PLANNING DESIGN ENVIRONMENT



St Peter's Square Redevelopment
Arboricultural Impact Assessment

Report Ref: TEP.3401.002
June 2012

Genesis Centre
Birchwood Science Park
Warrington
WA3 7BH

T: 01925 844004
F: 01925 844002
E: tep@tep.uk.com
W: www.tep.uk.com

St Peter's Square Redevelopment
Arboricultural Impact Assessment
Report Reference: TEP. 3401.002

Version 2.0

June 2012

Prepared by:

TEP
Arboricultural Consultant

for

Laing O'Rourke Northern Ltd
Trinity House
Eldon Place
Liverpool
L3 6HE

Written:	Checked:	Approved:
RNT	ROS	PAM

CONTENTS PAGE

1.0 INTRODUCTION 1

2.0 THE SITE AND SURROUNDINGS 2

3.0 STATUTORY PROTECTION 3

4.0 TREE POPULATION 4

5.0 IMPACTS OF THE PROPOSED DEVELOPMENT 5

6.0 TREE PROTECTION REQUIREMENTS 6

7.0 MANAGEMENT RECOMMENDATIONS 9

8.0 SUMMARY 11

APPENDICES

Appendix 1: Arboricultural Survey Data Sheets

Appendix 2: Survey Method

DRAWINGS

Drawing 1: Tree Location Plan: D3401.001

Drawing 2: Tree Removal Plan: D3401.002A

1.0 INTRODUCTION

1.1 TEP has been commissioned by Laing O'Rourke to conduct an arboricultural survey of St Peter's Square and Library walk in Manchester city centre. This report details the likely arboricultural impact of developing the site and subsequent mitigation recommendations.

1.2 The survey was carried out in June 2012 by means of inspection from ground level by a qualified Arboricultural Consultant. Trees were assessed in accordance with *BS 5837:2012 Trees in Relation to design, demolition and construction – Recommendations.*

1.3 Under the British Standard the assessment of trees is made objectively. The categorisation method identifies the quality and value of the existing tree stock.

1.4 A Ordnance survey base plan (Ref: 1200-MCC-DR-SP001) was supplied by the client and existing tree locations were approximated using fixed points of reference.

1.5 At present, detailed design proposals for the development are unavailable and are currently the subject of an international design competition. The arboricultural impact of the development is based on a preliminary site layout proposal supplied by the client (Ref: SPSDC016, page 29).

1.6 A total of 38 individual trees (T1-T38) and 2 groups of trees (G1-G2) were surveyed and mapped (refer to Drawing 1). All arboricultural information recorded during the survey is presented at Appendix 1.

1.7 The nature of the soils on site was not assessed during the survey. The possibility of minor soil movement due to tree root activity cannot be discounted. Prior to the undertaking of foundation depth calculations the exact location of all trees in relation to structures will be required.

1.8 This report provides the results of the survey and includes the following:

- A schedule of all trees located on, or within influencing distance of the proposed development site (Appendix 1);
- An assessment based on *BS 5837:2012*, of trees in terms of their potential value within any future development. On the basis of this assessment trees have been categorised into one of four categories: A, B, C or U (Appendices 1 & 2);
- An assessment, based on *BS 5837:2012*, of the requirement for protection of trees during the construction phase (Section 5);
- Advice on removal, retention and management of trees (Sections 4 & 6);
- A Tree Location Plan detailing tree quality categories, canopy spreads and Root Protection Areas (**RPA**) for all trees surveyed (Drawing 1); and
- A Tree Removal Plan detailing trees to be retained and removed (Drawing 2).

2.0 THE SITE AND SURROUNDINGS

2.1 The site is centred on St Peter's Square in Manchester city centre. The Central Public Library, town hall extension building, Metrolink station, a building site (formerly Elizabeth house) and cinema building are all within the survey boundary. A small public garden area, known as Peace Gardens, and a cenotaph are also located within the site.

2.2 The site is bounded by Peter Street to the south, the main town hall building and Princess Street to the north and Mount Street to the west.

Development Proposals

2.3 The proposals involve the redevelopment of St Peter's Square including the re-alignment of the Metrolink line to run alongside Princess Street. The relocation of the existing cenotaph and the removal of the Peace Gardens is proposed.

3.0 STATUTORY PROTECTION

Tree Preservation Orders & Conservation Area Designations

3.1 Where it is considered expedient to do so, local authorities reserve the right to create Tree Preservation Orders (TPO) to protect the amenity value conferred to a location by a tree or group of trees. Where a TPO is in force, lopping, topping, felling, uprooting or wilful damage caused to a tree is prohibited and such actions may be prosecuted and incur an unlimited fine. Works to TPO protected trees must only be undertaken with the written consent of the local authority.

3.2 Consultation will be required with Manchester City Council to obtain specific information regarding tree protected by Tree Preservation Orders or Conservation Area status.

Protected Species – Bats

3.3 Mature trees often contain cavities, crevices and hollows which are a potential habitat for roosting bats. Bats are afforded protection under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), as well as under Schedule 2 of the Conservation of Species and Habitats Regulations 2010, and as such causing damage to a bat roost constitutes an offence.

3.4 A preliminary ground level appraisal of the wildlife habitat value of each tree was undertaken as part of the arboricultural survey. No trees on site were noted as having features suitable to support roosting bats.

3.5 Should the presence of a bat roost be suspected whilst undertaking works on any other trees and groups on site, operations must be halted until a licensed bat handler or ecologist can provide advice.

Protected Species - Birds

3.6 Trees are a potential habitat for nesting birds, which (as well as their nests and eggs) are protected under the *Wildlife and Countryside Act 1981* (as amended). This makes it an offence to intentionally or recklessly, damage or destroy an active birds nest or any part thereof.

3.7 Several nests were observed during the survey. All tree work should ideally be undertaken outside the bird nesting season (British bird nesting season: March to August inclusive).

3.8 If this is not possible then a detailed inspection of each tree should be undertaken by a qualified ecologist immediately prior to the arboricultural works. Should an active nest be found (being built, containing eggs or chicks) then any work likely to affect the nest must be halted and a working boundary of 5m left intact around the nest until the nest becomes inactive.

4.0 TREE POPULATION

4.1 38 individual trees (T1-T38) and 2 groups of trees (G1-G2) were recorded within the site. A schedule of all trees and groups in terms of species, condition, age management recommendations and *BS 5837:2012* quality categories is provided at Appendix 1.

4.2 The tree stock on site ranges from low value young trees to high value mature specimens.

4.3 Tree T14 and T38 (mature London plane) are located within the grassed area of the Peace Gardens. Both are prominent landscape features and contribute substantially to the green space and surrounding infrastructure. No significant defects were visible on either of these two trees. Trees T19 (mature grey alder) and T21 (mature whitebeam) are located along the western edge of the Peace Garden. They are prominent, healthy and well-formed specimens.

4.4 11 middle-aged hornbeam trees (T2 to T13) line the eastern border of the Peace Gardens. They vary in condition from fair to good. Close spacing of these trees has resulted in poor crown development in a number of individuals and minor dead wood and broken, hanging branches are found throughout their crowns. Collectively, these hornbeam create a dense screen against the garden interior, block street level views of the library and town hall buildings from the east and cast dark shadows around the pavement and grassed areas.

4.5 A small cluster of young to middle-aged broadleaved trees (T25 to T30) was surveyed to the immediate north of the Peace Gardens. Access for detailed inspection was restricted due to them being enclosed by construction hoarding. However, they appear to be visibly healthy and display reasonable form.

4.6 Five middle aged pin oak trees (T31 to T35) were surveyed alongside the Central Library building to the south. These vary in condition from fair to good. Their close proximity to the building coupled with heavy pruning work has reduced the future potential of a number of these trees; T33, T34 and T35 in particular. T34 and T35 are displaying moderate die-back yet trees T31 and T32 are still vigorous and have good vitality.

4.7 Within the grassed area associated with the cenotaph are four formally planted fastigiate oak trees (group G1). They exhibit good form and health. An appropriate species selection for the location, they are an attractive compliment to the memorial.

4.8 Tree and group locations, their quality categories and canopy spreads are shown on Drawing 1.

Tree Quality Categorisation

4.9 Under *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations* trees and groups are objectively assigned a quality category designed to quantify their value within any future development. Table 1 (overleaf) presents a summary of the categories presented in the British Standard. The full table has been reproduced at Appendix 2.

Table 1: Summary of *BS 5837:2012* tree quality categorisation criteria

Category A	Trees of high value including those that are particularly good examples of their species and/or those that have visual importance or significant conservation or other value
Category B	Trees of moderate value including those that do not qualify as Category A due to impaired condition and/or those that collectively have higher value than they would as individuals; also trees with material conservation or other value
Category C	Trees of low value including those with very limited merit or impaired condition; trees offering transient or temporary landscape benefits
Category U	Trees with irremediable defects and anticipated early loss due to collapse; dead trees or those in immediate decline and those with infection pathogens that threaten other trees

5.0 IMPACTS OF THE PROPOSED DEVELOPMENT

5.1 Table 2 lists the number and quality of trees that will require removal and those that can be retained in order to facilitate the redevelopment of St Peter's Square. This is the result of an assessment based on a preliminary site layout supplied by the client. A more accurate assessment of tree removal and retention can be determined once a finalised design has been produced.

Table 2: Arboricultural implications of the proposed development

	Tree Quality Category			
	A	**B**	**C**	**U**
Trees and groups that can be retained	-	T31, T32, T33, G1, G2	T34, T35	-
Trees and groups that require removal to facilitate the redevelopment of St Peter's Square	T14, T19, T21, T38	T1, T3, T5, T7, T8, T9, T10, T11, T12, T13, T16, T17, T18, T20, T22, T23, T24, T25, T26, T27, T28	T2, T4, T6, T15, T29, T30, T36, T37	-

See Appendix 1, Arboricultural Data Sheets for subcategories

5.2 33 individual trees must be removed to facilitate the redevelopment of St Peter's Square. The majority of these are moderate value and are all located within the Peace Gardens area. Four high value individuals and seven low value individuals will require removal.

5.3 Replacement planting will take place to mitigate the loss of existing trees. Further details are contained in Section 7.

5.4 Fencing to protect the retained trees will be necessary. This will reduce the useable area for works and storage of materials during development.

6.0 TREE PROTECTION REQUIREMENTS

Root Protection Areas

6.1 As per *BS 5837:2012*, the **Root Protection Area (RPA)** is calculated using each tree's diameter at 1.5 metres (refer to Appendix 1) and represents the minimum area around each tree that must be left undisturbed to ensure their survival.

6.2 Tree roots typically spread two times the width of the crown, although this figure may be significantly increased for certain species and where specific ground conditions are present. The majority of tree roots are found in the top 600 mm of soil and most of the fine roots that absorb water and nutrients are found in the top 100 mm.

6.3 The morphology of roots is influenced by past and present site conditions (the presence of roads, structures and underground services), soil type, topography and drainage. This means that a tree's roots may not be uniform in their extent and the **RPA** may not be a circular area centred on the tree stem.

6.4 The **RPA** may be adjusted or offset to most accurately represent the likely spread of roots for each individual tree (refer to Drawing 1).

Protective Fencing and Exclusion Zones

6.5 Temporary protective barrier fencing will be required to demarcate a **Construction Exclusion Zone (CEZ)** around retained trees. This must be put in place prior to the commencement of any development works, including bringing machinery or materials onto site, the erection of site huts.

6.6 The **CEZ** acts to protect both tree roots and branches and has been extended to incorporate canopy spread where appropriate.

6.7 The fencing must be fixed into the ground to withstand accidental impact from machinery and to ensure that a sufficient protective area is maintained.

6.8 A weatherproof notice stating 'Construction Exclusion Zone – Keep Out' must be fixed to each fencing panel.

6.9 The protective fencing must not be removed until the physical construction phase has been completed and all vehicles have been removed from site, to the satisfaction of the council's Arboricultural Officer.

Ground Contamination

6.10 Storage areas for liquids such as fuels, oil or paint should not be located within 10m of any trees on or within proximity to the site due to the risk of soil contamination caused by accidental spillage.

Underground Utility Issues

6.11 Where the installation of services within the **Construction Exclusion Zone** of retained trees is unavoidable, appropriate work methods will be required to ensure the safe long-term survival of those trees. This process will require additional consultation with a qualified Arboricultural Consultant and is likely to be more expensive than conventional trench installation.

Ground Level Changes

6.12 A rise or reduction in soil level can have major implications on the longevity and health of the trees. Minor changes (up to 100mm) can be tolerated in some cases but is heavily dependent on tree species, condition and growing environment.

6.13 Existing ground levels within the **Construction Exclusion Zone** should be respected as far as is reasonably practicable. The advice of a qualified Arboricultural Consultant should be sought if level changes are required.

Drainage & Storm Water Run-off Issues

6.14 Drainage and storm water run-off requires due consideration and construction requirements (e.g. permeable surfacing) to prevent excessive and/or polluted run-off into the rooting area of trees to be retained.

7.0 MANAGEMENT RECOMMENDATIONS

Tree Protection Plan

7.1 A **Tree Protection Plan (TPP)** will need to be produced once a detailed design has been finalised. The **TPP** will provide measures for ensuring the healthy retention of trees during the construction phase, including protective fencing alignment, **CEZs** and ground protection.

Arboricultural Method Statement

7.2 An **Arboricultural Method Statement (AMS)** will be required where construction activities are proposed within the Root Protection Areas (RPA) of retained trees.

7.3 The purpose of an **AMS** is to demonstrate that the proposed operations can be undertaken with minimal risk of adverse impact on trees to be retained. It will set the parameters within which construction will need to be undertaken and will guide the actions of site operatives.

7.4 Construction methods presented in an **AMS** are likely to be the result of collaboration between an Arboricultural Consultant and other project specialists. This process may result in the use of un-conventional building techniques and those allowing more control over soil and root disturbance.

Mitigation for the removal of trees

7.5 33 individual trees must be removed to facilitate the redevelopment of St Peter's Square. Mitigation for the loss of existing trees will take place in the form of replacement planting. The extent of mitigation planting will be determined during a detailed design stage where suitable areas for replacement trees will be identified.

7.6 Aftercare is vital to the survival of newly planted trees. Provision should be made for a minimum of two years maintenance of newly planted trees and include watering, formative pruning and the checking of tree ties and stakes.

7.7 It is the recommendation of this report that mitigation in the form of tree planting has the potential to result in a net gain/loss of long-term tree cover (estimated at 40 years post-construction). This is wholly dependent on appropriate species selection, tree quality and high establishment rates. Suitable species include *paulownia sp., sophora sp., quercus sp., gleditsia sp*., and *tilia sp*.

7.8 Tree replacement and future management will be carried out in line with transport for Greater Manchester's 'Wildlife Habitat and Tree Replacement Policy' (TfGM 2011) and in agreement with Manchester City Council.

Post Construction Tree Care

7.9 Hazard recommendations are based on observations at the time of survey. Trees are dynamic living organisms whose structure is constantly changing. Even those in good condition can suffer from damage or stress. Following site development, regular (annual or biennial) inspections of all retained trees should be undertaken by a qualified Arboricultural Consultant.

8.0 SUMMARY

8.1 Based on an objective assessment made in accordance with *BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations*, there are 4 Category A, 27 Category B and 9 Category C trees and groups on or within influencing distance of the site.

8.2 Based on the information supplied by the client, 33 individual trees must be removed to facilitate the redevelopment of St Peter's Square. The majority of these are moderate value and are all located within the Peace Gardens area.

8.3 Several birds' nests were observed during the survey. No tree was found to have features desirable to bats (see Section 3).

8.4 A **Tree Protection Plan (TPP)** will need to be produced once a detailed design has been finalised. The **TPP** will provide measures for ensuring the healthy retention of trees during the construction phase, including protective fencing alignment, **CEZs** and ground protection.

8.5 An **Arboricultural Method Statement (AMS)** will be required where construction activities are proposed within the Root Protection Areas (RPA) of retained trees.

8.6 Mitigation for the loss of existing trees will take place in the form of replacement planting. The extent of mitigation planting will be determined during a detailed design stage where suitable areas for replacement trees will be identified.

APPENDIX 1

ARBORICULTURAL SURVEY DATA SHEETS

APPENDIX 1: Arboricultural Survey Data Sheets

Surveyor RNT
Date 07.06.12
Town Manchester
Site St Peter's Square
Dwg Ref D3401.001
0

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)
Trees																			
T1	Pin oak	11.0	230.0	1.0	3.5	3.5	4.0	3.5	2.0	E	Middle Age	Good	Minor branch stubs in central crown. Vigorous central leading stem. No significant defects	B,1,2	2.8	23.9		Long	
T2	Pin oak	10.0	200.0	1.0	3.0	3.5	4.0	1.5	2.0	E	Middle Age	Fair	Suppressed by more dominant neighbours. Moderate die-back in central crown. Birds nest in crown. Asymmetric form.	C,2	2.4	18.1		Medium	
T3	Hornbeam	10.0	210.0	1.0	3.0	3.5	3.5	2.0	2.0	E	Middle Age	Good	Slightly asymmetric crown due to proximity to neighbouring trees. Moderate dead wood in central crown.	B,1,2	2.5	20.0		Long	
T4	Hornbeam	10.0	130.0	1.0	1.0	2.0	1.5	2.0	2.0	E	Middle Age	Fair	Suppressed by more dominant neighbours. Asymmetric crown. Minor dead wood.	C,1,2	1.6	7.6		Medium	
T5	Hornbeam	11.0	170.0	1.0	3.0	3.5	3.0	2.5	1.5	E	Middle Age	Good	Minor broken hanging branches. Minor basal wound. No significant visible defects.	B,1,2	2.0	13.1		Long	
T6	Hornbeam	11.0	150.0	1.0	1.5	3.0	3.0	1.5	2.0	E	Middle Age	Fair	Branches from neighbouring London plan restricting growth and causing crown asymmetry. Minor dead wood and hanging branches in central crown.	C,2	1.8	10.2		Medium	
T7	Hornbeam	12.0	180.0	1.0	3.5	2.0	4.0	2.0	2.5	N	Middle Age	Good	Asymmetric crown weighted to the east. Minor stem lean. Minor dead wood and hangers in central crown.	B,1,2	2.2	14.7		Long	
T8	Hornbeam	12.0	190.0	1.0	2.5	2.0	4.0	1.5	2.5	W	Middle Age	Fair	Asymmetric crown weighted to the east. Minor dead wood in central crown and wound on lower stem.	B,1,2	2.3	16.3		Long	
T9	Hornbeam	12.0	220.0	1.0	4.0	4.0	5.0	4.0	2.0	W	Middle Age	Good	Good balanced crown. Flush cuts at 3m on main stem. Large birds' nest in upper crown. Minor dead wood present	B,1,2	2.6	21.9		Long	
T10	Hornbeam	12.0	210.0	1.0	3.5	3.5	4.5	4.0	2.0	W	Middle Age	Good	Minor branch wounds, dead wood and broken stubs	B,1,2	2.5	20.0		Long	
T11	Hornbeam	12.0	200.0	1.0	4.0	2.5	4.5	4.5	1.5	N	Middle Age	Good	Asymmetric crown due to close spacing. Minor dead wood in central crown. Minor branch stubs	B,1,2	2.4	18.1		Long	
T12	Hornbeam	12.0	200.0	1.0	4.0	2.0	5.0	3.5	2.0	N	Middle Age	Good	Asymmetric crown due to close spacing. Birds' nest in upper crown. Minor dead wood, hangers and flush cuts.	B,1,2	2.4	18.1		Long	
T13	Hornbeam	11.0	140.0	1.0	3.0	2.5	2.5	4.0	2.0	E	Middle Age	Good	Minor stem wounds and broken hanging branches.	B,1,2	1.7	8.9		Long	
T14	London plane	18.0	680.0	1.0	6.5	5.0	7.5	6.0	1.5	E	Mature	Good	Prominent tree. Good form and physiological condition. Burred main stem.	A,1,2	8.2	209.2		Long	

APPENDIX 1: Arboricultural Survey Data Sheets

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)
T15	Chinese red birch	4.0	80.0	1.0	2.0	0.5	1.0	1.0	2.0	W	Young	Good	Developing asymmetric crown due to proximity to T14. good vigour.	C,1	1.0	2.9		Medium	
T16	Common alder	12.0	240.0	1.0	4.5	3.5	5.0	3.5	4.0	E	Middle Age	Good	Poor form with bending leader. Good vitality. No significant defects.	B,1,2	2.9	26.1		Medium	
T17	Birch species	12.0	280.0	1.0	3.5	2.5	3.5	3.5	4.0	E	Middle Age	Good	No significant visible defects. Reasonable vitality..	B,1,2	3.4	35.5		Medium	
T18	Birch species	10.0	260.0	1.0	3.5	3.0	4.5	1.0	4.0	E	Middle Age	Good	Asymmetric from due to proximity to T19. Reasonable vitality.	B,1,2	3.1	30.6		Short	
T19	Grey alder	16.0	630.0	1.0	6.5	6.5	6.0	6.5	3.0	W	Mature	Good	Prominent tree. Minor root exposure. Crown raised recently. No significant visible defects.	A,1,2	7.6	179.6		Long	
T20	Grey alder	16.0	440.0	1.0	6.0	3.0	3.5	4.0	4.0	N	Mature	Good	Trifurcate at 4m. Asymmetric crown due to heavy pruning and proximity to neighbouring trees. Minor decay at main stem union.	B,1,2	5.3	87.6		Medium	
T21	Whitebeam	10.0	380.0	1.0	4.0	3.5	4.5	4.0	4.0	W	Mature	Good	Paving adjacent stem base restricting growth. Good form and vigour. Pruned wounds callused well.	A,1,2	4.6	65.3		Long	
T22	Cherry species	7.0	180.0	1.0	2.0	1.5	2.0	2.0	3.5	E	Middle Age	Good	No significant defects. Slightly asymmetric crown due to close spacing. Vigorous.	B,1,2	2.2	14.7		Long	
T23	Cherry species	9.0	240.0	1.0	2.5	2.5	3.0	3.5	3.0	E	Middle Age	Good	Good vigour and balanced crown. No significant defects. Minor defoliating insect presence.	B,1,2	2.9	26.1		Long	
T24	Cherry species	8.0	260.0	1.0	3.0	3.0	4.5	4.0	3.0	E	Middle Age	Good	Good vigour and balanced crown. Minor defoliating insect presence. No significant visible defects.	B,1,2	3.1	30.6		Long	
T25	Purple leaved Norway maple	7.0	250.0	1.0	4.0	4.0	4.0	4.0	1.5	E	Middle Age	Good	Survey restricted due to location inside hoarding. Good form and vitality. No significant visible defects.	B,1,3	3.0	28.3		Long	
T26	Birch species	7.0	190.0	1.0	3.0	3.0	3.0	3.0	1.5	S	Middle Age	Good	Survey restricted due to location inside hoarding. Good form and vitality. No significant visible defects.	B,1,2	2.3	16.3		Long	
T27	Silver birch	8.0	200.0	1.0	3.0	2.5	2.5	2.5	1.5	W	Middle Age	Good	Survey restricted due to location inside hoarding. Good form and vitality. Minor northerly stem lean. No significant visible defects.	B,1,2	2.4	18.1		Long	
T28	Himalayan birch	6.0	150.0	3.0	3.0	3.0	3.0	3.0	3.0	E	Middle Age	Good	Survey restricted due to location inside hoarding. Good form and vitality. Trifurcate at base. Memorial tree. No significant visible defects.	B,1,2,3	1.8	10.2		Long	
T29	Magnolia species	3.0	70.0	1.0	1.0	1.0	1.0	1.0	1.5	E	Young	Good	Survey restricted due to location inside hoarding. New planting. Stake and tie in place.	C,1	0.8	2.2		Long	

APPENDIX 1: Arboricultural Survey Data Sheets

Ref	Species	Height	Stem Dia.	No. of stems/ individuals	Crown Spread North	Crown Spread South	Crown Spread East	Crown Spread West	Height of Lowest Branch	Direction of Lowest Branch	Maturity	Condition	Comments on form, condition, health and significant defects	BS5837 Tree Quality Assess.	Radius of RPA guide circle	BS5837 RPA Area	Management Recommendations	Estimated Remaining Contribution	TPO
		(m)	(mm)	arising below 1.5m	(m)	(m)	(m)	(m)	(m)	(m)	Young, Middle Age, Mature	Good, Fair, Poor, Veteran		A,B,C,R (1,2,3)	(m)	(m2)		Long, Medium, Short	(*)
T30	Himalayan birch	3.0	70.0	1.0	1.0	1.0	0.5	1.0	1.5	N	Young	Good	reasonable form and vitality. Stem damage from support tie. Bartletts anniversary tree.	C,1,3	0.8	2.2		Medium	
T31	Pin oak	10.0	300.0	1.0	3.5	3.0	3.5	4.0	3.5	S	Middle Age	Good	Survey restricted due to location inside construction site compound. Crown previously reduced. Good vigour. No significant visible defects.	B,1,2	3.6	40.7		Long	
T32	Pin oak	9.0	300.0	1.0	2.5	3.0	3.5	3.0	3.5	S	Middle Age	Good	Survey restricted due to location inside construction site compound. Crown previously reduced. Good vigour. No significant visible defects.	B,1,2	3.6	40.7		Long	
T33	Pin oak	9.0	300.0	1.0	3.0	2.0	2.5	2.5	3.5	N	Middle Age	Good	Survey restricted due to location inside construction site compound. Heavily crown reduced previously. Minor tip die-back.	B,2	3.6	40.7		Medium	
T34	Pin oak	8.0	130.0	1.0	1.5	2.5	2.5	1.0	3.0	N	Middle Age	Fair	Survey restricted due to location in construction site compound. Low vigour. Moderate tip die-back throughout crown.	C,1,2	1.6	7.6		Medium	
T35	Pin oak	9.0	130.0	1.0	1.0	2.5	2.5	2.5	3.0	N	Middle Age	Fair	Heavily reduced on northern side. Future growth restricted. Minor tip die-back.	C,1,2	1.6	7.6		Medium	
T36	English oak	8.0	110.0	1.0	2.0	2.0	2.0	2.0	2.0	N	Young	Good	Young planting. Future growth potential restricted by dominant neighbouring trees	C,1,2	1.3	5.5		Long	
T37	English oak	6.0	100.0	1.0	1.5	1.5	1.5	1.5	1.0	N	Young	Good	Young planting. Future growth potential restricted by dominant neighbouring trees	C,1,2	1.2	4.5		Long	
T38	London plane	18.0	690.0	1.0	6.5	6.0	6.0	6.0	4.0	N	Mature	Good	Prominent tree. Good form and physiological condition. Burred main stem.	A,1,2	8.3	215.4		Long	
Groups																			
G1	Fatigiate oak	to 6	90 to 110	4.0					1.5		Middle Age	Good	Good form and vigour. No significant visible defects.	B,1,2	Refer to Drawing	n/a		Long	
G2	Norway maple	to 12	280 to 300	4.0					1.5		Middle Age	Good	Developed asymmetric crowns due to close spacing and proximity to building. Reasonable vitality. No significant visible defects.	B,1	Refer to Drawing	n/a		Medium	

APPENDIX 2

SURVEY METHODOLOGY

APPENDIX 2: SURVEY METHOD

The survey of trees is conducted from ground level only. The nature of the soils on site is not assessed.

Trees are dynamic living organisms with a constantly changing structure; even trees in good condition can suffer from damage or stress. The information recorded is presented as being correct at the time of survey.

The following features of each tree, group of trees or wood may have been recorded in the Arboricultural Survey Data Sheets at Appendix 1.

Species The common name is given. The Latin name may also be given if further clarification is required.

Height Top height of tree recorded in metres.

Stem Diameter For single-stemmed trees the measurement is taken at 1.5 metres above ground level and recorded in millimetres.
For multi-stemmed trees an average all stems measured at 1.5m above ground level is used.
For tree groups a range from minimum to maximum diameters is provided based on measurements taken using one of the aforementioned methods.

No. of Stems A count of stems arising below a height of 1.5 metres.

Crown Spread The N, S, E and W branch spreads are recorded in metres to provide a representative crown shape.

Height of Lowest Branch Crown clearance above ground level recorded in metres.

Direction of Lowest Branch The direction of growth of the first significant branch from the point of attachment.

Maturity

Young	Trees than can reasonably be relocated or replaced like for like, without undue cost;
Middle Age	Trees in the established growth stage of their life with the potential to continue increasing in size;
Mature	Trees that have reached their ultimate size, given their location and surroundings;

Condition **Good, Fair, Poor.** An overall assessment of a tree's physiological and structural state in which factors that may increase its susceptibility to the effects of development are taken into account.

Veteran. Trees that are in such a condition as to significantly increase their biological, cultural or aesthetic value. This is characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.

Comments A brief evaluation and description of the tree with comments on form, vitality, health and any significant defects or symptoms of ill-health.

BS 5837 Tree Quality Assessment

The tree quality assessment is based on Table 1 of BS 5837:2012 (See below). Four categories (A, B, C and U) are used to denote tree quality (A = High, B = Moderate, C = Low, U = Unsuitable for retention). Subcategories (1-3) denote the specific function value of the trees and the reasoning behind the allocation of a specific category (the subcategories may be used in combination but do not accumulate collective weight).

Root Protection Area (RPA)

The RPA is allocated to ensure that a sufficient area is left undisturbed during development. It is provided as an area (m^2) and as the radius of a circle (m) typically plotted from the centre of the stem.

The RPA is calculated using a mathematical equation included in BS 5837:2012 (Section 4.6 and Table D.1) and is based on a trees stem diameter. In some cases the RPA may need to be adapted to best reflect the likely area and position of roots required to ensure survival; this may be based on criteria such as the tree's condition, species, crown spread and any barriers to growth. Any alteration must be justifiable but is made at the Arboricultural Consultants discretion.

Recommendations

Recommendations for arboricultural works, etc. are based on the **current** land use, and take into account the tree or group attributes without bias to the proposed development.

Estimated Remaining Contribution An estimation of the life expectancy as healthy functioning tree. This will be influenced by species and the condition of the tree at the time of survey.

Long	> 40 years
Medium	20 – 40 years
Short	less than 20 years

Table 1 Cascade chart for tree quality assessment

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• 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 category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing 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 value	See Table 2
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 150 mm	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 collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

British Standards Institute 2012, p.9

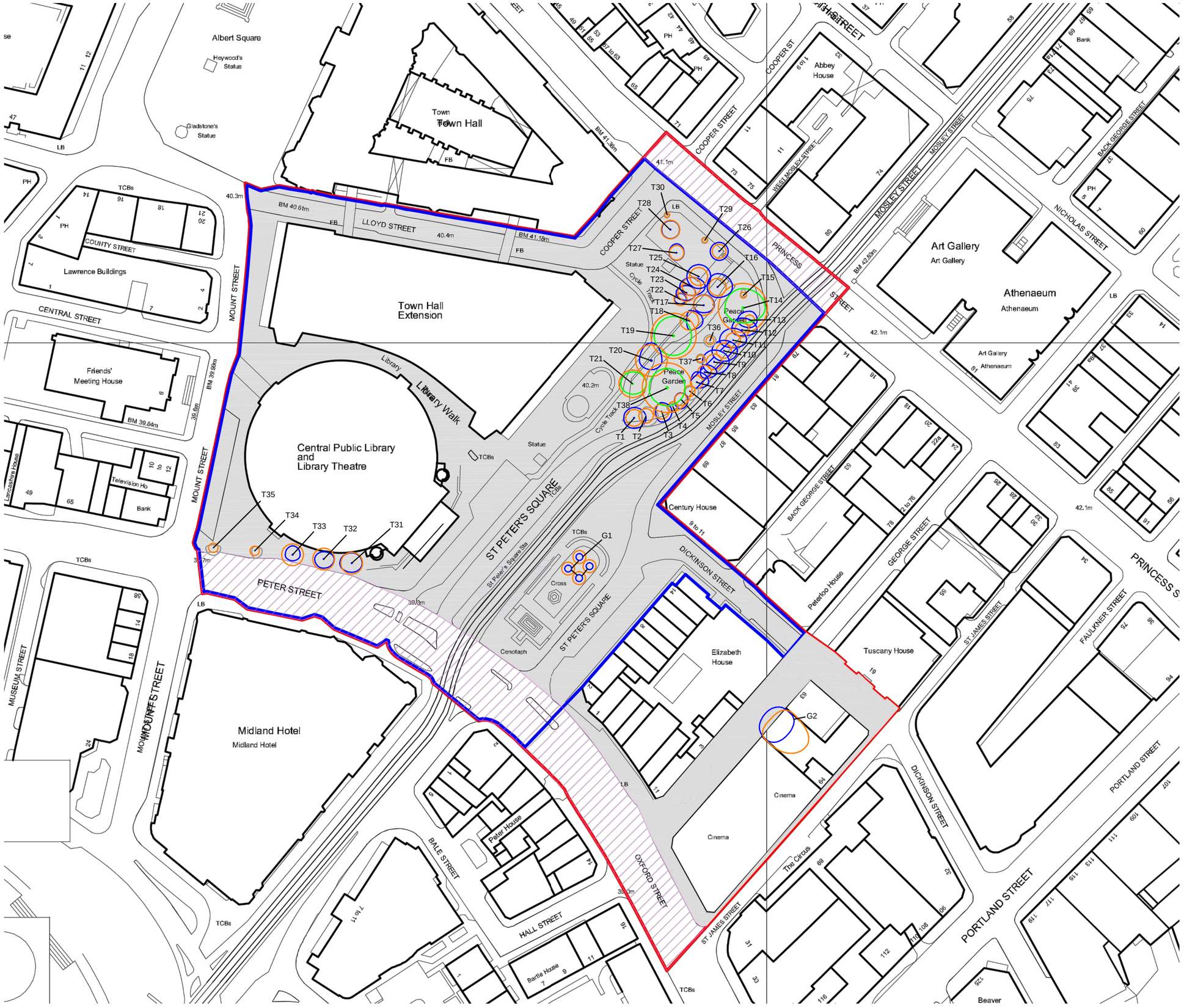
NOTES:

All young trees are assessed as quality category 'C' but this does not preclude their retention within a development.

For hedges the height, canopy spread and number of stems is recorded but they not assigned a quality category.

DRAWING 1

TREE LOCATION PLAN



KEY

[This drawing must be reproduced in colour]

- T1 Individual trees
- G1 Groups of trees
- Root Protection Area (RPA)
- Survey area
- Scope of design competition

Tree Categorisation

(Tree quality assessment based on BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)

NOTE: This drawing should be read in conjunction with the respective Arboricultural Data Sheets (Appendix 1).

Rev	Description	Drawn	Approved	Date

TEP
Genesis Centre
Birchwood Science Park Warrington
WA3 7BH
Tel 01925 844004
Fax 01925 844002
e-mail tep@tep.uk.com

Project

St Peter's Square and Library Walk: Arboricultural Implications Assessment

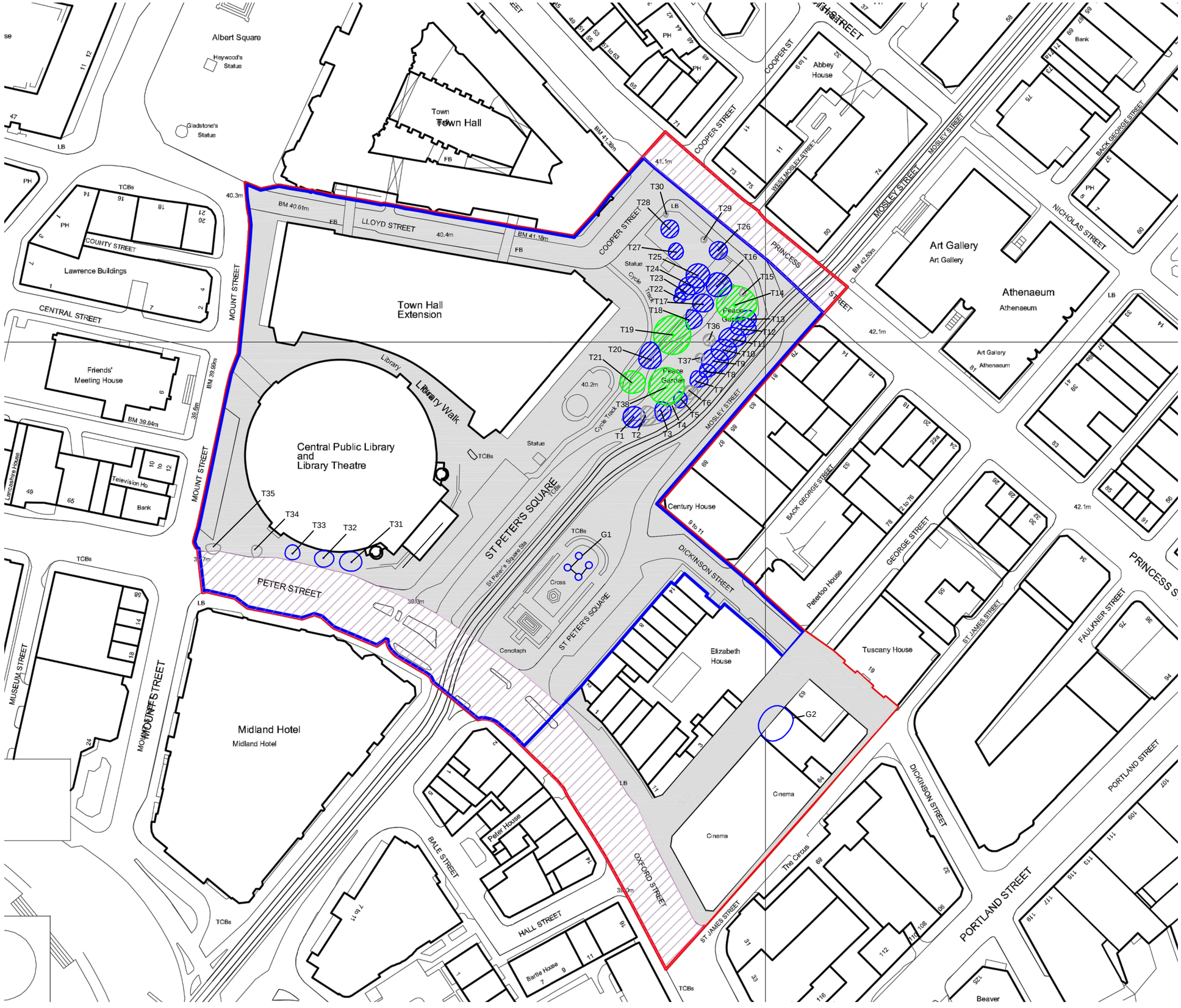
Title

Tree Location Plan (existing)

Drwg No		
D3401.001		
Scale 1:1250 @ A3		Date 08/06/12
Drawn RNT	Checked ROS	Approved ROS

DRAWING 2

TREE REMOVAL PLAN



KEY

[This drawing must be reproduced in colour]

- T1 Individual trees
- G1 Groups of trees
- Survey area
- Scope of design competition

Trees to be retained

(Tree quality assessment based on BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)

Trees to be removed

(Tree quality assessment based on BS 5837:2012 Trees in relation to design, demolition and construction - Recommendations)

- Category A (High quality)
- Category B (Moderate quality)
- Category C (Low quality)

NOTE: This drawing should be read in conjunction with the respective Arboricultural Data Sheets (Appendix 1).

Rev	Description	Drawn	Approved	Date
A	Removal scehdule alterations	RNT	JGS	04/06/12

TEP
Genesis Centre
Birchwood Science Park Warrington
WA3 7BH
Tel 01925 844004
Fax 01925 844002
e-mail tep@tep.uk.com

Project

St Peter's Square and Library Walk: Arboricultural Implications Assessment

Title

Tree Removal Plan

Drwg No		
D3401.002A		
Scale: 1:1250 @ A3		Date: 08/06/12
Drawn: RNT	Checked: ROS	Approved: ROS