

# Bearwood Associates Ltd

BS5837:2012

arboricultural impact assessment



## Wentworth Castle Gardens, Rebuilding Works – Collapsed Section of Battlements

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# **Arboricultural Statement**

## **Wentworth Castle Gardens**

### **Proposed Development: Rebuilding Works – Collapsed Section of Battlements**

The document 'WCG.03 – Heritage Design and Access Statement (1.0) – Battlements Collapse' gives the following historical introduction to the Battlements: *'The Battlements are a prominent feature of the Wentworth Castle Gardens landscape, spread over 300m from the formal gardens of Stainborough Hall through to Stainborough Castle. Thomas Wentworth, 1st Earl of Strafford, built the battlemented wall with bastions and archways during the winter of 1738-39. He died a few months later, making the battlements possibly his last building project. The Battlements are predominantly of rubble retaining wall construction, with more decorative gateways in the form of Archer's Hill Gate. The crenelations are of rubble stone construction with ashlar copings. The structure's significance comes from its contribution to the gardens, and every effort should be made to conserve the structure.'*

A section of Battlement wall, close to the Sun Monument Bastion, catastrophically failed leading to complete collapse of a 20m section of masonry, in October 2023. The cause of the collapse was attributed to extensive amounts of cementitious mortar which failed suddenly following a period of wet weather. The Battlement walls had also been weakened by a series of mature trees. Following consultation with Donald Insall Associates and Mason Clarke Civil and Structural Engineers, a plan for stabilisation and rebuilding works was put together. This has been subject of an LBC application with Barnsley Metropolitan Borough Council- 2024/0190, submitted in early 2024.

On 17 June 2024, Bearwood Associates Limited was commissioned by Donald Insall Associates, on behalf of the National Trust, to undertake a 'BS5837: 2012 Trees in Relation to Design, Demolition and Construction', arboricultural impact assessment (AIA), to assess trees in relation to the proposed development - that is the stabilisation and rebuilding works - of the collapsed section of the Battlements.

Documents provided to Bearwood Associates Limited by Donald Insall Associates, as background, references and information, to inform this BS5837 AIA, included:

- 2718-001 – WCG03 – Soil Nail Detail
- 2718-002 – WCG03 – Soil Nail Layout
- 20340 – WCG03 – Soil Nail connection to masonry retaining wall
- 20340 – WCG03 – Structural Justification Report
- Method Statement – Wentworth Castle Gardens Battlement Collapse – 12.04.24
- WCG.03 – Heritage Design and Access Statement (1.0) – Battlements Collapse
- WCG02-DR-400-D-0-BattlementSitePlan

## **Arboricultural Survey Methodology**

All trees, deemed to be potentially impinged upon by the proposed development were assessed (Categories A, B, C or U), at the request of the client (Donald Insall Associates). Any other trees, not deemed to be potentially impinged upon by the development were not assessed and are not included in this report (uncategorized trees).

The preliminary arboricultural survey assessment is a ground-based, external, visual assessment, primarily intended to determine the health/condition of the trees from visible, external symptoms. An assessment of the 'quality' of each tree, within its present context, was made based upon their individual characteristics of rarity, maturity, form, health/condition, aesthetic appeal and ecological value. Using the plans provided by the client and their architect, the position of each assessed tree, has been plotted on 'BS5837:2012 AIA – Map01 Tree Constraints' and 'BS5837:2012 AIA – Map02 Tree Constraints'. Each tree was given a site number reference, corresponding to a metal, number-tag affixed to each tree, and the observations and recommendations set out on the attached tree survey tabular report document.

In accordance with British Standards (BS) 5837:2012 the Root Protection Areas (RPAs) for all assessed trees, designated for long-term retention, and deemed to be potentially impacted upon by the proposed development, were calculated. These are set out on the attached 'BS5837 Report, Battlements, Wentworth Castle NT' tabular document, and their location and crown spreads plotted over the satellite images on the attached 'BS5837:2012 AIA – Map01 Tree Constraints' and 'BS5837:2012 AIA – Map02 Tree Constraints'. These will enable the developer to take the correct protection measures. The Root Protection Areas (RPAs) of the trees are shown on 'BS5837:2012 AIA – Map03 Tree Protection', in accordance with BS 5837:2012.

## **Arboricultural Impact Assessment**

A section of Battlement wall, close to the Sun Monument Bastion, catastrophically failed leading to complete collapse of a 20m section of masonry, in October 2023. The cause of the collapse was attributed to extensive amounts of cementitious mortar which failed suddenly following a period of wet weather. The Battlement walls had also been weakened by a series of mature trees. The collapsed section of the Battlements is located at OS reference SE 31673 03000.

The document '20340 – WCG03 – Structural Justification Report' sets out the methodology for '*The adopted conservation approach aimed at minimising the harm to the architectural and historical significance of the collapsed section of the Battlement walls, while addressing issues of long-term stability, drainage, sustainability, and public safety*' as follows:

*'The proposed solution consists of soil nails for soil stabilization and to restrain the newly rebuilt dry-stone masonry wall on top of the existing bedrock. This is similar to the solution adopted previously on an adjacent section of the wall.*

*The stone wall debris will have to be carefully removed prior to works commencing which will allow us to determine the exact profile of the bedrock where the wall will be sitting. The ground behind the wall will be battered back to allow safe working and to provide a 70° slope to the soil. The zone of impact will extend up to 2m behind the wall.*

*Specialist soil design has been carried out by Byland Engineering. The soil nails will be driven into the ground in sequence to anchor the wall and provide lateral restraint. They consist of 32mm diameter hollow reinforcement bars drilled into the soil which are then injected with grout. Ground anchorage is reliant on the grout penetrating the surrounding strata. They extend up to 5m from the facing and are inclined to minimise disturbance to the upper layers. The head of the soil nails is anchored to the soil facing through a stainless-steel mesh and anchor plates.*

*In this case, the vertical and horizontal spacings are respectively 1.0m and 1.5m to provide the anchorage necessary to restrain the wall. If the spacing was increased and the total number reduced the potential load imposed on the soil nail would exceed its anchorage capability and cause instability to the soil and wall.*

*After the completion of the soil nails, the rebuilding of the dry-stone wall can be carried out in stages using the original stone blocks. As the wall is raised, a stainless steel mesh will be placed on the back of the wall which will be connected to the wall using stainless steel bent straps and fixed to the soil nails through clamped stainless steel bars. To ensure a good bond between the newly built wall and the existing one, alternate courses should overlap.*

*To address drainage issues, the wedge between the soil facing and the dry-stone wall will be filled with Type 3 aggregate surrounded with a Terram geotextile or similar, which will enable the water to percolate and reach the gravel fill with a perforated drain and the weep holes at the base of the wall.*

*Although the soil nails are a difficult solution to reverse, they will enable minimum disturbance to the site and excavation and are compatible with other solutions for the retaining wall. The combined solution of a dry-stone wall with a permeable backfill is fully reversible, if necessary.'*

The document 'Method Statement – Wentworth Castle Gardens Battlement Collapse – 12.04.24' sets out the methodology/rebuilding works as follows:

*'The collapsed section of walling currently lies in a pile of masonry. It is proposed to re-site the pile of masonry from the base of the collapsed section of battlement by drawing the material away from the danger zone by use of a long reach mechanical excavator, for health and safety purposes.*

*Once safely out of harm's way the rubble can be processed by selecting out any good walling stone by hand, cleaning old mortar from it and then setting it aside on pallets ready for re use. The useable stone will be sorted into size order which will be then re-use to match in with similar sized coursing of the existing Battlements.*

*It is envisaged that due to damage sustained in the collapse there will be a shortfall of reusable stone, this shortfall can be mitigated by supplementing good quality matching reclaimed stone procured from a trusted salvage merchant, or alternatively newly quarried stone which could be tooled to match the existing battlements.*

*Reclaimed stonework can be subject to a LBC condition, whereby it is approved by the architect and conservation officer on site; to ensure that it is an appropriate match. When rebuilding work is undertaken the course dimensions and bonding pattern should be faithfully replicated by referencing existing original sections of the walling along the line.*

*The use of hot lime mortar mix is proposed for all of the rebuilding and pointing works. The inner and outer leaves of the wall should be tied together using header courses set into the wall at the appropriate course spacing this should add structural stability as well as maintaining the integrity of the build pattern.*

*Weep holes should be introduced at the base of the wall as a precaution against the build-up of ground water to the retaining infill this can be achieved by inserting 110mm clay drainpipes laterally along the length of the new section of wall, similarly, undertake elsewhere on site.*

*Any infill to the core of the wall should be in the form of rubble work, this should be consolidated with hot lime mortar used as a binder.'*

It is assumed by the author of this document that the rebuilt wall will – on a spatial basis – replace the collapsed wall on a like-for-like basis, occupying the same footprint. The document '20340 – WCG03 – Structural Justification Report' states that *'The ground behind the wall will be battered back to allow safe working and to provide a 70° slope to the soil. The zone of impact will extend up to 2m behind the wall.'* This can be seen on the plan, elevation and section documents '2718-001 – WCG03 – Soil Nail Detail', '2718-002 – WCG03 – Soil Nail Layout' and '20340 – WCG03 – Soil Nail connection to masonry retaining wall'. The creation of the batter to allow safe working

and to provide a 70° slope to the soil, will mean the removal of a considerable amount of the existing and remaining original backfill soil at the face of the existing precipice, behind the collapsed section of Battlement wall. The section removed to create the batter – the zone of impact – will taper downwards, being at the top – the current ground level behind the top of the Battlements – up to 2m behind the current wall top. Measurements taken, by the author of this document, from the scale section drawing document '2718-001 – WCG03 – Soil Nail Detail' indicate the removal of about 1.5m of soil from the ground level at the top of the Battlements, tapering downwards to extinction at approximately the point that the narrowing taper meets the sandstone bedrock.

A summary of the trees that will be affected by the proposed development, is as follows:

**A category** (high quality) trees.

There are no trees that are of high quality.

**B category** (medium quality) trees.

Trees 3910, 3947 and 3958 are of medium quality.

**C category** (low quality) trees.

Trees 3873, 3875, 3939 and 3978 are of low quality. These trees are of ubiquitous non-native or hybrid species. Furthermore, most of these trees are of young to early-mature age-class; most display somewhat impaired condition and/or poor form.

**U category** (other quality) trees.

There are no trees that are of high quality.

### **Uncategorized trees**

The remaining trees and shrubs, in within the grounds and woodlands of the proposed development area and beyond in the wider landscape are uncategorized. Uncategorized trees – for the purposes of this document - are termed 'retained trees'. They are not deemed to be potentially, or significantly, negatively, impinged upon by the proposed development, to the best knowledge of the author of the document; no methodologies or plans have been supplied to the author of this document that show how the proposed development would or might impact and affect uncategorized trees and shrubs.

**Proximity of structures to trees**

Trees 3873, 3939 and 3947 are located close to – less than 3m – from the precipice left by the collapse of the 20m section of the Battlements, or to adjacent parts of the Battlements at either end of the collapsed section.

Trees 3910 and 3958 are located behind and close to sections of the Battlements that have not yet collapsed - more than 3m from the collapsed sections - although RPA of tree 3958 does include sections of ground that have collapsed and will be excavated as part of the proposed development works.

Trees 3875 and 3978 are located at the foot of the Battlements, below the collapsed section; tree 3978 grows from a rock-ledge on the bedrock onto which the Battlements were constructed in this section.

The trees are detailed on the attached 'BS5837 Report, Battlements, Wentworth Castle NT' tabular document, and their location and crown spreads plotted over the satellite images on the attached 'BS5837:2012 AIA – Map01 Tree Constraints' and 'BS5837:2012 AIA – Map02 Tree Constraints'. These will enable the developer to take the correct protection measures. The Root Protection Areas (RPAs) of the trees are shown on 'BS5837:2012 AIA – Map03 Tree Protection', in accordance with BS 5837:2012.

## **Arboricultural Method Statement**

**Proposed development in general:** as stated in 'Arboricultural Impact Assessment' above, the creation of the batter to allow safe working and to provide a 70° slope to the soil, will mean the removal of a considerable amount of the existing and remaining original backfill soil at the face of the existing precipice, behind the collapsed section of Battlement wall. The section removed to create the batter – the zone of impact – will taper downwards, being at the top – the current ground level behind the top of the Battlements – up to 2m behind the current wall top. Measurements taken by the author from the scale section drawing document '2718-001 – WCG03 – Soil Nail Detail' indicate the removal of about 1.5m of soil from the ground level at the top of the Battlements, tapering downwards to extinction at approximately the point that the taper meets the sandstone bedrock.

Accordingly, the 'footprint' of the proposed development – the zone of impact - impinges upon the RPAs of trees 3873, 3939, 3947 and 3958. Tree 3947 is located close to the collapsed section, but is still behind an extant area of wall; it occupies an ambiguous and liminal area. The RPA of tree 3958 does include sections of ground that have collapsed and will be excavated as part of the proposed development works, although the tree is located behind an extant section of the Battlements that has not yet collapsed. Tree 3910 is located sufficiently far from the collapsed section that it should be retained.

Tree 3978 grows from a rock-ledge on the bedrock onto which the Battlements were constructed, but will probably not be affected by the proposed development.

Tree 3875 is located near to the base of the Battlement wall, and may be affected by the proposed development, in that it might be within the working area.

The document 'Method Statement – Wentworth Castle Gardens Battlement Collapse – 12.04.24' states that '*The Battlement walls had also been weakened by a series of mature trees*'. The retention of large and mature tree 3947 is not prudent, as it would continue to pose a threat to the stability of the Battlement wall. Tree 3958 is somewhat further from the collapsed section of the Battlements, and the National Trust wishes to retain this tree.

Accordingly, a combination of the putative damage of the existing mature trees to the Battlement wall and the requirement, as part of the proposed development, to create a batter that will remove up to 2m of the soil behind the current wall top – the so-called zone of impact – means that trees 3873, 3939 and 3947 should be removed in their entirety.

Trees 3958 and 3910 should be retained and protected with a RPA exclusion fences and zones.

Trees 3875 and 3978, located at the foot of the Battlements, below the collapsed section, are C-category and not deemed worthy of special mitigation and protection measures during the development phase.

**Tree works:** no remedial or preventative tree pruning works are proposed for this development.

**General arboricultural good practice site measures:** applicable to retained, uncategorized trees beyond the immediate proposed development area.

Concrete, fuels, chemicals, contaminated surface water and any other potentially noxious substances, must be prevented from entering RPA of any retained tree. Concrete mixing, transportation and moulding must be completed using hand tools and light plant only.

No machinery, plant or vehicles are to be washed down within 5 metres of any retained tree.

No fire should be created within 10 metres of, or close enough that it might cause damage to, the crown of any retained tree.

Any earth excavated will be either removed from the site or stored in areas beyond the RPA of any retained tree. Any landscaping, alteration, or significant changes in the ground level or hydrology of soil, within the RPA of any retained tree, may be detrimental to these trees and should be avoided.

Care must be taken, when using cranes, diggers or other large plant machinery, to prevent damage to the ground surface within the RPA of any retained tree, as well as all above ground, or aerial parts, of any retained tree.

If development phase takes place during periods that experience wet ground conditions, every effort and measure should be undertaken to ensure that no ground compaction or poaching occurs within the RPA of any retained tree. This would be achieved by minimizing the use of heavy and high impact plant machinery; only working over favourable, dry ground conditions; and/or the installation of temporary ground protection - such as Cellweb® support system – as necessary.

**Works within the RPA of trees 3958 and 3910:** the 'footprint' of the proposed, new development impinges upon the RPA of tree 3958. As discussed above, tree 3958 occupies an area behind an intact and extant section of the Battlement wall, but nonetheless the RPA of tree 3958 does include sections of ground that have collapsed and will be excavated as part of the proposed development works. Trees 3910 and 3958 will need to be incorporated into RPA exclusion zones, enforced with exclusion fences. The methodology for the development phase seeks to minimise the risk of damage and disturbance to tree roots, of retained trees 3910 and 3958, by employing a 'no-dig', or 'minimal-dig' policy within the RPAs of these trees, where it is possible to do so. Parts of the RPA of tree 3958 are either over the void, south of the wall, or in the development area. It is inevitable that the true root-plate, and therefore RPA, of tree 3958 is highly asymmetrical both in horizontal and vertical space.

Development within the RPAs of retained trees 3910 and 3958 - the 'root investigation zones' - will take care not to damage or disturb the roots of these trees and will adhere to 'General arboricultural good practice site measures' as set out below.

**RPA exclusion zones:** as stated above, the methodology for the development phase seeks to minimise the risk of damage and disturbance to tree roots, of retained trees 3910 and 3958, by employing a 'no-dig', or 'minimal-dig' policy within the RPAs of these trees, where it is possible to do so. Parts of the RPA of tree 3958 are either over the void, south of the wall, or in the development area. It is inevitable that the true root-plate spread, and therefore RPA, of tree 3958 is highly asymmetrical both in horizontal and vertical space. Accordingly, the RPA exclusion zones for trees 3910 and 3958 will incorporate as much of the RPAs of both trees, so far as is possible within the context of the development and the topographical constraints.

During the development/construction phase, especially any excavation works, care should be taken not to rip up, or damage, any roots within the RPA of retained trees 3910 and 3958. Excavations, beyond the RPA exclusion zone and fence, will be completed in a controlled and sensitive manner, using hand-tools, or an air-lance (which utilises high-pressure gas to loosen soil aggregates that will minimise root damage and disturbance). Due to the woodland location of the trees, it might be impossible to ascertain if roots belong to a retained tree, a non-retained (felled or dismantled) tree, or an uncategorised tree or shrub. If roots are found to be present, during this process, which are smaller than 25mm, it might be acceptable to prune these with a sharp tool, but only after consultation with the project arboriculturalist. If roots are found to be present, during this process, which exceed 25mm or as large masses of fibrous roots, no further excavation will occur, and top-soil will immediately be spread over them, to prevent desiccation, and further advice sought from the project arboriculturalist. If any roots greater than 50mm are encountered, the project arboriculturalist should be consulted. If roots encountered are considered too great to remove without causing irreversible damage to the tree, they will be retained, and the proposed footings must be constructed at a level that will safeguard the roots.

Care should be taken to ensure that roots, exposed by excavation, are re-covered with topsoil, or moist hessian sacking if there is to be a delay in backfilling. If roots, above 25mm, or large masses of fibrous roots, are not found at any depth, excavation and construction will continue. New surfaces must be constructed above the existing ground level, and no excavation will take place. The ground surface can be levelled, where necessary, with a layer of sharp sand or topsoil. Any topsoil used will be taken from topsoil excavated on site, and must be clean and uncontaminated. Builders sand will not be used due to its high salt content.

Care must be taken, when using cranes, diggers or other large plant machinery, to prevent damage to the ground surface within the RPA of any retained tree, as well as all above ground, or aerial parts, of any retained tree. If development phase takes place during periods that experience wet ground conditions, every effort and measure should be undertaken to ensure that no ground compaction or poaching occurs within the RPA of any retained tree. This would be achieved by minimizing the use of heavy and high impact plant machinery; only working over favourable, dry ground conditions; and/or the installation of temporary ground protection - such as Cellweb® support system – as necessary.

Within the RPA exclusion zone, no digging, excavation or changes of ground level will take place; no materials will be stored; no machinery, plant or temporary development

site infrastructure (such as cabins or toilets), or fires will be permitted. RPA exclusion zones shall be entirely empty and unencumbered.

**Replacement tree planting of trees 3873, 3939 and 3947:** trees 3873, 3939 and 3947, that are to be removed shall be replaced, at locations around the National Trust, Wentworth Castle Gardens land-holding. Replacements should consist of two *Quercus robur*, two *Taxus baccata* and two *Liriodendron tulipifera*. The planting stocks should be bare-root or pot-grown for the *Quercus robur* and *Liriodendron tulipifera*, and pot-grown for the *Taxus baccata*. Smaller sized planting stock should be used, preferably 1-2m tall when sourced and planted. Plants should be guarded against vermin, as appropriate to their locations, adequately maintained throughout the establishment period, and replaced, as necessary, if plants fail to thrive or die. Plants will be located at the discretion of the National Trust, on their Wentworth Castle Gardens land-holding, in suitable locations apropos shade and distance from thoroughfares, utilities, trees, shrubs and structures, in suitable ground conditions.

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**Bibliography:** British Standard Publication: BS 5837:2012.

## Photograph Plates 01-03



**Plate 01:** view of the collapsed and remaining sections of the Battlement wall, from the south. Trees 3873, 3947 and 3910 (left to right) are visible at the top of the wall. 15 July 2024.



**Plate 02:** view of the collapsed and remaining sections of the Battlement wall, from the southeast. Trees 3978, 3958, 3875, 3873, 3947 and 3910 (left to right) are visible. 15 July 2024.



**Plate 03:** view of the collapsed and remaining sections of the Battlement wall, from wall-top level, from the southeast. Trees 3978, 3958, 3939, 3873 and 3947 (left to right) are visible. 15 July 2024.

## **BS5837 Report, Battlements, Wentworth Castle NT**

### Legend

<b>Tree Number (On Plan/Map &amp; Table)</b>	<ul style="list-style-type: none"> <li>0001: each tree noted is given a numbered, metal tag, in situ. This corresponds to the number both on the map and on this inspection report sheet.</li> <li>G01: where an 'G' precedes a number, this is termed a 'group map reference'. Generally, group map references are used to refer to groups of trees, where a single numbered tag would not suffice.</li> <li>T01: where an 'T' precedes a number, this is termed a 'tree map reference'. Generally, tree map references are used to refer to trees on which an individual numbered tag could not be placed, due to factors such as dense ivy growth or inaccessibility.</li> </ul>
<b>Species</b>	<ul style="list-style-type: none"> <li>Species of tree using the common name (anglicised name known by the tree inspector) followed by the scientific, botanical nomenclature.</li> </ul>
<b>Life Stage (Age Class)</b>	<ul style="list-style-type: none"> <li>Life stage or age class is expressed in the following way: <ul style="list-style-type: none"> <li>Newly planted</li> <li>Young=up to ½ mature size/age.</li> <li>Semi Mature</li> <li>Early Mature=up to ¾ mature size/age.</li> <li>Mature=approximately (+/-) mature size/age.</li> <li>Over Mature=mature size/age, but with reduced vigour/some die-back.</li> <li>Veteran=mature size/age, but with advanced die-back, significant faults and decay.</li> <li>Ancient</li> <li>Dead</li> </ul> </li> </ul>
<b>Dbh (mm)</b>	<ul style="list-style-type: none"> <li>Estimated diameter of stem, at breast height (at ~1.3m from ground), in millimetres.</li> <li>Multi-stemmed tree (MT): tree with no distinct boll: may be low-forked and/or multi-stemmed stool.</li> </ul>
<b>Height (m)</b>	<ul style="list-style-type: none"> <li>Estimated maximum height of the tree, in metres.</li> </ul>
<b>Crown Spread (m)</b>	<ul style="list-style-type: none"> <li>Estimated maximum, average crown spread, in metres, for both symmetrical and asymmetrical crowns.</li> </ul>
<b>Bats</b>	<ul style="list-style-type: none"> <li>Where indicated the tree displays either symptoms of, or has the potential for, bat usage, that is it displays PRFs (Potential Roost Features).</li> <li>Such a tree should be (climbed and) checked over by a qualified arborist or arboriculturalist, prior to remedial works commencing, for evidence of bat activity, and appropriate action taken.</li> </ul>
<b>Condition</b>	<ul style="list-style-type: none"> <li>Each tree is systematically inspected.</li> <li>The condition entry lists the areas as: crown, limbs, stem (and butt) and roots. 'Stool' refers to the base of a multi-stemmed and/or coppice tree or large shrub; this is generally the lower 0.5m of the plant. 'Bole' refers to the lower part of a tree trunk, below origins of the main crown limbs. 'Bole' specifically refers to the bole of a pollard, and is frequently used, in these VTA reports, to describe the part of the trunk that remains when a pollard has been pollarded/lopped. 'Lop and top' refers to the limbs, brash, etc. that are removed from a pollard during the process of pollarding or lopping.</li> <li>An overall condition is also given. Condition is expressed in the following way: <ul style="list-style-type: none"> <li>Good: good vigour, no significant defects noted.</li> <li>Fair: reasonable vigour, some minor defects noted.</li> <li>Poor: poor vigour, significant defects noted, requiring prompt action.</li> <li>Dead: dead or moribund tree.</li> </ul> </li> </ul>
<b>Recommendations</b>	<ul style="list-style-type: none"> <li>Recommendations (recommended action/s) should be clear and unambiguous.</li> <li>If more than one recommendation option is set out, the tree inspector's preference is always given.</li> <li>If these are not the case, further clarification must be sought by the tree owner/tree manager.</li> </ul>
<b>Work Priority</b>	<ul style="list-style-type: none"> <li>The work priority of recommended action/s is expressed as follows: <ul style="list-style-type: none"> <li>Urgent: to be completed immediately.</li> <li>High: to be completed within 3 months.</li> <li>Medium: to be completed within 6 months.</li> <li>Low: to be completed within 12 months.</li> </ul> </li> </ul>
<b>Inspect Period (Inspection Frequency)</b>	<ul style="list-style-type: none"> <li>Re-inspection of trees within the condition 'reasonable' or 'poor' categories, should be undertaken at 6, 12 or 18 month intervals, as indicated. Use of brackets denotes an inspection frequency relevant only where the tree has not been felled/removed.</li> </ul>
<b>Acronyms and Abbreviations</b>	<ul style="list-style-type: none"> <li>PRoW: Public Right of Way, viz. footpath, bridle-way, road.</li> <li>N, S, E or W: points on the compass and their intermediates (e.g. NE, SW, etc.)</li> </ul>






# BS5837 Report



Battlements

Wentworth Castle NT

Retention Category	No. trees
A	0
B	3
C	4
U	0
<b>Total</b>	<b>7</b>

Rem. Contrib.	No. trees
<10 years	2
10+ Years	1
20+ Years	0
30+ Years	0
40+ Years	1
50+ Years	3

Ref.	Species	Full Structure	Measurements	Survey Notes	Retention Category	RPA	Comments	Measurements2	Recommendations	Photo
3873	Irish yew ( <i>Taxus baccata</i> 'Fastigiata')	Multi-Stemmed 10 stems	Height (m): 5 10 stems, avg.(mm): 40 Spread (m): 2N, 2E, 2S, 2W Life Stage: Young Rem. Contrib.: <10 years	Tree on the edge of the precipice.	C2	Radius: 1.5m. Area: 7 sq m.		Physiological Condition: Fair Structural Condition: Fair Public Amenity Value: Moderate Inspection Limitations: Access Bat Habitat: None		
3875	Azalia spp. ( <i>Azalia</i> )	Tree 2 stems	Height (m): 5 2 stems, avg.(mm): 100 Spread (m): 1N, 1E, 2S, 3W Crown Clearance (m): 1 Life Stage: Over Mature Rem. Contrib.: 50+ Years	Bifurcated at 0.3m	C1,3	Radius: 1.7m. Area: 9 sq m.		Physiological Condition: Fair Structural Condition: Fair Public Amenity Value: Moderate Inspection Limitations: None Bat Habitat: None		
3910	Irish yew ( <i>Taxus baccata</i> 'Fastigiata')	Multi-Stemmed 15 stems	Height (m): 6 15 stems, avg.(mm): 50 Spread (m): 3N, 3E, 3S, 3W Life Stage: Semi Mature Rem. Contrib.: 50+ Years		B2	Radius: 2.3m. Area: 17 sq m.		Physiological Condition: Good Structural Condition: Good Public Amenity Value: Moderate Inspection Limitations: Access Bat Habitat: None		
3939	Irish yew ( <i>Taxus baccata</i> 'Fastigiata')	Multi-Stemmed 10 stems	Height (m): 7 10 stems, avg.(mm): 50 Spread (m): 2N, 2E, 2S, 2W Life Stage: Young Rem. Contrib.: <10 years	Very close to precipice.	C2	Radius: 1.9m. Area: 11 sq m.		Physiological Condition: Good Structural Condition: Good Public Amenity Value: Moderate Inspection Limitations: Access Bat Habitat: None		
3947	Austrian pine ( <i>Pinus nigra</i> <i>austriaca</i> )	Tree	Height (m): 20 Stem Diam(mm): 880 Spread (m): 4N, 4E, 7S, 6W Crown Clearance (m): 7 Lowest Branch (m): 1(SE) Life Stage: Mature Rem. Contrib.: 50+ Years	Good specimen tree. Some thinning of crown foliage density.	B1,2,3	Radius: 10.6m. Area: 353 sq m.		Physiological Condition: Fair Structural Condition: Good Public Amenity Value: Good Inspection Limitations: Access Bat Habitat: Low		

Ref.	Species	Full Structure	Measurements	Survey Notes	Retention Category	RPA	Comments	Measurements2	Recommendations	Photo
3958	Pedunculate oak ( <i>Quercus robur</i> )	Tree	Height (m): 18 Stem Diam(mm): 910 Spread (m): 7N, 7E, 7S, 4W Crown Clearance (m): 5 Lowest Branch (m): 3(S) Life Stage: Over Mature Rem. Contrib.: 40+ Years	Historical crown limb breakout damage evident. Decayed branch stubs on trunk and in crown. Water-marking from cavity at 10m, on S of tree. Some thinning of crown foliage density.	B2	Radius: 10.9m. Area: 373 sq m.		Physiological Condition: Fair Structural Condition: Fair Public Amenity Value: High Inspection Limitations: None Bat Habitat: Medium		
3978	Wych elm ( <i>Ulmus glabra</i> )	Tree 2 stems	Height (m): 10 2 stems, avg.(mm): 200 Spread (m): 3N, 7E, 4S, 3W Crown Clearance (m): 2 Lowest Branch (m): 1(SE) Life Stage: Semi Mature Rem. Contrib.: 10+ Years	Character tree, growing from base of wall and rock ledge. Some die-back at tips of branches.  Pests and Diseases: Dutch Elm Disease (Ophiostoma novo-ulmi)	C2	Radius: 3.4m. Area: 36 sq m.		Physiological Condition: Diseased Structural Condition: Good Public Amenity Value: Moderate Inspection Limitations: None Bat Habitat: None		



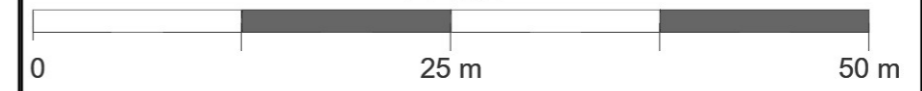
Stainborough Castle

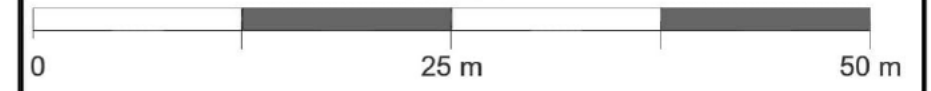
Wentworth Castle NT

BS5837:2012 AIA - Map02 Tree Constraints

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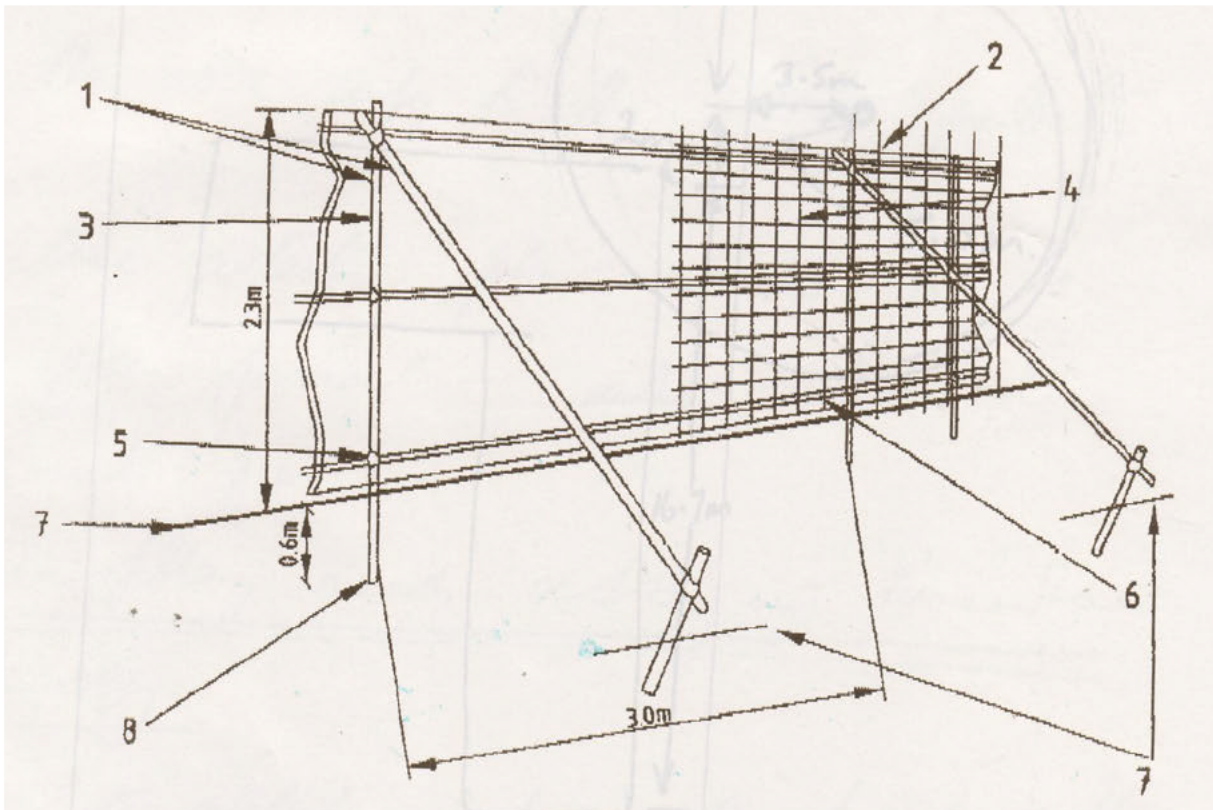




# Wentworth Castle Gardens, Proposed Development: Rebuilding Works – Collapsed Section of Battlements

## Protective Barrier/Ground Protection

August 2024



### Legend:

1. Standard scaffold poles.
  2. Uprights to be driven into the ground.
  3. Panels secured to uprights with wire ties and where necessary standard scaffold clamps.
  4. Weldmesh wired to the uprights and horizontals.
  5. Standard clamps.
  6. Wire twisted and secured on inside face of fencing to avoid easy dismantling.
  7. Ground level.
  8. Approximately 0.6m driven into ground.
- N.B. the fence will also have an all-weather sign attached to it saying 'Tree Protection Area'.

# Wentworth Castle Gardens, Proposed Development: Rebuilding Works – Collapsed Section of Battlements

## Protective Barrier/Ground Protection (section)

August 2024

