

DAVID CLEMENTS ECOLOGY LTD

**CATHAYS LIBRARY, CARDIFF,
SOUTH WALES**

SURVEY FOR BATS

REGULATORY SERVICES

- 2 JAN 2008

Action By.....

September 2008

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SUMMARY

This report sets out the results of a bat survey of Cathays Library in Cardiff, South Wales, for the presence (or possible presence) of roosting bats and other protected species. Cathays Library is a Carnegie building opened in 1906 and is prominently situated on the junction of Cathays Terrace, Whitchurch Road, Fair oak Road and Crwys Road, next to Cathays Cemetery. It is a Grade 2 Listed building and contains numerous interesting architectural features.

Current proposals involve refurbishing and restoring the existing library along with a variety of internal alterations. It is also proposed to carry out trimming works to the large trees which lie immediately adjacent to the rear of the building, on the boundary with Cathays Cemetery. This work is scheduled to start in the summer of 2009, running through to the summer of 2010.

Overall, the survey evidence suggests that the Cathays Library building does not support any roosting bats, although it appears superficially suitable for such use. The voids of the pitched roofs are assessed as being potentially attractive to roosting bats, but may not be suitable due to the comparative lack of access arising from the tight-fitting nature of the exterior ridge tiles, fascias and soffits etc, and possibly also because it is thermally unstable.

There is some potential for roosting by bats on the building exterior, in decorative stonework etc. However, there is no evidence of such activity to date, and the probability is considered to be no greater than average. Any such exterior use of the building is likely to be adventitious or casual.

There is no evidence available relating to the potential use of the building for winter hibernation, but the probability of this is considered to be lower, or at least no greater, than average.

None of the surveyed trees appear to be especially suitable for use by roosting bats, and there is no evidence that bats use any of the trees for this purpose. Many of the trees are conifers, which do not tend to be favoured by roosting bats, and none of the trees have any well developed features which are likely to be attractive to bats, such as cavities, splits, delaminating bark etc

Given the lack of any evidence of roosting, and the generally low suitability of both the building and the trees for roosting use, there is not considered to be any requirement to seek a licence from the Welsh Assembly with respect to bats prior to any potentially disruptive works.

There is no evidence of birds nesting on the building. However, there is potential for nesting by common species such as house sparrow and starling etc. The potential presence of common nesting birds, all species of which are protected by law, should be taken into account with respect to any disruptive works.

Recommendations regarding appropriate mitigation measures are made.

1.0 INTRODUCTION

- 1.1 This report has been prepared by David Clements Ecology Ltd (DCE) acting on behalf of Cardiff City Council. It sets out the results of a bat survey of Cathays Library in Cardiff, South Wales, for the presence (or possible presence) of roosting bats and other protected species.
- 1.2 Cathays Library is a Carnegie building opened in 1906 and is prominently situated on the junction of Cathays Terrace, Whitchurch Road, Fair oak Road and Crwys Road, next to Cathays Cemetery. It is a Grade 2 Listed building and contains numerous interesting architectural features.
- 1.3 Current proposals involve refurbishing and restoring the existing library along with a variety of internal alterations. It is also proposed to carry out trimming works to the large trees which lie immediately adjacent to the rear of the building, on the boundary with Cathays Cemetery. This work is scheduled to start in the summer of 2009, running through to the summer of 2010.

1.4 Statutory Position and Background Information

- 1.4.1 Bats are flying insectivorous mammals. There are about 16 species resident in Britain which vary from comparatively common and widespread species (eg the pipistrelles¹, brown long-eared bat) to internationally rare and endangered species (eg the horseshoe bats). Bats do not make nests but have 'roosts', which may be solitary or gregarious. Individual bats require a range of different roosting sites for differing purposes: in the summer, for example, daytime roosts in buildings and trees may be used, whilst for winter hibernation roosts in locations such as humid caves, basements or deep within the fabric of stonebuilt structures are preferred.
- 1.4.2 All bats and their roosts are protected under UK legislation by virtue of their listing on Schedule 5 of the amended Wildlife and Countryside Act 1981. They are also protected under the EU Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC; the 'Habitats Directive'), implemented in the UK via the Conservation (Natural Habitats, etc) Regulations 1994 (the 'Habitats Regulations') as amended in 2007. Bats are also listed under the Bern Convention on the Conservation of European Wildlife and Natural Habitats and under the Agreement on the Conservation of European Bats 1992 (the 'Eurobats Agreement'), signed within the framework of the Bonn Convention on the Conservation of Migratory Species of Wild Animals 1979.
- 1.4.3 Both the animals themselves and any structures or places used for breeding or shelter are fully protected against both intentional or unintended but 'reckless' disturbance or harm, the latter irrespective of whether or not bats are present in them at the time. Where works are allowed to affect such places there is a legal requirement to obtain a licence (or

¹ Pipistrelle bat (*Pipistrellus pipistrellus*) is now known to comprise an aggregate of two distinct species distinguished primarily by their echolocation calls, which are grouped at 45kHz and 55kHz respectively. The second species is now identified as the 'soprano pipistrelle' (*P. pygmaeus*). The precise distribution and conservation status of these two species is still being determined, but results to date indicate that both are comparatively common and widespread in the UK,

'derogation') in advance and to ensure that the works do not result in any avoidable harm to bats. The bats should also enjoy continued 'favourable conservation status' once the works are completed, through the incorporation of suitable mitigation and enhancement measures.

- 1.4.4 All bats are listed in Annex IV of the EC Habitats Directive, and the British species are listed on Schedule 2 of the Habitats Regulations 1994, and are therefore designated 'European Protected Species' by the latter. Such species are subject to enhanced protection and more stringent licensing provisions than those which are protected under the Wildlife & Countryside Act only.
- 1.4.5 The issuing of licences which allow the disturbance of European Protected Species by development, or for any other reason, is the direct responsibility of the Welsh Assembly Government (WAG). The licensing restrictions are considerably more onerous than those of the Wildlife & Countryside Act and could potentially have significant impact on the viability of a given development proposal, irrespective of whether or not a valid planning consent has been obtained. Further details on the procedures are given in the WAG guidance note on European Protected Species (WAG 2000) and WAG Circular No. 23/2001 (New Guidance for Local Planning Authorities on European Protected Species & Changes in Licensing Procedures).
- 1.4.6 All species of bat in Britain are believed to be declining in range and numbers, with about half of the resident species classed as 'rare', three classed as 'endangered' and one 'extinct' (but recently rediscovered in Britain) (Morris 1993; Richardson 2000). Several bats are listed as 'Priority Species' in the UK BAP (UKSG 1995; UKBG 1998-99; BRIG 2007) and its Welsh equivalent (WAG 2003; WBP 2007).
- 1.4.7 Some of the rarest bat species in Europe, including the horseshoe bats, barbastelle, Bechstein's bat and greater mouse-eared bat, are additionally listed on Annex II of the Habitats Directive. This requires the EU nation states to designate key areas of habitat used by these species as Special Areas of Conservation (SACs), and to implement policies to conserve and enhance their populations through appropriate management etc. These species are accorded enhanced conservation significance in the UK, although they are not subject to any additional protection measures.

Derogations

- 1.4.8 Amongst other things, the Habitats Regulations make it an offence to deliberately or recklessly:

- capture or kill;
- disturb;
- take or destroy eggs or young, or;
- damage or destroy a breeding site or resting place of;

a European Protected Species, except under certain narrowly defined circumstances. New developments which would contravene the protection afforded to such species require a derogation, in the form of a licence, from the Habitats Directive which must be issued by the WAG.

1.4.9 Before such a licence can be issued, the WAG must be satisfied that:

- the derogation would not be detrimental to the 'favourable conservation status' of populations of the species concerned within its natural range.
- the derogation is in the interests of public health and public safety, or for other imperative reasons of over-riding public interest, including those of a social or economic nature, or will have beneficial consequences of primary importance to the environment.
- there is no satisfactory alternative to the derogation which would allow the development to proceed but which would avoid, or reduce, the need for adverse impact to the species.

1.4.10 Failure to obtain a derogation would render any actions which cause harm or disturbance to bats illegal, including any activities which might be undertaken under a valid planning consent. The possession of planning consent in no way alleviates or over-rides the requirements of the Habitats Regulations, and neither does it automatically ensure that a derogation may be obtained.

2.0 APPROACH AND METHODS

- 2.1 Surveys for bats were carried out following the broad guidance given by BCT (2007). The general layout of the buildings is shown at Plan 1, and photographs are given at Appendix 1.
- 2.2 The building was surveyed in daylight on 2 September 2008 by two experienced and licensed surveyors. The accessible exterior and interior voids were all searched carefully using high-powered lanterns (Clulite CB1). Other equipment which was available as required included an endoscope (ProVision 300), which was used to examine voids in the fill of stone walls etc, inspection mirrors and a ladder to inspect high areas. Searches were made especially for evidence such as bat droppings and feeding remains, as well as for sightings of actual bats (in cracks and crevices etc) and secondary signs such as fur-oil and urine stains, scratch marks etc.
- 2.3 The ground plan and construction of the building was recorded and the internal voids were briefly described and characterised, with an estimate being made of their potential attractiveness and suitability for bats with reference to a range of factors such as human disturbance, lighting, air movement/exposure and cobwebbing of access points etc.
- 2.4 In addition, the exterior of the building was monitored by four surveyors in moderately warm, humid conditions on the evening of 17 September 2008 to watch for signs of emerging bats. Survey commenced from about 20 mins before dusk until after nightfall, ie from about 7.15pm to 9.00pm. The buildings were subject to visual observation whilst the light allowed, and subsequently searched using various bat detection equipment, including Pettersson D-200 heterodyne detectors and Anabat SD1 frequency division detectors. Signals from the latter were recorded to flashcard for subsequent study using the AnalookW bat-sound analysis software. Night-vision equipment (Night Owl, generation 1) was also available if required.

2.5 Existing Records

- 2.5.1 In addition to original survey, enquiries were made in order to seek out any existing records for the site which might be held by data-holding bodies and individuals in the region. The contacted data sources included:

- Countryside Council for Wales (CCW)
- Cardiff City Council (CCC)
- South East Wales Biological Record Centre (SEWBRcC)

SEWBRcC is now the main depository for bat records and ecological data in the South-East Wales region.

- 2.5.2 Isolated records of common pipistrelle, soprano pipistrelle, brown long-eared bat, Brandt's bat, whiskered bat, Daubenton's bat, Natterer's bat, noctule, lesser horseshoe bat and other unidentified bats have been made in the general vicinity of the site in recent years. However, there do not appear to be any previous bat records from the building itself (SEWBRcC data).

3.0 SURVEY RESULTS

3.1 Description of the Site

Building

- 3.1.1 Cathays Library is a Carnegie building opened in 1906. It is a Grade 2 Listed building and contains several interesting architectural features. The building is currently occupied and used as a library, although is in a very dilapidated condition, having been neglected for several years and suffering from major damp problems.
- 3.1.2 The building comprises three connected parts. The central part of the building is low and single storey, and houses the main library. This part has a flat roof over the northern section, with associated hipped glass skylights, and a ridged roof over the southern section with a decorative circular 'spire' to provide illumination into the area. At the eastern and western sides of this central building there are two identical hall-type wings, each lit by lofty church-like windows. Both of these contain rooms with high vaulted ceilings below ridged roofs, one of which run broadly from north to south, whilst the other runs broadly from north-west to south east. The northern part of the eastern wing has a set of stairs giving access to two further floors and a basement.
- 3.1.3 The northernmost part of the eastern wing of the building has a sub-floor space (basement). This is head-height, and extends across the eastern side of the building. The basement is accessed by a flight of stairs and is divided into two main rooms, one of which is further divided into two and houses the boiler. All of the rooms and the associated hallway were flooded and waterlogged at the time of the survey, holding approximately 5cm of water throughout. The boiler room is believed to be used and disturbed quite regularly, but the other two basement rooms are neglected and no longer in current use.
- 3.1.4 The walls of each of the basement rooms comprise a combination of brick and stone. One of the rooms has a former window which has been filled in with breeze block. A former coal chute, now boarded with a metal panel, is present on the eastern wall of the basement where it adjoins Fair Oak Road. A window boarded with timber is also present on this wall. A wooden louvered vent is present in the boiler room on the northern wall of the basement. The ceilings are all of lathe and plaster supported on steel girders. The boiler room has various pipes covered with plastic lagging. One of the basement rooms has several large gaps in the ceiling. These rooms all have a moderate degree of cobwebbing, particularly in the corners.
- 3.1.5 The main interior spaces of the building comprise the library reception area in the central area, a children's library in the eastern wing and a book storage area to the west. The north-eastern part of the building on the ground, first and second floors comprises offices, kitchens and auxiliary rooms etc which are mostly in current use, although in a dilapidated condition.
- 3.1.6 There is a large attic space over each of the two high vaulted wings, although only that of the eastern wing adjoining Fair Oak Road could safely be accessed. Both attics appear superficially to be identical.

- 3.1.7 The roof of the eastern wing is supported on a standard king post timber construction, with tie beams and the usual purlins, rafters and battens. There is a slate roof, although there is no felt, sarking or other lining under the tiles. The void lacks decking, is unlined and contains electrical wiring throughout. A decorative metal structure is present in the central part of the ridge. It is assumed that the attic of the western wing has a similar construction. The exterior of the roofs of these parts of the building have parapets and turrets on the side walls.
- 3.1.8 Another attic space is present to the north-west of the eastern wing. This is ridge roofed, but could only be accessed in part during the present survey. This adjoins another attic space to the south which has a complex arrangement of intersecting ridges and valleys, giving rise to a complex attic void. The part of the roof leading towards the central decorative circular skylight has a modified queen post construction. Elsewhere the construction is of old A-frame timbers. The void lacks decking and is unlined.
- 3.1.9 There are two chimneys towards the northernmost part of the building. Both of the chimneys have associated lead flashings which appeared to be in good order, with no obvious gaps towards the roof.

Trees

- 3.1.10 An assessment was made of the trees to the north of the library for their potential to be used by roosting bats. Brief descriptions of the trees are set out in the table below, together with any evidence of bat occupation, and a subjective assessment of their likely use by roosting bats is also given. The trees, which are shown on Plan 1, are numbered in the sequence in which they were surveyed and were assigned to the categories set out below:

Category	Category Description
Known	Trees with direct evidence of current use by bats. Includes sighting or hearing of bats, bats seen emerging, or the presence of fresh droppings or staining.
Probable	Trees with no direct evidence of current use by bats. Includes small numbers of old droppings or old staining. This category also includes roosts identified by reliable third parties but which could not be confirmed in the field.
High	Trees of an age and structure that have characteristics considered ideal for summer roosting bats, such as large heart-rot cavities, woodpecker holes etc. May possibly be suitable as breeding and hibernation sites in extreme cases.
Moderate	Trees which although not ideal for bats, have sufficient features (such as heavy ivy cover, shallow cavities, rugose bark etc) to suggest potential for use by bats.
Low	Mainly smaller or smooth-barked, mostly undamaged trees with few potential features for use by bats.
Negligible	Very young or small trees, and trees without any of the features which might suggest potential for use by roosting bats.

- 3.1.11 The results of the tree survey were as follows:

No.	Description	Evidence of Bats	Potential for Bats
T1	Leyland cypress (x <i>Cupressocyparis leylandii</i>), twin-stemmed from base with DBH's of c18m and c13cm; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low

No.	Description	Evidence of Bats	Potential for Bats
T2	Group of 3 Leyland cypress (<i>x Cupressocyparis leylandii</i>) trees growing close together. The trees have DBH's of c16cm, c16cm and c20cm, none of the trees have any obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low
T3	Ornamental cherry (<i>Prunus</i> sp); 17cm DBH; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low
T4	Ornamental cherry (<i>Prunus</i> sp); 14cm DBH; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low
T5	Ornamental cherry (<i>Prunus</i> sp); 17cm DBH; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low
T6	Leyland cypress (<i>x Cupressocyparis leylandii</i>); 17cm DBH; single-stemmed to a height of c1.5m before branching to give a twin-stemmed mid crown; extensive flaking bark; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches; no ivy cover.	Nil	Low
T7	Scot's pine (<i>Pinus sylvestris</i>); c65cm DBH; very tall tree with one main limb with almost no forks or side branches; extensive flaking bark which is moderately rugose.	Nil	Low - Moderate
T8	Leyland cypress (<i>x Cupressocyparis leylandii</i>); c65cm DBH; the trunk is surrounded by dense ivy growth which itself has a large girth of up to 15cm; ivy cover extends into the canopy.	Nil	Low
T9	Leyland cypress (<i>x Cupressocyparis leylandii</i>); c45cm DBH; dense ivy cover extending into canopy; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches.	Nil	Low
T10	Leyland cypress (<i>x Cupressocyparis leylandii</i>); c50cm DBH; dense ivy cover extending into canopy and fruiting extensively at top of canopy; no obvious crevices or cavities; no obvious fungal growth or decay; no obvious split limbs or broken branches.	Nil	Low - Moderate
T11	Lime species (<i>Tilia</i> sp); c65cm DBH; single-stemmed to a height of 1.75cm before stem trifurcates to give triple-stemmed mid crown with DBH's of c35cm, c30cm and c25cm; all of the forks high up in the canopy are narrow, acutely angled and v-shaped, as is typical of this species. There is one fork with occluded bark and possibly a small cavity within the fork; bark smooth with no significant delamination; no obvious fungal growth or decay.	Nil	Moderate
DBH – Diameter at Breast Height			

3.2 Site Inspection Results

Building

- 3.2.1 No signs of bats were found anywhere in or around the building. The building was assessed as being moderately suitable and attractive for roosting bats. The apparent absence of bats may be due to the lack of potential access points within the attic spaces, and possibly also thermal instability as a result of poor insulation and lack of lining.
- 3.2.2 No signs of any other protected species were found anywhere in the buildings. It is, however, possible that birds such as house sparrows nest on the exterior in some years.

- 3.2.3 There were no signs of roosting butterflies (eg small tortoiseshell (*Aglais urticae*), and peacock, (*Inachis io*), roosting moths (such as herald moth, *Scoliopteryx libatrix*) or cluster flies (*Pollenia* spp), all of which often occur in buildings used by bats.

Trees

- 3.2.4 No evidence of roosting bats was found in any of the inspected trees, and the majority were assessed as having low potential for use by roosting bats. One tree (T11) was considered to have moderate potential for use by roosting bats, and two trees (T7; T10) were assessed as having low-moderate potential, but none of these were considered to be in any way exceptional in this regard.

3.3 Flight/Emergence Survey Results

- 3.3.1 The flight/emergence survey did not detect any bats emerging from the building or the trees. individual common pipistrelles were detected flying to the north of the building within the adjacent Cathays Cemetery, but no activity was recorded around the building itself. The survey also detected occasional noctule bats (a tree-roosting species) flying high over the site. All of the bats recorded clearly originated from off-site, however.

4.0 ASSESSMENT AND CONCLUSIONS

- 4.1 Overall, the survey evidence suggests that the Cathays Library building does not support any roosting bats, although it appears superficially suitable for such use. The voids of the pitched roofs are assessed as being potentially attractive to roosting bats, but may not be suitable due to the comparative lack of access arising from the tight-fitting nature of the exterior ridge tiles, fascias and soffits etc, and possibly also because it is thermally unstable.
- 4.2 There is some potential for roosting by bats on the building exterior, in decorative stonework etc. However, there is no evidence of such activity to date, and the probability is considered to be no greater than average. Any such exterior use of the building is likely to be adventitious or casual.
- 4.3 There is no evidence available relating to the potential use of the building for winter hibernation, but the probability of this is considered to be lower, or at least no greater, than average.
- 4.4 None of the surveyed trees appear to be especially suitable for use by roosting bats, and there is no evidence that bats use any of the trees for this purpose. Many of the trees are conifers, which do not tend to be favoured by roosting bats, and none of the trees have any well developed features which are likely to be attractive to bats, such as cavities, splits, delaminating bark etc.
- 4.5 Given the lack of any evidence of roosting, and the generally low suitability of both the building and the trees for roosting use, there is not considered to be any requirement to seek a licence from the Welsh Assembly with respect to bats prior to any potentially disruptive works.
- 4.6 There is no evidence of birds nesting on the building. However, there is potential for nesting by common species such as house sparrow and starling etc. The potential presence of common nesting birds, all species of which are protected by law, should be taken into account with respect to any disruptive works.

5.0 RECOMMENDATIONS

5.1 In the event of either of the circumstances below arising, the following mandatory requirements would apply:

- Demolition, construction, tree-works or other works must not cause harm to any birds which are nesting at the time, including any disturbance which might cause birds to abandon nests, eggs or dependant young. In the event that nesting birds are discovered immediately prior to or during the works, all works in the immediate area must cease and appropriate expert advice sought. In the majority of cases, the birds will have to be allowed to complete their current nesting cycle unmolested before works in the area can recommence.
- In the unlikely event that bats are discovered within any of the affected structures, at any point during the works, all works in the immediate area must cease until appropriate expert advice has been sought. In most cases there is likely to be a requirement for a survey to ascertain that bats have left the structure unharmed, or to establish what measures, if any, may be required to ensure their safe removal or exclusion from the affected structure, together with any other appropriate mitigation measures. It is also possible that a licence will need to be sought from the Welsh Assembly before works are allowed to continue in any areas where bats are discovered, which may incur a significant delay.

5.2 The following best-practice measures are recommended, but are not mandatory:

- Demolition or other disruptive works should ideally be carried out during the winter months (ie November to February). This timeframe should minimise the risk of encountering either bats or nesting birds.
- The buildings should ideally be briefly resurveyed for bat and/or nesting bird presences immediately prior to the commencement of demolition or other disruptive works, and appropriate measures taken either to remove any bats which may be present or to reschedule works in the affected area for a more appropriate time.
- All contractors carrying out building works should be warned of the *possible* presence of roosting bats (and/or nesting birds), and of their protected status. It should be clearly understood that in the event of any bats (or occupied birds' nests) being found during works, all works should cease in the affected area until appropriate expert advice has been sought.
- Contractors should check for the *possible* presence of bats on the undersides of roof sheets, ridge tiles and exterior timbers and fascias etc as they are lifted off, and also within roofing supports and under wall plates etc. This is especially important at the outset of the works, since once works have started the disturbance is likely to drive any bats which may be present away voluntarily.
- The services of an appropriately qualified and licensed bat expert should be available on an 'on-call' basis throughout the redevelopment period in order to deal promptly with any bat presences which may be discovered during the works.

- Any treatment of structural timbers in the buildings with chemicals to eradicate or deter wood-boring beetle infestations should be of non-toxic, 'bat friendly' formulations only. A list of currently-available timber treatment formulations approved for use in buildings containing bats should be obtained from the CCW.
- Measures should ideally be incorporated to enable and encourage the future use of the redeveloped buildings by roosting bats and nesting birds. This could, for example, take the form of dedicated bat voids of appropriate design within the re-roofed building. Suitable access could be provided either through the gable walls (eg by removing the wire mesh blocking the vents) or alternatively through modified roof tiles etc (see Appendix 2). Any bat access points should not be illuminated at night (eg by security lighting or street lighting etc).
- Cobwebs should be removed from all roof voids wherever possible.

5.0 REFERENCES

Bat Conservation Trust (BCT 2007) *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London.

Biodiversity Reporting & Information Group (BRIG 2007) *Report on the Habitats & Species Review: A Report to the UK Biodiversity Partnership*. Joint Nature Conservation Committee, Peterborough.

Mitchell-Jones, A J (2004a) *Bat Mitigation Guidelines*. English Nature, Peterborough.

Mitchell-Jones, A J (2004b) *Conserving and Creating Bat Roosts*. In: *Mitchell-Jones, A J & McLeish, A (Eds) The Bat Worker's Manual (3rd Edition)*, pp111-129. Joint Nature Conservation Committee, Peterborough.

Morris, P A (1993) *A Red Data Book for British Mammals*. The Mammal Society, London.

Richardson, P (2000) *Distribution Atlas of Bats in Britain & Ireland, 1980-1999*. Bat Conservation Trust.

Schofield, H W, Mitchell-Jones, A J & Ovenden, D W (2004) *The Bats of Britain & Ireland (2nd Edition)*. Vincent Wildlife Trust.

UK Steering Group (UKSG 1995) *Biodiversity: The UK Steering Group Report (2 vols)*. HMSO, London.

UK Biodiversity Group (UKBG 1998-99) *Tranche 2 Action Plans (6 vols)*. English Nature.

Wales Biodiversity Partnership (WBP 2007) *List of Species & Habitats of Principle Importance for Conservation of Biological Diversity in Wales, December 2007*. Wales Biodiversity Partnership/Welsh Assembly Government.

Welsh Assembly Government (WAG 2001) *New Guidance for Local Planning Authorities on European Protected Species and Changes in Licensing Procedures*. Circular 23/2001.

Welsh Assembly Government (WAG 2000) *European Protected Species: Guidance Note*. In-house guidance note

**Cathays Library, Cardiff
Survey for Bats**

Plan 1: Tree Survey Results

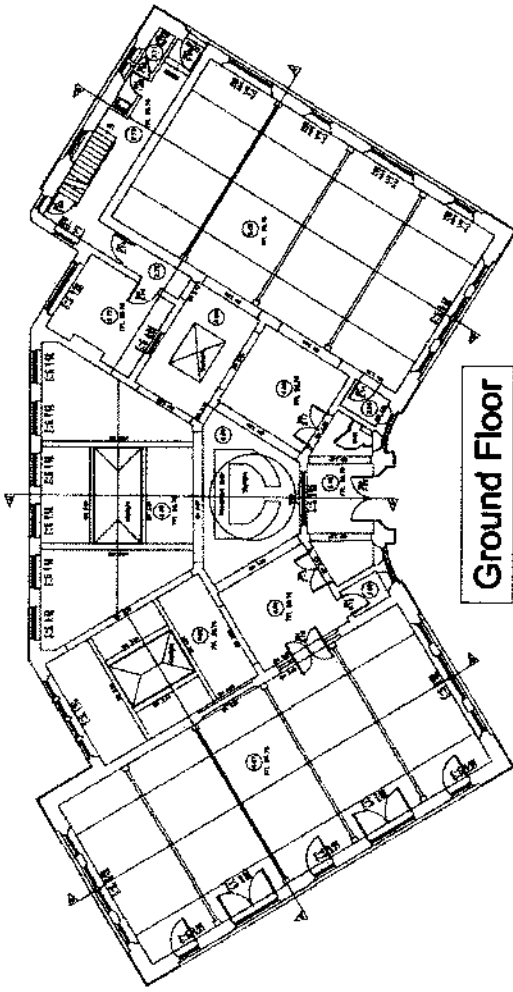
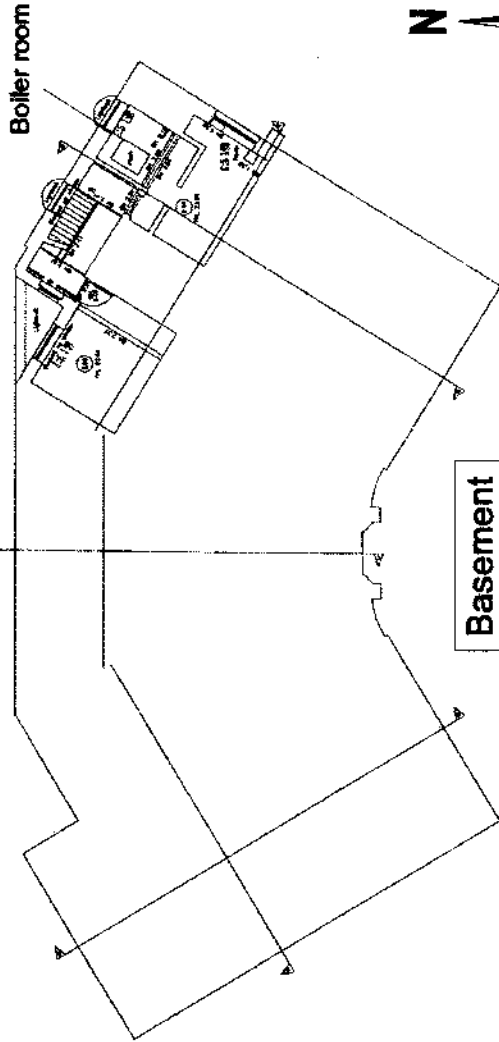
DCE 471 NTS Sep 2008



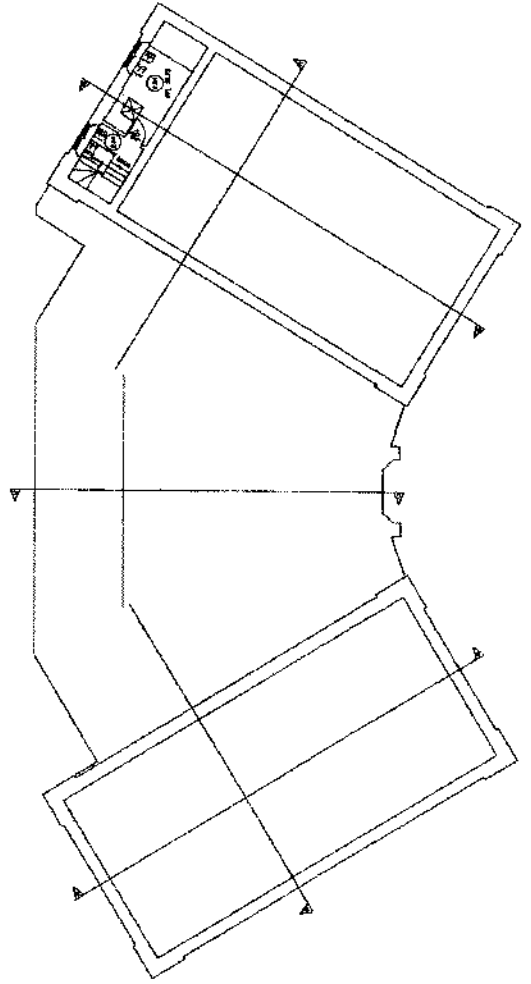
**Cathays Library, Cardiff
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Plan 2: Layout and Survey Results

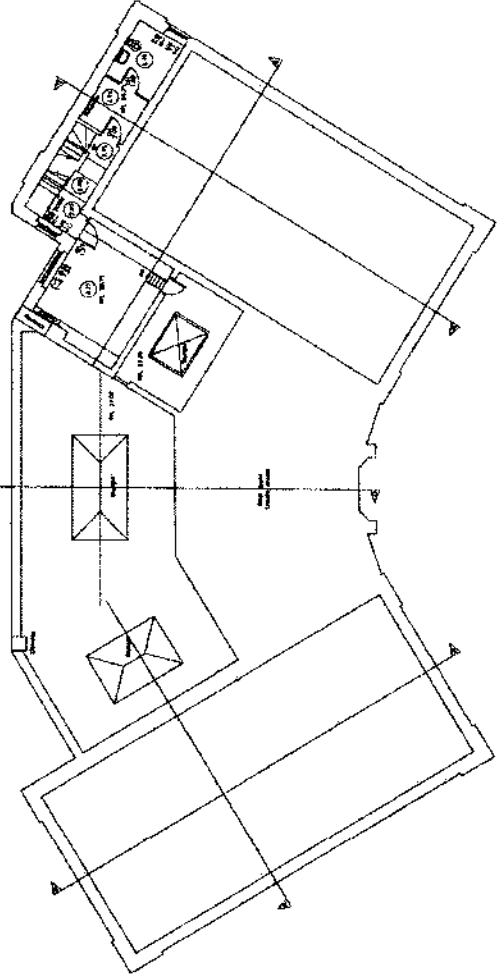
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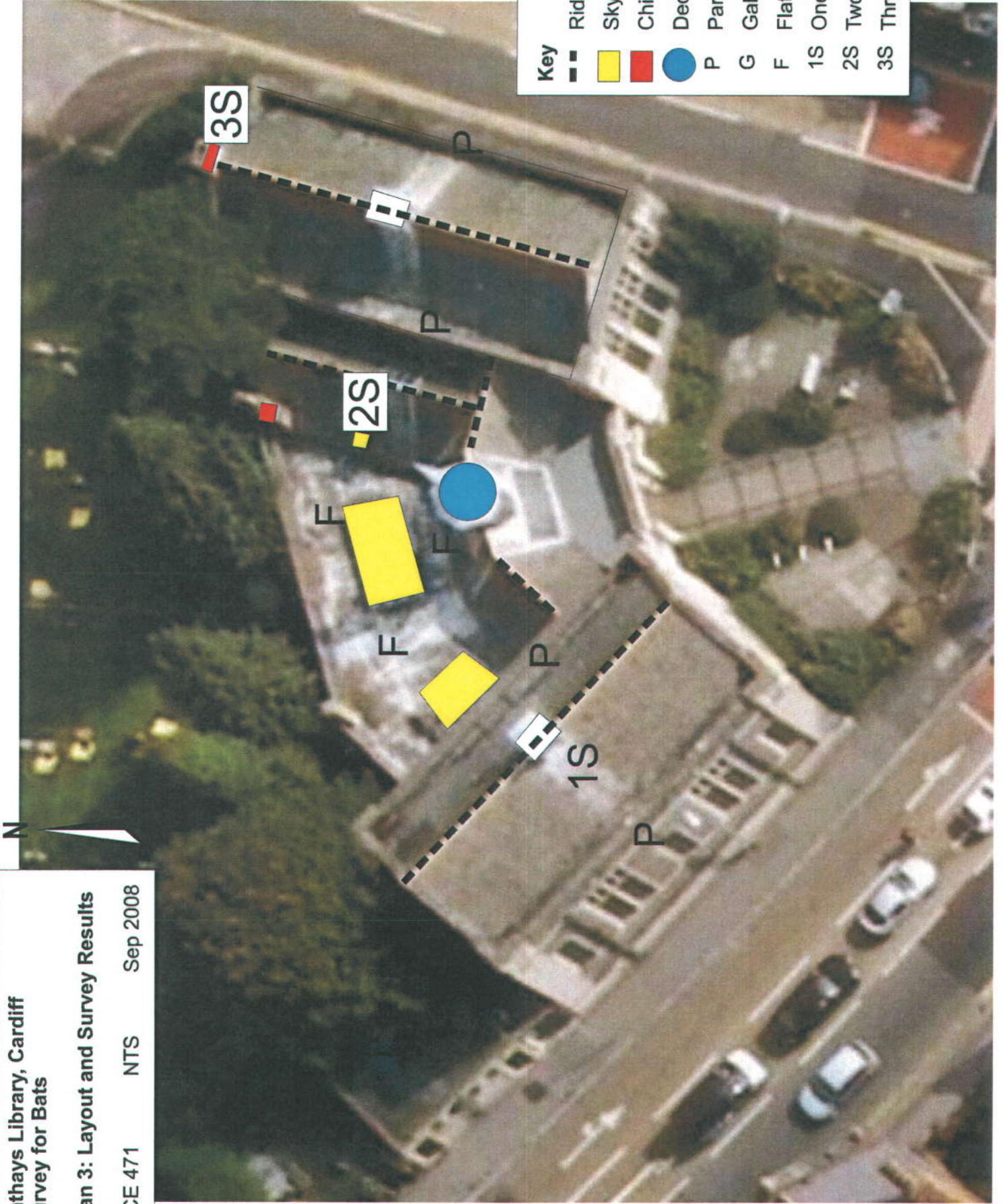


Second Floor



First Floor





Key	Symbol	Description
---	Dashed line	Ridge
■	Yellow square	Skylight
■	Red square	Chimney
●	Blue circle	Decorative spire
□	White square	Parapet
G	Letter G	Gable
F	Letter F	Flat Roof
1S	Text 1S	One Storey
2S	Text 2S	Two storey
3S	Text 3S	Three storey

Cathays Library, Cardiff
Survey for Bats

Plan 4: Flight Survey Results

DCE 471 NTS Sep 2008

Key



Common pipistrelle



Noctule



Indicative flight patterns



Observer position

Note: Symbols represent individual contacts, but may not necessarily refer to different individuals



APPENDIX 1: PHOTOGRAPHIC RECORD, AUGUST 2008



Photo 1: Front Elevation – Eastern Wing

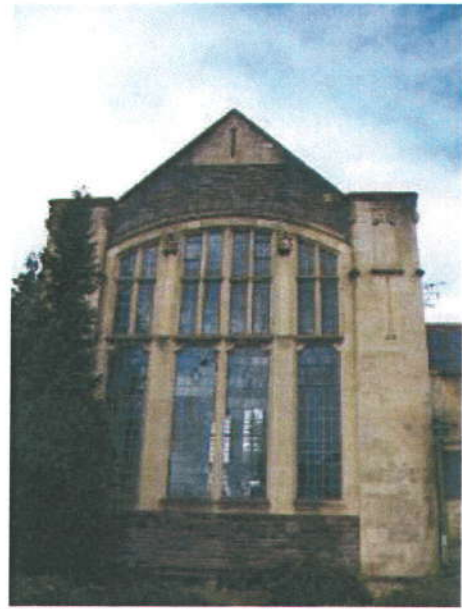


Photo 2: Front Elevation – Western Wing



Photo 3: Front Elevation – Central Part

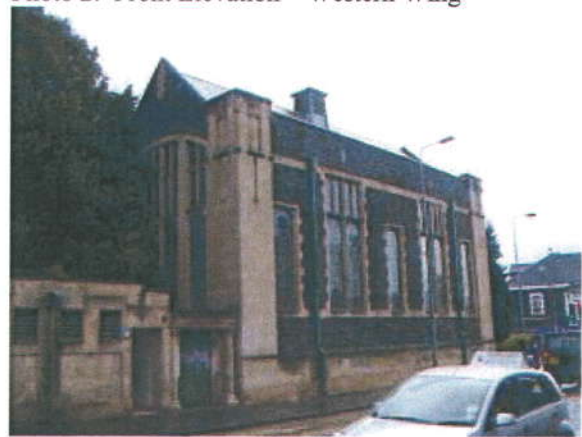


Photo 4: Side Elevation From Whitchurch Road



Photo 5: Rear Elevation



Photo 6: View From Flat Roof



Photo 7: View From Flat Roof



Photo 8: View From Flat Roof



Photo 9: View From Flat Roof



Photo 10: Basement



Photo 11: High Vaulted Ceiling

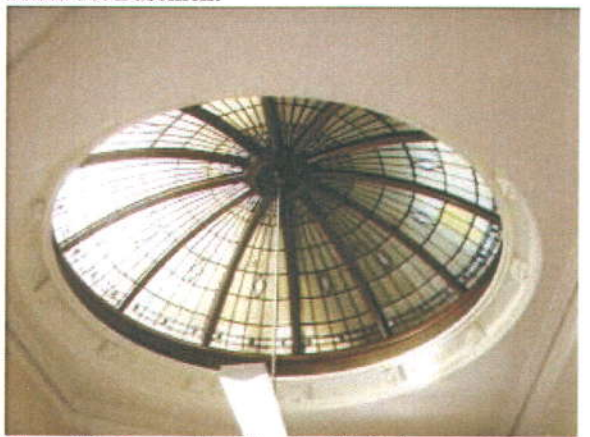


Photo 12: Decorative Circular Skylight



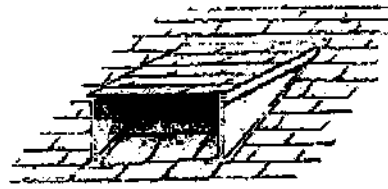
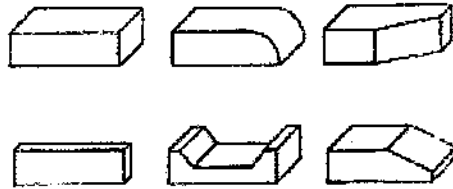
Photo 13: Main Attic Space



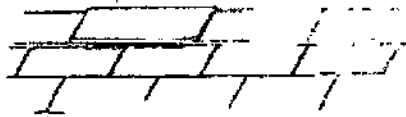
Photo 14: Smaller Attic Space

APPENDIX 2: BAT ACCESS POINTS

New access points



WALLING BRICKS FOR CREATING BAT ACCESS POINTS - A STANDARD BRICK IS SHOWN TOP LEFT



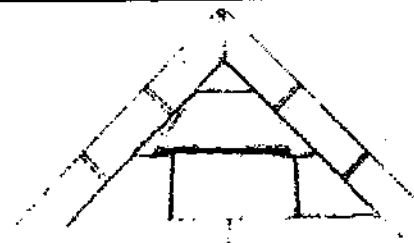
RIDGE VENTILATORS CAN BE ADAPTED AS BAT ACCESS POINTS - IT MAY BE NECESSARY TO REMOVE INTERNAL MESH OR PLASTIC MOULDING



DORMER ENTRANCE PARTICULARLY SUITABLE FOR HORSESHOE BATS



ACCESS SLITS IN SOFFITS



LEAD SADDLE IN PLACE OF A SLATE TO ALLOW BATS ACCESS TO RIDGE OR ROOF VOID

REDRAWN FROM THE BAT WORKERS' MANUAL (JNCC, 1999)