



# ‘Lower’ Terminus Terrace, Southampton

Arboricultural Report

August 2013  
Southampton City Council



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# Issue and Revision Record

<b>Revision</b>	<b>Date</b>	<b>Originator</b>	<b>Checker</b>	<b>Approver</b>	<b>Description</b>
A	27.08.13	C .Uden	B.MacFarlane/ R. Lennon	K.Hampton	Final

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# Executive Summary

Mott MacDonald Ltd has been commissioned by Southampton City Council (SCC) to undertake an Arboricultural Survey to support a combination of works proposed to Central Bridge.

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.

The proposed works are located adjacent to the Oxford Street Conservation Area. No trees affected by the Scheme are subject to Tree Preservation Orders (TPOs).

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*.

- Sixteen individual trees were surveyed in relation to the Scheme. Of these trees:
- 15 trees have been assessed as Grade B (i.e. trees of moderate quality and value); and,
- 1 individual tree as Grade C (i.e. trees of low quality and value);
- A total of two individual trees (T1-T2) will need to be removed to facilitate construction of the Scheme. The trees for removal comprise one category B tree and one category C tree (T2).
- Fourteen trees will require minor pruning works to provide the appropriate vertical clearance of 5.2m over the carriageway.

There is potential for nesting birds in the vegetation on site and appropriate checks should be carried out prior to commencement of works. .

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.

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.

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 a combination of works to Central Bridge as outlined below. This Report covers the trees identified on 'Lower' Terminus Terrace only as illustrated in the Tree Constraints Plan in Appendix A.

### 1.1.1 Scheme Description

The works proposed to Central Bridge comprise elements of three Schemes, Central Bridge maintenance works (to include carriageway resurfacing, waterproofing and work to the underside of the bridge), Platform Road (to include junction improvements at Bernard Street and Terminus Terrace) and Southampton Eastern Cycle Route works (to include the installation of signage and the construction of a dedicated cycleway). A plan of Phase 1a of the Eastern Cycle Route works is included in Appendix A, Figure A.1 and the overall extent of the works to Central Bridge is highlighted in the hatched area in Figure A.2.

In order to undertake these works the temporary closure of Central Bridge would be required. To mitigate this temporary closure and the associated impact on local traffic, it is proposed that the stopped up Terminal Terrace is temporarily reopened and traffic diverted. Refer to the red Traffic Diversion Route illustrated in Figure A.2, contained in Appendix A. This report is associated with the temporary re-opening of 'Lower' Terminal Terrace.

## 1.2 Scope of Work and Methodology

The survey was carried out by a Mott MacDonald qualified Arboriculturalist, on Wednesday 7<sup>th</sup> August 2013 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 D) 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 D. The Root Protection Area (RPA) calculations are contained in Appendix E.

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 (m<sup>2</sup>)'.

### **1.3 Limitations of Survey**

The survey only encompassed the trees likely to be affected by the proposed Schemes (refer to Appendix A Figure A.3 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 immediate proposed works site consists of footway along Terminus Terrace, adjacent to the Central Bridge which rises up immediately adjacent to the trees, affectively forming a retaining wall within 2m of the trees stem. There is also small open area of hard paving with two further street trees and a bench facing south.

### 2.2 Tree Overview

The trees on site are mainly of semi mature to early mature and are well established within the local landscape. Sixteen trees were surveyed as part of the works. The majority of the trees are lime trees running in a linear fashion along Terminus Terrace itself. Three other trees were also surveyed including whitebeam, field maple and london plane.

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	0 individual trees
Category B	Trees of moderate quality and value	15 individual trees
Category C	Trees of low quality and value	1 individual tree
Category U	Trees for removal	0 individual trees

Photo 2.1: Looking east towards T1 and T2



Photo 2.2: Looking south towards T3



Photo 2.3: Looking south east towards T4-T7



Photo 2.4: Looking north along Terminus Terrace



Photo 2.5: T16 in foreground. T15 and T14 beyond.



Photo 2.6: Looking north along Central Bridge





Photo 2.7: Looking north along Central Bridge



Photo 2.8: Looking south along Central Bridge



## 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); and
- 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; and
- Damage to bark from mowers and strimmers.

### 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 E.



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

The principal road associated with the works does not fall within a Conservation Area. However, the works are located adjacent to the boundary of the Oxford Street Conservation Area at the Terminus Terrace and Bernard Street junction as illustrated in Appendix F.

The Southampton City Council Trees, Allotments, Park Improvements and Natural Environment Team has confirmed that there are no Tree Preservation Orders (TPOs) on Terminus Terrace between Marsh Lane and Bernard Street. However, as the trees are Southampton City Council owned, any works to the trees would require prior permission from Southampton City Council.

### 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	Whitebeam	No	No	Fell: trees fall within immediate Scheme footprint associated with the opening up of the stopped up section of carriageway.
T2	Field maple	No	No	Fell: trees fall within immediate Scheme footprint associated with the opening up of the stopped up section of carriageway.
T3	London Plane	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T4	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T5	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T6	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T7	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T8	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T9	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T10	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T11	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T12	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T13	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T14	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.

Tree Ref	Species	TPO	CA	Recommended Action
T15	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.
T16	Lime	No	No	Retain: prune to achieve 5.2m clearance above carriageway (minor works). No tree protection required.

### 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.

The Southampton City Council Tree Officer was contacted in June 2013 and it was agreed that both T1 and T2 would be replaced at the same location or nearby once the proposed road works at Central Bridge are completed in 2014.

## 4. Recommendations – preventing damage to retained trees.

### 4.1 Tree Works

All tree works should 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 and 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.

### 4.2 Protective Barriers

Protective barriers are not recommended as part of the construction works as no impact on the remaining fourteen trees is anticipated as a result of the 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*.

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

- 15 individual trees and one tree group as Grade B (i.e. trees of moderate quality and value); and,
- 1 individual tree as Grade C (i.e. trees of low quality and value).

A total of two individual trees (T1-T2) will need to be removed to facilitate construction of the Scheme. The trees for removal comprise one category B tree and one Category C tree.

Fourteen trees will require minor pruning works to provide the appropriate vertical clearance of 5.2m over the carriageway.

There are no TPOs or Conservation Areas on Terminus Terrace between Marsh Lane and Bernard Street; however, as the trees are Council owned, any works to the trees would require prior permission from Southampton City Council.

# Appendices

Appendix A. Drawings \_\_\_\_\_

Appendix B. Key to Tree Survey Schedule \_\_\_\_\_

Appendix C: Key to Common and Scientific name \_\_\_\_\_

Appendix D. Tree Survey Schedule \_\_\_\_\_

Appendix E. Root Protection Area \_\_\_\_\_

Appendix F. TPO and CA information \_\_\_\_\_

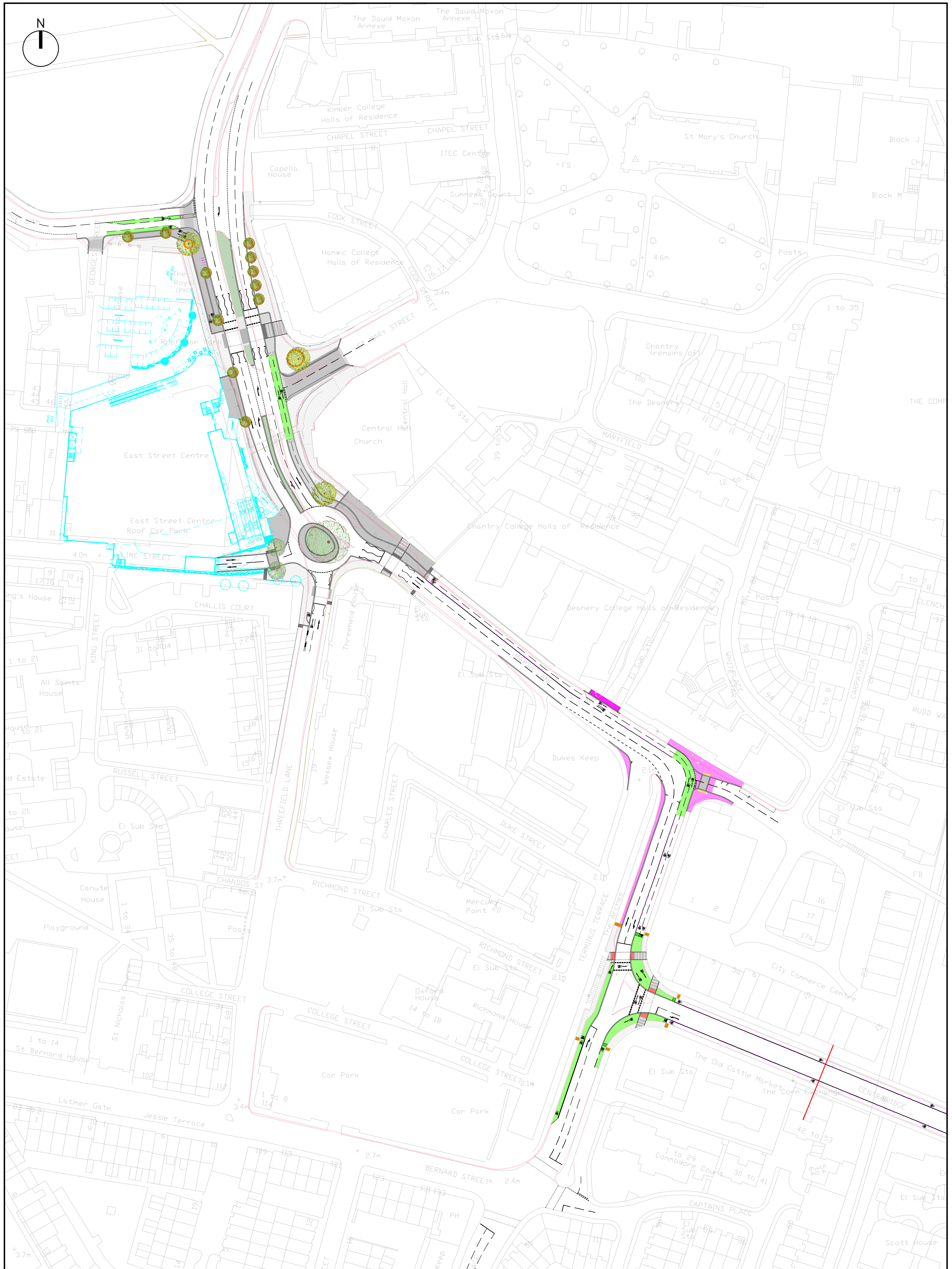
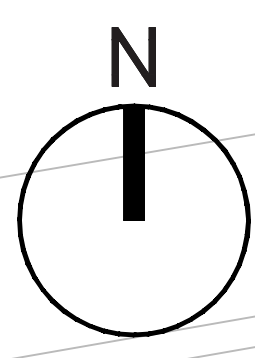
Appendix G. Glossary \_\_\_\_\_

Appendix H. References \_\_\_\_\_

# Appendix A. Drawings

## **A.1. Southampton Eastern Cycle Route (Phase 1a – South)**





Notes

				 38-40 York Way, London, N1 9AB TEL: +44 (0)20 7643 3165 e-mail: hello@urbanmovement.co.uk		Job Southampton Eastern Cycle Route Scale: A0 1:500 Date 09/04/13
				Client Southampton City Council		Title Phase 1a - North Drawn OD Checked -
Rev	Description	Date	By	Drawing No. DRAFT		Revision -

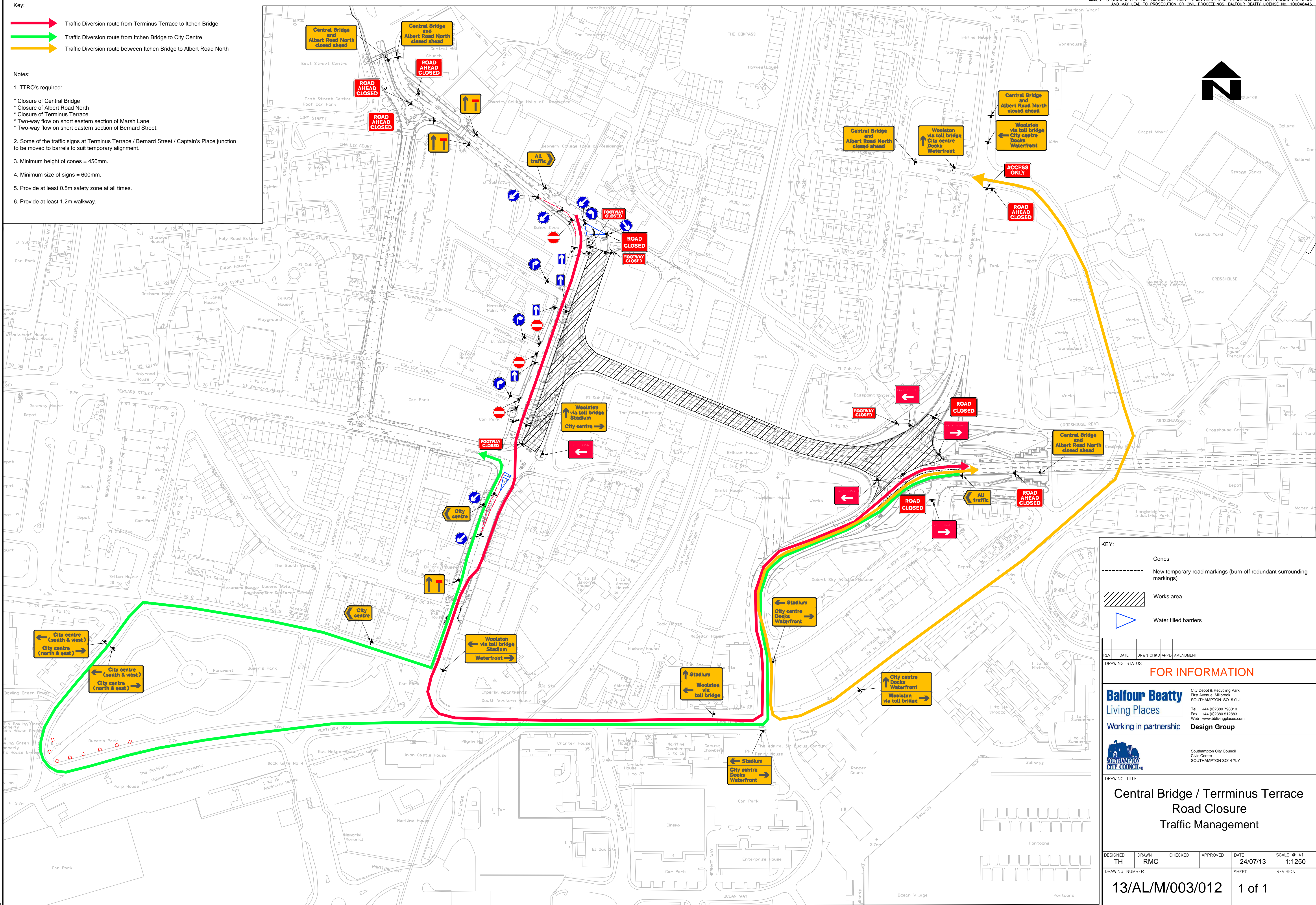


## **A.2. Central Bridge/ Terminus Terrace Road Closure Traffic Management**



- Key:**
- Traffic Diversion route from Terminus Terrace to Itchen Bridge
  - Traffic Diversion route from Itchen Bridge to City Centre
  - Traffic Diversion route between Itchen Bridge to Albert Road North

- Notes:**
1. TTRQ's required:
    - \* Closure of Central Bridge
    - \* Closure of Albert Road North
    - \* Closure of Terminus Terrace
    - \* Two-way flow on short eastern section of Marsh Lane
    - \* Two-way flow on short eastern section of Bernard Street.
  2. Some of the traffic signs at Terminus Terrace / Bernard Street / Captain's Place junction to be moved to barrels to suit temporary alignment.
  3. Minimum height of cones = 450mm.
  4. Minimum size of signs = 600mm.
  5. Provide at least 0.5m safety zone at all times.
  6. Provide at least 1.2m walkway.



- KEY:**
- Cones
  - New temporary road markings (burn off redundant surrounding markings)
  - Works area
  - Water filled barriers

REV	DATE	DRWN	CHKD	APPD	AMENDMENT

DRAWING STATUS: **FOR INFORMATION**

**Balfour Beatty Living Places**  
 City Depot & Recycling Park  
 First Avenue, Millbrook  
 SOUTHAMPTON SO15 0LJ  
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Working in partnership with **Design Group**

**SOUTHAMPTON CITY COUNCIL**  
 Southampton City Council  
 Civic Centre  
 SOUTHAMPTON SO14 7LY

DRAWING TITLE:

## Central Bridge / Terminus Terrace Road Closure Traffic Management

DESIGNED <b>TH</b>	DRAWN <b>RMC</b>	CHECKED	APPROVED	DATE <b>24/07/13</b>	SCALE @ A1 <b>1:1250</b>
DRAWING NUMBER <b>13/AL/M/003/012</b>				SHEET <b>1 of 1</b>	REVISION



### **A.3. Tree Constraints Plan**

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- Key:**
- 30 Tree Reference
  - Approximate extent of canopy
  - Tree Root Protection Area (RPA)
  - Tree 1 and Tree 2 to be Removed
- Individual Trees**
- Ungraded
  - Grade A Trees
  - Grade B Trees
  - Grade C Trees
  - Grade U Trees to be removed for reasons of sound arboricultural management
  - ▲ Approximate location only (not on topo)

P2	28.08.13	DL	AH	KH	Trees to be removed added
REV	DATE	DRWN	CHKD	APPD	AMENDMENT
DRAWING STATUS					

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DRAWING TITLE  
**Lower Terminus Terrace Arboricultural Report  
Tree Constraints Plan**

DESIGNED CU	DRAWN DL	DATE 22.08.2013	SHEET 1 of 1	REVISION P2
CHECKED BM	APPROVED KH	SCALE @ A3 1:1000	DRAWING NUMBER 251399/RB/SECR/HWY/001	

# Appendix B. Key to Tree Survey Schedule

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.
	<b>Y</b> Young: within first third of normal life expectancy.
	<b>SM</b> Semi Mature; within second third of normal life expectancy.
	<b>M</b> Mature: within final third of normal life expectancy.
	<b>OM</b> Over Mature: senescent trees nearing end of their anticipated life expectancy.
	<b>V</b> Veteran: exhibiting features of biological, cultural or aesthetic value characteristic of individuals surviving beyond typical age range
<b>D</b> 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.
	<b>A</b> 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). <b>Tree retention is highly desirable: significant amendments to any proposed development should be considered before removing these trees</b>
	<b>B</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. <b>Tree retention is desirable: amendments to any proposed development should be considered before removing these trees.</b>
	<b>C</b> 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. <b>Trees could be retained however the removal of some of these trees should be considered acceptable if required to facilitate any proposed development.</b>
<b>U</b> 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. <b>These trees should be removed or treated in such a way as to make them safe where they have high ecological value or benefits.</b>	

## Appendix C: Key to Common and Scientific name

Table 0.1: Native Trees

Tree Group	Common Name	Scientific Name
Alder	Common alder	<i>Alnus glutinosa</i>
Apple	Crab apple	<i>Malus sylvestris</i>
Ash	Common ash	<i>Fraxinus excelsior</i>
Birch	Silver birch	<i>Betula pendula</i>
	Downy birch	<i>Betula pubescens</i>
Beech	European beech	<i>Fagus sylvatica</i>
Box	Box	<i>Buxus sempervirens</i>
Cherry and Plum	Wild cherry	<i>Prunus avium</i>
	Bird cherry	<i>Prunus padus</i>
	Blackthorn	<i>Prunus spinosa</i>
Elm	Wych elm	<i>Ulmus glabra</i>
	Smooth leaved elm	<i>Ulmus minor, syn. U. carpinifolia</i>
Hawthorn	Common hawthorn	<i>Crataegus monogyna</i>
	Midland hawthorn	<i>Crataegus laevigata</i>
Hazel	Common hazel	<i>Corylus avellana</i>
Hornbeam	European hornbeam	<i>Carpinus betulus</i>
Holly	European holly	<i>Ilex aquifolium</i>
Juniper	Common juniper	<i>Juniperus communis</i>
Linden - Lime	Small leaved lime	<i>Tilia cordata</i>
	Large leaved lime	<i>Tilia platyphyllos</i>
Maple	Field maple	<i>Acer campestre</i>
Oak	Pedunculate oak	<i>Quercus robur</i>
	Sessile oak	<i>Quercus petraea</i>
Pine	Scots pine	<i>Pinus sylvestris</i>
Poplar	Aspen	<i>Populus tremula</i>
	Black poplar	<i>Populus nigra</i>
Rowan and Whitebeam	European rowan	<i>Sorbus aucuparia</i>
	Common whitebeam	<i>Sorbus aria</i>
	Service tree	<i>Sorbus domestica</i>
	Wild service tree	<i>Sorbus torminalis</i>
Strawberry Tree	Strawberry tree	<i>Arbutus unedo</i>
Willow	Bay willow	<i>Salix pentandra</i>
	Crack willow	<i>Salix fragilis</i>
	White willow	<i>Salix alba</i>
	Almond leaved willow	<i>Salix triandra</i>
Yew	European yew	<i>Taxus baccata</i>

Table 0.2: Naturalised Trees

Tree Group	Common Name	Scientific Name
Cedar	Western red cedar	<i>Thuja plicata</i>
Chestnut	Sweet chestnut	<i>Castanea sativa</i>
Cypress	Lawson's Cypress	<i>Chamaecyparis lawsoniana</i>
	Monterey Cypress	<i>Cupressus macrocarpa</i>
Elm	English elm	<i>Ulmus procera</i>
Fir	Douglas fir	<i>Pseudotsuga menziesii</i>
	Grand fir	<i>Abies grandis</i>
Hemlock	Western hemlock	<i>Tsuga heterophylla</i>
Horse Chestnut	Common horse chestnut	<i>Aesculus hippocastanum</i>
Larch	Japanese larch	<i>Larix kaempferi</i>
	European larch	<i>Larix decidua</i>
Maple	Sycamore	<i>Acer pseudoplatanus</i>
	Norway maple	<i>Acer platanoides</i>
Oak	Holm oak	<i>Quercus ilex</i>
	Turkey oak	<i>Quercus cerris</i>
Pear	European pear	<i>Pyrus communis</i>
	Plymouth pear	<i>Pyrus cordata</i>
Pine	European black pine	<i>Pinus nigra</i>
	Lodgepole pine	<i>Pinus contorta</i>
	Maritime pine	<i>Pinus pinaster</i>
Plum	Cherry plum	<i>Prunus cerasifera</i>
Spruce	Sitka spruce	<i>Picea sitchensis</i>
	Black spruce	<i>Picea mariana</i>
	Norway spruce	<i>Picea abies</i>
Willow	Weeping willow	<i>Salix babylonica</i>

Table 0.3: Native Large Shrubs

Shrub Group	Common Name	Scientific Name
Buckthorn	Alder buckthorn	<i>Rhamnus frangula</i>
	Purging buckthorn	<i>Rhamnus cathartica</i>
Dogwood	Common dogwood	<i>Cornus sanguinea</i>
Elder	Common elder	<i>Sambucus nigra</i>
Euonymus	Spindle	<i>Euonymus europaeus</i>
Seabuckthorn	Common seabuckthorn	<i>Hippophae rhamnoides</i>
Whitebeam	Rock whitebeam	<i>Sorbus rupicola</i>
Willow	Goat willow	<i>Salix caprea</i>
	Grey willow	<i>Salix cinerea</i>
	Purple willow	<i>Salix purpurea</i>
	Common osier	<i>Salix viminalis</i>
	Eared willow	<i>Salix aurita</i>



## Appendix D. Tree Survey Schedule

Central Bridge Southampton Tree Survey Schedule																						
Tag Number	Common Name	Life Stage	Height (m)	Crown Spread (m)				Crown Height (m) and Direction				Stem Diameter (mm)	Nominal Radius of circle (m)	RPA m <sup>2</sup>	Condition				BS5837 Category (Table 1)		Life Expectancy (yrs)	Comments
				N	E	S	W	N	E	S	W				Crown	Stem	Basal	Physical	Category	Subcategory		
1	Whitebeam spp	SM	3	3	3	3	3	1.8	1.8	1.8	1.8	295	3.54	39.37					B	2	20-40	Good form. Crowded canopy. Stands in metal tree grill. Scarring on stem.
2	Field Maple	SM	6	Average 1				Average .8				60	0.72	1.63					C	2	<20	Very poor form. Pigeon in very dense upper part of crown. Maybe nesting.
3	London Plane	SM	6	3	3	3	3	4	4	2.2	2.5	368	4.42	61.26					B	2	40+	Pollarded. Large wound in stem on north side.
4	Lime	EM	13	2.5	Extends 3m from parapet edge		6	4	1.5			450	5.40	91.61					B	2	20-40	
5	Lime	EM	16	2	Extends to Middle of footway		1.5	6	1.4			453	5.44	92.83					B	2	20-40	
6	Lime	EM	14.5	2	Extends to Middle of footway		2	4	1.5			480	5.76	104.23					B	2	20-40	
7	Lime	EM	5	2	Extends to parapet edge -elevated bridgeside		2	1	1.4			333	4.00	50.17					B	2	20-40	Wound on stem at 1.2-1.5m
8	Lime	EM	10	5	Extends 3m from parapet edge		3	4	1.4			510	6.12	117.67					B	2	20-40	Wound at .5-1.5m
9	Lime	EM	11	6	Extends 3m from parapet edge		4.5	4	1.4			748	8.98	253.11					B	2	20-40	
10	Lime	EM	6	2.5	Extends 3m from parapet edge		2	1.5	1.4			559	6.71	141.36					B	2	20-40	Wound approx. 40cm at 3m.
11	Lime	EM	12	4	Extends 3m from parapet edge		3	4	1.3			489	5.87	108.18					B	2	20-40	Large deep wound at 1m. Signs of wood worm.
12	Lime	EM	13	3	Extends 3m from parapet edge		4	5	1.4			434	5.21	85.21					B	2	20-40	
13	Lime	EM	13	5	Extends 3m from parapet edge		3	5	1.6			485	5.82	106.41					B	2	20-40	
14	Lime	EM	14	5.5	Extends 3m from parapet edge		5	5	1.6			573	6.88	148.53					B	2	20-40	
15	Lime	EM	17	6	4m from parapet		6	5	1.6			600	7.20	162.86					B	2	20-40	
16	Lime	EM	13.5	5	4m from stem		4	4	1.5			554	6.65	138.85					B	2	20-40	

## Appendix E. Root Protection Area

Table 5.4: 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 <sup>2</sup> )
T1	Whitebeam spp	295	3.54	39.37
T2	Field Maple	<u>60@2m</u>	0.72	1.63
T3	London Plane	368	4.42	61.26
T4	Lime	450	5.40	91.61
T5	Lime	453	5.44	92.83
T6	Lime	480	5.76	104.23
T7	Lime	333	4.00	50.17
T8	Lime	510	6.12	117.67
T9	Lime	748	8.98	253.11
T10	Lime	559	6.71	141.36
T11	Lime	489	5.87	108.18
T12	Lime	434	5.21	85.21
T13	Lime	485	5.82	106.41
T14	Lime	573	6.88	148.53
T15	Lime	600	7.20	162.86
T16	Lime	554	6.65	138.85

## Appendix F. TPO and CA information

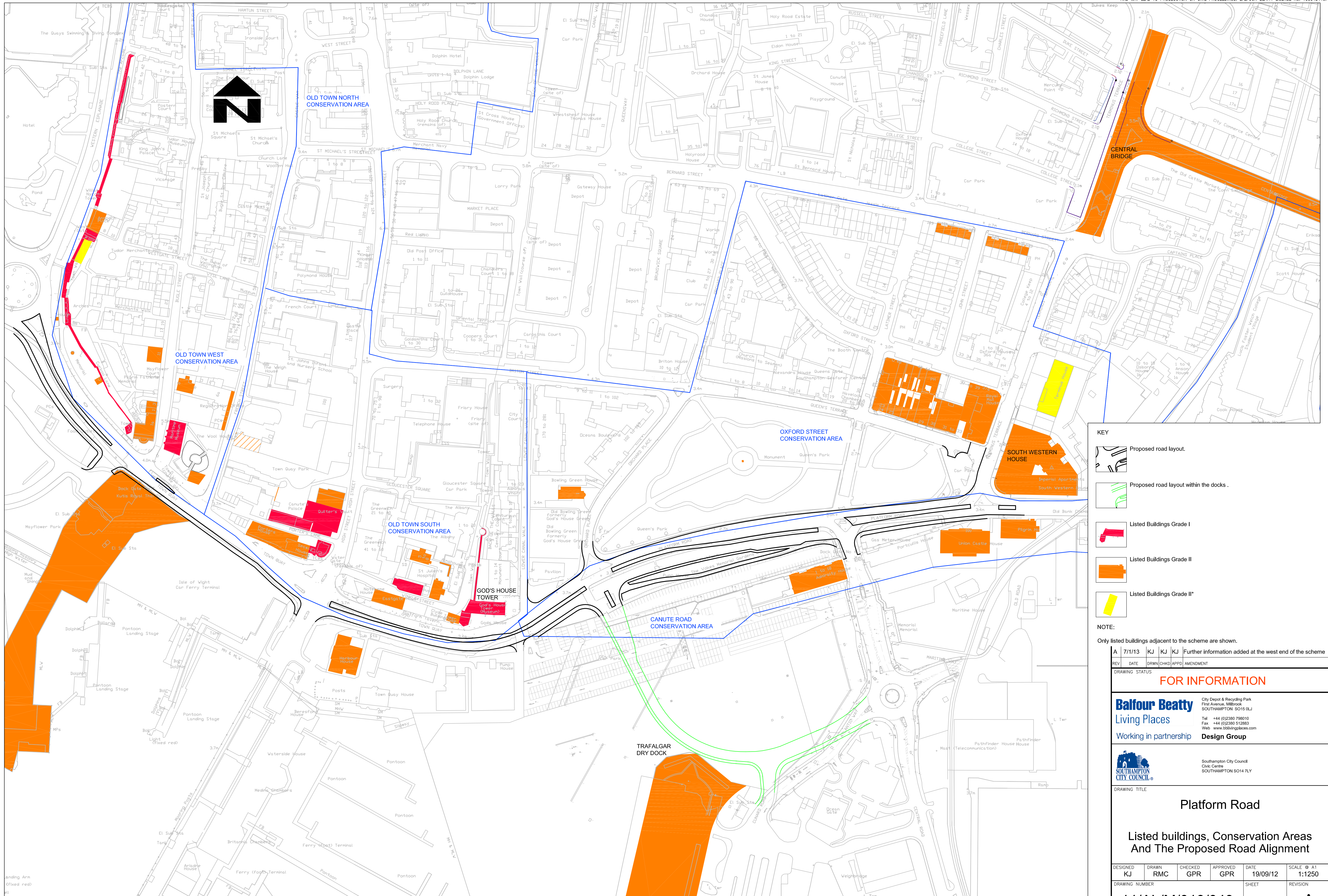
### **F.1. TPO information**

No TPOs identified within or adjacent to Scheme Footprint.

### **F.2. Conservation Area information**

No Conservation Areas were identified within the Scheme Footprint; however the Oxford Street Conservation Area boundary is located at the Terminus Terrace and Bernard Street junction as illustrated in Appendix F.





**KEY**

- Proposed road layout.
- Proposed road layout within the docks.
- Listed Buildings Grade I
- Listed Buildings Grade II
- Listed Buildings Grade II\*

**NOTE:**  
Only listed buildings adjacent to the scheme are shown.

A 7/1/13 KJ KJ KJ Further information added at the west end of the scheme					
REV	DATE	DRWN	CHKD	APPD	AMENDMENT
DRAWING STATUS					
<b>FOR INFORMATION</b>					
<b>Balfour Beatty</b>		City Depot & Recycling Park First Avenue, Millbrook SOUTHAMPTON SO15 0LJ			
Living Places		Tel +44 (0)2380 798010 Fax +44 (0)2380 512883 Web www.bbivingplaces.com			
Working in partnership		<b>Design Group</b>			
		Southampton City Council Civic Centre SOUTHAMPTON SO14 7LY			
DRAWING TITLE					
<b>Platform Road</b>					
<b>Listed buildings, Conservation Areas And The Proposed Road Alignment</b>					
DESIGNED	DRAWN	CHECKED	APPROVED	DATE	SCALE
KJ	RMC	GPR	GPR	19/09/12	A1 1:1250
DRAWING NUMBER				SHEET	REVISION
11/AL/M/019/043				1 of 1	A



## Appendix G. Glossary

<b>Adventitious bud</b>	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
<b>AGL (Above Ground Level)</b>	Terminology (prefixed by a measurement) stated within the Tree Survey Schedule to reference the location/height of a particular tree feature or tree part
<b>Co-dominant stem</b>	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
<b>Crown Lift</b>	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.
<b>Dieback</b>	Where branches are beginning to show signs of death usually at the tips of the crown
<b>Epicormic growth</b>	Small branches that grow in uncharacteristic clusters around the base of a tree, usually as a result of bad pruning or other stress factor
<b>Etiolated</b>	Tall, thin tree which has extended vertically without substantial lateral development. Usually as a result of competition for light from other species
<b>'Hung up' branch</b>	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
<b>Included bark</b>	Where the bark on two adjoining branches or stems is growing tight together, forming a joint with limited physical strength
<b>ms</b>	A multi stemmed tree
<b>Pollarding</b>	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
<b>Occluded wound</b>	The growth of a wound with (callus) tissue produced subsequently
<b>RPA (Root Protection Area)</b>	The theoretical rooting area of a tree defined by BS5837:2005 Trees in Relation to Construction - Recommendations
<b>Topping</b>	Topping is a form of pruning that removes terminal growth leaving a 'stub' cut end. Topping causes serious health problems to a tree

## Appendix H. 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