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Barry Waterfront

Environmental Statement
Chapter M

Arboricultural Effects

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1.0 Introduction

Arboricultural Implications Assessment

1.1 This Arboricultural Assessment has been undertaken by Steve Ambler, a professional Arboriculturist and Fellow of the Arboricultural Association on behalf of the Consortium with regard to an outline planning application that has been submitted to the Vale of Glamorgan Council for a residential-led, mixed-use development at Barry Waterfront.

1.2 A field study has been conducted to identify, evaluate and mitigate the extent of direct and indirect impacts on existing trees that may arise as a result of the implications of any site layout. This assessment takes account of (a) the effect that development proposals may have on the amenity value of trees both on and near the site and (b) whether the loss resulting from the development proposals can be acceptably overcome through the implementation of the landscape proposals which form part of the development proposals.

1.3 The study area includes the planning application site and tree specimens of groups immediately adjacent to this area, which may be effected by the implementation of the development. The extent of the study area is illustrated in Appendix M1 and groups are illustrated on the Tree Survey and Constraints Plan, Appendix M2

1.4 This technical assessment identifies the baseline arboricultural situation prior to development including any receptors that may be impacted on as a result of the development. The section then considers the potential impact(s) that the proposed development will have on the identified receptors, together with mitigation measures that will be implemented to seek to overcome any negative effects.

1.5 The section concludes by summarising the impact(s) of the proposed development on the arboricultural resource following mitigation measures i.e. the ‘residual impacts’ of the development.

2.0 Planning Policy Context

2.1 Attention is drawn to the following statutory regulations: the Town and Country Planning Act 1990 (as amended), the Forestry Act 1967 (as amended), the Wildlife and Countryside Act 1981 (as amended), the Conservation (Natural Habitats etc.) Regulations 1994, the Countryside and Rights of Way Act 2000, the Hedgerows Regulations 1997, the Construction (Design and Management) Regulations (CDM) and the Environment Act 1994 (as amended).

Town and Country Planning Act 1990 (as amended)

2.2 This establishes that it is a duty of the LPA to:

2.3 *"Ensure wherever it is appropriate that, in granting planning permission, adequate provision is made by the imposition of conditions for the preservation or planting of trees."*

Technical Advice Note 10 (Tree Preservation Orders)

2.4 No trees within or immediately adjacent to the site have been identified as being protected by Tree Preservation Orders.

Planning Policy Wales

2.5 Paragraphs 5.2.8 and 5.2.9 are of relevance

2.6 Section 5.0 of Planning Policy Wales relates to 'Conserving and Improving Natural Heritage and the Coast. Paragraph 5.2.8 states the following in relation to Trees and Woodlands:

2.7 *'Trees, woodlands and hedgerows are of great importance, both as wildlife habitats and in terms of their contribution to landscape character and beauty. Local planning authorities should seek to protect trees, groups of trees and areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality. Ancient and semi-natural woodlands are irreplaceable habitats of high biodiversity value which should be protected from development that would result in significant damage.'*

2.8 Further to the protectionist stance of paragraph 5.2.8, Paragraph 5.2.9 states that: "local planning authorities should, as appropriate, make full use of their powers to protect and plant trees to maintain and improve the appearance of the countryside and built up areas"

Vale of Glamorgan Unitary Development Plan

2.9 Policy ENV11 – Protection of Landscape Features states;

2.10 *'Development will be permitted if it does not unacceptably affect features of importance to Landscape or Nature Conservation including; Trees, Woodlands…'*

British Standard Trees in Relation to Construction Recommendations 5837: 2005

2.11 The methodology used for assessing the quality of existing trees draws from the recognised and established British Standard, Trees in Relation to Construction Recommendations 5837:2005. This Standard provides guidance for a balanced approach and methodology on deciding which trees are appropriate for retention. A pre development arboricultural survey was completed at an initial stage to guide developing proposals, which is attached as Appendix M2. This assessment document is the most widely accepted and relevant assessment basis for assessing the impact on trees within the development and Chapter M has been based on this, responding to the Local Authorities request to have this included within the Environmental Statement.

3.0 Assessment Methodology & Significance Criteria

Methodology

3.1 Based on the extent and type of trees and scrub on the assessment site and the professional judgement of the Arboriculturist who completed the assessment, the following methodology has been developed to fairly represent the Magnitude of Change and Sensitivity of the trees covered by the assessment. Development of this methodology takes into consideration the size, quality, and value in terms of arboriculture landscape, cultural and conservation value, nature of the site, including topography, and underlying ground conditions, balancing all issues related to the potential value of the trees present on site.

3.2 The arboricultural resources were assessed in compliance with BS: 5837 2005 (Survey Phase 4.1, 4.2 and 4.3), assessing all trees and tree groups within or immediately adjacent to the Barry Waterfront site. A plan of the survey areas is provided at Appendix M1 for reference.

3.3 The ground level inspection took place on 29th and 30th May 2009 and 6th June 2009.

Significance Criteria

3.4 Based on the assessment methodology with the BS 5837: 2005 (Survey Phase 4.1, 4.2 and 4.3) assessment and the context and significance of the trees within the study area, the following significance criteria have been identified. The criteria have been set against the level of perceived significance following the removal of a tree or a group of trees, gauged on a percentage removal basis.

3.5 The sensitivity of trees or groups is scored according to their perceived retention value. Their value is categorised on their perceived importance based on their potential size, quality, and value in terms of arboriculture landscape, cultural and conservation value. Their importance is scored as high, medium or low (A, B, C or R respectively). Category R trees are recommended for removal as they are not worthy of retention in their proposed situation

Sensitivity of Receptors

3.6 The following sensitivity groups are based on BS 5837: 2005 categories and have been used in this Arboricultural Assessment.

- **High** – Category A Trees
- **Medium** – Category B trees
- **Low** – Category C Trees

- **Negligible** – Category R Trees

3.7 The categories, based on the BS 5837: 2005 (Survey Phase 4.1, 4.2 and 4.3), assessment have been used to identify their potential size, quality, and value in terms of arboriculture landscape, cultural and conservation value. Their importance is scored as high, medium or low (A, B, C or R respectively) to define receptor sensitivity. Further details on the characteristics assigned to each sensitivity category are provided below.

Category A

3.8 Those of high quality and value in such a condition as to be able to make a substantial contribution (a minimum of 40 years is suggested) to the site's arboricultural resource. Included are:

1 Trees that are particularly good examples of their species, especially if rare or unusual, or essential components of groups, or of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue);
2 Trees, groups or woodlands which provide a definite screening or softening effect to the locality in relation to views into or out of the site, or those of particular visual importance (e.g. avenues or other arboricultural features assessed as groups); and
3 Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture).

Category B

3.9 Those of moderate quality and value in such a condition as to make a significant contribution (a minimum of 20 years is suggested) to the site's arboricultural resource. Included area:

1 Trees that might be included in the high category, but are downgraded because of impaired condition (e.g. presence of remediable defects including unsympathetic past management and minor storm damage);
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 but which are not, individually, essential components of formal or semi-formal arboricultural features (e.g. trees of moderate quality within an avenue that includes better, A category specimens), or trees situated mainly internally to the site, therefore individually having little visual impact on the wider locality; and
3 Trees with clearly identifiable conservation or other cultural benefits.

Category C

3.10 Those of low quality and value: currently in adequate condition to remain until new planting could be established (a minimum of 10 years is suggested), or young trees with a stem diameter below 150 mm. Included are:

1 Trees not qualifying in higher categories;
2 Trees present in groups or woodlands, but without this conferring on them significantly greater landscape value, and/or trees offering low or only temporary screening benefit; and
3 Trees with very limited conservation or other cultural benefits.

Please note that whilst C category trees will usually not be retained where they would impose a significant constraint on development, young trees with a stem diameter of less than 150 mm could be considered for relocation.

Category R

3.11 Those in such a condition that any existing value would be lost within 10 years and which should, in the current context, be removed for reasons of sound arboricultural management. Included are;

- Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other R category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning);
- Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline; and
- Trees infected with pathogens of significance to the health and/or safety of other trees nearby (e.g. Dutch elm disease), or very low quality trees suppressing adjacent trees of better quality.

Please note that habitat reinstatement may be appropriate (e.g. R category tree used as a bat roost: installation of bat box in nearby tree).

Magnitude of Change

3.12 The following terms have been used to define the magnitude of change:

- **High** – Where development is likely to result in 100% removal of a group or specimen tree;
- **Medium** - Where development is likely to result in more than 50% removed, but less than 100%; and
- **Low** - Where development is likely to result in less than 50% removed
- **Negligible** - marginal or no effect.

3.13 Table M1 below sets out the derivation of significance for arboricultural impacts. Major and major/moderate or moderate/major are considered significant in terms of the EIA Regulations.

Assessment of the Impact on Trees

3.14 The following table determines the significance of effect based on the identified sensitivity of each tree or tree group and the assessed magnitude of change the development is likely to have on each tree or tree group. The resulting impacts are either;

- Major
- Moderate
- Minor, or
- Negligible.

		Sensitivity of Receptor/Receiving Environment to Change/Effect			
		High	**Medium**	**Low**	**Negligible**
Magnitude of Change /Effect	**High**	Major	Moderate to Major	Minor to Moderate	Negligible
	Medium	Moderate to Major	Moderate	Minor	Negligible
	Low	Minor to Moderate	Minor	Negligible to Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Table M1 Matrix for Determining Significance of Effects

- **Major:** If the development will result in the loss of a considerable part of existing positive features (or the extent of these), if the trees or tree groups are of high sensitivity and/ or have a low capacity to accommodate the proposed change and the magnitude of the impact is high.
- **Moderate**: If the development will result in some loss of trees or tree groups, but the overall integrity of the arboricultural asset is maintained.
- **Minor**: If the development could be integrated within the existing site area without the loss of essential townscape features which contribute to townscape character and quality.
- **Negligible**: If the development has a negligible magnitude of change or is of negligible sensitivity.

3.15 For each assessment of impact these can either be:

- **Beneficial**:- Improving the value of the tree or tree group;
- **Adverse**:- Reducing the value of the tree or tree group; or
- **Negligible**:- Having a negligible result on its existing value.

3.16 By the nature of the assessment subject impacts are expected to be either adverse, or negligible, however where a tree group would benefit from the removal of lower quality elements of the group this could result in a beneficial impact.

4.0 Baseline Conditions

4.1 This brown field site of past, intense industrial usage, is presently derelict. It contains areas of extensive concrete pad formation and redundant concrete foundations. Large areas of what would appear to be waste building material and rubble occur throughout areas of the site. Extremely poor and almost impossible ground conditions are present, from an arboricultural perspective, due to severe compaction, contaminates and non-soil materials forming the upper layers. The ground conditions and building contaminants internal to the site do not provide a satisfactory material or geology for the establishment of tree and woodland cover. Therefore, the further development of young scrub and trees present on the site will be restricted and unlikely to be of any long-term quality.

4.2 A few isolated individual or small groups of mature trees exist within the site but these are mainly exotic species of limited quality both physically and from an amenity perspective. The following survey areas have been identified. See Appendix M1 for survey areas.

Area A

4.3 Area A occupies land at the East Quay running either side of the Graving Dock. It is predominantly level and bound on the north by Fford y Mileniwm Road. The eastern section is distinguished by Cory Way and to the west and south by water forming Dock Number 1. It is almost entirely colonized by grasses and broadleaved herbaceous material although the northern boundary sloping upwards towards the road is fenced off at the top, isolating a strip some 20 metres wide containing scrub, predominantly Buddleia (*Buddleia davidii*) approx 2m high. This has little if any amenity value at present.

Area B

4.4 Area B, formerly known as the Arno Quay, is mainly flat open grassland bordered on the north by Fford y Mileniwm Road and on the west by the access roadway to car parking bays to the south along Y Rhodfa. Landscape planting to the west is identifed as Group 1, and contains the outgrown species Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), willow (*Salix*), and white poplar (*Populus alba*). These trees are planted within shrubberies containing among others Sea Buckthorn (*Hippophae rhamnoides*).

Area C

4.5 *T*he northern extent of Area C is distinguished by Hood Road, the south by Harbour Road, to the northeast the Tank Wash building and to the west, Powel Duffryn Road. This part of the site was known as West Pond. Some industrial units, their boundary fencing and landscaping are also situated along the southwest boundary.

4.6 Area C is again mostly level ground containing grass and some areas of developing scrub namely willow, (Salix sp), Gorse (*Ulex europaeus*) and Buddleia, mostly under 2 metres tall, which occur sporadically as small to medium sized clumps. A small patch of scrub is marked on the plan at the northern most section and this contains Grey Sallow (*Salix cinerea*) which is about 4 metres in height, although stem diameters are below 100-mm.

Area D

4.7 Area D is a linear, crescent shaped feature at the southern extremity of the site. Bound by Clive Road, it is formed mainly with a steep sloping North-facing embankment, almost vertical in places, with some exposed rocky outcrops. There is a considerable difference in height from the main body of the site to Clive Road. At the top of this embankment, running adjacent to Clive Road, the land levels out to form a plateau of varying width. Trees and shrubs are sporadic throughout Area D occupying both the slopes and the upper plateau. Whilst the larger groups or specimen trees are recorded, there are a number of individual and small groups of vegetation which are not recorded and thought to be less than 75-mm in diameter.

Area E

4.8 Area E is a linear feature representing a site of intense, former industrial usage. The area is predominantly level, made up of the remnant hard standings for the former oils storage facilities. Grasses, herbaceous material and some perennials occupy the remaining land, outside of these concrete hard stands areas with buddleia and a little hawthorn occurring sporadically. Dock No. 1 demarcates the north of this area where a 2 metre high chain-link fence runs adjacent to Charles Darwin Way. A concentration of buddleia occupy this fence line that are small, around 2 metres tall and below 75mm in diameter. The slope and cliff of Area D form a physical boundary to the south.

4.9 The baseline tree assessment to BS 5837:2005 is contained in the Appendix M5.

5.0 Potential Impacts

5.1 This section considers the overall effect of the development on the arboricultural receptors (tree groups and tree specimens), assessing the adverse effects that arise from construction and operation of the scheme and any beneficial environmental effects of mitigation and habitat creation measures.

Construction Phase

5.2 As part of the intended construction and to protect against the possibility of flooding, the existing ground levels throughout the site are to be raised typically by 1 metre across the lower levels of the site. This will involve the removal of all the trees internally on the lower levels. However, some groups are to be retained outside of these areas and outside the site boundary and will not be affected (Figure M3), therefore the following are considered the impacts on the arboricultural resource as a result of the Barry Waterfront development:

- **Vegetation clearance** – such clearance involves the removal of low value material on this site and heavy plant machinery is likely to undertake this work. The established Root Protection Areas (RPA) for each tree or group is indicated within the Tree Survey, Categorisation and Constraints Plan Report (Appendix M3). These RPAs highlight areas of importance in considering the physiological and structural requirements of a tree or group. These RPAs for trees or groups selected for retention are to be identified on site prior to the onset of construction works, and construction activities which will be restricted within these sensitive areas aided through the erection of suitable barrier fencing to create construction exclusion zones (Appendix M4).

- **Increased plant activity** – is unlikely to have an adverse effect on retained trees providing the established RPAs are protected.

5.3 Many construction activities including demolition can have a damaging effect on trees particularly the roots, as they are hidden from view. All trees for retention are advised for a 'physical' protection through the erection of suitable, robust barrier fencing around each retained tree or groups. Such barrier fencing must be erected prior to any commencement of construction activities.

5.4 The following assessment of the impact of construction activity is identified for each receptor tree and tree group.

Area A

5.5 There are no identified trees or tree groups in this area, with only scrub present.

Area B

Group 1

5.6 Group 1 is off site, immediately adjacent to the western fringe of the proposed Arno Quay development and forms part of a wider planting scheme from the 1990s or 2000s.

5.7 As category B2 trees their sensitivity is Medium.

5.8 Although the Root Protection Areas (RPAs) may extend into the development area by a short distance the magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Group 2

5.9 Group 2 is off site, immediately adjacent to the northern fringe of the proposed Arno Quay development.

5.10 As category B2 trees their sensitivity is Medium.

5.11 Although the Root Protection Areas (RPAs) may extend into the development area by 1 metre the magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Area C

Group 3

5.12 Group 3 is principally off site, immediately adjacent to the north western fringe of the proposed West Pond and District Centre areas of the development, with a small section within the development footprint. This is an important developing woodland strip with a wide variety of trees and shrub species.

5.13 As category B2 and B3 trees their sensitivity is Medium.

5.14 The Root Protection Areas (RPAs) extends into the development area by 1.8 metres and development will result in the removal of less than 20% of the group. The magnitude of change of the development is likely to be low, resulting in a minor adverse impact on this developing group.

Group 3a

5.15 Group 3a is off site, immediately adjacent to the north western fringe of the proposed West Pond area of the development. This is an important developing woodland strip with a wide variety of trees and shrub species.

5.16 As category B2 and B3 trees their sensitivity is Medium.

5.17 Although the RPAs may extend into the development area by 1 metre the magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Group 4

5.18 Group 4 is principally off-site with, immediately adjacent to the western fringe of the proposed West Pond development and the existing pumping station.

5.19 As category B2 trees their sensitivity is Medium.

5.20 Adjacent on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Area D

Group 5

5.21 Group 5 is principally on-site, immediately adjacent to the south western fringe of the proposed West Pond development and proposed new vehicle access to the site. The group is young in age although quickly developing and will require management in time.

5.22 As category B2 and B3 trees, their sensitivity is Medium.

5.23 The majority of the on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site. The magnitude of change of the development is likely to be low resulting in a minor adverse impact.

Group 5a

5.24 Group 5A is on-site along the cliff top disused allotment strip.

5.25 As category B2 trees their sensitivity is Medium.

5.26 The on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site and potential wildlife gardens, open space and new allotments. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Group 6

5.27 Group 6 is on-site along the cliff top disused allotment strip, a group of principally native species.

5.28 As category C2 trees their sensitivity is Low.

5.29 The on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site and potential wildlife gardens, open

space and new allotments. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Group 7

5.30 Group 7 is on-site along the cliff top disused allotment strip, a group of mixed, principally native species.

5.31 As category C2 trees their sensitivity is Low.

5.32 The on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site and potential wildlife gardens, open space and new allotments. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Group 8

5.33 Group 8 is on-site along the cliff top disused allotment strip. A group comprising a row of cypress trees which are unsuitable for long term retention.

5.34 As category C2 trees their sensitivity is Low.

5.35 The on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site and potential wildlife gardens, open space and new allotments. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Tree 1 (T1)

5.36 Tree T1 is on-site along the cliff top disused allotment strip. A Sycamore with a tear-out wound occurring on the west side with some early decay evident, reducing its vigour and life expectancy.

5.37 As category C1 tree, its sensitivity is Low.

5.38 The on-site areas will be retained within the development proposals as part of the wider green infrastructure of the site and potential wildlife gardens, open space and new allotments. The magnitude of change of the development is likely to be negligible resulting in a negligible impact.

Area E

Group 9

5.39 Group 9 is on-site, near the No. 1 Dock waters edge in the eastern part of South Quay. It consists of a row of three maples to the frontage of the former research building.

5.40 As category C1 trees their sensitivity is Low.

5.41 As a result of ground level raising, flood prevention measures associated with the development and the proposed development footprint, this area will be

cleared. The magnitude of change of the development is therefore likely to be high resulting in a minor to moderate adverse impact on group 9.

Group 10

5.42 Group 10 is on-site, on the eastern part of South Quay. It consists of a group of willows. Access to the immediate proximity was restricted by existing dense scrub vegetation.

5.43 As category C2 trees their sensitivity is Low.

5.44 As a result of ground level raising flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a minor to moderate adverse impact.

Group 11

5.45 Group 11 is on-site, near the waters edge on the eastern part of South Quay. It consists of a stand of early mature cherries planted in a tight group near the former research building.

5.46 As category C2 trees their sensitivity is Low.

5.47 As a result ground level raising, flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a minor to moderate negative impact.

Group 12

5.48 Group 12 is on-site, a large group of principally native tree and shrub species, but predominantly hawthorn. The larger tree sizes are contained on the slopes of the cliff edge with the younger material below 75mm diameter on the level area.

5.49 As category C2 trees their sensitivity is Low.

5.50 As a result of ground level raising, flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a minor to moderate negative impact.

Tree 2 (T2)

5.51 Tree T2 is near the Dock No. 1 water edge on the eastern part of South Quay, near the old research buildings. A White Beam, it is a poor specimen which has suffered an incipient root-plate failure and a substantial amount of the crown is already dead.

5.52 As a category R tree, its sensitivity is Negligible.

5.53 As a result of ground level raising, flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a negligible impact as the tree should be removed due to its condition in any case.

Tree 3 (T3)

5.54 Tree T3 is near the Dock No. 1 water edge on the eastern part of south quay, near the old research buildings. A White Beam, it is poor specimen which appears to be suffering from a partial incipient root-plate failure, its asymmetric crown leaning to the east.

5.55 As a category R tree, its sensitivity is Negligible.

5.56 As a result of ground level raising flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a negligible impact, as the tree should be removed due to its condition in any case.

Tree 4 (T4)

5.57 Tree T4 is on the eastern part of South Quay, near the old research buildings. A reasonably large Lawson Cypress is considered to be unsuitable for retention.

5.58 As a category R tree its sensitivity is Negligible.

5.59 As a result of ground level raising flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a negligible impact, as the tree should be removed due to its condition in any case.

Tree 5 (T5)

5.60 Tree T5 is on the eastern part of South Quay, near the old research buildings. A White Willow of low quality.

5.61 As a category R tree its sensitivity is Negligible.

5.62 As a result ground level raising flood prevention measures associated with the development and the proposed development footprint, this area will be cleared. The magnitude of change of the development is therefore likely to be high resulting in a negligible impact as the tree should be removed due to its condition in any case.

Impact Summary Table

Arboricultural Receptor	Sensitivity/ Significance of Effect	Magnitude of Effect	Significance of Effect (Adverse/ Beneficial/ Neutral)
Group 1	medium	negligible	negligible
Group 2	medium	negligible	negligible
Group 3	medium	low	minor adverse
Group 3a	medium	negligible	negligible
Group 4	medium	negligible	negligible
Group 5	medium	low	minor adverse
Group 5a	medium	negligible	negligible
Group 6	low	negligible	negligible
Group 7	low	negligible	negligible
Group 8	low	negligible	negligible
Group 9	low	high	minor to moderate adverse
Group 10	low	high	minor to moderate adverse
Group 11	low	high	minor to moderate adverse
Group 12	low	high	minor to moderate adverse
Tree 1	low	negligible	negligible
Tree 2	negligible	high	negligible
Tree 3	negligible	high	negligible
Tree 4	negligible	high	negligible
Tree 5	negligible	high	negligible

Table M2 Impact Summary Table

Operational Phase

5.63 The operational phase assumes that all development is constructed and functional. With the nature of the impact on existing trees being principally affected by site clearance, group works and construction activity and the nature of the development as a principally low storey height residential led mixed use development, no significant operational phase impacts have been identified. In the case of some developments significant shading, emissions, wind tunnelling, ground water impact, exposure or continued ground disturbance or pollution can result. In the case of this development, no such cases have been identified and therefore no operational impacts are identified that are likely to impact on retained trees beyond the construction phase assessment.

6.0 Mitigation Measures

6.1 Loss of existing trees and shrubs as a result of this development overall is considered negligible in terms of landscape amenity. A continued development plan for the young developing woodland and scrub material within the site will add a considerable linear landscape character to the slopes at the south of the site, if encouraged to develop. Such linear landscape features are important for nature conservation corridors as identified with the ecology chapter.

6.2 The condition, functionality, and impact on the Receptor Groups 5, 5a, 6 and 7 can be enhanced through management. These groups may have been planted or self-set and individuals are developing at close spacing's. This is normal in the early part of a developing woodland or group of trees although intervention management is beneficial for re-spacing and in selecting the better formed individuals for long term retention and those considered a suitable species for the local conditions. Re-spacing also promotes health along with the formation of stronger and better individual trees amongst a stand. Therefore, management intervention is likely to raise the landscape, amenity and conservation value of these groups and ensure the long-term survival and their relationship with any proposed development.

6.3 With regard to retained trees, the protection of RPAs (as illustrated on figure M3), using suitable protective fencing conforming to BS 5837:2005, will be an essential component for protecting against further damage to trees selected for retention. These measures should be included in a written Tree Protection Plan, developed as part of the reserve matters detailed design.

6.4 The Development landscape design proposes the planting of advanced and semi-mature tree stock (in excess of 800 number), complemented with areas of green open space (6.14 hectares within the application site). This, along with the establishment of the existing landscape as referred to above, should mitigate any short term loss and result in a longer term, beneficial effect for the area in terms of landscape amenity and quality.

7.0 Residual Impact Assessment

Introduction

7.1 Following the implementation of the mitigation measures, re-assessment has been undertaken to identify residual impacts with respect to the arboricultural resource and the significance of the impacts has been re-assessed. A summary of residual impacts is provided in the tables below.

Construction Impacts

7.2 The impacts, mitigation and residual impact during the construction phase are summarised in Table M3. Construction phase operations would require protective fencing and the implementation of a Tree Protection Plan developed to BS 5837:2005. Initial thinning and enhancement measures identified for tree groups 5, 5a, 6 and 7 should also be progressed at during the initial site clearance and construction phases. The following table assesses the residual impacts of these operations.

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Arboriculture	Loss of trees	Negligible	Management of existing peripheral planting and scrub (5,5a,6+7)	residual effects	Moderate-major beneficial Long Term
Arboriculture	Loss of trees and shrubs	Negligible	Root Protect Area Barrier Fencing During Construction Phase	residual effects	Moderate-major beneficial Long Term

Table M3 Summary Table of Residual Effects of the Proposal Together with Mitigation Measures – Construction Phase

Operational Impacts

7.3 The impacts, mitigation and residual impact during the operational phase of the development are summarised in Table M4. As part of the development proposals significant green infrastructure in the form of over 800 street and open space trees and green open space are proposed. These have the potential to mature over a long time scale to significantly contribute to the development and mitigate tree loss.

Environmental Topic	Description of Impact		Description of Mitigation Measures	Description of Residual Impact	
	Description	Significance		Description	Significance
Arboriculture	Loss of trees and shrubs	Negligible	Management of existing peripheral planting and scrub (5,5a,6+7)	No long-term residual effects	Moderate-major beneficial Long Term
Arboriculture	Loss of trees and shrubs	Negligible	Street Trees and Green Open Space Trees and soft landscape	No long-term residual effects	Major beneficial Long Term

Table M4 Summary Table of Residual Impacts of the Proposal Together with Mitigation Measures - Operational Phase

8.0 Summary and Conclusions

Arboriculture

8.1 Consultation with the local authority tree officer has confirmed that there are no trees protected by Tree Preservation Orders (TPO), in the study area.

8.2 The proposed development will result in a loss of the majority of the scrub within the development area. All the scrub offers little or no amenity value.

8.3 The development will result in a loss of trees in South Quay. These trees are typically of lower quality, some being identified for removal under the British Standard Assessment (BS 5837:2005).

8.4 The main boundary trees along the Barry Island cliff top and along the northern boundaries of the study area, will be mainly unaffected by the development.

8.5 A few larger trees are present internally within the development area but their numbers are low and their present contribution to the amenity of the site is negligible. The condition of these trees is typically poor, or they comprise mainly species that are unsuitable for long-term retention.

8.6 The majority of the effect of the development will be negligible and there will be no significant adverse effects on the overall tree resource.

8.7 The landscape proposals for the development, includes the provision of significant tree planting (in excess of 800 number) and provision of green open space (6.14 hectares), as an integral part of the development. The quantity and potential value of the proposed landscape significantly outweighs the value of the vegetation lost and within the context of a redeveloped site, is likely to result in significant residual benefits over time.

9.0 Abbreviations

9.1 Arboriculturalist – a person who has, through relevant education, training and experience, gained recognized qualifications and expertise in the field of trees in relation to construction

9.2 Root Protection Area - this is a protection area established for around the base of each tree to prevent physical, chemical or compaction damage occurring. This is usually achieved through the erection of fencing or other barrier.

9.3 Construction Exclusion Zone - an area established where construction is not permitted and usually correlates to the Root Protection Area.

9.4 Special Precautionary Area - an area, usually within the root protection area, where construction or other activity may be permitted but only under the direction of an 'Arboricultural Method Statement' and the supervision of an Arborist.

9.5 Tree Protection Plan - scale drawing prepared by an arboriculturalist showing the final layout proposals, tree retention and tree and landscape protection measures detailed within the arboricultural method statement (AMS), which can be shown graphically.

9.6 Tree Constraint Plan (TCP) - plan prepared by an Arboriculturalist for the purpose of layout design showing the RPA and representing the effect that the mature height and spread of retained trees will have on layouts through shade dominance, etc

9.7 Group - 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).

9.8 Construction Exclusion Zone; area based on the RPA (in m^2 or radius), identified by an Arboriculturalist, to be protected during development, including demolition and construction work, by use of barriers and/or ground protection fit for the purpose to ensure the successful long-term retention of a tree.

9.9 Arboricultural Method Statement; methodology for the implementation of any aspects of development that has the potential to result in loss of or damage to a tree.

10.0 References

10.1 British Standard Trees in Relation to Construction Recommendations 5837:2005

10.2 Tree Survey, Categorisation and Constraints plan at the Former Barry Docklands Site, dated July 2009 (Ambler SJ)

11.0 Appendices