BY APPOINTMENT
TO HER MAJESTY THE QUEEN
TREE SURGEONS
F.A. BARTLETT TREE EXPERTS CO. LTD.

Bartlett Consulting

DEVELOPMENT SITE METHOD STATEMENT
DRAFT – FOR COMMENT

Our Ref: 190092/AMS/Ver.5

Your Ref: 19/00114/FULL

Date: 01st September 2020

CLIENT:
Mr. Donncha O'Shea
Gustafson Porter and Bowman
1 Cobham Mews
London
NW1 9SB

PROJECT:
United Kingdom Holocaust Memorial & Learning Centre
Victoria Tower Gardens
Millbank
Westminster
London
SW1P 3JA

Document Summary:

The following report provides a detailed methodology for the relocation of the Spicer Memorial and improvements to the existing footpath network, within Victoria Tower Gardens, London, to eliminate and/or minimise previously identified impacts of development taking place within notional root protection areas.

Included within the report are recommended planning and working methodologies for associated demolition, ground works and construction activities from an Arboricultural perspective, as well as the specification for physical tree protection measures in accordance with British Standard 5837 (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations*.

A series of Tree Protection Plans is also appended, illustrating the precise location of physical tree protection measures, operational logistics, as well as identifying areas of useable free space and other development site requirements.

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1.0 SCOPE OF REPORT

1.1 Report Brief

Following "the granting of detailed planning permission" Bartlett Consulting has been instructed to provide a report and recommendations suitable for the provision of robust tree protection measures and working practices, to allow for implementation of two aspects of "approved development": relocation of the Spicer Memorial and improvements to the footpath network throughout Victoria Tower Gardens.

This report is intended to discharge Pre-Commencement Condition 07 of "planning permission" 19/00114/FULL as these aspects of "approved development" are within the root protection area of retained London Plane trees.

Following the current guidance of British Standard 5837(2012) this report will provide details on: specification of tree works for facilitation; location and appropriate specification of tree protection measures; recommended planning for associated development site operations; a schedule of site supervision and monitoring; tree compensation and mitigation measures; and contingency planning.

1.2 Background

Victoria Tower Gardens "benefits from Westminster City Council detailed planning permission 19/00114/FULL" which includes Pre-Commencement Condition 07 which states:

You must apply to us for approval of a method statement explaining the measures you will take to protect the trees on and close to the site. You must not start any archaeological or other site investigations, demolition, site clearance or building work, and you must no take any equipment, machinery or materials for the development onto the site, until we have approved in writing what you have sent us. The method statement must take account of anticipated construction requirements (Sections 5.2.3, 5.5.6, 6.0 and 7.0 of BS5837:2012). You must then carry out the work according to the approved details.

NOTE: As this document has been written from a purely arboricultural perspective without the benefit of planning permission and an appointed site contractor, at this stage we will not likely address all the requirements of the British Standard clauses highlighted above. Every effort has been made to do-so with the information available.

1.3 Report References

This Arboricultural Method Statement has evolved from the following technical documents and "approved planning layouts" as provided by Gustafson Porter & Bowman in both PDF and DWG file format:

• Bartlett Consulting *Arboricultural Impact Assessment* referenced 190092/AIA and dated 26th April 2020.
• BS 5837: (2012) *Trees in Relation to Design, Demolition and Construction – Recommendations*

• BS 3998: (2010) *Tree Works - Recommendations*
• National Joint Utilities Group (2007) Publication Volume 4: Issue 2 *Guidelines for the Planning, Installation*
and Maintenance of Utility Apparatus in Proximity to Trees

[INSERT LIST OF APPROVED DRAWINGS]

1.0 SCOPE OF REPORT (continued…)

1.4 Report Limitations & Methodologies

This report is restricted to the fifty (50) London Plane trees within Victoria Tower Gardens and illustrated on the attached Tree Protection Plans (TPP). Each TPP is illustrative of the relevant discussions within this report, and based entirely on the drawings provided to Bartlett Consulting and listed above.

The Tree Protection Plan can only be used for dealing with the issues related to each particular element of "approved development" and all scaled measurements must be checked against the original submission documents as well as confirmed on site.

This report has been prepared as best as reasonably practical, from a purely arboricultural perspective, without the benefit of final design and installation detail as no overall contractor or subcontractor(s) have been appointed to deliver the approved development.

This report is intended to demonstrate to Westminster City Council and the Planning Inspector that an "approved development" can be implemented and delivered without causing significant harm to the London Plane trees; and that it is feasible to adequately protect the London Plane trees whilst working within the notional root protection areas.

The statements, findings and recommendations made within this report do not take into account any effects of extreme climate and weather incidences, vandalism, changes in the natural and built environment around the tree(s) after the date of this report which are outside the scope of the "approved development" nor any damage whether physical, chemical or otherwise which may be caused during site operations which have been undertaken outside the scope and recommendations of this report.

Bartlett Consulting cannot accept any liability in connection with the above factors, nor where recommended tree management and/or tree protection is not carried out in accordance with the guidance and recommendations of this report, within the timelines stipulated.

The contents of this report remain valid for one year.

1.5 Assessment of Ecological Status of Tree & Potential Constraints

Following the site visit and tree survey and assessment, we believe that there is a LOW potential for wildlife and ecological associations with the tree subject to this report. Ecological associations are considered to be limited to nesting birds.

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000, provides statutory protection to birds, bats, insects and other species that inhabit trees, hedgerows, or other associated vegetation.

All trees must be thoroughly and properly assessed for nesting birds and any other protected species prior to the commencement of any recommended tree works.

2.0 TREE PRESERVATION ORDER & CONSERVATION AREA PROTECTION STATUS

The Town & Country Planning Act (Tree Preservation) (England) Regulations 2012 and the Town & Country Planning Act 1990 (as amended) provides legislative protection for trees within England.

A status check was originally conducted by Bartlett Consulting on 26th February 2018 through the Westminster City Council website https://www.westminster.gov.uk/trees-and-high-hedges In the absence of further formal communication from Westminster City Council regarding tree protection, the below information is still valid.

2.1 Conservation Area (CA) Status

Victoria Tower Gardens is within the *Westminster Abbey & Parliament Square* designated Conservation Area.

2.2 Tree Management Implications

The Conservation Area status affects all trees of a stem diameter greater than 75 millimetres, regardless of tree species, when measured at 1.5 metres above ground level. Therefore the trees subject to this report will be protected by virtue of their location in the designated CA.

Only the tree works detailed within this report can be completed following formal discharge of the planning condition(s) from Westminster City Council. Tree work requirements are identified outside the scope of this report, or after the discharge of condition(s), they cannot be completed and must be approved through a new planning process.

Please note that the removal of dead branches from living trees are permitted and "excepted" works under the 2012 Regulation listed above. These works can be undertaken without formal notification to Westminster City Council, however we recommend 5 working days' notice being given first.

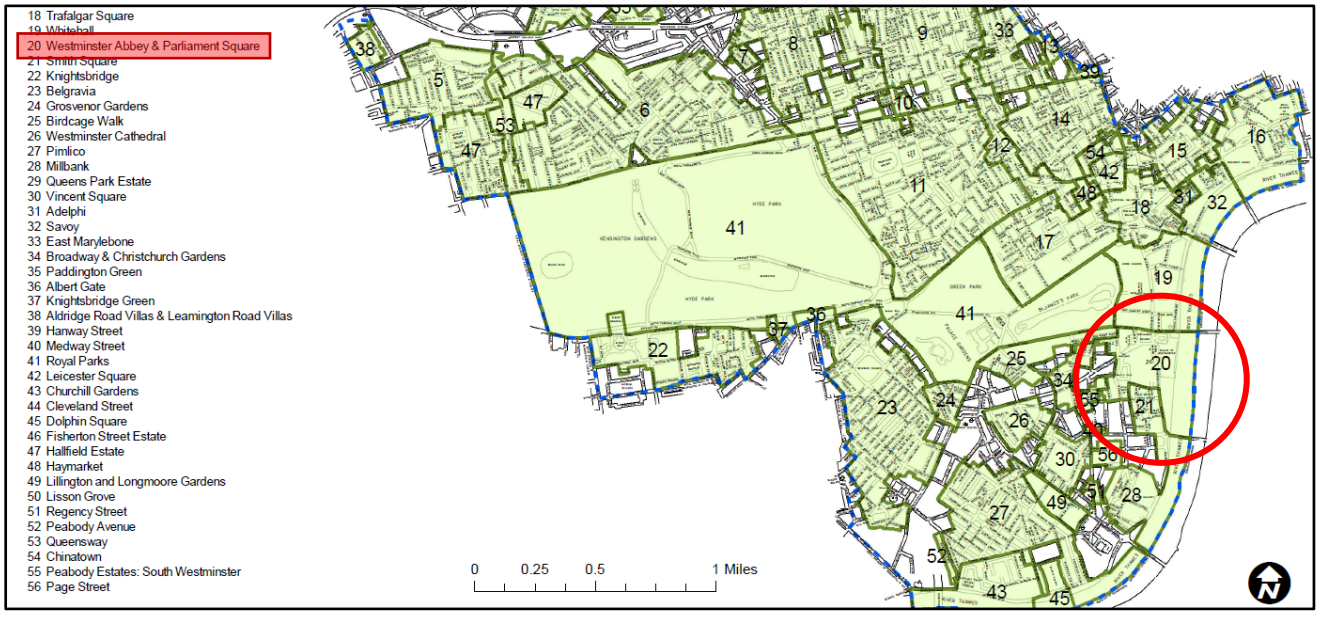


Figure 1: Image from "My Westminster" Showing Victoria Tower Gardens within Conservation Area

3.0 APPROVED DEVELOPMENT & DEVELOPMENT SITE DETAILS

3.1 Development Detailed within AMS

1 – Relocation of Spicer Memorial
2 – Improvement and Reinstatement of Footpath Network
3 – Tree Mitigation Measures (Plant and Soil Health Care)

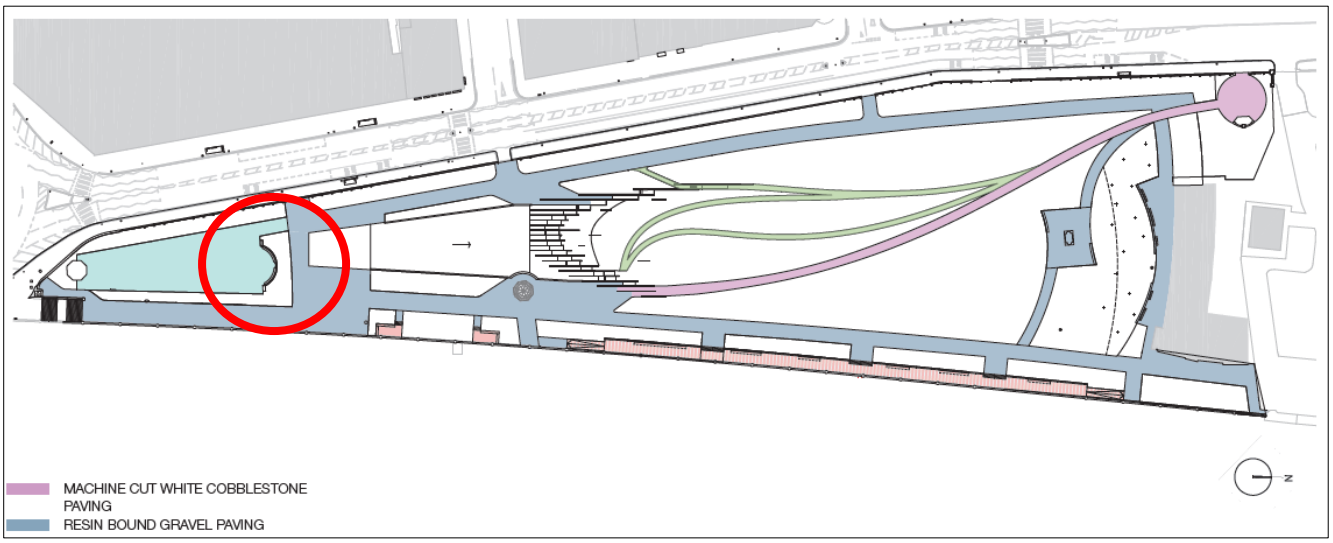


Figure 2: Image Showing Existing Footpath Network and Location of Spicer Memorial (Red Circle)

3.2 Existing Grounds

3.2.1 Spicer Memorial

The Spicer Memorial itself is made of Portland Stone, understood to be sat on a raft-type foundation. Details of that foundation are unknown. The Spicer Memorial is surrounded by the hard surface footpath to the north, east and west (detailed below) with the Horse Ferry Playground to the south, comprising resin-bound gravel and bonded rubber mulch.

3.2.2 Footpath Network

During the geo-technical investigations within Victoria Tower Gardens (29th April – 17 May 2019) a 1.25 metre deep trial pit was excavated adjacent to the Thames River wall, north of London Plane T70007. In this location the tarmac is 50 millimetres deep followed by 600 millimetres depth of mixed rubble. There are layers of silty clay and sandy clay to a depth of 1.25 metres.

3.2.3 Slope & Levels

The entire site gently slopes down in a north – south direction with spot levels at the northwest of +5.48 and southeast of +4.27.

Figure 3: Image of Eastern Footpath Adjacent to Thames River

There are many localised level changes, for example levels vary between +4.96 and +4.78 around the Spicer Memorial.

3.0 APPROVED DEVELOPMENT & DEVELOPMENT SITE DETAILS (continued…)

3.3 Summary of Detailed Design Proposals

3.3.1 Spicer Memorial

The Spicer Memorial will be relocated approximately 8.0 metres north of the current footprint, further within Victoria Tower Gardens. We have identified that this location will trespass into the root protection area of London Plane trees 71022 – 71024 and 70002 – 70004.

The foundations serving the existing memorial are confirmed to be of a modern design: reinforced concrete raft, as designed by a structural engineer. However we are currently unaware of the exact dimensions of the raft foundations, in particular its depth. As per the Arboricultural Impact Assessment, due to the location of the Spicer Memorial between the two rows of London Plane trees, leaving the original raft foundation in situ is the first option. If retention is deemed not possible, the raft foundation will need to be broken-up with appropriate plant machinery, whilst under the direct supervision of Bartlett Consulting.

Due to the dimensions and associated weight of the Portland Stone forming the memorial, it will be necessary for plant machinery (such as a Manitou or heavy duty fork lift) to lift and move the stonework during the course of approved re-development. The lifted stone will be moved off-site for any repairs to the stonework; or temporarily stored on reinforced ground if retained on-site.

The new foundation for the Spicer Memorial is currently proposed as a 300 millimetre thick concrete slab, situated atop 300 millimetre thick compacted base-layer, all situated above the existing sub-grade.

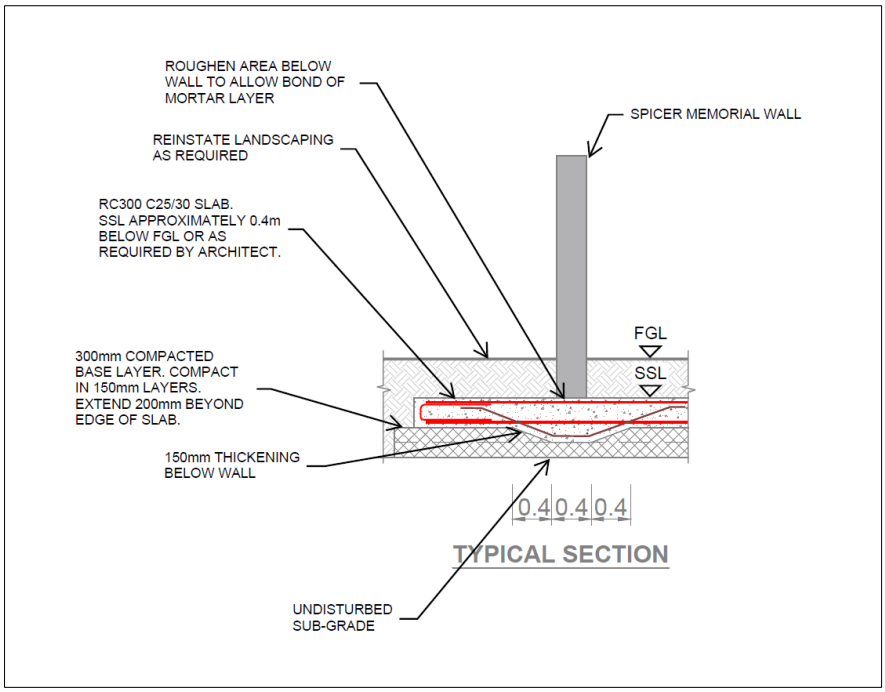


Figure 4: Cross-section New Foundation for Spicer Memorial

3.0 APPROVED DEVELOPMENT & DEVELOPMENT SITE DETAILS (continued…)

3.3.2 Footpath Network

As there is "approved" development within the notional root protection area of retained trees, in accordance with the guidance of Clause 5.3.1(b) of British Standard 5837(2012) "*…a series of mitigation measures to improve the soil environment…*" of the London Plane trees will be implemented.

The existing impermeable hard surfacing, as well as compacted and inhospitable made-ground (sub-base) will be carefully removed; the surrounding soil de-compacted and ameliorated; and the footpath reinstated with a modern three dimensional cellular confinement system and permeable resin-bound surface.

This process will improve the soil conditions for water, oxygen and nutrient availability, encouraging root growth and positive tree health. The soil amelioration will replace micro- and macro-nutrients which have been lost over time, as well as add nutrients to the soil which are beneficial for tree vitality and health. The construction of the footpath will prevent future soil compaction, as well as maintain permeability through to the improved soil below.

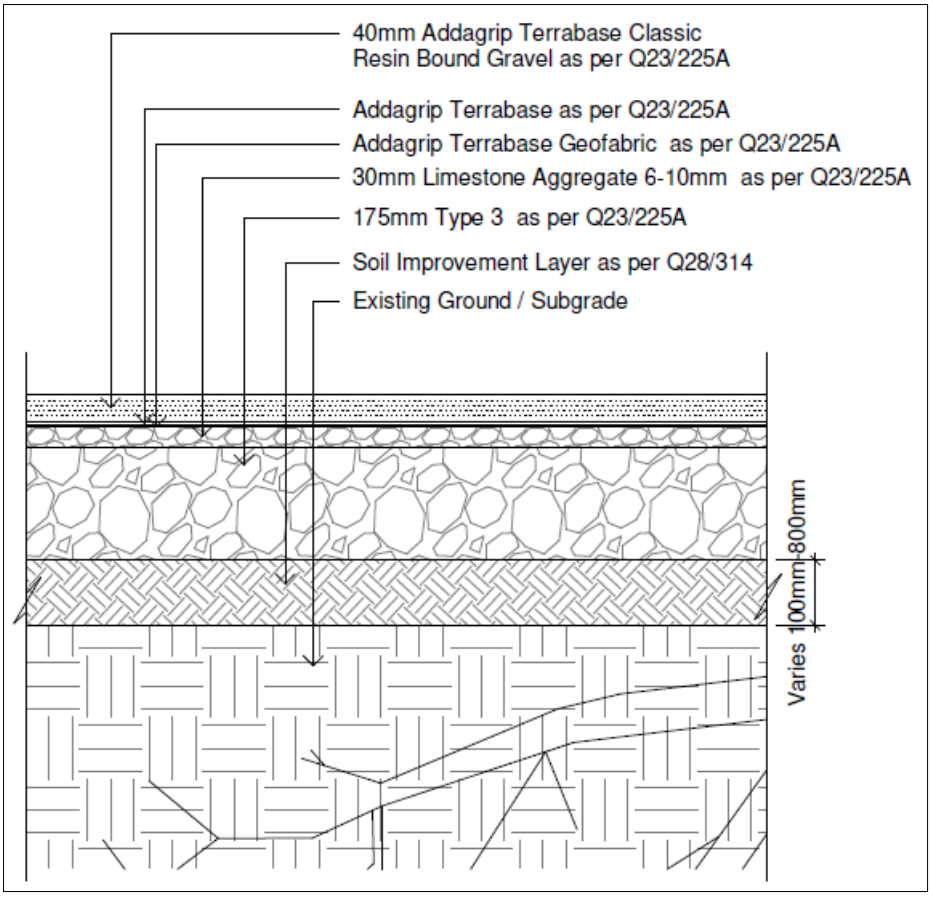


Figure 5: Detailed Cross-Section of New Footpath within Victoria Tower Gardens

4.0 TABLES OF DEVELOPMENT IMPLICATIONS & MITIGATION ON TREE STOCK

4.1 Table 01: Implications on Existing Tree Stock – Spicer Memorial

Tree Ref	Species	Cat.	Removal Due To		Mitigation Required		Aspect of Development Affecting Retained Trees
			Proposed Development	Tree Condition	Canopy	RPA	
T71024 T71023 T71022 T70002 T70003 T70004	London Plane	A2 A2 A2 B2 A2 A2	N/A	N/A	N/A	✓	· Controlled demolition of the Spicer Memorial · Plant machinery (Manitou) movements within calculated RPAs · Removal of existing semi-permeable hand standing · Retention of existing reinforced concrete raft foundation (option 1) · Controlled demolition and removal of existing reinforced concrete raft foundation (option 2) · Temporary storage of stonework 'on-site' · Temporary parking of flatbed vehicle with VTG · Removal of stonework 'off-site' · Installation of new foundations constructed using a low impact and bespoke design, utilising modern building techniques · Reconstruction of renovated stonework Spicer Memorial

4.0 TABLES OF DEVELOPMENT IMPLICATIONS & MITIGATION ON TREE STOCK (continued…)

4.2 Table 02: Implications on Existing Tree Stock – Footpath Network

Tree Ref	Species	Cat.	Removal Due To		Mitigation Required		Aspect of Development Affecting Retained Trees
			Proposed Development	Tree Condition	Canopy	RPA	
T71002 to T71023 T70000 to T70024	London Plane	A2 & B2 A2 & B2	N/A	N/A	N/A	✓	· Controlled breaking-up and lifting of hard surfacing within calculated RPA · Controlled breaking-up and lifting of made-ground within calculated RPA · Working zone and pedestrian / light plant-machinery movement within RPA · Soil de-compaction works with compressor and commercial vehicle moving within calculated RPA · Laying of cellular confinement system within RPA · Reinstatement of formal footpath network within RPA

4.3 Table 03: Mitigation for Identified Development Implications

Tree Ref	Species	Cat.	Mitigation Required
ALL	London Plane	A2 To B2	1 – Erection of vertical tree protection barrier(s) to create effective construction exclusion zone(s) 2 – Laying of ground protection when working in notional RPA and outside construction exclusion zone 3 – Site specific working methods for ground works and installation of "approved" development 4 – Site specific and bespoke foundation design for development within notional RPA 5 – Site supervision and monitoring from Arboricultural perspective

5.0 ARBORICULTURAL METHOD STATEMENT

5.1 Project Key Contact List

Organisation / Role	Contact	Contact Number
Adjaye Associates – Architect	TBC	TBC
DP9 – Planning Agents	Mark Knibbs	TBC
Gustafson Porter & Bowman – Landscape Architects	Donncha O Shea	TBC
Turner & Townsend – Project Managers	TBC	TBC
WSP – Structural Engineers	TBC	TBC
Bartlett Tree Experts – Project Arboriculturist	Mr. Jason Hasaka	TBC
Westminster City Council – Arboricultural Officer	Ms. Barbara Milne	TBC
The Royal Parks – Arboricultural Officer	Mr. Ian Rodger	TBC

5.2 Facilitation Pruning and Tree Works

The two existing site access locations will continue to be utilised throughout all phases of approved development, with lorries and other construction vehicles entering and exiting Victoria Tower Gardens through these locations.

Therefore, crown lifting will be required to allow access without damaging the low tree branches.

Tree Ref	Species	Schedule of Works Prior to Development
T71009	London Plane	1 – Crown lift east & south elevation to 5.5 metres height above ground. (targeting secondary branches – primary branches only if necessary)
T71010	London Plane	1 – Crown lift north & east elevation to 5.5 metres height above ground. (targeting secondary branches – primary branches only if necessary)
T71022	London Plane	1 – Crown lift east & south elevation to 5.5 metres height above ground (secondary branching will be lifted only – not structural scaffold / primary limbs)
T71023	London Plane	1 – Crown lift east & north elevation to 5.5 metres height above ground (secondary branching only – not structural scaffold / primary limbs)

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.3 Sequence of Events

From an Arboricultural perspective, the sequence of events for elements included within this Arboricultural Method Statement should follow the phasing listed in the below table. It is understood that once a project contractor has been appointed, a site-wide build programme and sequence of events will supersede – but be informed by – the below table.

Sequence	Brief Outline of Event
1	Tree pruning (crown lifting) at site access
2	Erection of vertical tree protection barriers (Spicer Memorial & Footpath works)
3	Establishment of ground protection (Spicer Memorial)
4	Site set-up for materials, supplies, access routes, etc. (Spicer Memorial & Footpath works)
5	Controlled dismantle of Spicer Memorial
6	Temporary storage of stonework 'on-site' outside of RPAs
7	Temporary access (between trees 71022 and 71023) for flatbed vehicle
8	Removal of all stonework 'off-site'
9	Installation of a low impact and bespoke foundation
10	Establishment of ground protection (Spicer Memorial)
11	Reconstruction of renovated Spicer Memorial
12	Relocation and/or installation of new hard-landscape infrastructure
13	Break-down and clean-up of Spicer Memorial work site
14	Removal of existing footpath network
15	Soil and tree health care programme
16	Installation of new footpath network
17	Break-down and clean-up of footpath work site.

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.4 Tree Protection Measures (General)

With regard to the pre-existing site layout and the two elements of "approved" development detailed within this Arboricultural Method Statement, there will need to be a variety of tree protection measures for different trees and each element of "approved" development.

A series of Tree Protection Plans (hereafter referred to as TPP) can be found at the end of this document.

5.4.1 Vertical Barriers

For the London Plane trees along the western site boundary with Millbank, given the scale and intensity of development, the "default specification" of vertical tree protection barriers for the purpose of excluding construction activities will be necessary.

A specification and illustration for "default" vertical barriers can be found in Method Statement 1 below.

The London Plane trees along the eastern site boundary adjoin the River Thames, especially those surrounded in some part by hard surfacing, will require a bespoke and site specific method of protection, as erecting fencing will preclude access to areas of the footpath network and working zone immediately around these trees.

Installation of Chestnut-pale fencing in combination with hessian (Figure 6 opposite) will adequately protect the main stems and buttresses of the retained trees during works to the footpath network.

A recommended specification can be found in Method Statement 2 at the end of this document.

Figure 6: Image of Hessian and Chestnut Pale Fencing Protected Tree Stem

5.4.2 Ground Protection – Footpath Network

There will be no requirement for additional ground protection measures as part of the removal and reinstatement of the footpath network itself.

This is due to the fact that this aspect of development can be undertaken from atop the existing hard-surfacing as well as cellular confinement system – both of which are sufficient as load bearing surfaces to prevent further compaction of the sub-soil.

The tree and soil health care programme is likely to require additional ground protection in the form of load-bearing and load-spreading wooden boards for air compressors and light commercial vehicles.

Both of these site operations will need to be undertaken in a systematic and carefully planned and co-ordinated procedure, as detailed in Arboricultural Method Statement (AMS) 05 below.

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.4 Tree Protection Measures (General) (continued…)

5.4.3 Ground Protection – Spicer Memorial

In order to safeguard the local soils within the footprint and working-zone of the Spicer Memorial due to the associated weight of the Portland Stone, machinery and vehicles will be required for this aspect of development. It will therefore be necessary to install suitable ground protection atop the existing areas of hard standing surrounding the Spicer Memorial as well as a designated route off site.

The ground protection will be bespoke, and specific to the site operations and anticipated loads. We have provided a specification of ground protection which is detailed in AMS 03 below.

5.5 Site Supervision

Good tree protection cannot be reliably implemented without regular Arboricultural input. The nature and extent of that provision will vary according to the complexity of the site, the approved development as well as the resources available. Bartlett Consulting shall be instructed to work within the guidance of this report and pre-existing Westminster City Council conditions of approval, to oversee implementation of protective measures; tree management proposals; and site specific working methodologies as detailed within this report.

As this report is being submitted to discharge a condition of planning approval, this report and its contents will form legal requirements during all phases of development. Breaches of planning conditions can result in enforcement action being taken by Westminster City Council in the form of "stop notices" as well as monetary fines. It is strongly recommended therefore that this report and accompanying plans are kept on site at all times; and all contractors are familiarised with the requirements during their site induction.

Arboricultural planning conditions cannot be effectively discharged without site supervision by an Arboricultural Consultant. Any supervisory action must be confirmed by formal letters or log entries circulated to all relevant parties, including Westminster City Council. These records of site visits will provide proof of compliance and allow planning conditions to be discharged as the development progresses. Bartlett Consulting shall be engaged to help the appointed contractor comply with Westminster City Council requirements set out in the planning conditions, and provide the necessary site monitoring forms.

A site supervision form can be found at the end of this document in Appendix 02.

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.5 Site Supervision (continued…)

5.5.1 Phasing of Supervision

Phasing of Arboricultural involvement in the development project, including proper budgeting, can only be factored into the developing work programmes if the overall project management takes full account of tree issues if the application is consented.

Bartlett Consulting must be involved in a supervisory capacity during the following phases of the project:

1 – Erection of all tree protection measures (fencing / wrapping / ground protection)

2 – Setting out Phase 1 ground protection for 'existing' Spicer Memorial

3 – Setting out of working areas, storage of material and routing of material for collection purposes

4 – Controlled dismantle of Spicer Memorial

5 – Controlled demolition of reinforced concrete raft foundation (option 2, as required)

6 – Setting out Phase 2 ground protection for 'approved' Spicer Memorial

7 – Excavations associated with new foundations of proposed new Spicer Memorial location (as per structural engineer's specification)

8 – Installation of Spicer Memorial

9 – During breaking-up of existing footpath (frequency to be agreed upon final work programme)

10 – During soil amelioration programme (frequency to be agreed as above)

11 – During installation of cellular confinement system (frequency to be agreed as above)

5.5.2 Contingency Procedures

Should there be a breach of a tree protection zone which causes contamination, compaction, or damage to the supporting soils around the protected trees; or any direct damage to a tree's root system, root collar, main stem, or overhead branching; it is critical that specialist advice is sought from Bartlett Consulting immediately.

A photographic record of the breach and/or damage must be made by an appointed site supervisor, and retained for perpetuity. Bartlett Consulting may have to attend site to and evaluate the incident.

Direct contact with the Westminster City Council Planning Department to inform them of the incident may also be necessary.

Following any incident, all associated works must cease immediately, until professional direction is given.

The following steps and process must be actioned and followed:

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.5.2 Contingency Procedures (continued…)

Procedure	Timeframe
1 – Immediately stop all works near breach	At occurrence
2 – Site Foreman to document (via photograph) nature of breach (pedestrian trespass / vehicle trespass / etc.)	Within 5 minutes
3 – Site Foreman to contact Project Arboriculturist (telephone conversation or video call of breach)	Within 10 minutes
4A – Site Foreman to reinstate tree protection and continue works (if advised by Project Arboriculturist as no damage)	Within 60 minutes
4B – Reinstate tree protection but continue to cease work in area pending site visit (if advised by Project Arboriculturist as damage considered likely or otherwise visible)	Within 3 working days
5 – Bartlett Tree Experts will appraise Westminster City Council of the situation (via telephone or email after initial contact and prior to site visit)	Within 60 minutes of Item 3
6A – Damage will be documented by Bartlett Tree Experts, qualified and quantified as appropriate, and recorded via digital photography.	During site visit
6B – Any immediate corrective action and compensation will be undertaken by Bartlett Tree Experts at the time of their visit. The project manager will be advised of further compensation and mitigation required as result of damage.	During site visit and within 2 working days of visit
6C – Reinstate tree protection measures and re-commence with works in area	At conclusion of site visit
7 – Implementation of further tree compensation and mitigation	At conclusion of phase of development

5.6 Useable Free Space

There are numerous spatial requirements on development sites, apart from that of the proposed structure and ancillary development. These requirements include designated areas for storage; room for deliveries; space for materials and equipment; and space for site huts to name but a few.

Clause 5.5.6 of BS5837:2012 provides a list of requirements with regards to tree protection in relation to free and useable space. The Tree Protection Plans included within this document have annotated from an arboricultural perspective where there is useable free space for the aspects of "approved" development included within this Arboricultural Method Statement.

This document and associated plans do not show site-wide tree protection measures and useable free space outside the scope of this report. These matters will need to be addressed and planned with the appointed site contractor at a later stage, when reviewing the overall programme of works for the development as a whole, and produced as a separate document at a later stage.

5.0 ARBORICULTURAL METHOD STATEMENT (continued…)

5.7 Arboricultural Method Statement Attachments

AMS 1 – Vertical Barriers
AMS 2 – Tree Stem Protection
AMS 3 – Ground Protection
AMS 4 – Working within Tree Root Protection Area: Spicer Memorial
AMS 5 – Working within Tree Root Protection Area: Footpath Improvements
AMS 6 – Foundations within Tree Root Protection Areas

ARBORICULTURAL METHOD STATEMENT 1 – VERTICAL BARRIERS

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

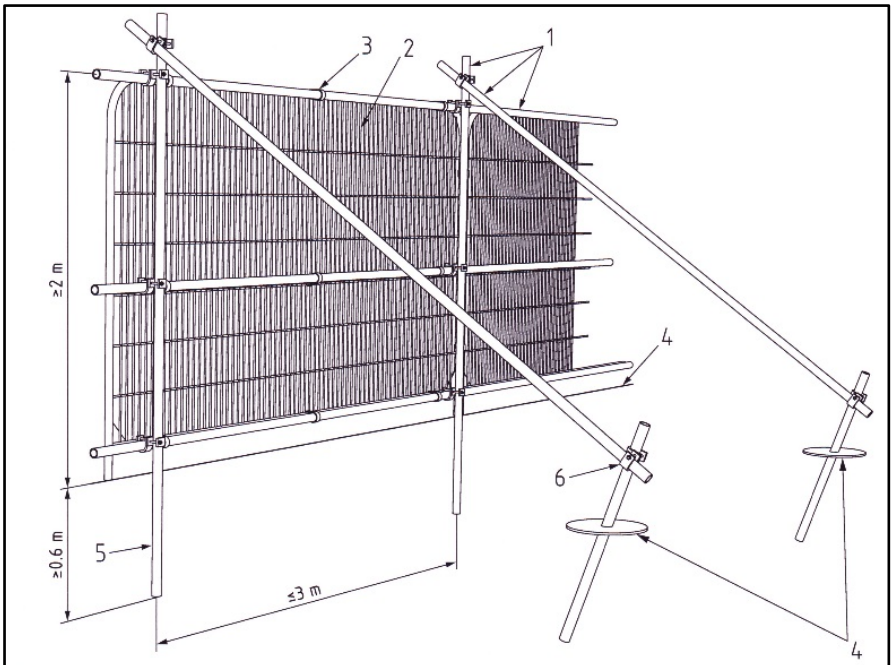
Project: All Aspects

Given the intensity and scale, as well as proximity of development, to the retained London Plane trees, vertical barriers will be of the default specification as detailed within BS5837:2012:

A vertical and horizontal scaffold framework, well braced to resist impacts. Vertical tubes should be spaced at a maximum interval of 3.0 metres and driven securely into the ground. Welded mesh panels should be securely fixed onto this scaffold framework.

Care must be taken when locating the vertical and bracing poles so as not to damage the buttress (root collar) of the London Plane trees, as well as and structural tree roots within the protection zone.

• All London Plane trees along the western site boundary will be protected by the default specification fencing.



Key

1 Standard scaffold poles
2 Heavy gauge 2 m tall galvanized tube and welded mesh infill panels
3 Panels secured to uprights and cross-members with wire ties
4 Ground level
5 Uprights driven into the ground until secure (minimum depth 0.6 m)
6 Standard scaffold clamps

Figure 7: Illustration of Default Specification Vertical Barrier (reproduced from BS5837:2012)

ARBORICULTURAL METHOD STATEMENT 2 – TREE STEM PROTECTION

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Footpath Improvements

London Plane trees T70000 – T70009 and T70018 – T70024 along the eastern site boundary are each developing within the tarmac pedestrian footpath and as such will need a bespoke method of protection during hard landscaping works and improvements to the footpath network.

This method of protection will be a combination of vertical barriers to the default specification, as well as hessian and chestnut pale fencing around the buttresses (root collar) and main stem, to prevent direct damage to these tree parts.

1 – Hessian will be wrapped snugly around each London Plane tree (loose enough so that it doesn't constrict, but tight enough that it doesn't slip down) from ground level to 3.0 metres height, and securely fastened with pins or clips.

2 – Hessian will be wrapped in 3 – 4 layers so as to adequately protect each tree stem and buttresses.

3 – Chestnut pale fencing will then be wrapped snugly (as described above) around each tree stem in two layers, from approximately 500 millimetres above ground level to 3.0 metres height. The two layers will overlap so there are no gaps in the fencing. The fencing will be secured by clips, zip-ties, or similar.

4 – A third layer of chestnut pale fencing will then be wrapped around each tree, this time from ground level, ensuring the base of each tree stem and buttresses / root collar is protected. The fencing will also be secured by clips, zip-ties or similar.

NOTE: It is likely that the fencing will be at an angle towards the stem, or proud of the tree stem, after wrapped around the base of each tree. This is okay as long as the fencing is secure around the base of the tree.

ARBORICULTURAL METHOD STATEMENT 3 – GROUND PROTECTION

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: All Aspects

Due to relocation of the Spicer Memorial within and adjacent to the notional root protection area (RPA) of London Plane trees 70002, 70003, 70004, 71022, 71023 and 71024 as well as the requirement for a 'working zone' and temporary construction access within and adjacent to the RPA of all London Plane trees for "approved development" prior to the commencement of *any* associated site operation, ground protection in accordance with the below specifications must be established:

Operative & Machinery up to Gross Weight ≤2 Tonnes

Lay geo-textile matting directly onto the existing hard surfaced ground; apply approximately 100mm–150 mm of compressible material, such as mulch or sand, over the matting; lay down abutting interlinked metal/plastic tracks such as Ground Guard®. The latter shall be rated beyond 2 tonnes.

Figure 8: Default Image of Ground Guard

Machinery and/or Vehicles with Gross Weight ≥2 Tonnes

Where plant-machinery and vehicles with a working weight greater than 2 tonnes will traverse and/or temporarily park within tree root protection areas for loading and unloading, a site specific and bespoke system of ground protection will be necessary to prevent damage to the hard surfacing and compaction of the soils in the RPA below.

Once the plant-machinery and vehicle requirements for the project become known, and there is a full understanding of size and weight, as well as calculation for loaded and unloaded weight, an engineered system of ground protection can be developed and designed with arboricultural input.

THIS SYSTEM WILL BE DETAILED HERE

ARBORICULTURAL METHOD STATEMENT 3 – GROUND PROTECTION (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: All Aspects

Temporary Storage Areas

Due the requirement for temporary storage of Portland Stone within Victoria Tower Gardens, it will be necessary to establish ground protection to one of the above specifications appropriate for the weight of the Portland Stone, around the Spicer Memorial itself and in the temporary storage area.

Ground protection to the appropriate above specification must also be laid to provide a transportation route to the temporary storage area(s) to and from the Spicer Memorial.

The temporary storage area shall be located centrally within the Victoria Tower Gardens, and outside the calculated RPA of any retained London Plane tree. Please refer to Tree Protection Plane 01 for further details and illustrations.

Each item of Portland Stone, upon being dismantled, shall be placed upon a suitable pallet and positioned into the designated temporary storage area, until as such time as it is to be removed from site.

ARBORICULTURAL METHOD STATEMENT 4 – WORKING WITHIN TREE ROOT PROTECTION AREAS (SPICER MEMORIAL)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Spicer Memorial

Dismantling and Movement of Portland Stone

1 – The Spicer Memorial shall be dismantled in a controlled manner, and with a specific working strategy to be agreed by the appointed contractor and Bartlett Consulting, but essentially employing a 'top-down' methodology.

2 – The wooden bench will require removal from its fixings and appropriately stored temporarily on site.

3 – Each capping stone and the two carved goat and kid sculptures shall then be carefully relieved from the memorial and hoisted using a Manitou or heavy fork lift (as required).

3A – Once each item has been removed from the Spicer Memorial, it shall then be carefully placed upon and secured to a suitable loadbearing timber pallet and moved to a designated temporary material storage area.

4 – Once all Portland Stoneware has been dismantled from the Spicer Memorial, it shall then be removed from site using a vehicle of an appropriate size and load bearing capacity.

4A – Each item of Portland Stone shall then be transferred to the vehicle using a Manitou or heavy fork lift (as required), along the designated route through the Victoria Tower Gardens site, atop of the existing ground protection.

Breaking-up of Existing Foundations

1 – Due to the size and location of the existing reinforced concrete raft foundation currently serving the Spicer Memorial within the calculated RPA's of trees: 70002, 70003, 71022, 71023 and 71024 the preferred option 1, as viewed from an Arboricultural perspective would involve the retention of the raft.

If however retention is not considered to be viable option due to the constraint posed by the finished levels on site, the raft will therefore require a careful and considered approach.

2 – It is suspected that the concrete raft foundation includes a significant steel cage reinforcement system, which will influence its breakup. We anticipate the employment of a hand operated mechanical diamond disk cutter will be used to cut through the steel cage and raft foundation, creating smaller sections. Each section can then be carefully extracted from its seating by means of a Manitou or heavy fork lift (as required).

2A – All operatives will work from within the footprint of the Spicer Memorial, or atop the ground protection.

2B – All works will be undertaken under the direct supervision and guidance of Bartlett Consulting.

2C - Pneumatic breaker heads on plant-machinery cannot be used to break-up the existing foundation. Only hand operated breakers may be employed with the operative within the footprint of the memorial or atop the ground protection.

ARBORICULTURAL METHOD STATEMENT 4 – WORKING WITHIN TREE ROOT PROTECTION AREAS (SPICER MEMORIAL) (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Spicer Memorial

Groundworks for New Foundations

1 – Prior to any groundworks within the footprint of the new location of the Spicer Memorial, robust ground protection shall be installed and established around the footprint of the memorial to create a 'working zone' whilst mitigating the risk of compaction occurring to the local supporting soils.

All ground protection shall accord with Method Statement 3 above.

All ground protection shall be positioned on site as per Tre Protection Plan 01.

2 – All excavations and level changes associated with the new foundation for the repositioned Spicer Memorial must strictly be only be implemented using hand tools such as spades, shovels, mattocks etc. whilst under the direct supervision of Bartlett Consulting.

2A – Once the correct sub-grade level has been achieved; as dictated by the architect/structural engineer's reinforced concrete raft foundation design and by the finished ground level, preparations may continue.

3 – A 300 millimetre compacted base layer shall first be provided by laying in two 150 millimetre layers, which shall extend a further 200 millimetres beyond the proposed footprint of the reinforced concrete raft foundation.

3A – This material can be compressed using a light roller only (not a whacker plate)

Installation of New Foundations

1 – Creation of a channel, positioned directly beneath the Spicer Memorial wall and within the base layer, shall be excavated to a depth of 150 millimetres – completed using hand tools only

2 – Concrete casting boards may be installed, ensuring all joints and edging is adequately sealed to ensure no leeching of concrete occurs during the concrete pouring phase of works.

3 – Once concrete casting mould is firmly in position and fit for purpose, the steel reinforced caging system may be constructed in accordance with the architect/structural engineer's design specification.

4 – Following the completion of the reinforced steel works, a ready-made concrete mix may be poured into the casting mould. Deliverance of concrete can be provided from a concrete mixer via an operator controlled long reaching extension boom.

4A – The concrete mixer must be positioned atop of the appropriate specification for the loaded vehicle weight, in the designated location as per Tree Protection Plane 01.

5 – A spill kit is essential within the work site prior to the delivery of concrete and readily accessible.

ARBORICULTURAL METHOD STATEMENT 4 – WORKING WITHIN TREE ROOT PROTECTION AREAS (SPICER MEMORIAL) (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Spicer Memorial

Reinstatement of Portland Stone

1 – Delivery of Portland Stone will be made via the existing ingress/egress from Millbank, via the previously utilised route between trees 71022 and 71023. Vehicles will temporarily park atop the established ground protection appropriate for the loaded vehicle weight.

2 – Each stone shall be removed from the flatbed vehicle from the designated loading area and positioned once again into the designated temporary storage area on site, located within the previously utilised area, beyond the calculated RPA of retained trees.

3 – The re-construction of the Spicer Memorial shall continue in a similar process as its dismantlement but in reverse, employing a Manitou or similar heavy forklift to assist in relocating the stonework into position, as required.

ARBORICULTURAL METHOD STATEMENT 5 – WORKING WITHIN TREE ROOT PROTECTION AREAS (FOOTPATH WORKS)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Footpath and Rooting Environment Improvements

Breaking-up of Existing Hard Surface & Made Ground

1 – Given the depth and make-up of the made ground, it is reasonable to use light-weight plant machinery to break-up the existing tarmac and made-ground below. The plant machinery must be less than 2 tonnes and work backwards, atop the existing hard surfacing (as identified on TPP 03 below)

NOTE: Where surface roots have broken and lifted tarmac, plant machinery cannot be used, and hand held tools such as a pneumatic drill or hammer will be employed. This equipment will not be used directly on a lifted area, but along either side of the lifted area and subterranean root, ensuring 500 millimetre clearance distance.

2 – Broken pieces of tarmac will be carefully lifted using hand tools such as a crowbar, pick-axe, or maul and placed into a motored wheelbarrow and removed from the work site. No plant machinery is to be employed during this phase of operations.

3 – Made-ground will continue to be loosened with hand held pneumatic drill or hammer, and removed using hand tools only, under Arboricultural supervision. Acceptable tools include: spades; shovels; narrow trenching shovel; cutting maul; etc.

Made-ground will be removed to approximately 600 millimetres depth or when the soil level is achieved.

4 – Arising material will be removed from site as it accumulates, using a motored wheelbarrow and working within the footprint of the existing footpath network, atop the existing hard surfacing (as per TPP 03 below).

5 – Arising material will be transported to vehicles in designated parking / loading areas for removal from site. These areas will be at the pre-existing site access locations with Millbank between trees 71009 – 71010 and 71022 – 71023.

5A – Vehicles will be parked atop ground protection as detailed in Method Statement 3 above, which will be established to the specification appropriate for fully loaded weight of the vehicles.

6 – Once the native soil level is reached, this phase of site operations will cease and all tools, plant machinery, PPE and motored wheelbarrows will be removed from the working area.

ARBORICULTURAL METHOD STATEMENT 5 – WORKING WITHIN TREE ROOT PROTECTION AREAS (FOOTPATH WORKS) (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Footpath and Rooting Environment Improvements

Tree Roots

1 – Any tree roots which are uncovered during the removal of hard surfacing and made-ground will be retained and protected, and incorporated into the finished landscape. They will not be pruned.

2 – If roots are damaged they will be bark traced with a sharp and sterile knife, or cleanly cut to healthy tissue at the time of damage, and treated with a Potassium Phosphite spray. These works will only be completed by Bartlett Consulting.

3 – Large diameter structural roots will be wrapped and gently tied in hessian and kept moist; bundles of fibrous roots will have hessian laid over them and pinned to the ground and kept moist – until backfilling and laying of cellular confinement system.

Soil De-compaction and Amelioration

1 – Soil de-compaction will be undertaken using the VOGT Geo-injection system, at 1.0 metre and 500 millimetres depth, in the exposed native soil under the footpath network.

2 – Soil amelioration with the VOGT system will include perlite or terramol to improve soil structure, as well as Bio-Char to improve soil holding capacity. A final mix can be agreed with Royal Parks and Westminster City Council prior to treatment.

Figure 9: Image of Soil De-compaction with VOGT Geo-Injection

ARBORICULTURAL METHOD STATEMENT 5 – WORKING WITHIN TREE ROOT PROTECTION AREAS (FOOTPATH WORKS) (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Footpath and Rooting Environment Improvements

Soil De-compaction and Amelioration (continued…)

3A – The VOGT unit requires an air-compressor on a trailer. Therefore, ground protection will be required for where the trailer and air-compressor temporarily park. Ground protection will be of the specification detailed for plant and machinery above, at the specification ≤2 tonnes.

The ground protection can be leapfrogged as the works progress through Victoria Tower Gardens.

3B – The VOGT unit itself, shown in Figure 9 above, will be able to track on the exposed areas of native soil, which have not been de-compacted, due to the unit's light weight and air-filled tyres.

4 – Soil de-compaction and amelioration will be carried out within the entire footprint of the footpath network, typically at 1.0 metre spacing, in a triangle pattern where space and width allows.

Laying of Cellular Confinement System

The below will be completed by construction or landscape operatives, with no plant or machinery. Vehicles will be parked in designated areas away from the work site and tree protection areas. Hand tools such as spades and shovels will be used to move stone, and motorised wheelbarrows will be used to transport material.

1 – Once soil amelioration is complete, the geotextile matting will be rolled-out across the prepared zone of footpath and identified work site. Based on the width of the footpath and geotextile matting, it may need to be overlapping by a minimum of 300 millimetres.

2 – The final surface level will be achieved by in-filling hollows with clean, sharp stone (Type 3) or sharp sand.

3A – Each section of cellular confinement system will then be laid-out, stretched-out to full length and width, and pinned into place using the manufacturer specified number of pins.

· Ensure pins do not puncture tree roots.

· Confinement system placed side-by-side will be stapled together as per manufacturer specification.

3B – Curved sections of cellular confinement system will need to be cut into shape, after following the above step, and not bent or manipulated into place and shape. When cutting, entire cells must remain.

ARBORICULTURAL METHOD STATEMENT 5 – WORKING WITHIN TREE ROOT PROTECTION AREAS (FOOTPATH WORKS) (continued…)

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Footpath and Rooting Environment Improvements

Laying of Cellular Confinement System (continued…)

4A – Infilling of the cells will be with a clean angular stone, Type 4/20 millimetre. In-fill will commence at the empty finished end of the cellular confinement system, then working from atop the cellular confinement system and moving forward.

· Stone will be moved with motorised wheelbarrows and spread using hand tools.

4B – The cells should be overfilled if top dressing with a hard surface.

4C – Settlement of the stone can be completed using a light roller only (NOT A WHACKER PLATE)

4D – Edging such as treated timber boards pinned into place (no excavations below ground level) or wooden sleepers can then be installed adjacent to the cellular confinement system.

4E – The porous surface can then be installed.

ARBORICULTURAL METHOD STATEMENT 6 – FOUNDATIONS WITHIN TREE ROOT PROTECTION AREAS

Date: 01st September 2020

Site: Victoria Tower Gardens, Millbank, London

Project: Spicer Memorial

New Excavations within Tree Root Protection Areas

1 – Stripping of grass surfaces or subsoils within the notional RPA of trees 70003, 70122 and 70123 for new foundations for the "approved" location of the Spicer Memorial must be completed using air-spade technology, under direct supervision of Bartlett Consulting.

The air-spade will be used to achieve the necessary finished depth, as per the structural engineers' design.

2 – With reference to APPROVED PLAN REFERENCE, the footprint of the relocated Spicer Memorial within the RPA of trees 70003, 70122 and 70123 will be measured and accurately marked out on site. This shall be achieved by using landscape pegs, spray paint, or another similar form of identification and marking out.

Root Pruning

1 – Exposed roots with a diameter of 25 millimetre or smaller may be pruned and excavations and construction can continue. Roots must be pruned with a sharp and sterile pair of secateurs and/or hand-loppers by Bartlett Consulting.

2 – Roots with a diameter greater than 25 millimetres, or massed bundles of fibrous roots, cannot be pruned and must be retained. These roots must be covered with hessian and kept wet during periods of no rain or during the winter when frost damage can occur, while exposed. Alternatively they should be covered over with backfill while completing working in the area.

2A – A decision will be made by Bartlett Consulting whilst on-site, as to the appropriateness of this type

of root pruning and cumulative impacts on the London Plane tree(s).

2B – Alternative, foundation design will have to be revised to accommodate these tree roots.

Figure 10: Image Showing Bartlett Tree Experts Employing Air-spade in Root Protection Area

REPORT CLASSIFICATION: Arboricultural Method Statement (Ref: 190092.AMS.ver.5)

REPORT STATUS: DRAFT

REPORT COMPLETED BY: Jason Hasaka
Arboricultural Consultant

SIGNATURE: **DATE: 01.09.2020**

REPORT COMPLETED BY: James Percy-Lancaster
Arboricultural Consultant

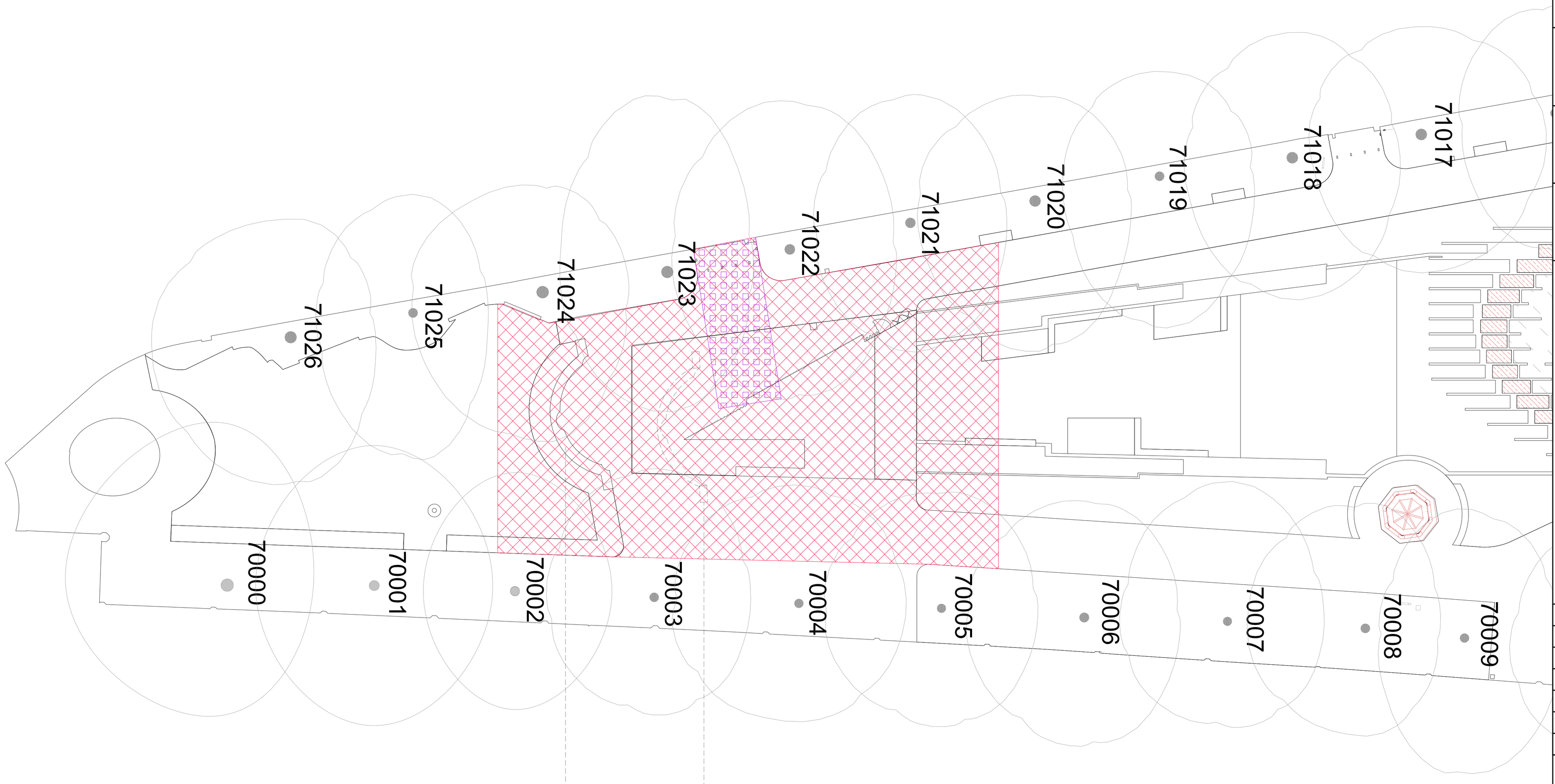
SIGNATURE: **DATE: 01.09.2020**

APPENDIX 01 – TREE PROTECTION PLANS

Tree Protection Plan 01:	Spicer Memorial – Ground Protection
Tree Protection Plan 02:	Spicer Memorial – Vertical Barriers & Storage Compound
Tree Protection Plan 03:	Footpath Improvements – Ground Protection and Work Flow
Tree Protection Plan 04:	Footpath Improvements – Overall Tree Protection Plan
Tree Protection Plan 05:	Footpath Improvements – Trees with Wrapped Stems

NOTE: Plan will be inserted sized A3 after this cover page as report provided electronically.

APPENDIX 02 – SITE SUPERVISION FORM



Existing location of Spicer memorial

Proposed location of Spicer memorial

General Notes:

Drawing to be read in conjunction with the specification and all relevant drawings.

Do not scale from this drawing.

Contractor to check all dimensions on site. Adjaye Associates to be advised of any discrepancies between this drawing and site conditions immediately.

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Ground protection Type 1
(up-to 2 Tonnes)
Ground protection Type 2
(over 2 Tonnes)

revision	date	by	chkd	appr	description

Status:
D2 ISSUED FOR TENDER

Rev.:
T00

Client:
UK Holocaust Memorial Foundation

Project:
UK Holocaust Memorial and Learning Centre

Drawing Title:
TPP 01

Drawing No.:

Scale: 1 : 200 @ A1

Drawn By: CDe

Date: 27.08.2020

Checked By: KL

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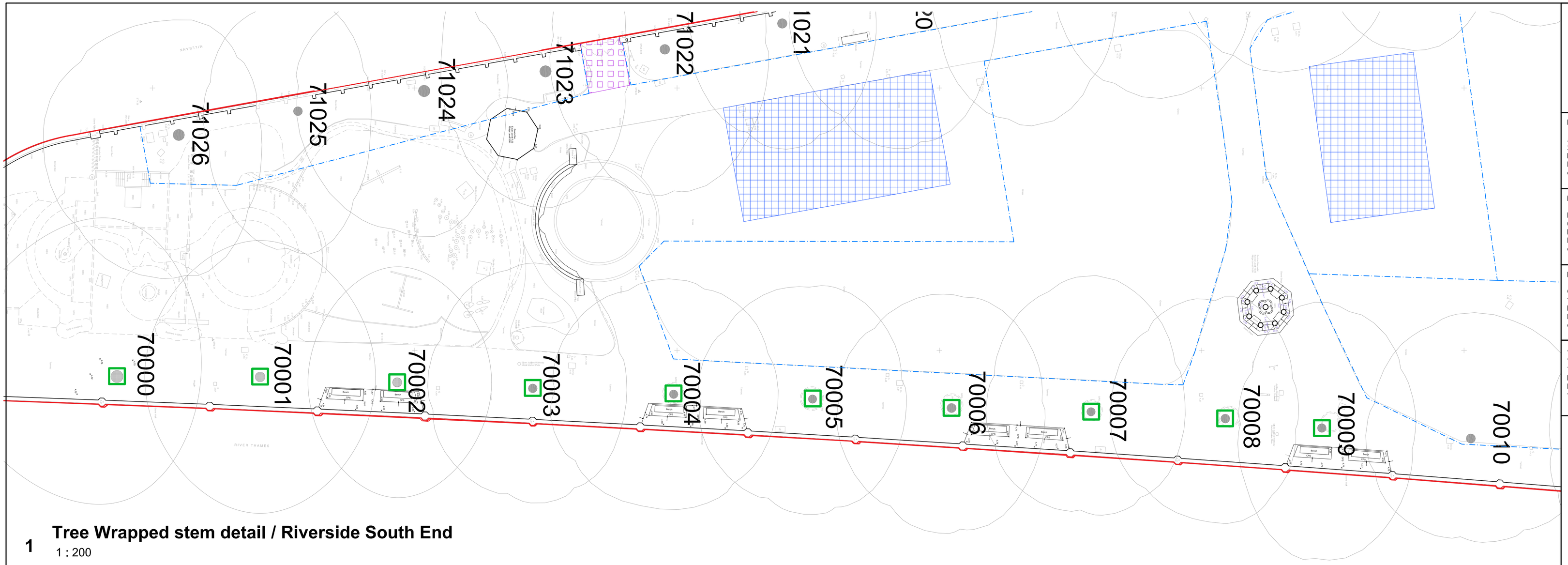
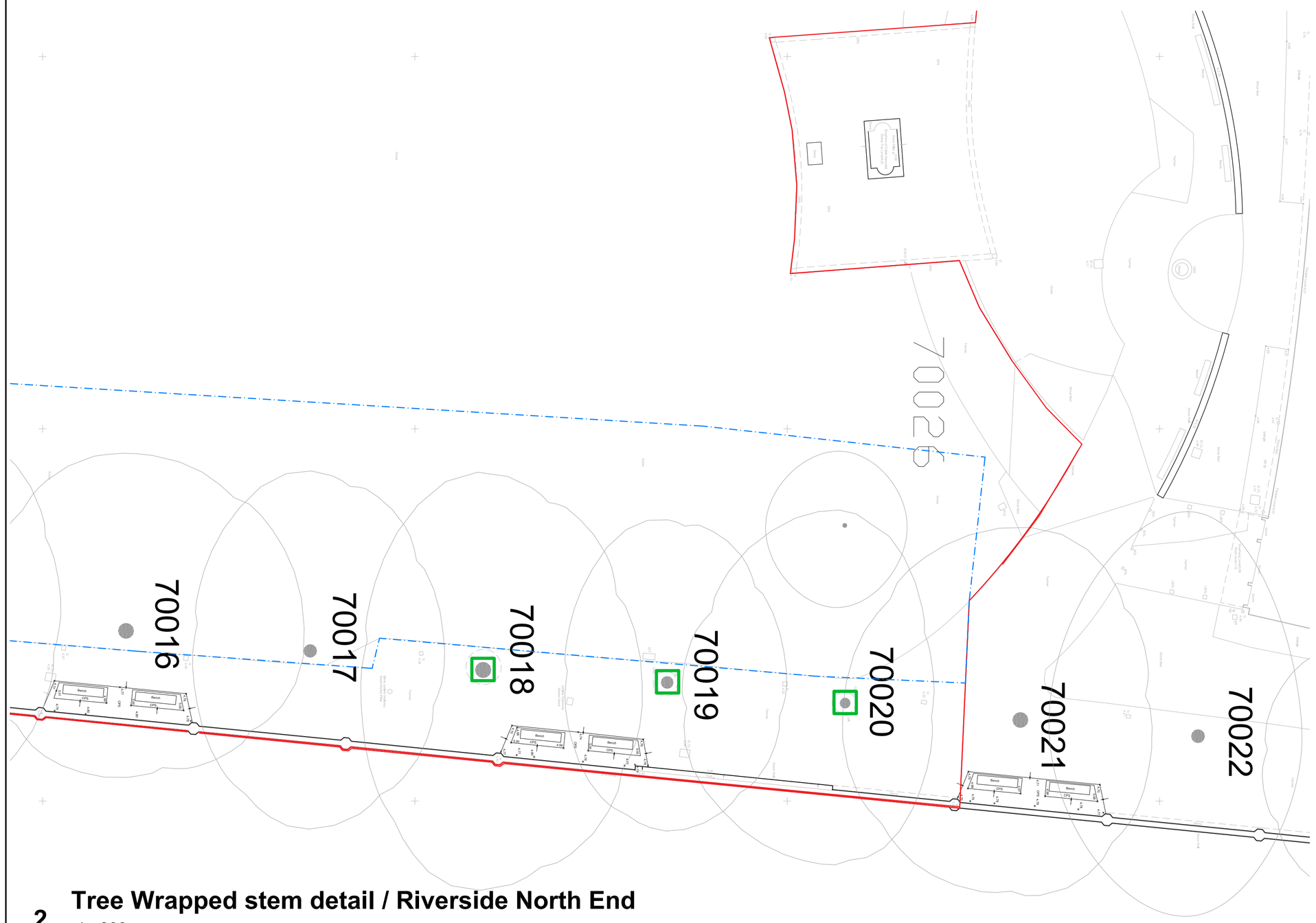


1 **Tree Wrapped stem detail / Riverside South End**
1 : 200



2 **Tree Wrapped stem detail / Riverside North End**
1 : 200

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Tree Protection Plan Overall Setup

- Storage Area
- Ground protection Type 2 (over 2 Tonnes)
- Vertical Barrier
- Tree Wrapped Stem
- Project boundary

revision	date	by	chkd	appr	description

Status: D2 ISSUED FOR TENDER
Rev.: T00

Client: UK Holocaust Memorial Foundation

Project: UK Holocaust Memorial and Learning Centre

Drawing Title: TPP 05

Drawing No.:

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Date: 27.08.2020
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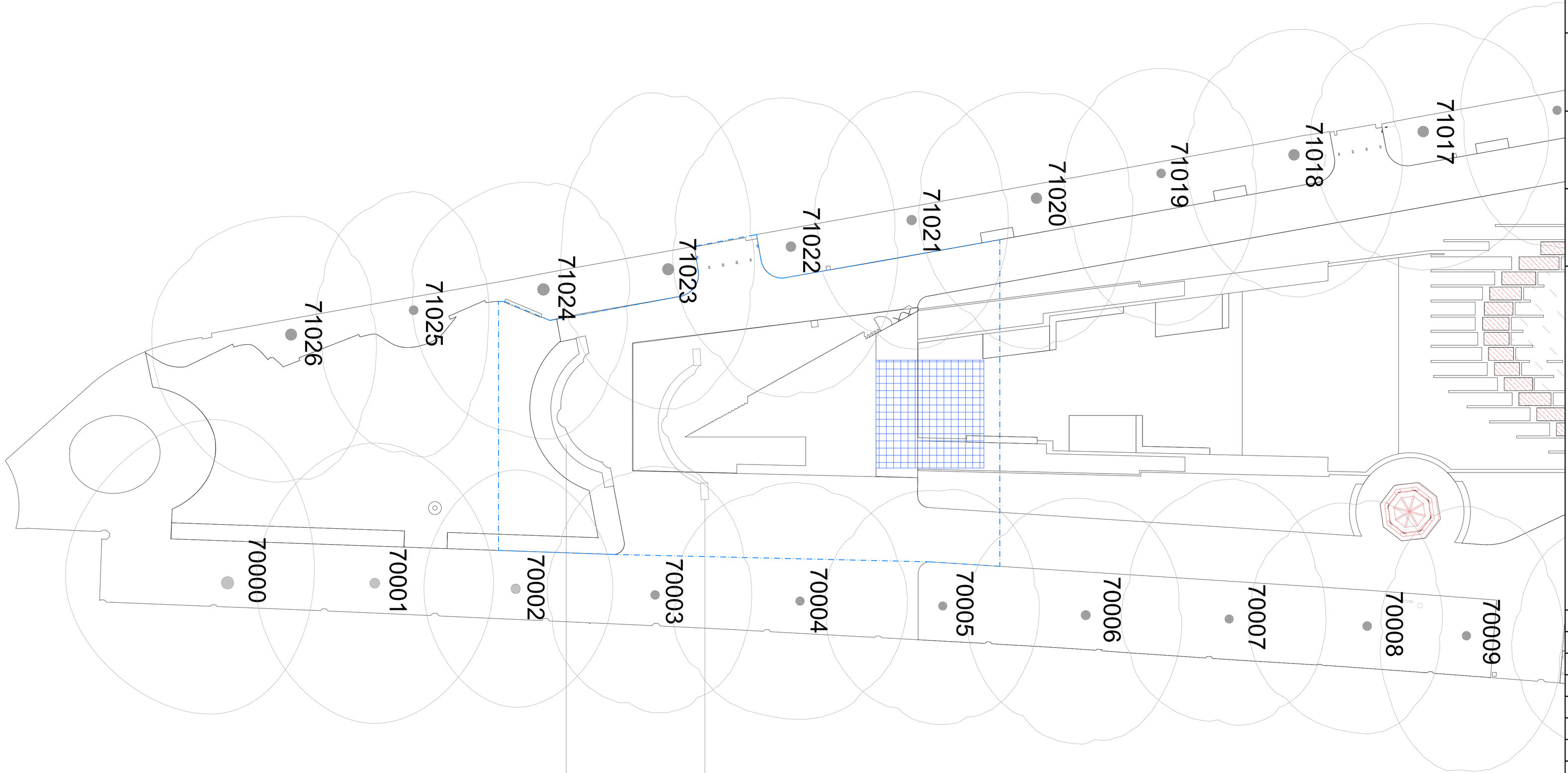

Existing location of Spicer memorial

Proposed location of Spicer memorial

General Notes:

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Tree protective barriers

Temporary storage area

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Rev.: T00

Client: UK Holocaust Memorial Foundation

Project: UK Holocaust Memorial and Learning Centre

Drawing Title: TPP 02

Drawing No.:

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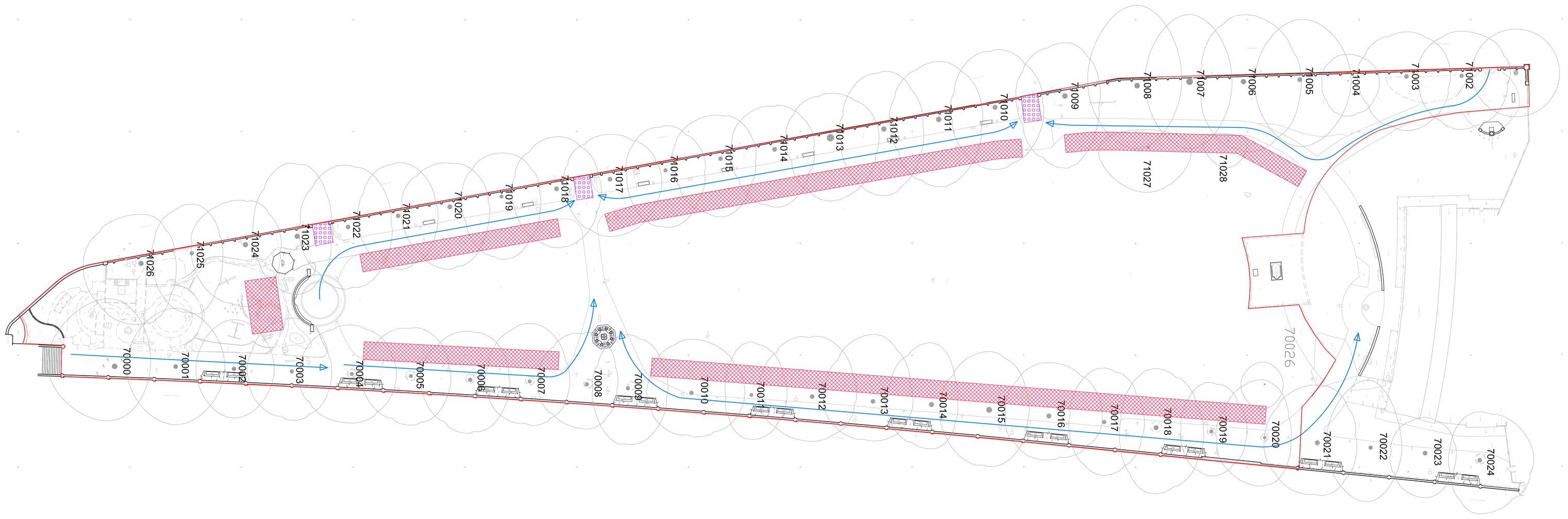

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Footpath Improvements Work Flow
VOGT Ground Protection

- Ground protection Type 1 (up-to 2 Tonnes)
- Ground protection Type 2 (over 2 Tonnes)
- Work Flow
- Project boundary

revision	date	by	chkd	appr	description

Status: D2 ISSUED FOR TENDER

Rev: T00

Client: UK Holocaust Memorial Foundation

Project: UK Holocaust Memorial and Learning Centre

Drawing Title: TPP 03

Drawing No.:

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Date: 27.08.2020

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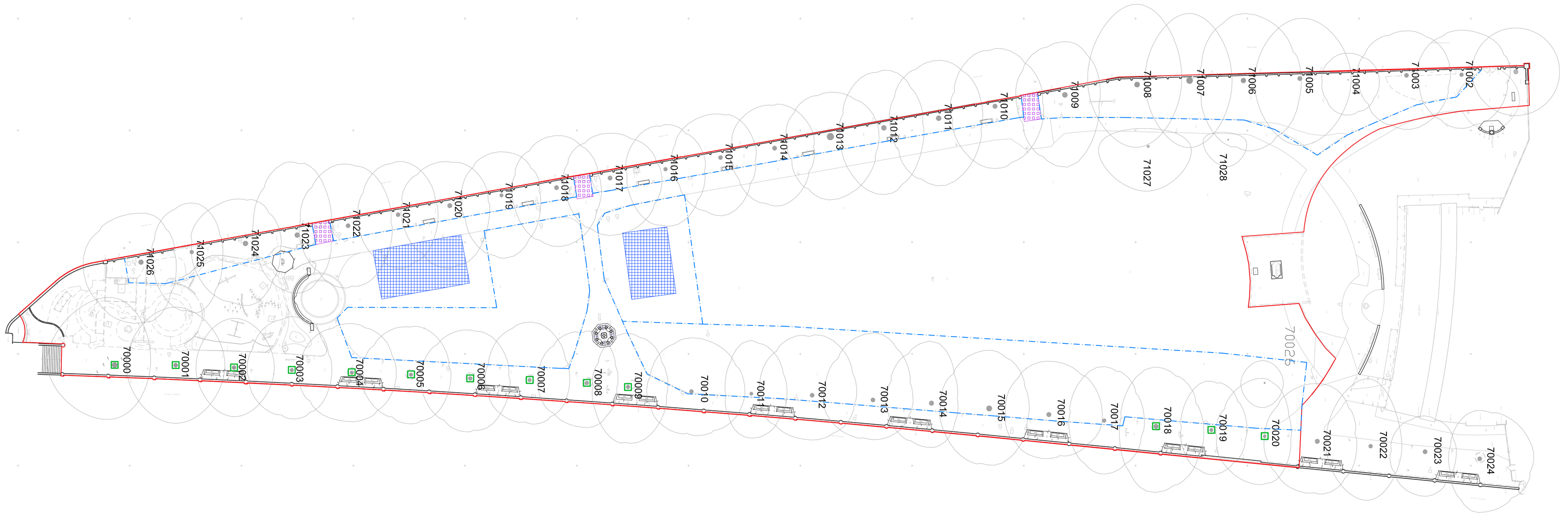

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Tree Protection Plan Overall Setup

- Storage Area
- Ground protection Type 2 (over 2 Tonnes)
- Vertical Barrier
- Tree Wrapped Stem
- Project boundary

revision	date	by	chkd	appr	description

Status: D2 ISSUED FOR TENDER

Rev.: T00

Client: UK Holocaust Memorial Foundation

Project: UK Holocaust Memorial and Learning Centre

Drawing Title: TPP 04

Drawing No.:

Scale: 1 : 500 @ A1

Drawn By: CDe

Date: 27.08.2020

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email: enquiries@gp-b.com

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BARTLETT CONSULTING – SITE ARBORICULTURAL MONITORING FORM

Arboricultural Consultant's Details	
Consultant's Name: Tel: Mobile:	
Development Site Details	
Address: Planning Application Ref:	
Local Authority Details (LPA):	
LPA: LPA Tree Officer: LPA Planning Case Officer/ Contact:	
Developer's Details	
Developer name: Address:	
Contractor Details:	
Contractor name: Contact name:	
Date & Time of Visit	
Stage of Development	
Purpose of Visit	
Protective Barriers	
Ground Protection	
Soil Compaction	
Any Damage to Retained Trees	
Other Pertinent Notes	
Photos Attached	
Any Further Action Required:	
Date of Next Site Visit:	

Signature:

Date: