Appendix 9.4: Sloy Pumped Hydro Storage Scheme: Arboricultural Impact Assessment (AIA)

Appendix 9.4

Sloy Pumped Hydro Storage Scheme
Arboricultural Impact Assessment

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Sloy Pumped Hydro Storage Scheme
Arboricultural Impact Assessment

August 2024

CONTROL SHEET

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EXECUTIVE SUMMARY

ASH Design + Assessment (the client) retained EnviroCentre Limited to conduct a tree survey at a site referred to as Sloy Power Station, near Inveruglas, Loch Lomond. This Arboricultural Impact Assessment details the findings of the desk study, field data interpretation, quantification of tree constraints, descriptions of predicted impacts on arboricultural interest, and recommendations for avoidance, mitigation, and compensatory strategies.

The results and recommendations in this document relate to the site boundary as provided by the client at the time of the survey.

The site is located at Sloy Hydro-Electric Power Station, approximately centred at NN 32163 09872. The site is located within the Loch Lomond and The Trossachs National Park. The site is on undulating ground, which slopes downwards to the east, towards the shores of Loch Lomond, reaching a maximum elevation of 35 metres (m) above the sea level and a minimum of 6m. The site is comprised of the power station building with associated amenity grassland, hardstanding vehicle access/parking, and a mixed-wood woodland bordering the north side of the power station grounds.

The site survey was conducted on 12 November 2023 and followed guidance set within British Standard 5837:2012. The desk study identified the woodland to the south of the hydro station is classified as an ancient woodland by the Ancient Woodland Inventory of Scotland and the woodlands to the north and south of the hydro station are classified as native woodlands by the Native Woodland Survey of Scotland.

The impact assessment identified the requirement for approximately 2.38 ha of category B woodland to be removed to facilitate the currently proposed design. This woodland loss equates to approximately a 45.7% reduction of the woodlands surveyed.

Tree loss should be compensated for by planting new woodland at a minimum rate of one unit of area planted per one unit of area removed. New woodland planting, where possible, should connect currently disconnected woodlands to enhance woodland habitat across the site. Annual inspection of the new planting should be conducted for the first five years, followed by a final inspection 10 years after planting with a target of 90% survival.

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1 INTRODUCTION

1.1 Terms of Reference

ASH Design + Assessment (the client) retained EnviroCentre Limited to conduct a tree survey at a site referred to as Sloy Power Station, near Inveruglas, Loch Lomond. This Arboricultural Impact Assessment details the findings of the desk study, field data interpretation, quantification of tree constraints, descriptions of predicted impacts on arboricultural interest, and recommendations for avoidance, mitigation, and compensatory strategies.

The results and recommendations in this document relate to the site boundary as provided by the client at the time of the survey.

1.2 Scope of Report

The aim of this study was to present the potential constraints posed by existing trees and vegetation in relation to the design for future development of the site. The objectives of the study were as follows:

- Undertake a desk study to ascertain and statutory/non-statutory designations pertaining to the site, including tree preservation orders (TPOs) in addition to any pertinent guidance from the Argyll and Bute Local Development Plan (LDP)[1]
- Utilise tree survey data in reference to BS5857:2012 *Trees in relation to design, demolition and construction –Recommendations* to depict the influence that tree constraints pose to the design
- Identify trees which would be removed as part of sound arboricultural management (i.e., dead/unviable trees)
- Assess the predicted impact of the design on the arboricultural interests of the site
- Describe how trees should be protected during construction
- Provide management recommendations to encourage the persistence of any high-quality trees and tree groups on or adjacent to the site
- Provide mitigation, compensation, and enhancement recommendations as required

1.3 Site Description

The site is located at Sloy Hydro-Electric Power Station, approximately centred at NN 32163 09872. The site is located within the Loch Lomond and The Trossachs National Park. The site is on undulating ground, which slopes downwards to the east, towards the shores of Loch Lomond, reaching a maximum elevation of 40 metres (m) above the sea level and a minimum of 6m. The site is comprised of the power station building with associated amenity grassland, hardstanding vehicle access/parking and a mixed-wood woodland bordering the north side of the power station grounds.

[1] Available at: https://www.argyll-bute.gov.uk/sites/default/files/migrated_files/written_statement_0_1_ac.pdf (accessed 10 November 2023)

1.4 Author Qualifications

I, Eliah Hunter-Dixon, am an Arboricultural Consultant with EnviroCentre Limited with more than three years' field survey experience. I have a Bachelor of Science in Forestry, hold a Technician membership with the Arboricultural Association, and an Associate membership of the Institution of Environmental Sciences.

1.5 Report Usage

The information and recommendations contained within this report have been prepared in the specific context stated above and should not be utilised in any other context without prior written permission from EnviroCentre Limited.

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2 METHODS

2.1 Guidance Documents

The survey was conducted applying the standards and methods outlined in:

- BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations[2]
- BS 5837 – Advanced: Tree Assessment for Planning[3]
- Guidance Note 7: Tree Surveys - A Guide to Good Practice[4]

2.2 Desk Study

A desk study was undertaken prior to the initial field survey which included a review of:

- Available aerial imagery
- Tree Preservation Orders (TPOs), conservation areas[5], and statutory and non-statutory designated sites
- The Ancient Woodland Inventory[6]
- The Native Woodland Survey of Scotland (NWSS), National Forest Inventory (NFI), and, where applicable, Scottish Government policy[7]
- Relevant species and habitats listed on the Argyll and Bute Local Development Plan (LDP)[8]
- Soil conditions on site including compaction risks[9]

2.3 Tree Survey

Trees and tree groups were visually assessed from ground level. No invasive instruments were used in assessing the trees' condition. The following information was recorded:

- Unique identification number
- Species
- Height measured using a Haglof digital clinometer to the nearest 0.5m
- Diameter at 1.5m above ground level measured with a diameter tape to the nearest 5mm
- Crown dimensions estimated or measured to the nearest metre
- Life stage (age profile)
- Condition
- General observations including preliminary management recommendations
- Tree quality categorisation

[2]Available at: https://shop.bsigroup.com/products/trees-in-relation-to-design-demolition-and-construction-recommendations/standard (accessed 01/03/2024)
[3] Barrell, J. (2016) BS 5837 – Advanced: Tree Assessment for Planning (1st ed.). Arboricultural Association.
[4]Available at: https://www.trees.org.uk/Book-Shop/Products/Guidance-Note-7-Tree-Surveys-%e2%80%93-A-Guide-to-Good-Practice (accessed 01/03/2024)
[5] Available at: https://map.environment.gov.scot/LIS_Agri/Agri.html (accessed 18/03/2024)
[6] Available at: https://map.environment.gov.scot/sewebmap/ (accessed 18/03/2024)
[7] Available at: https://map.environment.gov.scot/sewebmap/ (accessed 18/03/2024)
[8] Available at: https://www.argyll-bute.gov.uk/sites/default/files/migrated_files/written_statement_0_1_ac.pdf (accessed 10 November 2023)
[9] Available at: https://map.environment.gov.scot/Soil_maps/?layer=1 (Accessed on 18 March 2024)

For multi-stemmed trees and those on sloping ground, variance to the measurement method was made according to BS5837: 2012. Where trees stems were inaccessible, e.g., obscured by vegetation, the DBH has been estimated.

Where trees formed a cohesive group, they were treated as a tree group where a representative sample of trees were assessed rather than every individual tree within.

2.3.1 Tree Numbering and Identification

Individually surveyed trees were tagged with unique ID numbers or, where present, existing tree tag ID numbers were recorded. All tags were attached on the main stem, approximately 1.5m above ground level.

Tree groups have been assigned an identification code in the format: *TG#.*

2.3.2 Tree Groups

“The term “group” is intended to identify trees that form cohesive arboricultural features either aerodynamically (e.g., trees that provide companion shelter), visually (e.g., avenues or screens) or culturally, including for biodiversity (e.g., parkland or wood pasture), in respect of each of the three subcategories” (British Standard 5837:2012 section 4.4.2.3). Individual trees within groups are surveyed to aid in depiction of the larger woodland and its likely constraint to development but are not intended to represent an exhaustive list of the trees present within the woodland.

2.3.3 Life Stage

Table 2.1: Tree Age Classes

Abbreviation	Category	Description
Y	Young	A juvenile tree newly planted or recently established.
EM	Early mature	A tree that is becoming established increasing in height and landscape significance.
SM	Semi-mature	An established tree but not showing any species-specific mature characteristics such as ridged bark.
M	Mature	A tree which has reached maturity and contains features such as anticipated climax height, and species-specific mature characteristics.
LM	Late mature	A tree which is exhibiting physiological and biomechanical changes associated with aging and has the potential to become veteran or ancient.
V	Veteran	A tree usually in the mature stage of its life and has important wildlife and habitat features including hollowing or associated decay fungi; holes; wounds and large dead branches.
A	Ancient	A tree with one or more of the following characteristics: • Biological, aesthetic or cultural interest because of its great age • A growth stage that is described as ancient or post-mature • A chronological age that is old relative to others of the same species.

2.3.4 General Observations and Management Recommendations

General (non-invasive) observations were made of individual trees regarding their structural and physiological condition (e.g., the obvious presence of decay or physical defects shown by external bio-mechanical signs). Trees were classified in terms of their general condition using the categories outlined in Table 2.2.

Table 2.2: Tree Condition Classes

Abbreviation	Category	Description
G	Good	A tree not showing more mechanical defects than would be expected or that could be easily remedied.
F	Fair	A tree showing more defects than could be reasonably expected, or which could be remedied.
P	Poor	A tree in a poor structural condition with defects which could not be easily remedied.
D	Dead	A tree afflicted with a pathogen or having suffered a trauma which has resulted in death.

2.3.5 Tree Quality Categorisation

Individual and groups of trees were afforded a general quality categorisation from **A**/**B**/**C** for retention or '**U**' for removal. The categorisation also reflects the future contribution that the tree may provide. Please refer to Appendix B: Tree Quality Assessment Criteria for further details of the categorisation.

2.3.6 Root Protection Areas (RPA)

The RPA was calculated as an area equivalent to a circle with a radius 12 times that of the stem DBH or the equivalent diameter for multi-stemmed trees.

For the tree groups where the dominant trees can be surveyed, these shall be presented on the tree plans as individual trees within a tree group. Edge trees within groups will also be prioritized for individual survey as they are expected to depict an accurate representation of the significant constraints to development. At a minimum, tree groups shall be afforded an RPA that extends to the dripline of the group. Where tree groups are deemed to require additional RPA allowance beyond their dripline, a modified RPA will be added to the tree plans.

Where access was not possible for individual trees or tree groups, estimated dimensions will be identified with the suffix # (British Standard 5837:2012 section 4.4.2.6 – c) and aimed to be representative of the likely constraints plus allowance for future growth.

2.4 Tree Reference Plans

Individual trees and tree groups have been plotted on the Tree Constraints Plan following survey of the site using GPS field data collection equipment.

The Tree Constraints Plan shows the following information:

- The location of the surveyed trees and groups of trees on site
- The tree quality colour code of individual trees and tree groups
- The estimated extent of individual tree crowns and tree group canopies

- The calculated individual and representative tree group RPAs (where required)
- Trees that are deemed physically incompatible with the current design or have RPA infringement resulting from development works

The Tree Protection Plan shows the following:

- The location of retained trees and vegetation groups
- The suggested location of vertical tree protection barriers and areas that would require mitigated works within the RPA

2.5 Disclaimers

This survey does not specifically address or quantify the health and safety risks posed by tree groups, although where potential hazards have been recognised it is possible to recommend an appropriate strategy for management. Regular arboricultural assessment should be undertaken of trees, particularly those recognised as posing a risk to persons or property within the site.

The survey conclusions relate solely to the conditions recorded at the time of inspection. Trees can be affected by environmental changes such as weather events, topographical alterations, or changes in hydrological regime; therefore, such changes may necessitate further survey.

Individually surveyed trees within tree groups are representative of the dominant trees within the group and are not an exhaustive survey of all trees within the woodland.

The Tree Schedule presented in this document includes preliminary management recommendations but is not a schedule of works and is not designed to be submitted to a contractor. Task specific Arboricultural Method Statements can be provided upon request.

3 RESULTS

3.1 Desk Study

Table 3.1: Desk Study Results

Desk Study Area	Results Influencing the Site
Tree Preservation Orders	N/A
Ancient Woodland Inventory of Scotland	Three of the woodlands around the hydro station are classified as ancient woodlands by the Ancient Woodland Inventory of Scotland (Figure 3.1).  Figure 3.1: Aerial imagery with Ancient Woodland Inventory of Scotland polygons.
Native Woodland Survey of Scotland	Several of the woodlands around the hydro station are classified as native woodlands by the Native Woodland Survey of Scotland (Figure 3.2).  Figure 3.2: Aerial imagery with Native Woodland Survey of Scotland polygons.

Desk Study Area	Results Influencing the Site
Conservation Area	The entire survey area falls within the Loch Lomond and the Trossachs National Park area. Their goals are as follows: "conserve and enhance the natural and cultural heritage, promote the sustainable use of natural resources of the area, promote understanding and enjoyment (including enjoyment in the form of recreation) of the special qualities of the area by the public and promote sustainable social and economic development of the communities of the area."[10]
Local Development Plan	SG LDP ENV 6 – Development Impact on Trees/Woodland To protect and expand forests, woodland and trees. Policy Outcomes: Existing woodlands and trees are protected, and cover is expanded. Woodland and trees on development sites are sustainably managed. Local Development Plans: LDPs should identify and protect existing woodland and the potential for its enhancement or expansion to avoid habitat fragmentation and improve ecological connectivity, helping to support and expand nature networks. The spatial strategy should identify and set out proposals for forestry, woodlands and trees in the area, including their development, protection and enhancement, resilience to climate change, and the expansion of a range of types to provide multiple benefits. This will be supported and informed by an up to date Forestry and Woodland Strategy. Policy 6 a) Development proposals that enhance, expand and improve woodland and tree cover will be supported. b) Development proposals will not be supported where they will result in: i. Any loss of ancient woodlands, ancient and veteran trees, or adverse impact on their ecological condition; ii. Adverse impacts on native woodlands, hedgerows and individual trees of high biodiversity value, or identified for protection in the Forestry and Woodland Strategy; iii. Fragmenting or severing woodland habitats, unless appropriate mitigation measures are identified and implemented in line with the mitigation hierarchy; iv. Conflict with Restocking Direction, Remedial Notice or Registered Notice to Comply issued by Scottish Forestry. c) Development proposals involving woodland removal will only be supported where they will achieve significant and clearly defined additional public benefits in accordance with relevant Scottish Government policy on woodland removal. Where woodland is removed, compensatory planting will most likely be expected to be delivered. d) Development proposals on sites which include an area of existing woodland or land identified in the Forestry and Woodland Strategy as being suitable for woodland creation will only be supported where the enhancement and improvement of woodlands and the planting of new trees on the site (in accordance with the Forestry and Woodland Strategy) are integrated into the design.

[10] Available at: https://spatialdata.gov.scot/geonetwork/srv/eng/catalog.search#/metadata/21e648e4-d8c7-482d-bb42-985f311f8d19 (accessed 30 April 2024)

Desk Study Area	Results Influencing the Site
Soil Structure and Profile	Parent Material: Drifts derived from arenaceous schists and strongly metamorphosed argillaceous schists of the Dalradian Series Texture: No Data Soil Moisture: No Data Compaction Risk: No Data Soil Leaching Potential: No Data

3.2 Site Survey Details

The site survey was conducted on 12/10/2023 by Eliah Hunter-Dixon, Arboricultural Consultant, EnviroCentre and Luigi Cristofaro, Graduate Ecologist, EnviroCentre. No inclement weather occurred that could have limited the survey quality. Trees were in typical fall condition with foliage present on most deciduous trees and reproductive structures present on some.

3.3 Current Tree Stock

This section should be read in conjunction with:

- Appendix C Tree Schedule
- Appendix D Tree Reference Plans

Species recorded during the survey are detailed in Table 3.2.

Table 3.2: Tree Species Recorded During Survey

Common Name	Scientific Name
Alder	*Alnus glutinosa*
Ash	*Fraxinus excelsior*
Horse Chestnut	*Aesculus hippocastanum*
Field maple	*Acer campestre*
Goat willow	*Salix caprea*
Larch	*Larix decidua*
Lime	*Tilia x europaea*
Norway maple	*Acer platanoides*
Oak	*Quercus sp.*
Rhododendron	*Rhododendron ponticum*
Rowan	*Sorbus aucuparia*
Scots pine	*Pinus sylvestris*
Silver birch	*Betula pendula*
Silver maple	*Acer saccharinum*

Common Name	Scientific Name
Sitka spruce	*Picea sitchensis*
Sycamore	*Acer pseudoplatanus*

3.3.1 Individual Trees and Arboricultural Features

A total of 99 trees and four tree groups were recorded during the survey. The general quality of the trees was moderate. There were signs of ash dieback present on the ash trees observed on site. *Rhododendron ponticum* was observed throughout the survey area.

Table 3.3: Individually Surveyed Trees by Category

Tree Category	Number of Trees
A	5
B	69
C	14
U	11

3.4 Tree Constraints and Impact Assessment

Due to the bulk of the tree groups being removed for the proposed design the primary constraint will come from protecting the woodlands on the edge of the development area. Wooded area adjacent to development should be protected with vertical protection barriers. Locations where these barriers should be used have been drawn in the Tree Protection Plan (see Appendix D).

Of the 99 individual trees surveyed, 81 trees were categorized as incompatible with the design. The majority of the trees within the survey that will not be impacted are to the northern extend of TG3. A crane pad on the southern edge of the site will require the removal of tree 43 and infringe slightly on the RPA of trees 44, 45, and 2243.

The total area of tree groups surveyed was approximately 5.2ha, the amount of canopy loss due to the proposed development design is approximately 23,800m^2 (45.7% reduction).

Table 3.4: Estimated Tree Group Canopy Loss by Category

Tree group Quality Category	Total Area on Site (Approximate m^2)	Projected Canopy Loss (Approximate m^2)
B	52,000	23,800

3.5 Conclusions

Following collection of the tree data, review of the desk study results, and assessment of the proposed development design, I can provide the following opinions:

1. The tree stock on site is generally in good health and form and provides moderate quality arboricultural value to the landscape. The areas of woodland adjacent to the A82 contribute to the overall national park scenery increasing the importance of the amenity they provide.
2. As currently designed, approximately 2.38 ha of category B woodland would require removal to facilitate development.

    a. NPF4 Policy 6 states that where removal of woodland is required, compensatory planting should be delivered.
3. Exposing previously sheltered trees within a group to climatic edge effects by removing a portion of a woodland may result in increased risk of tree failure due to stress or windthrow.
4. This Arboricultural Impact Assessment assumes a worst-case scenario of the removal of all trees within the site boundary to facilitate the project development. Where design changes result in a smaller footprint within the woodlands on site, a project arborist should be consulted on how to protect the remaining trees.

4 MITIGATION AND ENHANCEMENT RECOMMENDATIONS

The following suggestions have been extrapolated from the industry standards BS5837:2012 *Trees in relation to design, demolition, and construction – Recommendations* or on a site-specific basis.

The baseline data compiled to inform this document should be referred to and amended, if required, on receipt of a changed design. Updates may include but not be limited to utility and service drawings, road engineering details, and any amendments to the footprint of the proposed development.

4.1 Tree and Woodland Protection

To preserve retained trees and tree groups, the protection of their structure and health during construction will be required. The following methods should be adopted:

- Site operations should be planned to consider the location of the tree stem, crown, and root protection areas. Transit, traverse, and operation of machinery should be supervised by a banksman to ensure adequate clearance of the constraints. Pruning of trees may be required to facilitate access of such machinery. All pruning of this nature should be undertaken following consultation with a project arborist and completed by a qualified tree surgeon.
- It is suggested that retained trees in proximity to development activities are afforded protection using the default barrier specification as described in Figure 4.1.
- Installation of tree protection barriers in accordance with the Tree Protection Plan in Appendix D and audited by a project arborist (or Environmental Clerk of Works).
- All plant and vehicles, either stored or engaged in construction works, should operate outside the calculated RPA.
- Where construction works are required within the RPA or Vertical Tree Protection Barriers, works should be mitigated under the guidance of a project arborist.
- Existing ground levels within the RPA should be maintained with the existing topsoil remaining in situ.
- Limited manual excavation, if required, may be justified using hand-held tools. Engineered level changes should be subject to specifically designed mitigation in conjunction with the project arborist.
- In some cases, it is prudent to also protect the soil condition in areas identified for new planting. This precaution may reduce the need for costly soil conditioning and enhancement prior to the planting of new trees.
- Measures to control noise, dust, and other forms of water and airborne pollution should be adopted.

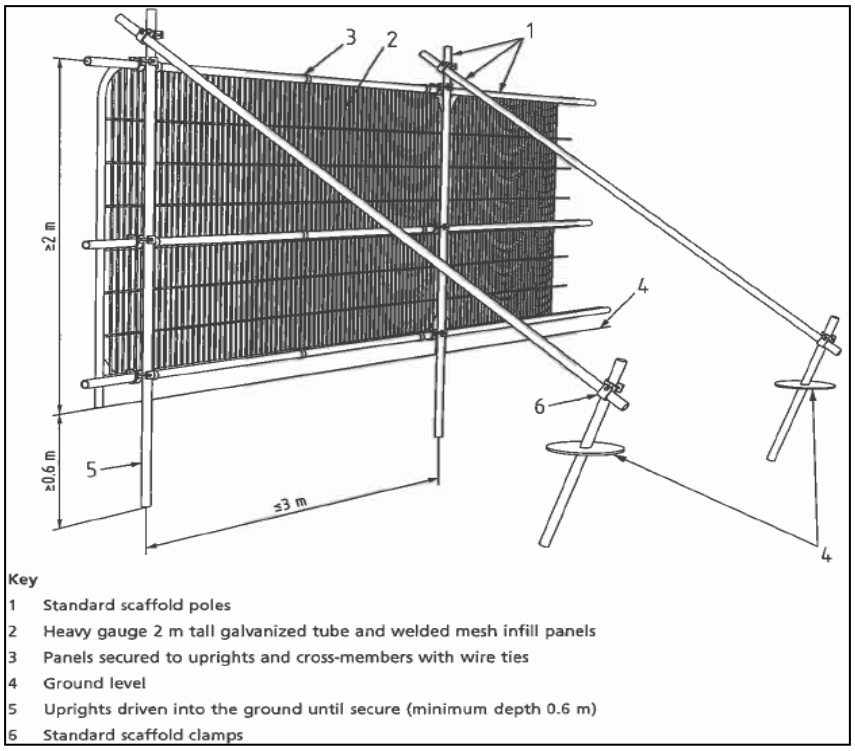


Figure 4.1: Default Specification Vertical Tree Protection Barrier

4.2 Working within the RPA

Where site operations may require the RPA of retained trees and woodland groups to be infringed, the following guidelines should be adopted:

- If required, activities within the RPA should follow the principle that the tree and soil structure take priority, ensuring adequate soil density to achieve root growth and function.
- The alteration of tree protection barriers and working within root protection areas should be guided by an appointed project arborist who can produce a task specific method statement, supervise and document works, and report compliance to the local authority.
- Changes in ground levels should be avoided within calculated rooting areas. Changes in levels should not create localised ponding of water, burial of root collars, limit gaseous exchange, or limit the tree root system's access to water.
- Where ground levels and engineering specification allow, calculated rooting areas scoped for surface changes such as footpaths or car parking may be bridged with cellular confinement systems to spread loading, allow percolation of water, and allow gaseous exchange[11].
- If required, surface material in calculated rooting areas should be dislodged with compressed air and hand tools with the aim of not damaging tree roots.
- Excavations within RPAs and pruning of roots <25mm using a sharp hand tool should be supervised by a project arborist.
- Arboricultural/forestry operations and soil improvement strategies may be required for trees which have been subject to root pruning or alteration of soil conditions. This strategy should be guided during works by a project arborist.
- All trees subject to RPA infringement should be included in a regular regime of Visual Tree Assessment.

[11] Information on Greenfix Geoweb available at: http://greenfix.co.uk/geoweb/ (accessed on 01/03/2024).

4.3 Compensation for Tree Loss

National Planning Framework 4 (NPF4) Policy 6 states that where woodland is removed compensatory planting will likely be expected to be delivered[12]. This planting should be done in a way to extend or connect existing woodlands. Planted species should be native species outlined by the Argyll and Bute Local Development Plan. Compensatory planting should be conducted following a standard set by the planning authority and audited by a suitably qualified arborist.

4.4 Recommendations

I recommend the following measures to minimise arboricultural impacts resulting from development:

1. Where woodland removal occurs, compensate for tree loss by planting new woodland. New woodland planting, where possible, should connect currently disconnected woodlands to enhance woodland habitat across the site.
    a. All compensatory planting to meet a minimum 1:1 ratio (2:1 preferable) of trees replanted to trees removed (or area for groups).
    b. Select a diverse species mix that is native to the area with appropriate hardiness for the climate.
    c. Employ tree guards to protect young trees from animal browsing.
2. Monitor the survival of planted woodlands.
    a. Survival of compensatory tree stock should be inspected annually for the first five years after planting.
        i. Replace dead stock discovered during the inspection.
        ii. Repair or remove any damaged or obsolete tree guards discovered during the inspection.
    b. One final inspection 10 years after planting targeting 90% survival of all stock planted.
        i. If 90% survival is not achieved in the 10th year, additional planting and monitoring will be required.

4.4.1 Monitoring and Further Survey of Retained Trees

I recommend that the newly formed woodland edges created by development are monitored regularly by a project arborist during the development activity; additional monitoring may also be required post development. Exposing previously sheltered trees to edge effects (e.g., increased exposure to wind and sun) can cause stress to those trees resulting in the development of hazards over time.

The new woodland edges should be monitored yearly for the next five years by a suitably qualified arborist to identify any need for intervention regarding the safety or health of the retained trees.

4.4.2 Landscape Design Considerations

Due to the abundance of *Rhododendron ponticum* on and around the site, an Invasive Non-native Species (INNS) management plan should be put in place in the disturbed wooded area to ensure that the INNS do not infest the area further or are spread offsite due to disturbance.

A project ecologist can be appointed to aid this management during and after development.

[12] Available at: https://www.gov.scot/publications/national-planning-framework-4/documents/ (accessed on 20 March 2024)

APPENDICES

A TREE QUALITY ASSESSMENT CRITERIA

Category and colour on TCP	Criteria		
U - Removal Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	• Trees that have a serious, irremediable structural defect such that early loss is expected through collapse or become unviable after removal of other category U trees. • Trees that are dead or are showing signs of significant, immediate, or irreversible overall decline. • Trees infected with pathogens of significance to the health and/or safety of other nearby trees or trees of very low quality, suppressing adjacent trees of better quality.		
A - Retain **Trees of high quality** with an estimated remaining life expectancy of at least 40 years.	**Mainly arboricultural value**	**Mainly landscape value**	**Mainly cultural values including conservation**
	1 Trees that are particularly good examples of their species, especially if rare or unusual. Essential components of groups or formal or semi-formal arboricultural features (i.e., dominant/principal trees in an avenue).	2 Trees, groups, or woodlands of particular visual importance as arboricultural and/or landscape features.	3 Trees, groups, or woodlands of significant conservation, historical, commemorative or other value (e.g., Veteran trees or wood-pasture).
B - Retain **Those of moderate quality** with an estimated remaining life expectancy of at least 20 years.	1 Trees that might be included in the high category, but are downgraded because of impaired condition (e.g., remediable defects or poor past management/storm damage) such that they are unlikely to be suitable for retention beyond 40 years.	2 Trees present in numbers usually as groups or woodlands, such that they form distinct landscape features thereby attracting a higher collective rating than they might as individuals, or trees occurring as collectives but situated to make little visual contribution to the wider locality.	3 Trees with measurable conservation or cultural value.
C - Retain **Those of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm.	1 Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories.	2 Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value and/or trees offering low or only temporary/transient landscape benefits.	3 Trees with very limited conservation or cultural value.

B TREE SCHEDULE

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
2	Sycamore (*Acer pseudoplatanus*)	11	190	2.28	2	3	3	1	1	F	EM	>20		B
3	Silver birch (*Betula pendula*)	12	180	2.16	1	2	2	2	2	P	EM	>10		C
4	Silver birch (*Betula pendula*)	12	200	2.4	3	2	1	2	3	F	EM	>10		B
5	Silver birch (*Betula pendula*)	13	220	2.64	1	1	2	2	2	F	EM	>10		B
6	Sycamore (*Acer pseudoplatanus*)	13	200	2.4	4	3	4	3	3	F	EM	>20		B
7	Silver maple (*Acer saccharinum*)	15	490	5.88	4	5	7	4	3	F	EM	>20		B
8	Silver maple (*Acer saccharinum*)	15	530	6.36	3	6	9	6	3	F	EM	>20		B
9	Silver maple (*Acer saccharinum*)	16	470	5.64	4	4	6	6	2	F	EM	>20		B
10	Sycamore (*Acer pseudoplatanus*)	18	540	6.48	3	5	9	5	4	F	EM	>20		B
11	Lime (*Tilia x europaea*)	17	330	3.96	4	3	3	4	6	P	EM	>10	Hollow stem	C
12	Sycamore (*Acer pseudoplatanus*)	16	440	5.28	6	7	7	6	3	F	EM	>20		B
13	Ash (*Fraxinus excelsior*)	20	430	5.16	2	2	5	2	4	P	EM	<10	Symptomatic of ash dieback	C
14	Ash (*Fraxinus excelsior*)	17	320	3.84	4	2	6	2	5	P	EM	<10	Symptomatic of ash dieback	U
15	Ash (*Fraxinus excelsior*)	18	570	6.84	2	2	7	5	5	P	SM	<10	Symptomatic of ash dieback	U
16	Sycamore (*Acer pseudoplatanus*)	9	170	2.04	2	3	2	3	1	F	EM	>20		B
17	Sycamore (*Acer pseudoplatanus*)	16	460	5.52	4	6	6	7	3	F	EM	>20		B

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
18	Silver birch (*Betula pendula*)	13	360	4.32	2	3	4	3	1	P	EM	>10		C
19	Silver maple (*Acer saccharinum*)	14	290	3.48	3	2	2	3	2	F	EM	>20		B
20	Silver maple (*Acer saccharinum*)	8	170	2.04	1	2	2	3	3	P	EM	>10		C
21	Norway maple (*Acer platanoides*)	13	390	4.68	4	4	5	4	2	F	EM	>20		B
22	Lime (*Tilia x europaea*)	14	280	3.36	4	2	2	2	2	F	EM	>20		B
23	Lime (*Tilia x europaea*)	13	300	3.6	2	2	3	3	2	F	EM	>20		C
24	Ash (*Fraxinus excelsior*)	14	180	2.16	1	1	2	1	7	P	EM	<10	Symptomatic of ash dieback	U
25	Ash (*Fraxinus excelsior*)	16	270	3.24	2	3	3	2	8	F	EM	>10	Symptomatic of ash dieback	C
26	Ash (*Fraxinus excelsior*)	9	260	3.12	7	2	1	2	2	P	EM	<10	Symptomatic of ash dieback	U
27	Chestnut (*Fagaceae sp.*)	18	620	7.44	7	4	4	5	3	F	SM	>20		B
28	Chestnut (*Fagaceae sp.*)	15	460	5.52	7	6	6	2	3	F	SM	>20		B
29	Chestnut (*Fagaceae sp.*)	13	310	3.72	1	2	5	3	10	P	EM	<10		U
30	Field maple (*Acer campestre*)	12	230	2.76	3	4	5	3	3	F	EM	>20		B
31	Ash (*Fraxinus excelsior*)	14	360	4.32	1	2	3	1	6	P	EM	<10	Symptomatic of ash dieback	U
32	Field maple (*Acer campestre*)	10	310	3.72	3	5	5	5	3	F	EM	>20		B
33	Field maple (*Acer campestre*)	13	250	3	2	3	4	3	4	F	EM	>20		B

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
34	Field maple (*Acer campestre*)	9	190	2.28	3	3	4	2	3	P	EM	>10		C
35	Field maple (*Acer campestre*)	10	260	3.12	4	4	2	2	2	F	EM	>20		B
36	Ash (*Fraxinus excelsior*)	14	380	4.56	3	2	3	4	3	P	EM	<10	Symptomatic of ash dieback	U
37	Oak (*Quercus sp.*)	7	170	2.04	4	4	3	3	2	F	EM	>40		B
38	Oak (*Quercus sp.*)	20	940	11.28	11	11	8	8	4	G	M	>20		A
39	Oak (*Quercus sp.*)	7	150	1.8	3	3	3	2	1	F	EM	>20		B
40	Oak (*Quercus sp.*)	12	190	2.28	3	3	3	3	2	F	EM	>20		B
43	Oak (*Quercus sp.*)	10	190	2.28	4	4	4	4	1	F	EM	>20		B
44	Oak (*Quercus sp.*)	11	200	2.4	4	4	5	4	1	F	EM	>20	Large wound on stem	B
45	Oak (*Quercus sp.*)	4	100	1.2	2	2	2	1	1	F	EM	>20		C
2243	Oak (*Quercus sp.*)	22	1030	12.36	11	11	10	11	2	F	M	>20	Tree 2243 has declining vitality and crown dieback**. Conduct further tree inspection (e.g., PTI, QTRA, TRAQ) to determine possible interventions for improving the health of the tree and identifying any hazards posed by the tree.**	B
46	Ash (*Fraxinus excelsior*)	16	420	5.04	7	7	3	6	10	P	EM	<10	Symptomatic of ash dieback	U
47	Ash (*Fraxinus excelsior*)	20	360	4.32	7	7	4	6	6	P	SM	<10	Symptomatic of ash dieback	U
48	Ash (*Fraxinus excelsior*)	20	370	4.44	5	8	9	8	10	P	SM	<10	Symptomatic of ash dieback	U
49	Alder (*Alnus glutinosa*)	14	200	2.4	3	2	3	3	1	F	EM	>20		B

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
50	Alder (*Alnus glutinosa*)	16	240	2.88	1	1	6	6	6	F	SM	>20		B
51	Alder (*Alnus glutinosa*)	14	250	3	5	1	6	6	1	F	SM	>20		B
52	Alder (*Alnus glutinosa*)	12	150	1.8	1	4	7	5	5	P	EM	>10		C
53	Alder (*Alnus glutinosa*)	12	190	2.28	5	1	5	9	7	F	EM	>20		C
54	Alder (*Alnus glutinosa*)	16	330	3.96	6	5	3	8	6	F	SM	>20		B
55	Alder (*Alnus glutinosa*)	17	450	5.4	4	6	6	6	6	F	SM	>20		C
56	Silver birch (*Betula pendula*)	17	300	3.6	7	6	4	4	6	F	SM	>20		B
57	Silver birch (*Betula pendula*)	19	440	5.28	5	8	8	8	5	F	SM	>20		B
58	Silver birch (*Betula pendula*)	20	520	6.24	8	8	3	6	8	F	SM	>20		B
59	Ash (*Fraxinus excelsior*)	16	270	3.24	5	6	5	6	3	P	EM	<10	Symptomatic of ash dieback	U
60	Silver birch (*Betula pendula*)	20	190	2.28	2	2	2	2	12	F	SM	>20		B
61	Silver birch (*Betula pendula*)	17	280	3.36	7	2	2	4	5	F	SM	>20		B
62	Silver birch (*Betula pendula*)	20	550	6.6	7	9	6	9	6	F	M	>20		B
63	Silver birch (*Betula pendula*)	20	400	4.8	5	9	5	7	4	F	SM	>20		B
64	Silver birch (*Betula pendula*)	14	320	3.84	4	5	6	5	4	F	SM	>20		B
65	Ash (*Fraxinus excelsior*)	22	550	6.6	8	10	6	7	2	P	SM	>10	Symptomatic of ash dieback	C
66	Silver birch (*Betula pendula*)	20	480	5.76	5	8	10	7	8	F	M	>20		B
67	Silver birch (*Betula pendula*)	17	450	5.4	6	6	6	6	7	F	SM	>20		B
68	Silver birch (*Betula pendula*)	18	220	2.64	3	3	3	3	14	F	EM	>20		B
69	Ash (*Fraxinus excelsior*)	23	610	7.32	10	8	12	10	7	F	SM	>10	Minor symptoms of ash dieback	B

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
70	Larch (*Larix decidua*)	23	570	6.84	1	6	9	6	5	G	SM	>40		A
71	Larch (*Larix decidua*)	20	400	4.8	1	4	6	6	6	G	SM	>40		B
72	Goat willow (*Salix caprea*)	18	630	7.56	9	10	6	6	10	F	SM	>20		B
73	Sitka spruce (*Picea sitchensis*)	24	580	6.96	5	6	3	2	15	G	SM	>40		A
74	Silver birch (*Betula pendula*)	15	260	3.12	3	5	3	3	8	G	EM	>20		B
75	Sycamore (*Acer pseudoplatanus*)	17	420	5.04	4	5	8	7	3	G	EM	>40		B
76	Larch (*Larix decidua*)	21	390	4.68	4	4	4	4	15	G	SM	>20		B
77	Larch (*Larix decidua*)	20	440	5.28	5	5	5	5	6	G	SM	>40		B
78	Larch (*Larix decidua*)	20	410	4.92	2	5	4	5	5	F	SM	>20		B
79	Scots pine (*Pinus sylvestris*)	16	190	2.28	4	4	4	2	8	F	EM	>20		B
80	Larch (*Larix decidua*)	22	440	5.28	5	8	5	3	10	F	SM	>20		B
81	Sitka spruce (*Picea sitchensis*)	22	680	8.16	4	6	4	4	15	G	SM	>40		A
82	Scots pine (*Pinus sylvestris*)	20	390	4.68	4	3	4	3	15	G	EM	>40		B
83	Larch (*Larix decidua*)	22	450	5.4	2	5	4	2	2	F	SM	>20		B
84	Norway maple (*Acer platanoides*)	16	220	2.64	5	5	5	5	3	F	EM	>20		B
85	Silver birch (*Betula pendula*)	14	180	2.16	2	2	1	1	10	F	EM	>10		C
86	Silver birch (*Betula pendula*)	18	310	3.72	5	5	5	5	10	F	SM	>20		B

Tree No.	Species	Height (m)	DBH (mm)	Calculated RPA (m)	Branch Spread (m)				Crown Clearance (m)	Physiological Condition (G/F/P/D)	Age Class (Y/EM/SM/M/LM/A/V)	Remaining Contribution (Years)	General Observations of Structure and Condition *and/or* Preliminary Management Recommendations (detailed in bold)	Category U/A/B/C
					N	E	S	W						
86	Goat willow (*Salix caprea*)	18	620	7.44	8	7	6	7	8	F	SM	>20		B
87	Silver birch (*Betula pendula*)	16	240	2.88	5	5	5	5	7	F	EM	>20		B
88	Silver birch (*Betula pendula*)	15	190	2.28	2	2	2	2	12	F	EM	>20		B
89	Silver birch (*Betula pendula*)	14	410	4.92	5	4	4	4	3	F	EM	>20		B
90	Silver birch (*Betula pendula*)	14	190	2.28	2	2	2	2	12	F	EM	>20		B
91	Silver birch (*Betula pendula*)	14	190	2.28	2	2	2	2	4	F	EM	>20		B
92	Silver birch (*Betula pendula*)	20	420	5.04	5	5	5	5	16	G	SM	>20		A
93	Silver birch (*Betula pendula*)	15	300	3.6	4	3	2	3	3	F	EM	>20		B
94	Silver birch (*Betula pendula*)	12	160	1.92	1	2	2	2	8	F	EM	>20		B
95	Rowan (*Sorbus aucuparia*)	11	310	3.72	3	3	3	3	2	F	EM	>20		B
96	Silver birch (*Betula pendula*)	13	220	2.64	2	2	3	2	3	F	EM	>20		B
97	Silver birch (*Betula pendula*)	14	230	2.76	2	2	2	2	4	F	EM	>20		B
98	Silver birch (*Betula pendula*)	16	460	5.52	5	4	7	4	2	F	SM	>20		B
99	Silver birch (*Betula pendula*)	13	220	2.64	2	2	2	3	2	F	EM	>20		B
100	Silver birch (*Betula pendula*)	11	160	1.92	2	2	2	2	3	F	EM	>20		B

DBH: Diameter at Breast Height - Measured at 1.5m from ground level.
RPA: Root Protection Area calculated as 12 times the DBH
Physiological Condition: **G**ood/**F**air/**P**oor/**D**ead
Age Class: **Y**oung/**E**arly-**M**ature/**S**emi-**M**ature/**M**ature/**L**ate-**M**ature/**A**ncient/**V**eteran

Tree Group ID	Species Composition	Current Maximum DBH (mm)	Current Maximum Height (m)	Age Class (Y/EM/SM/M/LM/A/V)	Group Description	Category U/A/B/C
TG1	Upper Canopy: • Ash • Sitka spruce Mid-Canopy: • Silver birch • Sycamore • Sitka spruce • Norway maple Understory and Regeneration: • Silver birch • Norway maple • Rhododendron	630	24	Y-M	TG1 is a young to mature mixed wet woodland with a variety of trees species and some *Rhododendron ponticum* present. Due the size and maturity of the woodland it would be difficult to replace. 	**B**

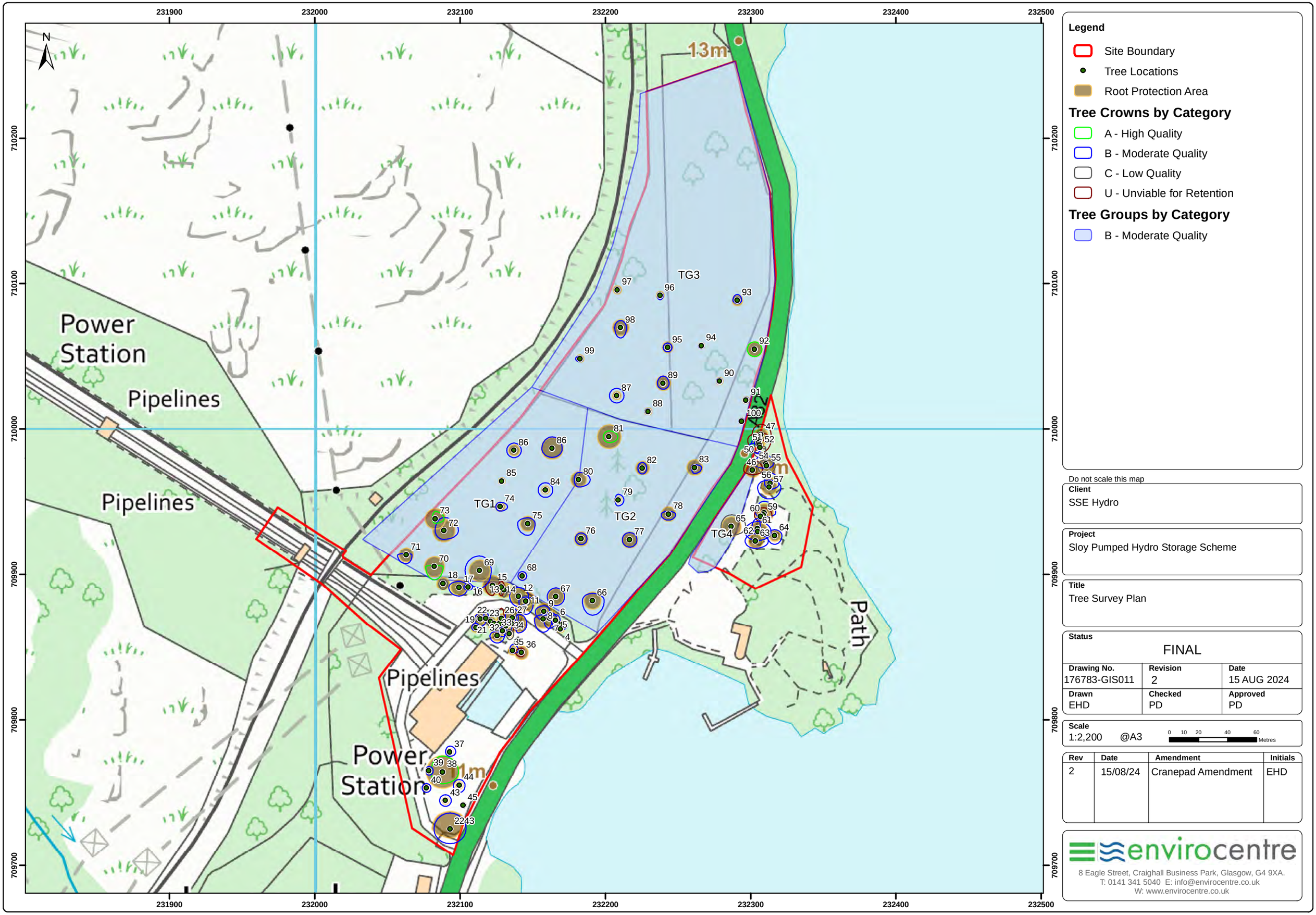
Tree Group ID	Species Composition	Current Maximum DBH (mm)	Current Maximum Height (m)	Age Class (Y/EM/SM/M/LM/A/V)	Group Description	Category U/A/B/C
TG2	Upper Canopy: • Larch • Scots pine • Sitka spruce Mid-Canopy: • Silver birch • Larch • Scots pine Understory and Regeneration: • Holly • Sitka spruce • Rhododendron	680	22	Y-SM	TG2 is a semi-mature softwood plantation adajcent to the right side of TG1. The woodland is growing on a moderate slope and connects to the road to the east. Due to the size and maturity of the woodland, it would be difficult to replace. 	B

Tree Group ID	Species Composition	Current Maximum DBH (mm)	Current Maximum Height (m)	Age Class (Y/EM/SM/M/LM/A/V)	Group Description	Category U/A/B/C
TG3	Upper Canopy: • Silver birch Mid-Canopy: • Silver birch • Rowan Understory and Regeneration: • Sitka spruce • Holly • Rhododendron	460	20	Y-SM	TG3 is a semi-mature birch woodland on the north end of the site. The tree group has wet woodland characteristics and continues north past the extent of the survey area. Wet woodlands are a rare and species rich habitat type. Due to the size and maturity of TG3, it would be difficult to replace. 	B

Tree Group ID	Species Composition	Current Maximum DBH (mm)	Current Maximum Height (m)	Age Class (Y/EM/SM/M/LM/A/V)	Group Description	Category U/A/B/C
TG4	Upper Canopy: • Ash • Silver birch Mid-Canopy: • Common alder • Silver birch • Ash Understory and Regeneration: • Alder • Ash • Silver birch	550	22	Y-SM	TG4 is a small woodland between the Iveruglas Visitor Centre carpark and the A82. The woodland is dominated by ash (which appear symptomatic of ash dieback) and silver birch trees. Due to the size of the trees in the woodland, it would be moderately difficult to replace. 	B

DBH: Diameter at Breast Height - Measured at 1.5m from ground level.
Age Class: **Y**oung/**E**arly-**M**ature/**S**emi-**M**ature/**M**ature/**L**ate-**M**ature/**A**ncient/**V**eteran

C TREE REFERENCE PLANS



Legend

- Site Boundary
- Tree Locations
- Root Protection Area

Tree Crowns by Category

- A - High Quality
- B - Moderate Quality
- C - Low Quality
- U - Unviable for Retention

Tree Groups by Category

- B - Moderate Quality

Do not scale this map

Client
SSE Hydro

Project
Sloy Pumped Hydro Storage Scheme

Title
Tree Survey Plan

Status
FINAL

Drawing No.	Revision	Date
176783-GIS011	2	15 AUG 2024
Drawn	**Checked**	**Approved**
EHD	PD	PD

Scale
1:2,200 @A3
0 10 20 40 60 Metres

Rev	Date	Amendment	Initials
2	15/08/24	Cranepad Amendment	EHD

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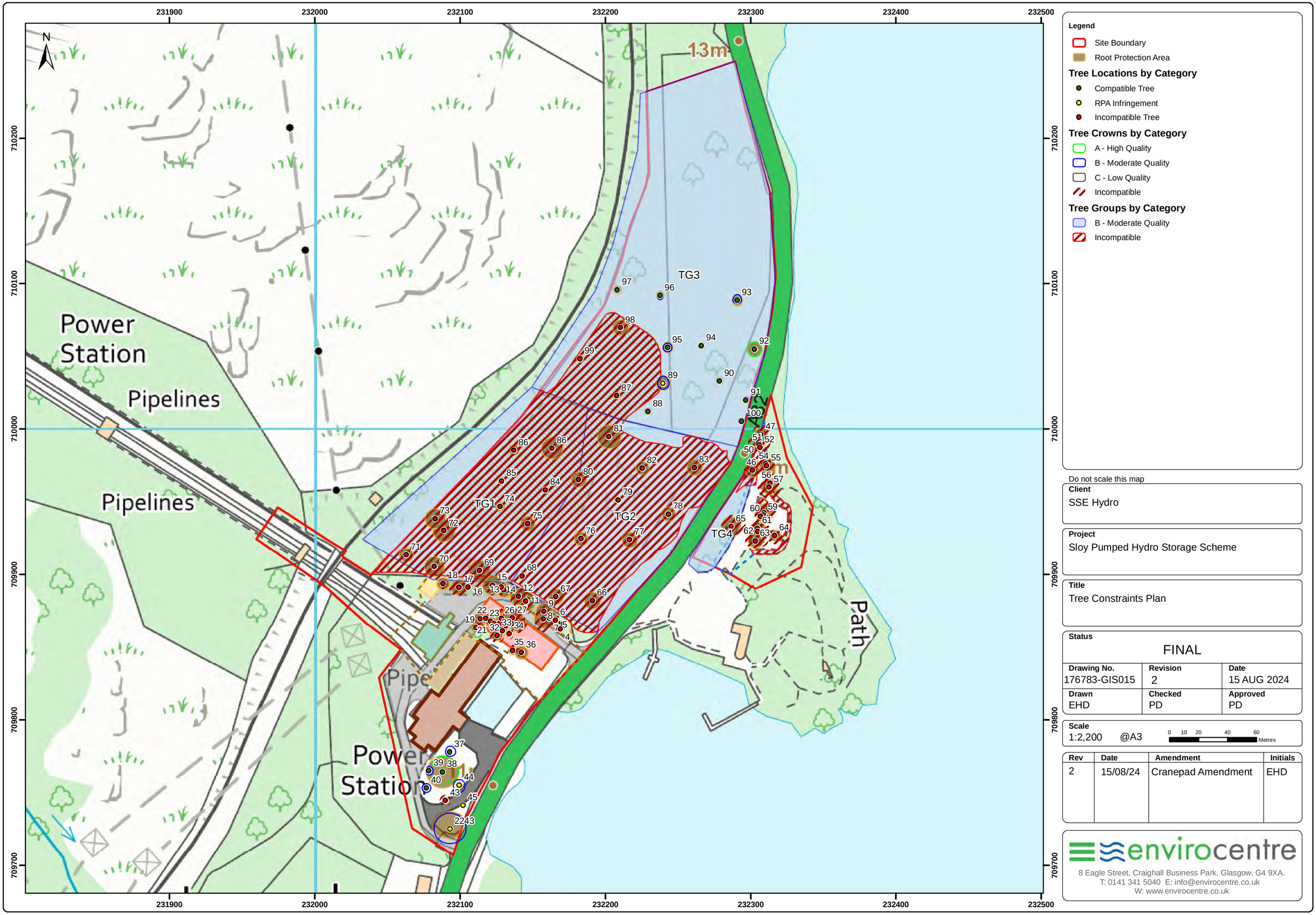

Legend

- Site Boundary
- Root Protection Area

Tree Locations by Category

- Compatible Tree
- RPA Infringement
- Incompatible Tree

Tree Crowns by Category

- A - High Quality
- B - Moderate Quality
- C - Low Quality
- Incompatible

Tree Groups by Category

- B - Moderate Quality
- Incompatible

Do not scale this map

Client
SSE Hydro

Project
Sloy Pumped Hydro Storage Scheme

Title
Tree Constraints Plan

Status
FINAL

Drawing No.	Revision	Date
176783-GIS015	2	15 AUG 2024
Drawn	**Checked**	**Approved**
EHD	PD	PD

Scale
1:2,200 @A3
0 10 20 40 60 Metres

Rev	Date	Amendment	Initials
2	15/08/24	Cranepad Amendment	EHD

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231900 232000 232100 232200 232300 232400 232500

710200 710100 710000 709900 709800 709700

N

Vertical Tree Protection Barriers placed 1-metre from cranepad footprint. Barrier next to tree 2243 will tie into existing stone wall.

37 39 38 40 44 45 2243

13m

TG3

97 96 93 95 94 92 89 90 91 88 100

TG1 TG2 TG4

Pipelines

Path

Power Station

Legend

- Site Boundary
- Vertical Tree Protection Barrier
- Root Protection Area

Tree Locations by Category

- Compatible Tree
- RPA Infringement

Tree Crowns by Category

- A - High Quality
- B - Moderate Quality
- C - Low Quality

Tree Groups by Category

- B - Moderate Quality

Do not scale this map

Client
SSE Hydro

Project
Sloy Pumped Hydro Storage Scheme

Title
Tree Protection Plan

Status
FINAL

Drawing No.	Revision	Date
176783-GIS016	2	15 AUG 2024
Drawn	**Checked**	**Approved**
EHD	PD	PD

Scale
1:2,200 @A3
0 10 20 40 60 Metres

Rev	Date	Amendment	Initials
2	15/08/24	Cranepad Amendment	EHD

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