

Havant Thicket Reservoir

Arboricultural Impact Assessment and Tree Protection Plan

Main Reservoir Works

02.02.2024 | Rev 2

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Revision history

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Havant Thicket Reservoir Arboricultural Impact Assessment Overview

1.0 Introduction

- 1.1 This report has been commissioned following completion of the detailed design for Havant Thicket Reservoir (HTR), its northern and southern embankments, the proposed southern access road (SAR) and the associated infrastructure.
- 1.2 The purpose of the report is to undertake a detailed Arboricultural Impact Assessment (AIA) along with a full standalone Tree Protection Plan (TPP) and Arboricultural Method Statement (AMS) in accordance with planning condition 27 of the granted planning consent (see Havant Borough Council reference APP/20/00990). The report follows the principles of British Standard 5837:2012 *Trees in relation to design, demolition and construction – Recommendations*.
- 1.3 The site has already been subject to an extensive and thorough Arboricultural Impact Assessment (Atkins document reference: HTR-ATK-ZZ-ZZ-RP-L-0001, dated 30th June 2022), in line with British Standard 5837:2012, which forms part of the Environmental Statement. Table A within this Advanced Arboriculture Ltd document includes information about the trees which are likely to be impacted by the works and the trees which will require protection during the construction works; the tree locations and numbering used within this report are as per the Atkins data.
- 1.4 The whole site was inspected at the end of September 2023 by Tom Hurley, BSc(For)Hons, Senior Consultant for Advanced Arboriculture Ltd.
- 1.5 This document has been prepared based on information provided by Future Water Ltd throughout 2023 leading up to the time of writing this report. It is the responsibility of the project management team to draw any changes in the project scope to our attention at the earliest opportunity if there is a potential of impacting the tree protection zones.
- 1.6 Trees are dynamic structures and advice should be taken on validity two years after the survey was undertaken. Tree condition assessments contained within the report may not be considered valid after more than three years from the date of publication.
- 1.7 The scheduling and implementation of the tree protection measures detailed in the report also remains the responsibility of the Future Water project management team. Whilst the Future Water project team may appoint a suitably qualified third-party arboricultural supervisor, Advanced Arboriculture Ltd are able to take on this role subject to the project manager's formal instruction.
- 1.8 The tree works prescribed are associated only with the HTR project. General commercial or amenity works within Havant

Thicket, Staunton Country Park or on the eastern or western site boundaries will still be required but are beyond the scope of this document. The installation of the new Bedhampton pipeline is covered by a separate planning application.

- 1.9 Advanced Arboriculture Ltd shall not be held liable for any unauthorised deviation from the tree protection measures and scheduling detailed within this report.
- 1.10 Whilst this document embraces the principles of British Standard 5837:2012, it acknowledges that the site already benefits from a heavy-duty perimeter security fence comprising Heras panels secured using security clamps, with at least every fourth panel connected to a scaffold pole driven into the ground. This physical barrier, alongside a robust site management system which includes daily checks of the fencing, provides a barrier which is considered at least as effective as the fencing specification detailed within figure 3 of British Standard 5837:2012. Accordingly, where boundary fencing is already set in a location whereby it is providing protection for adjacent trees, this shall be retained for the remainder of the project. However, any additional fencing shall comply with the British Standard (see Arboricultural Guidance Sheet AGS101 within appendix C).
- 1.11 Advanced Arboriculture Ltd noted the presence of a significant number of Ash trees on and adjacent to the site. Ash Dieback Disease (ADD) is now widespread throughout the south of England, though specific symptoms are not always obvious on more mature trees. The rate of decline of infected trees and the long-term prognosis for the health of Ash trees generally is currently uncertain. Some sources suggest that the UK may experience losses of up to 90% or more of its Ash trees in some areas. Woodland trees, in particular, appear to be particularly prone to decline. Once infected, trees can decline rapidly and quickly lose their structural integrity. On reaching less than 50% of their normal foliar density, they are likely to require removal where they pose a threat to persons or property. Such trees can become unpredictable and dangerous to fell or to dismantle using normal rope access techniques, and may thus require removal using a Mobile Elevated Work Platform (MEWP) or other machinery. Hence, where trees in an early stage of infection are in locations that are inaccessible to machinery and would pose a risk to persons or property if they declined further, it may be appropriate to consider their pre-emptive removal while it is still possible to deal with them safely using conventional techniques.
- 1.12 On those sites where Ash trees are present within falling distance of significant targets, they should be inspected regularly due to the potentially rapid decline which can occur with ADD. Should any Ash trees on site show signs of rapid defoliation or dieback then further advice from an experienced

arboriculturist should be sought. When considering the longer-term management of Ash trees on a site, our advice is that, where such trees are within falling distance of significant targets or otherwise present a significant constraint to the site, then lesser quality trees are unlikely to be worthy of consideration for longer term retention.

2.0 Arboricultural Impact Assessment - Overview

- 2.1 For the purposes of the Arboricultural Impact Assessment and the Tree Protection Plan, the site has been divided into 35 separate management zones, numbered 1 through 35. Each of these has been assessed in detail, as per Table A attached. Due to the size of the site, the Arboricultural Impact Assessment Plans and Tree Protection Plans have been broken down into 22 sections, each at a scale of 1:750 at A3, lettered A through V. The Arboricultural Impact Assessment Plans are presented in Appendix B and the Tree Protection Plans in Appendix C.
- 2.2 Tree removal to date has been largely completed by Portsmouth Water (PW) as part of the enabling works. At present, the site compound is located off Swanmore Road, but, with the completion of the northern access road (NAR) through Havant Thicket, the site compound, along with temporary staff accommodation, will be relocated to the north-western corner of the site.
- 2.3 As the proposed engineering works affect areas of woodland in addition to individual trees, it is not practicable in most cases to specify tree works on a tree-by-tree basis. Accordingly, and as per the Arboricultural Impact Assessment contained within the Environmental Statement of September 2020 (Environmental Statement volume 4, appendix A9.1), works to areas or blocks of trees are described by approximate area and species mix, rather than specifying numbers of individual trees. Where felling boundaries are shown, these are referenced relative to known points, for example the pegged-out final water limit in zones 8 and 13.
- 2.4 Where practicable, all tree works will need to be completed during the late-autumn or winter prior to the commencement of any given engineering works or flooding, so as to avoid disturbing nesting birds. However, this scheduling may be subject to further refinement to minimise impact on other ecological constraints.

3.0 Western Boundary and Southern Access Road AIA

- 3.1 The western boundary includes zones 1 through 3 and zones 33 and 34 (see Arboricultural Impact Assessment plans A through F for zones 1 through 3 and T, U and V for zones 33 and 34 in Appendix B). The most significant impact on trees is limited to Zone 1 on the western boundary and is associated with the construction of the Southern Access Road between Swanmore

- Road and the site compound. This has been designed to sweep around the outsides of the root protection areas of Oaks T123 and T124; these are important amenity trees due to their proximity to the public footpath which runs to the west of the HTR site.
- 3.2 The SAR requires the clearance of an area of trees and vegetation at the northern end of group G125. The affected trees are all young or early-mature stems, along with mixed understorey scrub. The individual trees of note to be removed include a total of three good Oaks and one good Field Maple, along with a larger, very poor-quality Goat Willow. The remainder are all young, etiolated stems, including significant numbers of Ash, though none are individually worthy of note. The likely clearance of Ash in due course will effectively achieve a silvicultural thinning.
- 3.3 The services originating off Swanmore Road for the new site compound can be routed to the east of the new SAR as it sweeps into the site, before being ducted beneath the SAR and following alongside the existing Heras boundary fence to the north-western corner of the site.
- 3.4 The construction and subsequent operation of the SAR and the western swales will require the cutting back of some overgrown vegetation from within groups G116, G119, G121 and G125 (zones 1 through 3). This includes the stems to the north of the point where the existing footpath enters the site. The affected trees are almost exclusively Goat Willow and any pruning back will have a negligible detrimental impact on the long term retention of these robust boundary stems. Only pruning is required with no actual tree removal anticipated.
- 3.5 With the exception of the clearance of a section of G125 to accommodate the SAR, the overall impact of the proposals on the western boundary is considered minimal. Whilst the new SAR will require the removal of trees, this can be mitigated by means of new plantings within this area.
- 3.6 The existing western boundary fencing is set sufficiently far away from the perimeter trees as to provide a robust line of protection which remains absolutely fit for purpose. The fencing around the SAR entrance point will need to be reconfigured using braced Heras (see Arboricultural Guidance Sheet AGS101) as shown on inset A of the Tree Protection Plans (see Appendix C).
- 4.0 Northern Embankment and Wetland AIA**
- 4.1 The northern embankment and wetland includes zones 5 through 19 (see Arboricultural Impact Assessment plans F through L in Appendix B). The significant majority of the tree removal works required for the proposed engineering and flooding of the northern embankment and wetland have already been completed, however, there are still some areas of trees which require partial felling. Details for zones 8, 13 and 17 are provided within Table A with detailed plans in Appendix B.
- 4.2 Only partial felling of zones 10 and 16 has been undertaken to date, even though the final waterline affects both zones to some

- extent. In the case of zone 10, it is recommended that the Oaks within the waterline be retained and allowed to die naturally. Their location is such that public access is expected to be minimal and thus any risk of harm associated with eventual collapse of any stems is expected to be very low; the remainder of the stems within the waterline of zone 10 are considered insufficiently durable for retention in a riparian environment. As per the Arboricultural Impact Assessment contained within the Environmental Statement, it is recommended that all of zone 16 is cleared as none of the trees present are expected to be viably retained due to the proximity of the waterline.
- 4.3 Zones 8 and 13 feature established woodland which will be flooded as the reservoir fills up. Again, some of these trees can be retained as a standing deadwood habitat, though beyond a certain point (7.5m beyond the waterline for zone 8 and 5.0m beyond the waterline for zone 13), the practicalities of future management of any standing deadwood becomes challenging so clear felling is unavoidable. In the shallower zones, and along the shoreline, some trees can be retained and this is detailed in further detail in the zone by zone data tables (see Table A).
- 4.4 Two sections of the Forestry England track will need to be raised to keep them above the finalised waterline. These are located within zones 6 and 8.
- 4.5 In the case of zone 6, all of the trees to the south of the track will need to be cleared, though these are all small, young specimens. Their removal could be mitigated by means of replacement plantings, though it may be deemed more desirable from an amenity perspective to keep this area cleared due to the vista out across the reservoir from the raised section of track. One Oak, one Ash and three Goat Willows will need to be cleared from the northern side of the track to accommodate the engineering works; all of these are relatively young specimens and their loss will have a negligible detrimental impact on the visual amenity value of the local landscape as dense woodland will be retained immediately to the north.
- 4.6 The northern embankment breaches the northern treeline in two locations, zone 7 to the west and zone 17 to the east. The affected trees in zone 7 comprise Silver Birch and Goat Willow stems while zone 17 includes almost entirely Goat Willow stems which were originally managed as a flailed hedge but have been allowed to lapse over time.
- 4.7 In terms of overall woodland footprint loss along the northern side of the site, a total of 150m² of zone 7 is shown for removal by PW. A further 8,500m² of zone 8 and 3,000m² of zone 13 are to be cleared of commercial conifers (Norway Spruce and Corsican Pine) by PW, though these only represent a small proportion of the overall canopy cover and the works are not therefore dissimilar to a silvicultural thinning from a woodland management perspective; even with the loss of these trees, the lower strata canopy cover will remain largely intact.

- 4.8 The loss of trees along the northern side of the site has already been mitigated by the transplanting of trees from The Avenue into zones 11, 14 and 18 by PW. The creation of a more convoluted woodland edge also offers new habitat opportunities where there is far more shelter from the prevailing winds and direct sunlight.
- 4.9 The existing northern boundary fencing is in most cases set sufficiently far away from the perimeter trees as to provide a robust line of protection which remains absolutely fit for purpose. The fencing in zones 6, 7 and 17 will need to be reconfigured prior to the commencement of any engineering works using braced Heras (see Arboricultural Guidance Sheet AGS101) as shown on insets G, H and J of the Tree Protection Plans in Appendix C. It is also assumed that the fencing within zones 8, 10, 13 and 16 will be removed prior to flooding, but will not need to be replaced from a tree protection perspective, even if it is relocated to satisfy public safety issues.
- 4.10 The raising of the Forestry England track will require braced Heras fencing to the north of the track in zone 6 and to the north and south of the track in zone 8, as shown in insets G and H respectively (see Appendix C).

5.0 Eastern Boundary AIA

- 5.1 The eastern boundary includes zones 20 through 23 (see Arboricultural Impact Assessment plans L through N in Appendix B). This is an area which features very few trees within the site itself, and those trees within zones 20 through 22 are all located on the opposite side of the robust and heavily compacted track leading up into Havant Thicket. Zone 23 comprises an area of advance planting which is establishing well.
- 5.2 No trees require felling or pruning to accommodate the engineering proposals, though it is noted that care will be required when working in close proximity to this public right of way.
- 5.3 The existing eastern boundary fencing is set sufficiently far away from the perimeter trees and provides an adequate line of protection. The two sections of fencing that step out into the site at the south-eastern end of zone 21 are expected to need to be pulled into the edge of the track to enable the construction of the main embankment. Also, a section of fencing is required to the north-east of the public right of way for the duration of the construction required for the connection of the new track to the existing track. All new sections of reconfigured fencing shall use braced Heras (see Arboricultural Guidance Sheet AGS101) as shown on inset M in Appendix C.

6.0 Main Embankment and Southern Boundary AIA

- 6.1 The southern boundary and main embankment comprises zones 24 through 33, along with zone 34 and zone 35 (see Arboricultural Impact Assessment plans N through V, plus E in Appendix B). This is an area in which extensive tree works have already been undertaken.

- 6.2 The design of the main embankment has evolved to ensure that there is no incursion into the root protection areas of any retained trees or woodland, either for the structure itself, or for its associated access tracks and any temporary works. Accordingly, no further trees require removal from within the retained section of The Avenue, and the northern face of Round Wood remains as-is.
- 6.3 The sections of Ancient and Semi-Natural woodland which comprise Round Wood and the northern edge of Staunton Country Park do not contain any ancient or veteran trees in close proximity to the site boundary, with almost all of the trees within any potential construction zone of influence having been planted probably post-war. Whilst the existing Heras boundary fencing provides an effective layer of protection for those trees within zones 24, 25, 27, 30 and 31, a formalised secondary line of fencing is recommended as shown in insets O through S in Appendix C, noting that this will also protect the layer of ancient woodland soil which was harvested from The Avenue and has now been distributed along the boundary of zone 30.
- 6.4 Effective protection has also already been established for the trees at the base of The Avenue (zone 26). The offset between the northernmost retained trees and the line of boundary Heras fencing which runs approximately east-west is generous and considered fit-for-purpose. The root protection areas of the eastern and western aspects of the retained section of The Avenue are also protected by this fencing, but a formalised secondary line of fencing is desirable in this area to provide additional protection as shown on inset Q in Appendix C.
- 6.5 The proposed route for the Bedhampton pipeline is presently shown cutting across the westernmost extent of Round Wood. This may necessitate the removal of three additional trees at Round Wood once detailed design has been undertaken as part of the Phase 5 Reserved Matters.
- 6.6 The proposed Bedhampton pipeline exits the main site through zone 31. This is covered in a separate planning application.
- 6.7 The installation of the Bedhampton pipeline link will require large excavators and therefore a secondary line of robust fencing will be required to offer appropriate protection to the retained trees either side of the clearance.
- 6.8 A new potable water main needs to be installed, connecting to an existing supply located at the base of The Avenue (zone 26), and extending around the southern and western boundaries before running alongside the new Southern Access Route. Rather than open-trenching through The Avenue, the pipe will be directionally tunnelled from a point approximately 15.0m to the west of the woodland edge to a receiving pit adjacent to the existing pipeline within the woodland. The use of directional tunnelling minimises any risk of harm to tree roots, and whilst the receiving pit is set on the edge of a number of smaller trees' root protection areas, this is considered acceptable subject to the excavations being undertaken using the smallest practicable excavator in accordance with Arboricultural Guidance Sheet AGS405 (attached within Appendix C). The pit must be dug to a size of approximately 1.2m × 1.2m, with the edges then being manually cut back and all roots pruned in accordance with Arboricultural Guidance Sheet AGS403. These works must commence with an arboricultural watching brief in attendance to ensure that any potential for damage to trees is minimised.
- 6.9 The new potable water main remains outside of the root protection areas of any retained trees, running around the northern edge of Round Wood to allow for a connection into the control room.
- 6.10 Zone 35 comprises a swathe of Goat Willow stems which are individually unremarkable but collectively offer some landscape and habitat value. These are unaffected by the proposals, but it is recommended that protective fencing be erected around the entire area as shown on inset T of the Tree Protection Plan in Appendix C to minimise any future risk of harm during construction.
- 6.11 The north-western edge of the main embankment has been redesigned with a shallower batter, and this now impacts marginally on the lone Oak which comprises zone 4. This tree has been diligently retained to date and it is considered appropriate to continue to retain it, noting that its future management within the publicly accessible realm will be dependent on the extent to which it declines or thrives as a consequence of waterlogging.
- 7.0 Remaining Tree Clearance and Pruning Works**
- 7.1 The significant majority of the tree works required to enable the construction of the reservoir have now been completed, however, some tree felling and tree surgery works are still outstanding. While some of these will need to be undertaken at an early stage to enable engineering activities, some, such as the clearance of commercial conifers within zones 8 and 13, can almost certainly be deferred until some point within the twelve months prior to localised activities commencing. The exact timing of any works will be determined in discussion with the project ecologists to ensure that any environmental impact is minimised and that relevant legislation is observed in full.
- 7.2 Where tree surgery is required, all works must comply with British Standard 3998:2010 *Tree Works – Recommendations* and it is strongly advised that the appointed tree contractor is Arboricultural Association Approved.
- 8.0 Tree Protection Measures**
- 8.1 As already detailed in paragraph 1.10, the site already benefits from a robust perimeter fence comprising Heras panels, secured using bolts which require a specialist wrench, with at least every fourth panel (though often every second or third panel) being attached to a scaffolding pole driven into the ground.
- 8.2 In most instances, this fencing is considered to be fit for purpose in terms of the protection which it offers adjacent trees. However, there are sections of the site where the existing fencing is set within the trees' root protection areas, or where it needs to be dismantled to accommodate engineering works or access; these are all shown within the Tree Protection Plans in Appendix C.
- 8.3 Where additional fencing is required as detailed within the Tree Protection Plans in Appendix C, it is recommended that this is constructed in accordance with Arboricultural Guidance Sheet AGS101 (also attached within Appendix C), noting that this is the same as the specification within figure 3 of British Standard 5837:2012.
- 8.4 There are locations, most notably along the southern boundary where secondary buffer fencing is required alongside zones 25, 26 and 27 (See Drawing Insets O, P, Q and R in Appendix C), where the AGS101 specification can be substituted with silt fencing (see Arboricultural Guidance Sheet AGS111 attached) or an amended version thereof. The use of a less robust specification will be contingent upon a very clear understanding from all site staff that the construction exclusion zones shown shall remain sacrosanct, and that any fencing shall remain as an absolute barrier to operatives, plant and materials unless expressly permitted by the site manager(s). It is recommended that the specific wording within the site-specific risk assessments and method statements, along with the content of any induction or toolbox talks be drawn up in consultation with the arboricultural supervisor. A model arboricultural induction sheet is included within the Tree Protection Statement detailed in Appendix C of this document and can be amended or modified to suit the project's established processes and documentation.
- 8.5 The existing programme of daily site fencing inspections must continue throughout the project and must include the tree protection fencing as well as the boundary security fencing. Any issues must be reported to the site management team for immediate rectification.
- 9.0 Arboricultural Site Supervision**
- 9.1 It is acknowledged that a carefully and comprehensively managed project of this scale is able to minimise any risk of harm to trees. Procedures and mitigation measures to monitor and control environmental impacts throughout construction are provided in the Construction Environment Management Plan (CEMP) and the supporting management plans. However, there is still an ongoing risk of harm to retained trees and even well-intentioned actions by operatives on site can result in significant or even unsustainable harm to trees for the duration of the project; these risks shall be managed and minimised through the adoption of good site practices and adherence to the CEMP.
- 9.2 It is recommended that a regular programme of arboricultural oversight is implemented (i.e. quarterly site visits). The purpose of this shall be for an experienced arboricultural consultant to visit the site and check all of the working zones for any issues that may arise, along with any unforeseen potential for harm to the retained tree stock. In the event of engineering and

construction activity changes which may affect the tree protection zones, these will need to be brought up to the attention of a suitably qualified arboriculturalist to agree the appropriate protection measures.

- 9.3 An Arboricultural Supervision Record Sheet must be filled in on an ongoing basis and retained on the site records.

10.0 Conclusions and Recommendations

- 10.1 The evolving engineering design has addressed earlier concerns raised regarding the potential for significant harm to retained trees, most notably those within the Ancient Woodland along the southern boundary.
- 10.2 On the basis of the finalised design, the projected arboricultural and silvicultural impact is mitigated by the extensive replanting proposals as outlined in the project LEMP.
- 10.3 The most significant outstanding arboricultural and silvicultural impacts are as follows:

- The clearance within zone 1 to accommodate the Southern Access Road link between Swanmore Road and the site*;
- The clearance of the vegetation to the south of the Forestry England track within zone 6;
- The clearance of a limited section of vegetation along the southern edge of zone 6 to accommodate the northern embankment;
- The clearance of all Corsican Pines and Norway Spruce in zone 8 within 5.0m of the outside of the finalised waterline**;
- The partial clearance of zone 10 to accommodate flooding;
- The partial clearance of all Norway Spruce within zone 13 within 5.0m of the outside of the finalised waterline**;
- The clearance of zone 17 to accommodate the northern embankment;
- The removal of the three westernmost stems within Round Wood (zone 29) to accommodate the Bedhampton pipe.

The items marked with a single asterisk (thus, *) are items already covered within the Arboricultural Impact Assessment of June 2022 and included within the Environmental Statement (see ES Vol 4 Appendix A9.1 from application reference APP/20/00990). The items marked with a double asterisk (thus, **) are items where the prescribed works are reduced in extent from those included within the Environmental Statement.

- 10.4 Every effort has been made to foresee the full impact of the construction works on the tree stock within and adjacent to the site, however, it has to be acknowledged that on a project of this scale, even minor design or engineering amendments are likely to arise. Engagement between the project team and the appointed arboricultural supervisor at the earliest opportunity is recommended in order to minimise future risk of harm to retained trees and their environments.

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Table A: Havant Thicket Reservoir Zone by Zone Arboricultural Impact Assessment

Zone 1 (See Drawing Insets A, B)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• G119 (part) • G121 • W122 • T123 Oak • T124 Oak • G125 (part)
Tree Removals Required
• The new Southern Access Road (SAR) sweeps into the site from the public highway through the northern end of group G125. The majority of this area comprises relatively poor-quality Goat Willow and Ash stems (many of which are already displaying evidence of established or advanced Ash Dieback Disease). However, there are also a number of young British Standard 5837:2012 category B Oaks and Field Maple stems present at the northern end of the group which will require removal; this includes three Oaks and one Field Maple. Some additional scrub and Goat Willow stems also require removal. • It is recommended that all trees whose trunks are growing within a line 3.5m to the south-east of the new services trench be removed, along with all Ash stems which are in moderate to advanced decline as a consequence of Ash Dieback Disease.
Tree Works Required
• Some lateral pruning back of retained canopies within group G125 will be required to maintain a 2.0m clearance from the south-eastern kerbline of the new SAR. • The eastern aspect of group G125 will also need to be pruned back to the existing Heras fenceline to minimise any risk of contact from mechanical plant excavating the new swale.
Overall Arboricultural Impact
• Some tree loss to accommodate the new SAR is inevitable and unavoidable, though this has been minimised by relocating the service routes and the swale configuration. As a result, the losses of good quality trees are limited to three young Oaks and one young Field Maple, with the remainder of the trees to be cleared being scrubby stems comprising primarily Goat Willow and Ash. • Lateral pruning of primarily Goat Willow stems within group G125, both to accommodate the SAR and along the eastern aspect where they overhang the secure site fencing, will have a negligible detrimental long term impact on these robust specimens. • Oaks T123 and T124 remain outside of the proposed working zone. • No significant mature, ancient or veteran trees require removal in this area.
Existing Tree Protection Measures
• The existing boundary fencing provides robust protection from the significant majority of groups G119, G121 and G125, woodland W122 and Oaks T123 and T124. The section of boundary fencing which presently runs across the route of the SAR will need to be dismantled to accommodate the new access.
Future Tree Protection Measures
• Two new runs of robust protective fencing (either existing boundary fencing specification or as detailed within Arboricultural Guidance Sheet AGS101) will need to be constructed either side of the SAR working corridor towards the public highway prior to future construction works commencing.
Further Comments
• The designs have been modified to minimise any risk of detrimental harm to the key Oaks in this area, these being Oaks T123 and T124.

Zone 2 (See Drawing Inset C)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• G119 (part) • G120
Tree Removals Required
• No tree removals are required within this zone.
Tree Works Required
• Some lateral reduction of the western canopy aspect to the existing boundary fence line of the primarily Goat Willow stems from group G119 will be necessary to prevent any risk of contact from mechanical plant working on the SAR. • These works will have a negligible detrimental long term impact on these robust specimens.
Overall Arboricultural Impact
• The proposals have no arboricultural impact within this zone. • No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
• The existing boundary fencing provides robust protection for all of the trees within zone 2.
Further Comments
• None.

Zone 3 (See Drawing Insets C, D, E, F)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• G116 • W117 • W118
Tree Removals Required
• No tree removals are required within this zone.
Tree Works Required
• Some lateral reduction of the western canopy aspect to the existing boundary fence line of the primarily Goat Willow stems from group G116 in the vicinity of the present footpath diversion will be necessary to prevent any risk of contact from mechanical plant working on the SAR. • These works will have a negligible detrimental long term impact on these robust specimens.
Overall Arboricultural Impact
• The impact of the lateral reduction of the stems at the southern end of group G116 is considered to be negligible. • The trees within woodlands W117 and W118 remain entirely unaffected by the proposals. • No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
• The existing boundary fencing provides robust protection for all of the trees within zone 3.
Further Comments
• None.

Zone 4 (See Drawing Inset E)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
G190 (single Oak)
Tree Removals Required
None.
Tree Works Required
None.
Overall Arboricultural Impact
- This tree has been meticulously protected and retained for the duration of construction to date. However, revised engineering stipulations mean that the toe of the embankment now encroaches into the tree's root protection area and some dieback or decline in this tree's condition is likely, either due to construction activities or soil waterlogging. - Future management of this tree will be dependent on how it responds to the change in its localised environment. The worst-case scenario would see the tree dying completely, in which case it would need to be reduced back to form a standing deadwood resource, utilising coronet cuts to mimic natural fractures. However, assuming the tree continues to thrive, works may be limited to regular removal of larger sections of deadwood where this presents a risk of harm to the public or reservoir personnel. Pull-testing using load cells may be required if there are concerns relating to any significant reduction in the structural integrity of the tree's rooting system.
Existing Tree Protection Measures
The tree is presently set within a robust Heras fencing enclosure. This is likely to need to be realigned to just outside of the revised toe of the main embankment.
Further Comments
It is recommended that this tree be inspected annually for the first five years following the completion of the filling of the reservoir.

Zone 5 (See Drawing Insets F, G)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
No tree removals are required in this zone.
Tree Works Required
No tree works are required in this zone.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 5.
Further Comments
- The tree stock to the south of the Forestry England track in zone 5 comprises relatively poor scrubby stems. - The trees within woodland W197 remain entirely unaffected by the proposals.

Zone 6 (See Drawing Inset G)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
- All stems to the south of the track alongside the section of track to be raised. - One Oak, One Ash and three Goat Willows will need to be removed from the edge of woodland W197 to the north of the track. All of these trees are relatively young.
Tree Works Required
None.
Overall Arboricultural Impact
- None of the trees to be removed are individually or collectively outstanding, and it is noted that the trees to the south of the track are likely to be managed by coppicing on a regular basis irrespective of the reservoir proposals. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The trees are presently protected from the main construction works by the existing robust Heras fencing.
Future Tree Protection Measures
A new line of fencing will need to be established to the north of the engineering works on the track when this construction element of the project commences.
Further Comments
- Zone 6 forms part of the wider woodland. To the south of the Forestry England track, this includes a strip of relatively scruffy stems running along the fenceline including Oak, Turkey Oak, Goat Willow, Field Maple, Silver Birch and occasional Yew. To the north of the Forestry England track, the area comprises a more dense mix of woodland species including Oak, Hazel, Silver Birch, Goat Willow, Ash, Hawthorn and a single Norway Spruce. As with zone 8, the Forestry England track dips down in this area as it passes over the existing narrow stream. This is to be re-engineered to ensure that it remains at an appropriate level above the future water level. - It is inevitable that any track-raising option will result in the loss of trees over and above those to be lost to the floodwaters. The raising of the Forestry England track will result in the clearance of a limited number of trees, though none are expected to be lost to the flooding. The engineering requirements require the removal of one Oak from the northern side of the track, along with three Goat Willows and one Ash. - A larger number of stems will need to be removed to the south of the track, though these are all relatively small and their removal can be mitigated by the provision of new plantings in this area if desired. It may, of course, be preferable to retain this as an open vista across the new reservoir, in which case no new plantings to the south of the track will be required. Whilst trees will be lost to enable the engineering works, none are considered to be individually or collectively outstanding.

Zone 7 (See Drawing Insets G, H)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
A small section of primarily Silver Birch and Goat Willow stems will need to be removed to accommodate part of the northern embankment. All trees whose trunks arise within 3.0m of the toe of the embankment will need to be cleared.
Tree Works Required
None
Overall Arboricultural Impact
- The tree removals are required in an area of W197 which is densely stocked with relatively young trees and the removal of some of these would almost certainly be required in due course as part of scheduled silvicultural thinning works. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The trees are presently protected from the main construction works by the existing robust Heras fencing.
Future Tree Protection Measures
At the time of construction of the northern embankment (proposed as part of future works), a section of the existing boundary fencing will need to be dismantled and a new section set 2.0m off the toe of the embankment to the north of the existing fencing line.
Further Comments
None.

Zone 8 (See Drawing Inset H)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
- The trees within zone 8 are growing within the area which will eventually be flooded. On this basis, it is unrealistic to expect the trees to survive within their newly waterlogged environment though some of the Goat Willows and Hazels may continue to grow due to their tolerance to saturated or riparian environments. - The broadleaves present can be retained, acknowledging that the significant majority of these will decline and die once the area is flooded, however, the beneficial habitat opportunities associated with this are considerable. - Whilst the retention of the broadleaved trees, with their entire canopies, is considered to be highly desirable, the commercial conifer stems present (comprising Norway Spruce and Corsican Pines), are expected to succumb to waterlogging rapidly and these present a potential hazard, both in terms of their collapsing into the canopies of the retained broadleaves, and also falling back onto the shoreline and offering an opportunity for members of the public to walk or climb along them above the water. It is therefore recommended that all of the conifers within a line set 5.0m outside of the final waterline be felled (see the Zone 8 plan within Appendix B). <u>Track Raising</u> The raising of the Forestry England track in due course will result in the clearance of a limited number of trees in addition to those which will inevitably be lost to the flooding. Based on an assessment of the emerging engineering options for the forestry track, it is likely that all Norway Spruce and Corsican Pine within 5.0m of the footprint of the engineering works will need to be removed, along with all other stems within 2.0m of the engineering footprint.
Tree Works Required
No additional tree works required.
Overall Arboricultural Impact
- In total, approximately 8,500m² of woodland is to be cleared of commercial conifers, though this only equates to approximately nine Corsican Pines and two Norway Spruce to the north of the Forestry England Track and approximately 25-30 Norway Spruce to the south of the track. - Whilst trees will be lost to enable the engineering works, none are considered to be individually or collectively outstanding, noting that the commercial conifers have a relatively limited safe useful life expectancy irrespective of either the track raising or flooding works. - As already noted, all of these trees are growing within a wider commercially managed woodland environment, and therefore in the absence of the reservoir project, a series of silvicultural thinnings, followed by clear-felling and restocking would still be expected in a forestry context. - Whilst the flooding limits the opportunities for restocking over time, it also presents some unique opportunities for the creation of new habitats, including utilising standing deadwood monoliths around the fringes of the waterline.
Existing Tree Protection Measures
The exposed, southern aspect of the woodland is presently protected from the main construction works by the existing robust Heras fencing.
Future Tree Protection Measures
- Prior to future construction works commencing, a new line of fencing will need to be established on the outside of the engineering works to raise the track, set 2.0m outside of the toe of the new construction works. - Any additional fencing within the woodland that is required to protect the health and safety of the public visiting this area is beyond the scope of this Arboricultural Impact Assessment. - It is assumed that any safety barriers required to protect the public from felling operations shall be determined by the appointed forestry contractor as part of their detailed risk assessment and method statement.

Zone 8 (continued)
Further Comments
• Zone 8 forms part of the wider woodland. To the south of the Forestry England track, the woodland comprises primarily dense natural regeneration dominated by young Silver Birch and Hazel with occasional young to middle-aged Oaks present and some remnant plantation Norway Spruce. To the north of the Forestry England track, the area comprises very dense young Goat Willow, Oak, Hazel, Blackthorn and occasional Turkey Oaks; there are also remnant forestry conifers in this area including several Corsican Pines and two Norway Spruce. • This area is to be flooded but offers the opportunity for the retention of most trees under a programme of managed decline. • At the point at which any waterlogged trees do eventually fail, it is highly unlikely that their failure would present any risk of harm to the public, and once failed, they would continue to provide a deadwood habitat, albeit partially or fully submerged. • No tree works are considered essential until the October through February period prior to this area being fully flooded; this will minimise any risk of disturbing nesting birds, though checks will still need to be made for bats or any other protected species. The EPS licence holder will need to be informed of any tree works impacting bats or dormice. • On completion of the clearance of the commercial conifers within the flooded zone, the primary hazard will be presented by the prevailing winds from the south and south-west swirling within the clearing and inducing sequential tree failure. • The Forestry England track dips down in this area as it passes over the existing stream. This is to be re-engineered to ensure that it remains at an appropriate level above the future water level; it is inevitable that the track-raising option will result in the loss of trees over and above those to be lost to the floodwaters.

Zone 9 (See Drawing Insets H, I)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
No tree removals are required in this zone.
Tree Works Required
No tree works are required in this zone.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 9.
Further Comments
- The tree stock to the south of the Forestry England track in zone 9 comprises relatively poor scrubby stems. - The trees within woodland W197 remain entirely unaffected by the proposals.

Zone 10 (See Drawing Inset I)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W191 (part)
Tree Removals Required
None.
Tree Works Required
None.
Overall Arboricultural Impact
- Some trees within zone 10 are growing within the area which will eventually be flooded. On this basis, it is unrealistic to expect the trees to survive within their newly waterlogged environment. - There is the potential for the Oaks and Goat Willow in particular to remain standing for some time beyond the point at which they succumb to their waterlogged environment. - At the point at which any retained waterlogged trees do eventually fail, it is highly unlikely that their failure would present any risk of harm to the public, and once failed, they would continue to provide a deadwood habitat, albeit partially or fully submerged. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 10.
Further Comments
- Zone 10 comprises a line of primarily young Oaks extending down towards the south from the wider woodland area. Also present are occasional Beech and Silver Birch, again all young stems. - This area is to be flooded but offers the opportunity for the retention of some trees under a programme of managed decline, subject to ecological scrutiny and agreement. - On completion of the clearance of trees within the flooded zone, the primary hazard will be presented by the prevailing winds from the south and south-west hitting the more exposed retained stems.

Zone 11 (See Drawing Inset I)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
This area was formerly commercial forestry plantation but is now occupied by young transplants taken from The Avenue. These are presently stabilised using guy lines.
Tree Removals Required
- No tree removals are required to accommodate the proposed engineering works. - Trees which have failed to establish following transplanting will need to be removed as part of a programme of standard tree management.
Tree Works Required
None.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 11.
Further Comments
- The trees in this area will eventually form part of the reservoir wetland shoreline. - Those transplants which successfully establish will have a heritage directly linked with The Avenue.

Zone 12 (See Drawing Inset I)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
No tree removals are required within zone 12.
Tree Works Required
No tree works are required within zone 12.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The trees within zone 12 are already afforded ample protection from the trees within zones 9, 11 and 13.
Further Comments
This section of woodland can continue to be managed commercially by Forestry England.

Zone 13 (See Drawing Inset I)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
- W191 (part) - W197 (part)
Tree Removals Required
- The trees within zone 13 are growing within the area which will eventually be flooded. On this basis, it is unrealistic to expect the trees to survive within their newly waterlogged environment though some of the Goat Willows and Hazels may continue to grow due to their tolerance to saturated or riparian environments. - The broadleaves present can be retained, acknowledging that the significant majority of these will decline and die once the area is flooded, however, the beneficial habitat opportunities associated with this are considerable. - Whilst the retention of the broadleaved trees, with their entire canopies, is considered to be highly desirable, the Norway Spruce stems present are expected to succumb to waterlogging rapidly and these present a potential hazard, both in terms of their collapsing into the canopies of the retained broadleaves, and also falling back onto the shoreline and offering an opportunity for members of the public to walk or climb along them above the water. It is therefore recommended that all of the conifers within a line set 5.0m outside of the final waterline be felled (see the Zone 13 plan within Appendix B).
Tree Works Required
No additional tree works required.
Overall Arboricultural Impact
- In total, approximately 3,000m² of woodland is to be partially cleared though this only equates to a small number of Norway Spruce stems. - No significant mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The exposed, southern aspect of the woodland is presently protected from the main construction works by the existing robust Heras fencing.
Future Tree Protection Measures
- None. - Any additional fencing within the woodland that is required to protect the health and safety of the public visiting this area is beyond the scope of this Arboricultural Impact Assessment. - It is assumed that any safety barriers required to protect the public from felling operations shall be determined by the appointed forestry contractor as part of their detailed risk assessment and method statement.
Further Comments
- Zone 13 forms part of the wider woodland and comprises primarily Goat Willow and Silver Birch at the southern end, transitioning more to Oak, Beech, Silver Birch with occasional Norway Spruce further to the north. Occasional Holly are present within the understorey layer. - The tree stock is growing at an open spacing suggesting that silvicultural thinning has taken place in the past. - This area is to be flooded but offers the opportunity for the retention of the broadleaved trees, with their entire canopies left intact, under a programme of managed decline, subject to ecological scrutiny and agreement. - At the point at which any waterlogged trees do eventually fail, it is highly unlikely that their failure would present any risk of harm to the public, and once failed, they would continue to provide a deadwood habitat, albeit partially or fully submerged. - No Norway Spruce clearance works are considered essential until the October through February period prior to this area being fully flooded; this will minimise any risk of disturbing nesting birds, though checks will still need to be made for bats or any other protected species. The EPS licence holder will need to be informed of any tree works impacting bats or dormice. - On completion of the clearance of Norway Spruce within the flooded zone, the primary hazard will be presented by the prevailing winds from the south and south-west swirling within the clearing and inducing sequential tree failure, however, it should be possible to minimise this by means of the thinning of the trees along the waterline margin as part of the preparation of this zone for flooding.

Zone 14 (See Drawing Insets I, J)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
This area was formerly commercial forestry plantation but is now occupied by young transplants taken from The Avenue. These are presently stabilised using guy lines.
Tree Removals Required
- No tree removals are required to accommodate the proposed engineering works. - Trees which have failed to establish following transplanting will need to be removed as part of a programme of standard tree management.
Tree Works Required
None.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 14.
Further Comments
- The trees in this area will eventually form part of the reservoir wetland shoreline. - Those transplants which successfully establish will have a heritage directly linked with The Avenue.

Zone 15 (See Drawing Insets I, J)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
No tree removals are required within zone 15.
Tree Works Required
No tree works are required within zone 15.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
- The trees within the bulk of zone 15 are already afforded ample protection from the trees within zones 14 and 19. - The limited section of woodland edge in the south-eastern corner of zone 15 is afforded good protection by the existing robust Heras boundary fencing.
Proposed Future Tree Protection Measures
At the time of construction of the northern embankment (proposed as part of future works), a section of the existing boundary fencing will need to be dismantled and a new section set 2.0m off the toe of the embankment to the north of the existing fencing line.
Further Comments
This section of woodland can continue to be managed commercially by Forestry England.

Zone 16 (See Drawing Inset J)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W191 (part)
Tree Removals Required
None.
Tree Works Required
No tree works are required.
Overall Arboricultural Impact
- Some trees within zone 16 are growing within the area which will eventually be flooded. On this basis, it is unrealistic to expect the trees to survive within their newly waterlogged environment. - There is the potential for the Oaks and Goat Willow in particular to remain standing for some time beyond the point at which they succumb to their waterlogged environment. - At the point at which any retained waterlogged trees do eventually fail, it is highly unlikely that their failure would present any risk of harm to the public, and once failed, they would continue to provide a deadwood habitat, albeit partially or fully submerged. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing provides robust protection for all of the trees within zone 16.
Further Comments
- Zone 16 comprises a line of young Silver Birch and Goat Willow with occasional Beech and Oak stems. These trees formed the southern edge the wider contiguous woodland canopy prior to the felling of the commercial conifer compartment to their north. - This area is to be flooded but offers the opportunity for the retention these trees under a programme of managed decline, subject to ecological scrutiny and agreement. - On completion of the clearance of trees within the flooded zone, the primary hazard will be presented by the prevailing winds from the south and south-west hitting the more exposed retained stems.

Zone 17 (See Drawing Inset J)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
Remove all stems to the south of the track within the section extending from the gateway at the western end to a line approximately 17m to the east.
Tree Works Required
No further tree works are required.
Overall Arboricultural Impact
- There are not considered to be any individually or collectively outstanding stems present within this area. - No significant mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 17.
Future Tree Protection Measures
At the time of construction of the northern embankment (proposed as part of future works), a section of the existing boundary fencing will need to be dismantled and a new section set 2.0m off the toe of the embankment to the north of the existing fencing line.
Further Comments
- The stems within zone 17 once formed a hedgerow managed by tractor-mounted flail, separating the rough pasture from the woodland of Havant Thicket. - The management by flailing has lapsed for some years now and the parent stems have produced a profusion of growth which will become increasingly brittle and prone to failure over time.

Zone 18 (See Drawing Insets J, K, L)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
This area was formerly rough pasture but is now occupied by young transplants taken from The Avenue. These are presently stabilised using guy lines.
Tree Removals Required
- No tree removals are required to accommodate the proposed engineering works. - Trees which have failed to establish following transplanting will need to be removed as part of a programme of standard tree management.
Tree Works Required
None.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
The existing boundary fencing and deer fencing provides robust protection for all of the trees within zone 11.
Further Comments
- The trees in this area will eventually form part of the reservoir wetland shoreline. - Those transplants which successfully establish will have a heritage directly linked with The Avenue.

Zone 19 (See Drawing Insets J, K, L)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W197 (part)
Tree Removals Required
No tree removals are required within zone 19.
Tree Works Required
No tree works are required within zone 19.
Overall Arboricultural Impact
- The proposals have no arboricultural impact within this zone. - No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
- The trees within the bulk of zone 19 are already afforded ample protection from the trees within zones 15 and 18. - The limited section of woodland edge in the south-western corner of zone 19 is afforded good protection by the existing robust Heras boundary fencing.
Proposed Future Tree Protection Measures
At the time of construction of the northern embankment (proposed as part of future works), a section of the existing boundary fencing will need to be dismantled and a new section set 2.0m off the toe of the embankment to the north of the existing fencing line.
Further Comments
This section of woodland can continue to be managed commercially by Forestry England.

Zone 20 (See Drawing Inset L)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• G056 • W057 (part)
Tree Removals Required
• No tree removals are required within zone 20.
Tree Works Required
• No tree works are required within zone 20.
Overall Arboricultural Impact
• Zone 20 is set some distance from any proposed engineering works and the final waterline. The stems within group G056 provide an effective buffer for woodland W057 behind. • No mature, ancient or veteran trees require pruning or removal in this area.
Existing Tree Protection Measures
• The existing boundary fencing presently provides robust protection for all of the trees within zone 20.
Further Comments
• This section of woodland can continue to be managed commercially by Forestry England.

Zone 21 (See Drawing Insets L, M)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• W058 • T059 Horse Chestnut • T060 Oak • T061 Beech • T062 Scots Pine
Tree Removals Required
• No tree removals are required within zone 21 to facilitate the construction of the reservoir. • However, Horse Chestnut T059 is in very poor condition and will require removal by the tree's owners.
Tree Works Required
• No tree works are required within zone 21.
Overall Arboricultural Impact
• Whilst the upper section of the main embankment is to be constructed within relatively close proximity to the trees which comprise zone 21, it is noted that their root protection areas remain outside of the site. • Furthermore, the heavily compacted track that runs along the western aspect of woodland W058 is likely to inhibit root growth with the significant majority of the trees' rooting systems preferentially exploiting the woodland itself. • No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
• The existing boundary fencing presently provides robust protection for all of the trees within zone 21, however, this may need to be moved back to the post and wire stockproof fencing adjacent to the footpath to allow for the construction of the northernmost section of the main embankment.
Further Comments
• It is recommended that the owners of Horse Chestnut T059 be contacted regarding the condition of this tree in the interests of safety.

Zone 22 (See Drawing Inset M)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• Group G064 (part) • T065 Oak
Tree Removals Required
• No tree removals are required within zone 22.
Tree Works Required
• No tree works are required within zone 22.
Overall Arboricultural Impact
• The nominally circular root protection area of Oak T065 is shown extending south-west beyond the heavily compacted track. However, in reality it is expected that the combination of the drainage ditch immediately to the south-west of the tree's trunk, and the compacted surface of the track will combine to minimise any rooting in this area. • The works in this area show the tying in of the new reservoir track to the existing public access into Havant Thicket, and these are not anticipated to have any detrimental impact on either the trees within group G064 or on Oak T065. • No mature, ancient or veteran trees require pruning or removal in this area to facilitate the construction of the track.
Existing Tree Protection Measures
• The existing boundary fencing presently provides robust protection for all of the trees within zone 22, however, this will need to be opened up to allow for the construction of the final section of the track.
Proposed Future Tree Protection Measures
• A section of protective fencing will be required running along the south-western edge of the track for the section of existing fencing which requires opening up to allow for construction of the new track.
Further Comments
• None.

Zone 23 (See Drawing Insets M, N)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
- G064 (part) - T066 Oak
Tree Removals Required
No tree removals are required within zone 23.
Tree Works Required
No tree works are required within zone 23.
Overall Arboricultural Impact
- The majority of zone 23 comprises new tree plantings set to the east of both the boundary Heras fencing and a secondary stockproof fence. There are also some established boundary trees in third-party ownership to the north-east and south-east of this area. - All groundworks remain some distance from both the new plantings and the established boundary trees so there is not considered to be any arboricultural impact associated with works in this area. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 23. This is further reinforced by the stockproof fence immediately to the east.
Further Comments
None.

Zone 24 (See Drawing Insets N, O)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
Third-party boundary trees not detailed within the Atkins survey data.
Tree Removals Required
No tree removals are required within zone 24.
Tree Works Required
No tree works are required within zone 24.
Overall Arboricultural Impact
- The proposed construction works remain sufficiently far away from the boundary trees as to present a negligible risk of harm, therefore the arboricultural impact is low. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 24.
Further Comments
- The majority of the trees within zone 24 are mature specimens located to the south-east of the track leading to Staunton Country Park; the root protection areas and canopy spreads of these trees do not extend significantly beyond the north-western track edge. - The trees immediately adjacent to the boundary are young naturally regenerated Oak and Goat Willow stems with limited lateral constraints.

Zone 25 (See Drawing Insets O, P, Q)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W112
Tree Removals Required
No tree removals are required within zone 25.
Tree Works Required
No tree works are required within zone 25.
Overall Arboricultural Impact
- Whilst the trees within zone 25 comprise part of the designated ancient woodland, none of the trees on or near the northern woodland edge are ancient or veteran specimens; they are all relatively young trees which have been replanted or naturally regenerated within the past century or less. - Furthermore, the construction zone is separated from these trees by a ditch which is expected to significantly limit rooting to the north. - Whilst some tree canopies do encroach some distance over the boundary line, these remain high and therefore above a height where there is considered to be a significant risk of harm associated with direct contact between mechanical plant and any tree limbs. - The existing boundary fencing is set approximately 6.0m off the stockproof post and wire fencing and this provides robust protection for all of the trees within zone 25. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 25.
Proposed Future Tree Protection Measures
A formalised second line of high-visibility fencing offset 5.0m from the existing Heras security fencing is recommended to provide an additional level of protection for these woodland edge trees.
Further Comments
- The existing line of Heras security fencing is set sufficiently far into the site as to provide effective protection for the trees' canopies and rooting systems. Therefore any risk to these still relatively-young trees within woodland W112 is considered to be low. However, it is acknowledged that the provision of a secondary belt of high-visibility fencing would provide an additional buffer zone. - It is acknowledged that a secondary line of fencing may need to be moved in towards the Heras security fencing in some locations to allow for full temporary works activities. Any secondary fencing relocation requests need to be managed by means of a permit system or equivalent.

Zone 26 (See Drawing Inset Q)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W127 (part)
Tree Removals Required
No further tree removals are required within zone 26.
Tree Works Required
No tree works are required within zone 26.
Overall Arboricultural Impact
- The trees within zone 26 form the remnants of The Avenue and remain publicly accessible from Staunton Country Park. They are also within the designated ancient woodland. - The significant majority of The Avenue has already been cleared and no further tree removals are considered necessary to accommodate the reservoir project. - There is an existing potable watermain which runs through the woodland. A connection into this is required for both the control building and the future works compound/visitors centre to the north-west of the reservoir. It has been established that this connection can be made using directional tunnelling, thus minimising any risk of harm to the rooting systems of the trees within the woodland, however, a 2.0m × 2.0m receiving pit will need to be excavated within the heavily compacted woodland track to enable the final connection. As assessment of the trees adjacent to the existing stopcock has demonstrated that this can be excavated without causing unsustainable harm to the surrounding young to early-mature Oaks in this vicinity, setting the existing stopcock at the south-eastern corner of the new pit. The excavations must be undertaken using the smallest practicable excavator in accordance with Arboricultural Guidance Sheet AGS405. The pit must be dug to a size of approximately 1.2m × 1.2m, with the edges then being manually cut back and all roots pruned in accordance with Arboricultural Guidance Sheet AGS403. It is recommended that these works commence with an arboricultural watching brief in attendance to ensure that any potential for damage to trees is minimised. - The entry pit for the new watermain pipe must be set no closer than 15.0m from the base of any retained trees. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 25.
Proposed Additional Tree Protection Measures
A second formalised line of high-visibility fencing offset 5.0m from the existing Heras security fencing to the east and the west of the woodland is recommended to provide an additional level of protection for these woodland edge trees.
Further Comments
- The existing line of Heras security fencing is set sufficiently far into the site as to provide effective protection for the trees' canopies and rooting systems. Therefore any risk to the trees within woodland W127 is considered to be low. However, it is acknowledged that the provision of a secondary belt of high-visibility fencing to the east and the west of the woodland would provide an additional buffer zone. - It is acknowledged that a secondary line of fencing may need to be moved in towards the Heras security fencing in some locations to allow for full temporary works activities. Any secondary fencing relocation requests need to be managed by means of a permit system or equivalent

Zone 27 (See Drawing Insets Q, R)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
- W127 (part) - W128 (part) - G129
Tree Removals Required
No tree removals are required within zone 27.
Tree Works Required
No tree works are required within zone 27.
Overall Arboricultural Impact
- Whilst the trees within zone 27 comprise part of the designated ancient woodland, none of the trees on or near the northern woodland edge are ancient or veteran specimens; they are all relatively young trees which have been replanted or naturally regenerated within the past century or less. - Whilst some tree canopies do encroach some distance over the boundary line, these remain high and therefore above a height where there is considered to be a significant risk of harm associated with direct contact between mechanical plant and any tree limbs. - The existing boundary fencing is set almost immediately adjacent to the stockproof post and wire fencing. Additional fencing will be required to provide robust protection for all of the trees within zone 27. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing does not presently provide robust protection for all of the trees within zone 27.
Proposed Additional Tree Protection Measures
A second line of braced Heras fencing offset 12.0m from the existing Heras security fencing is required to provide an acceptable level of protection for these woodland edge trees.
Further Comments
None.

Zone 28 (See Drawing Inset R)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W128 (part)
Tree Removals Required
No tree removals are required within zone 28.
Tree Works Required
No tree works are required within zone 28.
Overall Arboricultural Impact
- Whilst the trees within zone 28 comprise part of the designated ancient replanted woodland, none of the trees on or near the northern woodland edge are ancient or veteran specimens; they are all relatively young trees which have been replanted or naturally regenerated within the past century or less. - The canopies of the woodland edge trees are coalescing with the canopies of the trees within Round Wood (zone 29) to form continuous canopy cover across the corridor between these two woodland compartments. - The existing Heras security fencing surrounding zone 29 also provides robust protection for all of the trees within zone 28. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing for zone 29 provides robust protection for all of the trees within zone 28.
Further Comments
It is noted that an earlier, proposed alternative route for the new potable watermain showed it running between the trees in zones 28 and 29. Following an arboricultural assessment of the root protection area constraints and the extent of rooting overlap, the route of this pipeline has been changed to run to the north of zone 29.

Zone 29 (See Drawing Inset R)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W113 (part)
Tree Removals Required
Removal of the three westernmost Oaks to be reviewed once detailed design of the reservoir outfall is complete. To be addressed in Reserved Matters for Phase 5 – Bi-directional pipeline which forms part of a separate Portsmouth Water planning application.
Tree Works Required
No additional tree works are required within zone 29.
Overall Arboricultural Impact
- Zone 29 comprises the remaining southern half of Round Wood which is a designated ancient woodland. The woodland does not feature any ancient or veteran trees; they are all relatively young trees which have been replanted or naturally regenerated within the past century or less. - The installation of the new potable water connection will not have any detrimental arboricultural impact. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides robust protection for all of the trees within zone 29.
Further Comments
None.

Zone 30 (See Drawing Inset S)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W128 (part)
Tree Removals Required
No tree removals are required within zone 30.
Tree Works Required
No tree works are required within zone 30.
Overall Arboricultural Impact
- The trees within zone 30 comprise part of a larger designated area of ancient replanted woodland. The woodland does not feature any ancient or veteran trees; they are all relatively young trees which have been replanted or naturally regenerated within the past century or less. - Ancient woodland soils harvested from The Avenue have been spread to an estimated depth of 200-300mm to the west of these trees. - The trees and the ancient woodland soils all remain some distance from any proposed engineering activities. Accordingly there is negligible risk of harm subject to the provision of protective fencing set away from the boundary. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides moderate protection for all of the trees within zone 30 while a secondary line of temporary fencing has been installed to protect the deposited ancient woodland soils.
Proposed Additional Tree Protection Measures
A new line of braced Heras fencing needs to be established 12.0m off the existing Heras security fencing.
Further Comments
None.

Zone 31 (See Drawing Inset S)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
• T069 Oak • T070 Oak • G071 • T072 Oak • T073 Oak • T074 Oak
Tree Removals Required
• It is estimated that three of the young Oaks which comprise group G071 will need to be removed to accommodate the new pipeline from the reservoir. Some mixed scrub and understorey will also need to be cleared for this.
Tree Works Required
• Some minor lateral canopy reduction may be required to prevent contact between the retained trees and the mechanical plant installing the pipeline.
Overall Arboricultural Impact
• The trees which comprise zone 31 form a belt between the reservoir site and Thicket Lawn to the south south-east. None of these trees are set within the designated ancient woodland or ancient replanted woodland. • The tree stock comprises primarily Oak stems with mixed understorey. The Oaks range from young stems to mature specimens. • The only trees which are affected by the proposals are three young Oaks which form part of group G071. Whilst these contribute to the contiguous canopy cover in this area, none are individually outstanding specimens. • The positioning of the cut through this area has been designed to allow for the retention of the larger trees. • No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
• The existing boundary fencing presently provides only moderate protection for the trees within zone 31 while a secondary line of temporary fencing has been installed to protect the deposited ancient woodland soils towards the north-eastern end of this area.
Proposed Additional Tree Protection Measures
• A new line of braced Heras fencing will need to be established to provide robust protection for the retained trees in zone 31.
Further Comments
• The continuation of the pipeline to the south-east of this line of trees is beyond the scope of this report.

Zone 32 (See Drawing Insets S, T)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
G114 (part)
Tree Removals Required
No tree removals are required within zone 32.
Tree Works Required
No tree works are required within zone 32.
Overall Arboricultural Impact
- This area comprises a mix of generally scrubby naturally regenerated vegetation, though there are occasional good Oaks present too. - Some rooting disturbance has been experienced in establishing the settlement pond connection, though none of the damage is considered to be unsustainable. - No trees need to be removed to accommodate the proposals, however, it is recommended that the fencing for zone 31 be extended out to the north-east to provide protection for a section of vulnerable Oak canopy which extends beyond the existing fencing line. - No mature, ancient or veteran trees require pruning or removal in this area to facilitate the reservoir construction.
Existing Tree Protection Measures
The existing boundary fencing presently provides only moderate protection for the trees within zone 32 while a secondary line of temporary fencing has been installed to protect the extended Oak laterals growing to the north-east from the stream.
Proposed Additional Tree Protection Measures
The braced Heras fencing required for zone 31 can be extended to provide the formalised protection required for the overhanging Oak in zone 32.
Further Comments
None.

Zone 33 (See Drawing Insets T, U, V)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W126 (part)
Tree Removals Required
No tree removals are required within zone 33.
Tree Works Required
No tree works are required within zone 33.
Overall Arboricultural Impact
- Zone 33 comprises a belt of larger, maturing trees which run along the eastern side of Swanmore Road, along with swathes of new plantings which have been recently established on the east-facing slope below. - None of these trees are considered to be under threat from the proposals.
Existing Tree Protection Measures
The trees are already protected by the robust Heras security fencing. The newly established trees are also afforded addition protection from stockproof fencing.
Further Comments
None.

Zone 34 (See Drawing Insets A, V)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
W126 (part)
Tree Removals Required
No tree removals are required within zone 34.
Tree Works Required
No tree works are required within zone 34.
Overall Arboricultural Impact
- Zone 34 comprises a belt of larger, maturing trees which run along the eastern side of Swanmore Road, along with a section of new plantings which have been recently established immediately adjacent to the south-east. - None of these trees are considered to be under threat from the proposals.
Existing Tree Protection Measures
The trees are already protected by the robust Heras security fencing. The newly established trees are also afforded addition protection from stockproof fencing.
Further Comments
None.

Zone 35 (See Drawing Inset T)
Trees Present (see Atkins Arboricultural Impact Assessment of Sept 2020 for further data)
A belt of naturally regenerated Goat Willow stems not detailed within the Atkins survey data.
Tree Removals Required
No tree removals are required within zone 35.
Tree Works Required
No tree works are required within zone 35.
Overall Arboricultural Impact
- This area of naturally regenerated Goat Willow stems have been managed historically by low pollarding, however, these works have not been undertaken for some time. - While none of these trees are individually outstanding, collectively they do provide some visual amenity and habitat cover.
Existing Tree Protection Measures
None.
Proposed Additional Tree Protection Measures
These trees need to be protected with braced Heras fencing set at least at the extent of their canopy spreads.
Further Comments
The new potable watermain was originally shown running in close proximity to these trees but this has now been diverted to keep it away from these trees.

Havant Thicket Reservoir Tree Works Summary

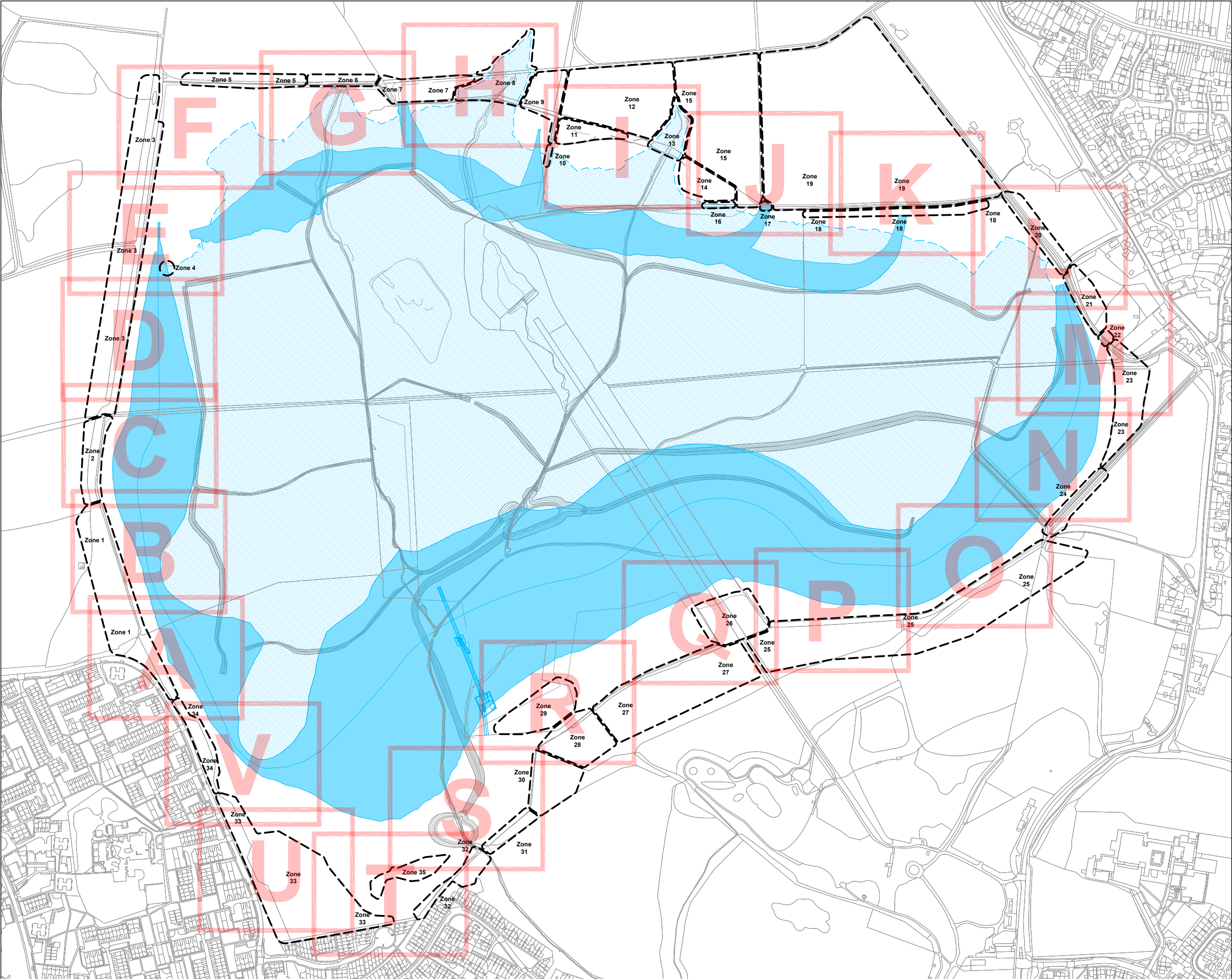
Zone Reference	Drawing Insets	Tree Works Required
Zone 1	A,B	- Clear the northern end of group G125 to a line 3.5m to the south-east of the new services trench. - Remove all Ash stems within group G125 which are in moderate to advanced decline as a consequence of Ash Dieback Disease. - Undertake lateral pruning back of retained canopies within group G125 to maintain a 2.0m clearance from the south-eastern kerbline of the new SAR. - Undertake lateral pruning of the eastern aspect of group G125 to the existing Heras fenceline to minimise any risk of contact from mechanical plant excavating the new swale.
Zone 2	C	No tree works required.
Zone 3	C, D, E, F	Undertake lateral reduction of the western canopy aspect to the existing boundary fence line of the primarily Goat Willow stems from group G116 in the vicinity of the present footpath to prevent any risk of contact from mechanical plant working on the SAR.
Zone 4	E	No tree works required.
Zone 5	F, G	No tree works required.
Zone 6	G	- Clear all stems to the south of the track alongside the section of track to be raised. - Remove one young Oak, one young Ash and three young Goat Willows from the edge of woodland W197 to the north of the track.
Zone 7	G, H	Remove small section of primarily Silver Birch and Goat Willow stems within 3.0m of the toe of the embankment.
Zone 8	H	- Reservoir Flooding Fell all Corsican Pine and Norway Spruce within a line set 5.0m outside of the final waterline be felled (see the Zone 8 plan within Appendix B) - Track Raising Remove all Norway Spruce and Corsican Pine within 5.0m of the footprint of the engineering works, along with all other stems within 2.0m of the engineering footprint.
Zone 9	H, I	No tree works required.
Zone 10	I	No tree works required.
Zone 11	I	No tree works required.
Zone 12	I	No tree works required.
Zone 13	I	Fell all Corsican Pine and Norway Spruce within a line set 5.0m outside of the final waterline be felled (see the Zone 13 plan within Appendix B)
Zone 14	I, J	No tree works required.
Zone 15	I, J	No tree works required.
Zone 16	J	No tree works required.
Zone 17	J	Remove all stems to the south of the track within the section extending from the gateway at the western end to a line approximately 17m to the east.
Zone 18	J, K, L	No tree works required.
Zone 19	J, K, L	No tree works required.
Zone 20	L	No tree works required.
Zone 21	L, M	No tree works required.

Zone Reference	Drawing Insets	Tree Works Required
Zone 22	M	No tree works required.
Zone 23	M, N	No tree works required.
Zone 24	N, O	No tree works required.
Zone 25	O, P, Q	No tree works required.
Zone 26	Q	No tree works required.
Zone 27	Q, R	No tree works required.
Zone 28	R	No tree works required.
Zone 29	R	No tree works required.
Zone 30	S	No tree works required.
Zone 31	S	Remove the young Oaks within group G071
Zone 32	S, T	No tree works required.
Zone 33	T, U, V	No tree works required.
Zone 34	A, V	No tree works required.
Zone 35	T	No tree works required.

Zone Reference	Drawing Insets	Tree Works Required
Zone 22	M	No tree works required.
Zone 23	M, N	No tree works required.
Zone 24	N, O	No tree works required.
Zone 25	O, P, Q	No tree works required.
Zone 26	Q	No tree works required.
Zone 27	Q, R	No tree works required.
Zone 28	R	No tree works required.
Zone 29	R	No tree works required.
Zone 30	S	No tree works required.
Zone 31	S	Remove the young Oaks within group G071
Zone 32	S, T	No tree works required.
Zone 33	T, U, V	No tree works required.
Zone 34	A, V	No tree works required.
Zone 35	T	No tree works required.

Appendix A

Site Master Plans



Key

Proposed embankments

Future flooded extent of reservoir

Tree zone

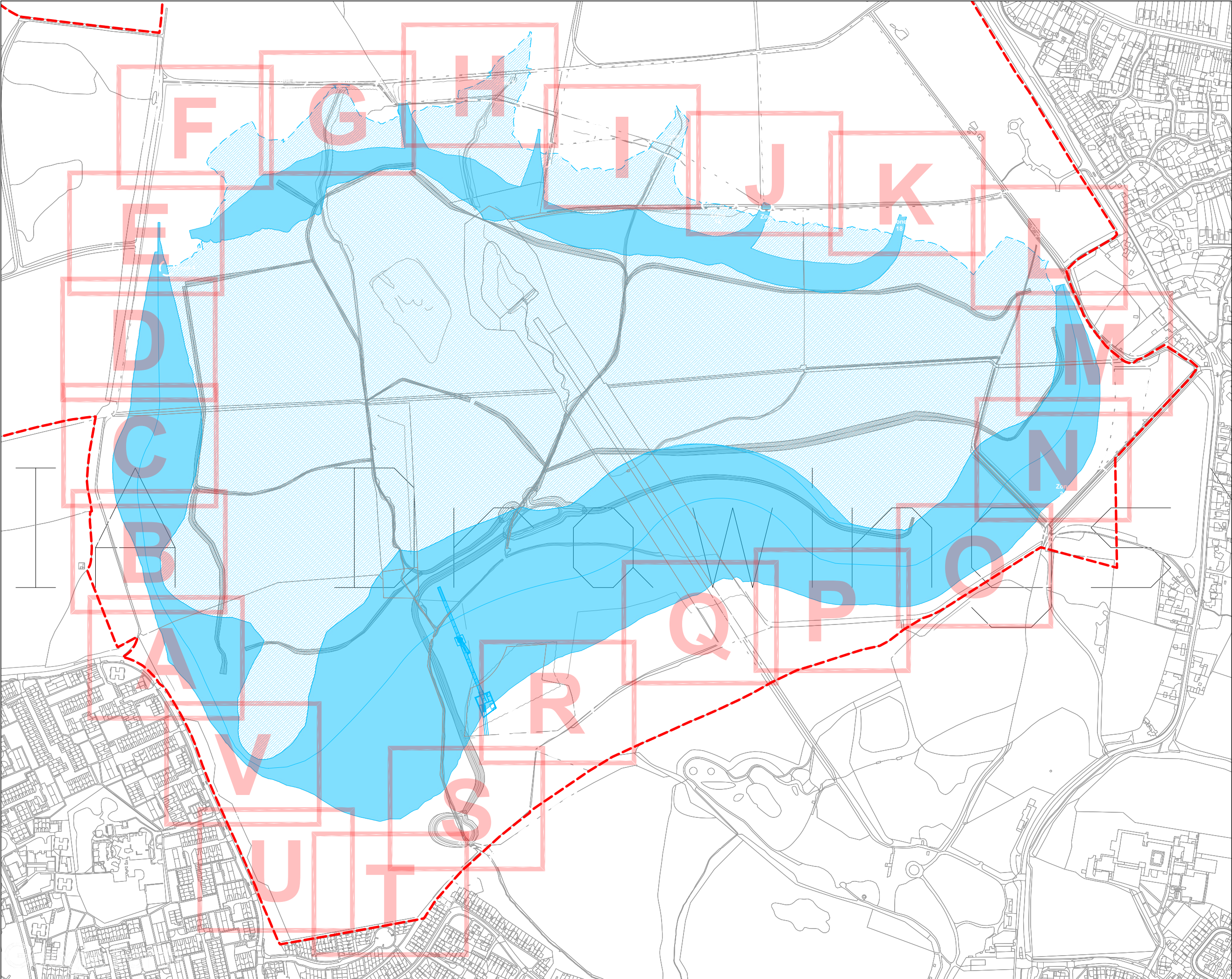
Inset plan reference

Drawing Title:

Site Master Plan

Location:		
Havant Thicket Hampshire		
Date:	Project Reference:	Revision:
02.02.2024	TH/B352/1023	1.4
Scale:	Paper Size:	Drawn By:
1:750	A3	TH

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Key

Proposed embankments

Future flooded extent of reservoir

Tree zone

Project redline boundary

Location Inset

Drawing Title:

Site Master Plan

Location:

Havant Thicket
Hampshire

Date:
02.02.2024

Project Reference:
TH/B352/1023

Revision:
1.4

Scale:
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Paper Size:
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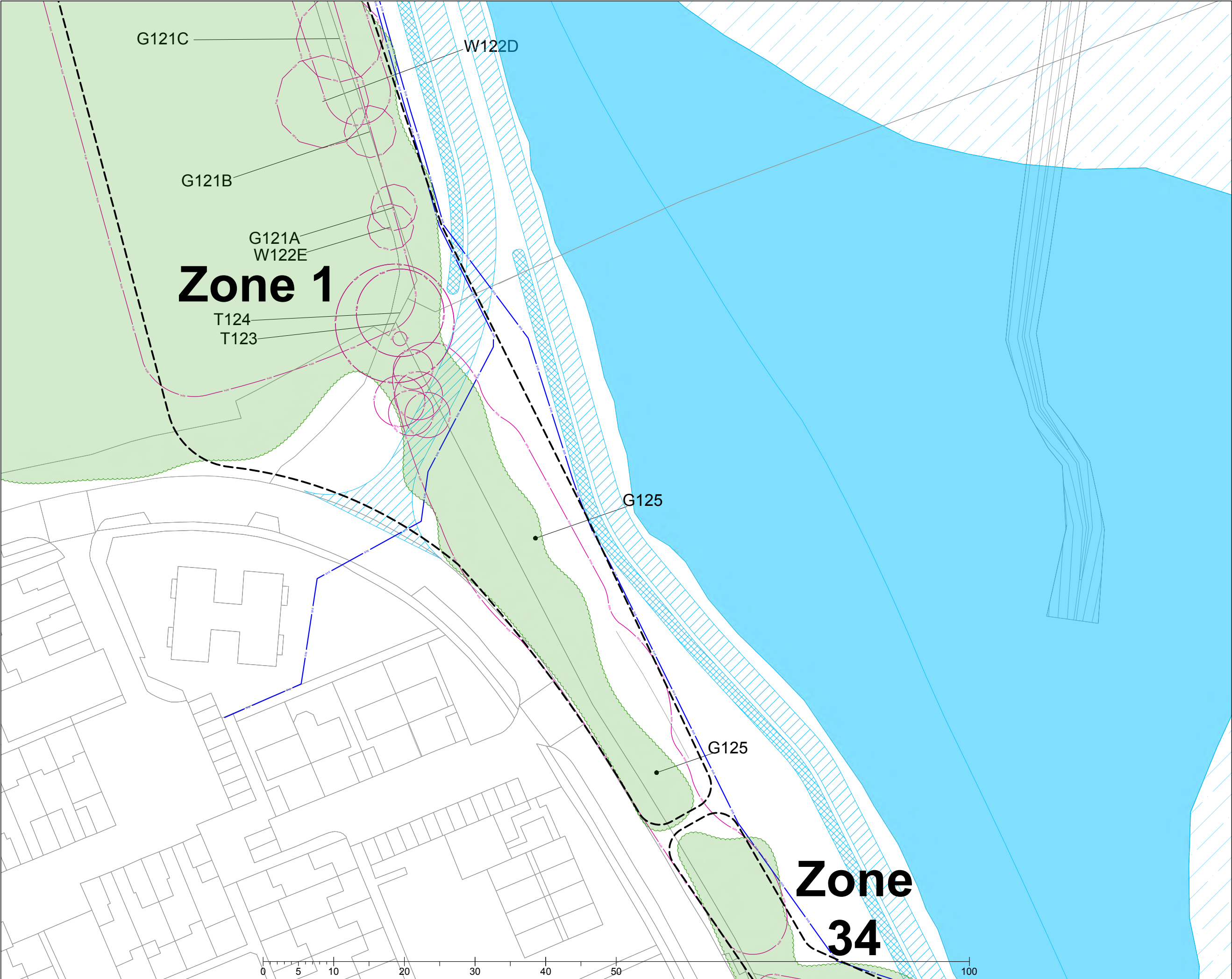
Drawn By:
TH

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Appendix B

Arboricultural Impact Assessment Plans

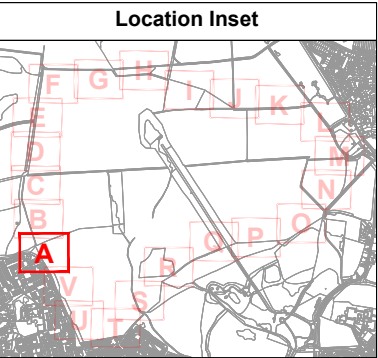


Key

- Indicative collective crown spreads
- Root protection area
- Proposed embankments
- Future flooded extent of reservoir
- Proposed tracks, roads and paths
- Proposed swales
- Indicative line of proposed underground services
- Phase 5 bi-directional pipeline

Location Inset

The location inset map shows a larger area with a grid of letters. A red box labeled 'A' indicates the location of the site within the grid. The grid includes letters A through Z, with some letters missing or obscured by the site boundary.

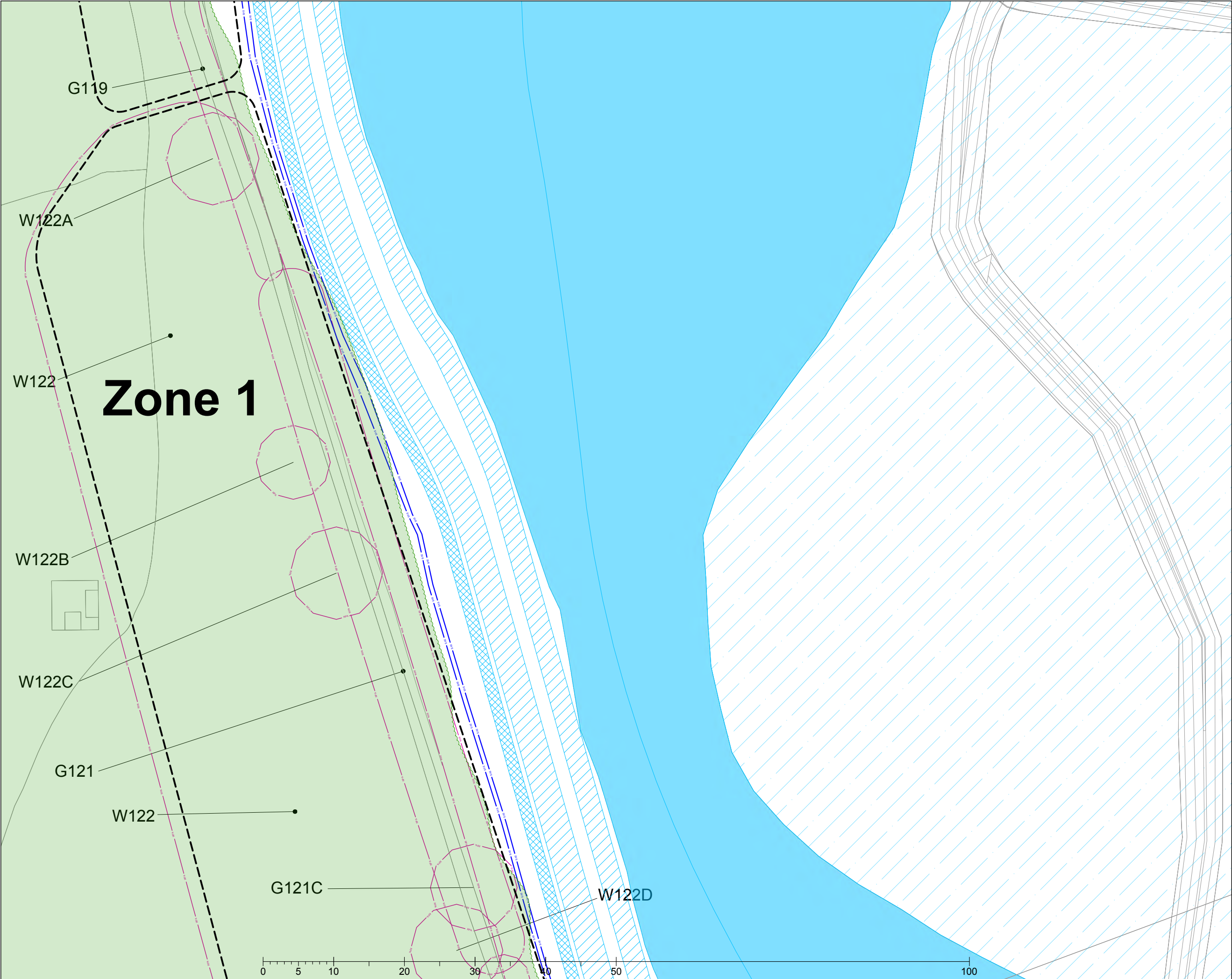


Drawing Title:
Arboricultural Impact Assessment - Inset A

Location:
**Havant Thicket
Hampshire**

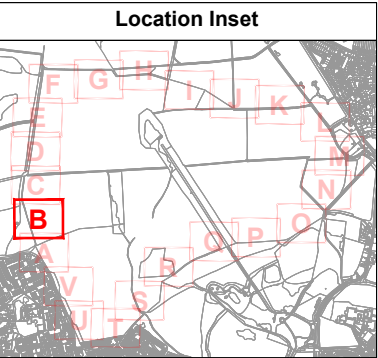
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Key

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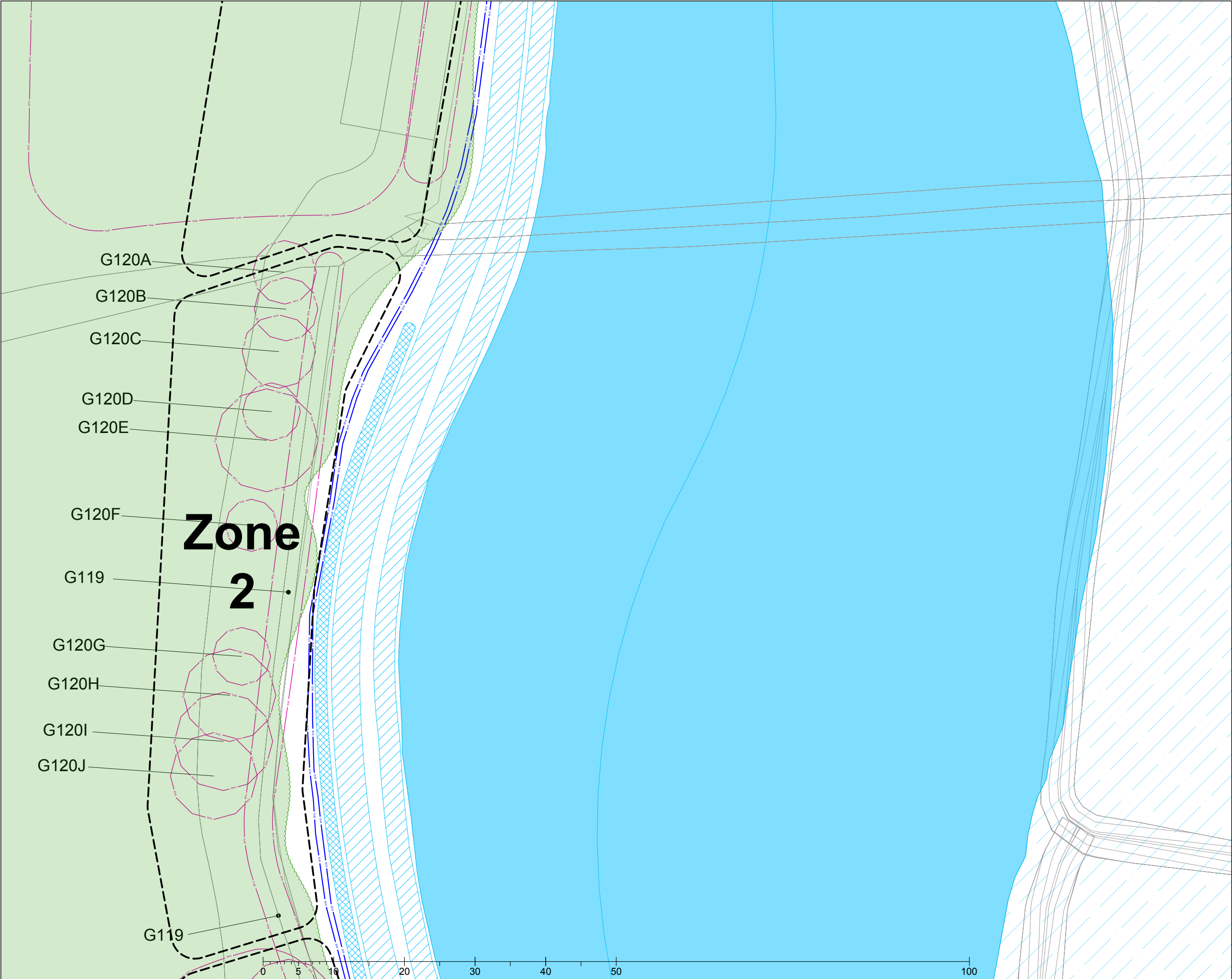
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Location:
**Havant Thicket
Hampshire**

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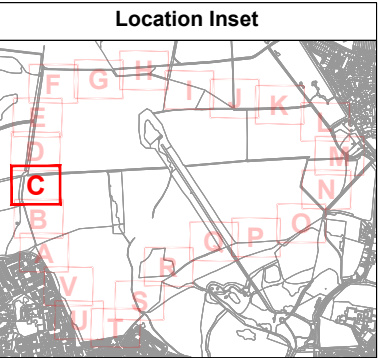
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Key

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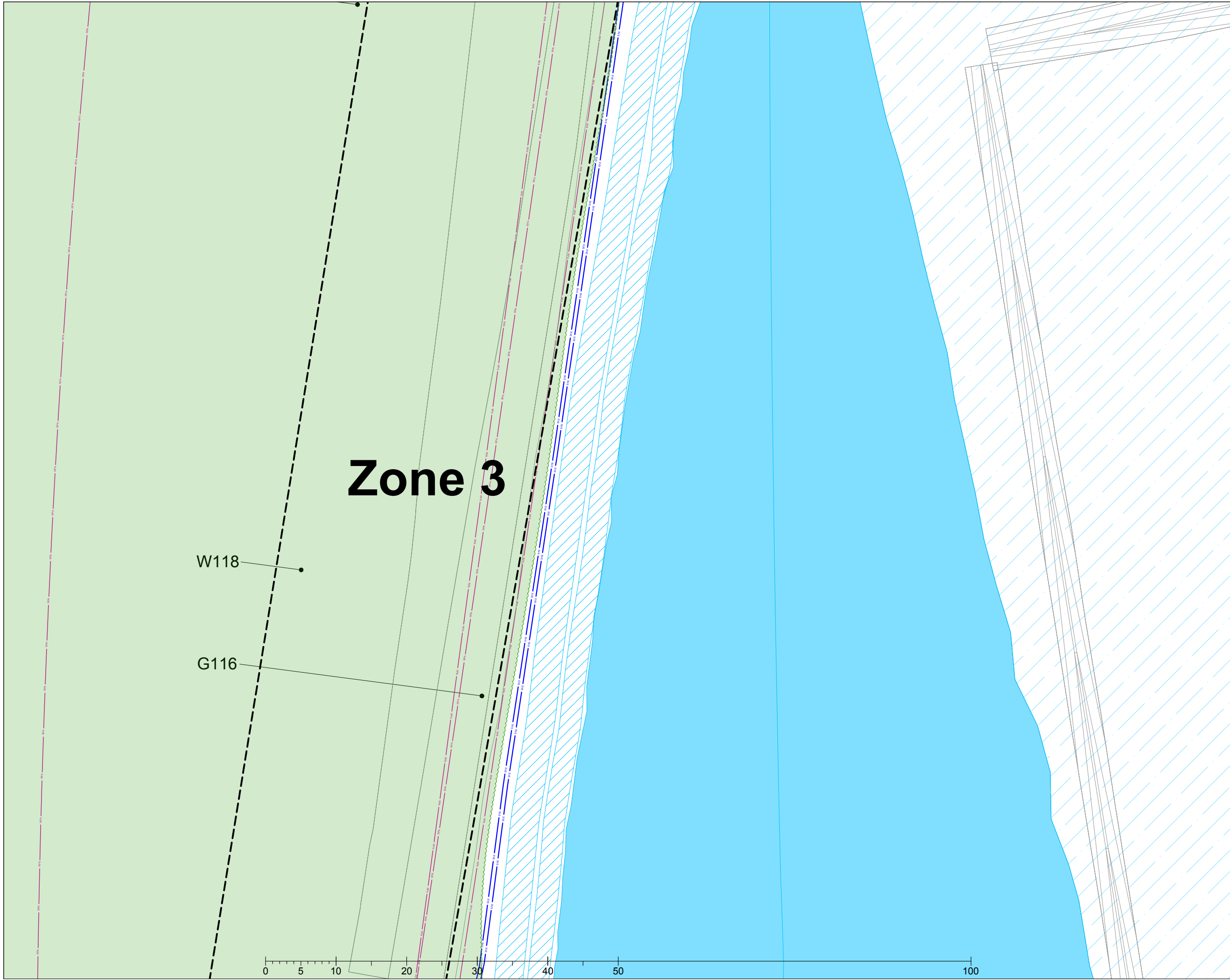
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Location:
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Hampshire**

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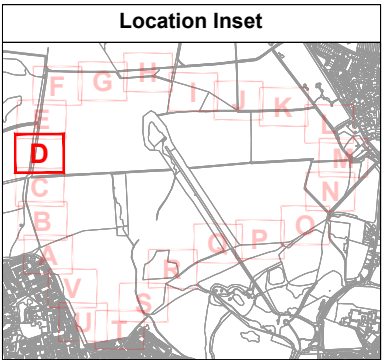
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Key

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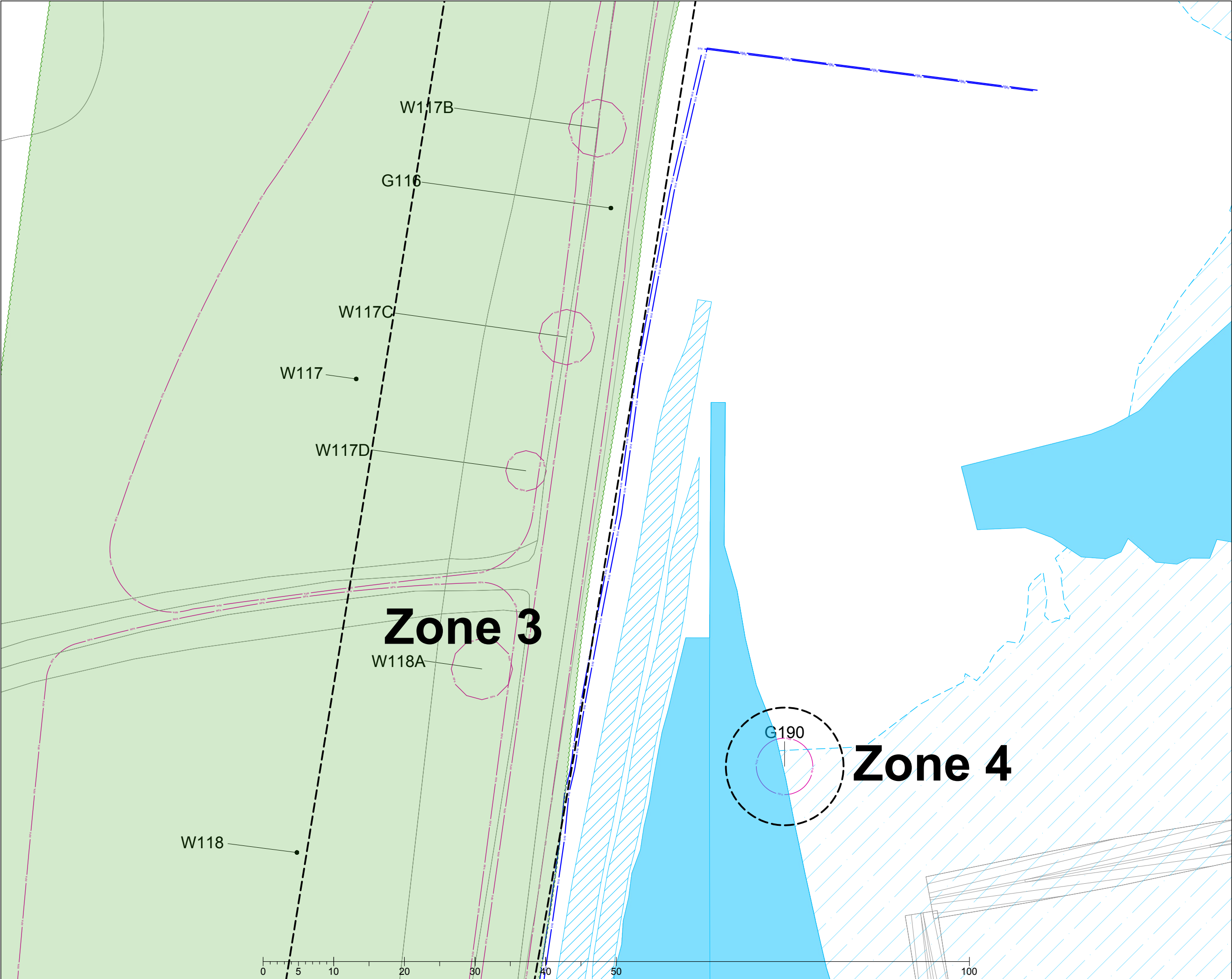
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Arboricultural Impact Assessment - Inset D

Location:
**Havant Thicket
Hampshire**

Date:	Project Reference:	Revision:
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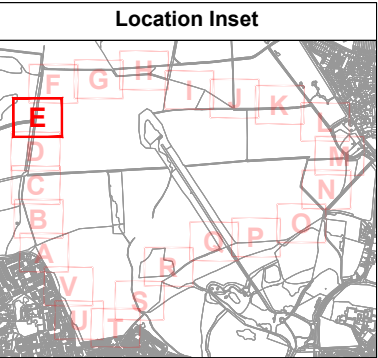
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Key

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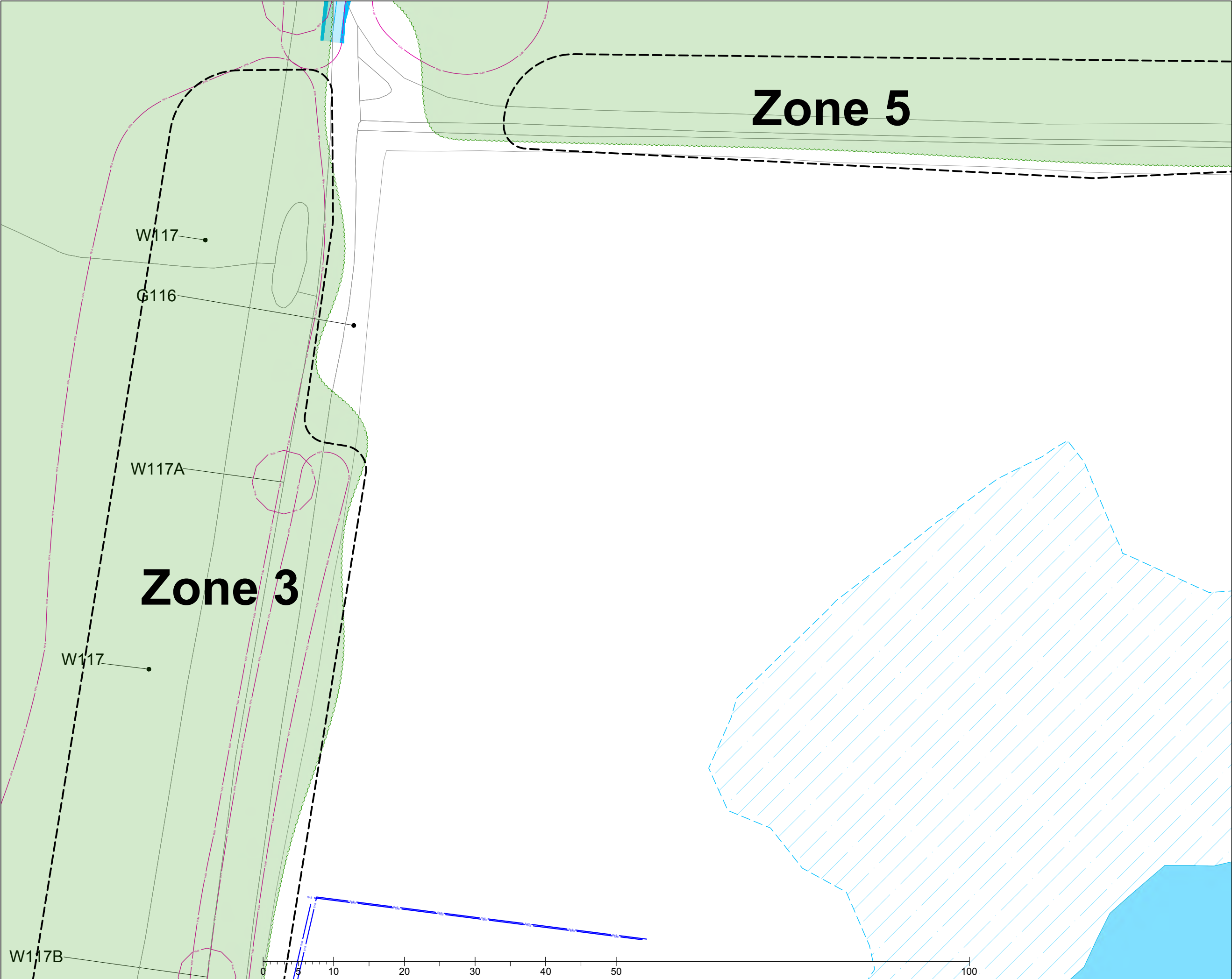
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Location:
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Hampshire**

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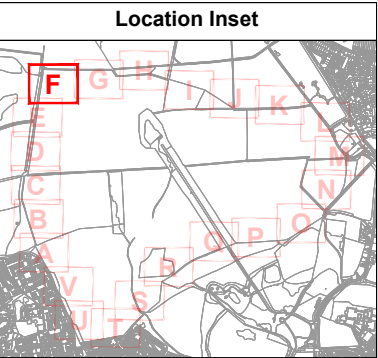
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Key

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- Proposed embankments
- Future flooded extent of reservoir
- Proposed tracks, roads and paths
- Proposed swales
- Indicative line of proposed underground services
- Phase 5 bi-directional pipeline



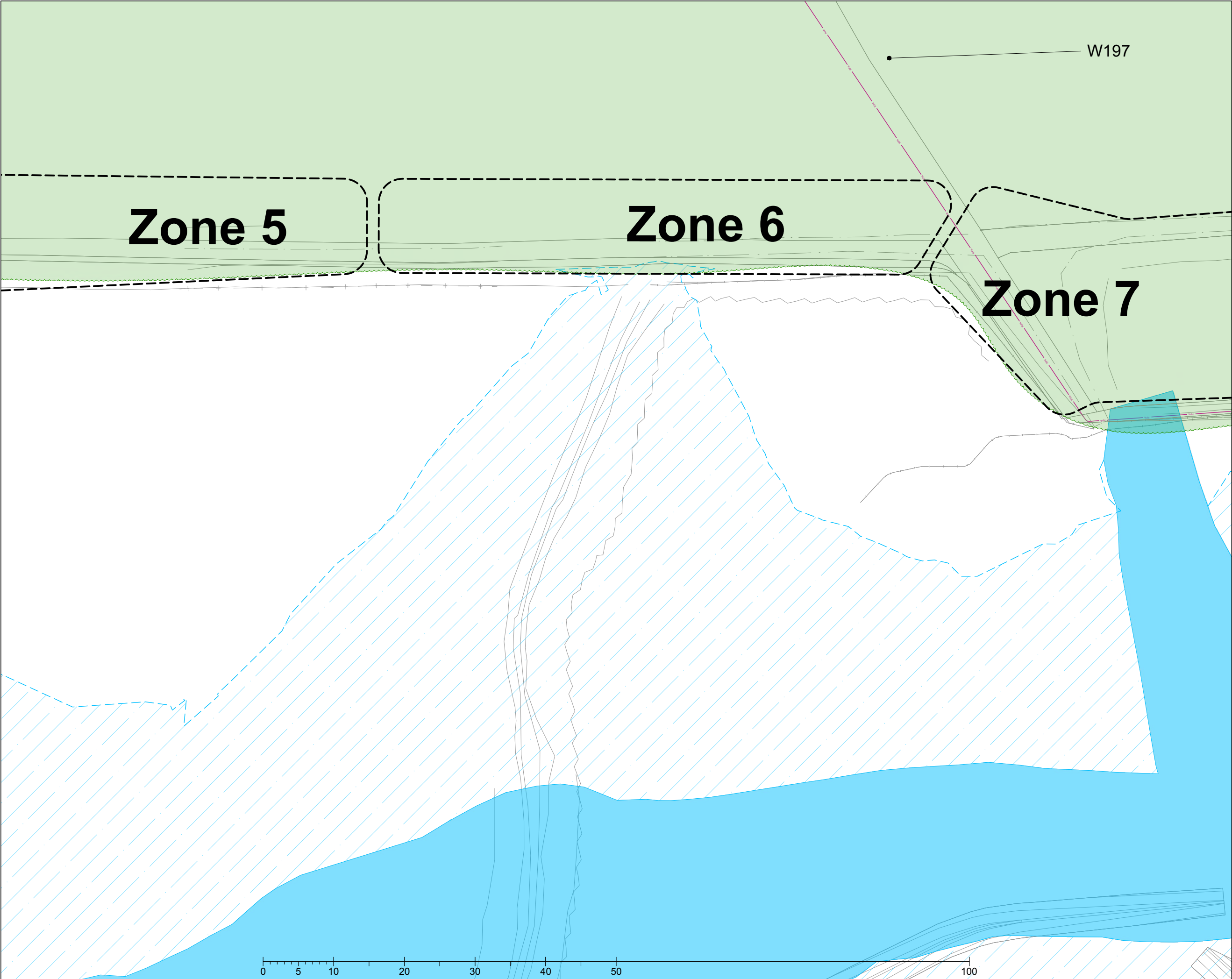
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Arboricultural Impact Assessment - Inset F

Location:
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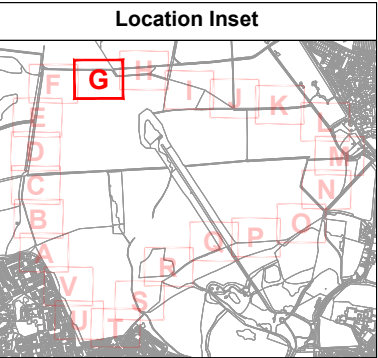
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Key

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- Proposed tracks, roads and paths
- Proposed swales
- Indicative line of proposed underground services
- Phase 5 bi-directional pipeline



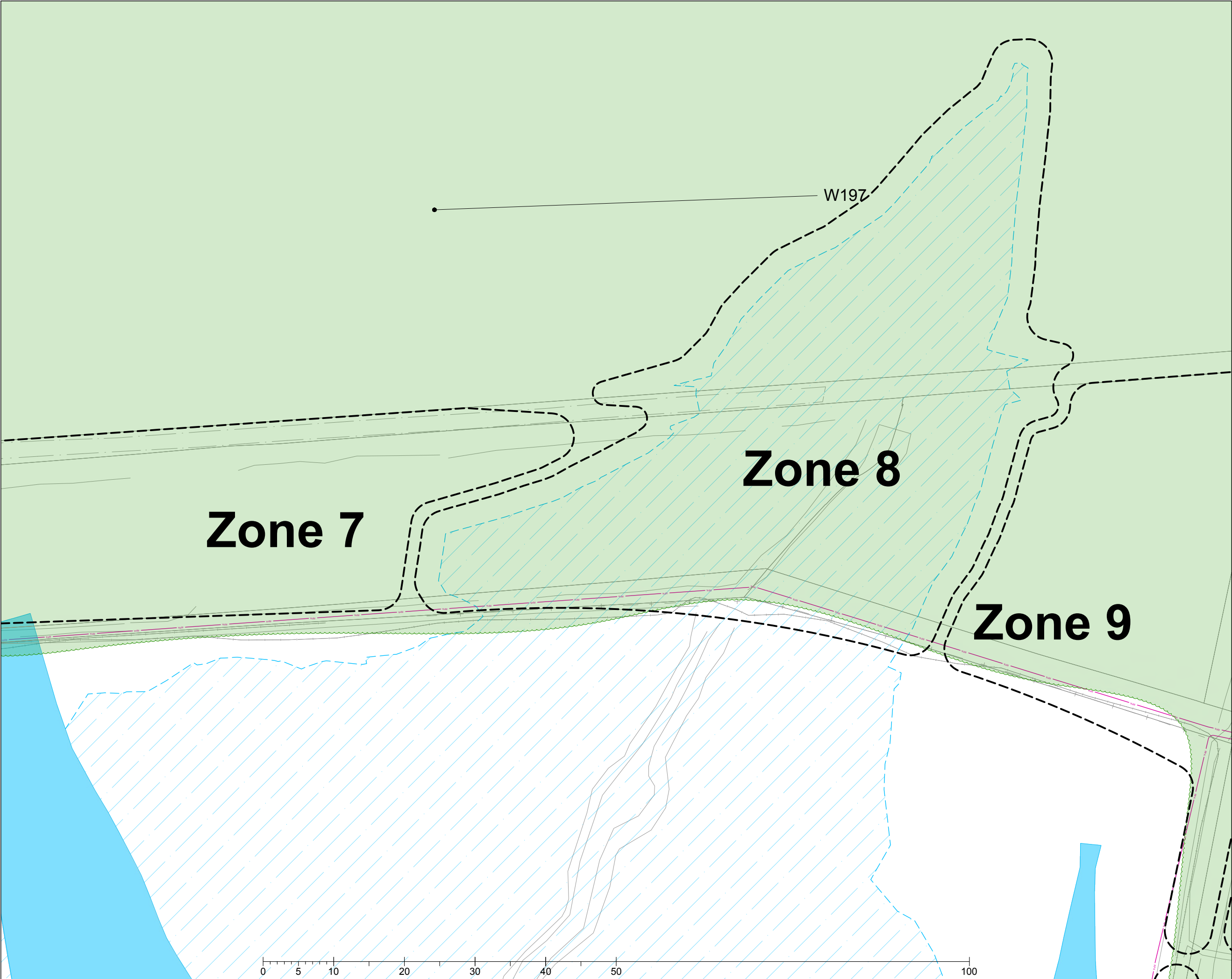
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Location:
**Havant Thicket
Hampshire**

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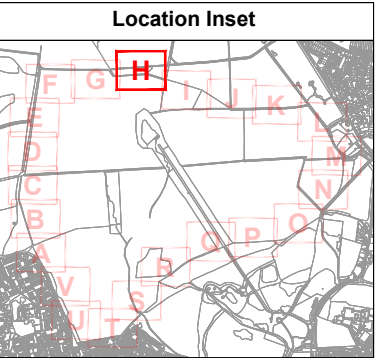
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Key

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- Root protection area
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- Proposed swales
- Indicative line of proposed underground services
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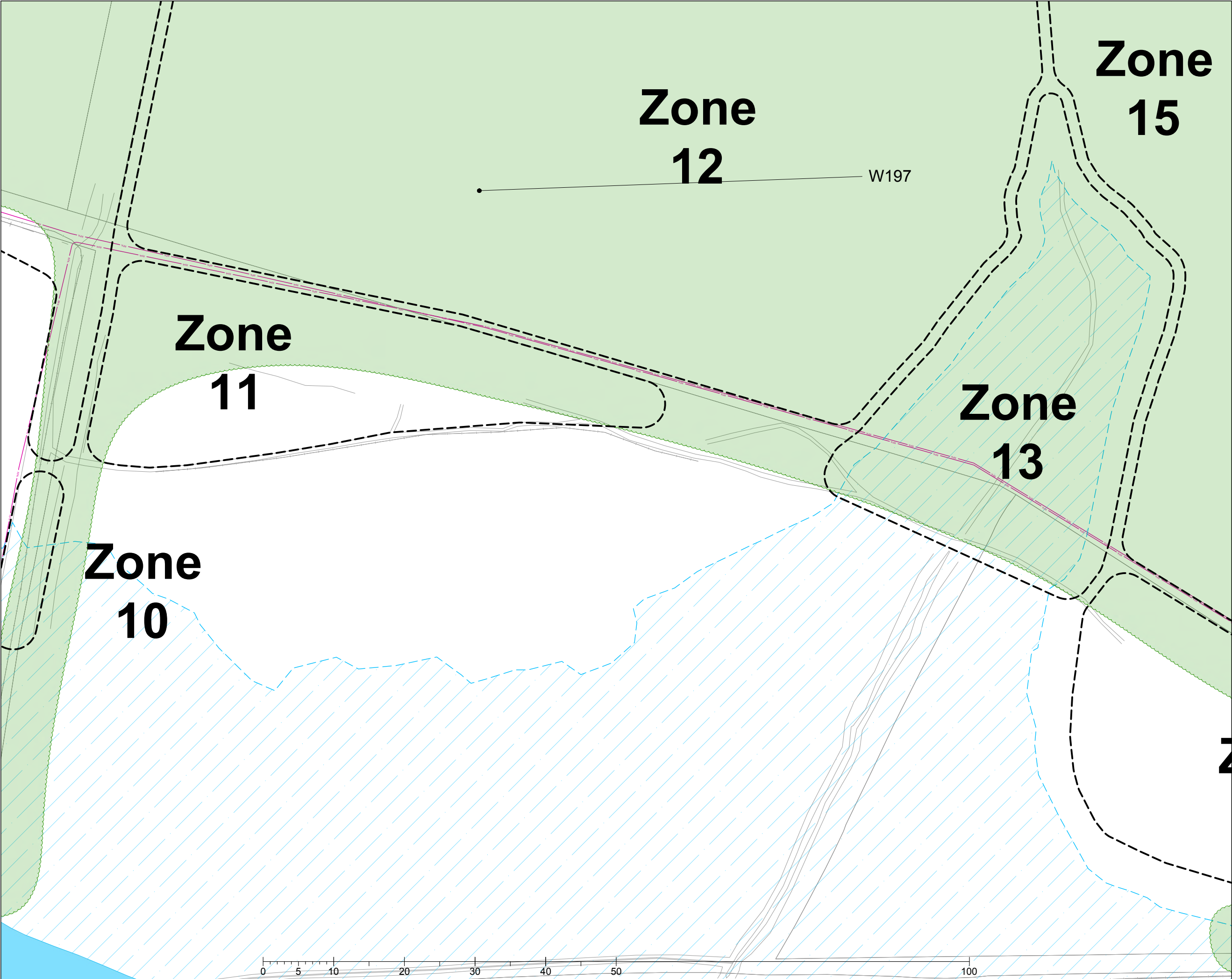
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Location:
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Hampshire**

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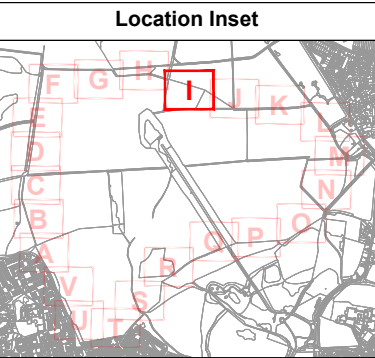
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W197

- Key**
- Indicative collective crown spreads
 - Root protection area
 - Proposed embankments
 - Future flooded extent of reservoir
 - Proposed tracks, roads and paths
 - Proposed swales
 - Indicative line of proposed underground services
 - Phase 5 bi-directional pipeline

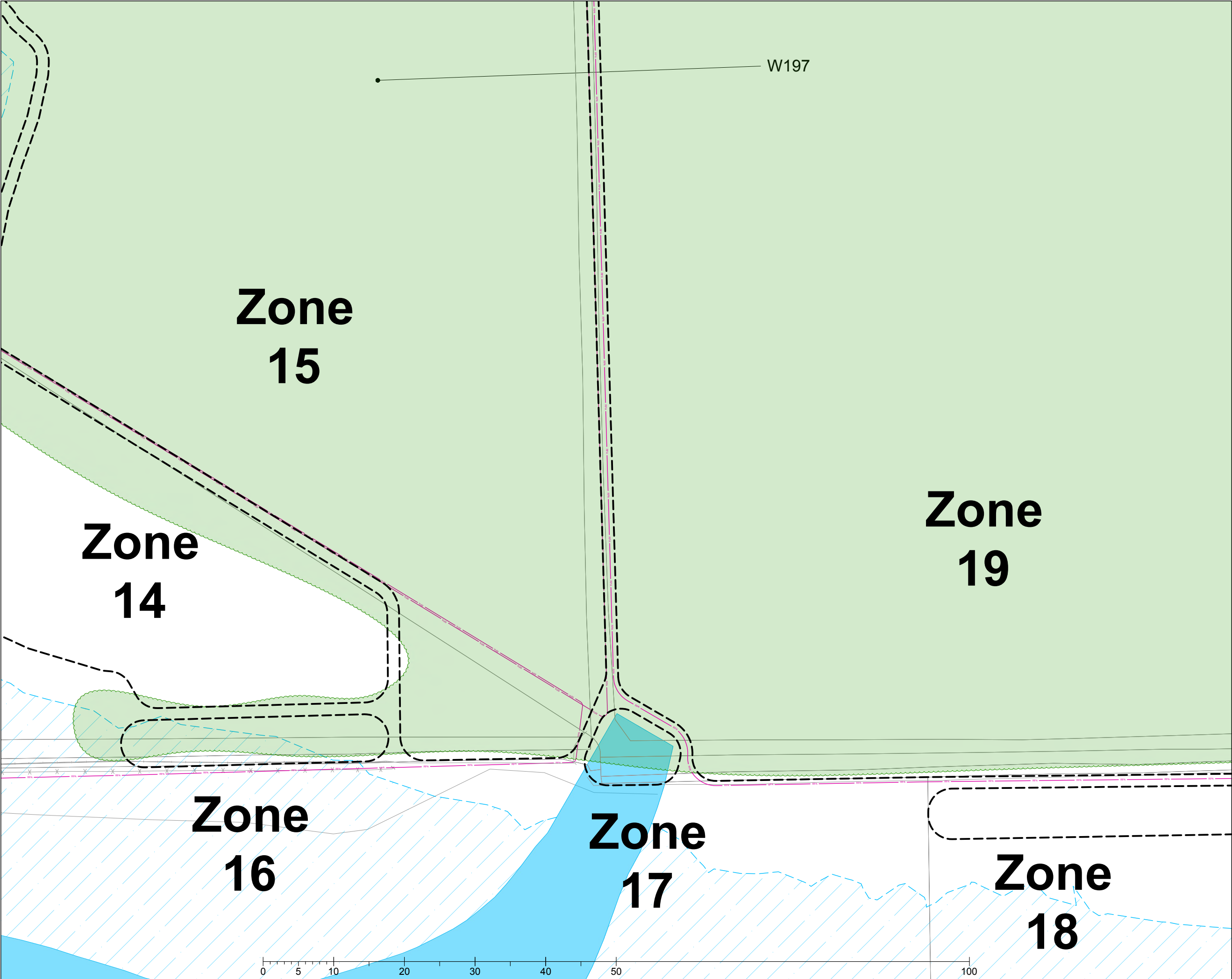


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Arboricultural Impact Assessment - Inset I

Location:
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Hampshire**

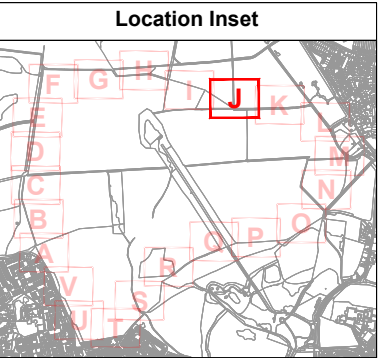
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Key

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- Proposed embankments
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- Proposed swales
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- Phase 5 bi-directional pipeline



Drawing Title:
Arboricultural Impact Assessment - Inset J

Location:
**Havant Thicket
Hampshire**

Date:	Project Reference:	Revision:
02.02.2024	TH/B352/1023	1.4
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Note: The original of this drawing was produced in colour - a monochrome copy should not be relied upon. All drawings © Advanced Arboriculture.