

BREEAM ECOHOMES LAND USE & ECOLOGY ECO 1 TO ECO 5
ASSESSMENT: CPA 1149 BC 01
JANUARY 2012

NEW BUILD MAINSTREAM & SUPPORTED ACCOMODATION
BELLROCK CRESCENT, GLASGOW

FOR SCOTTISH VETERANS HOUSING ASSOCIATION



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 ASSESSMENT: REPORT REFERENCE: CPA 1149 BC 01

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1 Introduction

- 1.1 Christopher Palmer Associates have been commissioned through MAST Architects by Scottish Veterans Housing Association to prepare a Land Use & Ecology Breeam EcoHomes Pre-Assessment report for the redevelopment site at Bellrock Crescent, Glasgow. The purpose of the report is to assess how the proposed development will impact on the Land Use & Ecology of the site and how the biodiversity of the site can be both protected & enhanced.
- 1.2 The report is based on the EH06 Guidance released in 2006 and covers Eco 1 to Eco 5.
- 1.3 Christopher Palmer is a landscape architect, an Associate of the Landscape Institute and has an Msc in Ecology from Durham University. See Appendix for proof of qualification to carry out this assessment. Christopher Palmer is a practicing ecologist with a minimum of 3 years relevant experience within the last 5 years. Relevant experience includes carrying out species surveys, management and maintenance plans and ongoing site monitoring. My ecology qualification informs my landscape design using ecological principles for ecological protection, biodiversity enhancement and mitigation measures. Recent work (2009 to 2012) includes designing maintenance regimes and follow-on annual monitoring of landscape and open ground sites on Hillington Industrial Estate for MEPC to enhance biodiversity. This project was awarded a Biodiversity Benchmark by the Wildlife Trust in 2011. I have also carried out EcoHomes surveys for Thenu Housing Association Ltd and MAST Architects and a BREEAM Education Report for Archial Architects for redevelopment of Dundee College.
- 1.5 I am bound by the professional code of conduct of the Landscape Institute of which I am a full time Associate member and registered Landscape Practice. Member Number 545.

2 Site Context & Scope of the Development & Survey. See Drawing C1149.001

- 2.2 The Bellrock Crescent proposed redevelopment site is defined by the Gartcraig Road/Fastnet Street adjacent to the M8 Motorway on the north side, Bellrock Crescent on the south side and existing occupied Bellrock Crescent housing on the east and west boundaries. It is essentially a polygonal shaped cleared site measuring some 126 metres x 85 metres. The total area is approximately 9400m². However 606m² is taken up by the footpath and out to the centreline of Gartcraig Road on the north boundary and can be discounted from the calculations in that this part of the site will not form part of the redeveloped. The revised area for calculation is therefore approximately 8,365m².

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- 2.3 In line with the EcoHomes guidelines, the land being considered in this report, includes any land used for buildings, hard standing, landscaping or for site access, including any other land where construction work is carried out plus a 3m boundary in either direction around these areas. It also includes any area used for temporary site storage and buildings, e.g., contractor's compounds.
- 2.4 According to available records, the site was undeveloped until the construction of the former school in 1955 and no significant industrial land uses have been noted on or near to the site. Residential housing has generally been present in the immediate vicinity of the site. The school site was cleared approximately 10 years ago following a fire and the site has subsequently lain in an unmaintained state and suffers from fly-tipping and dog fouling around the perimeters.
- 2.5 Site Characteristics: Vegetation, Land Use, Levels and Aspect. The site comprises unmaintained vegetation and various types of hardstanding and retaining walls. There are approximately 47 trees around the perimeters of the site, with 42 of these on the north boundary embankment with the Gartcraig Road and the remainder on the east boundary. The dominant species is Ash (29), with lesser numbers of Hawthorn (9), Sycamore (6), Silver Birch (2), and Cherry (1). The main development site slopes in three terraces from approx 76.5m AOD on the Gartcraig Road north boundary to 68.75m AOD on the Bellrock Crescent south boundary and includes south facing embankment slopes and brick retaining walls. The site can be classified as a brown field site awaiting redevelopment made up of the following area types:

Table 1: Existing Areas

- Tarmac Hard surface (excludes footpath and to centreline of Gartcraig Road): 2,847 m²
- Hardstanding foundations of former school: 657m²
- Unmaintained grass (former playground areas and embankments) 3,570m²
- Walls, Steps & Ramps: 127m²
- Young, Semi-mature and Mature trees 47 Nr
- Shrubbery and understorey 1,163m²

- 2.6 Site Ground Condition Investigation Report Findings
A site investigation report involving boreholes and trial pits reveals that much of the site is 'made ground' dating from the time of the construction of the school. This comprises a thin layer of topsoil on the grass areas, over brown slightly sandy fine to coarse gravel with concrete, brick, tarmac, ash, burnt shale, glass and cobbles. No visual or olfactory contamination was noted in the made ground stratum during the site investigation works carried out under the supervision of Scott Bennett Associates. Underlying this made ground with an

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average depth of 0.8m, natural clays and sands were encountered over bedrock.

- 2.7 Based on the results of the site investigation and contamination risk assessment, remedial actions have been considered to be required due to elevated polycyclic aromatic hydrocarbon (PAH) species concentrations recorded in the made ground in excess of the human health soil assessment criteria. The provision of an environmental capping layer to communal garden areas, soft landscape areas and any allotments constructed on the site has been recommended. This is to comprise 300mm layer on both communal garden and soft landscape areas and 1000mm on allotment areas comprising certified 'uncontaminated' topsoil/subsoil

3. Establishing the Ecological Status of the Site

- 3.1 Under Sections 1.2 to 1.5 Schedule A; 'Ecohomes Checklist for Land of Low Ecological Value' it is confirmed that:
There are no ponds rivers or streams running through the site.
There is no marsh or other wetland present on the site.
There are no meadows or species rich grassland present on the site.
There is no heathland present on the site.
- 3.2 Under Sections 1.1 to 1.5 Schedule A; 'Ecohomes Checklist for Land of Low Ecological Value' it is confirmed that the site does contain both trees and hedges above 1m high or with a trunk diameter greater than 100mm. With 'Yes' recorded against this question in Section 1, the site cannot be defined as *land of low ecological value* and the credit cannot be awarded. Whereever possible the existing trees will be retained as part of the proposed development. See Proposal Drawing P1132.01
- 3.3 However, under Section 2 of Schedule A; 'Ecohomes Checklist for Land of Low Ecological Value', Type of Land to be used for new buildings, hardstanding, landscaping or for access, it has been established that (See Para 2.6) the land is contaminated by industrial or other waste to the extent that it would need decontamination before building, (in this case by capping layers as described above). In addition the development site (2.4) consists of land which is a mixture of either existing building (footprint), hard surfaces and/or contaminated land. 80% of the land within the development site complies with statements 2.3. This being the case the site can be defined as having land of low ecological value and the credit can be awarded.

4. Site Ecological Survey

- 4.1 The findings of the ecology report have been based on data collected from a site survey on 20th October 2011 and checked on 17th January 2012, both during periods of mild weather. October is an appropriate time of the year to determine the presence, or evidence of the presence, of different plant and animal species and whilst January

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is not ideal it was felt to be satisfactory for site checking. Both dates were prior to the commencement of initial site works. The surveyed part of the site is relatively small (8,365m²), comprising both hard and soft landscape elements dating from the former school site. The findings of the ecology report is representative of the site's existing ecology prior to the commencement of initial site preparation work, i.e. before RIBA Stage K Construction to practical Completion and after RIBA Stage B, Design Brief.

- 4.2 The total area can best be described under the two headings of 'urban mosaic' and 'building and derelict land.' It is made up of an existing vacant building site (demolished former school) and a complex mix of habitats of low ecological value including tarmac, brick walls and areas of unmaintained grass being progressively colonised by ruderal plants, areas of non-native shrubbery and 47 trees ranging in size from semi-mature to mature.

The total site area (in m²) is approximately 8,365m². This will be the same before and after development.

- 4.3 Plants colonising the former school grass areas, joints in tarmac and former school building foundation slab include:

- White Clover : *Trifolium repens*
- Fat Hen: *Chenopodium album*
- Broad-leaved Dock: *Rumex obtusifolius*
- Creeping Thistle: *Cirsium arvense*
- Couch Grass: *Elytrigia repens*
- Rosebay willowherb: *Epilobium angustifolium*
- Ragwort: *Senecio jacobaea*
- Meadow Buttercup: *Rannunculus acris*
- Creeping Buttercup: *Rannunculus repens*
- Bramble: *Rubus fruticosus*
- Raspberry: *Rubus idaeus*
- Broom: *Cytisus scoparius*
- Cocksfoot: *Dactylus glomerata*
- Silver Birch: *Betula pendula*
- Honeysuckle: *Lonicera percllymenum*
- Browntop Bent,
- Perennial Ryegrass
- Fescues.

- 4.4 Whilst some of these species do have some ecological value and provide feeding for insects & birds, Broad-leaved Dock, Rosebay Willowherb, and Creeping Thistle are regarded as being troublesome weed species in domestic gardens.

- 4.5 Ornamental shrub species on the site include two distinct areas of Berberis on the north embankment (above the retaining wall) a hedge of Escallonia below the lower retaining wall, a single Fatshedera

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adjacent to the large Sycamore, a hedge of *Spiraea* within the double retaining wall flanking the set of steps on the east side of the site and a Privet hedge forming the boundary with Bellrock Crescent. The latter will be required to be removed to form the site construction access.

4.6 Tree Cover

The principle area of trees on the site are on the embankment above the north retaining wall and north east boundary. The dominant species is Ash *Fraxinus excelsior* (29 Nr), which appear to be part of a wider roadside planting scheme to Gartcraig Road. Also on the embankment are a number of Hawthorn *Crataegus monogyna* (9), Sycamore *Acer pseudoplatanus* (2) and a double stemmed Silver Birch *Betula pendula* (1).

Within the main part of the site, trees are restricted to the east boundary and include a large Sycamore immediately north east of the old school building foundation, a Silver Birch and an ornamental Cherry to the east of the former school building foundation and two Sycamore to the south east of the school building foundation. The Silver Birch has currently non-threatening axe damage approx 1 metre above ground level. The larger of the two Syamores has a very large and old bark wound stretching from the ground level to 1.2m above ground level and greater than 50% of the girth with advanced fungal decay. It is recommended that this tree is removed for public safety reasons. The smaller Sycamore is growing on the boundary fenceline and the main trunk has grown around the fence.



Sycamore with bark wound



Sycamore growing through fence.

- 4.8 There are opportunities for breeding birds to nest on the site in the existing dense shrubbery. However, contravention of the Wildlife & Countryside Act (1981, as amended) will be avoided with regards the destruction of active nests, by timing clearance work outside the bird breeding/nesting season (March to August inclusive) and having the areas surveyed by an ecologist immediately prior to work starting to

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either declare them free of nesting birds or to advice delaying works until birds have fledged.

- 4.9 A 12 month maintenance programme has been produced which sets out the management recommendations over any 12 month period. (P1132.MP1). This covers maintenance and management of the swale and other low maintenance grass areas, high maintenance grass areas, native trees, shrubs and planted raised beds.

5. Photographic Survey of the Site

- 5.1 Initial photographic surveys were carried out on 12th August and 20th October 2011 to record the site prior to redevelopment. The following photographs clearly illustrate and the mosaic of hard surface, unmaintained grass, retaining walls, shrubbery, perimeter trees and hedges and the unmaintained state of the site following demolition of the school



View north along west boundary of the site from the site entrance showing tarmac areas and Escallonia shrubbery below the lower retaining wall dating from the former school site.

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View east along the southern part of site showing mosaic of tarmac, fly tipping and unmaintained grass with the privet hedge on the Bellrock Crescent boundary.



View east along the south edge of the mid-terrace with retaining wall and Escallonia shrubbery on lower side of wall and tarmac path on upper side

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View looking south east over the mid terrace between the grass embankment and lower retaining wall. The foundations of the former school building can be seen in the centre of the photograph.



View east along grass embankment between the mid and upper terrace with significant Sycamore tree in background and Cherry and Birch to right. Unmaintained grass embankment being colonised with creeping thistle.

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View from upper terrace looking north to the tree planted embankment on north boundary with Gartcraig Road, with mosaic of tarmac and grass in foreground dating from the former school use of the site.



View looking north east across upper terrace of the site to the planted embankment forming the north and north east boundaries and the former school site with tarmac and unmaintained grass in foreground. Note Broad-leaved Dock and Creeping Thistle in the grass areas.

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View looking south from upperterrace down the west boundary towards Bellrock Crescent showing a mosaic of tarmac & grass.



View north east from upper terrace showing north embankment with mixture of grass, Berberis ornamental ground cover shrubs, understory shrubs and trees. Note yellow Ragwort on embankment and Creeping Thistle in foreground.

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View of north embankment trees viewed from Gartcraig Road footpath. Species include Ash, Sycamore, Hawthorn & Birch.



View south from north boundary embankment over mosaic of tarmac hardstandings and unmaintained grass with mid terrace shrubs and south boundary privet hedge in the background

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View south west from north boundary embankment showing Berberis ground cover shrubs and birch tree with upper terrace and neighbouring housing behind.



View from north west corner of north boundary embankment showing top of retaining wall and mosaic of unmaintained hard and soft landscape surface of former school site.

6. The Proposals: Proposed Landscape and Ecology Enhancement

- 6.1 For the EcoHomes assessment, a comparison is being made between the brownfield site and the newbuild mainstream & supported housing development. In the process of design development it has been established that south of the north embankment retaining wall, all of the existing hard surfaces and vegetation with the exception of selected trees & vegetation on the east boundary will be stripped and the site regraded both to achieve new levels and provide the required capping layers referred to in para 2.6 above. There will be a minor encroachment into the north embankment to extend the development site and this will involve removing the existing retaining wall and building a new one with the loss of some of the smaller trees at the top of the existing wall. These are identified on Drawing C1149.001. The majority of the trees on the north embankment will be retained and will continue to have ecological value. These will be protected with fencing meeting the requirements of BS5837, Trees in Relation to Construction. Existing trees will be supplemented with new native species structure planting and tree planting to replace the dense Berberis shrubbery.
- 6.2 Based on the Breeam Ecohomes Eco 4 table, the cleared site will be redeveloped with two buildings, one which is mainstream flats for rent (21 units), and the other providing supported accommodation (30 units) with ancillary training and staff facilities. The scheme will include domestic scale gardens with small grassed areas, ground cover and specimen shrubs planting, associated therapy and teaching gardens with raised and allotment style beds for vegetable growing and fruit trees. Tree and shrub species have been chosen to be both useful, decorative or fulfilling a 'Secured by Design' function as well as a species being attractive to fauna, particularly pollinating insects, insect larvae and caterpillars; as well as insect, seed and berry eating birds as follows:
- 6.3 Selected Tree species with wildlife value:

North Embankment:

- Ash: *Fraxinus excelsior*: Blossom attractive to insects and seeds attractive to birds.
- Silver Birch: 2 No *Betula pendula*: attractive to a wide range of insects and seed eating birds.
- Rowan, *Sorbus aucuparia*: Blossom attractive to insects and berries attractive to birds.
- Common Alder, *Alnus glutinosa*: attractive to a wide range of insects & seeds attractive to birds.
- Scots Pine, *Pinus sylvestris* seeds attractive to birds.

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Gardens:

- Apple, Cherry & Pear varieties (*Malus*, *Prunus* & *Pyrus*): blossom attractive to insects and providing fruit for the residents. Windfalls attractive to birds.
- Pear: 2 No *Pyrus calleryana* Chanticleer: early blossom attractive to insects.

6.4 Structure Planting with wildlife value (all with blossom and fruits attractive to a wide range of fauna):

North Embankment:

- Hazel, *Corylus avellana*,
- Hawthorn, *Crataegus monogyna*,
- Blackthorn, *Prunus spinosa*,
- Common Elder, *Sambucus nigra*,
- Guelder Rose, *Viburnum opulus*,

6.5 Specimen Shrub and ground cover shrub species with wildlife value:

Gardens:

- Snowy Mespilus: *Amelanchier lamarkii*. :Blossom attractive to insects and berries attractive to birds.
- Oregon Grape, *Mahonia bealei*: early flowers attractive to insects.
- Viburnum bodnantense 'Dawn' winter flowering and attractive to insects.
- Hebe Great Orme and Hebe Sapphire: Summer flowering and attractive to insects.
- Potentilla Abbotswood : Flowers attractive to insectsSpiraea 'Gold Mound :Blossom attractive to insects
- Pyracantha Watereri: Flowers attractive to insects and berries attractive to birds.
- Kerria japonica: Flowers attractive to insects.

6.6 Herbaceous Plants with wildlife value:

Gardens:

- Achillea Cerise Queen: Flowers attractive to insects
- Eryngium bourgatii: Flowers attractive to insects
- Geranium endressi: Flowers attractive to insects
- Sedum spectabile Autumn Joy: Flowers attractive to insects.
- Lavender varieties: Flowers attractive to insects
- Stachys lanata: Flowers attractive to insects
- Rosmarinus officinalis: Flowers attractive to insects
- Rudbekia Goldsturm: Flowers attractive to insects

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6.7 It is also recommended that bird nest boxes be installed for tit and other species on the larger existing retained trees and potentially multiple nest boxes for House Sparrows and Swifts on the buildings.

6.8 A new swale is proposed as part of the SUDS scheme for the site. This will extend over the full length of the entrance road on the west boundary. It is proposed that this will be sown with a wetland seed mix including the following native grasses and wild flower species:

Strong Creeping Red Fescue	Red Campion
Rough Stalked Meadow Grass	Meadow Buttercup
Meadow Fescue	Ribwort plantain
Yorkshire Fog	Meadow Sweet
Creeping Bentgrass	Yellow Flag Iris
Meadow Foxtail	Wild Carrot
Tufted Hairgrass	Black Knapweed
Wood Barley	Selfheal
	Greater Birdsfoot Trefoil
	Devils Bit Scabious

6.9 The cleared ground resulting from cleared areas of Berberis on the north and north east embankments will be sown with a low maintenance grass seed mix including the following species:

Perennial Ryegrass
Chewings Fescue
Creeping Red Fescue
Browntop Bent

6.10 A small water feature is proposed as part of the therapy garden and whilst this will be planted with ornamental aquatic species, the area of water will be attractive insects and birds.

Table 2

Proposed Approximate Areas & Numbers

- Hard surface Tarmac, Block Paving, Paving Slabs: 3,200 m²
- Footprint of New Buildings: 1,750m²
- Swale grass 200m²
- Low Maintenance Grass 1,200m²
- High Maintenance Grass: 1110m²
- Walls, Steps & Ramps: 150m²
- Existing retained Young, Semi-mature and Mature trees 40 Nr
- New Native Trees 28 Nr
- New native Structure Planting: 355m²
- New Shrubbery and flowering plants, raised beds etc 400m²
- New Specimen Shrubs 80 No

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**7 Land Use & Ecology measured against BREEAM
Criteria & Assessment of BREEAM Ecology Credits**

7.1 Calculation of the Change in Ecological Value:

Species before development = $3570 \times 6.3 = 23625$ divided by 8365 = 2.82

Species after development = $2280 \times 46 = 104,880$ divided by 8365 = 12.54

7.2 Total Change in Species = $12.54 - 2.82 = 9.72$. This allows the 4 available credits for Eco 4 to be claimed.

Table 3

Category		Available Credit
Eco1	<p>Ecological Value of the site: The development is taking place on land which is inherently of low ecological value. The building site is a cleared school site having had grass areas of low ecological value and hard surfaces including former playground spaces, access paths, retaining walls and steps. Following clearance of buildings and cessation of maintenance from the site, the site has begun to establish with a number of potentially troublesome ruderal species including Broad-leaved Dock and Creeping Thistle. (See list of recorded species above). The proposed development is restricted to land that already has limited value to wildlife. The areas of ecological value on the north, north east and east boundaries will remain undisturbed and protected from the construction works. See Drawings C1149.001 and P1132.01</p>	1
Eco2	<p>Ecological Enhancement The ecological value of the site has been enhanced through consultation with an accredited expert. Ecological features have been designed-in for positive enhancement of the site ecology.</p>	

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	Recommendations include planting native woody and herbaceous species and floral species with a known attraction or benefit to local wildlife, horticultural good practice, installing bird boxes and avoiding clearance works at key times of year including bird breeding seasons.	1
Eco3	Protection of existing ecological features from substantial damage during site clearance and construction works . All trees to be retained will be protected with barrier fencing to comply with BS5837:2005 Trees in relation to Construction.	1
Eco4	Change of ecological value of site. From comparison through ecological survey of previous school layout with the proposed development. A change of ecological value of greater than +9 natural species can be demonstrated. For the purposes of the calculation we have placed the site within the Landscape Type of Industrial derelict land of less than 10 years. Whilst the site did not have a former industrial use it is felt that this landscape type fits most closely. We have assessed that the principle Plot Type is infertile grassland with a species count of 6.3.	4.00
Eco5	Building Footprint: Based on Mainstream Block only (Supported Block does not qualify under EcoHomes) Ratio = $1830:610m^2 = 3:1$ (target is 3.5:1)	0

7.4 In the light of the findings of the ecological assessment, a total of 8 credits can be achieved under the BREEAM Land Use and Ecology category assessment for development based on the current landscape proposals. See Table 5

8. Assessment of BREEAM Ecology Credits

Table 4

CREDIT REFERENCE	ESTIMATED CREDIT SCORE
ECO 1	1
ECO 2	1
ECO 3	1
ECO 4	4
ECO 5	0
TOTAL	8

9. Conclusions

- 8.1 It has been demonstrated that the area to be redeveloped has low ecological value and that there are ground contamination issues which require to be dealt with by capping layers of imported inert material as part of the redevelopment.
- 8.2 Comparison between the Ecological Survey Plan C1149.001 and the Landscape Proposal Plan P1132.01 and Tables 1 & 2 above demonstrate that the majority of the principle elements of ecological value (existing trees) will be retained and protected during the construction works and the proposed landscaping will enhance the ecological value and biodiversity of the site through the introduction of a native grass and wild flower sown swale, introduction of native tree and shrub planting, fruit trees & herbaceous planting with flowers, seeds and berries attractive to insects and birds.

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10 Section E Schedule of Evidence

Copies of the following documentation are required to support the above statements and act as evidence of compliance with the BREEAM ecology criteria:

The suitably qualified ecologists site / project specific report;
Written confirmation from the verifier of the ecology report (where necessary);

Any supplementary documentation, e.g. maps, plans, drawings, letters / emails of correspondence, etc

Please include these details along with the appropriate reference to each document in the table below

DOCUMENT	REFERENCE
BREEAM Ecology Report & A6 Checklist	CPA 1149 BC 01
Evidence of Qualifications	Scanned Degree & Professional Certificates
Ecology Survey Drawing	Drawing C1149.001 (A1 Drawing & Site Survey Photographs)
Ecology Enhancement Proposals	Drawing P.01 (A1 Drawing with Plant Schedules)

11. Section F: Statement of Verification

I confirm the information provided in this document is truthful and accurate at the time of completion.

Name of ecologist: Christopher Palmer

Signature of ecologist

A handwritten signature in black ink that reads "Christopher Palmer". The signature is written in a cursive style with a large initial 'C' and a long horizontal stroke at the end.

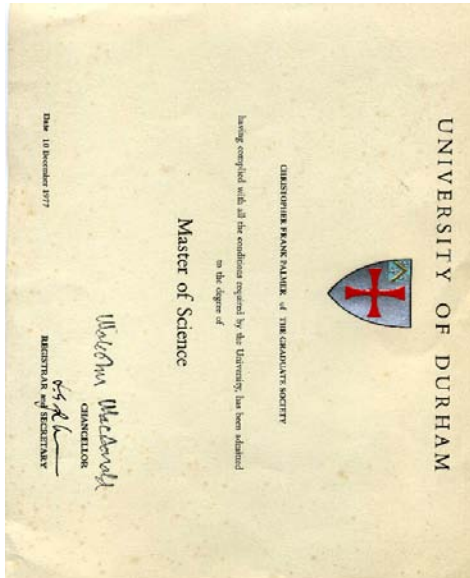
Date 26th January 2012

Name of Verifier: N/A

Signature of Verifier: N/A

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 26.1.12

Evidence of Qualifications



Master of Science in Ecology



Associate of the Landscape Institute