



## Ecological Survey: Bats

**Client:** The PCC of Holy Trinity Church

**Location:** Holy Trinity Church, High Street, Queenborough, Kent, ME11 5EP

**NGR:** TQ909 723

**Survey Date:** 1<sup>st</sup> June 2017

**Lead**

**Surveyor:** Sally-Ann Hurry MCIEEM BSc (Hons) FdSc

**Project:** Quinquennial repairs to include new rainwater goods and drainage, roof repairs, repairs to the interior of the belfry and external masonry repairs to the western tower, chancel and other areas of the building

**Written by:** Sally-Ann Hurry – 2<sup>nd</sup> June 2017



## Summary

Holy Trinity Church in Queenborough, Kent is to undergo significant quinquennial repairs. An up to date bat assessment of the church has been carried out in order to identify any potential impacts of the proposed works upon bats and their roosts. A brief summary of the findings and recommendations is provided below:

- Holy Trinity Church is situated on the exposed Isle of Sheppey off the north Kent coast. Although the surrounding habitats are of value to foraging bats, the immediate urban and exposed setting is likely to reduce the potential presence of roosting bats.
- The church supports a limited number of suitable and potential bat roosting features. No bats or secondary evidence to suggest the presence of a bat roost or any recent bat activity was found at the church and no bats emerged from the church.
- The church is assessed as having low bat roosting potential with negligible potential for a hibernation roost. The completed survey work confirms the absence of a bat roost and no further bat survey work is required.
- The proposed works are not anticipated to impact upon any bat roosts and so works may proceed without the need for a European Protected Species Mitigation (EPSM) license or any significant restrictions.
- Several active birds' nests were identified within the external cavities of the stone walls. The proposed works have potential to cause disturbance and obstruction of active nesting sites. Consideration for the possible presence of active birds' nests and suitable measures will be necessary.

## 1. Introduction and Background:

- 1.1 Mountfield Ecology were commissioned by the PCC of Holy Trinity Church to carry out an up to date bat assessment of the Church in Queenborough, Kent. This assessment includes a detailed building inspection and single emergence survey with suitable recommendations provided. The survey aims to identify the presence/absence of bat roosts and assess the possible impacts of the proposed works upon bats at the site.
- 1.2 The proposed project includes quinquennial repairs to the church which are planned to start in spring 2018. The works include:
- New rainwater goods and drainage;
  - Roof repairs to the south porch and nave;
  - Repairs to the interior of the belfry;
  - External masonry repairs to the western tower, chancel and other areas of the building.
- 1.3 The site is situated in an urban, coastal location within the industrial port town of Queenborough on the Isle of Sheppey in Kent. Queenborough lies to the east of West Swale, adjoining the River Medway and Thames Estuary. The church is immediately surrounded by the churchyard with residential properties beyond. Industrial units are situated further south with open marshland directly north of Queenborough. Beyond this, Sheerness lies to the north and Sittingbourne to the south.



*Surrounding landscape*

## 2. Methodology:

### Desk Top Study:

- 2.1 A desk top study was undertaken using Multi-Agency Geographic Information for the Countryside (MAGIC) for statutory and non-statutory nature conservation designations and surrounding habitats; aerial imaging and ordnance survey maps were also used.

### Preliminary Bat Roost Assessment:

- 2.2 Standard methodologies as recommended by The Bat Conservation Trust in Bat Surveys – Good Practice Guidelines’ (Collins, 2016) have been followed. The building was inspected for the suitability of bats; consideration was given to the surrounding area for foraging and flight lines (features such as tree lines and hedgerows). All external areas and surfaces of the building were inspected for the presence of bats and secondary signs such as droppings, urine stains and marks caused by their fur rubbing against any materials at a roost entrance. Potential suitable bat ingress points were inspected and noted.
- 2.3 The interior of the building including the tower, was inspected for the presence of bats and other secondary evidence of their presence such as droppings, butterfly and insect wings, urine stains and marks caused by fur rubbing against points where bats could gain access. All accessible surfaces were inspected searching for secondary evidence such as droppings.
- 2.4 The building was given a rating for the level of bat potential present i.e. the likelihood of a bat roost to be present within the structure. Field signs and features along with surveyor experience were used in order to make an assessment. The following categories were used in order to provide a general rating and level of assessment for each building or individual structure:

Negligible: No suitable features which could be used by bats. The structure may still have features which are commonly known to be used by bats but due to the circumstances of that feature or structure the feature is deemed unsuitable for bats;

Low: A small number of potential suitable bat roosting features are present but are most likely to support a low conservation status roost such as individual bats of a common species (not a maternity roost). The structure or site may be isolated within the surrounding landscape;

Moderate: Several potential suitable bat roosting features are present and the surrounding habitat is of value to commuting and foraging bats with linear features and suitable habitats;

High: Several potential bat roosting features are present and those features are of particular significance to roosting bats. Surrounding habitat is of high value to commuting and foraging bats e.g. woodland, open water etc. with linear features. The structure is close to a known roost;

Confirmed: Bats or recent secondary evidence of a bat roost such as droppings located within the structure and/or bats heard chattering from within the structure.

2.5 The following types of bat roosts were considered during the assessment:

Maternity roosts: Sites that provide protection from the elements and predators and provide the correct thermal environment for reproduction. Maternity roosts tend to be warmer in temperature because breeding females need to maintain a high metabolism to aid in lactation. Juvenile bats need to keep warm to maintain a metabolic rate that allows for rapid growth.

Day roosts: Areas where bats are able to spend the non-active period of the day resting or in torpor, depending on weather conditions. Day roosts provide shelter from the elements and safety from predators.

Night roosts: Areas used by bats to rest between foraging bouts, to allow for digestions of prey, to escape from predators, as shelter from weather, and possibly for social purposes. Night roosts are typically sites or structures that retain heat to aid the bats in maintaining the higher metabolism necessary for digestion.

Hibernation roosts: Areas that have a stable environment where bats may hibernate or be found in torpor; these areas are normally of a constant temperature and are not affected by sunlight or heating from the building. Temperatures of 7° Celsius and below are often found on the north aspect of a building, especially where areas are protected from wind chill.

Transitional roosts: Locations used by bats either prior to hibernation or just after the hibernation period. These roosts can either be used by single individual bats or small cluster of bats.

Feeding perch: A location used by bats to either hang up and eat their prey or a perch to hang from and catch their prey from. These are often identified by accumulations of discarded feeding remains and droppings.

Satellite roost: Alternative roost location within close proximity to the main maternity roost. Numbers of bats using these roosts can change over a season with only a few individuals to large clusters of bats being present, this may be due to changes within the main maternity roost, food supply and/or daily weather conditions.

Mating roost: These roosts are normally used from late summer through the autumn period, although they can also be used through to winter. These roosts are areas held by males as territories where they will 'sing' and display in order to attract females.

- 2.6 A See Snake video-scope was available to examine cracks, crevices and cavities. Other equipment included a digital camera, binoculars, Petzl head torch and LedLenser torches.

**Presence/Absence Survey:**

- 2.7 A bat emergence survey was carried out on the same evening as the preliminary bat roost assessment; 3 observers used Batlogger M bat detectors (Elekon CH) and analysis program, BatExplorer (Elekon CH) for post survey analysis. Surveyors were positioned around the church in order to view all elevations with a focus upon the proposed work areas and any potential bat roosting features identified during the preliminary bat roost assessment. Surveyors used voice recorders to make note of all bat activity including commuting, foraging, swarming, emergence and re-entry. Surveyors also used two-way radios in order to inform each other of bat activity. The survey began 15 minutes prior to sunset and finished approximately 1.5 hours after sunset depending on levels of bat activity and visibility.

**Surveyors:**



- 2.8 Sally-Ann Hurry has been commercially surveying for bats since 2009, she has extensive experience in all areas of bat surveying. Sally-Ann has carried out a wide range of different types of bat surveys and assessments using a variety of methods and equipment. She has held, designed and overseen the implementation of mitigation measures in accordance with a number of European Protected Species Mitigation licences (EPSM). Sally-Ann takes part in bat hibernation surveys across the UK and has assisted in European and International bat research; she also monitors summer maternity sites as part of the National Bat Monitoring Scheme in England. Sally-Ann holds a Natural England Scientific bat class 3 and 4 licence.
- 2.9 Roger Jones has been commercially surveying for bats since 2001 but he has many more years' experience of working with these mammals; he has extensive knowledge of all species of bats throughout the UK and Europe and has assisted in research surveys in many countries worldwide. He has held and overseen the implementation of mitigation measures required by many European Protected Species Mitigation licences (EPSM). Roger also surveys bat hibernation sites and monitors maternity sites as part of the National Bat Monitoring schemes in England and Wales. He holds a Natural England Scientific bat class 3 and 4 licence.
- 2.10 A third assistant surveyor was also present, this surveyor holds a foundation degree in Countryside Management and has undertaken commercial bat surveys since 2016.

**Constraints:**

- 2.11 Bats are highly mobile animals and it is possible that surveys undertaken during June, may not identify the presence of roosts which are utilised earlier or later than this time of year. Although the presence of other secondary evidence such as droppings, scratch marks and staining would remain all year and so would indicate bat activity. It is possible for bat droppings to become trapped within small crevices and so they may not have been visible during the inspection.

Note: All constraints have been carefully considered whilst providing conclusions from survey findings and recommendations which are suitable where constraints have been considered to have impacted upon the possible survey conclusions. If any constraints were felt to have impeded the survey results and in turn made the survey insufficiently rigorous to assess the ecological value of the site, this will be clearly stated.

### **3. Results:**

#### **Desk Top Study:**

- 3.1 Medway Estuary and Marshes are situated approximately 274m west of the church at its closest point. The marshes are designated as a RAMSAR site, a site of special scientific interest (SSSI) and a special protection area (SPA). There are no non-statutory designated sites within 2km of the site.
- 3.2 The church is immediately surrounded by its associated churchyard which includes a few mature trees, however there are no areas of woodland within 2km of the site and no significant linear features in the immediate setting.
- 3.3 The Isle of Sheppey includes significant areas of wetland and marsh habitats with a dense network of drainage ditches across the landscape. The Creek is the closest area of open water to the church, this flows into The Swale.

#### **Preliminary Bat Roost Assessment:**

- 3.4 The building inspection was carried out on the 1<sup>st</sup> June 2017, the weather conditions were good with no precipitation, a light breeze and the temperature was 23°C.
- 3.5 The grade II\* listed church is constructed of stone with several buttresses to the north and south. The church consists of a western tower, adjoining nave and chancel, southwest porch and north vestry. There are numerous cavities within the stone walls (particularly upon the western tower) where mortar has degraded, these were being used by a variety of bird species for nesting activities.
- 3.6 The gabled roof is pitched north to south and clad in traditional clay tiles which have naturally raised edges. There are a few missing and slipped flat tiles on the northern roof pitch of the nave. The ridge tiles are in good condition and are tight fitting. A single dormer is located within each roof pitch of the nave, these have tile hung cheeks, however the tiles are relatively tight fitting. The roofs are lined with traditional bitumen felt and the eaves are open, however they have been closed off with a



plastic/steel mesh in most area. However there are a few openings present along the northern elevation of the nave and chancel.



*Cavities within external masonry and missing roof tiles on the northern roof pitch of the nave*



*Aerial view of the nave and chancel roofs*

- 3.7 The vestry is attached to the northern elevation of the nave via a narrow passageway. It is constructed with corrugated fibre cement panels upon the walls and roof. The remains of a brick chimney are to the northern elevation. Timber barge boards are slightly raised from the surface of the corrugated sheeting. Numerous crevices have been previously filled with expanding foam. The vestry has an inaccessible roof void.
- 3.8 The southwest porch is open and the main entrance door is tight fitting. The internal roof area is lined with timber sarking, a small inaccessible void is present. The western tower is accessed via a stairway turret leading to the ringing chamber, belfry and

tower roof where there is a castellated parapet. The belfry has timber louvered openings, some of the boards are in poor condition. The openings have been covered over by a narrow gauge wire mesh and the frame associated with this is tight fitting. One opening also has internal timber shutters. The doorway leading onto the roof is tight fitting at the top and sides, with a narrow crevice at the base of the door.



*North vestry (left) and broken louvers on western tower (right)*

- 3.9 The main internal area of the church has a decorative painted ceiling upon the timber sarking. A small hatch provides access to the roof void via the southern dormer, however the void above the sarking is narrow and likely to be inaccessible from this hatch (in turn this area was not accessed).



*Internal roof of the nave and chancel (left) and the vestry (right)*

- 3.10 No bats or secondary evidence of a bat roost or bat activity was found in any areas of the church.

**Presence/Absence Survey:**

- 3.11 The survey began at 20:50 and ended at 22:10, sunset was at 21:03. The survey ended at this time owing to a considerable time period with no bat activity. The weather conditions were good with no precipitation, still air and the temperature fell from 20°C to 18°C.
- 3.12 Commuting and foraging activity of only 1 bat species was recorded, the common pipistrelle *Pipistrellus pipistrellus*. No bats emerged from the church.
- 3.13 The first recorded bat was a common pipistrelle at 21:34 commuting west to east and then heading south. Regular common pipistrelle foraging activity was recorded by all three surveyors with greatest foraging activity to the north eastern and south eastern areas of the churchyard. The last recorded bat pass was at 21:52 to the south east.
- 3.14 The surveyor positioned to the northwest, noted that a floodlight from a neighbouring residential property significantly illuminates the western and northern elevations of the tower.

#### **4. Discussion and Conclusions:**

4.1 Holy Trinity Church is set in an urban coastal setting immediately surrounded by habitats and habitat features of moderate value to commuting and foraging bats. However the sites exposed location reduces the suitability and potential for roosting bats to be present.

4.2 The church has very limited suitable potential bat roosting features and/or potential ingress points:

- Traditional clay tiles with naturally raised edges allow access to the crevice between the tiles and underlying felt;
- Eave openings along the northern elevation of the chancel and nave could allow direct access into the underlying roof void. However the void is highly restricted in height and so is largely unsuitable;
- Small crevice under the access door to the tower roof could provide internal access to the stairway, however bats are unlikely to access from this low potential ingress point;
- Numerous stone crevices upon all elevations of the church could be used opportunistically.

4.3 No bats or secondary evidence suggesting the presence of a bat roost or recent bat activity was found at Holy Trinity Church and no bats emerged from the building, confirming the absence of any bat roosts.

4.4 Owing to the very limited availability of suitable bat roosting features along with the sites exposed location, the site is overall assessed as having low bat roosting potential. However, common pipistrelle feeding activity within the immediate churchyard was moderate and bats made use of the dark, sheltered locations around the mature trees to the northeast, east and southeast of the building. Common pipistrelle bats are frequently found within the urban environment and can have highly mobile and opportunistic roosts. Holy Trinity Church supports very few potential roosting features, however those features identified above are suitable features for crevice

dwelling bat species such as the common pipistrelle. The Isle of Sheppey's prominent position on the north Kent coast is also known to receive migratory bats such as the nathusius pipistrelle which often use more exposed, prominent buildings within the landscape. In turn, the presence of occasional opportunistic bats remains possible.

- 4.5 The church is assessed as having negligible potential for a hibernation roost owing to a lack of suitable features and necessary environmental conditions required to facilitate hibernating bats.
- 4.6 The proposed works are not anticipated to impact upon any bat roosts and so works may proceed without the need for any further bat survey work or a EPSM license. Several active birds' nests were present within the external masonry and cavities of the walls. The proposed works will directly impact upon the numerous cavities present across the building and in turn there is potential for disturbance and obstruction to active nest sites to occur. In turn, precautionary measures will be necessary as detailed within section 5 below.

## **5. Recommendations:**

- 5.1 In order to prevent disturbance to nesting birds during the works, the installation of scaffolding and the start of works should ideally start prior to March 2018 as the active bird nesting period runs from March to August (inclusive). The ongoing disturbance of the works at the site should in turn deter nesting birds. However, if this is not feasible, the stone cavities within the proposed work areas should be accessed between September 2017 and February 2018 by an ecologist and contractor to inspect the crevices and block them using a suitable material.
- 5.2 Stone masons must inspect cavities and crevices within masonry prior to raking out and repointing. If a bat or active birds nest is found during the works, all work must immediately stop and Mountfield Ecology be contacted for further advice.
- 5.3 If the proposed works are not started within 18 months of the date of this survey, a re-survey of the site will be required. Should the proposed works alter from that detailed within this report, Mountfield Ecology should be contacted for further advice.
- 5.4 In order to retain the value of the immediate site area for bats, there should be no direct lighting or light spillage upon the surrounding trees within the churchyard (to the northeast, east and southeast of the building). If security lighting is required at the site during the works, this should be placed upon a timer so that if triggered it only remains illuminated for a set time period.



## 6. References / Bibliography:

Boldough, S., Denes, D. and Samu, P. (2007). *The effects of the illumination of buildings on house-dwelling bats and its conservation consequences*. *Acta Chiropterologica* **9**(2):527-534

Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3<sup>rd</sup> edn. The Bat Conservation Trust, London

DEFRA. (2010). *The Royal Commission on Environmental Pollution (RCEP) Report on Artificial Light in the Environment*. DEFRA

Fure, A. (2012). *Bats and Lighting – Six years on*. *The London Naturalist* **91**: 69-88

Hundt, L. (2012). *Bat surveys: Good Practice Guidelines*. 2<sup>nd</sup> edn. BCT, London

Kuijper, D.P.J., Shut, J., Van Dulleman, D., Toorman, H., Goosens, N., Ouweland, J. and Limpens, H.J.G.A. (2008). *Experimental evidence of light disturbance along commuting routes of pond bats *Myotis dasycneme**. *Lutra* **51**(1): 37-49

Limpens, H.J.G.A., Velamen, M.A., Dekker, J.J.A., Jansen, E.A. and Huitema, H.J. (2012). *Bat friendly colour spectrum for artificial light*. Dutch Mammal Society, LEDexpert. In preparation

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

Mitchell-Jones, A.J., McLeish, A.P. (2004). *Bat Workers Manual*. 3<sup>rd</sup> edn. JNCC

Stone, E.L., Jones, G. and Harris, S. (2009). *Street lighting disturbs commuting bats*. *Curr. Biol.* **19**: 1123-1127

The British Standards Institution. (2013). *Biodiversity – Code of practice for planning and development BS42020:2013*. BSI Standards Limited

Waring, S.D., Essah, E.A., Gunnell, K. and Bonser, R.H.C. (2013). *Double Jeopardy: The Potential for Problems when Bats Interact with Breathable Roofing Membranes in the United Kingdom*. *Architecture & Environment* **1**(1): 1-13

## 7. Legislation and Further Information:

### 7.1 Bats:

#### Bats and Lighting:

Bat vision has evolved to be most effective in dim light; many species of bat are particularly sensitive to artificial lighting (Limpens et al. (2012)). Several species of bat such as the long-eared bat (*Plecotus sp.*) and natterer's (*Myotis nattereri*) will avoid artificial lights and lit areas when commuting to their foraging grounds. Artificial lighting is also known to delay the emergence of bats and this in turn reduces the available time period available to forage (Boldough et al. (2007)). This can be highly detrimental to the survival of individual bats and their young. Some species of bats are more tolerant of light levels, however bats seen foraging around lights which emit high levels of ultraviolet (UV) light and so attract insects, are merely taking advantage of a concentration of prey which is no longer available in the unlit surroundings. Lighting interrupts the breeding cycle of insects and so can reduce the populations of insects available within a local area for other wildlife to prey upon. Bats will choose to commute through dark areas where there is an alternative available. Research has shown that bat activity can reduce significantly once artificial lights are switched on (in a previously dark area), (Stone et al. (2009) and Kuijper et al. (2008)) and bats often take alternative routes to avoid them; this can result in bats foraging in less favourable feeding areas and force them away from more sheltered routes, therefore putting them at greater risk of predation. Any development or conversion that will require external artificial lighting to be installed in areas that can be expected to be used by bats, or areas which bats are being encouraged to use, should ensure that such lighting is low level and low wattage, directed down to where it is needed and be on for as short a time as possible (i.e. controlled by PIR and timers). LED lighting is advantageous as it does not release UV rays, however bright white coloured lights should be avoided, preferably amber or warm white lighting should be used. Amber coloured lighting has been shown to have no impact upon bat activity (Limpens et al. (2012)).

Light spillage upon hedge and tree lines and areas of open water should be avoided in order to retain these important habitat features and provide dark commuting and foraging areas. In turn, light spillage from large glazed areas should be considered and

glass should be tinted or have window film installed in order to minimise the release of light onto such features.

#### Bats and Breathable Roofing Membrane (BRM):

Research carried out at Reading University has proved that NO breathable roofing membrane is bat friendly, all makes of this product are potentially fatal if used where bats can come into contact with it. Some companies are still marketing a breathable membrane product as 'bat friendly', however this is not the case. There is no such thing as bat friendly breathable roofing membrane, only traditional 1F bitumen felt with a hessian matrix (BS8747:2007) must be used in areas where bats could potentially be present. Breathable membrane fabric 'fluffs' with tiny loops created when bats try to grip onto the surface, this creates a cotton wool effect and they become entangled (Waring et al. (2013)) in these microfibers and are unable to free themselves.

#### Bats and the Law:

All species of bats and their roosts are legally protected in the UK under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and also Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (the Habitat Regulations). This lists all UK bat species as European protected species. The word 'roost' is not used in the legislation but is used here for simplicity. Anywhere used by bats for shelter and protection such as breeding sites and resting places are known as 'roosts'. Bat roosts are protected even when bats are not present.

All bats and their roosts are fully protected under The Conservation of Habitats and Species Regulations 2010 making it an offence to:

- Deliberately kill, injure or capture (take) bats;
- Deliberately disturb a bat in a way that would affect their local distribution or abundance, or affect their ability to survive, breed or rear young;
- Damage or destroy bat roosts or resting places;
- Intentionally or recklessly obstruct access to a roost;

- Possess, transport, control, sell/exchange or offer for sale a bat or any part of a bat live or dead.

A Natural England European Protected Species Mitigation (EPSM) Licence would be required if an individual wishes to undertake work or activities that would cause one of the above offences to be committed.

Under Regulation 53 (2)(e-g) & 53 (9)(a-b) of The Conservation of Habitats and Species Regulations 2010, Natural England, under powers conferred by the Secretary of State, has authority to issue licences under certain circumstances, provided that the appropriate mitigation for the particular situation has been met. No offence is committed if work is done under and in accordance with such a licence but Natural England must be satisfied that there is no satisfactory alternative to the proposed action and that it will not be detrimental to the maintenance of the bats at a favourable conservation status in their natural range.

## 7.2 **Birds and the Law (including Barn Owls):**

The Wildlife and Countryside Act 1981 is the primary legislation which protects all birds, their nests and eggs. All birds are fully protected and you must allow the young to fully fledge and leave the nest before taking any action to block access or remove the nest. Under the Wildlife & Countryside Act 1981 it is an offence to:

- Intentionally kill, injure or take a wild bird;
- Intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- Intentionally take or destroy the egg of any wild bird;
- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird;
- Have in one's possession or control any wild bird, dead or alive, or any part of a wild bird;
- Have in one's possession or control any egg or part of an egg;
- Use traps or similar items to kill, injure or take wild birds;

- Have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations.

**Disclaimer:**

Whilst every effort has been made to discover roosting bats, it is possible that owing to their small size and their secretive nature when roosting / hibernating that some individuals may have been overlooked.

1. Our staff and our sub-consultants will endeavour to identify the presence of protected species wherever possible on site, where this falls within the agreed scope of works.
2. Up to date standard methodologies have been used, which are accepted by Natural England and other statutory conservation bodies. No responsibility will be accepted where these methodologies fail to identify all species on site. We cannot take responsibility where Government, national bodies or industry subsequently modify standards.
3. The results of the survey and assessment undertaken by us are representative at the time of surveying.
4. We cannot accept responsibility for data collected from third parties and no liability is accepted for any delay or damage howsoever caused, including negligence or otherwise as a result of this report or any advice given.
5. Recommendations are provided following guidance from Natural England, other statutory bodies and from personal experience whilst considering the individual site and situation. No responsibility will be accepted by Mountfield Ecology if our recommendations are not requested to be carried out and a wildlife crime offence is committed.

**All contractors must be made aware of the advice contained in this report. It is the responsibility of those commissioning or managing the work to ensure this advice is complied with.**