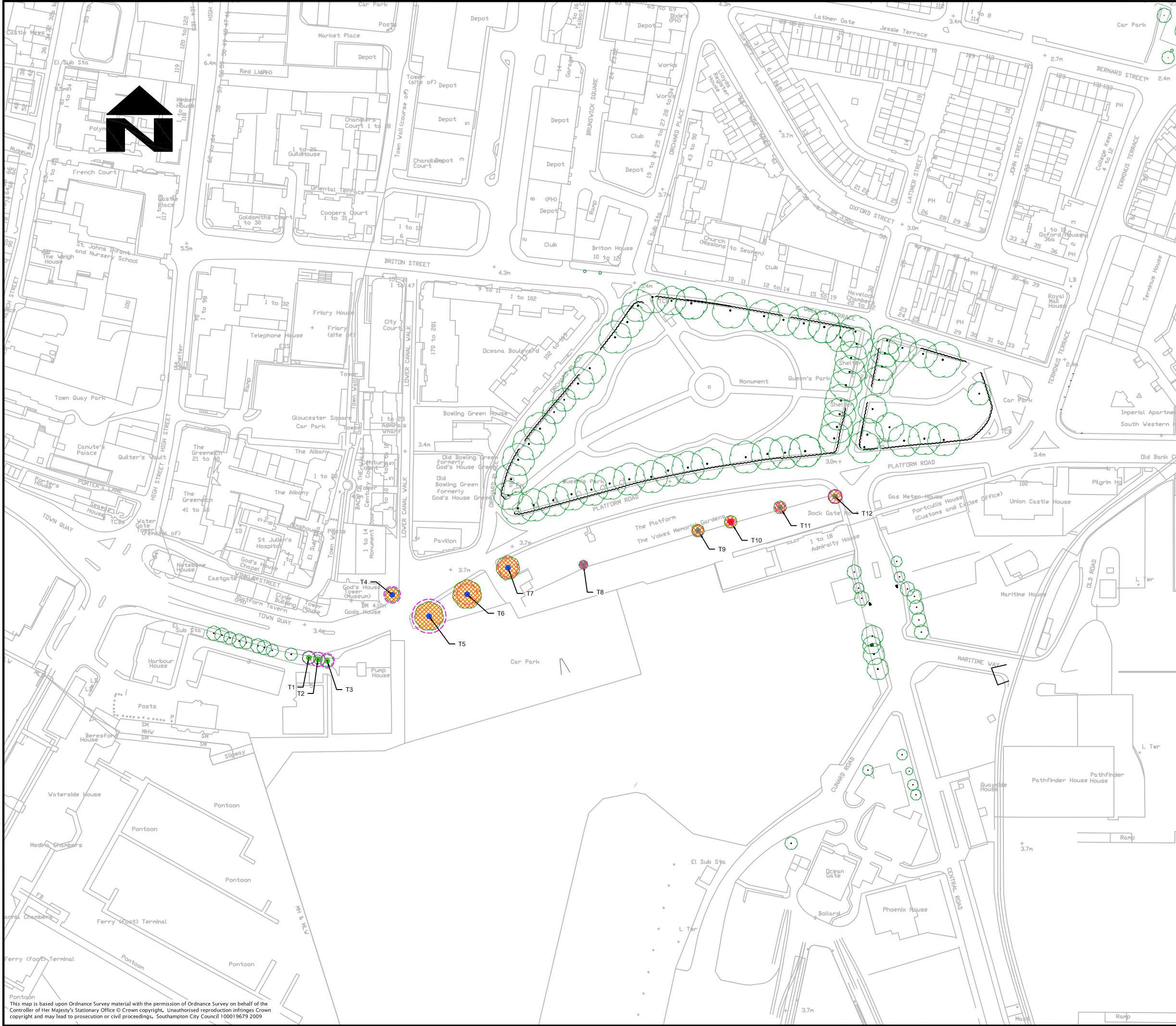
A.2. Tree Constraints Plan

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Notes
 1. To be read in conjunction with Platform for Posterity Arboricultural Report (July 2012).

KEY:

-  Unamended Tree Root Protection Area (RPA)
-  Approximate extent of canopy
-  Grade A Trees
-  Grade B Trees
-  Grade C Trees
-  Grade U Trees to be removed for reasons of sound arboricultural management



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Drawing Title

Platform for Posterity Arboricultural Survey Tree Constraints Plan

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Scale @ A1	Project			Status	PRE
1:1000					
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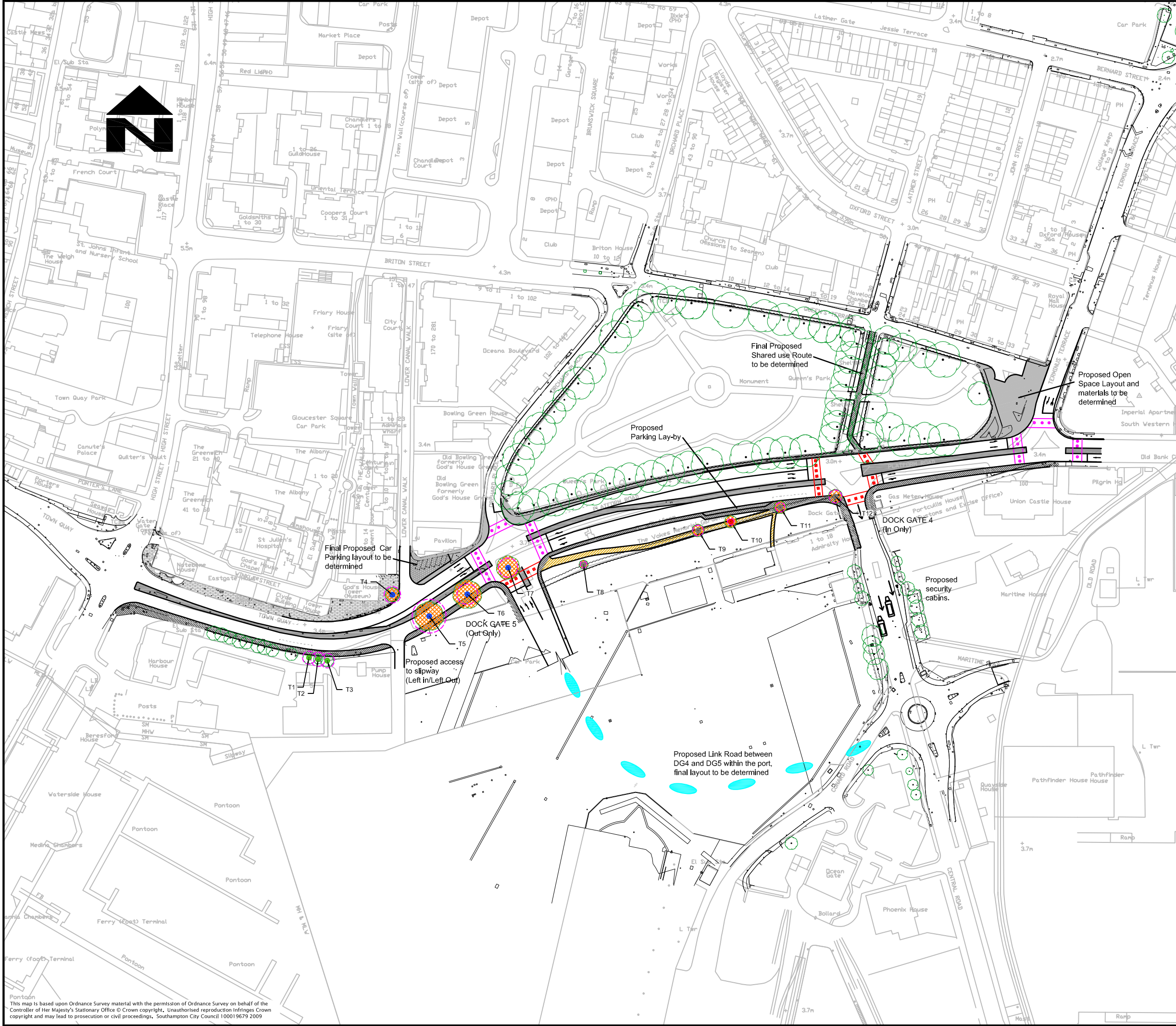
CAD file: P:\Southampton\WWS\Projects\251399\Southampton_Civil_Area_Municipal\Tracks\070 Platform Road\04 Environment\Acad\251399RB_HWY_HDS_005.dwg

A.3. Tree Protection Plan

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Notes
 1. To be read in conjunction with Platform for Posterity Arboricultural Report (July 2012).

- KEY:**
-  Unamended Tree Root Protection Area (RPA)
 -  Approximate extent of canopy
 -  Trees to be Removed
 -  Grade A Trees
 -  Grade B Trees
 -  Grade C Trees
 -  Grade U Trees to be removed for reasons of sound arboricultural management



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Rev	Date	Drawn	Description	Ch'kd	App'd



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Drawing Title

Platform for Posterity Arboricultural Survey Tree Protection Plan

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Scale @ A1	1:1000		Project	Status	
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Appendix B. Key to Tree Survey Schedule

Tree Reference	Unique reference or Tree Tag number, identifying each tree and/or tree group on the accompanying plan/s.
Species	Tree species giving the vernacular and full botanic name.
Height	Recorded in metres, measured in m from the base of the tree.
Stem Diameter	Tree trunk diameter measured at 1.5m above ground level (on sloping ground above highest ground level) or immediately above root flare for multi-stemmed trees. Expressed in millimetres. (est) dimension estimated; (av) average or max maximum dimension used in groups.
Branch Spread	Tree canopy extent taken from centre of tree trunk to edge of general canopy line along the four principal points of the compass (note this distance is to the general canopy line in certain cases and that an exceptional or etiolated branch may extend beyond stated figure).
Crown Clearance	Existing height above ground level of 1) first significant branch and direction of growth (e.g. 2.4 N); and 2) canopy, to inform on ground clearance, crown/stem ratio and shading. Measured in m (rounded up to nearest half metre for dimensions up to 10m and up to nearest metre for dimensions over 10m).
Life Stage	Estimated life expectancy assessed in accordance with figures provided in Arboricultural Association Leaflet No. 4 tree Management. Note: these age classes may be pre-fixed with 'Early' or 'Late' in the Tree Survey Schedule to provide a more accurate indication of age.
	Y Young: within first third of normal life expectancy.
	MA Middle Aged: within second third of normal life expectancy.
	M Mature: within final third of normal life expectancy.
	OM Over Mature: senescent trees nearing end of their anticipated life expectancy.
	V Veteran: exhibiting features of biological, cultural or aesthetic value characteristic of individuals surviving beyond typical age range
D Dead.	
General Observations	Observations particularly of structural and/or physiological condition (e.g. the presence of any decay and physical defect), and/or preliminary management recommendations.
Estimated Remaining Contribution	Relates to the potential life expectancy of the tree in its current setting, shown in years as one of the following categories: <10; 10 to 20; 20 to 40; and, 40+.
Category Grading in accordance with Table 1 (BS 5837:2012)	Tree categorisation as defined by Table 1 – Cascade chart for tree quality assessment of British Standard 5837:2005. Decisions regarding which trees are to be retained should be influenced by their retention categories as suggested below.
	A Trees of high quality and value; > 40 years contribution remaining; marked light green on plan. Category is sub-divided as follows: 1 particularly good example; essential component of group e.g. in avenues; 2 screening value, particular visual importance 3 significant conservation, historical, commemorative or other value (includes veteran or wood pasture trees). Tree retention is highly desirable: significant amendments to any proposed development should be considered before removing these trees
	B Trees of moderate quality and value with a significant life expectancy; > 20 years contribution remaining; marked mid-blue on plan. Category sub-divided as follows: 1 Trees that may be of impaired condition in relation to trees in category above; 2 Trees present in numbers/groups attracting higher collective rating; internal to site, of limited visual impact to locality; 3 Trees with clear conservation or cultural benefits. Tree retention is desirable: amendments to any proposed development should be considered before removing these trees.
	C Trees of low quality and value; >10 years contribution remaining; marked grey on plan. Includes young trees below 150mm diameter (to which consideration for transplanting should be given). Note that "C" trees will usually not be retained where they would impose a significant constraint on development. Category sub-divided as follows: 1 Trees not qualifying in higher categories; 2 Trees within groups of low landscape value, having limited screening value; 3 Trees with very limited conservation or other cultural benefits. Trees could be retained however the removal of some of these trees should be considered acceptable if required to facilitate any proposed development.
	U Trees for removal; those in such a condition that are dead, dying, dangerous, severely suppressed or where any existing value would be lost within 10 years; marked dark red on plan. These trees should be removed or treated in such a way as to make them safe where they have high ecological value or benefits.

Appendix C. Tree Survey Schedule

Platform for Prosperity Tree Survey Schedule															
Tag Number or Ref	Individual Tree or Group	No. in group	Species	Common name	Height (m)	Stem Diameter (mm)	N	E	S	W	Crown Clearance (m) a = first branch b = canopy	Life Stage	General Observations (and Preliminary Management Recommendations)	Life Expectancy	Category
T1	Individual Tree	n/a	<i>Platanus x hispanica</i>	London plane	12	295	5	2	5	5	a = 3.5	Y	Tree forms part of avenue on south side of road; N - crown extends over footpath; kerb line is to be re-aligned to adjacent tree. Amendments will not affect rooting zone of tree however minor pruning will be required to provide 5.2m highway clearance required.	40+	A2
T2	Individual Tree	n/a	<i>Platanus x hispanica</i>	London plane	12	323	6	3.5	4	3.5	a = 3.5	Y	Tree forms part of avenue on south side of road; N - crown extends over footpath; kerb line is to be re-aligned to adjacent tree. Amendments will not affect rooting zone of tree however minor pruning will be required to provide 5.2m highway clearance required.	40+	A2
T3	Individual Tree	n/a	<i>Platanus x hispanica</i>	London plane	12	324	5	2	5	6	a = 3.5	Y	Tree forms part of avenue on south side of road; N - crown extends over footpath; kerb line is to be re-aligned to adjacent tree. Amendments will not affect rooting zone of tree however minor pruning will be required to provide 5.2m highway clearance required.	40+	A2
T4	Individual Tree	n/a	<i>Betula pendula</i>	Silver birch	10	380	5av	5av	5av	5av	a = 3.5 b = 2.5	M	Located in pavement on north side of road	10 to 20	B 2
T5	Individual Tree	n/a	<i>Acer spp.</i>	Maple	14	772	7	8.5	7	8	a = 2.5 SW b = 2.5 av	M	Subject to some minor pruning.	40+	B 2
T6	Individual Tree	n/a	<i>Acer platanoides</i> 'Crimson King'	Purple Norway Maple	9	468	5	5.5	5	4.5	a = 2 S b = 2.2 av	MA	Balanced crown.	40+	B 2
T7	Individual Tree	n/a	<i>Acer platanoides</i>	Norway Maple	10	438	5	6	5	5	a = 2.2 S b = 2 av	Y	2 stage canopy, initial dieback in lower tier.	40+	C1
T8	Individual Tree	n/a	<i>Sorbus aucuparia</i>	Rowan	4	154	1.5	2.5	1.5	0.5	b = 2.5 N	MA	Within maintained hedgerow (biased to north edge); leaning to N	<10	C 1
T9	Individual Tree	n/a	<i>Sorbus aucuparia</i>	Rowan	8	250	2.5av	2.5av	2.5av	2.5av	Not Recorded	MA	Within maintained hedgerow (biased to north edge)	<10	C 1
T10	Individual Tree	n/a	<i>Sorbus aucuparia</i>	Rowan	5	150	1.5av	1.5av	1.5av	1.5av	a = 2 S b = 2.2 av	MA	90% dead; within maintained hedgerow (biased to north edge)	<10	U
T11	Individual Tree	n/a	<i>Sorbus aucuparia</i>	Rowan	7	220	4	2	2.5	2.5	a = 2 S b = 2.2 av	MA	Within maintained hedgerow (biased to north edge)	10 to 20	C 1
T12	Individual Tree	n/a	<i>Acer pseudoplatanus</i>	Sycamore	12	425 (200+225+300)	4	5	4	5	a = 2.2 E b = 2.2 av	MA	Tree formed by 3 main stems, one stem impacted by railing creating weak point within stem - management recommendation: remove limb; tree impacting on road sign to the south. Stems rubbing and future growth will be constrained by railing.	20 to 40	C 1

Appendix D. Root Protection Area

Table 5.1: Root Protection Areas calculated in accordance with Table D.1 (annex D) of BS 5837:2012

Tree	Species	# Stem Diameter (mm)	RPA Circle Radius (m)	RPA (m ²)
T1	London plane	300	3.6	41
T2	London plane	330	3.96	49
T3	London plane	330	3.96	49
T4	Silver birch	380	4.56	65
T5	Acer spp.	780	9.36	275
T6	Purple Norway Maple	470	5.64	100
T7	Norway Maple	440	5.28	88
T8	Rowan	160	1.92	12
T9	Rowan	250	3	28
T10	Rowan	150	1.8	10
T11	Rowan	220	2.64	22
T12	Sycamore (ms)	425	5.1	81

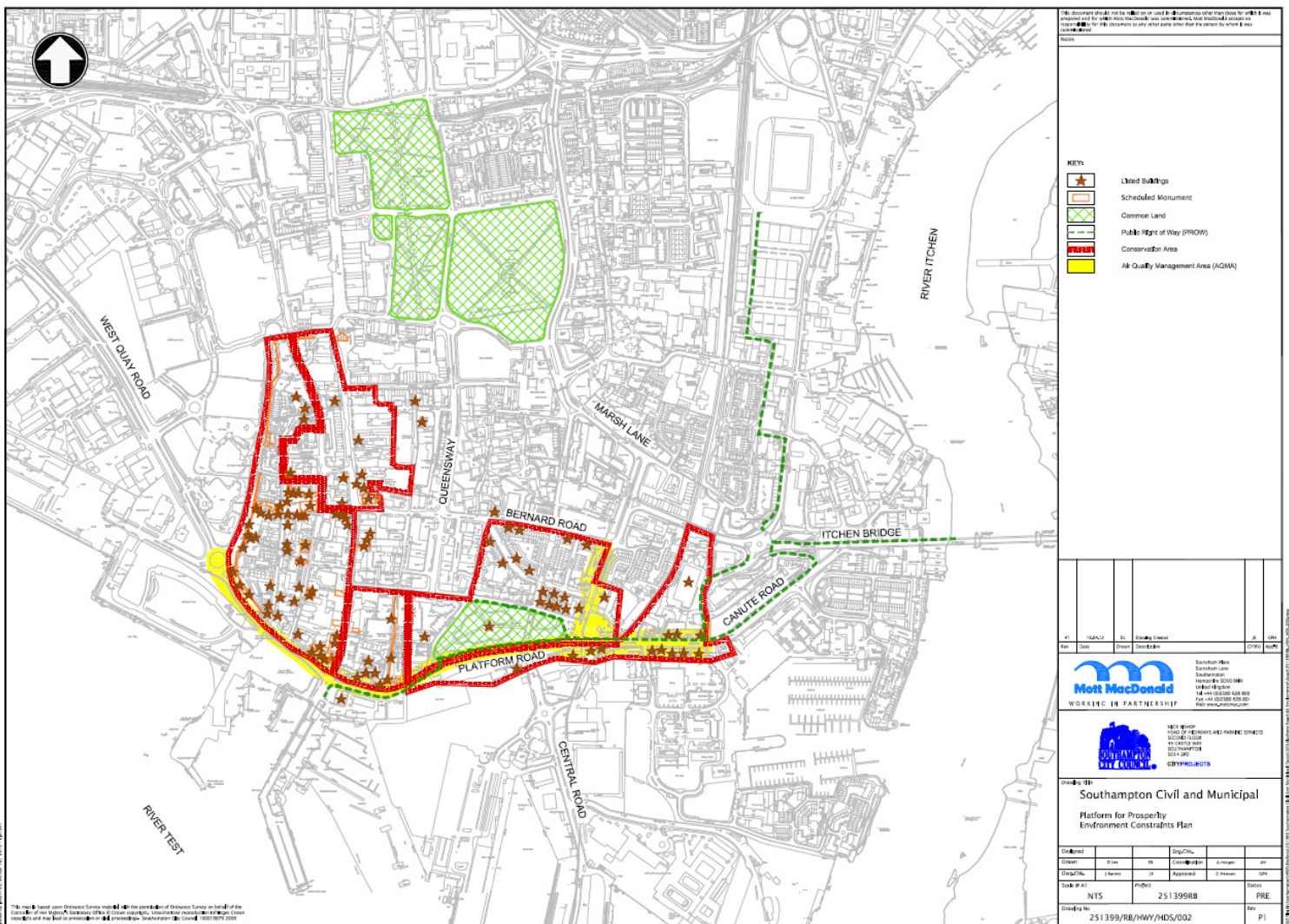
stem diameter has been rounded up to nearest 0.1

Appendix E. TPO and CA information

E.1. TPO information

No TPOs identified within or adjacent to Scheme Footprint.

E.2. Conservation Area information



Appendix F. Glossary

Adventitious bud	Adventitious buds develop from places other than a shoot at the tip of a stem e.g. along a branch, often formed as a result of stress e.g. after the stem is wounded or pruned
AGL (Above Ground Level)	Terminology (prefixed by a measurement) stated within the Tree Survey Schedule to reference the location/height of a particular tree feature or tree part
Co-dominant stem	A stem that has grown in direct competition to the main stem and which has formed a substantial size influencing the appearance of the tree
Crown Lift	The removal of the lowest branches, usually to a specified height. It can be used to allow more residual light and greater clearance underneath the canopy for vehicles etc.
Dieback	Where branches are beginning to show signs of death usually at the tips of the crown
Epicormic growth	Small branches that grow in uncharacteristic clusters around the base of a tree, usually as a result of bad pruning or other stress factor
Etiolated	Tall, thin tree which has extended vertically without substantial lateral development. Usually as a result of competition for light from other species
'Hung up' branch	A branch which has become detached from the tree but is prevented from falling to the ground by the presence of other branches within the crown
Included bark	Where the bark on two adjoining branches or stems is growing tight together, forming a joint with limited physical strength
ms	A multi stemmed tree
Pollarding	A method of tree management in which the main trunk of the tree is cut at a particular height, and the resulting branches are then cropped on a regular basis
Occluded wound	The growth of a wound with (callus) tissue produced subsequently
RPA (Root Protection Area)	The theoretical rooting area of a tree defined by BS5837:2005 Trees in Relation to Construction - Recommendations
Topping	Topping is a form of pruning that removes terminal growth leaving a 'stub' cut end. Topping causes serious health problems to a tree

Appendix G. References

British Standard BS 5837:2012 Trees in Relation to design, demolition and construction – Recommendations; April 2012; ISBN 978 0 580 69917 7

British Standard BS 3998:2010 Recommendations for Tree Work; Third (present) edition, December 2010; ISBN 978 0 580 53777 6

The National Joint Utilities Group, Issue 1 – 8th October 2007, Volume 4 - Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees

Arboricultural Association, 1991, Leaflet 4 - Tree Management