

EXETER COLLEGE OXFORD

A New Quad at Walton Street
Arboricultural Impact Assessment

March 2013

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1. INTRODUCTION

1.1 Instructions

1.1.1 Instructions were received from Exeter College to carry out an Arboricultural Implication Assessment on the likely impact and effect to trees in regard to the potential to re-develop land at the Ruskin Building Site, Walton Street, Oxford.

1.1.2 This appraisal assesses the impact of the potential to re-develop the site in relation to the trees and discusses mitigation measures that may have to be adopted. The appraisal has been assessed in relation to the Stage D drawings issued by Alison Brooks Architects Ltd.

1.2. Arboricultural Survey

1.2.1 On the 8th January 2013 a revision of the 2012 arboricultural tree survey was carried out in accordance with British Standard 5837:2012 'Trees in relation to Design, Demolition and Construction-Recommendations' and good arboricultural practice. This is a basic data collection exercise and a record of the trees condition at the time of surveying. The tree survey data, tree survey plan and arboricultural constraints plan are included in a separate document called the 'Arboricultural Survey'.

1.3 Site Description

1.3.1 The trees subject of this appraisal are growing on land at Worcester College and are adjacent to the southern boundary of the site.

1.3.2 The trees are a noteworthy feature within the immediate environment and are publically visible from selected views along Walton Street and Walton Lane. The trees have been planted in a staggered row with relatively even spaces. Due to the close proximity of the trees with one another the trees have influenced one another's' growth. In some instances the canopies overhang the boundary into the Ruskin Building Site.

1.4 Proposed Development

1.4.1 It is proposed to re-develop the land at the Ruskin Building Site, with the purpose of this report is to assist with the design process.

1.4.2 Please note all tree numbers referred to in this document relate to the tree numbers annotated on the arboricultural implication assessment plan.

2. ARBORICULTURAL SURVEY

2.1 A total of 14 individual trees have been recorded within this assessment. The tree quality is assessed as follows:

U: Trees that are considered to be of such condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboriculture management. However, if category 'U' trees are placed in an inaccessible location such that concerns over public safety are reduced to an acceptable level, it may be preferable or possible to defer this recommendation.

A: Trees of the highest quality and value and are considered to be of such a condition as to be able to make a substantial contribution (e.g. 40 years +).

B: Trees of moderate to high value and are considered to be of such a condition as to be able to make a significant contribution (e.g. 20 years +).

C: Trees of low quality with an estimated life expectancy of at least 10 years. Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories. Young trees with a stem diameter of less than 150mm should be considered for relocation or replacement through mitigation (e.g. 10 years).

Category A, B & C trees are further divided into sub-categories. These sub-categories carry equal weight and are selected for either arboricultural values, landscape values or cultural values, including conservation. Within the British Standard 5837:2012 it is recommended to record hedge and shrub masses, however in the context of the standard it is not necessary to assess the quality of these or to provide a category classification.

The numbers of trees falling under each classification within the arboricultural survey are as follows:

U: 0 trees

A: 0 trees

B: 11 trees

C: 3 trees

3. PRINCIPLE ARBORICULTURAL IMPLICATIONS

3.1 Introduction

- 3.1.1 It is proposed to redevelop the land at the Ruskin Building Site. Consideration is given to the significance of the trees identified in the arboricultural tree survey, the constraints that they are likely to pose to any development that may occur, post development implications (if any) and work requirements to trees for reasons of sound arboricultural management in order to facilitate the development.
- 3.1.2 This appraisal has been assessed in relation to the Stage D drawings issued by Alison Brooks Architects Ltd.

3.2 Trees

- 3.2.1 The Holm Oaks subject of this report are located within Oxford Central Conservation Area; Information supplied on Oxford City Council's website details that the Holm Oaks are not subject to any Tree Preservation Orders (TPO); however I have not contacted Oxford City Council (OCC) to confirm this.
- 3.2.2 Prior to undertaking any work that may be recommended within this report, it is advisable to check which planning controls are in operation; written consent must be obtained for works on trees subject to a TPO and in the case of a Conservation Area six weeks' notice of intent must be forwarded before undertaking any such work. All tree works that may be recommended within this report should be carried out in accordance with British Standard 3998:2010 'Recommendations for Tree Works' and in compliance with good practice as promoted by the Arboricultural and Forestry Advisory Group.

3.3 Overview

- 3.3.1 The arboricultural tree survey concluded that the Holm Oaks are a noteworthy boundary feature with the trees publically visible from selected vantage points along Walton Street and Walton Lane. The Holm Oaks are outside of the site boundary and due to the trees proximity to the proposal it has been recommended that due consideration regarding their retention, should development occur is undertaken. Post development concerns such as shading, debris and concerns of the trees proximity and juxtaposition to buildings must also be considered during the design process.
- 3.3.2 In August 2012 five trial pit holes (TP1-TP5) were excavated by hand in order to ascertain whether roots of the adjacent third party Holm Oak trees were present within the Ruskin Building Site. The locations of the trial pits were chosen as it was considered that there would be a greater likelihood of roots in these locations based on the assumption that the boundary wall was not impeding root growth.
- 3.3.3 In February 2013 a further three trial pit holes (TP6-TP8) were excavated at the request of the arboricultural officer at Oxford City Council. The same methodology was applied. On completion of this second phase of works an Arboricultural Assessment was produced with regard to the root investigation works. The findings of which can be viewed at Appendix 1.

3.4 Trees T1-T14 Holm Oaks (*Quercus ilex*): Below Ground Constraints

- 3.4.1 A total of 14 trees are within influencing distance of the proposal. The Holm Oaks are in the ownership of Worcester College and are a prominent boundary feature within the grounds of the College. The Holm Oaks are also visible from selected public vantage points along Walton Street and Walton Lane. Whilst it is acknowledged that the trees are not visible in their entirety it is considered that they contribute positively to the immediate environment. The Holm Oaks located towards the western section of the group have reduced public visibility; however it must be noted that within Worcester College these trees are still an integral component of the group.
- 3.4.2 The Revision B tree constraints plan submitted with the revised arboricultural report dated January 2013 illustrates that the existing boundary wall is acting as a root barrier. As a result it is considered that the proposal will not adversely affect the root protection areas of these trees.
- 3.4.3 To ensure the Holm Oak root protection areas are adequately protected it is proposed that where possible the existing boundary wall will act as a tree protection barrier. However additional tree protection measures will be made should it be necessary to renovate the existing boundary wall. In this instance tree protection barriers will be installed along the boundary line and will be based on Figure 3 of the British Standard 5837:2012.

3.5 Trees T1-T14 Holm Oaks (*Quercus ilex*): Above Ground Constraints

- 3.5.1 Currently trees T1, T3, T5, T7, T9, T11, T13 and T14 overhang the boundary line with T1, T7 and T9 currently in direct contact with existing buildings. Observations made at the time of the arboricultural survey recorded that the Holm Oaks have not been recently pruned. It is considered that currently the trees could be pruned back from the existing buildings in accordance with British Standard 3998:2010 'Recommendation for Tree Works' without causing any adverse effects to the trees.
- 3.5.2 With regard to the scheme it is proposed to create a Quod adjacent to the southern boundary. The openness of the proposed southern Quod will aid in reducing post development concerns of excessive and unnecessary pruning works to the canopies of trees T1, T3, T5, T7 & T9 with regard to the proximity of these trees to the proposed final layout.
- 3.5.3 It is acknowledged that the Holm Oaks are evergreen; however it is considered that there is a reasonable juxtaposition with the trees and the proposed southern Quod. Whilst concerns could be raised regarding shading it is considered that shading within this area will be desirable especially during the summer months when ultra violet rays are at their greatest, therefore bringing welcome relief to this section of the proposal and associated amenity space.
- 3.5.4 Located to the north of the southern Quod student accommodation rooms are proposed on the first, second, third and fourth floors. These accommodation areas are at a distance of 13m from trees T1, T3, T5, T7 and T9 and as such it is considered there is a realistic relationship post development between the tree locations and these accommodation rooms.
- 3.5.5 It is acknowledged that the tree canopies of T11, T13 and T14 are within close proximity to 6 x student accommodation rooms on the first floor and 6 x student accommodation rooms on the second floor. In addition the tree canopies of T11 and T13 are within close proximity to 1 x Fellow accommodation room and the proposed

senior common room which are located on the fourth floor. In order to construct the proposal the canopies of these trees will require facilitative pruning works. Post development the initial pruning works will provide adequate clearance to the building line. It is considered that the facilitative pruning works can be carried out to acceptable standards in accordance with BS3995:2010 'Recommendations for Tree Works'.

- 3.5.6 Due to juxtaposition of the student and Fellow accommodation rooms with regard to the Holm Oaks it is acknowledged that there will be a reduction in natural light levels due to the evergreen characteristics of the trees. However it must be noted that shading from tree canopies can be desirable in order to reduce glare or excessive solar heating. With regard to the senior common room skylights are proposed negating any perceived reduction in light levels.
- 3.5.7 To avoid ad hoc cutting back of branches and to ensure appropriate clearances are maintained to the proposal it is proposed to incorporate the required facilitative pruning works into a long term tree management strategy agreement with Worcester College. This is to ensure that both tree health and the aesthetics of the Holm Oaks do not become compromised.

3.6 Trees T1-T14 Holm Oaks (*Quercus ilex*): Construction Phase

- 3.6.1 With regard to the implementation of the proposal access facilitation pruning will be required so as to avoid injurious contact between the demolition and construction plant and the adjacent Holm Oak trees. It is considered that this work can be carried out to acceptable standards in accordance with British Standard 3998:2010 'Recommendations for Tree Works'.
- 3.6.2 To avoid any damage occurring to the Holm Oak trees during the proposed demolition phase it is recommended that existing buildings are pulled inwards and away from the trees. Should there be excessive build-up of dust on the trees due to demolition activities it is further recommended that the trees are hosed down.
- 3.6.3 Due to the juxtaposition of the trees to the proposal the planning of site operations will be required to take into account large machinery and the movement of materials around the site so as to avoid contact with the trees. In order to safeguard the Holm Oaks through the construction phase it is strongly recommended that a site specific and robust arboricultural method statement, including site supervision is drawn up.
- 3.6.4 As highlighted previously is proposed that any pruning works to facilitate the development will form part of long term tree management strategy agreement with Worcester College. On agreement a tree works specification will be drawn up.

3.7 Trees T1-T14 Holm Oaks (*Quercus ilex*): Post Development Concerns

- 3.7.1 To avoid repeated and ad hoc pruning works consultation with Worcester College will follow in order to discuss a suitable long term tree management strategy programme that will aid in reducing post development conflicts with the Holm Oaks and the proposal. In addition a long term programme will ensure that a suitable screen is maintained between Worcester College and Exeter College.
- 3.7.2 It is considered that post development concerns such as fear and apprehension from the Holm Oaks within close proximity to the accommodation rooms can be overcome with the proposed implementation of a long term tree management strategy programme with regular tree inspections being carried out. With regard to concerns

of debris and seasonal nuisances it is considered that these can be managed appropriately under an in-house maintenance programme.

- 3.7.3 With regard to future growth the Holm Oaks have been crowned reduced in the past. In addition given the trees current growing restrictions it is considered that the trees are at their optimum size. Any pruning that would be required post development would form part of an agreed management strategy with Worcester College. It is certain that any pruning works agreed will be in accordance with the guidelines set out in the British Standard 3998:2010 'Recommendations for Tree Works' and in compliance with good practice as promoted by the Arboricultural and Forestry Advisory Group.

4. SUMMARY

4.1 Conclusions

- 4.1.1 With regard to the Holm Oak trees it is considered that the design takes into account the requirement of adequate protection. In addition future growth, excessive shading and post development concerns such as fear & apprehension have also been assessed to ensure that an appropriate juxtaposition exists between the proposed retained tree stock and layout.
- 4.1.2 The trial pit investigation report at Appendix 1 details that it is considered that the existing boundary wall is acting as a root barrier. As such it is considered that the position of the proposal is outside the root protection areas of the Holm Oaks. Consequently the rooting areas of the Holm Oaks can be adequately protected during the construction process.
- 4.1.3 In the event development ensues it is recommended that a site specific and robust arboricultural method statement is drawn up in order to ensure that adequate and appropriate tree protection measures are implemented.
- 4.1.4 Should development be permitted it is recommended that the trees are re-inspected following final design and a tree works schedule drawn up. This should consider tree removal, Health & Safety and facilitative pruning in accordance with the design layout.

4.2 Post development tree management.

- 4.2.1 Tree owners have a duty of care to maintain and manage the tree stock and it is recommended that regular tree inspections are undertaken by a person competent in arboriculture. It is acknowledged that the trees are outside Exeter College's control; however it is proposed that on-going inspections are included in the proposed long term tree management strategy. In addition it is also recommended that provision is made for replacement planting in order to mitigate future tree removal for reasons such as age or disease.
- 4.2.2 Section 8.8.2 of the British Standard: 2012 recommends post development aftercare of trees following the completion of development works. This is in order to inspect the retained trees for signs of intolerance due to the changes of conditions and the effect of the proposal. It is recommended the following is considered:
1. Trees that grow on a site prior development may, if adversely affected be in decline over a period of several years before they die. This varies due to age,

species, condition prior to development, extent of damage during development, soil conditions and climate. It is recommended that regular inspections are undertaken.

2. Where trees are protected by planning controls, it is recommended that the LPA is informed and necessary agreements obtained prior to any remedial works.
3. Following completion of a development it is recommended that the arboricultural consultant inspects the trees for signs of intolerance to the change of conditions and the effect of the development. There may be a need for additional tree works to those originally specified.
4. Maintenance of newly planted trees is important during the establishment period, of at least two years and it is recommended an appropriate maintenance schedule is included with the Landscaping Scheme.

4.2.3 In addition it must be noted that The Wildlife & Countryside Act 1981, as amended by the Countryside Rights of Way Act 2000, provides statutory protection to birds, bats and other species that inhabit trees. These have the potential to pose additional constraints on the use and timings of works that may occur to the Holm Oaks. These issues are beyond my expertise and it is strongly recommended that advice from an ecologist is sought prior to the implementation of any works considered within this report.

APPENDIX 1

Trial Pit Investigation Report

ROOT TRIAL PIT
INVESTIGATION
ASSESSMENT



Sylva Consultancy
expert arboricultural advice

Root Trial Pit Investigation Assessment
Land at Ruskin Building
Exeter College
Walton Street
Oxford
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Produced for:

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1. INTRODUCTION

1.1 Instructions

1.1.1 Instructions were received from Exeter College to carry out an Arboricultural Assessment with regard to root investigation works carried out at the Ruskin Building Site, Walton Street, Oxford.

1.2 Trees

1.2.1 The trees subject of this appraisal are growing on third party land at Worcester College. The trees have been planted in a staggered row and are adjacent to the southern boundary of the site. It is estimated that the trees have been planted circa the late 1950's/early 1960's.

1.2.2 The Holm Oaks are located within Oxford Central Conservation Area; Information posted on Oxford City Council's website details that the Holm Oaks are not subject to any Tree Preservation Orders (TPO); however Oxford City Council (OCC) have not been contacted to confirm whether this status has changed.

1.2.3 A total of 14 trees are within influencing distance of the proposal to re-develop the land at the Ruskin Building site. The Holm Oak trees are a prominent boundary feature and are visible from selected public vantage points along Walton Street and Walton Lane. Whilst it is acknowledged that the trees are not publically visible in their entirety it is considered that they contribute positively to the immediate environment. The Holm Oaks located towards the western section of the group have reduced public visibility; however it must be noted that within Worcester College the trees at the western edge are still an integral component of the group.

2. TRIAL PIT INVESTIGATION

2.1 Introduction

2.1.1 This appraisal is based on the following documents and site visits undertaken since January 2012.

- Site Investigation Statement issued by Stockley dated July 2012.
- Preliminary Information/Summery including trial pit logs, root identification undertaken by Richardson's Botanical Identification and site plan issued by Geotechnical & Environmental Associates via email dated October 2012.
- Letter report Ref J12073A/ME/02 issued by Geotechnical & Environmental Associates dated November 2012.
- Letter report Ref J12073B/ME/01 issued by Geotechnical & Environmental Associates dated November 2012.

2.1.2 The objectives of the scope of works in the site investigation statement (Appendix 1) was to determine whether Holm Oak trees roots are present within the Ruskin Building Site. The Statement instructed that the trial pits dimensions were to be excavated in the region of 750mm x 750mm and up to a depth of 1000mm. Samples of roots found at depths of 600mm and 1000mm were to be recorded and in the event roots were observed, the scope extended to carrying out root identification testing. Roots found at alternative depths were also to be sampled.

- 2.1.3 In August 2012 five trial pit holes (TP1-TP5) were excavated by hand in order to ascertain whether roots of the adjacent third party Holm Oak trees were present within the Ruskin Building Site. The locations of the trial pits were chosen as it was considered that there would be a greater likelihood of roots in these locations based on the assumption that the boundary wall was not impeding root growth (Appendix 2).
- 2.1.4 During the August 2012 site investigation works the trial pit excavations were supervised part time by Geotechnical & Environmental Associates (GEA). On completion of the excavation works a representative of Sylva Consultancy attended site to observe the open trial pits.
- 2.1.5 In February 2013 a further three trial pit holes (TP6-TP8) were excavated at the request of the arboricultural officer at Oxford City Council. The same methodology was applied and at the time of the trial pits excavation a representative of Sylva Consultancy attended site to view the works.

3. FINDINGS

3.1 Boundary Wall

- 3.1.1 It has been documented within the site investigation statement that the eastern section of the boundary wall was built in 1912 with the wall extended west in the 1930's. Site investigation works have recorded the boundary wall of having a foundation depth of 1.5m below the existing ground levels (Appendix 3).

3.2 Eastern Quod

- 3.2.1 A total of 2 trial pit holes were excavated within the Eastern Quod to determine to what extent roots may have encroached into the Ruskin Building site. The locations of the trial pits have been based on the assumption that the boundary wall is not acting as a constraint to root growth and as such were positioned within projected root protection areas (RPA's) of the adjacent Holm Oak trees. These projected RPA's have taken into account the site constraints of the existing buildings within the site.
- 3.2.2 The August 2012 investigations recorded numerous rootlets of 1mm – 7mm in diameter at depths of up to 200mm in TP5. From the samples taken from TP5 one root (sample size not recorded) was found to be of Quercus origin (Oak family) with a further 4 roots (sample size not recorded) not examined in detail but appearing similar (Appendix 4).
- 3.2.3 During the February 2013 investigations in TP8 one root, 3mm in diameter located at a depth of 200mm within the south west corner and 2 roots, 2mm in diameter located at a depth of 250mm within the eastern section of the pit were recovered. Neither sample was confirmed as Quercus in origin.

3.3 Southern Quod

- 3.3.1 Within the southern Quod a total of 4 trial pits were excavated in August 2012 with a further 2 trial pits excavated in February 2013. The locations of all the trial pits have been based on the assumption that the boundary wall is not acting as a constraint to root growth and as such the trial pits have been positioned within projected root protection areas (RPA's) of the adjacent Holm Oak trees. These projected RPA's have taken into account the existing site constraints of the existing buildings.

- 3.3.2 Of the 6 trial pits, 4 trial pits have been positioned within the projected RPA of T14, with TP4 & TP7 positioned within the projected RPA of T13.
- 3.3.3 From the samples forwarded to Richardson's Botanical Identification from the August 2012 investigations none were recorded as containing Quercus roots.
- 3.3.4 During the February 2013 investigations one root of 2mm in diameter located at a depth of 300mm was recovered from TP6 and confirmed as Quercus. A second root of 1mm in diameter located at a depth of 300mm in TP6 was recorded as being immature but most likely as Quercus.
- 3.3.5 From the samples forwarded to Richardson's Botanical Identification from TP7 none were recorded as Quercus roots.

4. DISCUSSION AND CONCLUSIONS

4.1 Discussion

- 4.1.1 Tree roots are wide spreading, and with ground conditions permitting will extend in all directions, for distances often in excess of the tree's height. The majority of live roots are found within the upper 600mm of the soil with the main structural roots found up to a distance of 2 - 3m from the main stem of the tree where they will then rapidly subdivide. Damage, death or excessive pruning to the root system can adversely affect the health, life expectancy and overall safety of a tree. Soil disturbance within the rooting area should also be avoided, as this can significantly affect a trees stability, and moisture uptake. Where tree roots become exposed via soil disturbance further desiccation and root death can occur to the root system.
- 4.1.2 The British Standard 5837:2012 'Trees in relation to design, demolition and construction – Recommendations' provides guidance on the principles and procedures to be applied to achieve a sustainable relationship between trees and construction. The root protection area (RPA) is a design tool indicating the minimum area around a tree deemed to contain sufficient root and rooting volume to maintain the trees viability and where the protection of the roots and soil structure is treated as a priority. The area is calculated on the stem diameter of a tree. The RPA should be initially be plotted as a circle centred on the base of the stem, however where pre-existing site conditions or where other factors may have influenced root growth a polygon of an equivalent area should be produced.
- 4.1.3 Built structures have the capability of influencing tree roots and the existing boundary wall foundations of 1.5m are considered to be of an exceptional depth. Tree roots are opportunistic and where conditions permit, such as soft ground areas roots will be laid down preferentially. In addition tree roots will exploit defects in structures where it is considered conducive for root growth. Given the age of the boundary wall it is not unrealistic to assume that cracks and fissures are present within the walls foundations. Fibrous roots can also descend to depths greater than 600mm and then can re-ascend to the upper layers within a soil were conditions permit. During the site investigation works no live Quercus roots have been recorded beyond a depth of 300mm suggesting that the identified Quercus roots are not 'circumventing' under the boundary wall foundations and re-emerging within the Quod areas.

4.2 Conclusion

- 4.2.1 In total 8 trial pits have been excavated within locations based on the assumption that the boundary wall is not acting as a constraint to root growth and as such have been positioned within projected RPA's of the adjacent Holm Oak trees. All 8 trial pits have been excavated to a depth of 1000mm and at distances no greater than 3m from the boundary wall.
- 4.2.2 The findings reveal that within the Eastern Quod only 1 Quercus root has been positively identified from 2 trial pits. Within the Southern Quod one root, 1mm in diameter located at a depth of 300mm has been recovered from 1 of 6 trial pits with one further immature root also having been examined and concluded that it is 'most likely Quercus'.
- 4.2.3 It is well documented that tree roots are wide spreading with the majority of live roots found within the upper 600mm of the soil. Given the locations of the Quercus roots that have been recovered it is concluded that these roots are opportunistic and it is highly likely that the roots have extended into site through defects within the wall's foundations. The known depth of boundary wall foundations and lack of Quercus roots recovered at depths beyond 300mm indicate that these roots have not extended into the site from beneath the walls foundations.
- 4.2.4 It is concluded that the pre-existing site condition of the boundary wall foundations have significantly prohibited the ingress of root growth into the Ruskin Building site. Therefore due to the lack of live Quercus roots recovered it is not unreasonable to presume that the boundary wall foundations are acting as a root barrier. Consequently the root protection areas of the Holm Oaks should not be calculated radially but as a polygon with the wall shown as a constraint to the ingress of root growth into the Ruskin Building site.

APPENDIX 1

Site Investigation Statement

STOCKLEY

**Exeter College Oxford
Walton Street Quadrangle
Site Investigations Statement
July 2012**

Background

As part of the redevelopment of the Ruskin College Walton Street Site a series of site investigations works are required in order to provide a detailed analysis of the geotechnical characteristics of the site. The information required by the design team to inform the design includes, but is not limited to, soil bearing capacities and expected stability, ground water levels, contamination and also in this case confirmation of the Root Protection Areas of a line of Holm Oaks Trees which run parallel to the southern boundary wall of the site and in very close proximity.

The eastern end of the Ruskin College building was built in 1912 and the eastern end of southern boundary wall formed part of this construction. The boundary wall was extended west in the 1930's. The boundary wall has a foundation depth of approx 1.5m below existing ground level, detailed sections through the wall are provided on (SK)016 included, section 3 & section 4 are relevant to the Holm Oaks.

The Holm Oaks Trees are on the site of the neighbouring Worcester College and were planted circa 1950's so the wall was in place approx 20-40 years before the trees were planted.

Given that the boundary wall has foundations as deep as 1.5 meters and was in place before the trees there is no certainty that the roots encroach on the Ruskin site as the roots may have taken the path of least resistance and tended towards the Worcester Site rather than the Ruskin Site. The purpose of this investigation is to establish the extent of the Holm Oak's root growth within the Ruskin Site.

Proposals

The current proposals are to carefully hand dig 5 No. trial pits within the root protection zone (RPA) of the Holm Oaks; the reason for digging within the RPA is to establish if the tree roots extend into the Ruskin site.

The trial pits are expected to be in the region of 750mm x 750mm x 1000mm deep, depending on the depth of the tree roots. If the roots are found at a shallower depth then the pits will not need to be dug to full depth and the plan area may also reduce as a result.

Boreholes are also proposed as part of the works, 3 No. in total. The boreholes are required to establish a ground water monitoring system and have been located to avoid the RPA's as can be seen on (SK) 059 attached. The boreholes will be in the region of 150-250mm diameter; boreholes 1 & 3 are to extend to a depth of 20 meters while borehole 2 will extend to a depth of 10 meters.

Team

The team appointed to carry out the works is Geotechnical & Environmental Associates (GEA) Ltd. They are a well established and experienced specialist consultancy and Stockley have successfully worked with GEA on many projects over the past number of years.

Sylva Consultancy, arboriculture experts, have also been appointed to the scheme and a representative from Sylva will be on site during the works to ensure the investigations go as planned and that the impact on the trees is kept to a minimum. A tree survey was carried out by Sylva Consultancy on January 9th 2012. The survey was carried out in accordance with BS5837:2005 'Trees in relation to construction – Recommendations'.

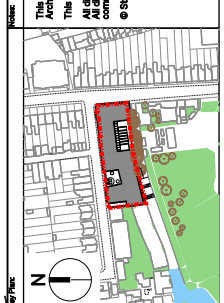
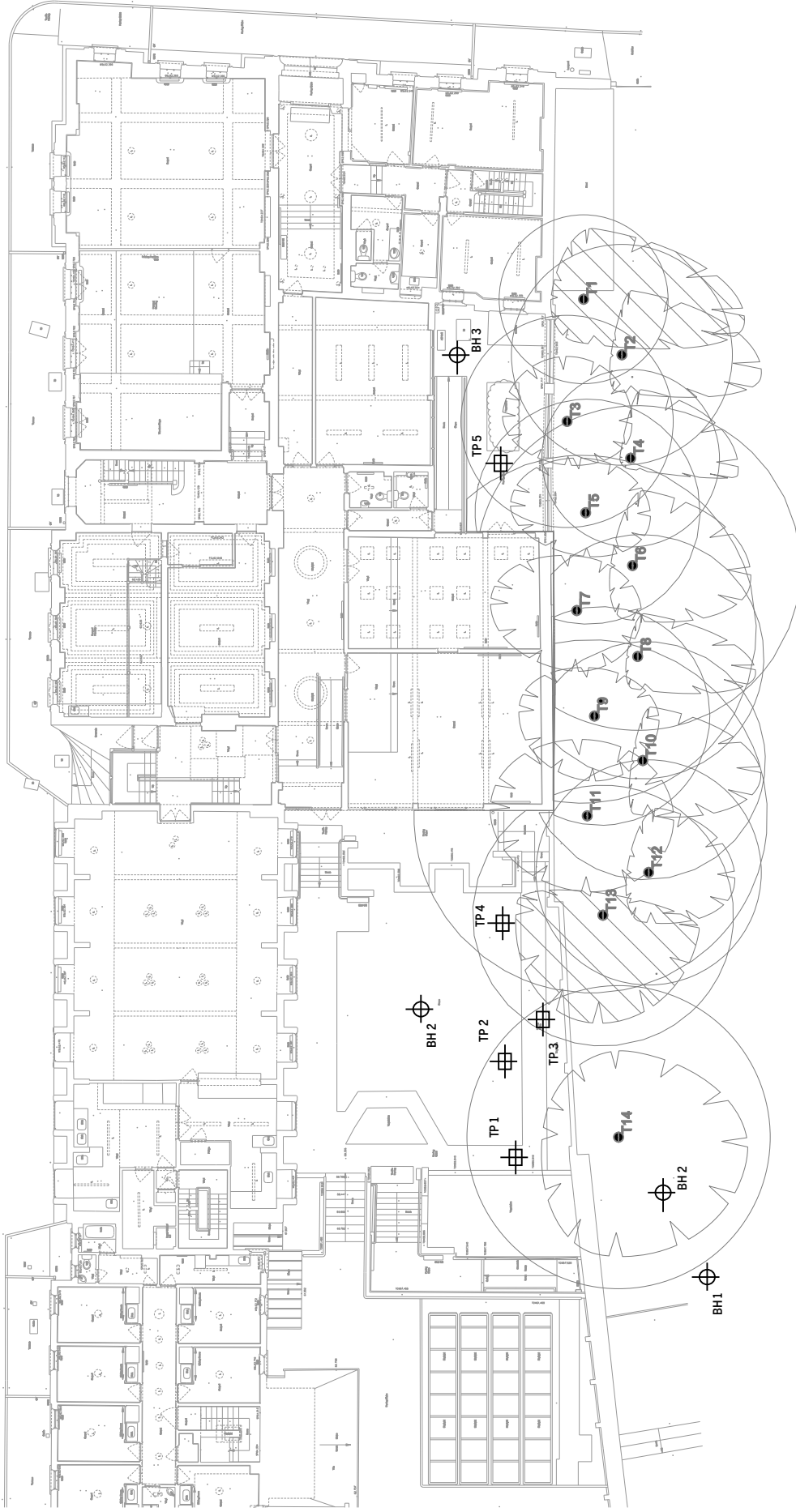
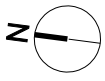
Testing and Tree Protection Measures

A testing regime for the tree roots encountered during the SI works has been put in place by Sylva Consultancy as follows:

'All roots found at a given depth should be bagged and sent in from 0.5mm in diameter upwards. Roots found within the vicinity of 600mm depth and 1000mm depth are recorded. However if there are roots at alternative depths to these samples should also be taken.

Iodine test shall also be undertaken so that there is clarification that the roots found are live.'

Throughout the duration of the works BS5837:2012 'Trees in relation to design, demolition and construction – recommendations' shall be referred in order to advise the works as they progress.



Notes:
 This document is to be used in conjunction with all relevant Architect's and Engineer's drawings and the specification.
 All dimensions are to be verified by the contractor on site.
 All discrepancies should be reported to the C.A. prior to the commencement of the works.
 © Stockley Broder O'Malley Limited

Notes Continued:

Key:
 ● T1-T14 Tree Location
 ○ Tree Road Protection Area
 ⊕ BH1 Borehole Location
 ⊕ TP 4 Trail Pit Location

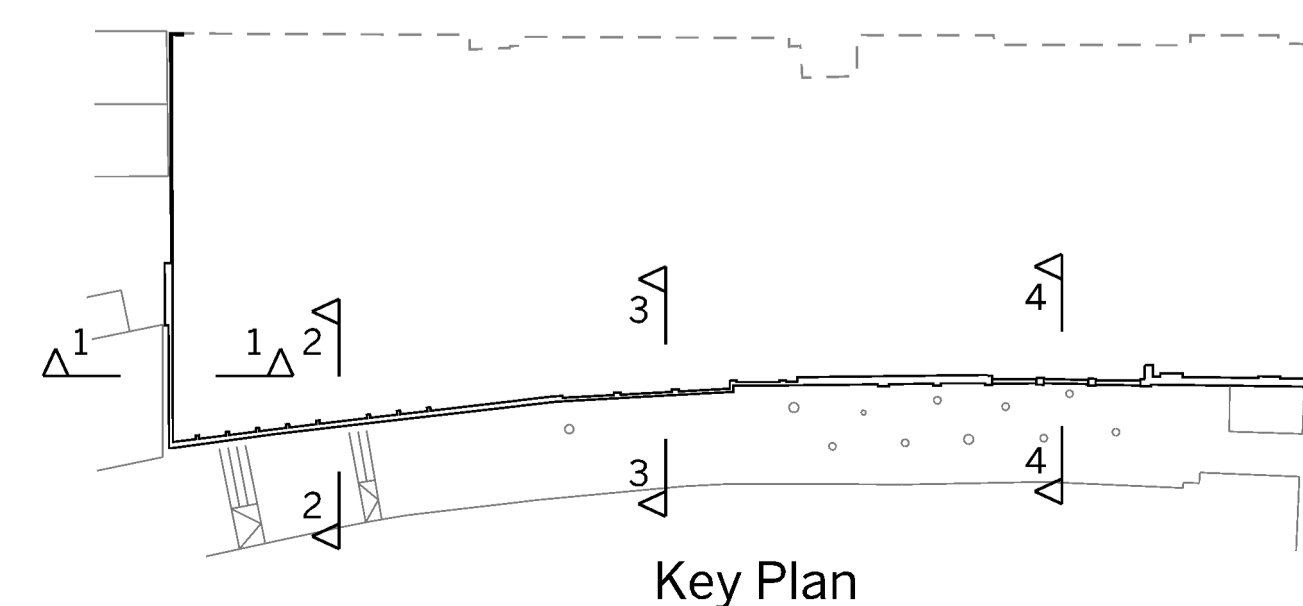
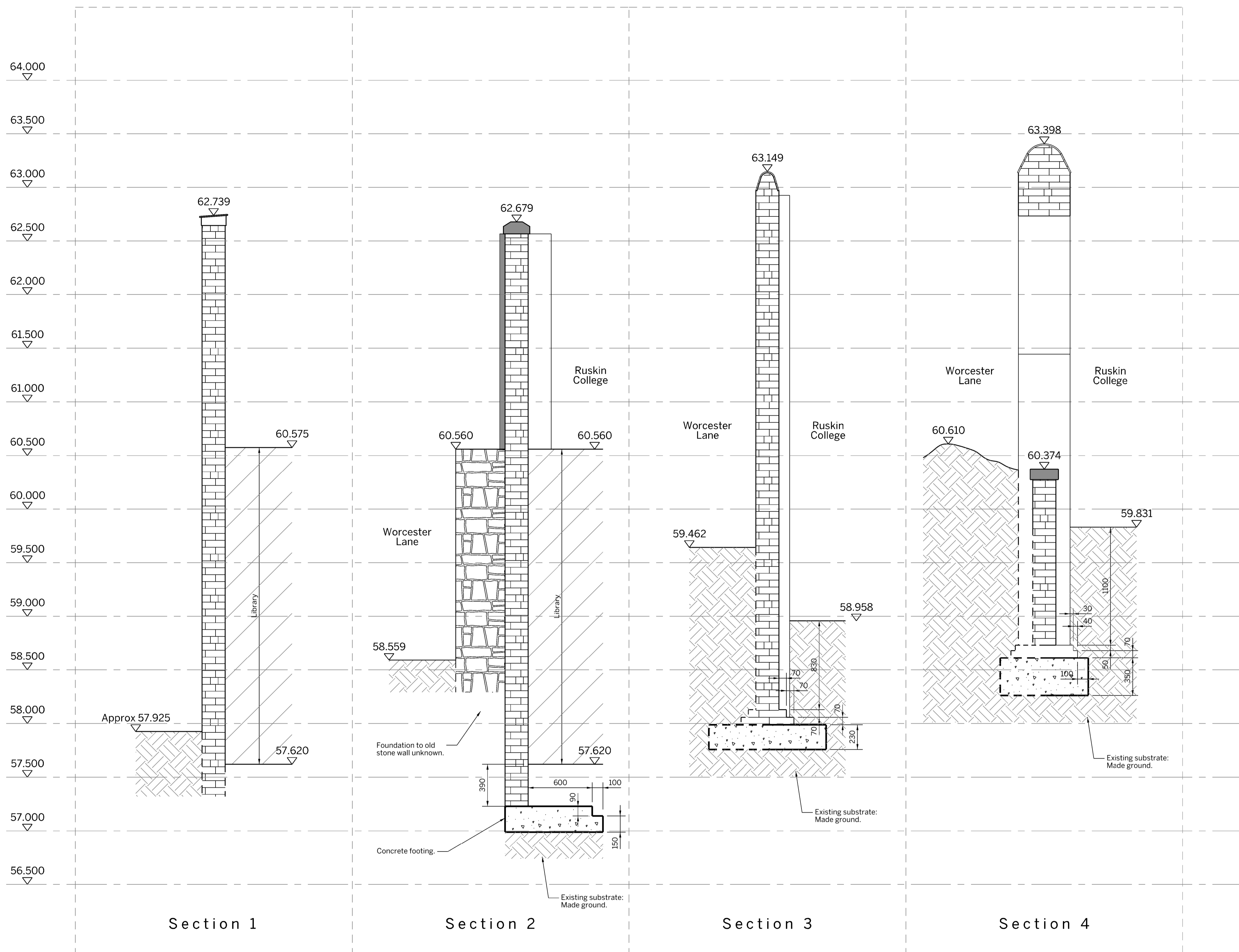
Notes Continued:

Notes Continued:

Notes Continued:

Project: Exeter College Oxford	Drawn By: JB
Title: Site Investigation Plan	Checked By: COR
Date: June '12	Scale: NTS

Stockley Civil & Structural Architects & Engineers 110-112, The Quadrant, Exeter, Devon, EX1 1HQ 01392 262000 www.stockley.co.uk	Information
Project Number: 521-01	Revision: P01
Client Reference: (SK) 059	



Notes:
 This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
 This drawing should not be scaled.
 All dimensions are to be verified by the contractor on site. All discrepancies should be reported to the C.A. prior to the commencement of the works.
 © Martin Stockley Associates Limited

Notes:
 Refer to (SK) 015 for location plan.
 All sections shown are indicative only and require confirmation on site through opening up works.

20.07.12	PO3	Drawing updated	IS	COR
07.06.12	PO2	Drawing updated	IS	COR
01.03.12	PO1	Issued for boundary wall report	IS	COR
Date:	Rev:	Description:	Drawn:	Chkd:



Project:
 Exeter College
 Oxford

Title:
 Existing Perimeter Wall Sections

Status:
INFORMATION

Scale: 1:20@A1 1:40@A3	Date: Mar 12	Drawn: IS	Checked: COR
Job Number: 521/01	Drawing Number: (SK) 016	Revision: P03	

APPENDIX 2

Trial Pit Location Plan



Sylva Consultancy

The Oxford Boaters Box, Woodstock Road, Oxford, OX2 7AH
 Tel: 01865 872 945 Mobile: 07976 596 517
 e-mail: mail@sylvaconsultancy.co.uk

Site: Exeter College	1:200 @ A3
Drawing Title: Tree Constraints Plan	January 2012

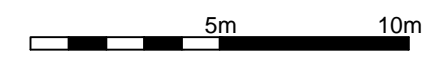
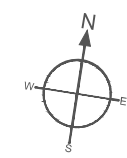
Key:

- Category A
- Category B
- Category C
- Category R

Category Crown Spread

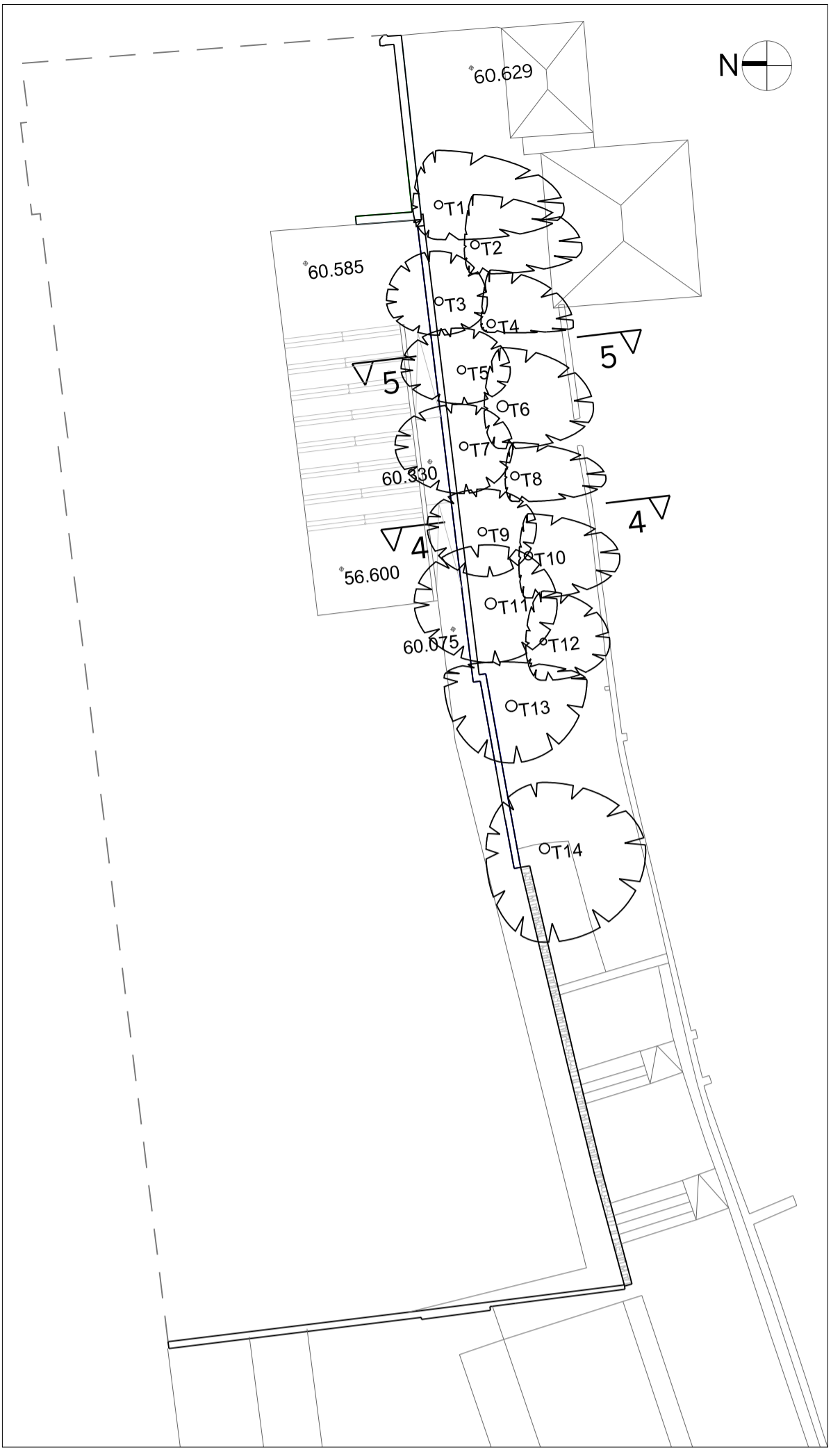
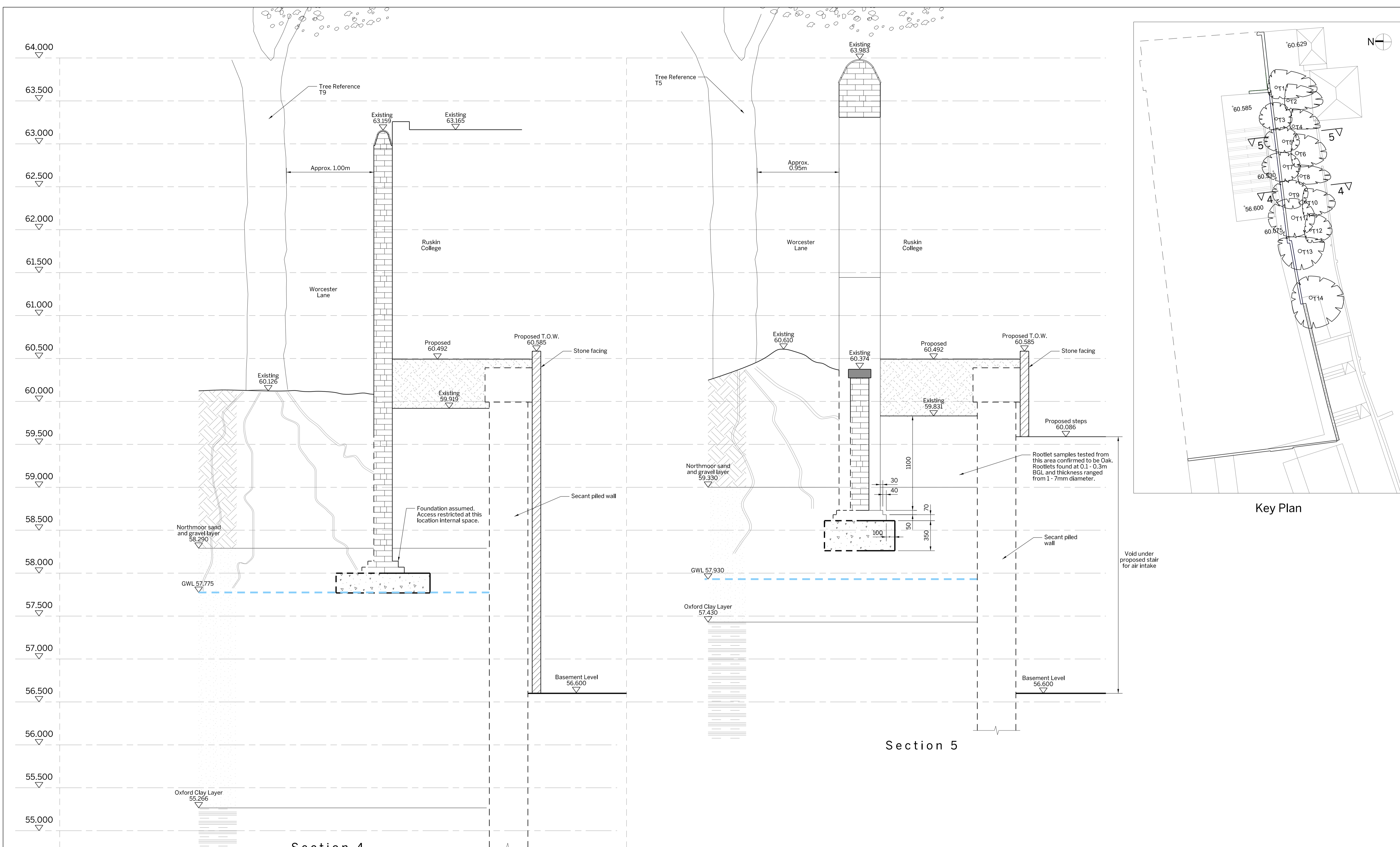
Root Protection Area Tree Number

Tree Position Approximate (not shown on original survey)



APPENDIX 3

Cross Section of Boundary Wall



Key Plan

Section 5

Section 4

<p>Key Plan:</p>	<p>Notes:</p> <p>This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.</p> <p>This drawing should not be scaled.</p> <p>All dimensions are to be verified by the contractor on site. All discrepancies should be reported to the C.A. prior to the commencement of the works.</p> <p>© Stockley Broster O'Malley Limited</p>	<p>Notes Continued:</p> <p>Refer to (SK) 015 for location plan.</p> <p>Refer to Stockley drawing (SK)015 for location plan.</p> <p>All sections shown are indicative only and require confirmation on site through opening up works.</p> <p>Figures as per GEA's phase 1 (dated April 12) and phase 2 (dated August 12) site investigation reports.</p>	<p>Notes Continued:</p>	<p>Notes Continued:</p>	<p>Project:</p> <p>Exeter College Oxford</p>	<p>Title:</p> <p>Existing Perimeter Wall Sections Sheet 2 of 2</p>	<p>MANCHESTER Carver's Warehouse, 77 Dale Street, Manchester, M4 3AQ T: 0161 228 6757</p> <p>LONDON 18 Bowling Green Lane, London, EC2R 9BW T: 020 7625 2977 www.stockley.co.uk</p>			<p>STATUS:</p> <p>INFORMATION</p>		
							<p>Date:</p> <p>1:20@A1 1:40@A3</p>	<p>Date:</p> <p>Dec 12</p>	<p>Drawn:</p> <p>GB</p>	<p>Checked:</p> <p>COR</p>	<p>Job Number:</p> <p>521/01</p>	<p>Drawing Number:</p> <p>(SK) 090</p>

APPENDIX 4

Root Identification (Trial Pit 5)



Geotechnical &
Environmental
Associates

Tyttenhanger House
Coursers Road
St Albans
Herts AL4 0PG

Site
Rusking College, Oxford, OX1 2HE

Trial Pit
Number
5

Excavation Method
Manual

Dimensions (mm)

Ground Level (mOD)

Client
Exeter College

Job
Number
J12073A

Location

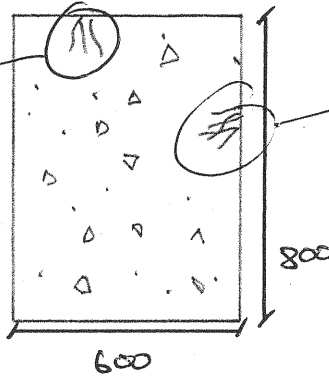
Dates
28 to 30 August 2012

Engineer
Stockley

Sheet
1 / 1

PLAN

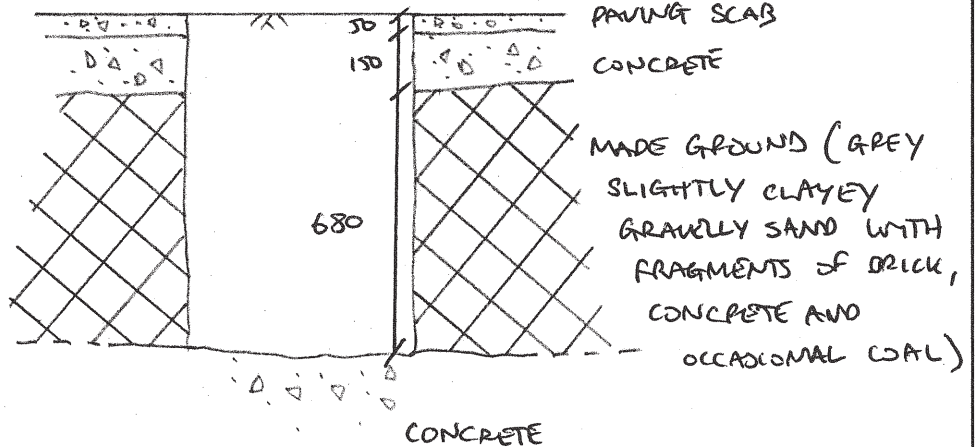
NUMEROUS FOOTLETS
3-7mm Ø from
0.1m to 0.3m



FOOTLETS
1-6mm Ø
@ 0.2m

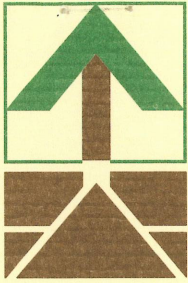


TYPICAL SECTION



Remarks:
All dimensions in millimetres
Sides of trial pit unstable during excavation

Scale:
1:20
Logged by:
ME



Richardson's Botanical Identifications

Root identification
Vegetation surveys
Tree/Building investigations
Plant taxonomy

Dr Ian B K Richardson
BSc, PhD, PGCE, MSB, FLS
James Richardson
BSc (Hons. Biology)

Geotechnical & Environmental Associates
Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Enterprise House
49-51 Whiteknights Road
Reading
RG6 7BB

Tel: (0118) 986 9552 (*Direct line*)
E-mail: richardsons@botanical.net
Web: www.botanical.net

07/09/2012

Your ref: J12073A

Our ref: 72/6010

RECEIVED 14 SEP 2012

Dear Sirs

Ruskin College, Oxford

The samples you sent in relation to the above on 31/08/2012 (received by us on 07/09/2012) have been examined. The structure was referable as follows:

TP1

1 root: FRAXINUS (Ash). Alive, recently*.

1 root: HEDERA (Ivy); also the related FATSIA (a robust shrub with fig-like leaves). 2 further roots, not examined in detail appeared similar under low magnification. Alive, recently*.

TP2

1 root: an unidentified SHRUB. Please send us twigs from nearby bushes if this is critical, and we should be able to give you a match. 2 further roots, not examined in detail appeared similar under low magnification. Alive, recently*.

1 piece of BARK only, insufficient material for identification.

TP3

1 root: a SHRUB, almost certainly the same type as from TP2, above. A further root, not examined in detail appeared similar under low magnification. Alive, recently*.

1 root: herbaceous (non-woody) plants.

TP4

1 root: again, the same SHRUB as TP2 and TP3. 3 further roots, not examined in detail appeared similar under low magnification. Alive, recently*.

1 root: microscopic examination showed insufficient cells for recognition.

TP5

1 root: QUERCUS (Oak). 4 further roots, not examined in detail appeared similar under low magnification. Alive, recently*.

I trust this is of help. Please call us if you have any queries; our Invoice is enclosed.

Yours faithfully



Dr Ian B K Richardson

* Based mainly on the Iodine test for starch. Starch is present in some cells of a living woody root, but is more or less rapidly broken down by soil micro-organisms on death of the root, sometimes before decay is evident. This result need not reflect the state of the parent tree.

** Try out our web site on www.botanical.net **

APPENDIX 5

Root Identification (Trial Pit 6)

Excavation Method
Manual

Dimensions (mm)

Ground Level (mOD)

Client
Exeter College

Job
Number
J12073B

Location

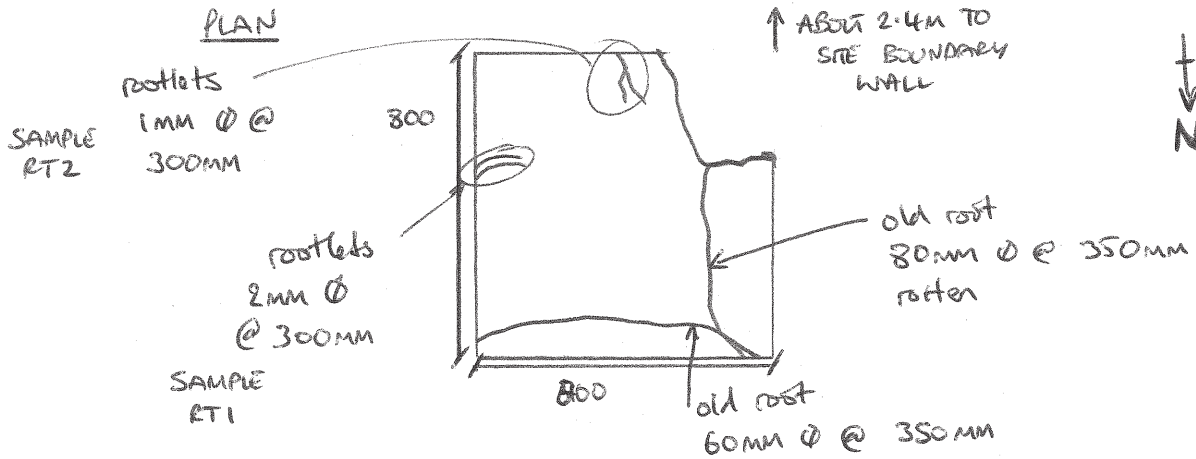
Date

Engineer
Stockley

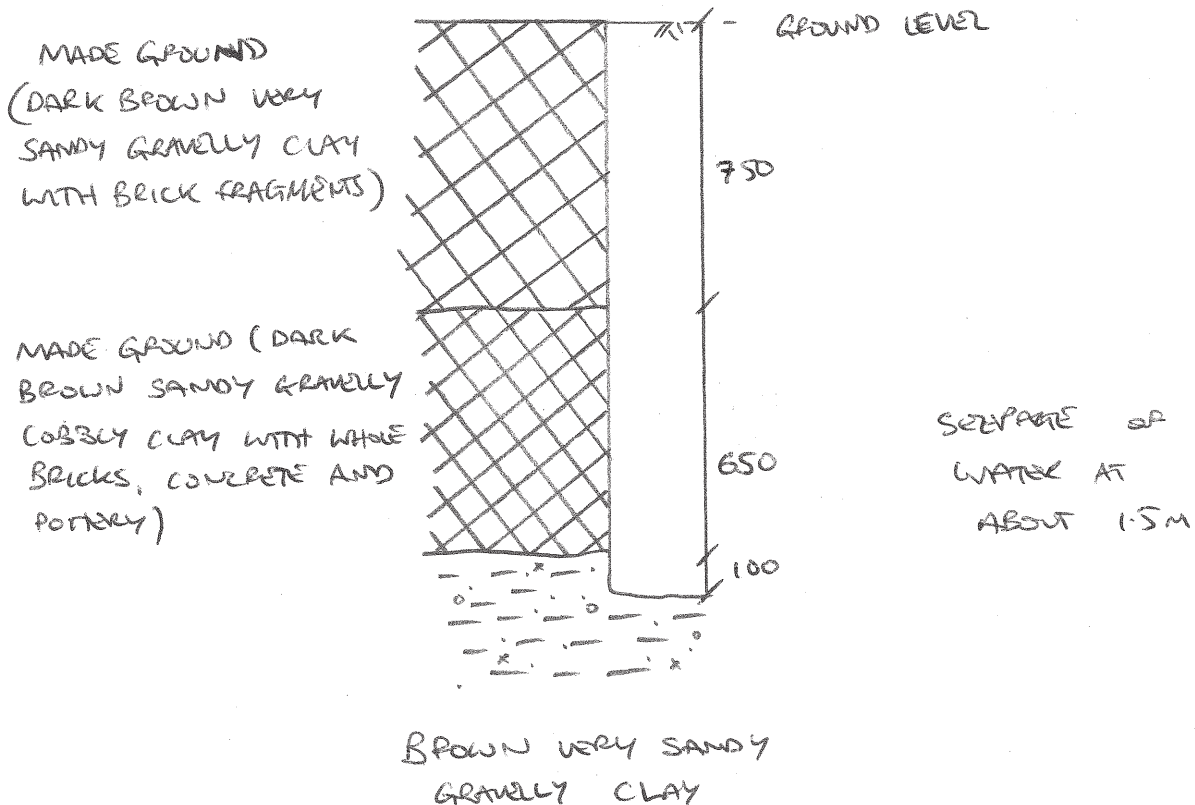
Sheet
1/1

19/02/2013

PLAN



TYPICAL SECTION



Remarks:

All dimensions in millimetres

Sides of trial pit remained stable during excavation

Scale:
1:20

Logged by:
ME



Root identification
Vegetation surveys
Tree/Building investigations
Plant taxonomy

Richardson's Botanical Identifications

Dr Ian B K Richardson
BSc, PhD, CBIol, MiBiol, MiHort, FLS
James Richardson
BSc (Hons. Biology)

Geotechnical & Environmental Associates
Tyttenhanger House
Coursers Road
St Albans
AL4 0PG

Enterprise House
49-51 Whiteknights Road
Reading
RG6 7BB

Tel: (0118) 986 9552 (*Direct line*)
E-mail: richardsons@botanical.net
Web: www.botanical.net

Your ref: **J12073B**

Our ref: 72/8110

22/02/2013

Dear Sirs

Ruskin College

The samples you sent in relation to the above on 20/02/2013 have been examined. The structure was referable as follows:

TP6, Root 1

1 root: essentially too immature for a confident identification although most like the family fagaceae - either QUERCUS (Oak), CASTANEA (Sweet Chestnut) or FAGUS (Beech). A further sample, not examined in detail appeared similar under low magnification. Alive, recently*.

TP6, Root 2

1 root: QUERCUS (Oak). A further root, not examined in detail appeared similar under low magnification. Alive, recently*.

TP7, Root 1

1 root: an unidentified SHRUB. Please send us twigs from nearby bushes if this is critical, and we should be able to give you a match. Dead*.

TP7, Root 2

1 root: again a SHRUB - the same type as above (if you send us twigs from nearby bushes we may be able to give you a match). Dead*.

TP8, Root 1

1 root: HEDERA (Ivy); also the related FATSIA (a robust shrub with fig-like leaves). Alive, recently*.

TP8, Root 2

1 root: QUERCUS (Oak). Alive, recently*.

I trust this is of help. Please call us if you have any queries; our Invoice is enclosed.

Yours faithfully



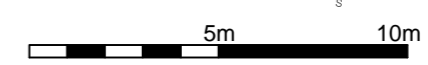
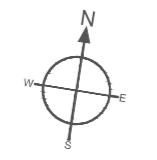
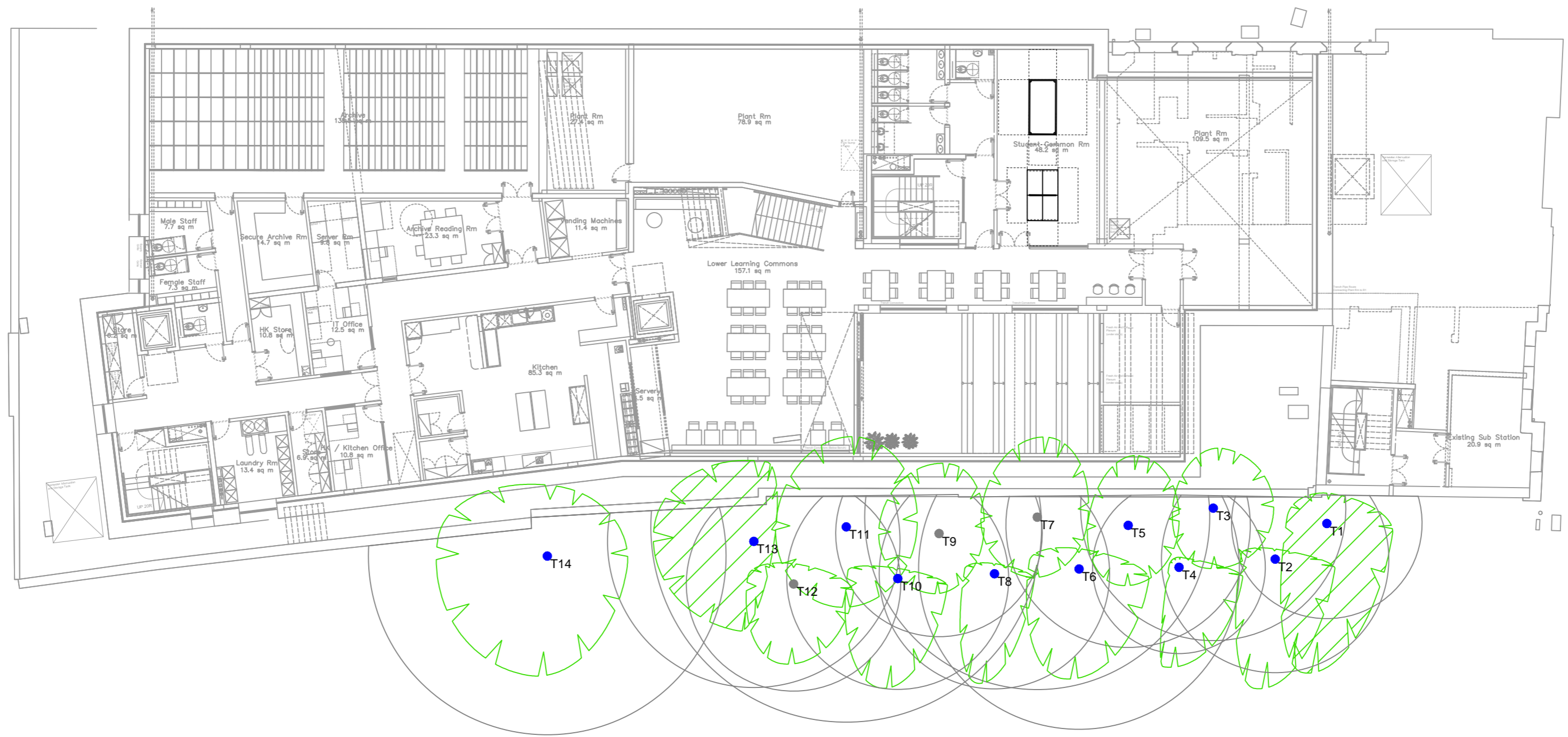
Dr Ian B K Richardson

- * Based mainly on the Iodine test for starch. Starch is present in some cells of a living woody root, but is more or less rapidly broken down by soil micro-organisms on death of the root, sometimes before decay is evident. This result need not reflect the state of the parent tree.

** Try out our web site on www.botanical.net **

APPENDIX 2

Arboricultural Implication Plan



Sylva Consultancy
 The Oxford Boaters Box, Woodstock Road, Oxford, OX2 7AH
 Tel: 01865 872 945 Mobile: 07976 596 517
 e-mail: mail@sylvaconsultancy.co.uk

Site: Exeter College	1:200 @ A2
Drawing Title: Arboricultural Impact Assessment	Rev A, Jan 2013

Key:

- Category A (Green circle)
- Category B (Blue circle)
- Category C (Grey circle)
- Category U (Red circle)
- Category (Green circle with cross-hatch)
- Crown Spread (Green dashed circle)
- Tree Number (Blue dot)
- Root Protection Area (Grey circle)
- Tree Position Approximate (not shown on original survey) (Green dashed circle with cross-hatch)

APPENDIX 3

Qualifications

ARBORICULTURAL
IMPLICATION
ASSESSMENT

Fiona Bradshaw

MicFor (Arb); RFS Dip Arb; F. Arbor.A; Tech Cert (Arbor.A)

I have over 14 years' experience of arboriculture and I am the principal consultant at Sylva Consultancy. I hold the Royal Forestry Society's Professional Diploma in Arboriculture and the Arboricultural Associations Technicians Certificate. I am also a Chartered Arboriculturalist, a Fellow of the Arboricultural Association and a Professional Member of the Institute of Chartered Foresters, of which I am also a registered Consultant.

I have the benefit of both a local authority and private practice background and I am frequently instructed to provide advice and assistance relating to trees and the planning process. I am also experienced at compiling expert reports, providing evidence and also appearing as an expert witness at Public Inquires.

I am committed to my continued professional development which is reflected in my regular attendance of seminars and workshops.