Writtle Forest
Consultancy

Redindyke Farm, Ivy Barn Lane, Ingatestone, Essex CM4 0PU
01277 355970 | info@writtleforest.co.uk | www.writtleforest.co.uk

Arboricultural Implication Assessment (AIA)

An Arboricultural Implication Assessment derived from the Tree Survey and Report (ref. no. 210342), relating to excavation investigations to establish the extent and position of underground services, building foundations and tree roots around the outside of the British Museum

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British Museum
Great Russell Street,
London WC1B 3DG

Ref No: 220122

Client:	William Horton Capital Planning & Programme Management The British Museum Great Russell Street, London WC1B 3DG
Date instructed:	18.02.22
Instructed by:	William Horton IIIP Project Manager Capital Planning & Programme Management
Documents referenced:	• Tree Survey and Tree Constraints Plan – Ref: 210342 • Proposed structure external areas sheets 1-10 1756/20/00- 08 + 10. April 2021 • 1910-40- Site Investigations • TPL Trial Pit Schedule (draft 2) 16.3.22 • Summary schedule of Investigations
Prepared by:	O.R. Booth
Date completed:	21.03.22

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1. Introduction

1.1 Aims of this Assessment:

The aim of this Arboricultural Implication Assessment (AIA) and Arboricultural Method Statement (AMS) is to consider how the proposed excavations to investigate below ground infrastructure could affect the tree roots of adjacent trees and to ensure that these roots are protected throughout the excavation process.
In addition to these documents a preliminary root map of roots detected through the use of sonic tomography will also be produced prior to commencement of works. This will identify roots greater than 25mm diameter down to a depth of approx. 500mm. This information, along with supervision and assistance of an Arboricultural consultant will constitute the primary mitigation to ensure minimal disturbance to root systems.

1.2 Aspects not dealt with within this Assessment

Please also refer to Appendix 1.
This AIA does not consider issues relating to boundary lines and the proposed structures. It may be that such issues effect ownership of trees but the assessment does not deal with this issue. (Issues of boundary line dispute and/or ownership of vegetation may require a land registry search and reference to local records).

2. Implications of Proposed Development on current Tree Populations

2.1 Description of Proposed Development

From my understanding, the proposed exploratory excavation works will involve one of the following types of investigation:

- Trial pit investigation
- Trench investigation
- Borehole investigation & Core sample

The trial pits are generally 1.5m x 1.5m. They vary in depth between 2m up to 3.5m.
The trenches are far more variable ranging from dimensions of 1.5m x 2m and 2m x 4m. They vary in depth between 2m and 3m
The borehole investigation is approx. 100mm in diameter to a depth of 15m, the core sample of the road is 200mm in diameter.

2.2 Modified Root Protection areas

The root protection areas as of Tree Constraints Plan ref 210342 have been modified to account for the predictive interaction with suspected below ground infrastructure. It is these RPAs that are considered in relation to the table as of 2.3.

2.3 Considerations of those trees that will be affected by the proposed Investigation works

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T1	Bay Laurel	N/A	N/A	N/A	N/A	No Issues
T2	London Plane	N/A	N/A	✓	✓	No machinery over a height of 5m should be used in this area to ensure no conflict with the crown of the tree. Installation of protective barrier to ensure machinery does not damage main stem and materials are not stored within the area of exposed soils immediately adjacent to the tree. Proposed trench 2 will impinge approx. < 5% of the modified RPA. This trench will be to a depth of 3m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (in accord with Sonic tomography findings). 2) Hand dig western side of trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots. Potential alternative trial pit 2a will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 3m. Mitigation will be as of above.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T3	London Plane	N/A	N/A	N/A	✓	It is assumed that this trial pit will excavated within the garage area with restrictive headroom and therefore no issues will relate to working under the canopy of the tree. If this is different the Arboricultural consultant should be advised before works progress. Potential alternative trial pit 2b will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (in accord with Sonic tomography findings). 2) Hand dig western side of trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots.
T4	Hawthorn	N/A	N/A	N/A	N/A	No Issues
T5	Bay Laurel	N/A	N/A	N/A	N/A	No Issues

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T6	London Plane	N/A	N/A	✓	✓	No machinery over a height of 5m should be used in this area to ensure no conflict with the crown of the tree. Proposed trial pit 3 will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots. Potential alternative trial pit 2b will impinge approx. 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will be as of above.
T7	Sycamore	N/A	N/A	N/A	N/A	No Issues

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T8	London Plane	N/A	N/A	✓	✓	No machinery over a height of 4m should be used in this area to ensure no conflict with the crown of the tree. Proposed trial pit 5 will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (in accord with Sonic tomography findings). 2) Hand dig western side of trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the pit is carried out without severance of protected roots.
T9	Sycamore	N/A	N/A	N/A	N/A	No issues
T10	Sycamore	N/A	N/A	N/A	N/A	No issues
T11	Cherry	N/A	N/A	N/A	N/A	No Issues
T12	Cypress	N/A	N/A	N/A	N/A	No Issues
G1	Fig & Bay Laurel	N/A	N/A	N/A	N/A	No Issues

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T13	Sycamore	N/A	N/A	✓	✓	All machinery should not exceed 6m in height. Proposed trench 6 will impinge approx. < 5% of the modified RPA. This trench will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T14	Sycamore	N/A	N/A	✓	✓	The height of the crown of the tree is approx. 6m from the access road level within the grounds of the British Museum. All machinery should not exceed 6m in height. Potential alternative trial pit 6a will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (in accord with Sonic tomography findings). 2) Hand dig western side of trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T15	Sycamore	N/A	N/A	✓	✓	The height of the crown of the tree is approx. 6m from the access road level within the grounds of the British Museum. All machinery should not exceed 6m in height. Proposed trench 7 will impinge approx. < 5% of the modified RPA. This trench will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots. Potential alternative trial pit 7a will not impinge upon the modified RPA. However, the work is within the canopy of the tree.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
G2	Elder x2, Cherry + Sorbus	N/A	N/A	✓	✓	Minor cut back of crowns to north to boundary line if required for access of machinery to accommodate excavation works. Current crown height approx. 3m in area of proposed works. Proposed trial pit 10 will impinge approx. < 5% of the modified RPA. This pit will be to a depth of 2m. Mitigation will include: 1) Use of hand operated machinery to excavate concrete (in accord with Sonic tomography findings). 2) Hand dig western side of trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the pit is carried out without severance of protected roots.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T16	London Plane	N/A	N/A	✓	✓	The height of crown clearance is approx. 5m. This would require that all machinery working within the area would need to be less than 5m in height. Proposed trench 11 will impinge approx. 5% of the modified RPA. This trench will be to a depth of approx. 2m dependent upon access Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots. Proposed trench 12 will impinge approx. 5% of the modified RPA. This trench will be to a depth of approx. 2m dependent upon access Mitigation will be as above.

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T17	London Plane	N/A	N/A	✓	✓	The height of crown clearance is approx. 5m. This would require that all machinery working within the area would need to be less than 5m in height. Proposed trench 11 will impinge approx. < 5% of the modified RPA. This trench will be to a depth of approx. 2m dependent upon access Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots. Proposed trench 12 will impinge approx. < 5% of the modified RPA. This trench will be to a depth of approx. 2m dependent upon access Mitigation will be as above. Potential alternative trial pits 12a and 13a will impinge approx. < 5% of the modified RPA. These pits will be to a depth of approx. 2m. Mitigation will be as above
T18	London Plane	N/A	N/A	N/A	N/A	No issues

Tree no.	Species	Removal due to		Mitigation required		Details of how proposed Investigation will affect the tree and the modified root protection area, with outline methods of mitigation
		Works	Condition	Canopy	RPA	
T19	Lime	N/A	N/A	✓	✓	The crown of this tree would need to be lifted to a height of 5m to accommodate machinery less than 5m height into the working area. Proposed trench 13 will impinge approx. 5% of the modified RPA. This trench will be to a depth of approx. 2m dependent upon access Mitigation will include: 1) Use of hand operated machinery to excavate concrete (and in accord with Sonic tomography findings). 2) Hand dig trench under Arboricultural supervision 3) Airspade around discoverable roots > 25mm and large root masses. 4) Protect to ensure they are not damaged mechanically or through exposure. 5) Prune roots < 25mm to facilitate dig 6) Ensure that all shoring of the trench is carried out without severance of protected roots.
T20	Ash	N/A	N/A	N/A	N/A	Tree now removed due to poor condition

2.3 Ground Protection

The general area is predominantly to hard standing. It will be important that only those areas in which excavation is to be carried out have hard standing broken up. The retained hard standing will act as ground protection for the undisturbed area of the root protection area of the tree.

2.4 Installation of Protective Barriers.

If works are progressed it will be necessary to install protective barriers to protect trees on the site from all construction traffic as well as denote the areas that should not be excavated or disturbed. This can be achieved with the use of Protective barriers. The protective barriers will remain in-situ throughout the development and only removed when construction has been completed. The specification of the Protective Barriers will be sufficiently robust to prevent access into the Construction Exclusion Zones and in accordance with BS5837:2012. Please note that the protective barriers have not been denoted on the draft TPP. This should be finalised on the decision of which trench option is favoured.

2.5 Consideration of Ecological concerns

No ecological concerns have been raised in relation to the works or the trees on the site and none were noted at the time of the survey. Ecological considerations that involve EU Habitats Directive will overrule any Arboricultural recommendations as given within this report.

3. Conclusions

The Arboricultural Method Statement (AMS) is commonly required to fulfil planning conditions and is generally drawn up with a finalised Tree Protection Plan (TPP) once all design details are known.

The AMS will take into consideration construction operations undertaken in the vicinity of the trees.

Appendix 1: Limitations of Arboricultural Implication Assessment

Limitations of the Arboricultural Implication Assessment

Please also refer to sections 1.2 and 1.3 at the beginning of this report.

- This Assessment is based upon information obtained from the Tree Survey.
- All dimensions and measurements are based upon the previous data collected from the survey and from the design drawings as provided.
- This Assessment considers the possible implications to proposed future built structures. Suggestions may be given outlining alternative proposals for building layout. Such suggestions must be considered by the Architect/ Designer/or Engineer before implementing any of the suggestions.

Data on which the Assessment is based

- Validity, accuracy and findings of the report will directly relate to the accuracy of information provided at the time of the survey.
- No checking of independent data provided will be undertaken. This is particularly relevant with regards to scaled maps and drawings provided to Writtle Forest Ltd.

Validation of the Assessment

- The Assessment considerations/ findings in this tree report are valid for one year.
- Such considerations/ findings will become invalid if any building works are undertaken, soil levels are altered or tree work undertaken.
- If there are any alterations to either the property or soil levels, or if tree works are carried out, it is recommended that a new tree survey/report is undertaken.

Trees in relation to other Properties:

- This assessment only considers the trees in relation to the site and the proposed structures as identified.
- The Assessment only considers those trees as are relevant to the proposed structures. Comment is not made with regard to trees in relation to structures beyond the boundaries as identified, (third party property).
- Issues with regard to neighbouring property and trees on the site considered maybe relevant if new planting is considered or required.
- Damage to, or possibility of damage to, any other structure that is not referred to within the report is not considered unless otherwise specified. This includes both neighbouring structures and any other structure on the property.

Trees in Relation to Subsidence, Heave and Direct damage

- This report does not deal with issues relating to subsidence or heave in relation to any built structures and surrounding vegetation. However, it may be prudent to consider the effects of heave on any property if trees are removed.
- Unless information relating to soils is presented or if the client has instructed the assessment to consider the type and depth of foundations, then this is not considered within the assessment.

Trees subject to statutory controls:

- Where trees are covered by a Tree Preservation Order or are located in a Conservation Area it will be necessary to consult the local authority before any tree works, other than certain exemptions, can be carried out.
- The works specified above are necessary for reasonable management and should be acceptable to the local authority. However, tree owners should appreciate that the local authority may take an alternative point of view and have the option to refuse consent.

Trees are subject to changes outside man's control:

- Trees are living organisms subject to changes outside man's control.
- Changes to ground water conditions will affect the root growth of a tree. Such changes are not always the result of man's influence and other factors may be involved.

Limitations of use of copyright: