CampbellReith
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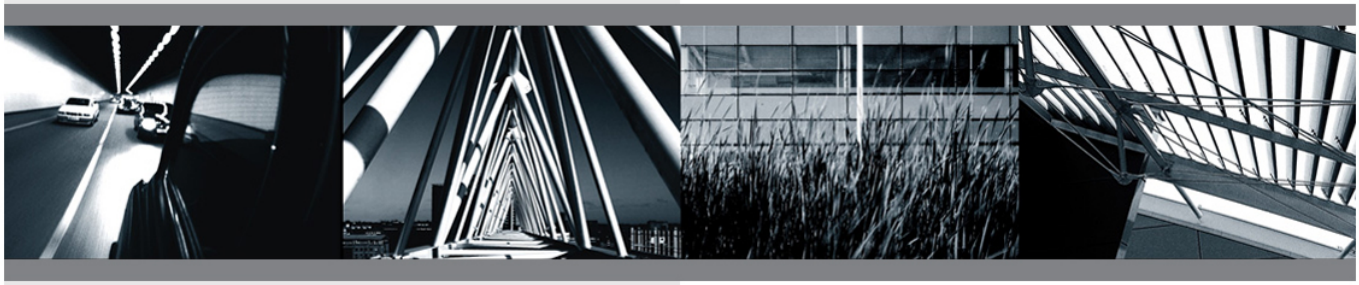
Daedalus
Lee-on-the-Solent

Summary of Ecological Surveys, Archaeological works and Constraints within the Waterfront



For

Homes and Communities Agency

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Contents

1.0	INTRODUCTION	4
2.0	EXTENDED PHASE 1 HABITAT SURVEY	7
3.0	HABITAT SUITABILITY INDEX (HSI) – GREAT CRESTED NEWTS	12
4.0	BADGER SURVEY	13
5.0	INITIAL BAT SURVEY	15
6.0	CAPTAINS GARDEN EXTENDED PHASE 1 HABITAT REPORT	18
7.0	REPTILE SURVEY OF THE CAPTAINS GARDENS	21
8.0	GROUND LEVEL TREE ASSESSMENT	23
9.0	STAGE 1 ARBORICULTURAL SURVEY	24
10.0	CULTURAL HERITAGE	27
11.0	SUMMARY AND CONCLUSIONS	30

APPENDIX A: EXTENDED PHASE 1 HABITAT SURVEY, HABITAT SUITABILITY INDEX FOR GREAT CRESTED NEWTS AND BADGER SURVEY REPORT	32
APPENDIX B: INITIAL BAT SURVEY REPORT	33
APPENDIX C: CAPTAINS GARDEN EXTENDED PHASE 1 HABITAT REPORT	34
APPENDIX D: REPTILE SURVEY WITHIN THE CAPTAINS GARDENS	35
APPENDIX E: GROUND LEVEL TREE ASSESSMENT	36
APPENDIX F: STAGE 1 ARBORICULTURAL SURVEY	37
APPENDIX G: WRITTEN SCHEME OF INVESTIGATION	38
APPENDIX H: ARCHAEOLOGICAL EVALUATION REPORT	39

1.0 INTRODUCTION

BACKGROUND AND PURPOSE OF THIS DOCUMENT

1.1. The Homes and Communities Agency (HCA) have commissioned Campbell Reith Hill LLP (CampbellReith) to manage and coordinate ecological surveys within the Waterfront (the site) to inform the current ecological baseline and to identify any ecological constraints to future development.

1.2. In addition, CampbellReith have been managing and coordinating archaeological evaluation works required to discharge a planning condition relating to the outline planning permission for Daedalus.

ECOLOGY AND ARBORICULTURE

1.3. The following ecological surveys that were undertaken to support the outline HMS Daedalus outline planning application submitted to Gosport Borough Council (Ref: 11/00282/OUT) and to Fareham Borough Council (Ref: N/11/0006) in 2011 include:

- Tree Survey (PBA Consulting, September 2009);
- Badger Survey (Thomson Ecology, August 2010);
- Bat Survey (Thomson Ecology, August / October 2010);
- Reptile Survey (Thomson Ecology, August / September 2010);
- Amphibian Surveys (Thomson Ecology);
- Great Crested Newt Survey (Thomson Ecology, May 2011); and
- Wintering Birds (Thomson Ecology, December 2010 / March 2011 and Dec, Jan, Feb);

1.4. Due to the nature of these ecological surveys, many of the above are invalid as the validation period of a number of the surveys is between 12 to 18 months. In order to support planning for the future proposed development of the Waterfront, the following ecological and Arboricultural surveys have been undertaken and are summarised in the chapters below:

- Extended Phase 1 Habitat Survey (Thomson Ecology, 23rd January 2014);
- Habitat Suitability Index for Great Crested Newts (Thomson Ecology, 23rd January 2014);
- Badger Survey (Thomson Ecology, 23rd January 2014);
- Bat Survey (RSK Environmental Ltd, 5th – 13th May 2014);

- Extended Phase 1 Habitat Survey of the Captains Gardens (RSK Environmental Ltd, 4th June 2014);
- Reptile Survey of the Captains Garden (RSK Environmental Ltd, 4th August – 1st September 2014);
- Ground Level Tree Assessment (RSK Environmental, 27th November 2014); and
- Stage 1 Arboricultural Survey (RSK Environmental Ltd, 5th June 2014).

CULTURAL HERITAGE

1.5. Outline planning permission was granted on 20th December 2013 and was subjected to the following planning conditions with regards to archaeology and the built environment:

- Planning condition 12: No development or demolition shall take place until a programme of archaeological work has been undertaken in accordance with a written specification which has been submitted to and approved by the local planning authority in writing. This will include a programme for visits and inspections to observe the excavations and record finds and items of interest. The results of the archaeological work shall be submitted to the local planning authority.

  This condition shall apply separately to each phase of the development as identified in the Phasing Scheme approved pursuant to condition 1 hereof.

  Reason: In order to ensure that the site, which has had limited archaeological investigation, but which is known to be of wide 20th Century and wartime significance (and may contain earlier archaeological interest) is adequately investigated prior to development in accordance with the guidance contained in the National Planning Policy Framework and in accordance with Policy CS12 of the Fareham Borough Core Strategy.

- Planning condition 13: No development, including demolition of buildings and structures, shall take place until the applicant has secured a programme of building recording that has been submitted to and approved in writing by the local planning authority. The results of the programme of building recording shall be submitted to the local planning authority. This condition shall apply separately to each phase of the development as identified in the Phasing Scheme approved pursuant to condition 1 hereof.

Reason: In order to ensure that the site, which has had limited archaeological investigation but which is known to be of wide 20th Century and wartime significance, is adequately investigated prior to development in accordance with the guidance contained in the National Planning Policy Framework and in accordance with Policy CS12 of the Fareham Borough Core Strategy.

1.6. Following consultation between CampbellReith and Hampshire County Councils (HCC) Archaeological Officer, it was confirmed that an archaeological evaluation of the Waterfront should be undertaken to discharge planning condition 12.

2.0 EXTENDED PHASE 1 HABITAT SURVEY

INTRODUCTION

2.1. Thomson Ecology was commissioned by CampbellReith on behalf of the Homes and Communities Agency (HCA) to undertake an online desk study to obtain freely available information on records of protected species within 1km of the site and designated sites within 2km and to undertake an extended Phase 1 habitat survey of the site to map the habitats present and assess the potential of the site to support protected species and species of conservation concern.

2.2. The desk study and extended Phase 1 habitat survey report is contained in Appendix A.

RESULTS

Ecological Desk study

2.3. The Waterfront area does not contain any designated site within its site boundary; however 6 statutory designated sites are located within 2km of the site. The names of the site designations, location and distance of the designated sites from the development are given in Table 2.1

Table 2.1 Designated sites within 2km of the site

Site Name	Grid Reference	Area	Distance to area (km)
International Sites (SPA, SAC and Ramsar)			
Solent and Southampton Water Ramsar and SPA	SU542019; and SU538033 (The Ramsar and SPA is split into two areas.)	173.1	0.1
National Sites (SSSIs)			
Lee-on-the-Solent to Itchen Estuary SSSI	SU545016	47.5	0.19
The Wild Grounds SSSI LNR and Ancient woodland	SU580009	28.1	1.5
Browndown SSSI	SU578991	66.5	1.75
Titchfield Haven SSSI NNR LNR	SU538033	134.5	0.92
County and Local Sites (LNRs)			
West of the River Alver LNR	SU580001	11.55	1.86

2.4. Two ancient woodlands; Tips Copse and ancient woodland within The Wilds Grounds SSSI LNR greater than 2ha were found to be located within 2km of the site.

2.5. Eight habitats of principal importance as listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 were found to be located within 2km of the site; however none were located within the site itself. The habitats recorded include:

- Coastal and floodplain grazing marsh
- Coastal vegetated shingle;
- Deciduous woodland;
- Lowland fens;
- Lowland heathland;
- Lowland meadows;
- Reed beds; and
- Traditional orchards.

2.6. Protected species and species of conservation concern were identified within the 1km study area during the online desk study. These include records of:

- Grass snake;
- Slow worm;
- Common lizard;
- Badger; and
- Hedgehog.

Extended Phase 1 Habitat Survey

2.7. The survey was conducted on 23rd January 2014 by ecologists from Thomson Ecology.

2.8. The following Phase 1 habitat types and fauna were identified within the site:

Table 2.2 Phase 1 habitat types and fauna within the site

Phase 1 habitat types	Fauna
Scattered broadleaved tree	Feral pigeon (Columba livia)
Scattered coniferous tree	Magpie (Pica pica)
Dense scrub	Jackdaw (Corvus monedula)
Scattered scrub	Carrion crow (Corvus corone)
Standing water	Herring gull (Larus argentatus)
Amenity grassland	Starling (Sturnus vulgaris)
Introduced shrub	Robin (Erithacus rubecula)
Species-poor hedge	House sparrow (Passer domesticus)
Fences and walls	Gold finch (Carduelis carduelis)
Hard standing	
Building	

Reptiles

2.9. Although several common reptile species were recorded as being within 1km of the site during the desk study, the habitat found within the site consists largely of fragmented parcels of amenity grassland and areas of hardstanding and building, therefore it is considered unlikely that populations of these species are supported, and no further survey is recommended.

2.10. During the previous reptile surveys (Thomson Ecology report ref: ACAM149/002/002) slow worm were recorded in the 'Captains Gardens' area of the site. If this area is to be developed in the future, recommendations for further survey should be followed and the status of the reptiles within the area confirmed (see section 2.18 below).

Bats

2.11. Buildings within the site have the potential to support roosting bats. Previous bat surveys within the site during 2010 recorded a total of 12 bat roosts within eight different buildings. Therefore the likelihood of presence is increased. The amenity grassland parcels and hedgerows may provide foraging habitat for bats. All bat species are fully protected by the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).

2.12. Recommendations for further survey should be followed to update the status of bats within the site (see section 2.19 below).

RECOMMENDATIONS AND FURTHER SURVEYS

2.13. The recommendations for mitigation measures for the site given in this section are based on the findings of the extended Phase 1 habitat survey and should be viewed as preliminary as the design plans are yet to be finalised.

Mitigation

Breeding Birds

2.14. Any necessary clearance of trees and areas of scrub should be undertaken outside of the breeding bird season (i.e. clearance work should be undertaken between September and February inclusive). If site clearance occurs within the breeding bird season, an ecologist

should check for active bird nests immediately prior to clearance. If an active nest is discovered, then work in that area should cease until such a time that the young have fledged or the nest is no longer active.

Hedgehogs

2.15. To avoid injury to hedgehogs, areas of dense scrub and introduced shrub should be taken apart by hand. Any hedgehog found should be moved to an area of suitable habitat (for example, dense scrub) which is to be retained and protected during the development.

Trees

2.16. As many trees as possible should be retained to maintain biodiversity and connectivity within the site. To prevent damage to any retained trees during or following development, a buffer zone should be set aside to protect the rooting area in which no construction activities are permitted. In accordance with British Standard BS5837:2012 Trees in relation to design, demolition and construction - recommendations this 'root protection area' is calculated in relation to the circumference of the tree trunk. Any native trees which are removed should be replaced with native species within the proposed landscaping.

Species of Principal Importance (SPI)

2.17. To ensure that the site remains suitable for SPI, such as house sparrow and hedgehog as much dense scrub as possible should be retained within the development. If this habitat needs to be removed, then these should be replaced on a like for like basis, to compensate for the loss of habitat.

Further Surveys

Reptiles

2.18. The suitability of the 'Captains Gardens' area of the site to support reptiles should be ascertained through further survey. Should this area provide suitable habitat then a presence / absence survey (following best practice guidelines) should be undertaken.

Bats

2.19. A number of the buildings within the site have the potential to support roosting bats, therefore a detailed Stage 1 internal / external inspection of the buildings and mature trees should be undertaken. The Stage 1 surveys would inform whether further Stage 2 surveys including emergence and return to roost surveys are required. The initial Stage 1

survey can be undertaken any time of year, with Stage 2 emergence and return to roost surveys taking place between May and August inclusive.

Designated Sites

2.20. Due to the proximity of the Solent and Southampton Water Ramsar and SPA to the site, a Screening assessment may need to be undertaken to determine whether an Appropriate Assessment is required under the Habitat Regulations. Consultation with the LPA and Natural England is therefore recommended to ascertain the need for this.

3.0 HABITAT SUITABILITY INDEX (HSI) – GREAT CRESTED NEWTS

INTRODUCTION

3.1. Thomson Ecology was commissioned by CampbellReith on behalf of the HCA to undertake a Habitat Suitability Index (HSI) assessment of all waterbodies within the site to assess their suitability to support breeding great crested newts.

3.2. The HSI for GCN report is contained in Appendix A.

RESULTS

3.3. During the 2010 HSI survey (Thomson Ecology Report ref: ACAM149/002/002) two water bodies were recorded within the site. In the subsequent presence / likely absence surveys carried out in 2011 no GCNs were recorded within these.

3.4. Of the two water bodies recorded during the previous survey, only one remained during this survey. The one water body within the site has brick sides (approximately 1m in height), has no aquatic vegetation and is isolated from any terrestrial habitat and as such is not considered to be suitable to support breeding GCNs.

RECOMMENDATIONS

3.5. No mitigation or further survey for GCNs is therefore recommended.

4.0 BADGER SURVEY

INTRODUCTION

4.1. Thomson Ecology was commissioned by CampbellReith on behalf of the Homes and Communities Agency (HCA) to undertake a full badger survey of the site and to map the locations of setts and signs of badger activity.

4.2. The Badger Survey report is contained in Appendix A.

RESULTS

4.3. The badger survey was undertaken on 23rd January 2014 by ecologists from Thomson Ecology.

Badger Setts

4.4. No badger setts were recorded within the site.

Other Badger Activity

4.5. Mammal runs, 'push throughs' and gaps under fences were observed along the eastern and northern boundary of the site (see Figure 3 of the Badger Survey Report, Appendix A). These features are likely to be used by a variety of mammals including rabbits, foxes and badgers.

Habitat Assessment

4.6. Field signs were recorded solely on the site boundaries. The small areas of amenity grassland, introduced shrub, dense scrub and scattered scrub within the site provides limited foraging habitat for badger. The exception to this is the larger area of amenity grassland found in the north of the site (see Figure 2a within Appendix A).

LEGAL AND PLANNING POLICY ISSUES

4.7. As no badger setts were recorded within the site boundary, there should be no issues in relation to badgers and the development.

POTENTIAL FURTHER ECOLOGICAL ISSUES

4.8. The 'Captains Gardens' area located in the north-east of the site (see Figure 3 within Appendix A) was not surveyed for badgers due to access limitations. If this area of the site is to be affected by the development, further survey for badgers is recommended.

RECOMMENDATIONS AND FURTHER SURVEYS

Mitigation

4.9. Whilst there are no badger setts within the site, potential signs of foraging badger have been recorded. To ensure no injury or harm comes for foraging and commuting badgers the following recommendations should be followed. These should include:

- Should any trenches need to be left open overnight a means of escape should be provided such as a suitably placed plank of wood;
- Any temporarily exposed open pipe system should be capped in such a way as to prevent badgers gaining access; and
- Badger paths should not be obstructed during development construction and operation.

Further Survey

4.10. If any future development affect the 'Captains Gardens' area of the site it is recommended that a walkover survey to identify signs of badger activity, including the presence of setts is undertaken within this area of the site.

CONCLUSION

4.11. No badger setts were recorded within the site although signs of foraging and commuting badgers were recorded. The recommendations given above should ensure no injury or harm comes to badgers that may use the site.

5.0 INITIAL BAT SURVEY

5.1. RSK Environmental Ltd (RSK) was commissioned by the HCA to undertake an initial bat survey of the buildings within the site and to identify the buildings that have the potential to support roosting bats

5.2. The Initial Bat survey is contained at Appendix B.

RESULTS

5.3. The bat survey was undertaken from the 5th to 13th May 2014 by a senior bat licensed ecologist from RSK.

5.4. 71 buildings within the Waterfront site were surveyed for the potential to support roosting bats.

5.5. Of the 71 buildings surveyed, three were confirmed to contain roosts, a further three were considered to have high potential, 10 to have moderate potential, three moderate to low potential and 15 low potential for roosting bats as detailed in table 5.1 below.

Table 5.1: Buildings with confirmed roosts and with bat potential

Potential	Buildings Number	Building Name
Confirmed	119	Westcliffe House
	137	Duncan Barracks
	165	Wykeham Hall
High	14	Kingston Villa
	118	Ward Room and Offices
	166	Keith Cottages
Moderate	71	Naval Stores
	78	Hetwell Bungalow (NAMDU)
	91	Dining room and Cook House (a.k.a Triumph Gallery and Boiler House)
	92	Anson Barracks
	97	Blake Barracks
	111	Westcliffe Lodge
	121	Exmouth Block
	132	Fire station and Police rest room
	139	Cunningham Barracks
	142	Frobisher Block
Low / Moderate	68	Swann Hangar
	96	Power House
	141	Ambulance bay and sub-station
Low	38	CAO's Office
	56	MT Offices and toilets
	60	Air raid shelter
	69	Swann toilet block
	73	Dunning Hangar

	88	Bedding Store
	100	Staff garages and EO's offices
	101	EVT section
	107	Ward Room annex
	116	Eagle block
	128	Eagle Club (NAAFI Club)
	130	NAAFI shop
	131	Main gate guard room
	135	NAAFI Barbers shop and Shoe repair
	146	Sick Bay

Surrounding landscape

5.6. The surrounding landscape in which the Waterfront site lies is not considered to provide optimum habitat for bats. It is therefore considered that the roosts that have been identified are of high ecological value within the area and an important assess for roosting bats in the local area.

RECOMMENDATIONS AND FURTHER SURVEYS

5.7. In order to gather sufficient information on the presence of bats in the buildings additional surveys of all buildings with the potential to support roosting bats and evidence of bats will be required. Table 5.1 sets out the details of the surveys required for the buildings at Waterfront.

Table 5.2: Details of additional surveys required for buildings at the Waterfront

Roosting potential	Number of surveys required	Survey timing	Survey season
Confirmed	3 emergence or re-entry surveys	Dusk and Dawn with at least one dawn survey required	May to September inclusive
High	3 emergence or re-entry sites	Dusk and Dawn with at least one dawn survey required	May to September inclusive
Moderate	2 emergence or re-entry surveys	Dusk and / or dawn	May to September inclusive
Low	1 emergence or re-entry survey	Dusk or Dawn	May to September inclusive

5.8. A number of buildings are earmarked for demolition and if evidence of bats are using these buildings if found then a European Protected Species (EPS) licence will be required before demolition. Where bats roosts are present an EPS licence from Natural England would be required prior to works commencing.

5.9. Hibernation surveys may also be required for the air raid shelters if they are likely to be impacted by the proposed development. These surveys are restricted to between November and March. If the shelters are due to be retained they would be suitable to be used for mitigation for impacts on other bat buildings.

LEGAL ISSUES

5.10. All species of British Bat are protected by The Wildlife and Countryside Act 1981 (as amended) and extended by the Countryside and Rights of Way Act 2000. Bats are also a European Protected Species under The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended). All bat sites receive legal protection even when bats are not present.

6.0 CAPTAINS GARDEN EXTENDED PHASE 1 HABITAT REPORT

6.1. Following the recommendation contained within the Thomson Ecology Extended Phase 1 habitat survey report (Ref: ACAM202/003/002); the HCA commissioned RSK Environmental Ltd (RSK) to undertake an Extended Phase 1 habitat Survey of the Captains Garden.

6.2. The extended Phase 1 habitat survey is contained in Appendix C.

RESULTS

6.3. The survey was conducted on 4th June 2014 by an ecologist from RSK.

Ecological Desk Study

6.4. Protected species and species of conservation concern were identified within the 2km study area during the online desk study. These include records of:

- Grass snake;
- Slow worm;
- Common lizard; and
- Badger.

Extended Phase 1 Habitat Survey

6.5. The following 1 habitat types were identified within the site:

- Semi-improved neutral grassland;
- Scattered broad-leaved trees;
- Broad-leaved woodland;
- Scrub; and
- Species-poor hedgerows.

Badgers

6.6. The site is suitable for badgers however no evidence of badger such as setts, latrines or paths was found therefore the surveyor is confident that badgers are not using the site. However as badgers are known to use Hangars West, it is not possible to rule out the possibility of badgers using the site in the future.

Bats

6.7. A detailed assessment of the trees was not undertaken as not all features could be observed due to the trees being in full leaf, therefore some of the trees may be suitable for roosting bats and further investigation at a suitable time of year should be undertaken.

Common Reptiles

6.8. The habitats on site are suitable for reptiles, in particular slow worms.

Great Crested Newts

6.9. No ponds are present on the site or adjacent to the site. The terrestrial habitat on site is suitable for GCNs, however the nearest ponds to the site are 400m to the north west and are separated from the site by a busy road which acts as a barrier to GCNs. There are no records of GCNs and it is unlikely that they are to be present in the Captains Garden.

Nesting Birds

6.10. The site contains suitable bird nesting habitat, however as the site and its context is within the Waterfront industrial area and adjacent to the airfield, it is likely to be used by low numbers of common birds only.

RECOMMENDATIONS AND FURTHER SURVEYS

Badgers

6.11. A walkover will be required prior to any construction work being undertaken to check that badgers have not colonised the site since the survey was undertaken.

Bats

6.12. Some of the trees are considered to have features suitable for roosting bats but a detailed survey was not possible due to the leaf cover on the trees.

6.13. A detailed survey of any trees that are due to be removed should be undertaken during the winter months when features can be more easily seen.

6.14. The site is likely to be used by low numbers of bats because of suitable foraging habitat in the form of grassland and woodland. However, due to the small size of the site and its location in an industrial area and airfield it is unlikely to support large numbers or important assemblages of bats.

Common reptiles

6.15. The site is considered suitable for common reptiles and therefore a reptile survey will be required.

Great Crested Newts

6.16. Although the terrestrial habitats on the site are suitable for terrestrial Great Crested Newts, they are unlikely to be present because of the lack of possible breeding ponds and significant barriers to movement around the site. However, if during any of the subsequent surveys or clearance works Great Crested Newts are found, then all work must stop immediately and advice from an ecologist sought.

Nesting birds

6.17. There is suitable bird nesting habitat in the woodlands, scattered trees, scrub and hedgerow. It is almost certain that there will be some nests.

6.18. All affected habitats suitable for nesting birds should be removed prior to the start of the bird-breeding season (March to August inclusive). Where this is not possible, a search by an ecologist for any nesting birds prior to vegetation clearance will be needed.

Other protected Species and Notable Species

6.19. The site has negligible potential to support any other protected species. However, in the unlikely event that any protected species are found during subsequent surveys or clearance, works must be stopped immediately and ecological advice should be taken promptly.

7.0 REPTILE SURVEY OF THE CAPTAINS GARDENS

7.1. Following the recommendation contained within the Extended Phase 1 habitat survey report for the Captains Gardens (RSK, 4th June); the HCA commissioned RSK Environmental Ltd (RSK) to undertake a Reptile Survey to determine the presence / absence of a reptile population.

7.2. The Reptile survey is contained in Appendix D.

RESULTS

7.3. The reptile surveys were carried out between August and September 2014 when the reptiles are active. Table 7.1 presents the results of the reptile presence – absence survey. The species that was found to be present was Slow-worm (Af).

Table 7.1: Reptile survey results

Survey location	Check 1	Check 2	Check 3	Check 4	Check 5	Check 6	Check 7
A				1 Af		2 Af	2 Af
B			1 Af				1 Af
C							
D							
E							
Totals	0	0	Af (1)	Af (1)		Af (2)	Af (3)

7.4. Based on the Herpetofauna Groups of Britain and Ireland (HGBI, 1998) guidance, the site supports a 'low' population of Slow-worm.

EVALUATION AND CONCLUSIONS

7.5. The site supports a low population of Slow worm (maximum count 3), distributed mainly towards the west of the Captain's Garden site.

7.6. Reptiles are protected from deliberate killing and injury by Schedule 5 of The Wildlife and Countryside Act 1981 (as amended).

7.7. Mitigation ideally involves the retention and maintenance of an area suitable for reptiles on the site. However, as this is not feasible or possible at Daedalus, reptiles will be moved (translocated) to suitable habitat off-site.

7.8. The entire section of the Captain's Garden will need to be fenced with suitable exclusion fencing so that all reptiles can be excluded (i.e. once fenced, reptiles will not be able to enter the site). The exclusion fencing will be installed while an ecologist is present who will perform a destructive hand search of all debris and scrub to ensure no reptiles are harmed during the fencing installation.

7.9. Once the fencing is erected, reptile felts will be placed along the inside of the fencing at 10 m intervals (with a minimum of 50 felts per ha). These felts will be checked daily for reptiles for 60 suitable days. Suitable days include: a temperature between 5-20°c, little wind and no/little rain. There must be a clear window of at least 5 days when no reptiles are caught for the translocation to be completed. If, once the 60 days is completed, reptiles are still being captured the translocation will be extended until 5 capture-free, suitable days are obtained. The number of trapping days can be reduced by half if the survey effort is increased by doubling the number of felts used and using drift fencing to compartmentalise areas (focussing trapping effort).

7.10. All reptiles caught will be transported immediately to the receptor site at Hangars East (Grid Reference SU 560 019) located north east of the Captain's Garden in the northern most part of Daedalus site. Hangars East has been surveyed for reptiles and has been confirmed as being a suitable receptor site (RSK, 2014). The Hangars East area already has suitable habitats for reptiles but may require enhancements prior to moving any reptiles. This will ensure that the released reptiles have the best chance of survival. This can be achieved by measures such as creating hibernacula and log piles. Exclusion fencing should remain in place until all site clearance and construction work is complete in order to stop the movement of reptiles back on to the site.

8.0 GROUND LEVEL TREE ASSESSMENT

8.1. Following the recommendation contained within the Extended Phase 1 habitat survey report for the Captains Gardens (RSK, 4th June); the HCA commissioned RSK Environmental Ltd (RSK) to undertake a Ground Level Tree Assessment to determine whether the trees were suitable for roosting bats.

8.2. This survey has been scheduled to be undertaken during the autumn / winter months when the features suitable for bats such as holes, cracks, flaking bark and climbing plants can be more easily seen.

8.3. The Ground level tree assessment will be contained in Appendix E.

9.0 STAGE 1 ARBORICULTURAL SURVEY

9.1. RSK Environmental Ltd (RSK) was commissioned by the HCA to undertake a Stage 1 Arboricultural Survey to identify the quality and value of the existing tree stock and to categorise the trees in respect to their suitability for retention. This information is then used to identify any constraints that trees may pose to development of the site and should be used to inform the design accordingly.

9.2. The Stage 1 Arboricultural Report is contained at Appendix F.

RESULTS

9.3. The Arboricultural Survey was undertaken on the 5th June 2014 by an Arboriculturalist from RSK.

9.4. All tree and tree groups inspected were categorised using the British Standard BS 5837:2012 - Trees in relation to design, demolition and construction – Recommendations. A definition of each category is contained in Table 8.1 below.

Table 8.1: BS5837:2012 Categories and Definition

BS5837:2012 Categories	Definitions	Retention implications to a site
Category A	Trees of high quality and value able to make a substantial contribution to the site.	Every effort should be made to retain trees and amendments to a proposed scheme should be identified in preference to tree removal.
Category B	Trees of moderate quality and value able to make a significant contribution to the site.	Where possible amendments to a proposed scheme should be considered in preference to tree removal.
Category C	Trees of low quality and value in an adequate condition until new planting can be established, trees with impairments downgrading them from A or B category OR young trees with a stem diameter of less than 150mm.	The retention of trees may be advantageous in the short term, but they should not be seen as a constraint to development.
Category U	Trees that have limited condition that will fail or die within 10 years and/or should be removed for reasons of arboricultural best practice	Not a material consideration in the planning process but may have other benefits

9.5. Trees that have been categorised as A, B, C should be considered in the planning process whereas trees categorised as U are note a consideration in the planning process.

9.6. In total 115 trees were surveyed on and adjacent to the site in addition to 6 groups. Of all the trees recorded, it was necessary to estimate the dimensions of 22 because they were off site or inaccessible.

9.7. The trees across the site have been categorised as the following:

Category A – 2 trees
Category B – 56 trees
Category C – 56 trees
Category U – 1 tree

9.8. T1. Monterey pine (shown within Figure 1 of the Stage 1 Arboricultural Report) is a large multi-stemmed tree which appears to have undergone root plate movement fairly recently. This tree may need removal if site usage frequency across the site increases.

CONCLUSIONS

9.9. The Tree Constraints Plan (shown within Figure 1 of the Stage 1 Arboricultural Report) details the restrictions posed on the site by the canopy of the trees and their Root Protection Areas (RPAs). This should inform the design process for the proposed development. The Category A and B trees should influence the design of the development in favour of their retention.

9.10. Works should not take place within the RPAs of retained trees, but where this is unavoidable no-dig methods should be used.

DESIGN AND PLANNING

Arboricultural Impact Assessment (Stage 2)

9.11. Once the design is in place, an Arboricultural Implication Assessment can be prepared to comment on the proposed design, with the aim of highlighting and, where possible, mitigating any tree issues that could otherwise delay the planning application.

Arboricultural Method Statement (Stage 3)

9.12. Once the design is finalised and before construction takes place, an Arboricultural method statement (AMS) should be compiled detailing the location and nature of protective

fencing, signage and other protection measures. All site operatives must be made aware of the nature of the protection detailed in the AMS and it should remain in place throughout construction.

10.0 CULTURAL HERITAGE

10.1. Wessex Archaeology was commissioned by CampbellReith on behalf of the HCA to undertake an archaeological trial trench evaluation of two areas within Daedalus; Hangers West and Waterfront, to discharge planning condition 12 below.

- Planning condition 12: No development or demolition shall take place until a programme of archaeological work has been undertaken in accordance with a written specification which has been submitted to and approved by the local planning authority in writing. This will include a programme for visits and inspections to observe the excavations and record finds and items of interest. The results of the archaeological work shall be submitted to the local planning authority.

  This condition shall apply separately to each phase of the development as identified in the Phasing Scheme approved pursuant to condition 1 hereof.

  Reason: In order to ensure that the site, which has had limited archaeological investigation, but which is known to be of wide 20th Century and wartime significance (and may contain earlier archaeological interest) is adequately investigated prior to development in accordance with the guidance contained in the National Planning Policy Framework and in accordance with Policy CS12 of the Fareham Borough Core Strategy.

WRITTEN SCHEME OF INVESTIGATION

10.2. The aims of the investigation, as defined in the Written Scheme of Investigation (WSI) (Wessex Archaeology, Ref: 104760.01) were:

- To locate, identify and to investigate and record the presence/absence of archaeological features or deposits;
- Where possible, to confirm the extent, date, character, relationship, condition and significance of archaeological features, artefacts and deposits within the proposed development area;
- To inform the scope and nature of any requirements for any potential further fieldwork, whether additional watching brief, excavation or post-excavation work;
- To enable the preservation by record of any archaeological features or deposits uncovered; and
- To place any identified archaeological remains within their historical context.

10.3. The WSI is contained within Appendix G and was submitted to HCC County Archaeologist for approval, which details the scope of works that were undertaken.

RESULTS

10.4. All works were undertaken in accordance with the WSI and the layout and number of trenches within the Waterfront and within the new road line were discussed and agreed in advance of the fieldwork within the HCC's Senior Archaeological Officer.

10.5. The Archaeological Evaluation Report detailing the findings of trial trenches is contained in Appendix H.

10.6. In total, 31 trenches within the Waterfront were proposed, however access and ecological constraints and the presence of underground or overhead services resulted in 8 trenches within the Waterfront not be excavated, resulting in a total of 23 trenches being excavated. Figure 2 in Appendix H shows the locations of the trial trenches.

DISCUSSION

10.7. No archaeological features or deposits were found to pre-date the modern period (1800–present).

10.8. The soil sequence recorded in the trenches within the Waterfront suggests that a degree of landscaping has occurred in the trenches around the northern and southern peripheries of the Waterfront area although this seems to have been relatively light.

10.9. Only in the central area of the Waterfront, in the trenches within close proximity to the standing airfield buildings, was a deeper impact into the natural geology seen from the construction of the buildings associated with the airfield, which could have potentially removed any archaeological features.

10.10. Other modern features discovered potentially relate to structures associated with the airfield, such as the brick foundation pads in Trench 61. Metal airfield matting directly associated with the airfield was also uncovered just below the topsoil in Trench 65 and Trench 69.

10.11. Although the Waterfront area showed some degree of modern landscaping as part of the development of the Site, the total absence of any archaeological features or notable

densities of associated archaeological material would indicate strongly that there is no or very little potential for archaeological remains within the Waterfront areas.

11.0 SUMMARY AND CONCLUSIONS

ECOLOGY AND ARBORICULTURE

11.1. A number of recent ecological and Arboricultural surveys have been undertaken across the Waterfront site, which consist of:

- Extended Phase 1 Habitat Survey (Thomson Ecology, 23rd January 2014);
- Habitat Suitability Index for Great Crested Newts (Thomson Ecology, 23rd January 2014);
- Badger Survey (Thomson Ecology, 23rd January 2014);
- Bat Survey (RSK Environmental Ltd, 5th – 13th May 2014);
- Extended Phase 1 Habitat Survey of the Captains Gardens (RSK Environmental Ltd, 4th June 2014);
- Reptile Survey of the Captains Garden (RSK Environmental Ltd, 4th August – 1st September 2014);
- Ground Level Tree Assessment (RSK Environmental, 27th November 2014); and
- Stage 1 Arboricultural Survey (RSK Environmental Ltd, 5th June 2014).

11.2. The surveys indentified a number of findings that are of notable consideration. Further surveys that should be undertaken to support the furture development proposals on the site are summarised in Table 11.1 below:

Table 11.1: Summary of the further surveys required to support planning

Habitats / Protected Species	Further Requirements	Timescales
Designated Sites	A screening assessment may need to be undertaken to determine whether an Appropriate Assessment is required under the Habitat Regulations. This will need to be undertaken once the development proposals have been finalised.	Undertaken after the development proposals have been finalised.
Reptiles	If reptile habitat cannot be maintained due to the future development proposals, reptiles should be translocated to a suitable reptile receptor site (the northern part of Hangars East) prior to development.	Undertaken between March – September.
Bats	A ground-level tree assessment within the Captains Gardens should be undertaken to determine the presence / absence of bat features before any development works commence.	Scheduled on 27th November
	Dusk emergence / dawn re-entry surveys are required for a number of buildings within the	Between May – September

Habitats / Protected Species	Further Requirements	Timescales
	Waterfront: - 3 emergence or re-entry surveys required for 3 buildings with confirmed roosts; - 3 emergence or re-entry surveys required for 3 buildings with high bat potential; - 2 emergence or re-entry surveys required for 10 buildings with moderate bat potential; - 2 or 1 emergence or re-entry surveys required for 3 buildings with moderate to low bat potential; and - 1 emergence or re-entry surveys required for 15 buildings with low bat potential. (See table 5.1 for building numbers and names with confirmed roosts and level of potential)	
Badgers	A site walkover survey should be undertaken prior to the commencement of works to identify signs of badger activity including the presence of setts.	Prior to site works
Trees	The following should be undertaken once a final masterplan has been approved: Stage 2: Arboricultural Impact Assessment Stage 3: Arboricultural Method Statement	Undertaken after the development proposals have been finalised.

11.3. In addtion to the requirement of the above surveys / assessments, the mitigation measures as detailed within the reports contained within the appendices should be adhered to.

CULTURAL HERITAGE

11.4. Archaeological evaluation trial trenching has been undertaken within the Waterfront in order to discharge planning condition 12 relating to the outline Daedalus planning application. No archaeological remains were found during the course of the evaluation therefore it is considered unlinkely that any further archaeological work would be required. This would need to be confirmed in writing by the County Archaeologist and Local Planning Authority.

11.5. In order to discharge planning condition 13, it is recommended that the future developer liases with HCC County Archaeologist to detertmine the level of building recording and scope that is considered appropriate.

APPENDIX A: EXTENDED PHASE 1 HABITAT SURVEY, HABITAT SUITABILITY INDEX FOR GREAT CRESTED NEWTS AND BADGER SURVEY REPORT

Project No.: ACAM202 / 003 / 002

February 2014

The Waterfront Area - Daedalus, Lee-on-the-Solent, Hampshire

Extended Phase 1 Habitat Survey

Habitat Suitability Index for Great Crest Newts

And

Badger Survey

For

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Project Number	Report No.	Revision No.	Date of Issue
ACAM202	003	002	28th February 2014

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Contents

1. Summary and Main Recommendations 6
   1.1 Summary 6
   1.2 Main Recommendations 7
2. Introduction 8
   2.1 Development Background 8
   2.2 Ecology Background 8
   2.3 The Brief and Objectives 9
   2.4 Limitations 9
3. Desk Study 11
   3.1 Methodology 11
   3.2 Results 11
   3.3 Legislation and Planning Policy Issues 16
   3.4 Recommendations 17
   3.5 Conclusion 18
   3.6 References 18
4. Extended Phase 1 Habitat Survey 20
   4.1 Methodology 20
   4.2 Results 20
   4.3 Legislation and Planning Policy Issues 23
   4.4 Potential Further Ecological Issues 24
   4.5 Recommendations 25
   4.6 Ecological Enhancements 26
   4.7 Further Survey 26
   4.8 Conclusion 27
   4.9 References 27
5. Habitat Suitability Index (HSI) - Great Crested Newt 28
   5.1 Background and Results 28
   5.2 References 28
6. Badger Survey 29
   6.1 Methodology 29
   6.2 Results 30
   6.3 Legal and Planning Policy Issues 31
   6.4 Potential Further Ecological Issues 31

6.5 Recommendations 31
6.6 Conclusion 31
6.7 References 32
7. Appendix 1 - Biology, Legislation and Planning Policy of Amphibians 33
7.1 Introduction 33
7.2 Biology 33
7.3 Site Designation 35
7.4 Species Protection 37
7.5 UK Post-2010 Biodiversity Framework and Species of Principal Importance 38
7.6 References 39
8. Appendix 2 - Biology, Legislation and Planning Policy of Reptiles 40
8.1 Introduction 40
8.2 Biology 40
8.3 Site Designation 42
8.4 Species Protection 43
8.5 UK Biodiversity Action Plan and Species of Principal Importance 44
8.6 References 44
9. Appendix 3 - Biology, Legislation and Planning Policy of Bats 46
9.1 Introduction 46
9.2 Biology 46
9.3 Site Designation 47
9.4 Species Protection 48
9.5 UK Biodiversity Action Plan and Species of Principal Importance 50
9.6 References 50
10. Appendix 4 - Biology, Legislation and Planning Policy of Badgers 52
10.2 References 54
11. Appendix 5 - Biology, Legislation and Planning Policy of Breeding Birds 55
11.1 Introduction 55
11.2 Biology 55
11.3 Site Protection 55
11.4 Species Protection 56
11.5 UK Post-2010 Biodiversity Framework and Species of Principal Importance 57
11.6 Red and Amber List Species 57
11.7 Red Data Book Species 58
11.8 References 58
12. Appendix 6 – Legal and Planning Policy Issues in England 60

12.2 Identification of Potential Further Ecological Issues 61

13. Appendix 7 – Extended Phase 1 Habitat Species Lists 63

FIGURE 1 SITE LOCATION, STUDY AREA AND ONLINE DESK STUDY RESULTS

FIGURE 2A EXTENDED PHASE 1 HABITAT SURVEY MAP

FIGURE 2B PHOTOGRAPHS OF THE SITE

FIGURE 3 BADGER SURVEY RESULTS

1. Summary and Main Recommendations

1.1 Summary

1.1.1 The Homes and Community Agency (HCA) are redeveloping an area of land (approximately 82ha) within the formal Royal Air force (RAF) and Royal Naval base HMS Daedalus. Proposals are for a mixed-use development including residential, employment, business and leisure infrastructures. The design plans are in the early stages and the proposals are not finalised. The site is located north of Lee-on-the-Solent, Hampshire. Campbell Reith Hill LLP has been appointed as the consulting engineers for the overall project.

1.1.2 Proposals within the Waterfront Area of the development include the refurbishment of some existing buildings, demolition of some buildings and construction of new buildings. Development will be undertaken in phases over a ten year period.

1.1.3 The brief was to undertake a preliminary ecological assessment of the Waterfront Area to highlight any potential issues relating to biodiversity. A Habitat Suitability Index (HSI) survey for great crested newt and a badger survey were also included within the brief. To that end, an online ecological desk study, an extended Phase 1 habitat survey, a HSI survey and a badger survey of the site were undertaken to gather baseline data.

1.1.4 The main findings of the desk study are that the site is located 0.1km from the Solent and Southampton Water Ramsar and Special Protection Area (SPA), which is protected by both European and national legislation for its internationally important assemblages of wintering bird. The Lee-on-the-Solent to Itchen Estuary Site of Special Scientific Interest (SSSI) is located 0.19km from the site. This nationally protected site is designated for its assemblages of rare coastal plant and bird species.

1.1.5 Two ancient woodlands and eight habitats of principal importance are located within 2km of the site, outside the site boundary. In addition, the desk study provided records of protected species and species of conservation concern within a 1km radius, including grass snake, slow worm, common lizard, badger and hedgehog.

1.1.6 During the field survey, the site was found to support scattered broadleaved trees, scattered coniferous trees, dense scrub, scattered scrub, standing water, coarse grassland, tall ruderal, amenity grassland, introduced shrub, species-poor hedges, fences and walls, hard standing and buildings. Additionally, nine bird species were recorded during the field survey.

1.1.7 No suitable great crested newt breeding ponds were found within the site. Therefore, no HSI surveys for great crested newt were undertaken.

1.1.8 All of the buildings found within the site provide suitable roosting opportunities for bats, therefore further survey for this species group is recommended to determine their presence or likely absence.

1.1.9 The badger survey did not record any badger setts within the site, however potential signs of badger activity including snuffle holes and mammal runs were identified around the site boundary.

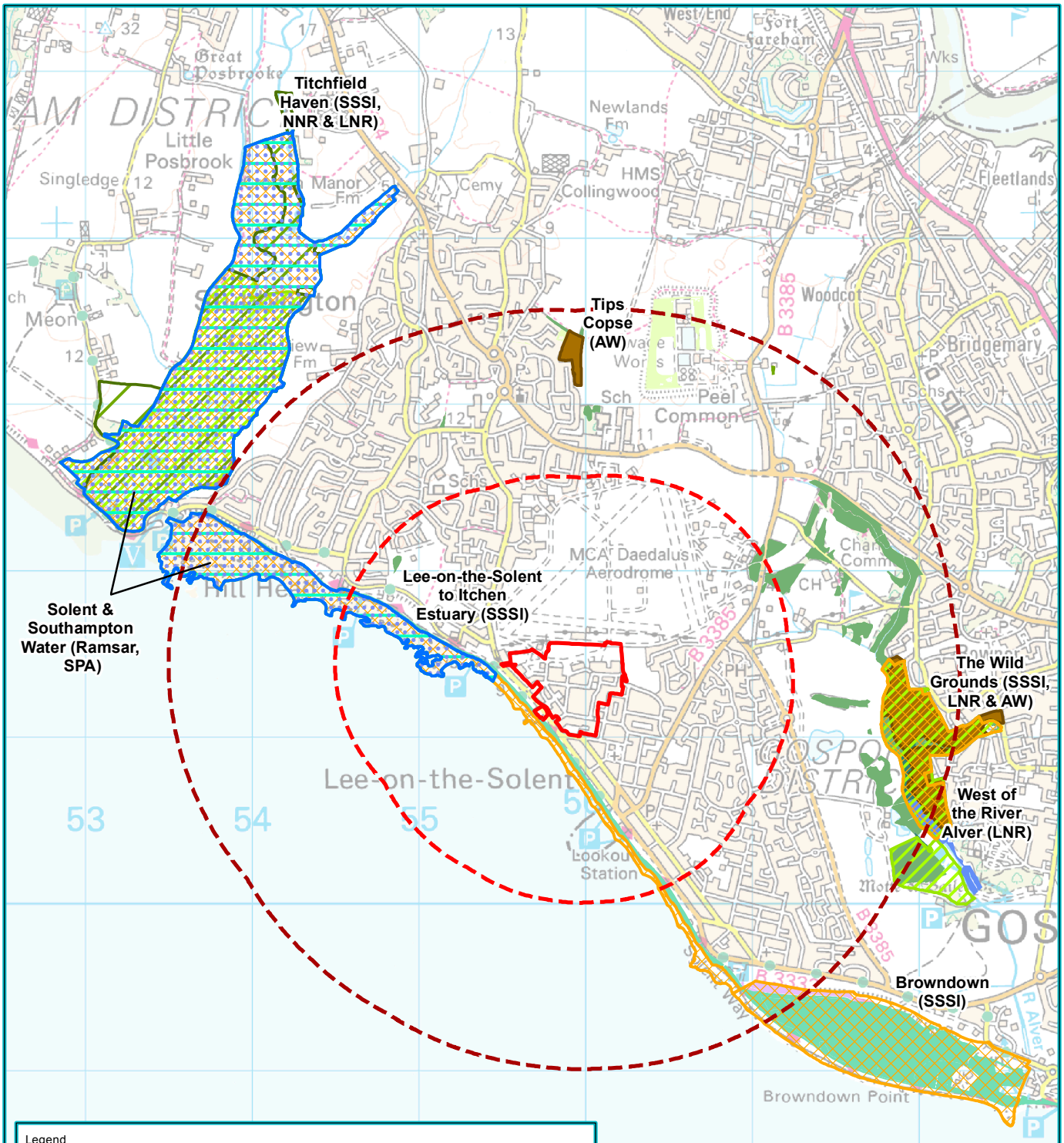
1.2 Main Recommendations

1.2.1 The development proposals have not yet been finalised but the following general measures are recommended for the development to comply with relevant biodiversity legislation and policy:

- Any necessary clearance of trees and shrubs should be undertaken outside of the bird breeding season (i.e. September to February inclusive);
- Retained trees should be protected during and after development in accordance with British Standard BS5837:2012. Any native trees lost as a result of habitat clearance should be replaced on a like-for-like basis;
- To avoid possible injury to hedgehog, any clearance of scattered scrub should be undertaken using hand tools, with any hedgehogs found moved to suitable areas of retained habitat;
- Suitable steps to prevent injury or harm coming to foraging badger should be implemented during construction, including providing escape ladders from trenches and capping manholes and open drains when not in use; and
- The 'Captains Gardens' area of the site was inaccessible (due to a locked gate) during the field survey. If this area of the site is to be affected by any future development works then a walkover survey should be conducted to ascertain the likely presence of protected species (for example reptiles and badgers).

1.2.2 Due to the proximity of the Solent and Southampton Water Ramsar and SPA to the site, a screening assessment may need to be undertaken to determine whether an Appropriate Assessment is required under the Habitat Regulations. Consultation with the LPA and Natural England is therefore recommended to ascertain the need for this.

1.2.3 Following best practice guidelines, further surveys for bats are recommended because suitable habitat was found during the survey and they are legally protected.



Client: Campbell Reith Hill LLP		Drawing Ref: ACAM202/14453/1	
Figure Number: 1		Scale at A4: 1:35,000	
Figure Title: Site Location, Study Area & Online Desk Study Results		Drawn: AC	Checked: NS
		Date: 28/01/2014	Date: 28/01/2014

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'Captains Garden' Area

P1

AM1 A

P2

IS4

SS2

P3

SW1

PH2

DS1

PH3

PH3

SS3

PH5

IS3

PH4

IS2

P4

IS1

0 20 40

Metres

N

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Legend

- Photograph Location and Direction
- Pond No Longer Present
- Scattered Broadleaved Tree
- Scattered Coniferous Tree
- Scattered Scrub
- Species-poor Hedge
- Fence
- Wall
- Dense Scrub
- Scattered Scrub
- Standing Water
- Amenity Grassland (*A*)
- Introduced Shrub
- Building
- Hard Standing
- Not Surveyed
- Survey Boundary

Site Grid Reference: 455929 101335

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This map has been drawn at a sufficient level of accuracy to fulfil the requirements of a Phase 1 baseline habitat survey. The level of accuracy depends on both the size of the area involved and the base mapping. Every effort has been made to create a map that is as accurate as possible. However, this map is not intended to represent a scaled landscape survey so should not be used to pin-point accurate engineering work or as a basis for detailed site planning.

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Scale at A3	1:2,300
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Client	Campbell Reith Hill LLP
Figure Number	2a
Figure Title	Extended Phase 1 Habitat Survey Map

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Photograph 1:
Amenity grassland 1 (AM1) located in north of the site.



Photograph 2:
Intoduced shrub (IS4) in north eastern part of the site.



Photograph 3:
Standing Water (SW1) within the centre of the site.



Photograph 4:
Building with bat roost potential within the site.

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Figure Title: Photographs of the Site		Drawn: AC	Checked: NS
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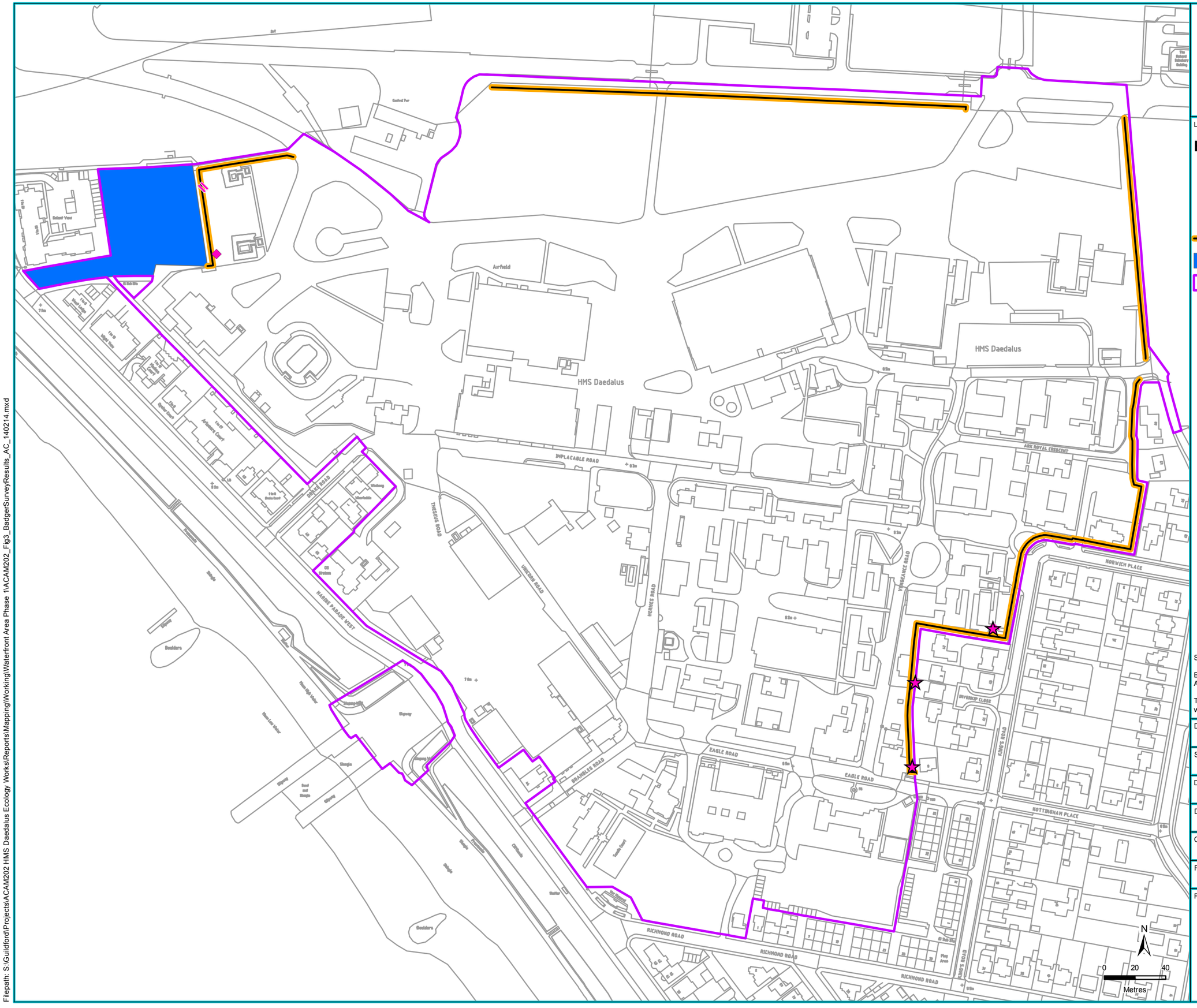

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Legend

Badger Sign

- Gap Under Fence
- Push Through in Fence
- Snuffle Hole
- Mammal Run
- No Access For Survey
- Survey Boundary

Site Grid Reference: 455929 101335

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Date: 29/01/2014	Date: 29/01/2014
Client	Campbell Reith Hill LLP
Figure Number	3
Figure Title	Badger Survey Results

2. Introduction

2.1 Development Background

2.1.1 The Homes and Community Agency (HCA) is redeveloping an area of land (approximately 82ha) surrounding the airfield at the former Royal Air Force base and Royal Navy base at HMS Daedalus, Lee-on-the-Solent, Hampshire. This area was previously owned by the South East of England Development Agency (SEEDA) who set out a Visionary Framework for the redevelopment of the site to create a sustainable, high quality mixed-use development. The area has now been named the 'Solent Enterprise Zone' and has been designated as a key area for business and economic growth. Campbell Reith Hill LLP have been commissioned as the consulting engineers for the project.

2.1.2 The Solent Enterprise Zone comprises three main areas: Hangars East, Hangars West and the Waterfront Area. The Solent Enterprise Zone falls within two catchment areas for local planning authorities, Gosport Borough Council and Fareham Borough Council. An Environmental Statement was submitted in April 2011 along with the outline planning application. Furthermore, Gosport Borough Council submitted a Habitats Regulation Assessment (HRA) in September 2011 to accompany the Daedalus Supplementary Planning Document (Gosport Borough Council, 2011). The outline planning permission for the development of the Solent Enterprise Zone was approved in March 2012 by both Fareham and Gosport Borough Councils.

2.1.3 The subject of this report is the development within the Waterfront Area (previously a Royal Air Force base) which is located adjacent to the seafront. Outline proposals include the refurbishment of existing buildings, demolition of buildings and the construction of new buildings. Development will be undertaken in phases over a 10 year period. A masterplan for the development proposals is yet to be finalised.

2.1.4 The proposals described above are hereafter referred to collectively as 'the development'.

2.1.5 The development will be located on land within the Waterfront Area (see Figure 1). The surrounding land comprises an active airfield, agricultural fields and to the south-west by the seafront. The area affected by the development is hereafter referred to as 'the site'.

2.1.6 The development falls entirely within Gosport Borough Council's jurisdiction. A planning application for the development is expected to be submitted later in 2014.

2.2 Ecology Background

2.2.1 A suite of ecology surveys were carried out by Thomson Ecology throughout 2010 and 2011. The results of these surveys were used to inform the ecological baseline for the Environmental Statement which was submitted in 2011. The surveys included:

- Great-crested newt (*Triturus cristatus*) - Thomson Ecology report ref: ACAM149/002/002 and ACAM152/001/001;
- Reptile - Thomson Ecology report ref: ACAM149/002/002 and ACAM161/001/002;
- Bat - Thomson Ecology Report ref: ACAM149/001/002;

- Badger (*Meles meles*) - Thomson Ecology Report ref: ACAM149/002/002; and
- Wintering and breeding bird surveys - Thomson Ecology report ref: ACAM153/001/002 and ACAM162/001/001.

2.2.2 A summary of the biology, conservation status and legal protection of great crested newt, reptiles, bats, badgers and birds is given in Appendix 1, 2, 3, 4 and 5 respectively.

2.3 The Brief and Objectives

2.3.1 Campbell Reith Hill LLP commissioned Thomson Ecology on 24th January 2014 to undertake a preliminary ecological assessment of the site to update the results from the previous ecology surveys. The brief was to:

- Carry out an extended Phase 1 habitat survey of the site to map the habitats present and assess the potential of the site to support protected species and species of conservation concern;
- Undertake an online desk study to obtain freely available information on records of protected species within 1km of the site and designated sites within 2km;
- Carry out a HSI of all water bodies within the site to asses their suitability to support breeding great crested newt;
- Carry out a full badger survey of the site to map the locations of setts and signs of badger activity;
- Provide a combined report detailing the methodology, findings of the survey, a discussion of any legal issues and our recommendations for further survey or mitigation if required; and
- Provide digitised maps of the survey results.

2.4 Limitations

2.4.1 The species data collated during the online desk study is mainly derived from records submitted by members of the public and *ad hoc* surveys undertaken by volunteers. Therefore, it should not be taken as a definitive list of the protected species and other species of conservation concern that occur in the local area.

2.4.2 The extended Phase 1 habitat survey was undertaken outside of the optimum time of year (late March – mid October). This period is considered as the optimum extended Phase 1 Habitat survey season as this is when a majority of species will be present and most apparent. However, all species recorded were common, widespread and easily identifiable therefore it was possible to classify the habitats present and make an assessment of their potential to support protected species and species of conservation concern.

2.4.3 A small area located to the west of the Waterfront Area (see Figure 2a, previously known as the 'Captain's Garden' Area) was not accessible (due to a locked gate) during the survey and therefore the habitats within this area could not be assessed. Recommendations for assessment of this area prior to the development are given in Section 4.7.

2.4.4 The badger survey was undertaken outside of the optimum badger survey period (during spring or early autumn/ winter), however, badger signs were still recorded during the survey therefore this is not considered to be a significant limitation.

3. Desk Study

3.1 Methodology

3.1.1 A 2km study area was defined that encompasses the site and all land within 2km of the site, see Figure 1.

3.1.2 Records of designated sites were sought for the full study area, whereas records for species were sought for part of the study area encompassing the site and land within 1km.

3.1.3 The following websites were used to conduct the online desk study search:

- The National Biodiversity Network (NBN) Gateway; and
- The Multi-Agency Geographical Information for the Countryside (MAGIC).

3.1.4 The online desk study search was undertaken on 28th January 2014.

3.2 Results

Designated Sites

3.2.1 No statutory designated sites are present within the site. However, six statutory designated sites are located within 2km of the site. Details of the location, area and distance of designated sites from the development are given in Table 1.

Table 1: Designated sites within 2km of the site

Site Designation	Grid Reference	Area (ha)	Distance to area (km)	Description
International Sites (SPA, SAC and Ramsar)				
Solent and Southampton Water Ramsar and SPA	SU542019; and SU538033 (The Ramsar and SPA is split into two areas.)	173.1	0.1	Internationally important wetland habitat supporting internationally important populations of wildfowl. During the breeding season, the area supports important numbers of terns (*Sterna* sp.) and Mediterranean gull (*Larus melanocephalus*).

Site Designation	Grid Reference	Area (ha)	Distance to area (km)	Description
National Sites (SSSIs)				
Lee-on-the-Solent to Itchen Estuary SSSI	SU545016	47.5	0.19	The SSSI supports an outstanding assemblage of nationally scarce coastal plants. At low water the intertidal flats comprise major feeding grounds for waders and dark-bellied Brent geese (*Branta bernicla*).
The Wild Grounds SSSI LNR and Ancient woodland	SU580009	28.1	1.5	Acid oakwood on the brickearth of the south Hampshire coastal plain. It is dominated by uneven-aged pedunculate oak (*Quercus robur*) with scattered yew (*Taxus baccata*), field maple (*Acer campestre*) and ash (*Fraxinus excelsior*).
Browndown SSSI	SU578991	66.5	1.75	An extensive shingle beach comprising three main plant communities of heather (*Calluna vulgaris*), open grass heath, scrub and gorse (*Ulex europaeus*).
Titchfield Haven SSSI NNR LNR	SU538033	134.5	0.92	An extensive fresh marsh which acts as an important resource for surface feeding duck species.

Site Designation	Grid Reference	Area (ha)	Distance to area (km)	Description
County and Local Sites (LNRs)				
West of the River Alver LNR	SU580001	11.55	1.86	One of the largest remaining reed beds in England, supporting large numbers of invertebrates and bird species.

SPA = Special Protection Area

SSSI = Site of Special Scientific Interest

NNR = National Nature Reserve

LNR = Local Nature Reserve

Ancient Woodland

3.2.2 Two ancient woodlands greater than 2ha were found to be located within 2km of the site during the desk study. These woodlands include Tips Copse, which is located approximately 1.54km from the site and the ancient woodland within The Wild Grounds SSSI LNR (see Figure 1).

Habitats of Principal Importance

3.2.3 Eight habitats of principal importance as listed under Section 41 of the NERC Act 2006 were found to be located within 2km of the site during the desk study. None were located within the site itself. The habitat types recorded include:

- Coastal and floodplain grazing marsh;
- Coastal vegetated shingle;
- Deciduous woodland;
- Lowland fens;
- Lowland heathland;
- Lowland meadows;
- Reed beds; and
- Traditional orchards.

3.2.4 The majority of these habitats are found within the designated sites listed in Table 1. Outside of the designated sites, there are some parcels of deciduous woodlands located between 0.3km and 1.8km from the site. An area of lowland meadow is located 1.53km north from the site and one very small parcel of traditional orchard is located 1.8km from the site (see Figure 1).

Protected Species and Species of Conservation Concern

3.2.5 Protected species and species of conservation concern were identified within the 1km study area during the online desk study. These included records of reptiles and mammals. Details of the species are given in Table 2.

Table 2: Records of protected and other species of conservation concern derived from the desk study.

Common Name	Scientific Name	HR Sch 2 or 4	WCA Sch1, 5 or 8	Section 41 Species of Principal Importance	Hampshire local BAP species	Other	Distance from both areas (km)
Grass snake	*Natrix natrix*		✓ (5)	✓		NERC	<1
Slow worm	*Anguis fragilis*		✓ (5)	✓		NERC	<1
Common lizard	*Zootoca vivipara*		✓ (5)	✓		NERC	<1
Badger	*Meles meles*					Badger Act 1992	<1
Hedgehog	*Erinaceus europaeus*			✓	✓	NERC Wild Mammals Act 1996	<1

HR = Conservation of Species and Habitat Regulations 2010

WCA = Wildlife and Countryside Act 1981, as amended

BAP =Biodiversity Action Plan (Local)

NERC = Natural Environment and Rural Communities Act 2006

Sch = Schedule

3.3 Legislation and Planning Policy Issues

Background

3.3.1 The content of the legislation and planning policy section is the legislation and planning policy issues that we know are relevant based on this desk study. A detailed description of the method for this section is given in Appendix 6.

Statutory Designated Sites

3.3.2 The Solent and Southampton Water Ramsar and SPA is located approximately 0.1km south/west from the site. This internationally designated site is strictly protected under the Conservation of Habitats and Species Regulations, 2010 (as amended), which stipulates that any new development must not significantly negatively affect the integrity of a protected site and its qualifying criteria. Furthermore, Policy LP43 of the Gosport Borough Local Plan 2011-2029 states that '*Planning permission will not be granted for development which will affect the integrity of internationally important sites. Such sites will be subject to the highest level of protection as set out in the relevant international and national legislations'*.

3.3.3 In order to assess the impact of the development on the Solent and Southampton Water Ramsar and SPA, the recommendations detailed in Section 3.4 should be followed.

3.3.4 The Lee-on-the-Solent to Itchen Estuary SSSI is located approximately 0.19km south of the site. All SSSIs are protected by National legislation, mainly the Wildlife and Countryside Act, 1981, as amended. In addition, Policy LP43 of the Gosport Borough Local Plan 2011-2029 states that *'Planning permission will not normally be granted for development if it directly or indirectly harms a Site of Special Scientific Interest (SSSI). Development that affects a SSSI will only be permitted where it has demonstrated that:*

a) the objectives of the designated area and the overall integrity would not be compromised; or

b) any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by social and economic benefits of national importance'.

3.3.5 The recommendations within Section 3.4 of this report should be followed to ensure that the Lee-on-the-Solent to Itchen Estuary SSSI is not negatively affected by the development.

3.3.6 Another four designated sites are located within 2km of the site. All of these sites are located over 1.55km from the site boundary and are unlikely to be significantly adversely affected by the proposed development because:

- The designated sites and the development are separated by of urban infrastructures such as roads and residential developments;
- The development will be confined to the existing site boundaries;
- The site will be fenced during development works; and
- Pollution, dust and surface run-off will be controlled during construction works in accordance with Environment Agency pollution prevention guidelines (2007).

Ancient Woodland

3.3.7 Ancient woodland is protected under the National Planning Policy Framework (NPPF) 2012, which states that '*planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including Ancient Woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss*'.

3.3.8 The 2 parcels of ancient woodland within 2km of the site should not be affected by the development for the same reasons outlined in Section 3.3.6. The development should therefore be compliant with the NPPF with regards to ancient woodland.

Habitats of Principal Importance

3.3.9 No habitats of principal importance (HPI) were recorded within the site boundary. However, eight HPIs were recorded within 2 km of the site boundary. These habitats are listed on Section 41 of the NERC Act 2006 and include all the habitats previously identified as UK level Biodiversity Action Plan (UK BAP) priority habitats. HPI are protected by the NPPF, which states that council policies should: *'promote the preservation, restoration and re-creation of priority habitats…. the council should have regard for conserving this habitat… Planning permission should be refused for development that results in the loss or deterioration of irreplaceable habitats, including ancient woodland…'*.

3.3.10 Many of the HPI are found within the statutory designated sites. For example, coastal vegetated shingle is found within the Solent and Southampton Water Ramsar and SPA and the Lee-on-the Solent to Itchen Estuary SSSI (which is both located less than 200m from the site boundary). Recommendations within Section 3.4 of this report should be followed to ensure the habitats of principal importance present within the designated sites are not adversely affected by the development.

3.3.11 Outside of these designated sites, the HPI should not be affected by the development for the same reasons outlined in Section 3.3.6.

Protected Species and Species of Conservation Concern

3.3.12 Within the desk study there are records of reptiles, badger and hedgehog within 1km of the site. Where suitable habitat to support these species was found during the extended Phase 1 habitat survey, and where deemed appropriate, further survey is recommended in Section 4.7.

3.4 Recommendations

3.4.1 The recommendations for mitigation measures given in this section are based on the findings of the desk study. Further recommendations pertaining to protected species and species of conservation concern are given in Sections 4.5, 4.7 and 6.4.

3.4.2 Detailed mitigation proposals cannot be prepared at this stage as the masterplan has not been finalised. Once the proposals have been confirmed, a robust assessment of the potential

impacts of the development on the features of nature conservation and biodiversity interest within 2km of the site can be undertaken and appropriate mitigation considered.

3.4.3 Due to the proximity of the Solent and Southampton Water Ramsar and SPA to the site, a screening assessment may need to be undertaken to determine whether an Appropriate Assessment is required under the Habitat Regulations. Consultation with the LPA and Natural England is therefore recommended to ascertain the need for this.

3.5 Conclusion

3.5.1 No designated sites are present within the site. However, a Habitat Regulations screening assessment may be required to determine whether the Solent and Southampton Water Ramsar and SPA is likely to be significantly affected.

3.6 References

3.6.1 Environment Agency. *Pollution prevention guidelines*. Available to download: http://www.environment-agency.gov.uk/business/topics/pollution/39083.aspx

3.6.2 Gosport Borough Council (2011) *Draft Gosport Local Plan 2011 -2019*. Gosport Borough Council.

3.6.3 HM Government (2012) *National Planning Policy Framework*. Department for Communities and Local Government.

3.6.4 HM Government (2010) The Conservation of Habitats and Species Regulations (2010).

3.6.5 HM Government The Wildlife and Countryside Act (1981).

3.6.6 JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) *UK Post-2010 Biodiversity Framework*.

3.6.7 Natural England (2012) *Standing Advice for ancient woodland*. Version 3. A revision of the ancient woodland Standing Advice. 30 May 2012.

3.6.8 *Natural Environment and Rural Communities* (NERC) Act (2006)

3.6.9 Office of the Deputy Prime Minister (ODPM). *Circular 06/2005* (2005)

3.6.10 The Multi- Agency Geographical Information for the Countryside (MAGIC) Centre. Available at: http://www.magic.gov.uk/.

3.6.11 Thomson Ecology (2011) *Badger, Reptile and Great crested newt surveys, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM149/002/002.

3.6.12 Thomson Ecology (2011) *Great Crested Newt Survey, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM152/001/001.

3.6.13 Thomson Ecology (2011) *Foreshore winter bird survey, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM153/001/002.

3.6.14 Thomson Ecology (2011) *Reptile mitigation strategy, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM161/001/002.

3.6.15 Thomson Ecology (2010) *Bat Surveys, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM149/001/002.

3.6.16 Thomson Ecology (2010) *Breeding Birds, Daedalus, Lee-on-Solent, Hampshire.* Thomson Ecology report ref: ACAM162/001/001.

4. Extended Phase 1 Habitat Survey

4.1 Methodology

4.1.1 A survey boundary was defined that encompassed the site. The survey area is shown on Figure 2a.

4.1.2 An extended Phase 1 habitat survey (JNCC, 2010; IEA, 1995) was conducted throughout the survey boundary. Phase 1 habitat survey is a standard technique for rapidly obtaining baseline ecological information over a large area of land. It is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique was modified / extended to provide more detail over a smaller area, and to provide further consideration to fauna.

4.1.3 The dominant and readily identified higher plant species from each habitat type within the survey area were recorded and their abundance was assessed on the DAFOR scale:

- D Dominant;
- A Abundant;
- F Frequent;
- O Occasional; and
- R Rare.

4.1.4 An additional score of 'L' (locally) was used for species that were abundant in specific locations of the areas only.

4.1.5 These scores represent the abundance within the defined area only and do not reflect national or regional abundances. Plant species nomenclature follows Stace (2010).

4.1.6 Incidental records of fauna were also made during the survey and the habitats identified were evaluated for their potential to support protected species and other species of conservation concern. Species of Principal Importance listed under the NERC Act 2006 and local biodiversity action plan (BAP) priority species.

4.1.7 The survey was conducted on 23rd January 2014.

4.2 Results

Habitats and Flora

4.2.1 The following Phase 1 habitat types were identified within the site:

- Scattered broadleaved tree;
- Scattered coniferous tree;
- Dense scrub;
- Scattered scrub;

- Standing water;
- Amenity grassland;
- Introduced shrub;
- Species-poor hedge;
- Fences and walls;
- Hard standing; and
- Building.

4.2.2 These habitats are described below and their distribution is given on Figure 2a. A detailed species list for each habitat is given in Appendix 7. Photographs of the area can be found in Figure 2b.

Scattered broadleaved trees

4.2.3 The majority of scattered broadleaved trees within the site were located within areas of amenity grassland (see AM1 on Figure 2a and Photograph 1 on Figure 2b). Native broadleaved tree species found within the site include whitebeam (*Sorbus aria*), oak (*Quercus robur*) and elder (*Sambucus nigra*). Non-native and introduced species found across the site include London plane (*Platanus* x *hispanica*), cherry (*Prunus* sp.) and apple (*Malus* sp.).

Scattered coniferous trees

4.2.4 Coniferous trees were located within the amenity grassland areas (see AM1 on Figure 2a). Two species were recorded within the site, these included Leyland cypress (x *Cuprocyparis leylandii*) and Monterey pine (*Pinus radiata*).

Dense scrub

4.2.5 One very small area (less than 0.01ha) of dense scrub was recorded within the site (see DS1 on Figure 2a). This habitat parcel is solely comprised of bramble (*Rubus fruticosus* agg.).

Scattered scrub

4.2.6 Four parcels of scattered scrub were found within the site (see SS1 to SS4 on Figure 2a). These parcels were found within the amenity grassland areas (AM1 on Figure 2a). Dominant species include bramble and young ash (*Fraxinus excelsior*).

Standing water

4.2.7 One area of standing water in the form of raised water storage container with brick sides was located within the area (see SW1 on Figure 2a and Photograph 3 on Figure 2b). No marginal or aquatic vegetation was recorded within it.

Amenity grassland

4.2.8 Parcels of amenity grassland totalling 8.38ha were located across the entire site (see AM1 on Figure 2a and Photograph 1 on Figure 2b). Perennial rye-grass (*Lolium perenne*) dominates the species assemblage with Yorkshire fog (*Holcus lanatus*) and red fescue (*Festuca rubra*) occurring abundantly.

Introduced shrub

4.2.9 Four parcels of introduced shrub were found throughout the site (see IS1 to IS4 on Figure 2a and Photograph 2 on Figure 2b). Garden species including Hebe (*Hebe* sp.) dominates the species assemblage and berberis (*Bereris* sp.), St John's wort (*Hypericum* sp.) and Himalayan tree cotoneaster (*Cotoneaster frigidus*) occur occasionally throughout.

Species-poor hedge

4.2.10 Five species poor hedges with trees were located within the site (see PH1 to PH5 on Figure 2a). All of the hedges border parcels of amenity grassland (AM1 of Figure 2a). Garden privet (*Ligustrum ovalifolium*), wild privet (*Ligustrum vulgare*) and ash are the dominant species of plant present within the hedges.

Fences and walls

4.2.11 Wire fences approximately 2.5m high border the entire site (see Figure 2a). One brick wall, approximately 1m in height, was recorded within the southern part of the site.

Hard standing

4.2.12 Hard standing covers 45% of the site (11.4ha) and comprises roads, car parking, pathways and concrete maintenance yards.

Buildings

4.2.13 Over eighty buildings are present within the site (see building example on Photograph 4, Figure 2b). The majority of these buildings were disused residential accommodation blocks, medical centres and sport facility blocks remaining from the RAF base which previously occupied the site. The remaining buildings within the site comprise hangars, garages and workshops associated with a variety of small scale industries.

Fauna

4.2.14 Nine species of bird were recorded during the field survey. These were:

- Feral pigeon (*Columba livia*);
- Magpie (*Pica pica*);

- Jackdaw (*Corvus monedula*);
- Carrion crow (*Corvus corone*);
- Herring gull (*Larus argentatus*);
- Starling (*Sturnus vulgaris*);
- Robin (*Erithacus rubecula*);
- House sparrow (*Passer domesticus*); and
- Gold finch (*Carduelis carduelis*).

4.3 Legislation and Planning Policy Issues

Background

4.3.1 The content of the legislation and planning policy section is the legislation and planning policy issues that we know are relevant based on this extended Phase 1 habitat survey. The legislation and policy issues that might arise following further surveys are excluded. Potential further ecological issues are discussed in Section 4.4. A detailed description of the method for this section is given in Appendix 6.

Ancient Woodland and Habitats of Principal Importance

4.3.2 No ancient woodland or habitats of principal importance were found to be present within the site during the field survey. Therefore the development is consistent with planning policy associated with ancient woodland and habitats of principal importance.

Protected Species

4.3.3 The ODPM circular 06/2005 states that the presence of protected species is a material consideration in the planning process. The NPPF states that "*planning policies should promote the protection of priority species populations linked to national and local targets*". Furthermore, Policy LP45 of the Gosport Borough Local Plan (2011-2029) states '*Planning permission will not be granted on a site that would have an adverse impact on a protected species or its habitat….'*

4.3.4 A number of bird species were recorded within the site during the field survey. Many of these species are likely to breed within the site as suitable habitat is present (i.e. dense scrub, scattered scrub and introduced shrub (see Figure 2a)). All birds, eggs and nests are protected from damage and destruction under the Wildlife and Countryside Act 1981 (as amended).

4.3.5 Providing that the recommendations made within Section 4.5 are followed, the development should be compliant with the legislation and planning policy regarding breeding birds.

Species of Principal Importance and Species of Conservation Concern

4.3.6 House sparrow, starling and herring gull were recorded during the field survey (all listed as SPI). All of these species, apart from herring gull, are likely to breed within the site as suitable habitat is present.

4.3.7 Furthermore, the desk study identified records of hedgehog within 1km of the site and there is suitable habitat to support hedgehog. Hedgehog is an SPI under Section 41 of the NERC Act, 2006 and is a Hampshire local BAP species. The enhancement and mitigation proposals set out in Section 4.5 and 4.6 should ensure that the site remains suitable (and are enhanced) for house sparrow, starling and hedgehog following completion of the development.

Ecological Enhancement

4.3.8 Central and local government policy now points towards ecological enhancement on development sites. The NPPF considers enhancement in the statement '*The planning system should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes….and minimising impacts on biodiversity and providing net gains in biodiversity*'. Furthermore, Policy LP5 of the Gosport Borough Local Plan (2011-2029) states that '*Planning permission will be granted for development provided that it includes measures to avoid and mitigate any impacts on internationally important habitats. Proposals should preserve and where possible enhance biodiversity and geological interests in the vicinity'.*

4.3.9 The precise landscaping details are yet to be finalised within the site. Recommendations for ecological enhancements are given in Section 4.6.

4.4 Potential Further Ecological Issues

Background

4.4.1 The potential further ecological issues section sets out our assessment of the potential of the site to support protected species and other species of conservation concern which were not detected during the extended Phase 1 habitat survey, either because their presence is seasonal or because specialist survey techniques are required. Further survey work or appropriate mitigation is likely to be required before these issues can be addressed. Further information on the methods of assessment is given in Appendix 6.

Reptiles

4.4.2 Although several common reptile species were recorded as being within 1km of the site during the desk study, the habitat found within the site consists largely of fragmented parcels of amenity grassland and areas of hard standing and building, therefore it is considered unlikely that populations of these species are supported, and no further survey is recommended.

4.4.3 During the previous reptile surveys (Thomson Ecology report ref: ACAM149/002/002) slow worm were recorded in the 'Captains Gardens' area of the site (see Figure 2a). If this area is to be

developed in the future, recommendations for further survey in Section 4.7 should be followed and the status of reptiles within this area confirmed.

Bats

4.4.4 Buildings within the site have the potential to support roosting bats. Previous bat surveys within the site during 2010 recorded a total of 12 bat roosts within eight different buildings. Therefore the likelihood of presence is increased. The amenity grassland parcels and hedgerows may provide foraging habitat for bats. All bat species are fully protected by the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).

4.4.5 Recommendations for further survey in Section 4.7 should be followed to update the status of bats within the site.

4.5 Recommendations

4.5.1 The recommendations for mitigation (including avoidance, mitigation and compensation) measures for the site given in this section are based on the findings of the extended Phase 1 habitat survey. The mitigation measures proposed for site should be viewed as preliminary as the design plans are yet to be finalised.

Mitigation

Breeding Birds

4.5.2 Any necessary clearance of trees and areas of scrub should be undertaken outside of the breeding bird season (*i.e.* clearance work should be undertaken between September and February inclusive). If site clearance occurs within the breeding bird season, an ecologist should check for active bird nests immediately prior to clearance. If an active nest is discovered, then work in that area should cease until such a time that the young have fledged or the nest is no longer active.

Hedgehogs

4.5.3 To avoid injury to hedgehogs, areas of dense scrub and introduced shrub should be taken apart by hand. Any hedgehog found should be moved to an area of suitable habitat (for example, dense scrub) which is to be retained and protected during the development.

Trees

4.5.4 As many trees as possible should be retained to maintain biodiversity and connectivity within the site. To prevent damage to any retained trees during or following development, a buffer zone should be set aside to protect the rooting area in which no construction activities are permitted. In accordance with British Standard BS5837:2012 *Trees in relation to design, demolition and construction - recommendations* this 'root protection area' is calculated in relation to the

circumference of the tree trunk. Any native trees which are removed should be replaced with native species within the proposed landscaping.

Species of Principal Importance

4.5.5 To ensure that the site remains suitable for SPI, such as house sparrow and hedgehog as much dense scrub as possible should be retained within the development. If this habitat needs to be removed, then these should be replaced on a like for like basis, to compensate for the loss of habitat.

4.5.6 The ecological enhancements (in Section 4.6 below) will also ensure that the site remains suitable for priority species recorded currently supported at the site.

4.6 Ecological Enhancements

4.6.1 The final design should incorporate enhancements for the benefit of wildlife in line with regional and local planning policy. The following suggestions should be implemented to enhance biodiversity within the site:

- Trees and shrubs could be managed to benefit biodiversity, for example, through the retention of dead wood and the creation of brash and log piles to favour fauna such as hedgehogs, reptiles and amphibians;
- Native trees, shrubs and insect attracting plants should be included in the final landscape design;
- Bird boxes could be installed on the outside of the new buildings or on retained mature trees. House sparrow and starling boxes could be attached to the buildings, while boxes for blue and great tits could be attached to trees; and
- Suitably placed bat roosting boxes on the new buildings and/or suitable mature retained trees (sited away from artificial lighting and out of the reach of potential predators).

4.7 Further Survey

Reptiles

4.7.1 The suitability of the 'Captains Gardens' area of the site to support reptiles should be ascertained through further survey. Should this area provide suitable habitat then a presence / absence survey (following best practice guidelines) should be undertaken.

Bats

4.7.2 A number of the buildings within the site have the potential to support roosting bats, therefore a detailed Stage 1 internal / external inspection of the buildings and mature trees should be undertaken. The Stage 1 surveys would inform whether further Stage 2 surveys including emergence and return to roost surveys are required. The initial Stage 1 survey can be

undertaken any time of year, with Stage 2 emergence and return to roost surveys taking place between May and August inclusive.

4.8 Conclusion

4.8.1 Prior to construction works commencing, further survey for bats (and if required in the 'Captain's Garden' area, reptiles) is required before it can be determined if the development will be compliant with legislation and planning policy pertaining to this species group.

4.9 References

4.9.1 British Standard 5837:2012 (2012). *Trees in Relation to design, demolition and construction - recommendations*.

4.9.2 English Nature (2001). *Great Crested Newt Mitigation Guidelines*. English Nature. Peterborough.

4.9.3 Fareham Borough Council (2011*) Fareham Core Strategy*

4.9.4 Froglife (1999) *Reptile Survey: An introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10*. Froglife. Halesworth.

4.9.5 Gosport Borough Council (2011) *Draft Gosport Local Plan 2011 -2019*. Gosport Borough Council

4.9.6 Hundt, L. (2012) *Bat Surveys: Good Practice Guidelines* (second edition). Bat Conservation Trust. London.

4.9.7 HM Government (2010) The Conservation of Habitats and Species Regulations (2010)

4.9.8 HM Government (2012) *National Planning Policy Framework*. Department for Communities and Local Government.

4.9.9 HM Government. *Wild Mammals (Protection) Act* (1996)

4.9.10 HM Government The Wildlife and Countryside Act (1981)

4.9.11 Joint Nature Conservancy Committee (JNCC) (1993) *Handbook for Phase 1 habitat survey: A technique for environmental audit*. Joint Nature Conservancy Committee, Peterborough.

4.9.12 JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) *UK Post-2010 Biodiversity Framework*. Available at: ttps://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69528/pb13743-bio-guide-developers.pdf

4.9.13 *Natural Environment and Rural Communities* (NERC) Act (2006)

4.9.14 Office of the Deputy Prime Minister (ODPM). *Circular 06/2005* (2005)

4.9.15 Thomson Ecology (2011) *Badger, Reptile and Great crested newt surveys, Daedalus, Lee-on-Solent, Hampshire*.

4.9.16 Stace, C. (2010) *New Flora of the British Isles* (third edition). Cambridge University Press, Cambridge.

5. Habitat Suitability Index (HSI) - Great Crested Newt

5.1 Background and Results

5.1.1 During the 2010 HSI survey (Thomson Ecology Report ref: ACAM149/002/002) two water bodies were recorded within the site. In the subsequent presence / likely absence surveys carried out in 2011 no great crested newts were recorded within these.

5.1.2 Of the two water bodies recorded during the previous survey, only one remained during this survey. The one water body within the site (see Photograph 3 on Figure 2b) has brick sides (approximately 1m in height), has no aquatic vegetation and is isolated from any terrestrial habitat and as such is not considered to be suitable to support breeding great crested newt.

5.1.3 No mitigation or further survey for great crested newts is therefore recommended.

5.2 References

5.2.1 Oldham et al: Oldham, R. S., Keeble, J., Swan, M. J. S. and Jeffcote, M. (2001) *Evaluating the suitability of habitat for the great crested newt (Triturus cristatus).* Herpetological Journal, 10, 143-155]

5.2.2 Thomson Ecology (2011) *Badger, Reptile and Great crested newt surveys, Daedalus, Lee-on-Solent, Hampshire.* ACAM149/002/002.

6. Badger Survey

6.1 Methodology

General Approach

6.1.1 The survey boundary encompassed the entire site (see Figure 1). This area covers approximately 25.1ha.

6.1.2 As badgers are principally nocturnal, the surveyor concentrated on searching for evidence of badgers. All areas within the site were searched; however, survey effort was concentrated on sloping ground within woodland, scrub and along hedgerows, since these are the most likely locations for badger setts. Where setts lie adjacent to, or within urban land, survey effort was concentrated along fence edges and around bird feeders/bins.

6.1.3 The classification of badger setts used in this survey is based on definitions given in Clark (2010).

Field Survey

6.1.4 The signs of badgers looked for during the survey included the following:

- Setts and day nests;
- Paw prints;
- Push-throughs;
- Paths and “squat-marking”;
- Latrines, droppings and urine;
- Hairs caught on fences and vegetation;
- Scratching posts;
- Feeding signs and “snuffle-holes” in grassland;
- Broken up wasp nests; and
- Badger bones.

6.1.5 Any setts discovered were classified as either a main, annexe, subsidiary, or outlier sett based on the number of entrances and apparent level of use, as follows:

- *Main sett*: A breeding sett, these usually have 5-20+ entrances. These are large, well-established setts, normally in continuous use. Each group will use only one main sett and it will form the most likely location for the raising of cubs;
- *Annexe sett*: These setts are usually found in close association with the main sett, and will often be linked to it by a well-worn path. Where a second litter of cubs is born they will be raised in the annexe sett;

- *Subsidiary sett*: Subsidiary setts will usually have five or more holes, although not all of these will be in continuous use; and
- *Outlier sett*: These setts are used on an occasional basis and will usually consist of only one to three holes. Spoil heaps will generally be smaller than those associated with the other sett types, indicating a smaller underground structure.

6.1.6 A note was also made of the number of sett entrances. Each sett entrance was then classified as follows:

- *Well-used*: Holes in regular use and are therefore free of debris. They may have been recently excavated;
- *Partially-used*: Debris, including leaves, twigs and other vegetation clutter the entrance to these holes, indicating they are not in regular use. The holes can be used after a minimum of clearance; or
- *Disused*: A considerable amount of clearance is needed before these holes can be used. The holes may become so blocked that only a depression in the ground is visible where the hole used to be.

Date of Survey

6.1.7 The survey was undertaken on 23rd January 2014.

6.2 Results

6.2.1 The badger survey results are shown on Figure 3.

Badger Setts

6.2.2 No badger setts were recorded within the site.

Other Badger Activity

6.2.3 Mammal runs, 'push throughs' and gaps under fences were observed along the eastern and northern boundary of the site (see Figure 3). These features are likely to be used by a variety of mammals including rabbits, foxes and badgers.

Habitat Assessment

6.2.4 Field signs were recorded solely on the site boundaries. The small areas of amenity grassland, introduced shrub, dense scrub and scattered scrub within the site provides limited foraging habitat for badger. The exception to this is the larger area of amenity grassland found in the north of the site (see Figure 2a).

6.3 Legal and Planning Policy Issues

6.3.1 As no badger setts were recorded within the site boundary, there should be no issues in relation to badgers and the development.

6.4 Potential Further Ecological Issues

6.4.1 The 'Captains Gardens' area located in the north-east of the site (see Figure 3) was not surveyed for badgers due to access limitations. If this area of the site is to be affected by the development, further survey for badgers is recommended (see Section 6.4).

6.5 Recommendations

Mitigation

6.5.1 Whilst there are no badger setts within the site, potential signs of foraging badger have been recorded. To ensure no injury or harm comes for foraging and commuting badgers the following recommendations should be followed. These should include:

- Should any trenches need to be left open overnight a means of escape should be provided such as a suitably placed plank of wood;
- Any temporarily exposed open pipe system should be capped in such a way as to prevent badgers gaining access; and
- Badger paths should not be obstructed during development construction and operation.

Further Survey

6.5.2 If any future development affect the 'Captains Gardens' area of the site it is recommended that a walkover survey to identify signs of badger activity, including the presence of setts is undertaken within this area of the site.

6.6 Conclusion

6.6.1 No badger setts were recorded within the site although signs of foraging and commuting badgers were recorded. The recommendations given in Section 6.4 should ensure no injury or harm comes to badgers that may use the site.

6.7 References

6.7.1 Clark, M. (1988) *Badgers*. Whittet Books, London.

6.7.2 English Nature (2002) *Badgers and development*.

6.7.3 HM Government (2012) *National Planning Policy Framework*. Department for Communities and Local Government.

6.7.4 HM Government. *Protection of Badgers Act* (1992)

6.7.5 Thomson Ecology (2011) *Badger, Reptile and Great crested newt surveys, Daedalus, Lee-on-Solent, Hampshire*. Thomson Ecology Report ref: ACAM149/002/002

7. Appendix 1 - Biology, Legislation and Planning Policy of Amphibians

7.1 Introduction

7.1.1 A summary of the biology of British amphibians and the legislation and policy that protects them is provided below.

7.2 Biology

7.2.1 There are six native amphibian species in Britain. These are the great crested newt (*Triturus cristatus*), smooth newt (*Lissotriton vulgaris*), palmate newt (*Lissotriton helveticus*), common toad (*Bufo bufo*), natterjack toad (*Epidalea calamita*) and common frog (*Rana temporaria*). A summary of each species is given below, based on information provided in Arnold (1995), Beebee and Griffiths (2000), English Nature (1991), Langton et al (2001), Gent and Gibson (1998), Oldham et al (2000) and Wisniewski (1989).

7.2.2 There is also one species, the pool frog (*Pelophylax lessonae*), which was confirmed to be native just prior to its extinction in Britain in the 1990s. This species is currently the subject of a re-introduction programme in Norfolk.

7.2.3 In addition to the native species, there are a number of introduced species arising from releases and escapes, which may occasionally be encountered including marsh frog (*Pelophylax ridibundus*), European tree frog (*Hyla arborea*), midwife toad (*Alytes obstetricans*) and alpine newt (*Mesotriton alpestris*).

Great crested newt

7.2.4 The great crested newt is the largest species of newt found in Britain. Adult great crested newts normally begin moving from their over-wintering land sites towards breeding sites between February and April, with movement occurring exclusively at night. The migration of newt populations however is staggered, and some individuals may not arrive at the breeding ponds until May. The main breeding season and egg-laying season is April to May and mid-April to mid-June respectively, with most adults having left the breeding site by August. Movements are typically within 500m of the breeding site but they may range more than 1 kilometre (km). The larvae may remain in the pond until the following spring, but typically emerge in late autumn.

7.2.5 The great crested newt is widespread in Great Britain but has a patchy distribution, being particularly sparse in Scotland, Wales, and south-west England. On land, the great crested newt prefers woodland and scrub habitats, though also uses hedgerow and rough grassland with suitable underground refuges. For breeding sites, medium sized ponds with neutral or hard water, abundant aquatic vegetation and an absence of fish are preferred.

Smooth newt

7.2.6 Smooth newts are much smaller than great crested newts, though the male also has a prominent crest during the breeding season. Most smooth newts over-winter on land and make their way to the breeding ponds in early spring. Egg laying occurs March-June, whilst the larvae may remain in the pond over winter but typically emerge in late autumn. The adults may spend several weeks in the pond but most will have returned to land by July.

7.2.7 The smooth newt is widespread across the British Isles and, being more common in the South-East, East and Midlands whilst scarce in northern Scotland and south-west England. It is also present in Ireland. It occurs in a wide range of terrestrial habitats and may even be found in arable areas, provided that suitable refuges exist. For a breeding site, it prefers ponds that are exposed to the sun with abundant aquatic vegetation and neutral to hard water.

Palmate newt

7.2.8 The palmate newt is similar in size to the smooth newt, though males lack the distinctive breeding crest and instead have large webbed feet and a filament at the end of the tail. This species has a similar annual cycle to the smooth newt, which is described above.

7.2.9 The palmate newt is patchily distributed across the British Isles, being most common in northern Scotland and the south-west and South-East of England and absent from the East Midlands, East Anglia and Ireland. Terrestrial habitat requirements are the same as for smooth newts, while their aquatic habitat is similar except that they tend to be found in ponds with soft water with a lower pH.

Common toad

7.2.10 The common toad has warty, brown skin. They emerge from hibernation in late February/early March and migrate to a waterbody to breed. Mating and egg laying occur over a brief period in March and April. The adult toads then leave the breeding waterbody and remain on land for the remainder of the year, entering hibernation in late September or early October. Tadpoles are present in the breeding waterbody from April to July. The main prey of the adults is invertebrates.

7.2.11 The common toad is widespread in Britain (but absent from Ireland) and is common in most areas, apart from southwest England and the north of Scotland. The common toad's preferred habitats are rough grassland, scrub and open woodland within 1.5km of their breeding site. For the breeding site, large ponds with abundant aquatic vegetation are preferred, with or without fish, though they will also use fishing lakes and slow-flowing rivers.

Natterjack toad

7.2.12 The natterjack toad is smaller than the common toad and has a narrow yellow stripe running down the centre of its back. They emerge from hibernation in March, but continue to spend daylight hours in their burrows throughout their active period. They have a long breeding

season which extends from April to July. Tadpoles are present in the breeding pond between April and August. The adults eat mainly invertebrates.

7.2.13 The natterjack toad is restricted to about 50 sites in Britain, located mainly along the coast in north-west England and south-west Scotland, though it is also found in a few scattered locations in eastern and southern England and southwest Ireland. The natterjack toad requires shallow and seasonal breeding pools. Terrestrial habitats need to be open (e.g. sand dunes, upper saltmarshes and heathland) providing open areas for feeding with an absence of dense cover which would otherwise provide refuges for competitively superior common amphibians.

Common frog

7.2.14 The common frog has smooth skin, with variable colour patterns but typically brown or grey. They may be active all year round in mild winters, though may hibernate in cold conditions either in terrestrial refuges or underwater. Spawning typically occurs in February, March and April, with tadpoles in the breeding pond from February onwards. The adults may spend much of the year in and around ponds but also make movements of up to 1km. Their main diet is invertebrates.

7.2.15 The common frog is widespread in Britain and Ireland and common in some areas, particularly where there is an abundance of suitable breeding sites. They occur in a wide range of habitats, from suburban gardens to upland bogs and utilise a variety of breeding sites, from small puddles to large lakes, even running water on occasion.

Pool frog

7.2.16 The pool frog is very variable in colour and our native population is now extinct, so any differences between the English population and those on the continent have been lost. However, pool frogs with similar appearance to our native ones have been taken from Sweden and introduced to Norfolk. These frogs are mainly brown with black blotches and a prominent yellow dorsal strip. Unlike common frogs, pool frogs bask in hot sunshine. They also breed later in the year. Currently, this variation of the species, known as the 'northern clade', only occurs at very few sites in Norfolk and is unlikely to be encountered. However, southern clade pool frogs, which are predominantly green, may be found elsewhere, especially in southern England. This variety of pool frog has never been native and is therefore not of conservation importance.

7.3 Site Designation

7.3.1 The most important sites for amphibians in the UK receive statutory protection under the following legislation:

- Conservation of Habitats and Species Regulations 2010 (which replaces the Conservation (Habitats &c) Regulations 1994 as amended);
- Wildlife and Countryside Act 1981, as amended;

- The Countryside and Rights of Way Act 2000 (which amends the Wildlife and Countryside Act); and
- Natural Environment and Rural Communities Act 2006 (which amends the Wildlife and Countryside Act).

7.3.2 Great crested newts are included on Annex II of the European Community Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora, referred to as the Habitats Directive. The Habitats Directive was transposed into UK law by the Conservation of Habitats and Species Regulations 2010. This legislation requires that areas are designated as Special Areas of Conservation (SACs) to protect great crested newt populations and ensure their conservation status in the European Union. At present there are 15 SACs designated in England where the great crested newt population is a primary reason for selection. These sites are considered to be of international importance for the great crested newt populations they support. In addition, there are a further 9 SACs in England where this species is a qualifying feature but not the primary reason for designation.

7.3.3 Sites designated under the Wildlife and Countryside Act 1981 (WCA) are known as Sites of Special Scientific Interest (SSSIs). SSSIs have been designated as a representative sample of the best wildlife sites in the UK and receive further protection under the Countryside and Rights of Way Act 2000 (CRoW Act) and the Natural Environment and Rural Communities (NERC) Act 2006.

7.3.4 Some SSSIs are designated for their assemblage of amphibians. The criteria for selecting SSSIs on the basis of the amphibians they support are provided in Guidelines for the Selection of Biological SSSIs (Nature Conservancy Council, 1989) and are summarised below:

- Natterjack toad – all important and established colonies with more than 100 adults or 25 spawn strings in 2 of the last 5 years and all heathland sites;
- Great crested newts – all exceptional sites with more than 100 adults seen in each of 3 years; and
- All species – sites with at least 4 species of breeding amphibians and large populations of at least 2 of these species, based on a point scoring system where 10 points are the minimum required to qualify.

7.3.5 Sites that are designated as SSSIs on this basis are considered to be of at least national importance for the amphibians they support. Sites which meet the criteria but are not designated should also be considered of national importance

7.3.6 Sites designated for nature conservation at the county level (Local Wildlife Sites) may also feature amphibian populations as all or part of the site qualifying criteria, although the criteria used vary from county to county. Such sites are protected through the planning system and there is generally a presumption against development in local authority development plans.

7.4 Species Protection

Legislation

7.4.1 Both within and outside designated sites, individual great crested newts, natterjack toads and the re-introduced northern clade pool frogs receive the highest degree of legislative protection afforded to species in England. Great crested newts, natterjack toads and pool frogs are covered by the Conservation of Habitats and Species Regulations 2010 (which replaces the 1994 Conservation (Habitats &c) Regulations). The Regulations make it an offence, with very few exceptions, to:

- Deliberately capture, injure or kill any wild animal of a European protected species (EPS);
- Deliberately disturb wild animals of any such species in such a way as to be likely:
    i. to impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or
    ii. in the case of animals of a hibernating or migratory species, to impair their ability to hibernate or migrate; or
    iii. to affect significantly the local distribution or abundance of the species to which they belong.
- Deliberately take or destroy eggs of any such wild animal;
- Damage or destroy a breeding site or resting place of such a wild animal; or
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from such an animal.

7.4.2 In addition to the protection given to great crested newts and natterjack toads under the Conservation of Habitats and Species Regulations 2010 already described, they are also partially protected in England under the Wildlife and Countryside Act, which adds the following offences (with certain exceptions):

- Disturbance while it is occupying a structure or place which it uses for shelter or protection; or
- Obstructing access to any structure or place used for shelter or protection.

7.4.3 The re-introduced northern clade pool frog receives full protection .It is an offence to kill, injure, capture or disturb them, and to damage or destroy pool frog habitats. It is also illegal to sell or trade pool frogs. Legal protection applies to all life-stages.

7.4.4 Offences under either Act may be punished through fines and / or custodial sentence at the discretion of the Court.

7.4.5 If proposed work could cause killing, injury or disturbance to either of these species or damage to their habitats, appropriate mitigation which seeks to avoid these impacts should be devised and implemented under a development licence from Natural England.

7.4.6 Smooth newts, palmate newts, common frog and common toad are not subject to European protection. However, these species are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and are subject to provisions of Section 9, which protect them from sale and trade only.

Planning policy

7.4.7 The National Planning Policy Framework (NPPF) 2012 gives further direction with respect to biodiversity conservation and land use change / development. The NPPF encourages local planning authorities to identify, conserve and restore, ecological networks, which should benefit amphibians, and it also states that planning permission should be refused if significant harm to biodiversity cannot be avoided, mitigated or compensated for. In addition, the Government Circular 06/05, which relates to biodiversity conservation, states that all protected species, such as great crested newts, are a material consideration for the planning authority when considering proposed developments.

7.5 UK Post-2010 Biodiversity Framework and Species of Principal Importance

7.5.1 Great crested newts, natterjack toads, common toads and northern clade pool frogs are considered priority species under the UK Post-2010 Biodiversity Framework 2012. Published by the Joint Nature Conservation Committee (JNCC) and the Department for Environment, Farming and Rural Affairs (Defra) in July 2012, this framework has now succeeded the United Kingdom Biodiversity Action Plan (UK BAP). The guidance dictates that former UK BAP information on priority species and priority habitats still remains in use. In addition, various amphibians appear as priority species on Local or Regional Biodiversity Lists.

7.5.2 Great crested newts, natterjack toads, common toads and clade pool frogs have been adopted as Species of Principal Importance for the conservation of biodiversity in England under Section 41 of the NERC Act 2006. Under this Act, the Secretary of State must take steps, or encourage others to take steps, to further the conservation of these species. In addition, every public body, including local planning authorities, has a general duty to have regard for the purpose of conserving biodiversity. This duty does not extend specifically to the Section 41 list; however, guidance published by Defra indicates that the Section 41 species should be considered a priority when implementing the duty. Furthermore, the NPPF states that local planning authorities should promote the protection and recovery of priority species populations, linked to national and local targets, which presumably means those listed under the Section 41 of the NERC Act and the former UK BAP.

7.6 References

7.6.1 Arnold, H.R (1995) Atlas of amphibian and reptiles in Britain. HMSO. London.

7.6.2 Beebee, T.J.C and Griffiths, R.A (2000) Amphibians and Reptiles. Harper Collins Publishers. London

7.6.3 Department for Environment, Farming and Rural Affairs (Defra) (2006) Natural Environment and Rural Communities (NERC) Act.

7.6.4 English Nature (1991) Facts about Amphibians. English Nature, Peterborough.

7.6.5 European Community (1992) Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.

7.6.6 Froglife (2001) Great Crested Newt Conservation Handbook. Froglife, Halesworth, Suffolk.

7.6.7 Gent, A.H and Gibson, S.D eds (1998) Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough.

7.6.8 Her Majesty's Stationery Office (HMSO) (1981) The Wildlife and Countryside Act.

7.6.9 Her Majesty's Stationery Office (HMSO) (2000) The Countryside and Rights of Way Act.

7.6.10 Her Majesty's Stationery Office (HMSO) (2010) The Conservation of Habitats and Species Regulations 2010.

7.6.11 Joint Nature Conservation Committee (JNCC) and the Department for Environment, Farming and Rural Affairs (Defra) (on behalf of the Four Countries' Biodiversity Group). (2012). UK Post-2010 Biodiversity Framework. Available from: http://jncc.defra.gov.uk/page-6189

7.6.12 Langton T, Beckett C and Foster J (2001) The great crested newt conservation handbook. Froglife.

7.6.13 Nature Conservancy Council (NCC) (1989) Guidelines for Selection of Biological SSSIs. Nature Conservancy Council, Peterborough.

7.6.14 Office of the Deputy Prime Minister (ODPM) (2005) 'Government Circular: Biodiversity and Geological Conservation- Statutory Obligations and Their Impact Within The Planning System.'

7.6.15 Oldham, R.S., Keeble, J., Swan, M.J.S., and Jeffcote, M (2000) Evaluating the Suitability of Habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal, Vol. 10, pp. 143-155.

7.6.16 Wisniewski, P.J. (1989) Newts of the British Isles. Shire Natural History, Aylesbury.

7.6.17 United Kingdom (UK) Biodiversity Partnership (1992). UK Biodiversity Action Plan. UK Biodiversity Partnership.

8. Appendix 2 - Biology, Legislation and Planning Policy of Reptiles

8.1 Introduction

8.1.1 A summary of the biology of British reptiles, the legislation that protects them and other mechanisms of highlighting species of conservation concern is provided below.

8.2 Biology

8.2.1 There are six British species of reptiles, comprised of three snake species, adder (*Vipera berus*), grass snake (*Natrix natrix*) and smooth snake (*Coronella austriaca*), and three lizard species, common lizard (*Zootoca vivipara*), sand lizard (*Lacerta agilis*) and slow worm (*Anguis fragilis*). In addition, there are a few introduced species, which may be encountered occasionally, arising from escapes or illegal releases. A summary of each species is given below, based on information provided in Arnold (1995), Beebee and Griffiths (2000) and Gent and Gibson (1998).

Adder

8.2.2 The adder has a distinctive zig-zag pattern running down the back. Adders emerge from hibernation from March onwards and bask in open areas, particularly in spring. The mean temperature of a basking adder is about 33°C. Adders do not feed before mating each year, with this occurring in April and May. The young are born in late August to September and hibernation commences in October. Adders are venomous and small mammals make up most of their diet.

8.2.3 The adder has a widespread but patchy distribution in Britain and is more abundant in the south than the north but nevertheless occurs in northern Scotland. They require undisturbed, open sunny areas in the vicinity of thick cover. South facing chalk or sandy slopes with mixed vegetation may be ideal, and adders may be found in heathland, moorland, coarse grassland and scrub.

Grass snake

8.2.4 The grass snake is the largest snake in Britain. They emerge from hibernation in March and, during spring in particular, bask in open areas in order to raise their body temperature. Active grass snakes maintain temperatures of between 26°C and 30°C. Eggs are laid in June and July with the young hatching in September. Their main food items are amphibians and fish, which they hunt when swimming or in vegetation.

8.2.5 Grass snakes have a lowland distribution in Britain and is absent from Scotland. It is widespread and locally common in the south-east of England. The grass snake is essentially an aquatic species, occurring mainly where there are good populations of amphibians. Nearby

open areas with direct sunshine in the vicinity of dense cover are also important, as are suitable egg laying sites.

Smooth snake

8.2.6 The smooth snake is superficially similar in appearance to the adder, though lacks the clearly defined zig-zag stripe running down the back. They emerge from hibernation from late February onwards though still spend much of their time below ground. They bask mainly by wrapping themselves around vegetation, rather than in open areas, although they may also lie under sheet material, such as corrugated tin. Their preferred operating temperature is between 28°C and 33°C. Live young are produced in August and September. Their main prey is small mammals and other reptiles.

8.2.7 The smooth snake is the rarest species of reptile in the UK, occurring almost exclusively on lowland dry heathland in the southern counties of England, namely Dorset, Hampshire, Surrey and West Sussex.

Common lizard

8.2.8 The common lizard is the smaller of the two British lizards with the typical legged body form. Common lizards emerge from hibernation from January onwards. Common lizards do bask in open sunny areas and try to achieve an optimum operating temperature of around 30°C. The young are born from mid-July to mid-September and hibernation commences in October. The main food items of this species are invertebrates.

8.2.9 Common lizards have a widespread distribution across England, Wales and Scotland and are also native to Ireland. They prefer undisturbed ground, with dense but short vegetation and patches of bare ground or promontories that are fully exposed to the sun. South facing slopes are often favoured. They are found in a variety of open habitats including roadside verges, railway embankments, woodland clearings, rough grassland, scrub, heathland and coastal sand dunes.

Sand lizard

8.2.10 The sand lizard is the other British lizard with the typical legged body form. Sand lizards emerge from hibernation from February onwards. They bask in open, sunny areas in spring but spend little time basking in the height of summer. They try to achieve a body temperature of between 27.5 and 32.5oC. Eggs are laid from the beginning of June to the end of August and hatch between 7 and 12 weeks later. Hibernation commences in early October. The main food items of this species are invertebrates.

8.2.11 The sand lizard has very specialised habitat requirements and occur naturally only on lowland sandy heathland in areas of Dorset, Hampshire and Surrey, and in Merseyside on coastal dunes densely vegetated with marram grass (*Ammophila arenaria*). They have also been introduced to parts of Berkshire, Cornwall, West Sussex, Devon and North Wales in recognition of the fact that the species used to occupy a wider range encompassing these areas.

Slow worm

8.2.12 The slow worm is a legless lizard that superficially resembles a snake. Slow worms emerge from hibernation from March onwards. When active, slow worms rarely bask in open areas and instead try to maintain a body temperature between 14.5°C and 28°C mainly by contact with warm surfaces. The young are born from mid-August to mid-September and hibernation commences in October. The main food items of this species are invertebrates.

8.2.13 Slow worms have a widespread distribution across England, Wales and Scotland, but are particularly common in southern and eastern England. They require fairly thick vegetation interspersed with sunny areas for thermoregulation and underground or covered refuges. They are found in a wide variety of habitats including rough grassland, heathland, moorland, downland, hedgerows, scrub and woodland edge. Good populations can sometimes be found on railway embankments, motorway verges and allotments.

8.3 Site Designation

8.3.1 The most important sites for reptiles in the UK receive statutory protection under the following legislation:

- Wildlife and Countryside Act (WCA) 1981, as amended;
- The Countryside and Rights of Way Act (CRoW) 2000 (which amends the Wildlife and Countryside Act); and
- Natural Environment and Rural Communities (NERC) Act 2006(which amends the Wildlife and Countryside Act).

8.3.2 Sites designated under the WCA 198, as amended, are known as Sites of Special Scientific Interest (SSSIs). SSSIs received further protection under the CRoW Act 2000 and the NERC Act 2006.

8.3.3 Some SSSIs are designated for the populations of reptiles that they support. The criteria for selecting SSSIs on the basis of their reptile populations are provided in Guidelines for the Selection of Biological SSSIs (NCC, 1989):

- Sand lizard – all important and established populations in Dorset and all established populations elsewhere;
- Smooth snake - all important and established populations in Dorset and all established populations elsewhere; and
- Other reptiles – best locality in a given area with outstanding assemblages of at least 3 species of the 4 other reptile species.

8.3.4 Sites that qualify as SSSIs are considered to be of at least national importance for the reptiles they support.

8.3.5 Sites designated for nature conservation at the county level may also include reptile populations as part of the site qualifying criteria, although the criteria used may vary from county to county.

Such sites are protected through the planning system and there is generally a presumption against development that affects such sites in local authority development plans.

8.4 Species Protection

Legislation

8.4.1 Both within and outside designated sites, individual smooth snakes and sand lizards are fully protected by law. Smooth snake and sand lizard are covered by the Conservation of Habitats and Species Regulations 2010 (which replaces the Conservation (Habitats &c) Regulations 1994). The Regulations make it an offence, with very few exceptions, to:

- Deliberately capture, injure or kill a smooth snake or sand lizard;
- Deliberately disturb a smooth snake or sand lizard in such a way as to be likely:
    i. to impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
    ii. to impair its ability to hibernate or migrate; or
    iii. to affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a smooth snake or sand lizard;
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead smooth snake or sand lizard, or any part of, or anything derived from a smooth snake or sand lizard.

8.4.2 In addition to the protection given to smooth snake and sand lizard under the Conservation of Habitats and Species Regulations 2010 already described, smooth snake and sand lizard are also partially protected in England under the WCA 1981, as amended, which adds the following offences (with certain exceptions):

- Disturbance while it is occupying a structure or place which it uses for shelter or protection; or
- Obstructing access to any structure or place used for shelter or protection.

8.4.3 If proposed work could cause killing, injury or disturbance to either of these species or damage to their habitats, appropriate mitigation which seeks to avoid these impacts should be devised and implemented under licence from Natural England.

8.4.4 Grass snake, common lizard, slow worm and adder also receive some protection under the WCA, though are protected from intentional killing, injuring and selling only. If proposed work could result in the killing and/or injury of grass snake, common lizard, slow worm or adder, appropriate mitigation should be devised and implemented with agreement from the local planning authority or Natural England. However, mitigation for these species is not subject to licensing by Natural England.

Planning Policy

8.4.5 The National Planning Policy Framework (NPPF), 2012 gives further direction with respect to biodiversity conservation and land use change / development. The NPPF encourages local planning authorities to identify, conserve and restore, ecological networks, which should benefit amphibians, and it also states that planning permission should be refused if significant harm to biodiversity cannot be avoided, mitigated or compensated. In addition, the Government Circular 06/05, which relates to biodiversity conservation, states that all protected species, such as reptiles, are a material consideration for the planning authority when considering proposed developments.

8.5 UK Biodiversity Action Plan and Species of Principal Importance

8.5.1 All British reptiles are considered priority species under the UK Post-2010 Biodiversity Framework (Joint Nature Conservation Committee (JNCC) and Defra, 2012). Published in July 2012, this framework has now succeeded the UK Biodiversity Action Plan (UK BAP). The JNCC guidance dictates that UK BAP background information on priority species and habitats still remains in use.

8.5.2 Reptiles have also been adopted as Species of Principal Importance for the conservation of biodiversity in England under Section 41 of the NERC Act 2006. This places a duty on all government departments to have regard for the conservation of these species and on the Secretary of State to further, or promote others to further, the conservation of these species. In addition, every public authority, including local planning authorities, has a general duty to have regard for the purpose of conserving biodiversity. This duty does not extend specifically to the Section 41 list; however, guidance published by Defra indicates that the Section 41 species should be considered a priority when implementing the duty. Furthermore, the NPPF states that local planning authorities should promote the protection and recovery of priority species populations, which presumably means those listed under the Section 41 of the Act.

8.6 References

8.6.1 Arnold, H.R (1995) *Atlas of amphibian and reptiles in Britain*. HMSO. London.

8.6.2 Beebee, T.J.C and Griffiths, R.A (2000) *Amphibians and Reptiles*. Harper Collins Publishers, London.

8.6.3 Department for Communities and Local Government (2012). *National Planning Policy Framework*. Published:27 March 2012.

8.6.4 Gent, A.H and Gibson, S.D eds (1998). *Herpetofauna Workers Manual*. Joint Nature Conservation Committee, Peterborough.

8.6.5 JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). (2012). *UK Post-2010 Biodiversity Framework*. Available from: http://jncc.defra.gov.uk/page-6189.

8.6.6 Nature Conservancy Council (NCC) (1989). *Guidelines for Selection of Biological SSSIs*. Nature Conservancy Council, Peterborough.

9. Appendix 3 - Biology, Legislation and Planning Policy of Bats

9.1 Introduction

9.1.1 A summary of the biology of British bats and the legislation and policy that protects them is provided below.

9.2 Biology

9.2.1 There are 18 British species of bats of two families, the horseshoe bats (*Rhinolophidae*) and vesper bats (*Vespertilionidae*). In Britain, there are two species of horseshoe bat both of which belong to the genus *Rhinolophus*, and the16 species of vesper belonging to six genera (*Myotis, Eptesicus, Nyctalus, Pipistrellus, Plecotus* and *Barbastella*). Whilst there are many differences in the biology of the different species, all share certain characteristics and these are described below.

Roosting

9.2.2 Bat species utilise roost sites of varying character; some preferring tree roosts whilst others are thought to be almost entirely dependent on built structures. Most bats will have a range of available roosting sites within their range which they move between throughout the year. They are generally faithful to their roosts and a colony of bats may use the same roost site(s) year after year.

9.2.3 In winter bats hibernate, often animals gather to hibernate communally remaining in the same hibernation roost from November to February/March. Hibernation roost sites typically have a constant low temperature and high humidity levels, sites include caves, mines, thick walled buildings and hollow trees. As the temperature and day length increase in spring bats leave their hibernation roosts, either moving immediately to summer roost sites or utilising occasional, transitional roosts.

9.2.4 By June breeding females congregate in maternity roost sites where they will give birth to, and nurture young. Male bats are also occasionally found roosting in maternity roosts but during this period they mostly roost alone. Maternity roost sites include hollowed out trees, buildings and bridges. Male bats may use similar sites but also cracks and crevices in trees, under loose tiles or even amongst dense ivy growth during the summer period. Similar sites may be used by bats for brief periods during the night when they are resting or eating recently caught prey. In autumn, male bats establish mating roosts and are visited by females and then a variety of roost sites may be used until the bats return to their hibernation roosts.

Foraging

9.2.5 All British bat species feed on invertebrates, with flies, beetles, moths and other insects making up much of their diet. Areas rich in insects are therefore favoured foraging sites for bats, with woodlands, scrub, wetlands, river corridors and flower rich grasslands being favoured foraging habitats. Habitats such as intensively farmed arable land, and amenity grassland support a much lower invertebrate diversity and is therefore unfavourable foraging habitat for bats.

Commuting

9.2.6 Bats favour roost sites in close proximity to suitable foraging habitat, however given variation in prey availability, land-use change, and competition with other bats, for at least part of the year bats must commute between their roosts and foraging habitat.

9.2.7 Commuting routes tend to follow linear features in the landscape such as hedgerows, woodland edges, rivers and other watercourses, particularly when crossing areas of less favourable habitat. The distance that bats commute between roost sites and foraging areas is dependent on local geography and also the species of bat. Some species will travel up to 18km, though shorter distances are more typical.

9.3 Site Designation

9.3.1 All bat roosts in the UK receive protection under the following legislation:

- Conservation of Habitats and Species Regulations 2010 (which replaces the Conservation (Habitats &c) Regulations 1994 as amended)
- Wildlife and Countryside Act 1981, as amended;
- The Countryside and Rights of Way Act 2000 (which amends the Wildlife and Countryside Act); and
- Natural Environment and Rural Communities Act 2006 (which amends the Wildlife and Countryside Act).

9.3.2 This is described in more detail under 'Species Protection' below. In addition, the most important sites for certain bat species in the UK receive further statutory protection by being designated as Special Areas of Conservation (SACs) and/or Sites of Special Scientific Interest (SSSIs).

9.3.3 Four bat species, greater and lesser horseshoe, barbastelle and Bechstein's bats, in the UK are included on Annex II of the European Community Directive of the Conservation of Natural Habitats and of Wild Fauna and Flora, referred to as the Habitats Directive. The Habitats Directive is transposed into UK law by the Conservation of Habitats and species Regulations 2010. This legislation requires that areas are designated as Special Areas of Conservation (SACs) to protect populations of these four bat species. To date, 26 SACs have been designated specifically to protect these species, and these sites are of international importance for the populations of bats that they support. A further 5 SACs have been designated, where the

presence of at least one of the four bat species is a qualifying feature but not the primary reason that the site was designated.

9.3.4 Sites designated under the Wildlife and Countryside Act 1981 (WCA) are known as Sites of Special Scientific Interest (SSSIs). SSSIs received further protection under the Countryside and Rights of Way Act 2000 (CRoW) and the Natural Environment and Rural Communities Act 2006.

9.3.5 Some SSSIs are designated for the population(s) of bats that they support. The criteria for selecting SSSIs on the basis of their bat populations are provided in Guidelines for the Selection of Biological SSSIs (NCC, 1989):

- Greater horseshoe bat – all main breeding roosts and all winter roosts with 50 or more adult bats;
- Lesser horseshoe bat - all main breeding roosts containing 100 or more adult bats and all winter roosts containing 50 or more bats;
- Barbastelle, Bechstein's and grey long-eared bats – any traditional breeding roosts;
- Natterer's, Daubenton's whiskered, Brandt's, serotine, noctule and Leisler's bats – only exceptionally large breeding roosts or those with a long history of use.
- Mixed Roost sites – all hibernacula containing four or more species and more than 50 individuals or three species and 100 or more individuals or two species and 150 or more individuals, though these criteria may be lower in some parts of the UK.

9.3.6 Sites that qualify as SSSIs for the bat populations they support are considered to be of at least national importance.

9.3.7 Sites designated for nature conservation at the county level may also include bat populations as part of the site qualifying criteria, although the criteria used may vary from county to county. Such sites are protected through the planning system and there is generally a presumption against development that affects such sites in local authority development plans.

9.4 Species Protection

Legislation

9.4.1 All bat species are protected by the Conservation of Habitats and Species Regulations 2010. The Regulations make it an offence, with very few exceptions, to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb a bat in such a way as to be likely:
    i. to impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
    ii. to impair its ability to hibernate or migrate; or
    iii. to affect significantly the local distribution or abundance of the species to which they belong.

- Damage or destroy a breeding site or resting place of a bat; or
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

9.4.2 In addition to the protection given to bats under the Conservation of Habitats and Species Regulations 2010 already described, bats are also partially protected in England under the Wildlife and Countryside Act, which adds the following offences (with certain exceptions):

- Disturbance while it is occupying a structure or place which it uses for shelter or protection; or
- Obstructing access to any structure or place used for shelter or protection.

9.4.3 A roost is any structure or place used by bats for shelter or protection. As bats tend to re-use the same roosts year after year, the roost is protected whether bats are present or not at the time.

9.4.4 In this context, 'damage' would include such operations as treatment of wood with toxic preservatives or use of rodenticides near roosting bats while 'disturbance' includes any work in or affecting a bat roost.

9.4.5 If proposed actions, such as redevelopment of an existing building may lead to an offence under the above legislation, appropriate mitigation which seeks to avoid these impacts should be devised and implemented under licence from Natural England to allow the activity to proceed legally.

9.4.6 In addition to the above legislation, all bats are protected under the Bonn Convention, within which the Agreement on the Conservation of Bats in Europe (1991) or EUROBAT, establishes a mechanism for international collaboration to conserve bats and their habitats, including foraging habitats. All European bat species are covered under Appendix II of the Conservation of Migratory Species of Wild Animals (CMS).

9.4.7 The Hedgerow Regulations 1997 provide for the conservation of 'important' hedgerows and their constituent trees. The presence of a protected species such as bats is included in the assessment of whether a hedgerow is considered 'important' and applications to remove such hedgerows must be made to the planning authority.

Planning Policy

9.4.8 The National Planning Policy Framework (NPPF) gives further direction with respect to biodiversity conservation and land use change / development. The NPPF encourages local planning authorities to identify, conserve and restore, ecological networks, which should benefit bats, and it also states that planning permission should be refused if significant harm to biodiversity cannot be avoided, mitigated or compensated. In addition, the Government Circular 06/05. which relates to biodiversity conservation states that all protected species, such as bats, are a material consideration for the planning authority when considering proposed developments.

9.5 UK Biodiversity Action Plan and Species of Principal Importance

9.5.1 Seven species of bat (Barbastelle, Bechstein's, greater and lesser horseshoe, brown long-eared, noctule and soprano pipistrelle) are priority species in the UK Post-2010 Biodiversity Framework (JNCC and Defra, 2012). Published in July 2012, this framework has now succeeded the UK Biodiversity Action Plan (UKBAP). The Joint Nature Conservation Committee guidance dictates that UK BAP background information on priority species and habitats still remains in use.

9.5.2 In addition, bats of any species may appear as Priority Species on Local or Regional BAPs. Government Circular 06/05 makes clear that UK Post-2010 Biodiversity Framework species and local BAP species are capable of being a material consideration in the planning process.

9.5.3 The bat species listed as priority species have also been adopted as species of principal importance for the conservation of biodiversity in England under Section 41 of the Natural Environment and Rural Communities Act 2006. Under this Act, the Secretary of State must take steps, or encourage others to take steps, to further the conservation of these species. In addition, every public authority, including local planning authorities, has a general duty to have regard for the purpose of conserving biodiversity. This duty does not extend specifically to the Section 41 list; however, guidance published by Defra indicates that the Section 41 species should be considered a priority when implementing the duty. Furthermore, the NPPF states that local planning authorities should promote the protection and recovery of priority species populations which presumably means those listed under the Section 41 of the Act.

9.6 References

9.6.1 Altringham, J. (2003) *British Bats*. New Naturalist Series No. 93.

9.6.2 Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines, 2nd Edition.* BCT, London.

9.6.3 Entwistle, A. C., Harris, S., Hutson, A., Racey, P., Walsh, A., Gibson, S., Hepburn, I., and Johnston, J. (2002) *Habitat management for bats: A guide for land managers, land owners and their advisors.* JNCC, Peterborough.

9.6.4 Highways Agency (1999 et seq) *Design Manual for Roads and Bridges, Volume 10 Environmental Design and Management,Section 3 The Good Roads Guide- Nature Conservation,* Part 6 Nature Conservation Management Advice in Relation to Bats.

9.6.5 HM Government (1995*) Biodiversity: The UK Steering Group Volume 2: Action Plans*. JNCC, Peterborough.

9.6.6 HM Government (1998) *Tranche 2 Action Plans: Volumes I and II.* English Nature, Peterborough.

9.6.7 Mitchell-Jones, A.J. & McLeish, A.P. (1999). *Bat Workers' Manual (2nd Edition).* Joint Nature Conservancy Committee, Peterborough

9.6.8 NCC (1989) *Guidelines for Selection of Biological SSSIs.* Nature Conservancy Council, Peterborough

9.6.9 Russ, J. (1999). *The Bats of Britain and Ireland*. Alana Ecology, Shropshire.

10. Appendix 4 - Biology, Legislation and Planning Policy of Badgers

Introduction

10.1.1 A summary of badger biology and the legislation and policy that protects this species is provided below.

Biology

10.1.2 Badgers (*Meles meles*) mostly live in family or social units of between 5 and 12 individuals that share a particular home range or territory, the boundary of which is marked with latrines. Within each territory, the social group is likely to have a number of setts, which are occupied during the day. Typically, badger setts are a series of inter-linked burrows and chambers created in a wooded embankment or hedgerow.

10.1.3 The setts vary in size, complexity and level of use. Normally, the social group will have one main sett used for breeding occupied throughout the year. Close to this may be one or more annexe setts, which are smaller and not necessarily used all year round. Two further sett types have been identified; these are subsidiary and outlying setts. Both of these sett types have few entrances and are usually some distance from the main sett. Occasionally, badgers rest above ground during the day, using 'day nests' comprised of bedding material amongst dense vegetation. Badgers do not hibernate but often spend long periods during the winter below ground, especially in very cold and wet weather.

10.1.4 Female badgers mainly become pregnant in December, though cubs may be born from January to April with a peak in February. Cubs are tended by the females until April or May, when they first emerge from the sett, however, they are not considered independent until the beginning of July (hence the "closed season" for development near a sett).

10.1.5 Badgers tend to live in areas of countryside that encompass a mixture of agricultural types and land uses, as a means to ensure that, throughout the entire year, access is available to a reliable and adequate food supply. A territory would ideally include a mixture of deciduous woodland and both pasture and arable land. Badgers are omnivorous; however, the majority of their diet is comprised of earthworms which are usually plentiful on short improved grassland. During certain times of the year they can vary their diet to include fruits and berries, or agricultural crops such as grain or maize.

10.1.6 This species is common and widespread throughout the British Isles. Badgers are abundant in south and south-west England and south Wales, less common in upland areas, East Anglia and Northern England and least common in central and western Scotland. In total there are approximately 309,000 adult badgers in mainland Britain, and this figure is believed to have remained stable over the past few years, though local variations have occurred.

Site Designation

10.1.7 Sites supporting badgers are not afforded statutory protection under either national or international legislation, since they are not considered to be of sufficient conservation importance. However, in an urban context, the presence of badgers, say in a local nature reserve, may well be considered of local nature conservation importance.

Species Protection

10.1.8 The principal law protecting badgers (*Meles meles*) is The Protection of Badgers Act 1992. The Act is primarily based upon the need to protect badgers from baiting and deliberate harm or injury. This statute makes it an offence to:

- willfully kill, injure, take, possess or cruelly ill-treat a badger, or attempt to do so;
- interfere with a sett by damaging or destroying it;
- obstruct access to, or any entrance of, a badger sett; or
- disturb a badger when it is occupying a sett.

10.1.9 In terms of licensing, a sett is defined as in 'current use' as long as signs indicative of 'current use' are present. Thus, a sett remains protected by the Act until such time as the field signs have deteriorated or decayed to such an extent that they no longer indicate that the sett is in 'current use'. For a sett to fall within the definition of the Act, a badger need not be in current occupation and may not have been for some time. As long as there are signs indicating current use, the sett is defined as such in the Act and is protected.

10.1.10 The maximum lapse of time between last occupation by badgers and the inspection of a sett for it to be considered in current use, is how long it takes for the field signs to disappear, or to appear so old as to not indicate current use.

10.1.11 Field signs are likely to last a period of weeks, depending on weather, soil type, habitat etc. Field signs indicating current use include prints, hairs, bedding, absence of debris at sett entrance, smooth tunnel edges at sett entrance, fresh dung pits.

10.1.12 The Act makes it an offence to interfere with a badger sett by disturbing a badger that is occupying the sett.

10.1.13 Disturbance is something more than limited noise or activity near a sett at levels which badgers commonly tolerate, without apparently being disturbed. Badgers appear to be able to withstand significant amounts of noise or activity near to their setts without apparently being disturbed, i.e. building setts under roads and railways and urban gardens.

10.1.14 As such, Natural England has taken the view that a licence is not required for low or moderate levels of disturbance akin to what badgers can generally tolerate.

10.1.15 In cases of major disturbance, a licence can only be obtained for sett disturbance between 1st July and 30th November so to avoid the time of year when cubs are present in the sett.

10.1.16 Where significant areas of foraging grounds are to be lost, a licence may be required as this can constitute disturbance and cruelty.

UK Post-2010 Biodiversity Framework and Species of Principal Importance

10.1.17 Published in July 2012, the UK Post-2010 Biodiversity Framework has now succeeded the UK Biodiversity Action Plan (UKBAP). The Joint Nature Conservation Committee guidance dictates that UK BAP background information on priority species and habitats still remains in use.

10.1.18 The badger is not a species of conservation concern nationally, and accordingly, is not considered a priority species under the UK Post-2010 Biodiversity Framework (JNCC and Defra, 2012). In an urban context and on the edges of its range, however, this species may be of local conservation concern.

10.2 References

10.2.1 Badgerland (2007). *Finding Evidence of Badgers.*

10.2.2 CCW (1999). *Badgers: a guide for developers.*

10.2.3 Clark, M. (1988). *Badgers. Whittet Books, London.*

10.2.4 Corbet, G.B. & Harris, S. (1991). *The Handbook of British Mammals. (3rd edn.). Blackwell, Oxford.*

10.2.5 English Nature (2002). *Badgers and development.*

10.2.6 Harris, S., Jefferies, D., Cheeseman, C. & Bright P. (1989). *Projects on Badgers. The Mammal Society, London.*

10.2.7 Harris, S., Jefferies, D., Cheeseman, C. & Booty, C. (1994). *Problems with Badgers? (3rd edn.). RSPCA, Horsham, West Sussex.*

10.2.8 Highways Agency (1996 et seq). *Design Manual for Roads and Bridges, Volume 10 Environmental Design and Management Section 4 The Good Roads Guide - Nature Conservation, Part 2 Mitigation Against Effects on Badgers.*

10.2.9 JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). (2012). *UK Post-2010 Biodiversity Framework. Available from: http://jncc.defra.gov.uk/page-6189.*

10.2.10 Jones, A. (1991). *The Badger Book. The Mammal Society, London.*

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

10.2.12 Neal, E. & Cheeseman, C. (1996). *Badgers*. T & A D Poyser Ltd, London.

10.2.13 Roper, T.J. (2010). *Badger.* Collins.

10.2.14 Woods, M. (1995). *The Badger.* The Mammal Society, London.

11. Appendix 5 - Biology, Legislation and Planning Policy of Breeding Birds

11.1 Introduction

11.1.1 A summary of the biology of breeding birds, the legislation and policy that protects them and other mechanisms of highlighting species of conservation concern is provided below.

11.2 Biology

11.2.1 There are around 250 species of bird which breed (or have bred in the recent past) in the UK (Gibbons *et al*, 1993; Mead, 2000). Many of these are resident birds, which are present all year round. However, they are joined in summer by migrants, which have spent the winter further south. The migrant species may also be seen passing through a site or region in spring and autumn, on their way to their breeding and wintering grounds, respectively. The different species breed in nearly all habitats, from bare ground through to woodland and therefore, bird's nests may be found almost anywhere. The breeding season for the majority of species extends from March through to July, though some species may nest earlier and later in the year (Snow and Perrins, 1998).

11.3 Site Protection

11.3.1 The most important sites for breeding birds in the UK receive statutory protection under the following legislation:

- The Ramsar Convention;
- The Conservation of Species and Habitats Regulations 2010;
- Wildlife and Countryside Act 1981, as amended;
- The Countryside and Rights of Way Act 2000 (which amends the Wildlife and Countryside Act); and
- The Natural Environment and Rural Communities Act 2006 (which also amends the Wildlife and Countryside Act).

11.3.2 Ramsar sites are protected under the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. Whilst many of these sites are important mainly as habitat for wintering birds, some are at least partly designated for the breeding birds that they support.

11.3.3 Sites protected under the Conservation of Species and Habitats Regulations 2010 (the Habitats Regulations) for the birds they support are known as Special Protection Areas (SPAs). SPAs are part of European wide network which are selected to conserve the habitat of certain species of bird that are listed under the EC Council Directive on the Conservation of Wild Birds, known as the Birds Directive.

11.3.4 Sites designated under the Wildlife and Countryside Act 1981 (WCA) are known as Sites of Special Scientific Interest (SSSIs). SSSIs received further protection under the Countryside and Rights of Way Act 2000 (CRoW). Some SSSIs are designated for their assemblage of breeding birds. The criteria for selecting SSSIs on the basis of their breeding bird assemblage are provided in Guidelines for the Selection of Biological SSSIs (NCC, 1989). The types of sites which may designated as a SSSI for breeding birds include the following:

- Localities which support more than 1% of the total British breeding population of any native species, including large aggregations of numerous species and small numbers of very rare species;
- Seabird colonies comprising more than 10,000 breeding pairs;
- The largest colony of colonial seabird species, herons or sand martin within a given area, but with at least 10 pairs;
- Localities which support an exceptionally good range of bird species characteristic of the habitat concerned;
- Localities consisting of semi-natural habitats where at least 70 breeding species have been recorded in recent years; and
- Localities which support rare species or which are otherwise unusual.

11.3.5 Sites designated for nature conservation at the county level may also include breeding bird populations as part of the site qualifying criteria, although the criteria used may vary from county to county. Such sites are protected through the planning system and there is generally a presumption against development that affects such sites in local authority development plans.

11.4 Species Protection

Legislation

11.4.1 Both within and outside of designated sites, all wild birds, their eggs and their nests are protected under the Wildlife and Countryside Act 1981, as amended (WCA). This makes it an offence, with certain exceptions to intentionally:

- Kill, injure or take any species of wild bird;
- Take, damage or destroy their nest while that nest is in use or being built; or
- Take or destroy their eggs.

11.4.2 Some species of bird that are of high nature conservation priority or are otherwise in greater need of legal protection are included on Schedule 1 of the WCA. For these species, it is also an offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young. Species listed on Schedule 1 of the WCA include kingfisher, red kite and greenshank. In addition, golden eagle, white-tailed eagle and osprey receive further protection still in that their nests are protected all year round, so even when not in use by the birds.

Planning Policy

11.4.3 The National Planning Policy Framework (NPPF) gives further direction with respect to biodiversity conservation and land use change / development. The NPPF encourages local planning authorities to identify, conserve and restore, ecological networks, which should benefit birds, and it also states that planning permission should be refused if significant harm to biodiversity cannot be avoided, mitigated or compensated. In addition, the Government Circular 06/05, which relates to biodiversity conservation, states that all protected species such as breeding birds, are a material consideration for the planning authority when considering proposed developments.

11.5 UK Post-2010 Biodiversity Framework and Species of Principal Importance

11.5.1 The UK Post-2010 Biodiversity Framework was published in July 2012 and includes all the species previously identified as UK level Biodiversity Action Plan (UK BAP) priority species. The UK Biodiversity Action Plan was published in 1994 in response to the 1992 International Convention on Biological Diversity and was last updated in 2007. There are 59 bird species listed as priority species on the UK BAP (now called UK Post-2010 Biodiversity Framework), with 48 of these occurring in England. Examples of breeding bird species that are priorities in the UK Post-2010 Biodiversity Framework include house sparrow, herring gull, dunnock, reed bunting, linnet, bullfinch and song thrush. In addition, species of breeding bird may appear as Priority Species on Local or Regional BAPs. Government Circular 06/05 makes clear that UK and local BAP species are capable of being a material consideration in the planning process.

11.5.2 The priority species of birds in the UK Post-2010 Biodiversity Framework that occur in England, plus hen harrier, are also Species of Principal Importance for the Conservation of Biodiversity in England under Section 41 of the NERC Act 2006. This places a duty on all government departments to have regard for the conservation of these species and on the Secretary of State to further, or promote others to further, the conservation of these species. In addition, every public authority, including local planning authorities, has a general duty to have regard for the purpose of conserving biodiversity. This duty does not extend specifically to the Section 41 list; however, guidance published by Defra indicates that the Section 41 species should be considered a priority when implementing the duty. Furthermore, the NPPF states that local planning authorities should promote the protection and recovery of priority species populations which presumably means those listed under the Section 41 of the Act.

11.6 Red and Amber List Species

11.6.1 The leading governmental and non-governmental conservation organisations have reviewed the status of 246 bird species that regularly occur in the UK. Those species of high or medium conservation concern are given 'Red List' (52 species) and 'Amber List' (126 species) status, respectively (Eaton, M.A. *et al*, 2009). The potential reasons for inclusion on the Red List for breeding birds are:

- Greater than 50% decline in the UK breeding population in the 25 years preceding 2009 or since the first BoCC review in 1969 ("longer term");

- Greater than 50% decline in the UK non-breeding population in the 25 years preceding 2009 or over the longer term;
- Greater than 50% contraction of UK breeding range in the 25 years preceding 2002;
- A historical population decline in the UK during 1800 to 1995 without substantial recovery; or
- On the IUCN list of globally threatened species

11.6.2 Species included on the Red List include several common and widespread species, including house sparrow, starling, skylark, bullfinch and song thrush.

11.6.3 For species on the Amber List potential reasons for inclusion for breeding birds are:

- A moderate (25-49%) decline in the UK breeding population over the 25 years preceding 2009 or over the longer term;
- A moderate (25-49%) contraction of the UK breeding range over the 25 years preceding 2009 or over the longer term;
- Species with unfavourable conservation status in Europe;
- A five-year mean of 1-300 breeding pairs in the UK;
- Greater than or equal to 50% of the UK breeding population in 10 or fewer sites, but not otherwise rare breeders; or
- Greater than or equal to 20% of European breeding population in the UK.

11.6.4 Examples of species on the Amber List are dunnock, kestrel, snipe and mistle thrush.

11.6.5 Red and Amber List species are not necessarily the same as Schedule 1 species, Priority species in the UKBAP or Species of Principal Importance. Red and Amber List species do not receive any specific additional legal protection over and above the basic provisions of the WCA, unless they are also included on Schedule 1 or listed under Section 41 of the NERC Act.

11.7 Red Data Book Species

11.7.1 A further system for identifying threatened bird species is the IUCN threat categories, with lists of threatened species published in Red Data Books. For birds, species accounts are provided in Batten *et al* (1990).

11.7.2 Red Data Book species do not receive any specific additional legal protection over and above the basic provisions of the WCA, unless they are also included on Schedule 1 or listed under Section 41 of the NERC Act.

11.8 References

11.8.1 Batten, Bibby, Clement, Elliot and Porter (1990) *Red Data Birds in Britain - Action for rare, threatened and important species.* T & AD Poyser, London.

11.8.2 Brown, A & Grice, P (2005) *Birds in England*. Christopher Helm.

11.8.3 Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. British Birds 102, pp296-341.

11.8.4 Gibbons D. W., Reed J. B. and Chapman, R. A. (1993) *The New Atlas of Breeding Birds in Britain and Ireland 1988 - 1991*. T & AD Poyser, London.

11.8.5 Gregory RD, Wilkinson NI, Noble DG, Robinson J A, Brown A F, Hughes J, Proctor DA, Gibbons DW and Galbraith CA (2002) *Population status of birds in the UK - Birds of conservation concern: 2002-2007* British Birds 95 410 – 450.

11.8.6 HM Government (1995) Biodiversity: The UK Steering Group Volume 2: Action Plans. JNCC, Peterborough.

11.8.7 HM Government (1998) Tranche 2 Action Plans: Volumes I and II. English Nature, Peterborough.

11.8.8 HM Government (2006) Natural Environment and Rural Communities Act.

11.8.9 Mead, C. (2000) *The State of the Nation's Birds*.

11.8.10 NCC (1989) *Guidelines for Selection of Biological SSSIs*. Nature Conservancy Council, Peterborough.

11.8.11 National Planning Policy Framework (2012)

11.8.12 Snow, D.W. & Perrins, C. M, (1998). *The Birds of the Western Paleartic,* Concise Edition Volumes I and II. Oxford University Press

12. Appendix 6 – Legal and Planning Policy Issues in England

Scope of Assessment

12.1.1 The first step is to identify any biodiversity features found on the site that are subject to legal or policy controls, as follows:

Designated Sites

12.1.2 The location of the site is compared to the distribution of sites with a statutory or non-statutory nature conservation designation using information derived from the desk study. Consideration is given to designated sites that could be affected directly or indirectly by the proposed development.

Habitats outside Designated Sites

12.1.3 The habitats known to occur on the site are compared to those which receive some protection, in law or policy, outside of designated sites *i.e.* hedgerows, uncultivated land and semi-natural areas, habitats listed as Priorities in the UK Post-2010 Biodiversity Framework (previously known as UKBAP), habitats listed as Habitats of Principal Importance for the Conservation of Biodiversity by the Secretary of State and habitats listed as requiring action in the Local Biodiversity Action Plan.

Ancient Woodland

12.1.4 The ancient woodland inventory is checked to determine whether any known ancient woodland occurs either on the site or nearby.

Protected Species

12.1.5 The species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared with those listed in nature conservation legislation i.e. the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended).

12.1.6 In addition, the species known to occur on the site as a result of the desk study and Phase 1 habitat survey are compared with those listed in animal welfare legislation, i.e. the Badgers Act 1992 and the Wild Mammals (Protection) Act 1996.

UK Post-2010 Biodiversity Framework Species (previously known as Biodiversity Action Plan Priority Species

12.1.7 The species known to occur on the site are compared with those listed as Priorities in the UK Post-2010 Biodiversity Framework (previously UKBAP), Species of Principal Importance for the Conservation of Biodiversity by the Secretary of State or requiring action in the Local Biodiversity Action Plan.

Other Species of Conservation Concern

12.1.8 The species known to occur on the site are compared with other nature conservation listings, such as red data books.

Invasive Plant Species

12.1.9 The species of plant present on the site are compared with those listed by government agencies as invasive non-natives, with particular attention given to those listed in the Wildlife and Countryside Act.

Review of Legislation and Policy

12.1.10 If any of the above are found to occur on or near the site and are likely to be affected by the development in any way, the relevant legislation and planning policy (including national, regional, county and borough policies) are examined to determine whether the proposed development is compliant.

Ecological Enhancement

12.1.11 Planning policy generally requires new developments to be enhanced for biodiversity. The existing proposals are considered to determine whether biodiversity enhancements are offered and whether they are adequate to meet the policy requirements. Again, national, regional, county and borough policies are considered.

12.2 Identification of Potential Further Ecological Issues

12.2.1 Further ecological issues are those which can not be resolved during the desk study and extended Phase 1 habitat survey for any reason, including the following:

- The development is near a designated site and consultation with the relevant regulator is required in order to determine whether further assessment is required;
- Suitable habitat is present on or near the site for a protected species/species of conservation concern and specialist survey techniques are required for their detection;
- Suitable habitat is present on or near the site for a protected species/species of conservation concern and the extended Phase 1 habitat survey was not undertaken at a suitable time of year for their detection;

- A protected species/species of conservation concern was found on or near the site but further information on population size or distribution is required in order to resolve any legal and planning policy issues (such as obtaining licences).

12.2.2 Discussion of issues raised by 3rd parties, e.g. reports of protected species from the site by local people, may also be discussed under this heading.

12.2.3 The desk study is used as a guide to the protected species/species of conservation in the local area, however, the list is not taken to be exhaustive and it is borne in mind that some species may no longer occur in the locality.

12.2.4 No attempt is made to evaluate the importance of the site for species not yet confirmed to be on or near the site, nor to discuss the implications for the development if the species were to be found on the site.

13. Appendix 7 – Extended Phase 1 Habitat Species Lists

Scattered broadleaved trees (SBW)

Common name	Scientific name	Abundance (DAFOR)
Pedunculate oak	*Quercus robur*	D
Ash	*Fraxinus excelsior*	A
Hawthorn	*Crataegus monogyna*	A
Goat willow	*Salix caprea*	F
Willow species	*Salix sp.*	F
Horticultural cherry tree	*Prunus* sp.	F
Sycamore	*Acer pseudoplatanus*	O
Horticultural apple tree	*Malus* sp.	O
Holly	*Ilex aquifolium*	O
Whitebeam	*Sorbus aria*	R
Common lime	*Tilia x europaea*	R
London plane	*Platanus x hispanica*	R
Elder	*Sambucus nigra*	R

Scattered coniferous trees (SCW)

Common name	Scientific name	Abundance (DAFOR)
Leyland cypress	*x Cuprocyparis leylandii*	D
Monteray pine	*Pinus radiata*	A

Dense scrub (DS1)

Common name	Scientific name	Abundance (DAFOR)
Bramble	*Rubus fruticosus* agg.	D

Scattered scrub (SS1)

Common name	Scientific name	Abundance (DAFOR)
Ash	*Fraxinus excelsior*	D

Scattered scrub (SS2-SS4)

Common name	Scientific name	Abundance (DAFOR)
Ash	*Fraxinus excelsior*	D
Bramble	*Rubus fruticosus* agg.	D

Amenity grassland (AM1)

Common name	Scientific name	Abundance (DAFOR)
Perennial rye-grass	*Lolium perenne*	D
Yorkshire fog	*Holcus lanatus*	A
Red fescue	*Festuca rubra*	A
Greater plantain	*Plantago major*	O
Yarrow	*Achillea millefolium*	O
Dandelion	*Taraxacum* agg.	O
Geranium species	*Geranium* sp.	O
Ragwort species	*Senecio* sp.	O
Common mallow	*Malva sylvestris*	O
Cock's-foot	*Dactylis glomerata*	O
Bristly Oxtongue	*Picris echioides*	R

Introduced shrub (IS1 to IS4)

Common name	Scientific name	Abundance (DAFOR)
Hebe	*Hebe* sp.	D
Bramble	*Rubus fruticosus* agg.	O
Ash	*Fraxinus excelsior*	O
Ivy	*Hedera helix*	O
Berberis	*Berberis* sp.	O
St. John's Wort (horticultural)	*Hypericum* sp.	O
Himalayan cotoneaster tree	*Cotoneaster frigidus*	O
Spindle (horticultural)	*Euonymus* sp.	O

Elder	*Sambucus nigra*	O
Common mallow	*Malva sylvestris*	O
Bay tree	*Laurus nobilis*	O
Holly	*Ilex aquifolium*	O
Butcher's-broom	*Ruscus aculeatus*	R
Hydrangea	*Hydrangea* sp.	R
Butterfly bush	*Buddleja davidii*	R
Pyracantha species	*Pyracantha sp.*	R

Species-poor hedge (PH1 to 5)

Common name	Scientific name	Abundance (DAFOR)
Garden privet	*Ligustrum ovalifolium*	A
Ash	*Fraxinus excelsior*	A
Wild privet	*Ligustrum vulgare*	A
Elder	*Sambucus nigra*	F
Ivy	*Hedera helix*	O
Lavender	*Lavandula* sp.	O
Bay tree	*Laurus nobilis*	O
Mexican orange blossom	*Choisya ternata*	O
Bramble	*Rubus fruticosus* agg.	O
Holly	*Ilex aquifolium*	O
Willow species	*Salix* sp.	O
Honeysuckle	*Lonicera periclymenum*	O

APPENDIX B: INITIAL BAT SURVEY REPORT



Homes and Communities Agency

Waterfront, Daedalus

Initial Bat Survey Report

855435

JUNE 2014

RSK GENERAL NOTES

Project No.: 855435

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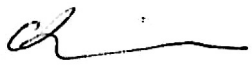
Signature		Signature	
Date:	18.06.14	Date:	20.06.14
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Date:	23.06.14	Date:	

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

CONTENTS

1 EXECUTIVE SUMMARY 1
2 INTRODUCTION 2
2.1 Purpose of this Report 2
2.2 Ecological Context 2
2.3 Structure of the Report 2
3 METHODS 3
3.1 Background Data Search 3
3.2 Initial Bat Survey 3
4 RESULTS 6
4.1 Background Data Search 6
4.2 Initial Bat Survey 6
5 EVALUATION AND CONCLUSIONS 37
5.1 Evaluation and Potential Impacts 37
5.2 Further Survey 37
6 LEGISLATION AND BAT ECOLOGY 39
6.1 Ecology 39
6.2 Legislation 39
7 REFERENCES 41
8 FIGURES 42

1 EXECUTIVE SUMMARY

1. This report presents the results of an initial bat survey carried out from the 5th to 13th May 2014 by Dave Cove, a senior bat licensed ecologist and Corin Simmonds MCIEEM a senior ecologist.
2. The main part of the Waterfront site comprises non-operational military barracks, hangers and industrial units with areas of hardstanding and amenity grassland.
3. Seventy one buildings were surveyed for bats
4. The surveys revealed three confirmed roosts, three high potential buildings, ten moderate potential buildings, three low to moderate potential buildings and 15 low potential buildings.
5. Additional surveys of these buildings will be required to gather sufficient data on their use by bats in order to inform future planning applications for the site.
6. Any building supporting roosting bats is protected by EU and UK law. If these buildings are due to be demolished then a European Protected Species Licence will be required to allow a derogation of the legislation.

2 INTRODUCTION

2.1 Purpose of this Report

This report presents the results of an initial bat survey carried out from the 5th to 13th May 2014 by Dave Cove, a senior bat licensed ecologist and Corin Simmonds MCIEEM a senior ecologist. The purpose of the survey was to make an initial assessment of the likelihood of the buildings to support roosting bats.

2.2 Ecological Context

The Waterfront site is located to the south of the operational airfield at HMS Daedalus. The site is bounded by the airfield to the north and the Solent coast to the south and west. To the east is the residential area of Lee-on-the-Solent. The site comprises hangers, industrial units, disused barracks and buildings which once formed part of the HMS Daedalus site. There is amenity grassland and hard standing used as access roads and parking between the buildings. Planted mature trees are located around the site, in particular the eastern half where the original barracks are located.

2.3 Structure of the Report

The remainder of this report is structured as follows:

- *Section 3* describes the survey and assessment methods;
- *Section 4* presents the survey results;
- *Section 5* sets out the legislation and ecology of bats
- *Section 6* gives an evaluation of the results; and
- *Section 7* lists the references.

3 METHODS

3.1 Background Data Search

An ecological background data search was not undertaken for this survey however data was available from a previous report undertaken by Thomson Ecology in 2014. This data search looked for records of bat species within 1 km of the site using the following websites:

- The National Biodiversity Network (NBN) Gateway; and
- The Multi-Agency Geographical Information for the Countryside (MAGIC).

3.2 Initial Bat Survey

The buildings were assessed for their suitability to support roosting bats, according to the following factors that influence the likelihood of bats roosting.

- Surrounding habitat: whether there are potential flight-lines and bat foraging areas nearby.
- Construction detail: the type and construction of architectural features such as attics, soffit boxes, lead flashing and hanging tiles that could be used by roosting bats. Some construction details and materials are more favourable to bat occupation than others.
- Building condition: whether the building has no roof or has a sound roof without any potential bat-access points.
- Internal conditions: bats favour sheltered locations with a stable temperature regime, protection from the elements and little wind/light/rain penetration.
- Potential bat-access points: whether there is flight and crawl access.
- Potential roosting locations: descriptions of all bat-accessible voids, cracks and crevices.

Descriptions of the buildings were recorded onto specially-designed survey sheets, and digital photographs were taken as a record. Each building was categorised as defined in *Table 3.1*.

Table 3-1 Classification criteria for Bat Roosting Potential (BRP) of Buildings and Built structures.

Category (Potential to support roosting bats)	Description
Negligible Potential	Buildings with no features suitable for supporting roosting bats. Modern, well maintained buildings or built structures that provide few opportunities for bat access/roosting (i.e. with no cracks or crevices); composed of prefabricated steel and sheet materials; no internal loft space; high level of regular disturbance; high interior light levels and subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Low Potential	Buildings with limited features to support roosting bats - shallow crevices where mortar is missing between brickwork. Buildings may have large open locations subject to large temperature fluctuations. Buildings may be surrounded by poor or sub-optimal bat foraging habitat. No evidence of bats found.
Moderate Potential	Buildings with some features suitable for roosting bats – building usually of brick or stone construction with a small number of features suitable for roosting bats – loose roof or ridge tiles, gaps in brickwork, gaps under fascia boards, and/or sealed internal loft space. No evidence of bats found.
High Potential	Buildings with a large number of features or extensive areas with potential for roosting bats. Sheltered locations with a stable temperature regime and suitable access points. Features can include: weatherboarding and/or hanging tiles with gaps/large (>20cm) roof timbers with mortise joints, cracks, holes); poorly maintained fabric providing ready access into roofs, walls, but at the same time not being draughty and cool; large and complicated roof void with unobstructed flying spaces. No evidence of bats found.
Confirmed Roost	Bats or evidence of bats recorded within the building during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

The buildings were then inspected for evidence of bats. Visual, systematic examinations were made for bats and evidence of bats, both internally and externally, of the following:

- roof slopes and the ridge;
- wall, window and door surfaces;
- window and door frames;
- wall bases;
- wall ledges and wall tops;
- roof beams;
- cracks, crevices and sheltered voids;
- the floors and stored items; and
- external features such as soffits and lead flashing.

Evidence of roosting bats includes droppings, urine stains, staining from fur-oils, scratch marks, wear marks, feeding remains, dead bats, odour, squeaking and chattering, and in some cases the absence of cobwebs. Bat droppings can prove beyond doubt that bats use a building and can help to identify roosting locations because piles often accumulate beneath roosting sites or entrance points.

4 RESULTS

4.1 Background Data Search

Information gathered from the background data search undertaken by Thomson Ecology in 2014 revealed that there are no records of any bat species from the 1km search area. Initial bat surveys and emergence surveys were undertaken by Thomson Ecology in 2010. *Table 4.1* summarises the results of these surveys.

Building Number	Results	Surveyed by RSK 2014
87	Single dropping found in roof void	No
91	Common Pipistrelle (*Pipistrellus pipistrellus)* emerging	Yes
92	Common Pipistrelle (*Pipistrellus pipistrellus)* emerging	Yes
97	Common Pipistrelle (*Pipistrellus pipistrellus)* emerging	Yes
118	Droppings found in roof	Yes
119	Droppings found in roof	Yes
148	Droppings found in roof void and Common pipistrelle (*Pipistrellus pipistrellus)* emerging	No
149	Single dropping found in roof void	No
162	Common Pipistrelle (*Pipistrellus pipistrellus)* emerging	No
165	Two droppings found in roof void	Yes
166	Common Pipistrelle (*Pipistrellus pipistrellus)* emerging	Yes

4.2 Initial Bat Survey

The Waterfront site comprises approximately 90 buildings of which RSK was commissioned to survey 79. Of these eight had been demolished so 71 buildings were assessed for potential to support roosting bats. The results of the survey are summarised in *Table 4.2* including the bat roosting potential and main evidence found. It is unknown whether or not these buildings were checked for bat prior to demolition.

Table 4-2 Results of Initial Bat Survey

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
3	E & T Block	Two-storey empty offices and garage building. 30m x 10m x 10m *Roof* – Flat, built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick walls with internal concrete rendering.	No access points or roosting features	None	**Negligible bat potential**	None
4	E&T Power House	Disused power house built 1930's. Single-storey. 5m x 5m x 5m *Roof* – Flat, built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick walls with internal concrete rendering.	No access points or roosting features	None	**Negligible bat potential**	None
6	Explosives store	Single-storey disused explosives store, built 1930's. 4m x 4m x 3m *Roof* – Flat, built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick walls.	No access points or roosting features	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
7	Air & Gas bottle store	Single-storey disused explosives store, built 1930's. 4m x 4m x 3m *Roof* – Flat, built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick walls.	No access points or roosting features	None	**Negligible bat potential**	None
14	Kingston Villa	Disused houses / offices two-storeys, built 1934. 12m x 12m x 7m *Roof* – Pitched with clay tiles with clay ridge tiles. Wooden sarking beneath. Both barge boards and soffit boxes present. *Walls* – Solid brick walls. Small ground floor extension on east elevation with wooden barge boards on three sides.	*Eastern extension* - no gaps beneath barge boards *South east upper corner of east facing main wall* missing mortar. Soffit boxes with occasional gaps between box and wall. *East facing roof* slope has many lifted tiles. North facing gable there is a gap between soffits into wall plate. *South facing gable* sever settlement crack with gap through brickwork into roof void. *West facing extension* – brickwork has collapsed at eaves level around windows creating suitable crevices. *West facing roof slope* has lifted tiles and missing/broken tiles. *Rear ground floor extension* barge board with suitable gaps and cracks in wall. *Roof void* – open with plenty of gaps along eaves.	No droppings or evidence of bats	**This building has high potential.** **No evidence of bats but there are areas where bats could roost out of view.**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
15	Crash Tender Bay	Disused single-storey open fronted parking bays. Built 1930's. *Roof* – Flat built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick with three open bays and brick walls between.	No access points or roosting features	None	**Negligible bat potential**	None
16	Control tower	Wooden board building with flat roof and external metal staircase. *Roof* – Flat with roof felt. *Walls* – Wooden boards.	No access points or roosting features	None	**Negligible bat potential**	None
18	Explosives Store	Single-storey above ground with possible basement level. Currently disused. Built 1930's. 10m x 10m x 3m *Roof* – Flat with concrete slabs and grass. *Walls* – Solid brick and concrete pre-fabricated walls. Concrete rendering on some external walls.	No access points or roosting features	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
20	Explosives Store	Single-storey above ground with possible basement level. Currently disused. Built 1930's. 10m x 10m x 3m *Roof* – Flat with concrete slabs and grass. *Walls* – Solid brick and concrete pre-fabricated walls. Concrete rendering on some external walls.	No access points or roosting features	None	**Negligible bat potential**	None
21	Storage shed – unknown use	Single-storey brick shed disused and totally overgrown with ivy and other vegetation. *Roof* – Flat constructed of concrete slabs. *Walls* – Solid brick walls.	No access points or roosting features	None	**Negligible bat potential**	None
26	MPBW Store and Garage	Single-storey building currently used for storage. *Roof* – Flat constructed of concrete / unknown material. Barge boards on all four elevations. *Walls* – Solid brick walls.	No gaps between barge boards and wall.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
27	Electricity Substation	Single-storey electrical sub-station. 4m x 4m x 1.5m *Roof* – Flat, built of concrete slabs. No soffit boxes or barge boards. *Walls* – Solid brick walls with internal concrete rendering	No access points or roosting features	None	**Negligible bat potential**	None
31	Boat Hanger (Type J Hanger)	Single-storey boat hanger currently in use as Hovercraft storage and museum. *Roof* – Pitched corrugated iron roof with metal ridge and metal frame. No lining to roof. Exterior with barge boards. *Walls* – Single skinned corrugated metal walls.	There are gaps in the building where bats could access the building but there are no internal areas suitable for roosting.	None	**Negligible bat potential**	None
33	Winch House	Small brick shed used by a charity. *Roof* – Pitched corrugated iron roof with metal ridge. Bargeboards along both gables and along the eaves. *Walls* – Solid brick walls.	No suitable gaps underneath the barge boards.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
34	MT Oil Store	Single-storey disused oil storage building. *Roof* – Flat constructed of concrete slabs. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
35	MT Hanger (Type J hanger)	Single-storey hanger. Partially in use. *Roof* – Pitched corrugated iron roof with metal ridge and metal frame. Metal interior lining *Walls* – Single skinned corrugated metal walls.	No access points or roosting features.	None	**Negligible bat potential**	None
37	MT Hanger (Type J hanger)	Single-storey hanger. Disused *Roof* – Pitched corrugated iron roof with metal ridge and metal frame. Metal interior lining. *Walls* – Single skinned corrugated metal walls.	No access points or roosting features.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
38	CAO's Office	Single-storey office building. Built 1935. *Roof* – Pitched slate tiled roof with wooden barge boards. Roof trusses extended outside brick wall and barge boards attached. Boiler room lean-to has large brick chimney. *Walls* – Solid brick walls. Large sash window.	Some slipped tiles on pitched roof. Internal - one large roof void with wooden sarking attached directly onto tiles, therefore not suitable for roosting. Metal truss frame.	None	**Low bat potential**	Roof void viewed but not accessed due to fragile roof structure.
39	MT Workshop (Type G Hanger)	Hanger used for storage. *Roof* – Pitched corrugated iron roof with metal ridge. Unlined. *Walls* – Single-skinned corrugated metal walls	Large open hanger with no access points or roosting features.	None	**Negligible bat potential**	None
40	HTU Hanger (Type G Hanger)	Hanger used for storage. *Roof* – Pitched corrugated iron roof with metal ridge. Unlined. *Walls* – Single-skinned corrugated metal walls.	Large open hanger with no access points or roosting features.	None	**Negligible bat potential**	None
41	MPBW store	*Roof* – Flat built of concrete slabs. *Walls* –Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
52	Boiler	Attached to large building 51 (not in remit to survey). *Roof* – Sloping corrugated asbestos roof attached to building 51. Wooden barge board on east and west elevation. *Walls* – Solid concrete walls.	No access points or roosting features.	None	**Negligible bat potential**	None
55	Refrigeration room	Two-storey open fronted. *Roof* – Concrete slab flat roof. *Walls* – Solid brick walls with metal garage type door on northern elevation. Metal lean-to on eastern elevation.	No access points or roosting features.	None	**Negligible bat potential**	None
56	MT offices and toilets	Two-storey building in use as workshop. Flat roof and pitched roof sections. *Roof* – Corrugated asbestos roof on pitched section. Wooden soffit boxes on pitch. Flat roof section built of concrete slab. *Walls* – Solid brick wall.	Small gaps beneath wooden soffit boxes.	None	**Low bat potential**	No access to structure – no accessible roof space.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
60	Air raid shelter	Air raid shelter set into a small mound with most of structure beneath ground. Grill type door at each end. *Roof* – Flat constructed of concrete slabs. *Walls* – Solid brick walls.	Grill doors provide suitable access points for bats. Through-draught created by open access at both ends reduces suitability for hibernating.	None	**Low potential for bats**	No access to structure
61	Victualling Store	Two-storey building. *Roof* – Flat constructed of concrete slabs. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
62	Paint Store	Single-storey paint store. *Roof* – Pitched corrugated iron roof with metal ridge and bargeboards.	No access points or roosting features.	None	**Negligible bat potential**	None
64	Demolished					Demolished

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
67	Esmonde Hanger	Two-storey hanger warehouse with small pitched roof section. *Roof* – Pitched with corrugate plastic and metal panels. Wooden barge board on southern elevation. *Walls* – Concrete walls on main hanger. Corrugated metal walls on southern elevation. Plastic fascia on 2nd storey of eastern elevation.	No access points or roosting features.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
68	Swann Hanger	Large hanger used for storage with boiler room and compressor room extensions. *Roof* – Seven pitched sections in parallel, all corrugated asbestos material. Brick lean-to on eastern elevation – corrugated asbestos roof. Wooden barge boards with asbestos barge board over top. Compressor room slate tiled roof with wooden barge board. *Walls* – Corrugated asbestos walls on north side with windows on 3rd floor level. Concrete pre-fabricated walls on south side. Compressor room with solid brick walls and brick weep holes at gable end.	Main hanger – some gaps under barge boards. Compressor room – some access through weep holes and slipped tiles but building very shaded and cluttered therefore limited flight lines. Lean-to – some gaps beneath barge boards.	None	**Low / moderate bat potential**	No access
69	Swann toilet block	Small brick toilet block. *Roof* – Flat concrete slab roof. Wooden barge boards mainly nailed at base. *Walls* – Solid brick walls	Some gaps under barge board on southern elevation. Building very shaded and therefore cold.	None	**Low bat potential**	No access

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
70	Air craft recovery store	Single-storey storage unit. *Roof* – Flat constructed of concrete slab. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
71	Naval stores	Single-storey workshop and store used for fabrication comprising various parts. 1) Nissan type building flat roof and brick, concrete walls. 2) Pitched slate and tile roofed building. 3) Flat roofed section. 4) Brick section with metal roof. 5) Long pitched roof. *Roof* – Mix of flat metal roof and pitched tiled and slate roof. *Walls* – Mix of brick and cement walls.	Some lifted tiles on slope of 2) and gaps along the ridges. Some gaps along ridge of 5). Six of the gable ends have barge boards all with gaps suitable for bats.	None	**Moderate bat potential**	Internally the building has a false ceiling so no access to roof void.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
73	Dunning Hanger	Single-storey large metal hanger currently used as fabrication site on north and south elevation. Comprises main hanger and two brick built two-storey extensions. *Roof* – Flat corrugated iron roof with metal frame and barge boards. *Walls* – Main hanger corrugated metal walls. Extensions solid brick walls.	Small gaps suitable for bats beneath the barge boards on south extension.	None	**Low bat potential**	None
74	Central Boiler House	Modern single-storey boiler house in use. *Roof* – Curved corrugated iron roof with metal ridge. *Walls* – Lower part of wall solid brick and upper part corrugated metal.	No access points or roosting features.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
78	Hetwell Bungalow (NAMDU)	Derelict bungalow with U-shaped roof with two gables on south side of building. *Roof* – Pitched slate roof with tiled ridge and wooden frame. Bitumastic under felt internally. Soffit boxes, chimney and lead flashing on exterior. *Walls* – Solid brick walls.	All soffits in poor condition but all intact with no potential access. Lifted slates on roof providing potential access to void between slates and felt and to roof void. Roof void covered in cobwebs. No bat droppings but many rat droppings	None	**Moderate bat potential**	Roof and floor timbers rotten and unsafe – access therefore limited.
88	Bedding Store	Single-storey 1930's construction. Two pitched sections with two flat sections. *Roof* – Pitched sections slate tiles with wooden barge boards. Flat roof with concrete slabs. *Walls* –Solid brick walls	Barge boards on pitched section very decayed in places may provide access on to wall plate. Some slipped tiles on pitched roof. Internal – one roof void with view through into second void. Wooden sarking throughout.	None	**Low bat potential**	Access to the eastern roof void only.
89	Vegetable store	Single-storey 1930's building. *Roof* – Pitched with corrugated plastic roof and wooden barge boards. *Walls* – Solid brick walls with concrete lintels above windows.	Some gaps under wooden barge boards which may provide access on to wall plate. Internal – small roof void with suspended panel ceiling.	None	**Negligible bat potential**	No access as suspended ceiling.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
91	Dining room and Cook House (a.k.a. Triumph Gallery and Boiler House)	Single-storey brick built building 1930's construction. *Roof* – Pitched on two long elevations and two short elevations. Wooden soffit box on pitched sections. Flat roof over entrance porch. Flat roof is concrete slab. Pitched roof is slate *Walls* – Solid brick walls.	Gaps beneath soffit box and walls may provide access on to wall plate and roof void. Some slipped tiles on pitched section. Lifted lead flashing on gullies between building sections. Internal – Wooden sarking and metal truss throughout. Comprises one main roof void from east to west and two smaller voids at east and west ends.	Three Pipistrelle droppings found in E roof void. Likely to have fallen from roost between tiles rather than within the roof space.	**Moderate potential for bats**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
92	Anson Barracks	Two-storey disused barracks. Built 1935 *Roof* – Hipped and pitched roofs with slate tiles and clay ridge tiles. Wooden soffit boxes on pitched section. Gable ends at north and south elevation and porch on W elevation. Flat roof section located on E elevation with roof felt. *Walls* – Solid brick walls, with cavity walls in places.	Gaps under ridge tiles at Northern elevation. Weep holes and vents in brickwork. Missing bricks beneath false soffit box at Western elevation. Gap at gable end where wooden soffit box meet at apex and gap under ridge tile at southern end. At southern elevation in courtyard where two parts of building meet there is a big gap where soffit is falling off that could provide access onto wall plate and into roof void. Gap where soffit box on easternelevation meets roof at right angle may provide access into roof void. Internal roof space only easternelevation accessed – wooden sarking present. Broken ventilation brick may provide access into cavity wall.	None	**Moderate bat potential**	No access due to medium asbestos risk throughout.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
94	Air raid shelter	Air raid shelter set into a small mound with most of structure beneath ground. Grill type door at each end. *Roof* – Flat constructed of concrete slabs. *Walls* – Solid brick walls.	Both ends closed off therefore no suitable access points for bats.	None	**Negligible potential for bats**	No access to structure.
96	Power House	Warehouse in use for construction. Built 1930's. complex with hanger and pitched sections. *Roof* – Hanger with pitched corrugated plastic roof. Two pitched sections with corrugated asbestos roof. Dormers along ridge with corrugated asbestos roof. Wooden barge boards attached to extruding rafters. Bargeboards on southern elevation have small gaps beneath. *Walls – Solid concrete walls*	Hanger has small roof void with access under corrugated roof over wall plate in to roof void.	None	**Low / moderate bat potential**	Internal access not possible as building in use.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
97	Blake Barracks	Two-storey disused barracks. Built 1932. *Roof* – Hipped and pitched roofs with slate tiles and clay ridge tiles. Wooden soffit boxes on pitched section. Gable ends at north and south elevation and porch on W elevation. Flat roof section located on E elevation with roof felt. *Walls* – Solid brick walls, with cavity walls in places.	Gaps under ridge tiles at northern elevation. Weep holes and vents in brickwork. Missing bricks beneath false soffit box at western elevation. Gap at gable end where wooden soffit box meet at apex and gap under ridge tile at southern end. At southern elevation in courtyard where two parts of building meet there is a big gap where soffit is falling off that could provide access onto wall plate and into roof void. Gap present where soffit box on eastern elevation meets roof at right angle may provide access into roof void. Internal roof space only eastern elevation accessed – wooden sarking present. Broken ventilation brick may provide access into cavity wall.	None	**Moderate bat potential**	No access due to medium asbestos risk throughout.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
100	Staff garages and EO's offices	Two-storey 1930's building complex in use as office and storage. *Roof* – Pitched roof with gable end and barge boards on southern elevation. Bargeboards attached to extruding rafters. Slate tiled roof with tiled ridge. *Walls* – Solid brick walls with cement rendering and pebbledash.	Some gaps under wooden barge boards.	None	**Low bat potential**	No access as building in use.
101	EVT section	Single-storey building. Built 1926. Two pitched sections running parallel with flat roof section connecting the two. *Roof* – Pitched slate tiled roof with gable ends. Western building slate roof with dormers covered in roof felt. No roof space- open to ceiling. Eastern building corrugated asbestos roof *Walls* – Solid brick walls.	Deep barge boards on flat roof section with gaps beneath providing potential roost feature.	None	**Low bat potential**	No internal access due to high risk asbestos.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
105	Wardroom Annexe boiler	Small brick built structure housing a boiler. *Roof* – Flat with concrete slabs. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
107	Ward Room annex	Three-storey disused building 1930's. *Roof* – Clay tiled hipped roof. Central hipped roof with two protruding hipped sections to west and east over entrances. Wooden soffit box on all elevations. External chimneys. *Walls* – Solid brick walls.	Clay tiled roof in good condition. Hole in soffit box where north elevation meets eastern elevation. Missing tiles in south east corner at low levels. Broken hip tile on south west elevation. Gap under soffit at south west elevation.	None	**Low bat potential**	No internal access due to Medium risk asbestos.
111	Westcliffe Lodge	Gate house lodge associated with Westcliffe House (B119). Presumed built same time circa 1904. In use as estate office. *Roof* – Pitched clay tiled roof with gable ends and bargeboards on rafters extruding from roof void. Catslide roof on south elevation and over small porch. *Walls* – Solid brick walls. Hanging tiles on 2nd storey.	Hanging tiles provide potential roost feature. Some gaps under tiles on northern elevation at gable end where mortar missing. Internal – small loft void with wooden A frame.	None	**Moderate bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
115	Police search	Disused police search building. *Roof* – Flat constructed of concrete slabs. *Walls* –Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
116	Eagle block	Three-storey disused 1930's building. Complex of building sections comprising pitched and flat roofed sections. *Roof* – Pitched with slate tiles and tiled ridge. Wooden soffit boxes on pitched sections. Chimney on central pitch with lead flashing. Flat roof with roof felt. *Walls* – Solid brick walls. Concrete lintels above windows.	Roof in mainly good condition with some slipped tiles at roof apex on central pitch. Ventilation bricks on all elevations. Three separate roof voids in U-shape. Wooden sarking throughout with metal truss frame.	None	**Low bat potential**	None
117	Squash Court	*Roof* – Flat with concrete slab. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
118	Ward Room and Offices	Disused building, 3 and 4 storey. South elevation has a mock tudor central section overhanging the eaves. *Roof* - Pitched and hipped roof built of clay tiles with clay ridge tiles. Metal framed internally with wooden sarking and underfelt. On the exterior are dormers, chimneys and lead flashing. *Walls* – Solid brick walls	Gaps under eaves on mock Tudor section on south elevation. Missing and lifted tiles on main roof slopes. On all other elevations occasional missing tiles. Gaps in mortar along tiles of hips. Extensive areas of damaged masonry and brickwork mainly at ground floor level. Very large open roof void extends throughout the roof.	None	**High bat potential**	No access to roof void due to high risk asbestos.
119	Westcliffe House	Built as residential house in 1904 now in use as offices for Britten Norman. *Roof* – Multi-pitch roof comprising two main pitches with gulley between and mansard roof to south elevation. Roof is clay tiled with clay tile ridges, small dormer windows and wooden soffit boxes present. Ornate chimneys both external and through pitched roofs. *Walls* – Solid brick walls with hanging tiles on west and south elevations.	Roof mainly in good condition with some slipped tiles (south east elevation). Potential roosting under hanging tiles. Internal – large central loft void with smaller sections attached. All accessible from main void.	Approximately 30 droppings found in total within roof space. Mainly located around chimney stack and along ridge. Considered to be Brown Long-eared Bat (*Plecotus auritus)*.	**Confirmed roost**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
121	Exmouth block	Large three-storey disused accommodation block with flat roof. *Roof* – Flat built of concrete slabs. Coping stones on exterior. *Walls* – Solid brick walls.	Concrete coping stones between floors have degraded and broken providing potential access points. Air bricks (made of four rows) have horizontal slots which would provide access into the walls.	None	**Moderate potential for bats**	No access to roof space due to "medium" asbestos risk
128	Eagle Club (NAAFI Club)	Two-storey building, 1930's built. Currently disused. Complex of buildings with hipped and pitched roofs. *Roof* – Hipped slate tiled roof with wooden soffit boxes. Pitched roof also slate tiled. All with tiled ridge. *Walls* – Solid brick walls.	Lifted tiles on both pitch and hipped sections. Gaps under ridge tiles and gaps under top of sash windows at western elevation. Internal wooden sarking throughout. Timber framed with joints at hipped corners. Three roof voids all connected.	None	**Low bat potential**	None
129	Demolished					Demolished
130	NAAFI shop	Single-storey 1930's brick building with lean-to. Disused *Roof* – Slate tiled hipped roof with wooden soffit boxes. Lean-to corrugated asbestos roof. *Walls* –Solid brick walls. Windows boarded up.	Some broken ridge tiles and slipped tiles may provide access in to roof void if present. Missing mortar in brickwork on lean-to.	None	**Low bat potential**	No access – no asbestos register and no key.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
131	Main gate guard room	Single-storey building used as security cell block. Two small gables both grilled. *Roof* – Catslide pitched roof built of tile and slate with tile ridge. Wooden frame and wooden sarking. Soffit boxes externally. Rest of building flat roofed with concrete slab. *Walls* – Solid brick walls.	Main pitched roof in good condition, no gaps.	None	**Low bat potential**	None
132	Fire station and Police rest room	*Roof* – Pitched slate roof with tiled ridge. Wooden frame with wooden sarking internally. Barge boards on exterior. Three gables all have barge boards. *Walls* – Solid brick walls.	Suitable gaps beneath barge boards. North and south elevation barge boards have arrow slit vents in walls allowing entry to roof void. Lifted tiles on all slopes potentially giving access to void between slates and sarking Internally – two interconnected roof voids. Ceiling of northern void partially collapsed.	None	**Moderate bat potential**	Collapsed ceiling at northern end.
133	Fire Pump House and adjacent Boiler House	*Roof* – Pitched corrugate metal roof with metal ridge and wooden bargeboards. *Walls* – Solid brick walls.	No gaps under barge boards.	None	**Negligible bat potential**	No internal access.
134	Demolished					Demolished

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
135	NAAFI Barber's shop and Shoe repair.	Single-storey brick building with slate roof. *Roof* – Pitched and hipped slate roof with tiled ridge. Soffit boxes externally. *Walls* – Solid brick walls.	Many slipped, broken and missing tiles would give access to void beneath slates. Occasional missing mortar along north facing gable.	None	**Low bat potential**	No internal access.
137	Duncan Barracks	Two-storey disused barracks. Built 1935. *Roof* – Hipped and pitched roofs with slate tiles and clay ridge tiles. Wooden soffit boxes on pitched section. Gable ends at north and south elevation and porch on W elevation. Flat roof section located on E elevation with roof felt. *Walls* – solid brick walls	Gap under ridge tile at gable end on Northern elevation. Gap under soffit box at W elevation above doorway. Gap present where soffit box on E elevation meets roof at right angle may provide access into roof void. Internal – wooden sarking on all roof voids. One main roof void with internal doors and one smaller void on eastern section.	Three Pipistrelle droppings found on floor beneath open roof hatch and on boards in roof void next to hatch.	**Confirmed roost**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
139	Cunningham Barracks	Two-storey disused barracks. Built 1935. *Roof* – Hipped and pitched roofs with slate tiles and clay ridge tiles. Wooden soffit boxes on pitched section. Gable ends at north and south elevation and porch on W elevation. Flat roof section located on E elevation with roof felt. *Walls* – solid brick walls.	Gaps under ridge tiles at Northern elevation. Weep holes and vents in brickwork. Missing bricks beneath false soffit box at Western elevation. Gap at gable end where wooden soffit box meet at apex and gap under ridge tile at southern end. At southern elevation in courtyard where two parts of building meet there is a big gap where soffit is falling off that could provide access onto wall plate and into roof void. Gap present where soffit box on E elevation meets roof at right angle may provide access into roof void. Internal roof space only E section accessed – wooden sarking present.	None (mouse and rat droppings present).	**Moderate bat potential**	Access to parts of roof void only due to asbestos on loft doors.

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
141	Ambulance bay and sub-station	Single-storey brick storage and electrical sub-station building. Built approximately 1930's. *Roof* – Flat with concrete slab roof. Hipped slate tiled roof with ridge tiles. Soffit box on hipped section and bargeboards on flat roof section. *Walls* – Solid brick walls.	On flat roof section barge boards have small gaps beneath suitable for bats. Hipped section has some gaps under tiles which may provide access to internal structure. No internal access allowed but likely to have internal wooden sarking and therefore potential for bats to roost between tiles and sarking.	None	**Low / moderate bat potential**	No internal access.
142	Frobisher Block	Two-storey disused accommodation block comprising two sections. L – shaped pitched roof section. *Roof* – Pitched and flat sections with tiles and other material. Wooden frame with king post and wooden sarking. Soffit box on exterior *Walls* – Solid brick walls with wooden cladding.	Occasional gaps in soffits that would give access to wall plate. Gaps beneath edges of roof tiles which would give access to roof void. Internally the roof void is very dirty with many cobwebs. Roof timbers starting to rot where there is water egress.	None	**Moderate bat potential**	None
144	Demolished					Demolished

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
145	X-ray department	Disused single-storey U-shaped building. *Roof* – Pitched corrugated iron roof with metal ridge. Wooden sarking internally. *Walls* – Solid brick walls with concrete cladding.	Part of roof collapsed but no features or access points for bats.	None	**Negligible bat potential**	None
146	Sick Bay	Single-storey 1930's building with mainly flat roof and one central pitched roof. *Roof* – Flat roof section built of concrete slabs. Pitched roof slate tiles and lean-to with corrugated asbestos roof. No soffit boxes or bargeboards. *Walls* – Solid brick walls.	Missing and slipped tiles on upper parts of pitched roof on both sides. Some gaps under ridge tiles. Internal – one roof void in central section only. Lined with wooden sarking. Some rafters rotting where water tank has leaked.	None	**Low bat potential**	None
154	Overlord Hanger (No 5 Bellman)	*Roof* – Gentle pitch roof built of corrugate metal. Metal strips where roof meets walls. *Walls* – Corrugated metal walls with line of windows at second floor level.	No access points or roosting features.	None	**Negligible bat potential**	None
158	Demolished					Demolished
160	Demolished					Demolished

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
164	Printing Shop	U-shaped brick building. *Roof* – Pitched corrugated iron roof with metal ridge. Wooden sarking on interior. Bargeboards on gables. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
165	Wykeham Hall	House built in 1895 then converted to offices, no longer in use. Mix of flat, pitched and hipped roofs. *Roof* – Hipped and pitch slate roof with tiled ridge and wooden sarking. Bargeboards, soffits, dormers, chimneys and lead-flashing on exterior. Some flat roof areas. *Walls* – Solid brick walls. Hanging tiles on dormers.	Potential access to south east roof void under roof tiles, ridge tiles. Potential roosting beneath soffits.	Five droppings in roof void at south east corner of building. Droppings appeared old.	**Confirmed roost**	None

Building Number*	Building Designation	Building Description	Building Condition	Bat Evidence Found	Conclusion	Access Restrictions during Survey
166	Keith Cottages	Former house no longer in use. *Roof* – Pitched clay tile roof with tiled ridge. Bargeboards, soffit boxes and dormers on exterior. *Walls* – Solid brick walls with hanging tiles.	North elevation has a single missing tile on roof slope. North facing gable gaps under edge of soffit. East elevation – hanging tiles between first and ground floor of bay. South elevation has two gables both with hanging tiles, gaps under tiles ar gable end apex in to wall plate and roof void. West elevation – hanging tiles at gable end many gaps beneath.	Single dropping attached to gable wall at northern elevation.	**High bat potential**	No internal access due to high risk asbestos.
375	Unknown	Single-storey disused building *Roof* – Flat and sloping corrugated iron roof. Bargeboards present. *Walls* –Solid brick walls	No access points or roosting features.	None	**Negligible bat potential**	None
387	NBCD	Single-storey toilet block. *Roof* – Flat concrete slab roof. *Walls* – Solid brick walls.	No access points or roosting features.	None	**Negligible bat potential**	None
388	Demolished					Demolished
390	Demolished					Demolished

- Building numbers from Estate Office plan

5 EVALUATION AND CONCLUSIONS

5.1 Evaluation and Potential Impacts

Of the 71 buildings surveyed for potential to support roosting bats three were confirmed to contain roosts, a further three were considered to have high potential, 10 moderate potential, three moderate to low and 15 low potential for roosting bats. Buil

The surrounding landscape in which the Waterfront lies is not considered to provide optimum habitat for bats. There are some mature trees but no extensive areas of woodland and the strong in-shore winds make foraging conditions difficult for bats. It is therefore considered that although some of the buildings have suitable features for bats the limited evidence of use may be a result of the conditions on site. It is therefore considered that these roosts are of high ecological value within the area as they are likely to be an important asset for roosting bats in the local area.

5.2 Further Survey

All bat roosts are protected under EU and UK law as set out in Section 5 and as such if any development is likely to result in the removal of a building which contains a bat roost or disturbance to a roost then this could result in a breach of legislation. In order to gather sufficient information on the presence of bats in the buildings additional surveys will be required. Additional surveys of all buildings with potential to support roosting bats and evidence of bats will be required. Emergence and re-entry surveys will establish whether bats are using the buildings where no evidence was found or access to roof spaces was not possible. For buildings where evidence was found further surveys will confirm the numbers and species of bats using each building. Table 5.1 outlines the details of additional surveys that will be required at Waterfront.

Table 5.1: Details of additional surveys required for buildings at Waterfront

Roosting potential	Number of surveys required	Survey timing	Survey Season
Confirmed	3 emergence or re-entry surveys	Dusk and Dawn with at least one dawn survey required.	May to September inclusive
High	3 emergence or re-entry surveys	Dusk and Dawn with at least one dawn survey required	May to September inclusive
Moderate	2 emergence or re-entry surveys	Dusk and /or dawn	May to September inclusive
Low	1 emergence or re-entry survey	Dusk or Dawn	May to September inclusive

A number of buildings are earmarked for demolition and if evidence of bats using these buildings is found then a European Protected Species (EPS) licence will be required before demolition. Where bat roosts are present an EPS licence from Natural England would be required prior to works commencing. The licence would permit activities that may otherwise be offences under The Conservation (Natural Habitats, & c.) Regulations 1994, such as destruction of roost sites.

Natural England takes 35 working days to process licence applications following receipt of all the relevant documentation. This includes a Local Planning Authority consultation document, Reasoned Statement of Application and Method Statement. The latter includes a mitigation strategy to eliminate or reduce impacts on bats.

Hibernation surveys may be required for the air raid shelters if they are likely to be impacted by the proposed development. These surveys are restricted to between November and March. If the shelters are due to be retained they would be suitable to be used for mitigation for impacts on other bat buildings. This could involve the provision of hibernation boxes within the shelters and improving conditions for bats within the structure to encourage use by hibernating bats.

6 LEGISLATION AND BAT ECOLOGY

6.1 Ecology

Bats use different roosting sites throughout the year according to their life cycle requirements.

Hibernation during the winter months requires roosting sites that are cool and humid. As conditions improve through the spring, bats become increasingly active and tend to use transitional roosting sites. During the summer months, females give birth in maternity roosts. Maternity roosts tend to be warm and temperature-stable, which aids rapid development of the young, which are weaned in late summer. In the autumn, adult bats congregate in mating roosts and also use transitional roosting sites. Autumn is the time when both adults and juveniles have to build up fat reserves in preparation for hibernation through the winter months.

Bats also use roosts during the night as feeding perches. Species that catch large prey items such as moths (e.g. *Plecotus auritus,* Brown Long-eared bat) often enter buildings to hang up and eat the prey before emerging again to forage. Such feeding perches tend to be obvious from scatterings of bat droppings with moth wings, which the bats discard.

Bats are at their most vulnerable during the summer in their maternity roosts, when disturbance can jeopardise their breeding success. Bats give birth to only one pup per year and young do not breed until the second or third year after birth. This means that if maternity colonies are disturbed there can be serious implications for the conservation status of populations.

Bats are also vulnerable during the winter hibernation period, when disturbance can reduce the chance of survival through the winter at a time when food is in short supply.

6.2 Legislation

All species of British bat are protected by The Wildlife and Countryside Act 1981 (as amended) extended by the Countryside and Rights of Way Act 2000. This legislation makes it an offence to:

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst is occupies a bat roost.

Bats are also European Protected Species listed on The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended). This legislation makes it an offence to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat (in such a way as to be likely to significantly affect: (i) the ability of a significant group of bats to survive, breed or rear/nuture their young; or (ii) the local distribution or abundance of the species concerned);

- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

All bat roosting sites receive legal protection even when bats are not present.

Where it is necessary to carry out an action that could result in an offence under The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended) it is possible to apply for a European Protected Species (EPS) licence from Natural England. Licences are only issued where Natural England are satisfied that there is no satisfactory alternative, works are for overriding reasons of public interest and that the favourable conservation status of bat populations will not be detrimentally affected.

7 REFERENCES

Biodiversity Reporting and Information Group (2007). *Report on the Species and Habitat Review: Report to the UK Biodiversity Partnership.* JNCC.

Hill, D., Fasham, M., Tucker, G., Shewry, M. & Shaw, P. (2005). *Handbook of Biodiversity Methods*. Cambridge University Press, Cambridge.

Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines, 2nd Edition*. Bat Conservation Trust, London.

Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. Spon, London.

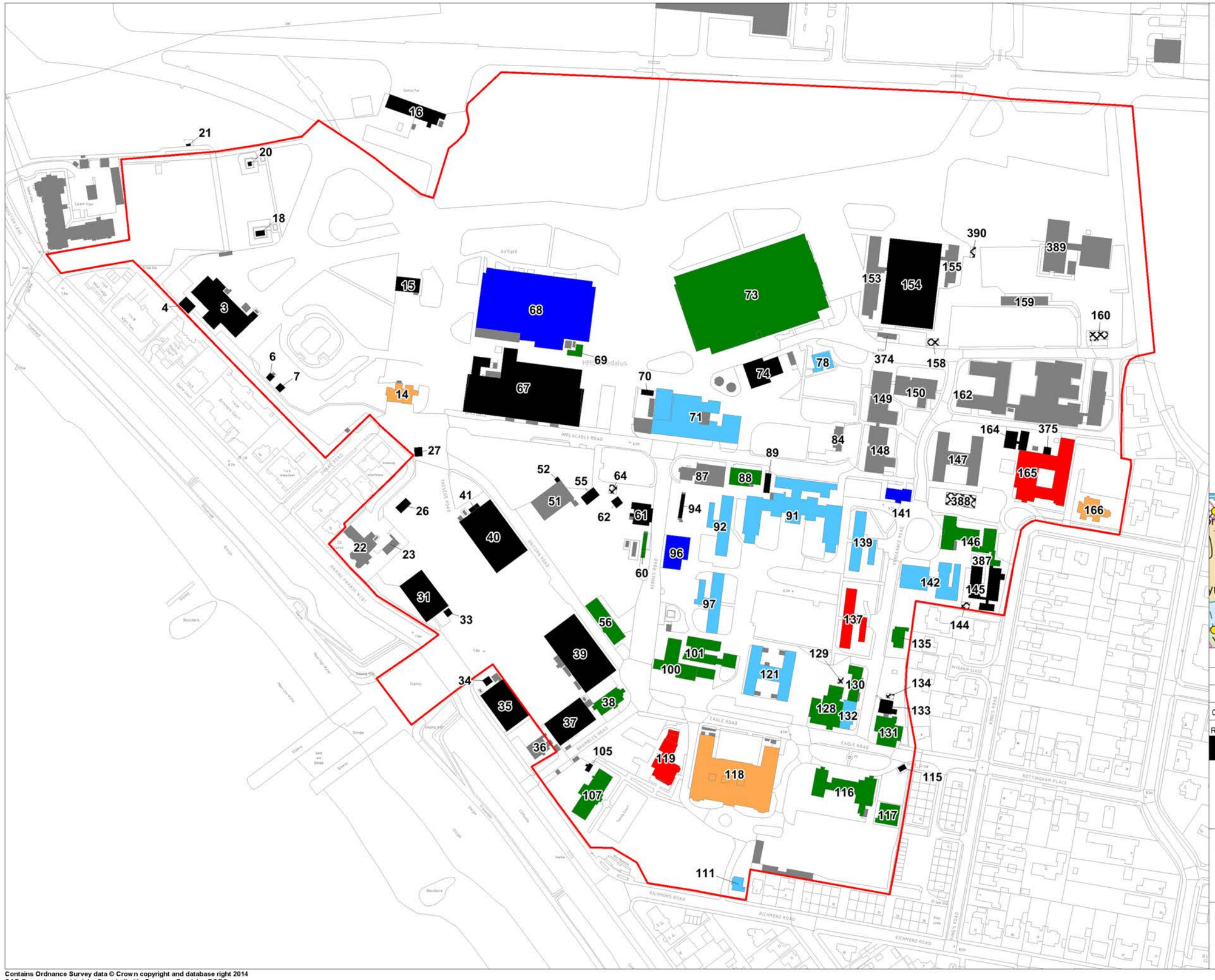
Thomson Ecology Report (2014). Hangars West Extended Phase 1 Habitat Survey, Habitat Suitability for Great Crested Newts and Badger Survey.

Thomson Ecology Report (2014). The Waterfront Area Extended Phase 1 Habitat Survey, Habitat Suitability for Great Crested Newts and Badger Survey.

8 FIGURES

Figure 1. Initial bat survey results

Plates 1 – 142



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Deadalus, Gosport

RSK

Figure 1

Initial Bat Survey of Buildings Results

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Scale = 1:2,500 @ A3

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APPENDIX C: CAPTAINS GARDEN EXTENDED PHASE 1 HABITAT REPORT



Homes and Communities Agency

The Captains Garden, Daedalus

Extended Phase 1 Habitat Report

855435

JUNE 2014

RSK GENERAL NOTES

Project No.: 855435

Title: The Captains Garden, Daedalus – Extended Phase 1 Habitat Report

Client: Homes and Communities Agency

Date: June 2014

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Status: Rev 0

Author	Corin Simmonds	**Technical reviewer**	Sarah Harmer
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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

CONTENTS

EXECUTIVE SUMMARY **1**
1 INTRODUCTION **2**
1.1 Aims of the Study 2
1.2 Site Description and Ecological Context 2
1.3 Project Description 2
2 METHODS **4**
2.1 Desk Study 4
2.2 Extended Phase 1 Habitat Survey 4
2.2.1 Invasive Plant Species 4
2.3 Habitat Assessment for Protected Species 4
2.3.1 General 4
1.1.1 Badger 5
1.1.2 Bats 5
1.1.3 Common Reptiles 5
1.1.4 Great Crested Newt 6
1.1.5 Nesting Birds 6
2.4 Criteria for Assessment 6
3 RESULTS **7**
3.1 Desk Study 7
3.2 Habitats 7
3.2.1 General 7
3.2.2 Semi-improved Neutral Grassland 7
3.2.3 Scattered Broad-leaved Trees 7
3.2.4 Broad-leaved Woodland 8
3.2.5 Scrub 8
3.2.6 Species-poor Hedgerow 8
3.2.7 Notable Plant Species 8
3.3 Protected Species 8
3.3.1 Badgers 8
3.3.2 Bats 9
3.3.3 Common Reptiles 9
3.3.4 Great Crested Newt 9
3.3.5 Nesting Birds 9
3.3.6 Other Protected or Notable Species 9
4 EVALUATION AND CONCLUSIONS **10**
4.1 Habitats and Plant Species 10
4.2 Protected Species 10
4.2.1 Badgers 10
4.2.2 Bats 10
4.2.3 Common Reptiles 10
4.2.4 Great Crested Newts 11
4.2.5 Nesting Birds 11
4.2.6 Other Protected Species and Notable Species 11

5 REFERENCES **12**
6 FIGURES **13**

APPENDICES
APPENDIX 1: TARGET NOTES **14**
APPENDIX 2 – PLANT SPECIES LIST **15**
APPENDIX 3 – LEGISLATION **17**

EXECUTIVE SUMMARY

1. This report presents the results of an extended Phase 1 Habitat Survey carried out on the Captain's Garden, Waterfront at HMS Daedalus (Ordnance Survey Grid Reference SU 55580147). The survey was carried out on 4th June 2014 by Corin Simmonds.

2. The survey area consists of semi-improved neutral grassland, broadleaved woodland, dense scrub and scattered trees.

3. No invasive plant species were found on the site.

4. The site contains habitat suitable for reptiles, in particular Common Lizard (*Zootoca vivipara*) and Slow-worm (*Anguis fragilis*). Surveys for reptiles should be undertaken to establish whether these species are present or absent.

5. Some of the trees on the site have features that appear to be suitable for roosting bats and will require further surveys to determine their status.

6. The trees, woodland, scrub and hedgerow are suitable for nesting birds and any vegetation clearance should only be undertaken outside the breeding season (March to August inclusive) to protect nesting birds.

1 INTRODUCTION

1.1 Aims of the Study

RSK were commissioned by to undertake an extended Phase 1 Habitat Survey of The Captains Garden area of the Waterfront at HMS Daedalus located in Lee-on-Solent in Hampshire. The survey was undertaken to accompany a planning application for the development of the Waterfront for housing and industrial use.

This report:

- identifies and maps broad habitat types and ecological features on the site and associated with the margins of the site,
- assesses the likelihood of the site to support protected and notable species;
- discusses relevant legislation and planning policy relevant to these habitats and species
- presents a preliminary assessment of any potential ecological impacts of the proposal based on current plans;
- provides recommendations for any further surveys; and
- provides initial recommendations for potential mitigation, compensation and ecological enhancement measures.

1.2 Site Description and Ecological Context

The Captains Garden is 0.5 ha area of land located in the north-west corner of the Waterfront part of HMS Daedauls, Lee-on-Solent. As the name suggests, the land once formed the gardens of the captain house, which has since been demolished. The Waterfront site was previously a Royal Air Force (RAF) Base. The central grid reference of the site is SU55580147. To the north of the garden lies the active airfield, to the east and south is the Waterfront area comprising hangers and industrial units and the Solent coast, which is designated as a SPA and Ramsar site (Solent and Southampton Water) is located 100m to the west.

The site comprises semi-improved neutral grassland, broad-leaved woodland, dense scrub and garden trees. The boundaries of the site are mainly fenced apart from the northern boundary which is formed of an overgrown hedgerow.

1.3 Project Description

The Homes and Communities Agency (HCA) is re-developing an area of land surrounding the airfield at the former RAF and Royal Navy base at HMS Daedauls. Previous surveys of the Waterfront area did not include the land at the Captain's Garden as access was not provided. This report, therefore, provide information on the

ecology of the Captain's Garden to supplement the ecology reports already produced in conjunction with a planning application for the wider site (Thomson 2014).

2 METHODS

2.1 Desk Study

A desk study was not undertaken for this survey but information from previous reports (Thomson 2014) was used to inform the conclusions of this report.

2.2 Extended Phase 1 Habitat Survey

An extended Phase 1 Habitat Survey was undertaken by Corin Simmonds on the 4th June 2014. Corin is a Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and experienced in undertaking these surveys.

Habitats were assessed following the methods outlined in the Handbook for Phase 1 habitat survey: a technique for environmental audit (2010) including:

- mapping using standardised colours and codes to indicate broad habitat types on a Phase 1 Habitat Map; and
- a description of habitat features to identify specific ecological or nature conservation features on the Phase 1 Habitat Survey Map (referred to as 'Target Notes'). These are provided in Appendix 1.

Plant nomenclature in this report follows Stace (2010) for native and naturalised species of vascular plant. Introduced species and garden varieties were identified using the relevant texts. Plant names in the text are given with scientific names first, followed by the English name in brackets. Doubtful identifications are preceded by cf. placed before the specific epithet where the plant is very probably the species indicated, but it is impossible to distinguish it from similar members of the genus with certainty.

The survey took place in June, which is the optimum time of year for this type of survey.

2.2.1 Invasive Plant Species

The list of invasive plant species included on *Schedule 9* of *The Wildlife and Countryside Act 1981* (as amended) is extensive and these plants are found in a range of different habitats. The walkover survey checked in particular for the presence of the most commonly found and problematic species: *Impatiens glandulifera* (Indian Balsam), *Heracleum trachyloma* (Giant Hogweed), *Fallopia japonica* (Japanese Knotweed) and *Fallopia sachalinensis* (Giant Knotweed).

2.3 Habitat Assessment for Protected Species

2.3.1 General

The habitat was assessed for protected species and features that are suitable for protected species were identified. Any obvious signs or incidental sightings of protected species were noted where present, although this type of survey cannot usually confirm whether species are actually present or absent.

Taking into consideration protected species records (summarised in Section 3.1), the geographical region and the habitat types at the site, protected animals that could be encountered are:

- Badger (*Meles meles*);
- Bats;
- common reptiles;
- Great Crested Newt (*Triturus cristatus*); and
- nesting birds;

1.1.1 Badger

An initial assessment was carried out to identify areas that might be used by Badgers for commuting, foraging or sett-building within 30m of all areas potentially affected by works (where access was possible). Any evidence of Badgers such as setts, foraging signs, paths (runs) and latrines would have been noted.

1.1.2 Bats

Habitats were assessed for their suitability for roosting, foraging and commuting bats.

Although foraging requirements differ between species, good bat foraging habitat generally includes sheltered areas and habitats with good numbers of insects, such as woodland, scrub, hedges, watercourses, ponds, lakes and more species-rich or rough grassland. For commuting, well-connected hedgerows, woodland edge, watercourses and other linear features are generally considered to be of high value.

Similarly there are a range of features that can be used by different species of bats for roosting but potential roosting features include splits, cracks and woodpecker holes in trees and gaps and crevices within buildings.

1.1.3 Common Reptiles

The site was assessed for reptiles, with particular attention paid to those features that provide suitable basking areas (*e.g*. south-facing slopes), hibernation sites (*e.g.* banks, walls, piles of rotting vegetation) and opportunities for foraging (rough grassland and scrub).

The site was assessed for its suitability for each of the four common reptile species. The specific habitat requirements differ between species. Common Lizards (*Zootoca vivipara*) use a variety of habitats from woodland glades to walls and pastures, although one of their favoured habitats is rough grassland. Slow-worms (*Anguis fragilis*) use similar habitats to Common Lizards, and are often found in rank grassland, gardens and derelict land. Grass Snakes (*Natrix natrix*) have broadly similar requirements to Common Lizards with a greater reliance on ponds and wetlands, where they prey on Common Frogs. Adders (*Vipera berus*) use a range of fairly open habitats with some cover, but are most often found in dry heath.

1.1.4 Great Crested Newt

The suitability of aquatic and terrestrial habitat on the site and in the immediate vicinity was considered, along with the habitat-connectivity between suitable habitat areas. Aerial photography and Ordnance Survey maps were searched for signs of ponds or other suitable breeding habitat within 500 m of the site.

1.1.5 Nesting Birds

Any habitat on site such as woodland, trees, scrub and hedgerows that was suitable for nesting birds was identified. Incidental sightings of birds or evidence of nesting was noted.

2.4 Criteria for Assessment

The nature conservation value of habitats is assessed according to widely accepted criteria that relates to important factors such as naturalness, extent, rarity, and diversity. In addition, the following criteria were used:

- relevance to International, European and wildlife law;
- relevance to the UK Post-2010 Biodiversity Framework (2012) through Species and Habitats of Principal Importance for Conservation and local Biodiversity Action Plans (BAP);
- semi-natural habitats, such as ancient woodland (Rackham 1986).

Significant species were defined as follows:

- species protected by International, European and UK wildlife law;
- IUCN Red List species;
- Species and Habitats of Principal Importance for Conservation (priority habitats and priority species) derived from Section 41 list of the Natural Environment and Rural Communities (NERC) Act 2006; and
- local BAPs

3 RESULTS

3.1 Desk Study

The following protected species were identified from within 2km of the site from the Thompson Ecology Report (2014).

- Grass Snake (*Natrix Natrix*) – less then 1km from the site
- Slow-worm (*Anguis fragilis)* – less then 1km from the site
- Common Lizard (*Zootoca vivipara*) – less then 1km from the site
- Badger (*Meles meles*) - less then 1km from the site

3.2 Habitats

3.2.1 General

The survey area comprised the following habitats including:

- semi-improved neutral grassland;
- scattered broad-leaved trees;
- broad-leaved woodland;
- scrub; and
- species-poor hedgerows.

Target notes are provided in *Appendix 1*, the plant species list is provided in *Appendix 2* and the extended Phase 1 Habitat Survey map (*Figure 1*) and plates are provided in *Section 6*.

3.2.2 Semi-improved Neutral Grassland

A large proportion of the site is semi-improved neutral grassland that would have once been amenity lawn which has been left to become overgrown (*Target Note* 1). Species present include the grasses *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog) and *Agrostis capillaris* (Common Bent), with *Brachypodium sylvaticum* (False Brome) around the base of the trees and at the woodland edge. Within the sward are common weed species such as *Lathyrus nissolia* (Grass Vetchling), *Plantago major* (Greater Plantain) and *Cerastium fontanum* (Common Mouse-ear) and ruderal species including *Urtica dioica* (Common Nettle), *Galium aparine* (Cleavers) and *Sonchus oleraceus* (Smooth Sow-thistle). The sward height is more than 50cm in places and there are significant patches of *Urtica dioica* (Common Nettle) and *Cirsium arvense* (Creeping Thistle) throughout.

3.2.3 Scattered Broad-leaved Trees

Throughout the garden are broad-leaved and coniferous trees that would have once formed part of the landscaped garden. Along the northern edge are planted individual *Acer pseudoplatanus* (Sycamore), *Fraxinus excelsior* (Ash), *Tilia ×europaea* (Lime) and

Horse Chestnut (*Aesculus hippocastanum)* trees (*Target Note* 4), and a *Pinus* (pine) tree is located near the eastern boundary. On the southern edge of the site are two *Quercus robur* (Pedunculate Oak) trees that have been severely wind blown over the years and have developed splits and dead wood (*Target Note 6*). Similarly, adjacent to the oaks, there is a *Fraxinus excelsior* (Ash) tree which appears to have had some crown reduction works undertaken and has significant amounts of dead wood (*Target Note 7)*.

3.2.4 Broad-leaved Woodland

In the centre of the site is a small broad-leaved wood, which comprises four mature *Fagus sylvatica* (Beech) trees with suckering *Fraxinus excelsior (Ash)* and *Prunus sp.* (Cherry) beneath (*Target Note* 2).

3.2.5 Scrub

There is native and non-native scrub along the boundaries of the site in particular in the south-western corner where species such as *Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder) and *Ligustrum* sp. (Privet) are present (*Target Note 8)* . There is a large area of scrub in the south-eastern corner which is dominated by *Rubus fruticosus* agg. (Bramble) with *Sambucus nigra* (Elder) and *Cirsium arvense* (Creeping Thistle). There is an area of dense scrub which has developed over the site of an old greenhouse (*Target Note* 5). The remains of the greenhouse including glass and rotten timbers are still present beneath mainly *Hedera helix* (Ivy) and *Rubus fruticosus* agg. (Bramble).

3.2.6 Species-poor Hedgerow

The northern boundary of the site is formed by a species poor un-managed hedgerow (*Target Note* 3). The hedge is 3m high and dominated by *Ligustrum* sp. (Privet) and *Fraxinus excelsior* (Ash) with some *Rubus fruticosus* agg. (Bramble).

3.2.7 Notable Plant Species

No invasive plant species were identified during the survey.

3.3 Protected Species

All target notes are provided in *Appendix 1* and the extended Phase 1 Habitat Survey map (*Figure 1*) and plates are provided in *Section 6*.

3.3.1 Badgers

The site is suitable for Badgers, with woodland for cover and long grassland for foraging. However, no evidence of Badgers such as setts, latrines or paths was found and as all areas were thoroughly searched, that the surveyor is confident that Badgers are not currently using the site. However, as Badgers are known to use the Hangers West area close to the site, cannot rule out the possibility of Badgers using the site in the future.

3.3.2 Bats

3.3.2.1 Trees

A detailed assessment of the trees was not undertaken as not all features could be observed because trees were in full leaf. However, some of the mature trees almost certainly have features that may be suitable for roosting bats and further investigation at a suitable time of year will be required.

3.3.3 Common Reptiles

The tussocky grassland, scrub and woodland habitats on site are suitable for reptiles, in particular Slow-worm (*Anguis fragilis*) and Common Lizard (*Zootoca vivipara*).

3.3.4 Great Crested Newt

There are no ponds on the site or adjacent to the site. Terrestrial habitat on the site is suitable for Great Crested Newts, particularly the rough grassland, scrub and woodland. However, the nearest ponds to the site are 400m to the north-west and are separated from the site by a busy road (which would be a barrier to newts). There are no records of Great Crested Newt from these ponds, and even if they were present in these ponds then they are unlikely to have colonised the habitats in the Captains Garden.

3.3.5 Nesting Birds

There is suitable bird nesting habitat in the woodland, scattered trees, scrub and hedgerow. It is almost certain that there will be some nests. However, the small size of the site and its context within the Waterfront industrial area and adjacent to the airfield mean that the site is likely to be used by low numbers of common garden birds only.

3.3.6 Other Protected or Notable Species

The habitat on the site is not likely to support any other protected or notable species.

4 EVALUATION AND CONCLUSIONS

4.1 Habitats and Plant Species

The semi-improved grassland, scattered trees, woodland and hedgerow are common locally and nationally and therefore of negligible ecological value.

At present, the details of the proposed development are not known and therefore the potential impacts cannot be quantified. However, the loss of the habitats on site is very unlikely to be ecologically significant and therefore no additional surveys of habitats or plants are required.

4.2 Protected Species

4.2.1 Badgers

A walkover survey will be required prior to any construction work being undertaken to check that Badgers have not colonised the site since this survey was undertaken.

4.2.2 Bats

All species of bat are afforded the highest level of protection through EU and UK law (see *Appendix 3*). Bats are known to roost in buildings and trees with suitable features and therefore any impacts on trees have the potential to impact on bats and their roosts.

Some of the trees are considered to have features suitable for roosting bats but a detailed survey was not possible due to the leaf cover on the trees. A detailed survey of any trees that are due to be removed should be undertaken during the winter months when features can more easily be seen. If features are identified that may be suitable for bats during the initial survey then additional tree climbing or emergence surveys will be required to confirm presence or absence. If bats are present in any tree requiring felling then a European Protected Species (EPS) will be required to comply with legislation protecting bats.

The site is likely to be used by low numbers of bats because of suitable foraging habitat in the form of grassland and woodland. However, due to the small size of the site and its location in an industrial area and airfield it is unlikely to support large numbers or important assemblages of bats.

4.2.3 Common Reptiles

The site is considered to have habitats suitable for common reptiles and therefore a reptile survey will be required. To show whether the site is used by reptiles, it would be necessary to carry out presence / absence surveys during the season when reptiles are active (generally between March and September). These surveys are typically required where a site will be developed and there is a risk of harming reptiles, either through direct harm or through loss of habitat that is used by them. Such surveys typically

require at least seven visits during the reptile active season to determine presence or likely absence.

If reptiles are present then it may be necessary to translocate them to a suitable receptor site before the development can proceed.

4.2.4 Great Crested Newts

Although the terrestrial habitats on the site are suitable for terrestrial Great Crested Newts, they are unlikely to be present because of the lack of possible breeding ponds and significant barriers to movement around the site. However, if during any of the subsequent surveys or clearance works Great Crested Newts are found, then all work must stop immediately and advice from an ecologist sought.

4.2.5 Nesting Birds

Habitats on the site (e.g. woodland, trees and hedgerows) are suitable for use by nesting birds and the loss of these habitats could result in potential impacts on these species. The site is unlikely to support important assemblages or rare species due to the small size and common habitats and therefore loss of habitat will not affect the ecological viability of the area for breeding birds. Nevertheless, all nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended) and as such mitigation is required to avoid the damage or destruction of nesting habitat or nests during the breeding bird season.

All affected habitats suitable for nesting birds should be removed prior to the start of the bird-breeding season (March to August inclusive). Where this is not possible, a search by an ecologist for any nesting birds prior to vegetation clearance will be needed.

4.2.6 Other Protected Species and Notable Species

The site has **negligible potential** to support any other protected species. However, in the unlikely event that any protected species are found during subsequent surveys or clearance, works must be stopped immediately and ecological advice should be taken promptly.

5 REFERENCES

Beebee T., and Griffiths R. (2000) Amphibians and Reptiles: A Natural History of the British Herpetofauna, Harper Collins Publishers

Biodiversity Reporting and Information Group (2007). *Report on the Species and Habitat Review: Report to the UK Biodiversity Partnership*. JNCC.

HMSO (1981). The Wildlife and Countryside Act 1981. HMSO, London.

JNCC and Defra (on behalf of the Four Countries' Biodiversity Group) (2012) *UK Post-2010 Biodiversity Framework. July 2012*. Available from: http://jncc.defra.gov.uk/page-6189. JNCC, Peterborough.

Joint Nature Conservation Committee (2011). *UK Biodiversity Action Plan*

Chartered Institute of Ecology and Environmental Management (CIEEM) (2013). *Guidelines for Preliminary Ecological Appraisal. Technical Guidance Series*. Available from http://www.cieem.net/data/files/Resource_Library/Technical_Guidance_Series/GPEA/GPEA_April_2013.pdf. CIEEM, Winchester.

Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001), Great Crested Newt Conservation Handbook, Froglife, Halesworth.

Stace, C.A. (2010). *New Flora of the British Isles. 3rd Edition*. Cambridge University Press, Cambridge.

Thomson Ecology (2014) The Waterfront Area – Daedauls, Lee-on-the-Solent, Hampshire. Extended Phase 1 Habitat Survey, Habitat Suitability Index for Great Crested Newts and Badger Survey. Thompson Ecology.

6 FIGURES

Figure 1. Extended Phase 1 Habitat Map

APPENDIX 1: TARGET NOTES

Target Note 1: Semi-improved neutral grassland. Grassland was once amenity lawn but has been left unmanaged for many years and has reverted to semi-natural state. Sward is more than 50cm in height and comprises a range of grasses including *Agrostis capillaris* (Common Bent), *Phleum bertolonii* (Smaller Cat's-tail) *Holcus lanatus* (Yorkshire-fog), and *Brachypodium sylvaticum* (False Brome). Ruderal species and common grassland weeds such as *Cirsium vulgare* (Spear Thistle), *Cerastium fontanum* (Common Mouse-ear), *Rubus fruticosus* agg. (Bramble), *Plantago major* (Greater Plantain) *Achillea millefolium* (Yarrow), *Vicia sativa* (Common Vetch), *Lathyrus nissolia (Grass Vetchling)* and *Anthriscus sylvestris* (Cow Parsley) also present.

Target Note 2 Broad-leaved semi natural woodland developed naturally but with four planted mature *Fagus sylvatica* (Beech) trees at the centre. Shrub layer dominated by suckering *Prunus padus* (Bird Cherry) and *Acer pseudoplatanus* (Sycamore). Ground flora mainly *Hedera helix* (Ivy), *Urtica dioica* (Common Nettle), *Anthriscus sylvestris* (Cow Parsley) and *Galium aparine* (Cleavers).

Target Note 3 Species poor hedgerow probably planted when garden was managed but now left unmanaged to reach height of approximately 3m. Mainly comprising *Ligustrum* sp. (Privet) and *Fraxinus excelsior* (Ash) suckers.

Target Note 4 Individual trees along hedge boundary. Trees likely to have been planted when the garden was managed. Species present include *Acer pseudoplatanus* (Sycamore), *Fraxinus excelsior* (Ash) *Tilia* ×*europaea* (Lime), ×*Cupressocyparis leylandii* (Leyland Cypress) and *Aesculus hippocastanum* (Horse-chestnut).

Target Note 5 Dense scrub comprising *Fraxinus excelsior* (Ash) suckers, *Rubus fruticosus* agg. (Bramble) *Hedera helix* (Ivy) and *Urtica dioica* (Common Nettle) on site of old greenhouse. Wood piles and broken glass also present.

Target Note 6 *Fraxinus excelsior* (Ash) tree with signs of dead wood. Appears to have had some crown reduction or wind blown top and has suffered decay as a result. Possibly suitably for bats.

Target Note 7 Two *Quercus robur* (Pedunculate Oak) trees that are severely wind blown and have developed cracks and splits. Possibly suitable for bats.

Target Note 8 Dense scrub mix of native (*Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder) *Ilex aquifolium* (Holly) and non-native species (*Ligustrum* sp. (Privet).

APPENDIX 2 – PLANT SPECIES LIST

Table A2.1. Plant species recorded during the field survey

Latin name	Common name
Trees, Shrubs and Climbers	
Acer pseudoplatanus	Sycamore
Aesculus hippocastanum	Horse-chestnut
Crataegus monogyna	Hawthorn
Fagus sylvatica	Beech
Fraxinus excelsior	Ash
Hedera helix	Ivy
Ligustrum sp.	Privet
Prunus sp.	Cherry species
Prunus spinosa	Blackthorn
Pinus sp	Pine
Quercus robur	Pedunculate Oak
Rosa sp.	Rose
Rubus fruticosus agg.	Bramble
Sambucus nigra	Elder
Herbs and Ferns	
Achillea millefolium	Yarrow
Agrostis capillaris	*(Common Bent)*
Bellis perennis	Daisy
Cerastium fontanum	Common Mouse-ear
Cirsium vulgare	Spear Thistle
Dactylis glomerata	*Cock's-foot*
Geranium molle	*(Dove's-foot Crane's-bill)*
Holcus lanatus	*(Yorkshire-fog)*
Lamium purpureum	Purple Dead Nettle

Latin name	Common name
Lathyrus nissolia	*Grass Vetchling*
Lolium perenne	Perennial Rye-grass
Luzula campestris	(Field Wood-rush)
Medicago lupulina	(Black Medick)
Plantago lanceolata	*(Ribwort Plantain)*
Plantago major	(Greater Plantain)
Poa annua	Annual Meadow Grass
Ranunculus repens	*(Creeping Buttercup)*
Sonchus sp.	Sowthistle species
Taraxacum sect. *Ruderalia*	Common Dandelion
Trifolium repens	White Clover
Urtica dioica	Common Nettle
Vicia sativa	*Common Vetch*

APPENDIX 3 – LEGISLATION

Bats

All species of British bat are protected by *The Wildlife and Countryside Act 1981* (as amended) extended by the *Countryside and Rights of Way Act 2000* (the CRoW Act). This legislation makes it an offence to:

- intentionally kill, injure or take a bat;
- possess or control a bat;
- intentionally or recklessly damage, destroy or obstruct access to a bat roost; and
- intentionally or recklessly disturb a bat whilst is occupies a bat roost.

Bats are also European Protected Species listed on *The Conservation (Natural Habitats, & c.) Regulations 1994* (as amended). This legislation makes it an offence to:

- deliberately capture, injure or kill a bat;
- deliberately disturb a bat, including in particular any disturbance which is likely (a) to impair their ability - (i) to survive, to breed or reproduce, or to rear or nurture their young; or (ii) hibernate or migrate, where relevant; or (b) to affect significantly the local distribution or abundance of the species to which they belong.
- damage or destroy a breeding site or resting place of a bat; and
- possess, control, transport, sell, exchange a bat, or offer a bat for sale or exchange.

All bat roosting sites receive legal protection even when bats are not present.

Birds General Protection

All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). The protection was extended by the CRoW Act.

The legislation makes it an offence to intentionally:

- kill, injure or take any wild bird;
- take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

Reptiles

The four common reptile species are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), in respect of section 9(5) and part of 9(1). This protection was extended by the Countryside and Rights of Way Act 2000.

The legislation makes it an offence to:

- intentionally, or recklessly, kill or injure any of the above species, and/or;
- sell, or attempt to sell, any part of the species, alive or dead.

The two rarer species receive greater protection under both the Wildlife and Countryside Act and also from the Conservation (Natural Habitats, etc.) Regulations 1994 which gives them full protection under Regulation 39.



Site boundary
Broad-leaved semi-natural woodland
Dense / continuous scrub
Scattered broad-leaved tree
Scattered coniferous tree
SI Semi-improved neutral grassland
Intact species poor hedge
Fence
Botanical target note



Rev	Date	Description	Drn	Chk	App
00	12.05.14	855435	SP	RG	LM

HCA - Daedalus, Gosport

RSK

Figure 1

Captains Garden, Waterfront Daedalus
Phase 1 Habitat Survey

0 15
metres
Scale = 1:500 @ A3

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APPENDIX D: REPTILE SURVEY WITHIN THE CAPTAINS GARDENS



Homes and Communities Agency

Reptile Survey Report

Captain’s Garden, HMS Daedalus

855435

OCTOBER 2014

RSK GENERAL NOTES

Project No.: 855435

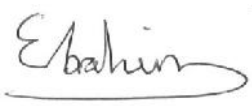
Title: Daedalus, Gosport, Captains Garden Reptile Survey Report

Client: Homes and Communities Agency

Date: October 2014

Office: Hemel Hempstead

Status: Draft

Author	Errol Ibrahim	**Technical reviewer**	Simon Boulter
Signature		Signature	
Date:	09/10/2014	Date:	15/10/14
Project manager	Corin Simmonds	**Quality reviewer**	Corin Simmonds
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Date:	15/10/14	Date:	15/10/14

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment Ltd.

CONTENTS

1 EXECUTIVE SUMMARY 4
2 INTRODUCTION 5
2.1 Purpose of this Report 5
2.2 Ecological Context 5
3 METHODS 6
3.1 Habitat Assessment 6
3.2 Artificial Refuge Surveys 6
3.3 Population Estimate 6
4 RESULTS 8
4.1 Artificial Refuge Surveys 8
4.2 Population Assessment 8
5 EVALUATION AND CONCLUSIONS 9
5.1 Evaluation and Conclusions 9
6 REFERENCES 10
7 FIGURES 11

APPENDICES
APPENDIX A - FULL SURVEY RESULTS 12
APPENDIX B - LEGISLATION 13

1 EXECUTIVE SUMMARY

1. This report presents the results of a reptile survey carried out on Captain's Garden, Waterfront at HMS Daedalus (*Figure 1*). The reptile presence-absence surveys were carried out during August and September 2014.
2. The Captain's Garden (Grid Reference SU 55580147) in the north-west corner of the Waterfront part of HMS Daedauls, Lee-on-Solent. The site consists of semi-improved grassland, broadleaved woodland, dense scrub and scattered trees.
3. The purpose of the survey was to ascertain whether reptiles were present or absent at the site. The result was required to accompany a planning application for the development of the Waterfront.
4. The survey comprised checks for reptiles using artificial refuges. Lines of refuges (squares of roofing felt) were placed in suitable habitats and checked for sheltering or basking reptiles on seven separate survey-visits during August and September 2014.
5. A low population of Slow-worm *(Anguis fragilis)* was found.
6. A mitigation strategy at the Captain's Garden should consist of exclusion fencing the entire area and translocating all reptiles caught (over a minimum period of 60 days) to a suitable receptor site at Hangars East (Grid Reference SU 560 019) located to the north east of the Captain's Garden.

2 INTRODUCTION

2.1 Purpose of this Report

This report presents the results of a reptile survey carried out on the Captain's Garden, Waterfront at HMS Daedalus (Grid Reference SU 55580147). The survey comprised a presence-absence survey using artificial refuges in five selected areas across the site (Figure 2: Areas A to E), carried out during August and September 2014.

2.2 Ecological Context

The Captain's Garden is 0.5 ha area of land located in the north-west corner of the Waterfront part of HMS Daedauls, Lee-on-Solent. As the name suggests, the land once formed the gardens of the captain house, which has since been demolished. The Waterfront site was previously a Royal Air Force (RAF) Base. The central grid reference of the site is SU55580147. To the north of the garden lies the active airfield, to the east and south is the Waterfront area comprising hangers and industrial units. The Solent coast, which is designated as a Special Protection Area (SPA) and Ramsar site (Solent and Southampton Water) is located 100m to the west.

The site comprises semi-improved neutral grassland, broad-leaved woodland, dense scrub and garden trees. The boundaries of the site are mainly fences, apart from the northern boundary which is formed of an overgrown hedgerow.

3 METHODS

3.1 Habitat Assessment

An Extended Phase 1 habitat survey was undertaken by RSK on 4th June 2014, and habitat suitable for common reptile species was identified. Records obtained from free internet sources showed that Grass Snake *(Natrix natrix)*, Slow-worm *(Anguis fragilis)* and Common Lizard *(Zootoca vivipara)* had all been recorded within 1 km of the site.

3.2 Artificial Refuge Surveys

The standard method for establishing reptile presence, as set out by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998), is to use reptile 0.5 m^2 roofing-felt tiles as artificial refuges. These tiles are placed in the areas that have been identified as suitable for reptiles during the habitat assessment. The felt tiles attract reptiles, which use them for shelter and to aid temperature regulation, which allows surveyors to find reptiles that would otherwise be widely dispersed and well-hidden.

Reptile surveys using approximately 100 felts were carried out during August and September 2014, a time of year when reptiles are active. Felts were checked for reptiles on seven occasions during suitable weather (ideally in bright sunshine between the hours of 0830 to 1100 and 1600 to 1830 with air temperatures between 9 and 15ºC, or if there is hazy or intermittent sunshine and little wind then between 9 and 18ºC, not during rain). Details of the weather conditions for all surveys can be found in *Appendix A, Table A1*.

When checking felts, a general watch was kept for other signs of reptiles, e.g. Grass Snake eggs, excrement or sloughed skins (often found beneath refuges).

3.3 Population Estimate

Population estimates have been made following best practice guidelines issued by the *Herpetofauna Groups of Britain and Ireland* (HGBI 1998). The estimates are placed into size classes shown in *Table 3.1*. The size classes are determined on the basis of the maximum number of each species spotted during one reptile survey conducted on one day in suitable weather conditions (Gent & Gibson, 2003). The population class determines the number of days of trapping that would be needed to clear the site of reptiles.

Table 3.1. Population classification according to HGBI guidelines

Species	Low Population	Medium Population	High Population
Adder	<2/ha	2-4/ha	> 4/ha
Common Lizard	<20/ha	>40/ha	>80/ha
Grass Snake	<2/ha	2-4/ha	>4/ha
Slow-worm	<50/ha	>50/ha	>100/ha

4 RESULTS

4.1 Artificial Refuge Surveys

Table 4.1 presents the results of the reptile presence-absence survey. *Column 1* gives the survey locations as shown in *Figure 2*. *Columns 2 – 8* give information on species and numbers recorded on visits 1 to 7 respectively. The species recorded is shown using the following code: Af – Slow-worm, This is followed by the number of individuals observed, the peak count is highlighted in red.

Table 4.1. Reptile Survey Results

Survey Location	Check 1	Check 2	Check 3	Check 4	Check 5	Check 6	Check 7
A				1 Af		2 Af	2 Af
B			1 Af				1 Af
C							
D							
E							
Totals:			**Af (1)**	**Af (1)**		**Af (2)**	**Af (3)**

4.2 Population Assessment

The maximum number of Slow-worms per hectare, calculated based on the results in Table 4.1 (using the peak count seen in one day in suitable weather conditions) is shown in *Table 4.2*. Numbers per hectare have been rounded up.

Table 4.2. Maximum Counts and Population Estimates

Species	Peak Count	Peak Count calculated per hectare	Population Estimate
Slow -worm	3	6	Low

Based on the HGBI guidance, the site supports a low population of Slow-worm.

5 EVALUATION AND CONCLUSIONS

5.1 Evaluation and Conclusions

The site supports a low population of Slow-worm (max count 3), distributed mainly towards west of the Captain's Garden site.

Reptiles are protected from deliberate killing and injury by *Schedule 5* of *The Wildlife and Countryside Act 1981* (as amended). *Appendix B* provides full details of the legislation. As such, some form of mitigation must be carried out on site to provide protection for the individuals present. Mitigation ideally involves the retention and maintenance of an area suitable for reptiles on the site. However, as this is not feasible or possible at Daedalus, reptiles will be moved (translocated) to suitable habitat off-site. The entire section of the Captain's Garden will need to be fenced with suitable exclusion fencing so that all reptiles can be excluded (i.e.once fenced, reptiles will not be able to enter the site). The exclusion fencing will be installed while an ecologist is present who will perform a destructive hand search of all debris and scrub to ensure no reptiles are harmed during the fencing installation.

Once the fencing is erected, reptile felts will be placed along the inside of the fencing at 10 m intervals (with a minimum of 50 felts per ha). These felts will be checked daily for reptiles for 60 suitable days. Suitable days include: a temperature between 5-20°c, little wind and no/little rain. There must be a clear window of at least 5 days when no reptiles are caught for the translocation to be completed. If, once the 60 days is completed, reptiles are still being captured the translocation will be extended until 5 capture-free, suitable days are obtained. The number of trapping days can be reduced by half if the survey effort is increased by doubling the number of felts used and using drift fencing to compartmentalise areas (focussing trapping effort).

All reptiles caught will be transported immediately to the receptor site at Hangars East (Grid Reference SU 560 019) located north east of the Captain's Garden in the northern most part of Daedalus site. Hangars East has been surveyed for reptiles and has been confirmed as being a suitable receptor site (RSK, 2014). The Hangars East area already has suitable habitats for reptiles but may require enhancements prior to moving any reptiles. This will ensure that the released reptiles have the best chance of survival. This can be achieved by measures such as creating hibernacula and log piles. Exclusion fencing should remain in place until all site clearance and construction work is complete in order to stop the movement of reptiles back on to the site.

6 REFERENCES

Gent, A.H. & Gibson, S.D. (2003). Herpetofauna Workers Manual. Joint Nature Conservation Committee, Peterborough.

Herpetofauna Groups of Britain and Ireland. (1998). Evaluating local mitigation/translocation programmes: Maintaining Best Practice and lawful standards.

7 FIGURES

Figure 1 – Location Map

Figure 2 – Results of Reptile Survey

Site boundaries

Hangers East and Reptile Receptor

Hangers West

Airfield

HMS Daedalus

Captains Garden

Waterfront

Scale = 1:150,000 @ A3

Scale = 1:10,000 @ A3

Rev	Date	Description	Drn	Chk	App
00	02.07.14	855435	RG	SP	TC

HCA - Daedalus, Gosport

RSK

Figure 1

Site Location Plan

0 300

metres

REV 00

File Name : T:\Projects\Projects HCA\855435 - HCA - Daedalus, Gosport\07 - GIS\Figures\Final Wksps

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Site boundary

Reptile felt locations - reptiles absent

Reptile felt locations - reptiles present

Peak survey counts indicated using the following codes:

Af Slow-worm *(Anguis fragilis)*



Rev	Date	Description	Drn	Chk	App
00	09.10.14	855435	SP	RG	EI

HCA - Daedalus, Gosport

RSK

Figure 2

Captains Garden, Waterfront Daedalus
Reptile Survey Locations and Results

0 15
metres
Scale = 1:500 @ A3

N W E S

REV 00

File Name : T:\Projects\Projects HCA\855435 - HCA - Daedalus, Gosport\07 - GIS\Figures\Final Wksps

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APPENDIX A - FULL SURVEY RESULTS

Table A1- Survey dates and weather conditions for each site

Survey Visit	Date	Time	Temp. (Air)	Wind (Beaufort)	Cloud (Octas) (0-8)	Rain (0- 5)	Suitable Conditions Yes, No or Fair
1	05.08.14	10:09	20.3	4	8	0	F
2	08.08.14	09:05	18.8	1	4	0	F
3	14.08.14	09:10	18.4	1	4	0	F
4	22.08.14	11:20	17.4	3	7	0	F
5	26.08.14	10:50	17	1	7	0	Y
6	29.08.14	12:50	18.8	4	5	0	F
7	01.09.14	10:10	17.4	2	6	0	F

APPENDIX B - LEGISLATION

Common Reptiles

Zootoca vivipara (Common Lizard), *Natrix natrix* (Grass Snake), *Anguis fragilis* (Slow-worm), and *Vipera berus* (Adder) are listed under *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), in respect of *Section 9(5)* and part of *Section 9(1).* This protection was extended by the CRoW Act.

Under the above legislation it is an offence to:

- intentionally or deliberately kill or injure any individual of such a species; or
- sell or attempt to sell any part of the species alive or dead.

APPENDIX E: GROUND LEVEL TREE ASSESSMENT

APPENDIX F: STAGE 1 ARBORICULTURAL SURVEY



Homes and Communities Agency

Waterfront, Daedalus

Stage 1 Arboricultural Report

Daedalus, Lee-on-the-Solent

121000

JUNE 2014

RSK

RSK GENERAL NOTES

Project No.: 121000

Title: Waterfront, Daedalus

Client: Homes and Communities Agency

Date: 9th June 2014

Office: Hemel Hempstead

Status: Final

Author	Luke Hawke	**Technical reviewer**	Annie Boulter
Signature		Signature	
Date:	17/06/14	Date:	19/06/14
Project manager	Robert Fear		
Signature			
Date:	19/06/14		

RSK Environment (RSK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK Environment.

CONTENTS

1 INTRODUCTION 1
1.1 General 1
1.2 Purpose of the Report 1
1.3 Site Context 1
1.3.1 General 1
1.3.2 Soil 1
1.3.3 Protected Species 1
1.4 Statutory Designations 2
1.5 Root Protection Area (RPA) 2
1.6 Supplied Documents 2
2 METHOD 3
2.1 General 3
2.2 Tree Categorisation 3
2.3 Distinction between Individual Trees and Tree Groups 4
2.4 Constraints 4
3 RESULTS 5
3.1 Summary 5
3.2 Condition 6
3.3 Amenity Value 6
4 CONCLUSIONS 7
4.1 General 7
4.2 Design and Planning 7
4.2.1 Arboricultural Impact Assessment (Stage 2) 7
4.2.2 Arboricultural Method Statement (Stage 3) 7
6 TABLES, FIGURES AND APPENDICES 8

TABLES
TABLE 1. TREE SURVEY DATA .....
TABLE 2. TREE GROUP SURVEY DATA .....

FIGURES
FIGURE 1. TREE CONSTRAINTS PLAN

APPENDICES
APPENDIX 1
METHOD .....

APPENDIX 2
CASCADE CHART BS 5837 .....

1 INTRODUCTION

1.1 General

This report details survey of trees on land at the Waterfront within Daedalus, Lee-on-the-Solent. The work was commissioned by the Homes and Communities Agency in May 2014 and carried out by Luke Hawke of RSK on the 5th June 2014.

Trees were inspected from ground-level without the use of specialist equipment, and inspection was restricted in a number of instances where trees were on third party land.

1.2 Purpose of the Report

The aim of the survey was to, using criteria outlined in *BS5837:2012 - Trees in Relation to design, demolition and construction-Recommendations*, identify the quality and value of the existing tree-stock and to categorise trees in respect to their suitability for retention. This information is then used to identify any constraints that trees may pose to development of the site, and should be used to inform the design process accordingly.

1.3 Site Context

1.3.1 General

The site is nearly 26 ha. and is approximately 5 miles west of Gosport town centre. It has multiple land uses ranging from warehouses and industrial units to older brick built former offices and residential buildings. This is the most developed area of the Daedalus airfield. The surroundings include the airfield itself to the north with residential dwellings to the east. To the south and west the site meets the Solent.

1.3.2 Soil

British Geological Society data indicates that the site is partially on Marsh Farm Formation as well as Bognor Sand Member bedrock, with River Terrace superficial deposits. However, this is only an indicative assessment as no soil samples were taken or lab analysis carried out.

1.3.3 Protected Species

Mature trees can be used by birds and bats. All species of bat and nesting birds are protected in the UK by *The Wildlife and Countryside Act 1981* (as amended), extended by the *Countryside and Rights of Way Act 2000*. If the presence of a legally protected species is suspected whilst undertaking any tree work, the task should be halted immediately and appropriate advice sought from a suitably qualified ecologist.

1.4 Statutory Designations

Trees can be afforded statutory protection in a number of ways, including;

- Tree Preservation Orders;
- planning conditions,
- Felling Licences; and
- being in a designated Conservation Area.

Protected trees can only be removed or pruned if permission is granted either as part of a planning permission, or if a separate application is made to the Local Authority (or the Forestry Commission).

The nature of any protection afforded to these trees has not been investigated as part of this report.

1.5 Root Protection Area (RPA)

To ensure that a tree is not harmed by development activities, a root protection area is calculated. BS5837 defines the root protection area as *'the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability'*. The root protection area is usually enclosed by a construction exclusion zone for the duration of works.

1.6 Supplied Documents

Drawing *10500 - Bp.Topo survey.dwg* was supplied by CampbellReith.

2 METHOD

2.1 General

All trees and tree groups inspected were categorised using the British Standard BS5837:2012 and the attached Tree Constraints Plan (Figure 1) shows tree positions, numbers and retention categories. A schedule of the trees is included in Table 1 and Table 2, which include species, physiological and structural condition, age, recommendations and retention values.

The survey followed the method described in Appendix 1 and follows guidance in BS5837:2012, with the life expectancy and condition of each tree and group informing its suitability for retention.

2.2 Tree Categorisation

Trees were categorised in terms of the tree s useful life expectancy and condition as summarised below. Full details of categorisation criteria are given in Appendix 2. Each category has three sub-categories relating to arboricultural (1), landscape (2) and cultural/conservation (3) qualities. Trees that have been categorised as A, B or C should be considered in the planning process whereas trees categorised as U are not a consideration in the planning process; these are likely to be lost in the short term due to physiological or structural defects.

BS5837:2012 Categories	Definitions	Retention implications to a site
Category A (marked light green on the TCP*)	Trees of high quality and value able to make a substantial contribution to the site.	Every effort should be made to retain trees and amendments to a proposed scheme should be identified in preference to tree removal.
Category B (marked mid-blue on the TCP)	Trees of moderate quality and value able to make a significant contribution to the site.	Where possible amendments to a proposed scheme should be considered in preference to tree removal.
Category C (marked in grey on the TCP)	Trees of low quality and value in an adequate condition until new planting can be established, trees with impairments downgrading them from A or B category OR young trees with a stem diameter of less than 150mm.	The retention of trees may be advantageous in the short term, but they should not be seen as a constraint to development.
Category U (marked in dark red on the TCP)	Trees that have limited condition that will fail or die within 10 years and/or should be removed for reasons of arboricultural best practice	Not a material consideration in the planning process but may have other benefits

* TCP = Tree Constraints Plan – Figure 1

2.3 Distinction between Individual Trees and Tree Groups

Trees have been recorded as individuals or as groups. BS5837:2012 sets out the description of a group as follows: *The term "group" is intended to identify trees that form cohesive arboricultural features either **aerodynamically** (e.g. trees that provide companion shelter), **visually** (e.g. avenues or screens) or **culturally** including for biodiversity (e.g. parkland or wood pasture), in respect to each of the tree subcategories."*

Where a tree in a group has characteristics that distinguish it from the rest of the group, it is generally recorded as individual. Such trees may include, but are not limited to, veteran trees, trees with important defects, and specimen trees.

2.4 Constraints

The trees were viewed from ground-level and from within the site boundaries only. The trees were inspected using the Visual Tree Assessment method (Mattheck and Breloer 1994). Detailed inspections including decay detection, soil assessment or aerial inspections have not been carried out.

This report is principally concerned with trees in relation to the proposed development. Although obvious structural defects and the condition of trees have been noted, this survey was not undertaken with health and safety in mind, and a full hazard assessment was not carried out.

Trees are living organisms and their health and condition is not static and so findings and recommendations in this report are only valid for one year. The health and condition of the trees may also change with other factors such as extreme weather conditions or development work.

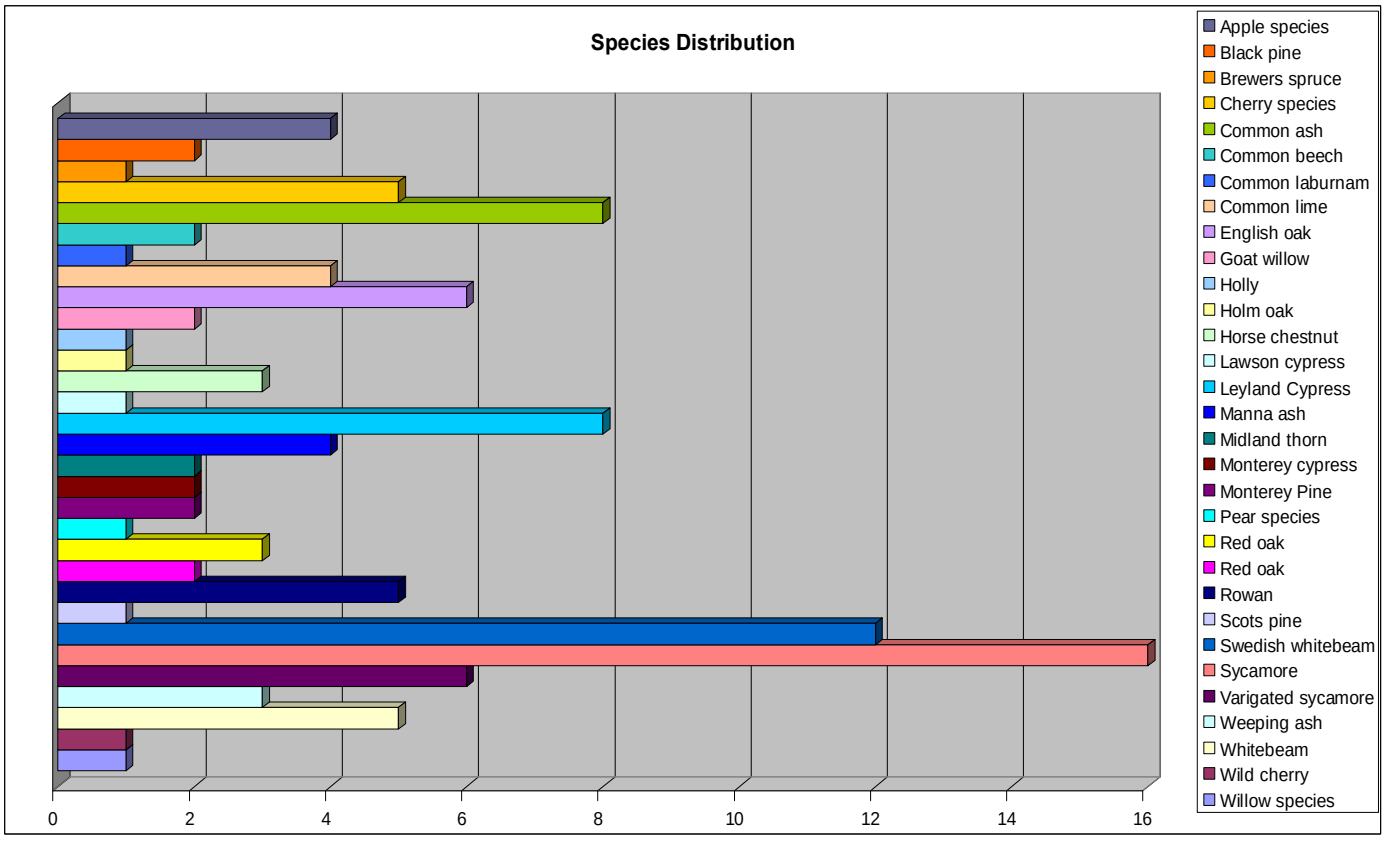
3 RESULTS

3.1 Summary

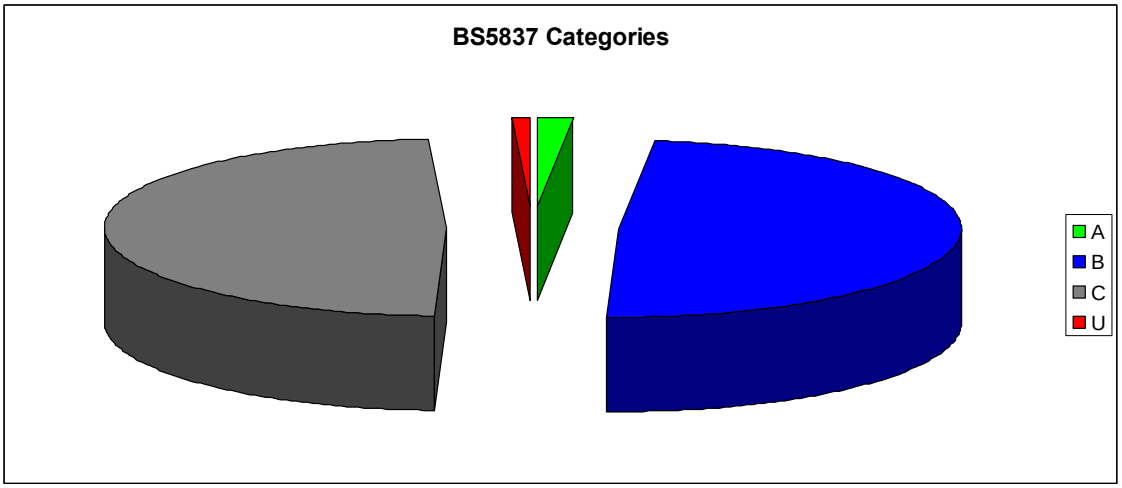
In total 115 trees were surveyed on and adjacent to the site. Tree data was also collected for six tree groups. There is a broad range of tree species represented across the survey area. Many of these are amenity trees planted for their visual characteristics or because they can survive the maritime conditions found here.

Of all the trees recorded, it was necessary to estimate the dimensions of 22 because they were off site or inaccessible. They are marked on the data tables with a hash tag (#).

The majority of species found are between semi and early mature, with a high portion being mature. There are few young trees and no veterans/over mature specimens. Further details can be found in Table 1.



Across the site there are two Category A and one Category U tree, with 56 Category B and 56 Category C trees together making up the majority.



3.2 Condition

The site is located on the Solent and receives a near constant saline breeze. This causes difficult growing conditions which are having a detrimental impact on the form, vigour and vitality of many trees. A number of trees have a 'windswept' appearance and are producing smaller leaves that are often brown and withered around the edges. Trees in the more sheltered locations, as well as species which can cope with the growing conditions, are not as affected. Further details can be found in Table 1.

T1. Monterey pine - This is a large multi-stemmed tree which appears to have undergone root plate movement fairly recently. Due to the site being secure with only limited access to the public and the location of the tree there is no immediate requirement for works but the tree should be monitored. The tree may need removal if usage frequency across the site increases.

3.3 Amenity Value

The trees offer moderate visual amenity to the personnel on site, with limited visual amenity value to the wider community. This is mainly due to many trees being small in stature, hidden by buildings together with the low density of trees across the site relative to the total area of 26 ha. There are a small number of maturing individuals that offer higher amenity value and would be beneficial to a future development on this site.

4 CONCLUSIONS

4.1 General

The Tree Constraints Plan (Figure 1) details the restrictions posed on the site by the canopy of the trees and their RPA's. This should inform the design process for the proposed development; the Category A and B trees should influence the design of the development in favour of their retention. Works should not take place within the RPA of retained trees, but where this is unavoidable no-dig methods should be used.

It would be possible to accommodate a development of the site whilst retaining a large number of trees without impacting on their RPA's. There is also plenty of scope for replacement planting if tree removals become necessary to facilitate development. Any replacements would have to be suitable to the site and able to cope with the coastal conditions.

4.2 Design and Planning

4.2.1 Arboricultural Impact Assessment (Stage 2)

Once the design is in place, an arboricultural implication assessment can be prepared to comment on the proposed design, with the aim of highlighting and, where possible, mitigating any tree issues that could otherwise delay the planning application.

4.2.2 Arboricultural Method Statement (Stage 3)

Once the design is finalised and before construction takes place, an arboricultural method statement (AMS) should be compiled detailing the location and nature of protective fencing, signage and other protection measures. All site operatives must be made aware of the nature of the protection detailed in the AMS and it should remain in place throughout construction.

5 TABLES, FIGURES AND APPENDICES

TABLE 1
TREE SURVEY DATA

Tree Data

Tree No.	Species	Diameter (mm)	Height (m)	N	S	E	W	Canopy Height	Life Stage	General Observations	Est. Remaining Contribution (yrs)	Category
T1	Monterey Pine	575	8	5	5	5	5	0.5	M	Multi stemmed low branching tree, three largest stems taken for measurement. Root plate movement, cracks around plate, squat crown, brown needles in places. Remove if usage increases	10-20	C1
T2	Apple species	300	4	5	4	4	4	1	M	Windswept, leaning tree with three stems/branches overgrown with bramble and elder	10-20	C2
T3	#Common ash	300	7	3	3	3	3	2	SM	Off site. Domed canopy, minor included unions	20-40	B2
T4	#Common ash	300	7	3	3	3	3	2	SM	Off site. Domed canopy, minor included unions all have amenity value to street and flats	20-40	B2
T5	#Common ash	300	7	3	3	3	3	2	SM	Off site. Domed canopy, minor included unions	20-40	B2
T6	#Swedish whitebeam	250	5	3	3	1	3	1.5	EM	Off site. Amenity street planting, stubs some tight forks, shares NTM canopy with T7 & T8	20-40	B2
T7	#Swedish whitebeam	250	5	3	4	2	4	1.5	EM	Off site. Amenity street planting, stubs some tight forks, , shares NTM canopy with T6 & T8	20-40	B2
T8	#Swedish whitebeam	250	5	4	3	4	2	1.5	EM	Off site. Amenity street planting, stubs some tight forks, shares NTM canopy with T6 & T7	20-40	B2
T9	#Swedish whitebeam	250	5	3	3	3	3	1.5	EM	Off site. Amenity street planting, stubs some tight forks	20-40	B2
T10	#Swedish whitebeam	250	5	3	2	3	3	1.5	EM	Off site. Amenity street planting, stubs some tight forks	20-40	B2
T11	Sycamore	450	13	4	4	3	3	2	M	Tarmac to single stem, epi on stem, asymmetric to sheltered building corner, dieback on exposed edge	20-40	B3
T12	Sycamore	450	4	3	3	3	3	1	M	Heavily topped sycamore, stem damage, epi re-growth	10-20	C1
T13	Sycamore	225	4	3	2	4	4	2	SM	Topped under phone wires, sparse crown, canopy includes NTM vegetation	10-20	C1

T14	Sycamore	550	5	3	3	2	2	1	M	Ivy clad, topped tree, epicormic re-growth, sparse and damaged due to wind	10-20	C1
T15	Sycamore	375	8	3	3	4	4	6	M	Single stem, very sparse crown, birds nest	10-20	C1
T16	Manna ash	325	7	3	3	3	3	1	EM	Single stem, compact full crown, leaf browning due to sea air. Some included unions	20-40	B1
T17	Sycamore	600	11	4	4	4	4	2	M	Co-dominant at base, ivy on stem, full crown, minor leaf browning	20-40	B1
T18	Leyland cypress	350	13	3	1	3	3	5	M	3 trees grown as one with half metre spacing, stubs, browning, ivy and tight forks, shares canopy with others	20-40	B2
T19	Leyland cypress	450	13	1	1	3	3	2	M	3 trees grown as one with half metre spacing, stubs, browning, ivy and tight forks	20-40	B2
T20	Leyland cypress	525	13	1	3	4	4	3	M	3 trees grown as one with half metre spacing, stubs, browning needles, ivy and tight forks	20-40	B2
T21	Brewers spruce	250	5	1	1	1	1	0	SM	Possibly topped, ivy clad tree. If retained remove ivy	10-20	C1
T22	Willow species	500	5	2	2	4	2	0.5	M	Ivy, moderate deadwood, asymmetric to car park	10-20	C1
T23	Common ash	250	4	2	2	1	1	0	SM	Bifurcate from base, ivy, crossing rubbing branches, strimmed re-growth	10-20	C1
T24	Cherry species	400	4	5	4	4	4	2	M	Graft, tag 2535, split from graft to base occluding	10-20	C1
T25	Midland thorn	350	4	3	2	2	3	2	M	Ornamental thorn, pink flowers, die back in canopy	10-20	C1
T26	Laburnum	250	4	3	2	2	2	1.5	EM	Basal wound, best condition in group	20-40	B1
T27	Apple species	225	4	1	3	3	2	1.8	EM	Poor condition, deadwood, die back	10-20	C1
T28	Cherry species	350	4	2	3	3	2	2	EM	Ornamental cherry, moribund, cracking bark, cavities	10-20	C1
T29	#Common ash	400	10	3	3	3	3	2	SM	Off site, twin stem with some minor stem damage a ppw	10-20	C1
T30	#English oak	400	4	1	1	1	1	3	M	Off site. Severely topped oak with regrowth, oak apple galls	20-40	B3
T31	#Horse Chestnut	500	12	3	2	3	3	3	M	Off site, single stem full canopy	20-40	B1

T32	#Sycamore	500	14	3	4	5	4	5	M	Off site, single stem with cavities from pruning wounds, minor dead wood, die back	20-40	B3
T33	#Sycamore	600	13	4	9	4	5	3	M	Off site. Twin at est. 1m, stubs from poor pruning, browning leaves, sharing NTM canopy with T34	20-40	B3
T34	#Sycamore	625	13	6	7	3	4	2	M	Off site. Twin at est. 1m, ppw on stem, browning leaves, sharing NTM canopy with T33	20-40	B3
T35	Swedish whitebeam	500	10	2	5	6	6	2	M	Asym away from building, branch break at 2m, lifted over path, shares NTM canopy with T36	20-40	B1
T36	Swedish whitebeam	475	10	5	1	5	5	3	M	Asym away from building, branch break at 2m, lifted over path, multiple pruning wounds, shares NTM canopy with T35	20-40	B1
T37	Swedish whitebeam	525	10	4	4	4	5	3	M	Asym away from building, branch break at 1.3m, ivy	20-40	B1
T38	Swedish whitebeam	700	9	5	5	5	5	1	M	Broadly domed squat crown, branch break at 1m, some tight, congested forks, 2550	20-40	B1
T39	Swedish whitebeam	675	9	5	6	5	5	1	M	Broadly domed squat crown, branch break at 2m, some tight, congested forks, crossing braches, tag 2549	20-40	B1
T40	Leyland cypress	750	12	4	4	4	4	1	M	Horribly multi stemmed, largest stems taken to measure, asymmetric away from neighbour,	10-20	C1
T41	Leyland cypress	750	12	5	5	3	4	1	M	Same as before, opposite direction	10-20	C1
T42	Leyland cypress	825	13	4	4	3	3	2	M	Single stem, some broken hangers, stubs	20-40	B1
T43	Sycamore	450	8	3	3	4	3	3	EM	Co-dominant at 1.8m, pruning wounds, browning leaves	10-20	C1
T44	Sycamore	375	11	5	5	5	5	3	EM	Pruning wounds at 2m with epicormic, sparse on windward side of canopy, shares NTM canopy	20-40	B3
T45	Whitebeam	450	9	3	7	4	3	2	M	Braches at 1.8, re-growth from pruning wounds, was tagged, number missing, sharing NTM canopy	20-40	B1

T46	Swedish whitebeam	700	10	3	3	4	4	3	M	Branches at 1m, took reading below union, included, ivy, crossing branches, re-growth from pruning wounds. Remove ivy	20-40	B1
T47	Common ash	100	4	1	1	1	1	0.5	Y	Windswept young tree, browning foliage	10-20	C1
T48	Sycamore	650	14	4	5	5	5	3	M	Pruning wounds at 2m with minor decay	20-40	B3
T49	Swedish whitebeam	500	5	4	1	4	1	0.5	M	Multiple pruning wounds with re-growth, suppressed by neighbour	10-20	C1
T50	Manna ash	250	6	3	3	3	3	0	SM	Low branching at .2m, domed canopy to ground	10-20	C1
T51	Rowan	200	4	3	2	3	1	1	SM	Low branching at 1m, small leaves, compact sparse crown, dominated by the wind	10-20	C1
T52	Manna ash	250	4	3	2	3	2	0.2	SM	Compact crown, some leaf browning	10-20	C1
T53	Apple species	250	5	3	3	3	3	2	EM	Roadside, wind swept, browning leaves, minor dieback	10-20	C1
T54	Midland thorn	250	6	4	1	2	1	2	EM	Ornamental. Deadwood in canopy, leaning due to wind, ivy, browning leaves	10-20	C1
T55	Apple species	350	6	3	4	4	5	2	EM	Similar to other apple, epicormic at base, ivy, minor deadwood	10-20	C1
T56	Cherry species	400	4	3	1	3	3	0	M	Ornamental ivy clad, in decline	10-20	C1
T57	Variegated sycamore	150	4	2	3	1	2	3	Y	Minor deadwood, sharing NTM canopy with T58, T59, T60, T61 & T62	10-20	C1
T58	Variegated sycamore	300	9	3	4	2	1	3	SM	Asymmetric to south east, pruning wounds	20-40	B2
T59	Variegated sycamore	100	4	3	3	5	3	1	Y	Suckers at base	10-20	C1
T60	Variegated sycamore	325	9	1	2	2	1	3	SM	Ivy clad, asymmetric to north, minor deadwood	20-40	B2
T61	Variegated sycamore	400	10	3	5	4	3	3	EM	Ivy clad, asymmetric to north east, minor deadwood	20-40	B2
T62	Variegated sycamore	450	10	7	4	8	8	3	EM	Ivy clad, sparse canopy	20-40	B2
T63	Weeping ash	400	4	3	3	3	3	0	SM	Dense weeping canopy	10-20	C1
T64	Manna ash	250	5	3	2	4	3	0	SM	Tripe stem ash, deformed foliage, , poor form	10-20	C1
T65	Red oak	225	5	3	3	4	1	1	SM	Very sparse and wind battered tree, deformed leaves	10-20	C1

T66	Red oak	300	4	4	2	5	5	0.5	SM	Better condition than neighbour, fully crowned with some foliage damage	10-20	C1
T67	English oak	500	8	3	3	4	4	0.5	EM	Established, ivy clad, squat crown, some browning leaves	20-40	B1
T68	English oak	550	7	4	5	4	4	2	EM	Established, squat crown, small leaves, tag 2599, previous failure	20-40	B1
T69	Pear Species	300	5	1	1	4	3	1	SM	Pruning wounds on stem and structural branches, sparse canopy due to conditions	10-20	C1
T70	Red oak	150	5	3	1	2	1	1	SM	Typical of site, poor canopy condition due to winds, some included unions	10-20	C1
T71	English oak	125	5	2	2	2	2	1	SM	Typical of site, poor canopy condition due to winds, stem wounding at 3m	10-20	C1
T72	Goat willow	400	10	2	3	3	3	1	EM	Co-dominant at base, tight fork/inc bark	10-20	C1
T73	Whitebeam	325	8	3	2	2	1	2	EM	Braches at 1.4m, suppressed by neighbour	10-20	C1
T74	Whitebeam	400	10	4	3	3	2	2	EM	Braches at 2m, tag no number, pruning wounds	20-40	B1
T75	Weeping ash	125	3	1	1	1	1	0	Y	Grafted, weeping tree on mound	10-20	C1
T76	Whitebeam	525	10	4	4	3	3	1	M	Branches at 1m all of similar size, pruning wounds over path, tight forks	20-40	B1
T77	Whitebeam	400	7	4	4	5	3	2	M	Included unions, tight forks, pruning wounds	10-20	C1
T78	cherry species	200	4	2	2	4	1	0.5	EM	Epicormic, pruning wounds on stem, included bark	10-20	C1
T79	Rowan	200	4	3	1	2	1	1	SM	Epicormic and suckers, asymmetric to north	10-20	C1
T80	Rowan	200	8	3	3	3	2	2	SM	Single stem asym to north east, sparse crown with dieback to south west	10-20	C1
T81	Rowan	150	4	1	1	1	1	2	Dead	Dead	-10	U
T82	Rowan	325	6	4	3	6	2	1	SM	Squat crown, fair condition, leaders are weather beaten - not sheltered, some stem wounds, tag 2586	20-40	B3
T83	Common lime	575	8	4	4	4	4	1	M	Co-dominant, epicormic, crossing branches, rubbing limbs, previous failures, browning leaves. Remove epi and west limb at 2m.	20-40	B3
T84	#Sycamore	175	5	1	1	1	1	2	Y	Single stem, self set, near mast	10-20	C1
T85	Sycamore	350	9	4	4	4	4	1	EM	Single stem, historically lifted over car park	20-40	B3

T86	Wild cherry	300	7	2	2	2	2	3	EM	Growing above shrub mass, sparse canopy poor condition	10-20	C1
T87	Goat willow	500	8	3	3	6	3	0.5	M	Co-dominant, included union, pruning wounds	10-20	C1
T88	Horse Chestnut	900	13	7	6	7	8	5	M	Dense ivy cover, trifurcate at roughly 2m. Remove ivy	20-40	B1
T89	Sycamore	500	8	5	4	5	4	3	M	Round canopy in good shape, stem wounds at base, pruning wounds, previous failures	20-40	B1
T90	Lawson cypress	525	10	1	1	1	1	1	M	Triple stem at 1.8m - included, one stem previously topped, slight lean away from building. Consider for removal	10-20	C1
T91	# Leyland cypress	700	12	5	4	2	2	4	M	Off site, typical for species	10-20	C1
T92	Common lime	500	11	4	5	4	5	3	M	Single stem, domed canopy, minor ivy, cut back epi, slightly damaged leaves	+40	A1
T93	Black pine	725	13	6	6	6	6	3	M	Single stem, some stubs, slight lean, previous failure, large basal stem wound	20-40	B1
T94	Black pine	525	11	5	5	5	5	5	EM	Single stem, flattened top, tag 0169	20-40	B1
T95	Scots Pine	600	8	5	5	5	5	1	EM	Squat crown, good condition, pruning wounds, crossing/fusing branches	20-40	B1
T96	Weeping ash	250	4	3	1	2	2	0	SM	Crossing branches	10-20	C1
T97	Holly	100	4	1	1	1	1	1	Y	Single stem	10-20	C1
T98	Weeping ash	275	4	3	2	2	1	0	SM	Poor form	10-20	C1
T99	Cherry species	100	3	3	2	2	2	1	Y	Ornamental, poor form and wind battered	10-20	C1
T100	Monterey Pine	800	15	6	5	6	5	0	M	Single stem, pruning wounds on stem, broken hanging branch, some brown needles	20-40	B1
T101	#Common ash	400	7	3	3	3	3	1	EM	Deep within bramble thicket, shaped by wind asym to east, very sparse wind shot canopy	10-20	C1
T102	English oak	575	5	5	5	6	2	3	EM	Shaped by wind, asymmetric to east, lowest branch cracked, ivy, reduced canopy, shares NTM canopy with T103	10-20	C1
T103	English oak	550	5	2	2	5	1	4	EM	Similar as T102, smaller tree with some dead limbs and extensive dead area on lower stem	10-20	C1
T104	Common beech	1000	13	9	9	11	10	0.5	M	Animal burrow at base, trifurcate inclusion at 2m, tag 2520, crossing branches tight forks, poor form due to shaping by wind.	+40	A3

Tree Data

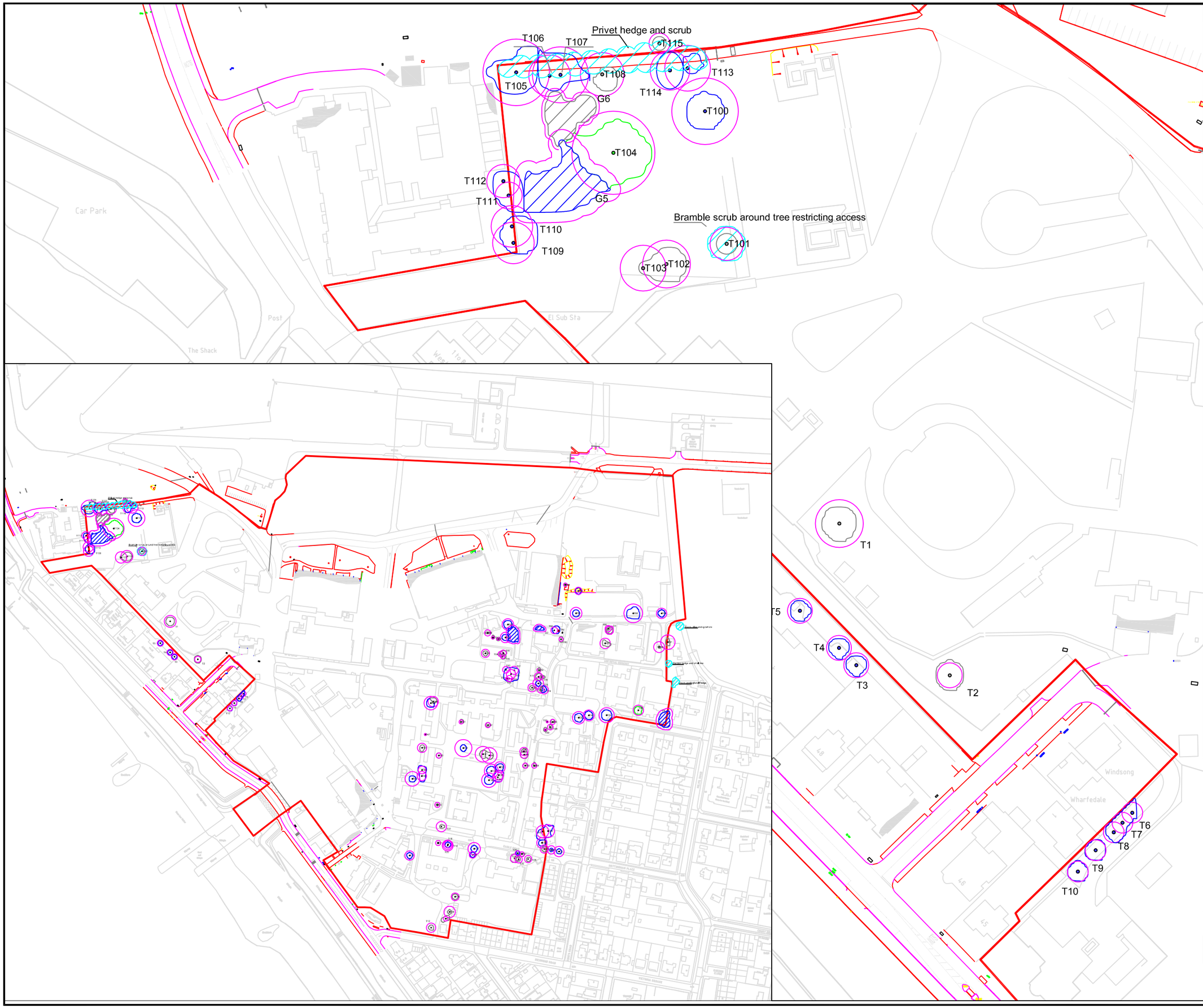
T105	Sycamore	800	12	5	6	6	8	2	M	Ivy, extensive die back and some deadwood in canopy.	20-20	B2
T106	Common lime	500	12	6	4	2	2	0.5	M	Single stem with ivy, small leaves in upper canopy due to wind. Remove ivy. Sharing NTM	10-20	B2
T107	Horse chestnut	675	12	6	4	8	2	0.5	M	Co-dominant at 2m, ivy on stem - to be removed. In similar condition to T106	10-20	B2
T108	Leyland cypress	525	12	2	5	4	2	1	M	Multiply unions from stem, stubs and failures in canopy, some ivy growth	10-20	C1
T109	#Monterey cypress	500	12	3	3	7	2	2	M	Off site, asymmetric due to windy conditions, multi stemmed, pruned over garden	20-40	B2
T110	#Monterey cypress	500	12	3	7	3	3	2	M	Off site, asymmetric due to windy conditions, pruning wounds	20-40	B2
T111	#Common beech	325	9	2	5	4	4	2	SM	Off site, asymmetric due to windy conditions, slightly suppressed with poor form	20-40	B2
T112	#Holm oak	400	8	3	3	5	3	2	EM	Off site, slightly asymmetric due to windy conditions, included union	20-40	B2
T113	Common ash	550	10	3	4	2	2	2	M	Reduced canopy due to conditions, epicormic growth. Typical condition of tree on site	20-40	B3
T114	Common lime	475	9	5	5	4	4	2	M	Top in poor condition due to winds, lower half of canopy sheltered and better	20-40	B1
T115	#Sycamore	250	11	2	2	2	2	1	SM	Single stem, growing amongst privet	10-20	C1

TABLE 2
TREE GROUP SURVEY DATA

Group Data

Group No.	Species	Diameter (mm)	Height (m)	N	S	E	W	Canopy Height	Life Stage	General Observations	Est. Remaining Contribution (yrs)	Category
G1	Variegated sycamore	300	8	9	9	6	6	2	SM	Group similar to other variegated sycamores, minor dead wood, tag 2594	20-40	B2
G2	Rowan	300	6	3	2	5	4	2	SM	Three trees on a different cultivar, epiormic growth, some stems wounds, included bark, tag 2589, 2587 & 2588	20-40	B2
G3	Portuguese, Sawara cypress 'squarrosa', sycamore	150	7	4	4	4	4	0	EM	Over grown shrub mass beneath tree, including elder and hawthorn	10-20	C2
G4	#Common beech	500	10	8	9	5	7	4	M	Off site, two trees, base not visible, one with larger diameter, poor unions and crossing limbs	20-40	B3
G5	Common beech, wild cherry	500	12	13	7	13	11	1	EM	Three beech and one cherry, with ivy covered stems, included bark, deadwood cause by conditions. Lots of scrub and self set cherry beneath.	20-40	B2
G6	Wild cherry, sycamore, Holm oak and garden privet	150	8	4	6	8	7	1	Y	Mix of scrub and young self set trees	10-20	C2

FIGURE 1
TREE CONSTRAINTS PLAN



Legend

- Tree Group BS5837 Category A
- Tree Group BS5837 Category B
- Tree Group BS5837 Category C
- Tree Group BS5837 Category U
- Tree BS5837 Category A
- Tree BS5837 Category B
- Tree BS5837 Category C
- Tree BS5837 Category U
- Root Protection Area
- Tree or tree group number
- Existing Design
- Additional Vegetation

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
—	—	—	—	—	—

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Project Title

Waterfront

Daedalus Airfield

Drawing Title

TREE CONSTRAINTS PLAN WATERFRONT WEST

Drawn	Date	Checked	Date	Approved	Date
LH	100614	JR	230614	JR	230614

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1:1000	A3	METRES

Project No.	Drawing File
121000	—

Drawing No.	Rev.
001	—

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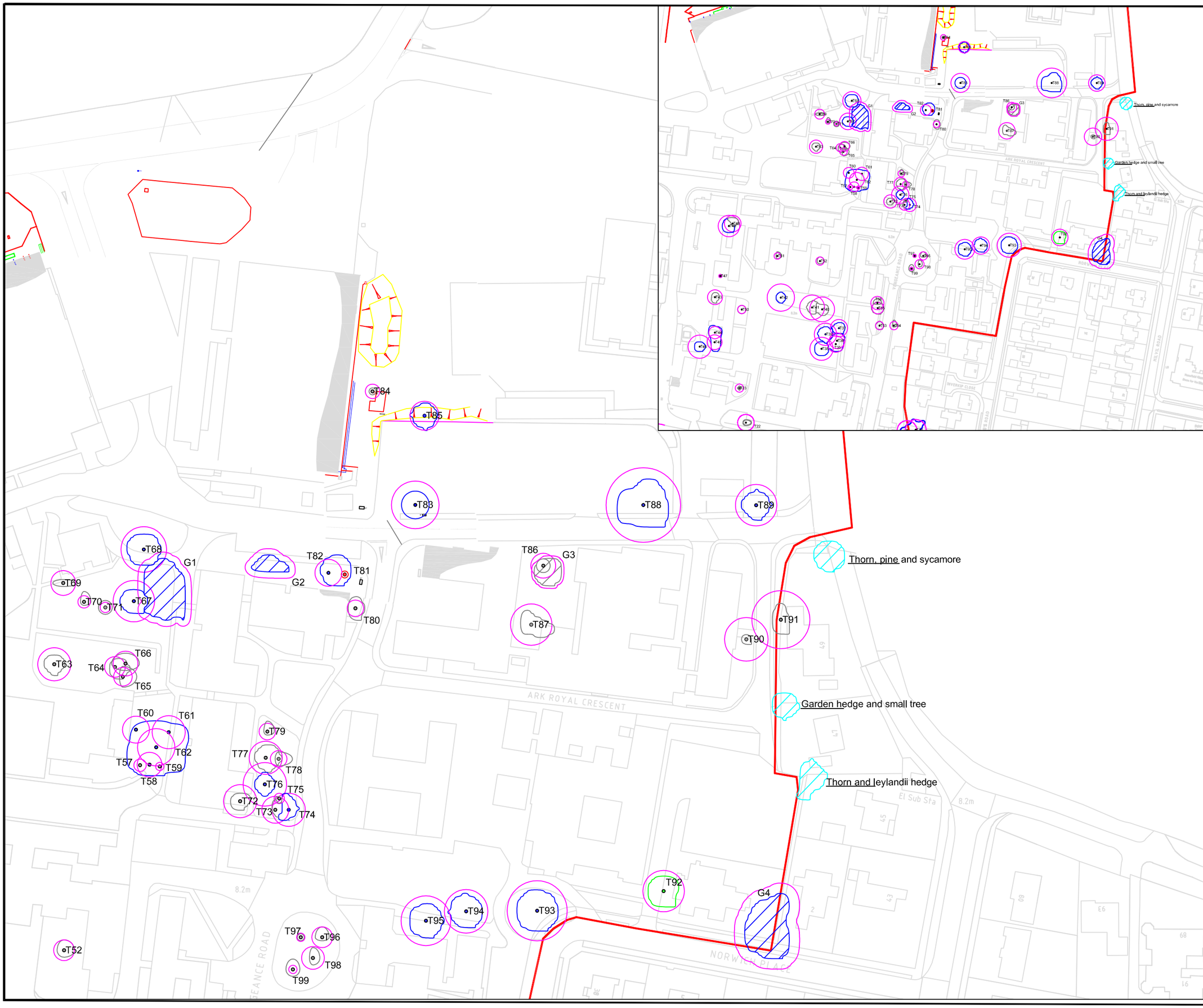

Legend

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- Tree Group BS5837 Category B
- Tree Group BS5837 Category C
- Tree Group BS5837 Category U
- Tree BS5837 Category A
- Tree BS5837 Category B
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- Tree BS5837 Category U
- Root Protection Area
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- Existing Design
- Additional Vegetation

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
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TREE CONSTRAINTS PLAN
WATERFRONT
EAST

Drawn	Date	Checked	Date	Approved	Date
LH	100614	JR	230614	JR	230614

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
121000	—

Drawing No.	Rev.
001	—

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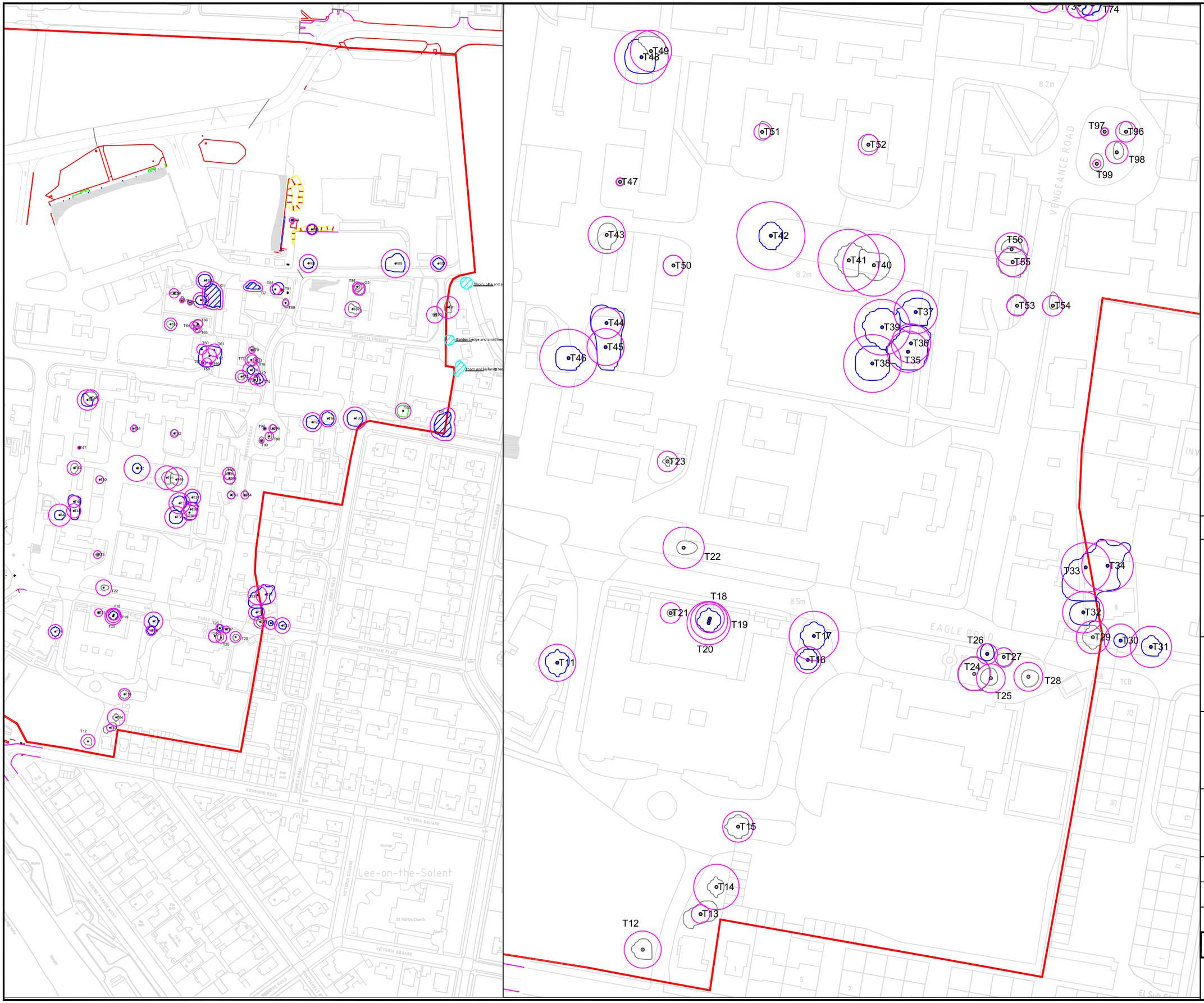

Legend

- Tree Group BS5837 Category A
- Tree Group BS5837 Category B
- Tree Group BS5837 Category C
- Tree Group BS5837 Category U
- Tree BS5837 Category A
- Tree BS5837 Category B
- Tree BS5837 Category C
- Tree BS5837 Category U
- Root Protection Area
- Tree or tree group number
- Existing Design
- Additional Vegetation

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
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Drawing Title

TREE CONSTRAINTS PLAN
WATERFRONT
SOUTH-EAST

Drawn	Date	Checked	Date	Approved	Date
LH	100614	JR	230614	JR	230614

Scale	Orig Size	Dimensions
1:1000	A3	METRES

Project No.	Drawing File
121000	—

Drawing No.	Rev.
001	—

Scale
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APPENDIX 1
METHOD

General

- On site data was recorded onto site copies of forms.
- The site data was transposed in the office into an MS Access database. Individual tree numbers and locations were plotted to a topographical survey showing tree positions. In instances where trees were not shown on the topographical survey tree positions were estimated.
- The data recorded includes:
- Height - data gathered using a Suunto optical clinometer PM - 5/1520. Where access to the tree was not possible the Heights were estimated.
- Diameter - measurements taken at 1.5 metres above ground level (complying with requirements for BS5837). Where multiple stems occurred below 1.5m the measurement was take as the point immediately above the root flare. Girth data was gathered using a metric diameter tape, callipers or estimated when no access.
- Tree crown spread estimated measurement of the four cardinal points to provide information to be used with the arboricultural constraints plan
- Tree condition - judged visually using the guidelines produced in the report. The condition is indicated with the appropriate colour on the plan found in the report. (see Figure 1)
- Age class - estimated from an examination of the tree in question.

Age Classification

The following classification is employed:

Y - Young: Trees estimated to be under ten years old.

SM - Semi Mature: Trees yet to attain mature stature and estimated to be up to 25% of attainable age.

EM - Early Mature: Almost full height, seed bearing but crown still developing. Estimated to be up to 50% of attainable age.

M - Mature: Tree has reached full height and crown spread for species, seed bearing and over 50% of attainable age.

OM - Over Mature: Full size but in decline, crown retrenchment, small leaf size and poor extension growth. Veteran features may be present.

Estimated Remaining Contribution in Years

The estimated remaining contribution in years is an estimate based on currently known factors of the possible remaining life of the tree as an asset. Clearly, it is impossible to predict changes in condition which may occur in the future and this reflects what is considered reasonable under existing circumstances, the following classification is employed:

Category U: Death or removal is likely within less than 10 years

Category C: Death or removal is likely within 10-20 years.

Category B: Death or removal is likely within 20-40 years.

Category A: Death or removal is likely beyond 40 years

The estimated remaining contribution in years will be dependent on the interaction of the typical longevity of the species, its current age and condition with prevailing environmental factors. The estimated remaining contribution in years also dependent on future tree management that can extend useful life in some instances.

Tree Condition

The tree survey assessed the individual condition of all trees identified on the site. The assessment of condition is based on a visual and professional view.

The categories considered for Physiological Condition are good, fair, poor and dead.

Structural Condition is also commented on and this will include such items of presence of decay and physical defects.

Trees are living organisms and their condition can change rapidly in response to environmental variables. Condition remarks refer to the date of survey and cannot be assumed to remain unchanged. While there is no such thing as a safe tree, regular inspection of trees is recommended to reduce the foreseeable risks associated with trees. There is currently no published guidance from the UK insurance industry on the frequency of tree inspections. In the German courts a bi-annual routine inspection is normally expected for older street trees, giving an indication of the rapidity of change in condition that can occur.

Preliminary Management Recommendations

Recommendations are given where it is felt by the arboriculturist that further investigations are required due to suspected defects and work recommendations.

Tree Categorisation Using BS 5837 Methodology

The trees surveyed were categorised using the method explained in BS5837 Trees in Relation to Construction 2012. This method categorizes individual trees, groups and woodlands in a systematic way. Each tree, group or woodland is identified on an attached plan.

Groups are identified as those trees forming a single arboricultural feature with trees that provide companion shelter, are avenues or screens or cultural.

Initially the surveyor will determine if the tree should be regarded as a U category tree. U category trees are those that are low value trees that have little future due to physiological and structural condition.

Other trees are graded A, B or C. The initial category should reflex the trees value in making an important contribution to the amenity of the site over a period of time. The higher the category the longer the perceived time period.

A sub category is included 1, 2 or 3. This sub category reflects the type of value the surveyor feels the tree presents in regards its value to 1 arboricultural, 2 landscape, 3 cultural or conservation.

The cascade chart used is included as Appendix 2 of this report.

APPENDIX 2 - BS5837:2012

Table 1 **Cascade chart for tree quality assessment**

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
Trees unsuitable for retention (see Note)				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see **4.5.7**.*			See Table 2
	1 Mainly arboricultural qualities	**2 Mainly landscape qualities**	**3 Mainly cultural values, including conservation**	
Trees to be considered for retention				
Category A **Trees of high quality** with an estimated remaining life expectancy of at least 40 years	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	See Table 2
Category B **Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	See Table 2
Category C **Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits	Trees with no material conservation or other cultural value	See Table 2

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APPENDIX G: WRITTEN SCHEME OF INVESTIGATION

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Written Scheme of Investigation for Archaeological Evaluation

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On behalf of:

Homes and Communities Agency (HCA)

Prepared by:
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July 2014

Wessex Archaeology Document: 104760.01
Gosport Borough Council Planning Application
P 11 0436 OA

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uality Assurance

Project Code	104760	**Accession Code**		**Client Ref.**	
Planning Application Ref.	Gosport Borough Council Planning Application P/11/0436/OA	**Ordnance Survey (OS) national grid reference (NGR)**	NGR 455867 101346 (Waterfront) and 455878 102174 (Hangers West).		

Version	**Status**	**Prepared by**	**Chec ed and Approved By**	**Approver s Signature**	**Date**
v01	F	*AIM*	*SF*		19th May 2014
File:	\\projectserver\wessex\Projects\104760\WSI\104760 Daedalus waterfront and hangers west WSI july 2014 v1.0 aim.docx				
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* I = Internal Draft; E = External Draft; F = Final

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Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Written Scheme of Investigation for Archaeological Evaluation

Contents

1 INTRODUCTION 1
1.1 Project background 1
1.2 The Site 2
2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND 2
2.1 Archaeological potential 2
3 IMPACTS 5
3.1 Waterfront and Hangers West: contamination and service constraints 5
3.1 Likely impact on the archaeological resource 5
4 AIMS AND OBJECTIVES 5
4.1 Project aim and objectives 5
5 METHODOLOGY 6
5.1 Fieldwork methodology 6
5.2 Recording 7
5.3 Treasure 8
5.4 Human remains 8
6 PROCESSING AND ASSESSMENT 8
6.1 Evaluation report 8
6.2 OASIS project reporting 9
6.3 Archive 9
7 UALITIY ASSURANCE PROCEDURES AND NOMINATED PERSONNEL .....
7.2 Core project team 10
7.3 Other personnel 10
8 TERMS AND CONDITIONS 10
8.1 Storage of materials and archives 10
8.2 Copyright 10
INSURANCE AND HEALTH AND SAFETY 10
9.1 Policy and risk assessment 10
10 REFERENCES 11

Figure 1: Site location plan
Figure 2: Proposed trenching plan for Hangers West
Figure 3: Proposed trenching plan for Waterfront

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Written Scheme of Investigation for Archaeological Evaluation

1 INTRODUCTION

1.1 Project bac ground

1.1.1 Wessex Archaeology has been commissioned by CampbellReith Consulting Engineers on behalf of the Homes and Communities Agency (HCA) to undertake the archaeological trial trench evaluation of two areas (Hangers West and Waterfront) located at the Daedalus Airfield, Lee-on-Solent, (hereafter 'the Site', **Figure 1**), centred on National Grid Reference (NGR) 455867 101346 (Waterfront) and 455878 102174 (Hangers West).

1.1.2 The Daedalus Airfield has been identified as the Solent Enterprise Zone, designated as a key area for business and economic growth. An outline planning consent (P/11/0436/OA) has been previously approved for development of up to 50,000m^2 of new mixed use buildings. The Waterfront and Hangers West areas are being proposed for redevelopment, although at this stage detailed plans are yet to be finalised and submitted.

1.1.3 However, following consultation between the Client and the Hampshire County Council archaeological officer (Hannah Fluck), who advises the Local Planning Authority, it is intended to undertake an archaeological assessment of the two areas by trial trenching, to ensure that the results of the archaeological work can be used to inform the determination of any future planning applications and the scope and nature of any future archaeological mitigation, if required.

1.1.4 Both the Hangers West and Waterfront areas lie approximately 1100m to the west of the new CEMAST development which lies on the eastern edge of the airfield and which has been shown to contain evidence for late prehistoric and later activity during recent archaeological investigation.

1.1.5 If the evaluation demonstrated that archaeological remains are surviving and are at risk from the impact of the proposed development, then a programme of future archaeological mitigation may be required. The full scope and nature of any future mitigation would be determined by the Hampshire County Council archaeological officer and based on the results of the evaluation.

1.1.6 Accordingly, this Written Scheme of investigation (WSI) is intended to set out in detail the archaeological work to be undertaken by Wessex Archaeology for the initial trial trench evaluation. This WSI has been prepared in accordance with best practice.

1.2 The Site

1.2.1 Daedalus Airfield is situated within the town of Lee-on-Solent, some 5km to the south of Fareham and 4km to the west of Gosport.

1.2.2 The Hangers West area (approximately 14.4ha) lies at the north-western edge of the airfield and occupies an area of rough grassland, hangers and associated hardstanding and an access road which all lie approximately 80m to the north-west of the main runway (**Figure 2**).

1.2.3 The Waterfront area (approximately 25.8ha) is located approximately 600m to the south of the Hangers West area and comprises a large complex of former military buildings, including hangers, workshops, barracks, stores and staff messes, largely dating from the period 1917 to late 1930s, although a number of elements pre and post-dated this period. Approximately 55 of these buildings and structures are Listed Buildings and are of considerable historical significance (**Figure 3**).

1.2.4 The underlying geology of the area is brickearth over river terrace deposits of sand and gravel (British Geological Survey). The underlying gravel deposits are mapped as belonging to Terrace 2 of the Eastern Solent, dating from MIS 7, *c*. 200 kya (Briant *et al* 2009, 25-32) and have been identified as potentially containing Palaeolithic archaeological remains.

1.2.5 Previous evaluation work within the airfield has identified surviving archaeological remains cut into the top of the brickearth at an average depth of between 0.40m to 0.70m below the present ground surface.

1.2.6 The top of the gravel terrace deposits (potentially containing Palaeolithic archaeology) has been located at an average depth of between 1.75m to 1.80m below the present ground surface, sealed by brickearth and topsoil/subsoil deposits.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Archaeological potential

Previous investigations

2.1.1 The Hampshire and Historic Building Record (HAHBR) has been consulted and a number of sites are noted, close to the proposed Site (**Figure 1**).

2.1.2 Archaeological evaluation and subsequent mitigation has been carried out on the CEMAST development site which lies approximately 1100m to the east of the proposed development area (Wessex Archaeology 2013). This site identified a number of Late Bronze Age pits, whilst several undated ditches may represent part of a former prehistoric field system. A number of pits and postholes containing medieval pottery and worked stone were also found.

2.1.3 Short possible surviving fragments of the prehistoric field system have also been identified during the on-going works at the iESE New Innovation Centre, which lies immediately to the northwest of the CEMAST site and possible undated traces at the Hangers East site (Wessex Archaeology 2014a) which lies further to the north (**Figure 1**).

2.1.4 A recent evaluation of the 0.8ha site at the MCA Coastal Safety Training Hub and Coastguard Rescue Station (Wessex Archaeology 2014b) is also very relevant, since this site was located in-between the Waterfront area (to the south) and Hangers West (to the north). The evaluation did not identify any archaeological features, although a small

quantity of late prehistoric worked flint and pottery were recovered during the machining of trenches. However, the overall observation was that this area had been substantially disturbed by previous modern activity in the area.

2.1.5 It appears highly likely that the features found within the CEMAST site represent a low level of activity that is related to the prehistoric midden and hearth site (**HAHBR 1 656 1 712 Figure 1**) and a possible medieval settlement at Cherque Farm (**HAHBR 3 280**) and associated chapel (**HAHBR 38748**), respectively, all found nearby on the opposite side of the Broom Way Road.

Palaeolithic to Bronze Age

2.1.6 The terrace gravels which underlie the Site have been identified as having Palaeolithic potential. A Lower Palaeolithic handaxe has been found in the vicinity of Shoot Lane, some 1000m to the south-east of the Site. Further handaxes and other Lower Palaeolithic tools have been found on the beach at Lee-on-Solent after being eroded from the gravels exposed at the cliff face (*ibid*) (**HAHBR 1 684, 1 6 8, 1 711, 37821**).

2.1.7 Both Palaeolithic and Mesolithic material has been located within the area of Cherque Farm, and is thought to potentially represent small scale occupation (**HAHBR 1 654, 1 70 , 38722**).

2.1.8 Neolithic material (**HAHBR 1 700, 30 8, 31004**) recovered during fieldwalking prior to gravel extraction works, is thought to indicate the presence of Neolithic to early Bronze Age settlement activity in the locality, and with the identification of further later Bronze Age material, is believed to be indicative of further and continued settlement in the area. A possible ring ditch has been identified from aerial photographs (**HAHBR 352**).

2.1.9 Further find spots of Palaeolithic, Neolithic and Bronze Age material (**HAHBR 1 655, 1 6 , 1 704, 1 707, 1 710, 37820**) have been found in the wider area.

2.1.10 As noted above, a reported late Neolithic or Early Bronze Age midden and hearth site (**HAHBR 1 656 1 712**) has also been identified within a gravel pit on the eastern side of the Broom Way.

2.1.11 These remains indicate that the wider environs of the Site were settled during the Bronze Age, suggesting that this area was at least partially cleared of woodland and utilised for agriculture.

Iron Age and Romano-British

2.1.12 At present there is limited evidence pertaining to the Iron Age within the general Gosport and Fareham costal area, and with the exception of the Porchester Roman Fort and associated road, there is little to suggest that the coastal area was intensely settled in the Roman period either. However, the presence of two possible Roman kiln sites recorded on the HAHBR approximately 800m to the east of the Site (HAHBR **1 714 1 65** and **31010**) would suggest at least some industrial activity.

Saxon and medieval

2.1.13 There are known Saxon settlements at Rowner (**HAHBR 3 282**) and Grange to the east of Lee-on-Solent, however there are no known sites or findspots of Saxon date in the immediate vicinity of the Daedalus site.

2.1.14 From at least the medieval period, this area of Hampshire has been dominated by dispersed settlement, mainly small farmsteads and hamlets. Evidence of this nature of

settlement in the vicinity of the Site includes a possible moated site and 13th century church near to the medieval settlement of Rowner to the east. The presence of the Grange Farm Abbey in Rowner implies that this area was still underused at this time. It is possible that the farmstead called *Milvill* shown on nineteenth century maps within the area of the airstrips was also of medieval origin.

2.1.15 A possible medieval settlement (**HAHBR 3 280**) and associated chapel (**HAHBR 38748**), is located at Cherque Farm to the east of the Site.

Post-medieval, 19th century and modern

2.1.16 The area occupied by the Site is characterised as 'coastal plain open' within Area 9f of the Hampshire County Integrated Character Assessment (Hampshire County Council 2012).

2.1.17 The 19th century landscape around Gosport and Rowner was comprised very small scale open and common fields, intensively farmed, serving the developing settlement of Gosport. While Rowner became a completely open landscape by 1850, areas to the south were subject to formal enclosure by 1800. This field pattern and character is now completely lost due to the development of Daedalus and Lee-on-Solent.

2.1.18 Late 19th century maps depict the area of the Site as predominantly rural and characterised by large open fields and Chark Common to the north-east. The Site remains undeveloped until the establishment of the modern airfield and seaplane base.

2.1.19 Although evidence of unofficial use by aircraft seems to have been occurring as early as 1915, it was in 1917 that the site was established as a temporary naval seaplane training school; a satellite centre to the Royal Naval Air Service base at Calshot. The temporary base occupied 30 acres of requisitioned land and incorporated the late 19th and early 20th century buildings of Westcliffe House and Wykeham Hall and included a series of temporary wood and canvas hangars.

2.1.20 From November 1917 when the base became permanent, more substantial structures including hangars and slipways were constructed. In April 1918 the RAF took over the administration of Daedalus (No. 209 Training Station), which is concentrated within the Waterfront area.

2.1.21 Three Admiralty 'type J' seaplane sheds and associated winch house in the southern part of the airfield are Grade II Listed Buildings (**LB 1406446**) and were amongst the earliest structures erected on the airfield.

2.1.22 A major rebuilding was undertaken after 1931 when the base became Coastal Area HQ with a number of new buildings including new headquarters, Airman's Institute, Officer's Mess and accommodation blocks were constructed. Within the Waterfront area, immediately to the south of the Site, over 55 listed and/or historic 20th century buildings are noted.

2.1.23 By 1939, Lee-on-Solent was a very important naval flying site with several operational squadrons. When the Fleet Air Arm was transferred to the Admiralty in May 1939 the Lee-on-Solent site was renamed, as was traditional, in the form of one of His Majesty's Ships and became HMS Daedalus. The Site was attacked twice during WWII because of its strategic importance and was involved both in the evacuation of Dunkirk and the D-Day landings.

2.1.24 Two HAHBR entries in the northern part of the Waterfront area are HAHBR **3 583** (the site of a known military camp known as North Camp) and **3 584** (the site of a former Second World War control tower).

2.1.25 Post-WWII the site contracted, as much of its training role was moved to other stations. As a military base HMS Daedalus closed in 1996 and ownership was transferred to civilian agencies.

3 IMPACTS

3.1 Waterfront and Hangers West: contamination and service constraints

3.1.1 The existing services and hard-standing hanger areas within the Hangers West area does not pose any significant constraints and a substantial part of this area is available for trial trenching (**Figure 2**).

3.1.2 Within the Waterfront area, there is evidence of a substantial number of live services and contamination hot-spots (fuel, dirty water and radioactive material) which have been generated by almost 100 years of activity within the Waterfront. Since this area is also still in current use, this has reduced considerably the area available for trial-trench evaluation. However, a general representative sample across the whole of the Waterfront area is still achievable (**Figure 3**).

3.1 Li ely impact on the archaeological resource

3.1.1 The initial development proposals clearly indicated a wide spread impact which is certain to exceed the relatively shallow depth at which *in-situ* archaeological remains, deposits or features may survive.

3.1.2 Recent work has indicated that that archaeological features cut into the natural brickearth are likely to be found at depths of between 0.40-0.70m below the current ground level. Accordingly, even minor groundworks will potentially truncate or completely remove any shallow archaeological deposits or features.

4 AIMS AND OBJECTIVES

4.1 Project aim and objectives

4.1.1 With due regard to the IfA *Standard and Guidance for archaeological evaluation* (IfA 2008), the generic aim of the project can be defined as:

- To locate, identify and to investigate and record the presence/absence of archaeological features or deposits;
- Where possible, to confirm the extent, date, character, relationship, condition and significance of archaeological features, artefacts and deposits within the proposed development area;
- To inform the scope and nature of any requirements for any potential further fieldwork, whether additional watching brief, excavation or post-excavation work;
- To enable the preservation by record of any archaeological features or deposits uncovered
- To place any identified archaeological remains within their historical context,

5 METHODOLOGY

5.1 Fieldwor methodology

5.1.1 The evaluation of the Hangers West Area will comprise the excavation of an initial 2% sample by area, which will comprise approximately 40 trenches; each 30m by 1.8m in size (**Figure 2**). It is intended that the results from this initial sample will be reviewed and discussed by the Hampshire County Council archaeological officer and Wessex Archaeology and additional trenching, if required, will be undertake in stages at a 3%, 4% and up to a maximum of 5% sample by area (approximately 96 trenches; each 30m by 1.8m in size).

5.1.2 Within the Waterfront area, the existing constraints restrict the number of trenches to approximately 28 trenches (**Figure 3**). The majority of the trenches will be 30m by 1.8m in size, although at least 6 of the trenches will be restricted to 10m by 1.8m in size.

5.1.3 The evaluation trenches will be accurately located before excavation using GPS survey equipment. The excavation of the evaluation trenches will be carried out by mechanical excavator in discrete 0.20m spits and will cease at the upper surface of significant archaeological features/deposits or the *in situ* natural brickearth geology, whichever is encountered first.

5.1.4 If the trench reaches a depth of 1m below the ground surface without reaching the natural, or there are stability issues in made ground deposits, discussions will be held with Hampshire County Council archaeological officer to agree the scope of appropriate fieldwork. Such work may include additional machine-excavated sondages etc., sufficient to provide information to meet the project aims but without the need for personnel to enter deep excavations.

5.1.5 Topsoil and subsoil/overburden deposits will be stored separately and scanned for artefacts.

5.1.6 All archaeological deposits or features will be characterised, their condition established and where possible, dated by the manual excavation of an appropriate sample. Care would be taken to preserve the integrity of any archaeological features or complex deposits which may be better excavated under a controlled full excavation/archaeological mitigation.

5.1.7 All features and deposits will be recorded using Wessex Archaeology's standard methods and *pro forma* recording system, with all features and deposits being assigned a unique number.

5.1.8 The following strategy will be employed as a standard sample level:

- Sufficient samples (usually 50%) of all discrete archaeological feature (e.g. postholes and pits) and lengths of all ditches, linear boundaries (usually 10-20%) etc. will be excavated in order to elucidate the date, character, relationships and function of the feature;
- All ditch/enclosure terminals will be investigated;
- A larger sample of up to 100% of industrial deposits or significant features/burials may be required;

5.1.9 In the event that significant features or deposits are revealed, Wessex Archaeology will consult with the Hampshire County Council archaeological officer and the Client to ensure that sufficient work is undertaken to ensure the aims and objectives of the project are met.

5.2 Recording

5.2.1 All features and deposits will be recorded using Wessex Archaeology's standard methods and *pro forma* recording system, with all features and deposits being assigned a unique number. A full graphic record will be maintained. Plans and sections will be produced at a scale of 1:20 and 1:10, where appropriate. The Ordnance Datum (OD) height of all principal features and levels will be calculated, with plans and sections annotated with OD heights. The location of features will be accurately surveyed by GPS and tied into the OS National Grid.

5.2.2 A full photographic record will be maintained using digital cameras equipped with an image sensor of not less than 10 megapixels. This will illustrate both the detail and the general context of the principal features and the site as a whole. Digital images will be subject to managed quality control and curation processes which will embed appropriate metadata within the image and ensure long term accessibility of the image set.

5.2.3 Wessex Archaeology's *Guidelines for Environmental Sampling* will be used for the sampling archaeological and environmental deposits and structures. Where appropriate bulk environmental soil samples, normally up to 40 litres, for plant macro-fossils/charred plant remains, small animal bones and other small artefacts will be taken from appropriate well-sealed and dated/datable archaeological deposits. The residues and sieved fractions of the bulk environmental soil samples will be recorded and retained with the project archive.

5.2.4 Where deposits or features containing a significant environmental potential are identified, advice will be sort of, regarding sampling size and strategy, from the appropriate WA specialist and the English Heritage Regional Science advisor.

5.2.5 All artefacts from excavated contexts will be retained, except those from features or deposits of obviously modern date. In such circumstances, sufficient artefacts will be retained in order to elucidate the date and/or function of the feature or deposit. Material of undoubtedly modern date will be noted but not retained.

5.2.6 All artefacts will, as a minimum, be washed, weighed, counted and identified. Any artefacts requiring conservation or specific storage conditions will be dealt with immediately in line with *First Aid for Finds* (Leigh, Watkinson and Neal 1998). Ironwork from stratified contexts will be X-rayed and stored in a stable environment along with other fragile and delicate material. The X-raying of objects and other conservation needs will be undertaken either by the staff of the Wiltshire Museums and Library Service Conservation Consortium or by Wessex Archaeology's in-house conservator.

5.2.7 Suitable material, primarily the pottery, worked flint and non-ferrous metalwork will be assessed, the results of which will form part of the assessment report.

5.2.8 Wessex Archaeology follows the guidelines set out in the document *Selection, Retention and Dispersal of Archaeological Collections* (SMA 1993) with regard to the retention of artefacts and samples. This allows for the discard of selected artefact categories and sample products which are not considered to warrant further analysis.

5.3 Treasure

5.3.1 If material is recovered which is considered to be covered by the *Treasure Act* of 1996, all necessary information required by the *Treasure Act* (i.e. finder, location, material, date, associated items etc.) will be reported to the County Coroner within 24 hours. In addition, Wessex Archaeology will also notify the Hampshire Archaeological Officer and the Client.

5.4 Human remains

5.4.1 In the event of discovery of any human remains, they will be left *in-situ,* covered and protected and a Ministry of Justice Licence for the disturbance of Human Remains will be obtained by Wessex Archaeology within two days. Following discussions with the Client, Coroner and the Hampshire Archaeological Officer, the need for and appropriateness of their excavation/removal as part of the works will be determined.

5.4.2 Should the human remains require excavation, all excavation and post-excavation will be in accordance with the standards set out in IfA Technical Paper 13 *Excavation and post-excavation treatment of cremated and inhumed remains*. Appropriate specialist guidance/site visits will be undertaken by Jackie McKinley of Wessex Archaeology. The final placing of human remains following analysis will be subject to the requirements of the Ministry of Justice Licence.

6 PROCESSING AND ASSESSMENT

6.1 Evaluation report

6.1.1 Following completion of the archaeological works, a detailed report will be prepared and sent to the Client and the Hampshire Archaeological Officer for comment and approval.

6.1.2 On the completion of fieldwork, the following tasks will be undertaken.

- All retained finds will be washed, marked, identified and quantified by feature and/or deposit.
- Environmental samples will be processed, scanned and an assessment of their potential prepared for the report
- An appropriately illustrated descriptive summary of the archaeological results with an indication of their initial significance will be prepared in the report.

6.1.1 On the completion of fieldwork, the following tasks will be undertaken. The report will conform to Annex 2 of *Standard and Guidance for archaeological evaluation* (IfA 2008). The report will include;

- A *frontis* detailing, as a minimum; site name, grid reference, site type (i.e. evaluation), date and duration of the project, site code, area of site, non-technical summary, monuments identified and location of archive
- An introduction, including project background, description of the site and surrounding area; including geology, topography and hydrography
- A site location plan tied into OS National Grid
- Aims and objectives, including a description of the relevant fieldwork and post-fieldwork project methodologies

- A location plan showing all investigations overlain on an Ordnance Survey map base
- A factual report including tabulated data, describing all archaeological remains (features, artefacts etc.) discovered during the works, and including a consideration of their location, form, function, date, preservation and significance, supported by any appropriate figures or photographs considered necessary
- An assessment of the significance of any archaeological remains

6.1.1 A draft copy of the interim report will be submitted within four weeks of completing the fieldwork. The final report including figures will also be made available in digital format. Unless specifically instructed otherwise, this will be as a fully hyperlinked and bookmarked Adobe Acrobat PDF file.

6.1.3 The information will be deposited within the Historic Environment Record (HER) maintained by Hampshire County Council where it can be freely copied without reference to Wessex Archaeology for the purposes of archaeological research or Development Control within the planning process.

6.2 OASIS project reporting

6.2.1 On completion of the interim report, Wessex Archaeology will complete an online OASIS *pro forma* at http://ads.ahds.ac.uk/project/oasis/ for the works. Wessex Archaeology will also provide the County HER with two paper copies of the interim and final fieldwork reports.

6.3 Archive

6.3.1 It is recommended that the project archive resulting from the excavation be deposited with the Hampshire Museums Service. Arrangements for deposition will be agreed in advance with the County Archaeological Officer. Deposition of any finds with the Museum will only be carried out with the full agreement of the landowner.

6.3.2 The complete Site archive, which may include paper records, photographic records, graphics, artefacts, ecofacts and digital data, will be prepared following the standard conditions for the acceptance of excavated archaeological material by the appropriate museum, and in general following nationally recommended guidelines (SMA 1995; Walker 1990; Brown 2011; ADS 2013).

7 UALITIY ASSURANCE PROCEDURES AND NOMINATED PERSONNEL

7.1.1 Wessex Archaeology operates a Project Management system. Projects are assigned to individual managers who monitor their progress and quality, and control budgets from inception to completion, in all aspects including Health and Safety etc. Projects are managed in accordance with English Heritage guidelines outlined in the document *Management of Research Projects in the Historic Environment* (*MoRPHE*, English Heritage 2006). At all stages the manager will carefully assess and monitor performance of staff and adherence to objectives, timetables and budgets to ensure that the project meets Wessex Archaeology's quality standards and is adequately programmed and resourced within Wessex Archaeology's portfolio of project commitments.

7.2 Core project team

7.2.1 The fieldwork will be undertaken in the field by a Project Archaeologist, who will be a member of the Institute for Archaeologists (IfA) and a core member of Wessex Archaeology staff. Overall project supervision and monitoring will be undertaken by the Project Manager, who in turn is monitored by the Regional Team Leader for the Southern Region.

7.2.2 Wessex Archaeology reserves the right to replace nominated staff with staff of equivalent or greater experience. Notwithstanding, as one of the largest professional archaeological organisations in the country, Wessex Archaeology has sufficient flexibility and resources to ensure all client requirements can be met without compromise.

7.3 Other personnel

7.3.1 During the course of the fieldwork and post-excavation, the advice of the following specialists will be sought as necessary:

- *Lorrain Higbee (Wessex Archaeology): Animal bone*
- *Jacqueline I McKinley (Wessex Archaeology): Human remains*
- *Rachael Seager Smith and Lorraine Mepham (Wessex Archaeology): Pottery*
- *Sarah Wyles (Wessex Archaeology): Charred Plant Remains*
- *Dave Norcott (Wessex Archaeology): Geoarchaeologist*

8 TERMS AND CONDITIONS

8.1 Storage of materials and archives

8.1.1 No charge will be made for the temporary storage of finds or archives during the period when Wessex Archaeology are undertaking analysis or report preparation.

8.1.2 However, if, after completion and submission of the report, finds and archives cannot be deposited with the relevant museum due to circumstances beyond Wessex Archaeology's control, a charge will be made for storage.

8.1.3 A charge for storage may also be made where a delay is caused by a lack of confirmation of post-fieldwork analyses and report, if the delay exceeds three months.

8.2 Copyright

8.2.1 Wessex Archaeology shall retain full copyright of any commissioned reports, tender documents or other project documents, under the *Copyright, Designs and Patents Act* 1988 with all rights reserved; excepting that it will provide an exclusive licence to the client for the use of such documents by the client in all matters directly relating to the project as described in the Project Specification or Design.

INSURANCE AND HEALTH AND SAFETY

.1 Policy and ris assessment

9.1.1 Health and safety considerations will be of paramount importance in conducting all fieldwork. Safe working practises will override archaeological considerations at all times.

9.1.2 All work will be carried out in accordance with the *Health and Safety at Work etc.* Act 1974 and the *Management of Health and Safety Regulations* 1992, and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

9.1.3 Wessex Archaeology will supply a copy of their Health and Safety Policy and a Risk Assessment to the Client before the commencement of any fieldwork. The Risk Assessment will have been read and understood by all staff attending the Site before any groundwork commences.

9.1.4 Wessex Archaeology has both public liability (£10,000,000) and professional indemnity insurance (£5,000,000), copies of which can be provided on request.

10 REFERENCES

ADS, 2013*, Caring for Digital Data in Archaeology: a guide to good practice*, Archaeology Data Service & Digital Antiquity Guides to Good Practice

Briant, R.M., *et al.* (eds.), 2009, *The Quaternary of the Solent Basin and the West Sussex raised beaches: field guide*, Quaternary Research Association

Brown, D.H., 2011, *Archaeological archives; a guide to best practice in creation, compilation, transfer and curation (revised edition)*, Archaeological Archives Forum

Hampshire County Council, 2012, Hampshire County Integrated Character Assessment: Gosport and Fareham Coastal Plain (Area 9f), May 2012

Institute for Archaeologists, 2008, *Standards and Guidance's for archaeological field evaluation*

Leigh, D., Watkinson, D. and Neal, V., 1998, *First Aid for Find: Practical Guide for Archaeologists*, United Kingdom Institute for Conservation of Historic & Artistic Works

SMA 1993, *Selection, Retention and Dispersal of Archaeological Collections*, Society of Museum Archaeologists

SMA, 1995, *Towards an Accessible Archaeological Archive*, Society of Museum Archaeologists

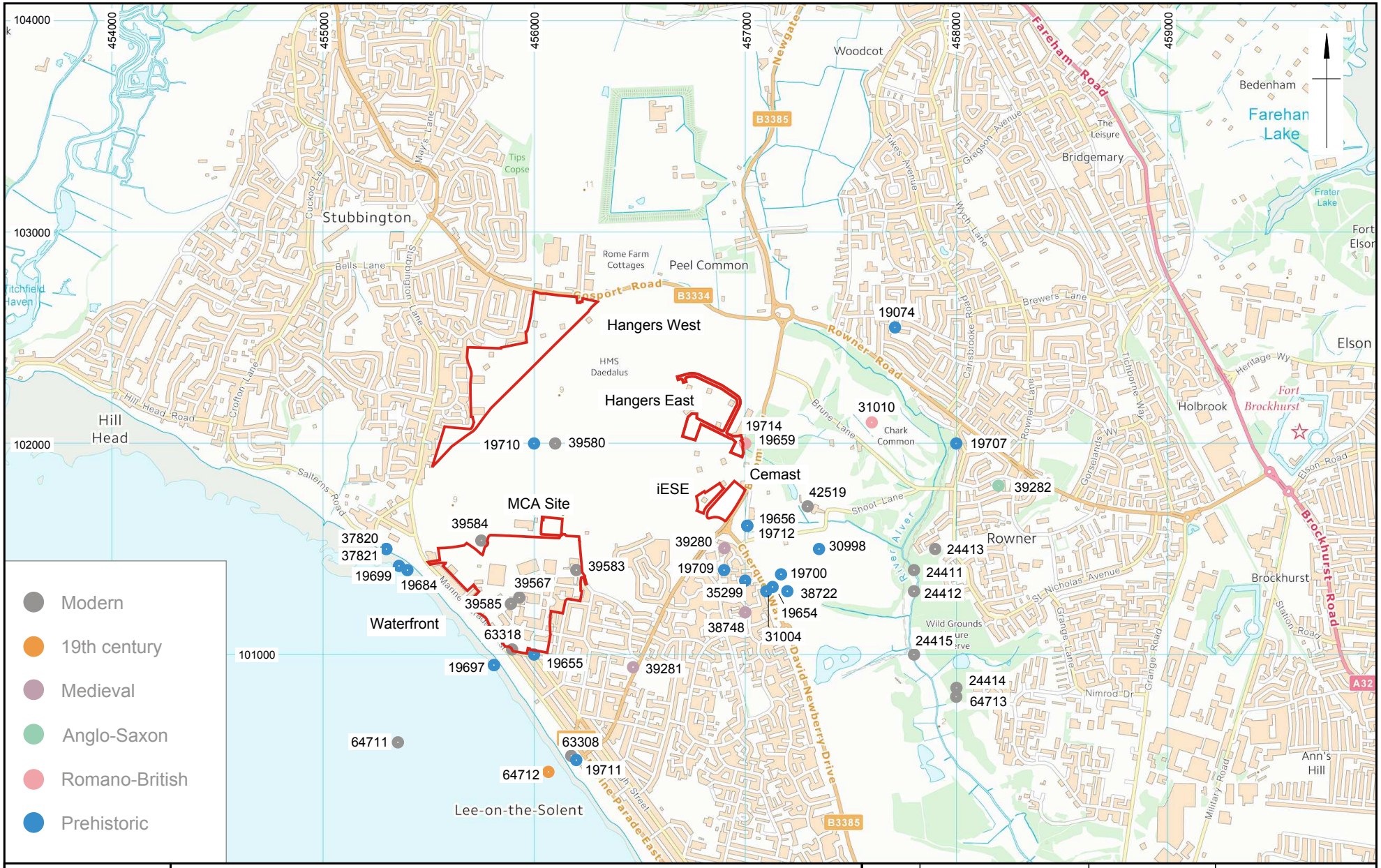
Terrence O'Rourke, 2007, Daedalus, Lee-on-Solent: Historic Environment Baseline Report, unpublished client report

Walker, K., 1990, *Guidelines for the Preparation of Excavation Archives for Long-Term Storage,* UKIC Archaeology Section

Wessex Archaeology, 2013, CEMAST, HMS Daedalus, Lee-on-Solent, Hampshire: Post-Excavation Assessment Report, Unpublished Client Report Ref: 89351.02**,** November 2013

Wessex Archaeology, 2014a, Airfield Hangers East, Phase 1C, Daedalus Airfield, Lee-on-Solent, Hampshire, Archaeological Evaluation Report, Unpublished Client Report Ref: 89353.03, April 2014

Wessex Archaeology, 2014b, MCA Coastal Safety Training Hub and Coastguard Rescue Station, Daedalus Airfield, Lee-on-Solent, Hampshire, Archaeological Evaluation Report, Unpublished Client Report Ref: 89354.03, June 2014



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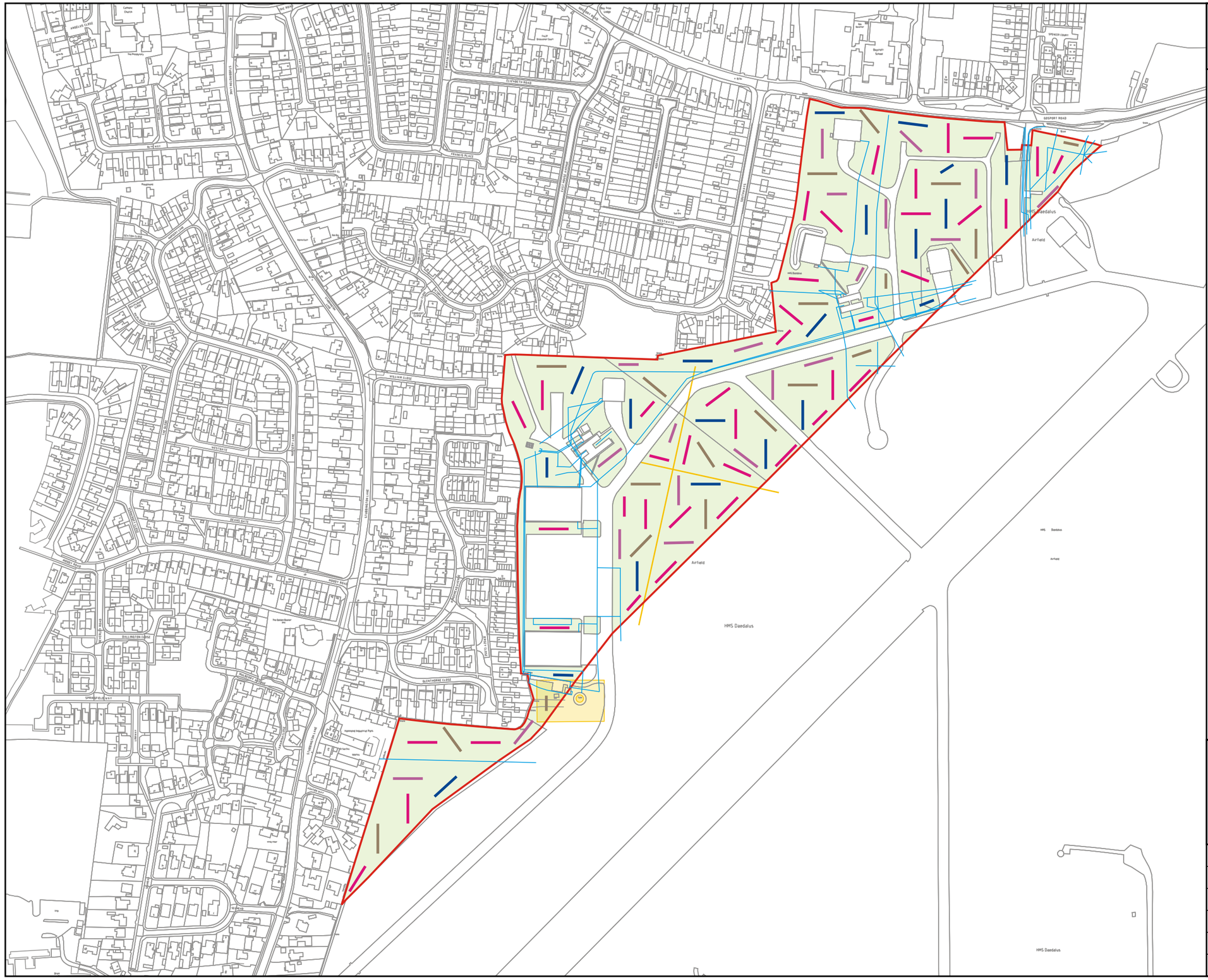
Site location plan

Figure 1



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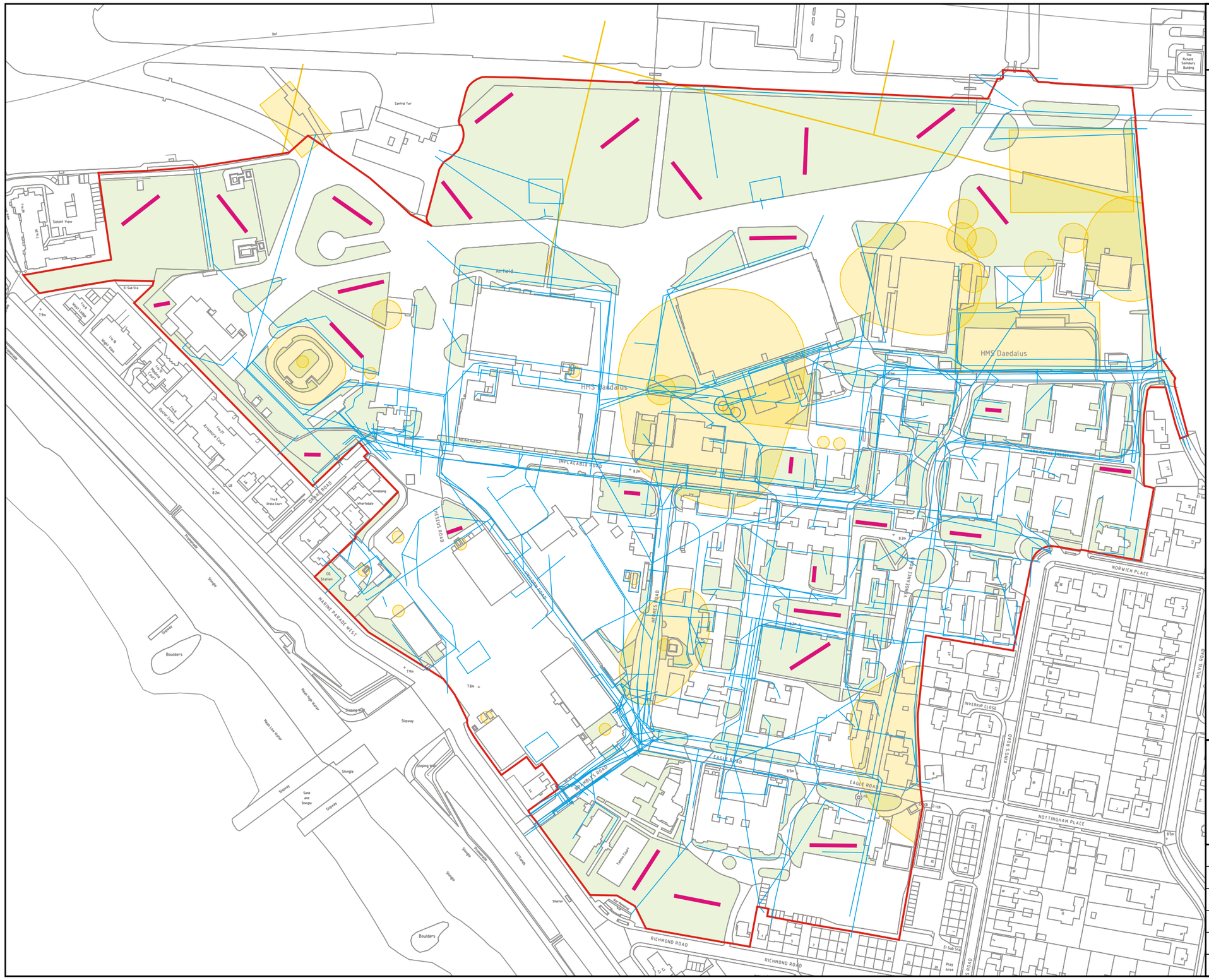
Proposed trenching plan for Hangers West

Figure 2



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Proposed trenching plan for Waterfront

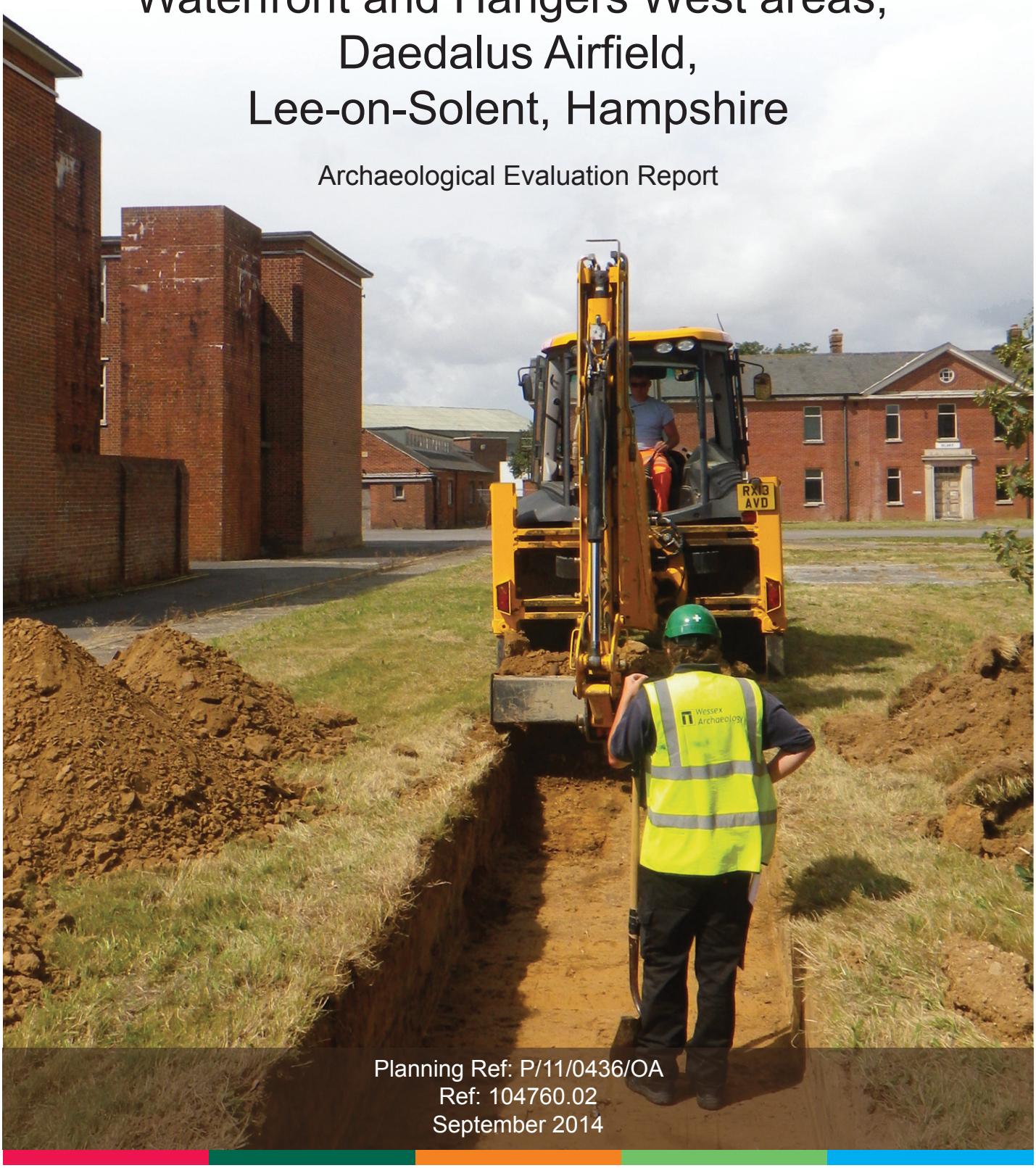
Figure 3

APPENDIX H: ARCHAEOLOGICAL EVALUATION REPORT

making sense of heritage

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report



Planning Ref: P/11/0436/OA
Ref: 104760.02
September 2014

archaeology

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report

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September 2014

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uality Assurance

Project Code	104760	**Accession Code**		**Client Ref.**	
Planning Application Ref.	P/11/0436/OA	**Ordnance Survey (OS) national grid reference (NGR)**	455867 101346 (Waterfront) and 455878 102174 (Hangers West)		

Version	**Status**	**Prepared by**	**Chec ed and Approved By**	**Approver s Signature**	**Date**
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* I = Internal Draft; E = External Draft; F = Final

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Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report

Contents

Summary iii
Acknowledgements iv

1 INTRODUCTION 1
1.1 Project background 1
1.2 The Site 1

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND 2
2.1 Introduction 2
2.2 Previous investigations 2

3 AIMS AND OBJECTIVES 5

4 METHODOLOGY 5
4.1 Fieldwork methodology 5
4.2 Health and Safety 6
4.3 Recording 6
4.4 Specialist strategies 6

5 ARCHAEOLOGICAL RESULTS 7
5.1 Introduction 7
5.2 The Waterfront 7
5.3 Hangers West 8

6 FINDS .....

7 ENVIRONMENTAL .....

8 DISCUSSION .....

STORAGE AND CURATION 10
9.1 Museum 10
9.2 Preparation of Archive 10
9.3 Conservation 10
9.4 Discard Policy 11
9.5 Copyright 11
9.6 Security Copy 11

10 REFERENCES 11

APPENDICES 13

Appendix 1: Trench summary tables 13
Appendix 2: Oasis Summary 31
OASIS ID: wessexar1-18 74 31

Figures

Figure 1 Site location plan
Figure 2 Trench location plan for Waterfront
Figure 3 Trench location plan for Hangers West

Plates

Plate 1 - Section through modern posthole 8206 cut into gully 8204.
Plate 2 - View of metal airfield matting in Trench 65.
Plate 3 - View of wall foundation in Trench 75.
Plate 4 - View of concrete foundation pad in Trench 61.

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report

Summary

Wessex Archaeology has been commissioned by Campbell Reith Consulting Engineers on behalf of the Homes and Communities Agency (HCA) to undertake an archaeolgical trial trench evaluation of two areas (Hangers West and Waterfront) located at the Daedalus Airfield, Lee-on-Solent, Hampshire, centred on NGR 455867 101346 (Waterfront) and 455878 102174 (Hangers West).

No archaeological features or deposits were found to pre-date the modern period (1800–present).

The soil sequence recorded in the trenches suggests that a degree of landscaping has occurred in the trenches around the northern and southern peripheries of the Waterfront area and across the Hangers West area, although this seems to have been relatively light, with the surface of the natural geology still intact, although it was locally disturbed by the frequent services and land drains and the occasional modern feature that cut into it. In the Waterfront area, a modern gully and posthole excavated in **Trench 82** probably represents a fence-line and an unexcavated modern animal burial in **Trench 63** may possibly pertain to the early use of the airfield or the late 19th century/early 20th century civilian buildings that were located in the Waterfront area.

Only in the central area of the Waterfront, in the trenches within close proximity to the standing airfield buildings, was a deeper impact into the natural geology seen from the construction of the buildings associated with the airfield, which could have potentially removed any archaeological features. In this area, evidence of modern building foundations such as the north–south aligned brick wall foundation in **Trench 75** could possibly relate to airfield buildings or earlier civilian buildings which fronted Implacable Road (formerly Grenville Road, a public thoroughfare) to the south.

Other modern features discovered potentially relate to structures associated with the airfield, such as the concrete and brick foundation pads in **Trench 61** (Waterfront area) and **Trench 131** (Hangers West). Metal airfield matting directly associated with the airfield was also uncovered just below the topsoil in **Trench 65** and **Trench 6** (Waterfront area).

A small quantity of heavily abraded Late Bronze Age pottery (13 sherds/89g) was recovered from the subsoil layers within **Trenches 86** and **87** in the south of Hangers West. No evidence of associated features was found within the Site. This residual material indicates some limited activity of this period within the vicinity of the airfield which has already been noted at the nearby CEMAST and Coastal Safety Training Hub and Coastguard Rescue Station sites.

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report

Ac nowledgements

Wessex Archaeology would like to thank Campbell Reith Consulting Engineers for commissioning the work on behalf of Homes and Communities Agency (HCA), and Ruth Jones, in particular is acknowledged for her assistance. Thanks are also extended to Hannah Fluck, the Senior Archaeological Officer and David Hopkins, County Archaeologist, Hampshire County Council, for monitoring the works and for their advice and guidance.

The project was managed on behalf of Wessex Archaeology by Andrew Manning. The project was directed in the field by Matt Kendall assisted by Piotr Orczweski, Ray Kennedy, Tom Blencowe and Tom Burt. This report was compiled by Gail Wakeham, and the illustrations were prepared by Rob Goller. The artefacts were assessed by Lorraine Mepham.

Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire

Archaeological Evaluation Report

1 INTRODUCTION

1.1 Project bac ground

1.1.1 Wessex Archaeology has been commissioned by Campbell Reith Consulting Engineers on behalf of the Homes and Communities Agency (HCA) to undertake the archaeological trial trench evaluation of two areas (Hangers West and Waterfront) located at the Daedalus Airfield, Lee-on-Solent, (hereafter 'the Site', **Figure 1**), centred on National Grid Reference (NGR) 455867 101346 (Waterfront) and 455878 102174 (Hangers West).

1.1.2 The Daedalus Airfield has been identified as the Solent Enterprise Zone, designated as a key area for business and economic growth. An outline planning consent (P/11/0436/OA) has been previously approved for development of up to 50,000m^2 of new mixed use buildings. The Waterfront and Hangers West areas are being proposed for redevelopment, although at this stage detailed plans are yet to be finalised and submitted.

1.1.3 However, following consultation between the Client and Hampshire County Council's (HCC) Senior Archaeologist, who advises the Local Planning Authority, a trial trench evaluation was decided upon to assess the archaeological potential and to inform the determination of any future planning applications and the scope and nature of any future archaeological mitigation that may be required.

1.1.4 Accordingly, a Written Scheme of Investigation (WSI) was prepared by Wessex Archaeology and approved by HCC (Wessex Archaeology 2014a). The archaeological evaluation was undertaken between 4th and 19th August 2014. This report provides an assessment of the results of the archaeological evaluation.

1.1.5 During the course of the work, two additional areas were identified, which required assessment. These areas comprised the line of a new proposed road within the northern edge of the Waterfront area (covered by the initial trenching and an additional Trench **116**) (**Figure 2**) and a 60m by 720m area immediately adjacent to the Hangers West area, which has been provisionally proposed for new hangers (Trenches **118-132**) (**Figure 3**).

1.2 The Site

1.2.1 Daedalus Airfield is situated within the town of Lee-on-Solent, some 5km to the south of Fareham and 4km to the west of Gosport (**Figure 1**).

1.2.2 The Hangers West area (approximately 14.4ha) lies at the north-western edge of the airfield and occupies an area of rough grassland, hangers and associated hardstanding and an access road which all lie approximately 80m to the north-west of the main runway (**Figure 2**).

1.2.3 The Waterfront area (approximately 26ha) is located approximately 600m to the south of the Hangers West area and comprises a large complex of former military buildings,

including hangers, workshops, barracks, stores and staff messes, largely dating from the period 1917 to late 1930s, although a number of elements pre and post-dated this period. Approximately 55 of these buildings and structures are Listed Buildings and are of considerable historical significance (**Figure 3**).

1.2.4 The underlying geology of the area is brickearth over river terrace deposits of sand and gravel (British Geological Survey). The underlying gravel deposits are mapped as belonging to Terrace 2 of the Eastern Solent, dating from MIS 7, *c*. 200 kya (Briant *et al* 2009, 25-32) and have been identified as potentially containing Palaeolithic archaeological remains.

1.2.5 Previous evaluation work within the eastern edge of the airfield has identified surviving archaeological remains cut into the top of the brickearth at an average depth of between 0.40m to 0.70m below the present ground surface.

1.2.6 The top of the gravel terrace deposits (potentially containing Palaeolithic archaeology) has been located at an average depth of between 1.75m to 1.80m below the present ground surface, sealed by brickearth and topsoil/subsoil deposits.

2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

2.1 Introduction

2.1.1 Recent archaeological investigations have been undertaken within close vicinity of the Site, and the results of these are summarised below. This is followed by discussion of other known heritage assets, by period, recorded within the locality of the Site, from the Hampshire County Council's Archaeology and Historic Buildings Record (HAHBR). All sites and heritage assets are shown in **Figure 1**.

2.2 Previous investigations

2.2.1 Archaeological evaluation and subsequent mitigation has been carried out on the CEMAST development site which lies approximately 1.1km east of the proposed development area (Wessex Archaeology 2013). This site identified a small number of Late Bronze Age pits, whilst several undated ditches may represent part of a former prehistoric field system. A number of pits and postholes containing medieval pottery and worked stone were also found.

2.2.2 Short segments of possible surviving fragments of the prehistoric field system have also been identified during works at the iESE New Innovation Centre (Wessex Archaeology 2014d) , which lies immediately to the northwest of the CEMAST site and at the Hangers East site (Wessex Archaeology 2014b) which lies further to the north.

2.2.3 A recent evaluation of the 0.8ha site at the MCA Coastal Safety Training Hub and Coastguard Rescue Station (Wessex Archaeology 2014c) is also very relevant, since this site was located in-between the Waterfront area (to the south) and Hangers West (to the north). The evaluation did not identify any archaeological features, although a small quantity of late prehistoric worked flint and pottery were recovered from the top of the subsoil during the machine excavation of the trenches. However, the overall observation was that this area had been substantially disturbed by previous modern activity in the area.

2.2.4 It appears highly likely that the features found within the CEMAST site represent a low level of activity that is related to the prehistoric midden and hearth site (**HAHBR 1 656 1 712**) and a possible medieval settlement at Cherque Farm (**HAHBR 3 280**) and

associated chapel (**HAHBR 38748**), respectively, all found nearby on the opposite side of the Broom Way Road.

Palaeolithic to Bronze Age

2.2.5 The terrace gravels which underlie the Site have been identified as having Palaeolithic potential. A Lower Palaeolithic handaxe has been found in the vicinity of Shoot Lane, some 1km to the south-east of the Site. Further handaxes and other Lower Palaeolithic tools have been found on the beach at Lee-on-Solent after being eroded from the gravels exposed at the cliff face (*ibid*) (**HAHBR 1 684, 1 6 8, 1 711, 37821**).

2.2.6 Both Palaeolithic and Mesolithic material has been located within the area of Cherque Farm, and is thought to potentially represent small scale occupation (**HAHBR 1 654, 1 70 , 38722**).

2.2.7 Neolithic material (**HAHBR 1 700, 30 8, 31004**) recovered during fieldwalking prior to gravel extraction works, is thought to indicate the presence of Neolithic to early Bronze Age settlement activity in the locality, and with the identification of further later Bronze Age material, is believed to be indicative of further and continued settlement in the area. A possible ring ditch has been identified from aerial photographs (**HAHBR 352 **).

2.2.8 Further find spots of Palaeolithic, Neolithic and Bronze Age material (**HAHBR 1 655, 1 6 , 1 704, 1 707, 1 710, 37820**) have been found in the wider area.

2.2.9 As noted above, a reported late Neolithic or Early Bronze Age midden and hearth site (**HAHBR 1 656 1 712**) has also been identified within a gravel pit on the eastern side of the Broom Way. These remains indicate that the wider environs of the Site were settled during the Bronze Age, suggesting that this area was at least partially cleared of woodland and utilised for agriculture.

Iron Age and Romano-British

2.2.10 At present there is limited evidence pertaining to the Iron Age within the general Gosport and Fareham costal area, and with the exception of the Porchester Roman Fort and associated road, there is little to suggest that the coastal area was intensely settled in the Roman period either. However, the presence of two possible Roman kiln sites recorded on the HAHBR approximately 800m to the east of the Site (HAHBR **1 714 1 65** and **31010**) would suggest at least some industrial activity.

Saxon and medieval

2.2.11 There are known Saxon settlements at Rowner (**HAHBR 3 282**) and Grange to the east of Lee-on-Solent, however there are no known sites or findspots of Saxon date in the immediate vicinity of the Daedalus site.

2.2.12 From at least the medieval period, this area of Hampshire has been dominated by dispersed settlement, mainly small farmsteads and hamlets. Evidence of this nature of settlement in the vicinity of the Site includes a possible moated site and 13th century church near to the medieval settlement of Rowner to the east. The presence of the Grange Farm Abbey in Rowner implies that this area was still underused at this time. It is possible that the farmstead called *Milvill* shown on nineteenth century maps within the area of the Site was also of medieval origin.

2.2.13 A possible medieval settlement (**HAHBR 3 280**) and associated chapel (**HAHBR 38748**), is located at Cherque Farm to the east of the Site.

Post-medieval, 19th century and modern

2.2.14 The area occupied by the Site is characterised as 'coastal plain open' within Area 9f of the Hampshire County Integrated Character Assessment (Hampshire County Council 2012).

2.2.15 The 19th century landscape around Gosport and Rowner was comprised very small scale open and common fields, intensively farmed, serving the developing settlement of Gosport. While Rowner became a completely open landscape by 1850, areas to the south were subject to formal enclosure by 1800. This field pattern and character is now completely lost due to the development of Daedalus and Lee-on-Solent.

2.2.16 Up to the late nineteenth century the site of what was to become HMS Daedalus was open farmland, the southern part mainly consisting of small fields that appeared to have been based on former strip fields and larger fields to the north of a lane that ran east – west (approximately on the line of the northern edge of the Waterfront area). A road, Milvill Lane, ran north – south through the site continuing the line of Manor Way/Albion Road (OS 1st Edition 6" map, 1871 Sheet 82). Along this road was a single isolated farmstead called Milvill (Forum Heritage Services 2007, 3-4).

2.2.17 At the end of the 19th century, Lee-on-Solent was developed in attempt to attract visitors to its seafront. On the south-west edge of the Site (Waterfront area), some houses of historic interest such as Westcliffe House, Wykeham Hall and Beachcroft (now demolished) were built in the period 1895-1905 (OS 3rd Edition 25"map 1909), together with some smaller houses such as the semi-detached pair of Keith Cottages (*ibid*). However, the Site remains largely undeveloped until the outbreak of World War I and the establishment of the seaplane base and the modern airfield.

2.2.18 Although evidence of unofficial use by aircraft seems to have been occurring as early as 1915, it was in 1917 that the site was established as a temporary naval seaplane training school; a satellite centre to the Royal Naval Air Service base at Calshot. The temporary base occupied 30 acres of requisitioned land and incorporated the late 19th/early 20th century buildings of Westcliffe House and Wykeham Hall and included a series of temporary wood and canvas hangars.

2.2.19 From November 1917 when the base became permanent, more substantial structures including hangars and slipways were constructed. In April 1918 the RAF took over the administration of Daedalus (No. 209 Training Station), which is concentrated within the Waterfront area.

2.2.20 Three Admiralty 'type J' seaplane sheds and associated winch house in the southern part of the airfield are Grade II Listed Buildings (**LB 1406446**) and were amongst the earliest structures erected on the airfield.

2.2.21 A major rebuilding was undertaken after 1931 when the base became Coastal Area HQ with a number of new buildings including new headquarters, Airman's Institute, Officer's Mess and accommodation blocks were constructed. Within the Waterfront area, immediately to the south of the Site, over 55 listed and/or historic 20th century buildings are noted.

2.2.22 By 1939, Lee-on-Solent was a very important naval flying site with several operational squadrons. When the Fleet Air Arm was transferred to the Admiralty in May 1939 the Lee-on-Solent site was renamed, as was traditional, in the form of one of His Majesty's Ships and became HMS Daedalus. The Site was attacked twice during WWII because of its strategic importance and was involved both in the evacuation of Dunkirk and the D-Day landings.

2.2.23 Two AHBR entries in the northern part of the Waterfront area are **HAHBR 3 583** (the site of a known military camp known as North Camp) and **3 584** (the site of a former Second World War control tower).

2.2.24 Post-WWII the site contracted, as much of its training role was moved to other stations. As a military base HMS Daedalus closed in 1996 and ownership was transferred to civilian agencies.

3 AIMS AND OBJECTIVES

3.1.1 With due regard to the IfA's *Standard and Guidance for Archaeological Evaluation* (IfA 2008), the aims of the investigation, as defined in the WSI (Wessex Archaeology 2014a) were:

- To locate, identify and to investigate and record the presence/absence of archaeological features or deposits;
- Where possible, to confirm the extent, date, character, relationship, condition and significance of archaeological features, artefacts and deposits within the proposed development area;
- To inform the scope and nature of any requirements for any potential further fieldwork, whether additional watching brief, excavation or post-excavation work;
- To enable the preservation by record of any archaeological features or deposits uncovered ; and
- To place any identified archaeological remains within their historical context.

4 METHODOLOGY

4.1 Fieldwor methodology

4.1.1 All works were undertaken in accordance with the WSI (Wessex Archaeology 2014a): an initial 2% sample was to be undertaken by the excavation of trial trenches (generally 30m by 1.8m). Any changes to those proposed were made in consultation with HCC's Senior Archaeological Officer. The layout and number of additional trenches within the new road line and hanger area were also discussed and agreed in advance of fieldwork.

4.1.2 In total, 79 trenches were proposed: 31 trenches within the Waterfront, 48 within Hangers West. Access and ecological constraints and the presence of underground or overhead services resulted in nine trenches not being excavated (eight within the Waterfront and one within Hangers West), resulting in a total of 70 trenches excavated.

4.1.3 The evaluation trenches were accurately located using GPS.

4.1.4 The trenches were excavated by mechanical excavator using a toothless ditching bucket and under the direction of an experienced Archaeologist. Machine excavation proceeded in spits to a depth at which the top of archaeological levels, or the top of natural deposits, were exposed, whichever was the higher. Once the level of archaeological deposits was exposed by machine, cleaning was undertaken by hand where necessary.

4.1.5 Topsoil and subsoil/overburden deposits were stored separately and scanned for artefacts.

4.1.6 Appropriate sample excavation by hand of archaeological features and deposits was undertaken in an archaeologically controlled and stratigraphic manner in order to fulfil the aims and objectives of the evaluation, with the agreement of HCC's Senior Archaeological Officer. Care was taken to preserve the integrity of any archaeological features or complex deposits which may be better excavated under a controlled full excavation/archaeological mitigation.

4.2 Health and Safety

4.2.1 Health and Safety considerations were of paramount importance in conducting all fieldwork. Safe working practices override archaeological considerations at all times.

4.2.2 All work was carried out in accordance with the *Health and Safety at Work etc. Act* 1974 and the *Management of Health and Safety Regulations* 1992, and all other relevant Health and Safety legislation, regulations and codes of practice in force at the time.

4.3 Recording

4.3.1 All exposed archaeological deposits were recorded using Wessex Archaeology's *pro forma* recording system with all features and deposits being assigned a unique context number. A unique project code (104760) was allocated, and was used on all records and any recovered artefacts and environmental samples.

4.3.2 An accurate overall plan of the Site was produced by surveying using a Leica Total Station Theodolite (TST) or GPS, and thereby related to the Ordnance Survey National Grid.

4.3.3 A full written and drawn record of excavated archaeological features and deposits was compiled. This included both plans and sections drawn to appropriate scales (1:20 for plans, 1:10 for sections), and referenced to the overall Site plan. The Ordnance Datum (OD) height of all principal features and levels were calculated and plans/sections were annotated with OD heights.

4.3.4 A full photographic record was maintained using digital photography. The photographic record illustrates both the detail and the general context of the principal features, finds excavated, and the Site as a whole. Digital images are embedded with appropriate metadata to ensure long term accessibility of the image set.

4.4 Specialist strategies

Artefact recovery

4.4.1 All artefacts were retained, except those from features or deposits of obviously modern date. Material of undoubtedly modern date was noted but not retained. Bulk finds were collected and recorded by context from excavated features. Small finds (objects) were recorded three-dimensionally using TST or GPS surveying equipment.

4.4.2 All artefacts were, as a minimum, washed, weighed, counted and identified. Any artefacts requiring conservation or specific storage conditions were dealt with immediately in line with *First Aid for Finds* (Watkinson and Neal 1998). Suitable material, primarily the pottery, worked flint and non-ferrous metalwork, was scanned to assess the date range of the relevant assemblages. Any ferrous metalwork was X-rayed to provide further detail concerning its original form as part of the assessment.

Environmental

4.4.3 Bulk environmental soil samples, normally up to 40 litres, for plant macro-fossils, charred plant remains, small animal bones and other small artefacts were taken from appropriate well-sealed and dated/datable archaeological deposits following Wessex Archaeology's standard environmental sampling policy.

4.4.4 Any bulk environmental soil samples taken were processed, scanned and assessed for their potential, and the residues retained with the project archive.

5 ARCHAEOLOGICAL RESULTS

5.1 Introduction

5.1.1 The results of the archaeological evaluation are discussed by area below. All excavated trenches are shown in **Figures 2** and **3**.

5.1.2 A tabulated trench summary is provided in **Appendix 1**.

5.2 The Waterfront

5.2.1 A total of 31 trenches were proposed within the Waterfront, however due to access constraints and the presence of services eight trenches (**Trenches 57**, **62**, **64**, **71**, **74**, **78**, **115** and **117**) could not be excavated, therefore resulting in 23 trenches being excavated in this area (**Figure 2**).

5.2.2 No evidence of archaeological activity was noted within this area dating before the 19th century.

5.2.3 Around the northern and southern peripheries of the Waterfront area, **Trenches 55**, **56**, **58**–**60**, **63**, **65**–**70**, **73**, **80**–**82** and **116** were relatively shallow 0.34 – 0.48m deep with turfed topsoil of mid greyish brown silty loam (average 0.2m deep) overlying a pale yellowish brown silty clay loam layer (probably a remnant subsoil), which in many trenches had been compacted/rolled suggesting that landscaping had occurred for ground levelling of the airfield site. Occasional modern finds of ceramic building material fragments (CBM), as well as glass (**Trench 70**) and a moulded piece of marble, possibly from a fireplace (**Trench 55**), were recovered from the subsoil/compacted layer (but were not retained). The underlying natural geology consisted of a pale yellowish/orange brown silty clay with sparse sub-rounded flint <0.50m throughout and manganese flecking.

5.2.4 In the central part of the Waterfront area, **Trenches 61**, **72**, **75**–**77**, **7** , were generally found to be deeper (0.48 – 0.88m) and contained evidence of modern made ground deposits underlying the topsoil and overlying the natural geology. In one trench it was not possible to reach natural geology because of the presence of a modern wall foundation (**Trench 75**). This indicates that the surface of the natural geology in the area of these trenches has been locally truncated by construction activity related to the airfield buildings.

5.2.5 Asides from a variety of modern service trenches and land drains that cut into the natural geology in many of the trenches, a few other features were recorded but were also of modern date and may possibly pertain to the early use of the airfield or the late 19th century/early 20th century civilian buildings that were located in this area (**Figure 2**). This included an animal burial (possibly a dog) in small circular pit **6304** (0.5m in diameter) cut into the natural in **Trench 63** which was not excavated but its location was surveyed and it was noted that the backfill of the animal burial contained clay pipe fragments and CBM fragments (not retained). In **Trench 82**, shallow gully **8204**, 0.77m wide and 0.12m deep, was cut into the natural and had a single fill (**8205**) from which coke/clinker, modern CBM

fragments and blue and white willow pattern china were recovered (although not retained). An almost vertical-sided posthole **8206** (0.19m diameter and 0.33m deep) was cut through the above infilled gully (**Plate 1**) but did not contain any finds. It is considered likely that it forms part of a modern fence-line.

5.2.6 Some trenches contained modern remains directly relating to the airfield. This includes metal airfield matting (an early form of geotextile matting) recorded just below the topsoil in **Trench 65** and **Trench 6** (**Plate 2**). A section of modern wall foundation (frogged bricks with cement mortar) measuring 6m in length aligned approximately north–south with associated demolition debris in **Trench 75** (**Plate 3**) and a concrete and brick foundation pad measuring approximately 3.3m by 1.6m in **Trench 61** (**Plate 4**) could potentially relate to airfield buildings, parking or taxiways or earlier civilian buildings which fronted Implacable Road (formerly Grenville Road, a public thoroughfare) to the south.

5.3 Hangers West

5.3.1 A total of 48 trenches were proposed within Hangers West, only one trench (**Trench 88**) was unable to be excavated because of access constraints, therefore resulting in 47 trenches being excavated in this area (**Figure 3**).

5.3.2 No archaeological features pre-dating the 20th century were noted within this area. However, a small quantity of Late Bronze Age pottery was recovered from the subsoil layers within two adjacent trenches (Trenches **86** and **87**) in the south of the Hangers West area. The pottery was recovered during machining of the top of the subsoil and this material comprised small heavily abraded sherds which had been reworked. They were not found in association with any stratified archaeological deposits.

5.3.3 The vast majority of trenches within the Hangers West area were shallow (0.35 – 0.55m deep) with turfed topsoil of mid greyish brown silty loam (0.10 – 0.15m deep) overlying a light-mid greyish brown silty clay subsoil or in some trenches a made ground layer. Most trenches had a compacted/rolled mid yellowish brown silty clay layer underlying the above and overlying the natural geology suggesting landscaping for the airfield had occurred to this level across the area with this layer probably representing the truncated surface of the original subsoil which had been levelled and compacted by machinery during the airfield construction.

5.3.4 Occasional finds of modern date, CBM, tarmac and glass were found from these layers, as well as the small amount of Late Bronze Age pottery from the subsoil in **Trenches 86** and **87**.

5.3.5 In the north-east of the area, **Trenches 105–108** were slightly deeper (up to 0.8m deep) with evidence of made ground (modern demolition rubble) which may suggest that a building once stood in this locality near Gosport Road.

5.3.6 Asides from a variety of service trenches and land drains cutting the natural geology, the only other features investigated were of modern date (**Figure 3**). These included a very shallow possible ditch and gully, aligned east–west, in **Trench 112**, both of which contained tarmac, modern glass and CBM (not retained). **Trench 83** contained a shallow feature which was filled with a deliberate backfill containing modern CBM (not retained) and covered by a layer of sub-base material and tarmac. A similar modern feature was also found in **Trench 86**. Local residents reported that a firing range was once located in this part of the Site. In nearby **Trench 131** a modern brick foundation pad measuring approximately 3.5m by 2.1m was revealed underlying the topsoil/subsoil, 0.15m deep; this could potentially relate to a structure associated with the airfield.

6 FINDS

6.1.1 Finds recovered from the Site were limited to a very small quantity of heavily abraded pottery from the subsoil in **Trenches 86** and **87**: These comprised 12 sherds (weighing 84g) from **8602**, and one sherd (5g) from **8702**.

6.1.2 All 13 sherds are in soft-fired, friable fabrics and coarse tempered with flint. The sherds are undiagnostic, but can be dated on fabric grounds to the Late Bronze Age.

7 ENVIRONMENTAL

7.1.1 No archaeological features or deposits suitable for environmental sampling were identified during the course of the fieldwork.

8 DISCUSSION

8.1.1 No archaeological features or deposits were found to pre-date the modern period (1800–present).

8.1.2 The soil sequence recorded in the trenches suggests that a degree of landscaping has occurred in the trenches around the northern and southern peripheries of the Waterfront area and across the Hangers West area, although this seems to have been relatively light, with the surface of the natural geology still intact, although it was locally disturbed by the frequent services and land drains as well as the occasional modern feature that cut into it.

8.1.3 For example, in the Waterfront area, a modern gully and posthole excavated in **Trench 82** probably represents a fence-line and an unexcavated modern animal burial in **Trench 63** may possibly be associated with the early use of the airfield or the late 19th century/early 20th century civilian buildings that were located in the Waterfront area.

8.1.4 Only in the central area of the Waterfront, in the trenches within close proximity to the standing airfield buildings, was a deeper impact into the natural geology seen from the construction of the buildings associated with the airfield, which could have potentially removed any archaeological features. In this area, evidence of modern building foundations such as a north–south aligned brick wall foundation in **Trench 75** could potentially relate to airfield buildings or earlier civilian buildings which fronted Implacable Road (formerly Grenville Road, a public thoroughfare) to the south (Forum Heritage Services 2007, 63).

8.1.5 Other modern features discovered potentially relate to structures associated with the airfield, such as the brick foundation pads in **Trench 61** (Waterfront area) and **Trench 131** (Hangers West). Metal airfield matting directly associated with the airfield was also uncovered just below the topsoil in **Trench 65** and **Trench 6** (Waterfront area).

8.1.6 Although no archaeological features were identified, a small quantity of Late Bronze Age pottery was recovered from the subsoil layers within **Trenches 86** and **87**. The material was heavily abraded with a relatively low mean sherd size. In the absence of any archaeological features and the relative high location of the material within the top of the subsoil, this material would appear to be residual material.

8.1.7 A similar result was found within the MCA Coastal Safety Training Hub and Coastguard Rescue Station, which lies less than 600m to the south of the Hangers West area. Here, the only evidence for earlier archaeological occupation was a single worked flint flake and a small number of residual pottery sherds of Late Bronze Age date from the interface

between the subsoil and natural. As has been shown at the CEMAST, iESE and Hangers East sites at the south-eastern edge of the airfield, archaeological remains can, and have survived, the modern development of the airfield.

8.1.8 Although both the Hangers West and Waterfront areas showed some degree of modern landscaping as part of the development of the Site, the total absence of any archaeological features or notable densities of associated archaeological material would indicate strongly that there is no or very little potential for archaeological remains within the Hangers West and Waterfront areas in the western part of the airfield

8.1.9 The Late Bronze material found at the Hangers West and MCA Coastal Safety Training Hub and Coastguard Rescue Station may well be reworked material which relates to the known Late Bronze Age activity found on, and beyond, the eastern edge of the Airfield and which maybe strongly associated with the Neolithic or Early Bronze Age midden and hearth site (HAHBR **1 656 1 712**). It is possible that the material found within this evaluation could be associated with, as yet, unidentified sites lying beyond the west edge of the airfield, but this cannot be proved at this point.

STORAGE AND CURATION

.1 Museum

1.1.1 It is recommended that the project archive resulting from the excavation be deposited with Hampshire Museums Service. The Museum has agreed in principle to accept the project archive on completion of the project. Deposition of any finds with the Museum will only be carried out with the full agreement of the landowner.

.2 Preparation of Archive

9.2.1 The archive is currently held at Wessex Archaeology's Salisbury office under the project code **104760**.

9.2.2 The complete site archive, which will include paper records, photographic records, graphics, artefacts, ecofacts and digital data, will be prepared following the museum service's guidance, and in general following nationally recommended guidelines (SMA 1995; IfA 2009; Brown 2011; ADS 2013). All archive elements will be marked with both site and accession codes and a full index will be prepared.

9.2.3 All archive elements will be marked with the accession code, and a full index will be prepared. The physical archive comprises the following:

- 1 cardboard boxes or airtight plastic boxes of artefacts & ecofacts, ordered by material type
- 1 files/document cases of paper records & A3/A4 graphics
- 0 A1 graphics
- digital data (photographs, spreadsheets, pdf files)

.3 Conservation

9.3.1 No immediate conservation requirements were noted in the field. Finds which have been identified as of unstable condition and therefore potentially in need of further conservation treatment comprise the metal objects.

9.3.2 Metal objects have been X-radiographed as part of the assessment phase, as a basic record and also to aid identification. On the basis of the X-rays, the range of objects present and their provenance on the Site, no objects are considered to warrant any further conservation treatment.

.4 Discard Policy

9.4.1 In the matter of selection and retention of physical or digital archive prior to deposition, Wessex Archaeology follows national guidelines (SMA 1993; English Heritage 2002; Brown 2011, section 4; Archaeology Data Service online guidance), which allow for the discard or dispersal of selected archive elements which are not considered to warrant any future analysis.

.5 Copyright

9.5.1 The full copyright of the written/illustrative archive relating to the Site will be retained by Wessex Archaeology Ltd under the Copyright, Designs and Patents Act 1988 with all rights reserved. The recipient museum, however, will be granted an exclusive licence for the use of the archive for educational purposes, including academic research, providing that such use shall be non-profitmaking, and conforms with the Copyright and Related Rights regulations 2003.

.6 Security Copy

9.6.1 In line with current best practice (e.g. Brown 2011), on completion of the project a security copy of the written records will be prepared, in the form of a digital PDF/A file. PDF/A is an ISO-standardised version of the Portable Document Format (PDF) designed for the digital preservation of electronic documents through omission of features ill-suited to long-term archiving.

10 REFERENCES

ADS, 2013, *Caring for Digital Data in Archaeology: a guide to good practice*, Archaeology Data Service & Digital Antiquity Guides to Good Practice

Briant, R.M., *et al.* (eds.), 2009, *The Quaternary of the Solent Basin and the West Sussex raised beaches: field guide*, Quaternary Research Association

Brown, D.H., 2011, Archaeological archives; a guide to best practice in creation, compilation, transfer and curation, Archaeological Archives Forum (revised edition)

English Heritage, 2002, Environmental Archaeology; a guide to theory and practice of methods, from sampling and recovery to post-excavation, Swindon, Centre for Archaeology Guidelines

Forum Heritage Services, 2007, Daedalus, Lee-on-Solent: Historic Environment Baseline Report. Unpublished client report
http://www.gosport.gov.uk/custompages/planning/00000127.pdf

Hampshire County Council, 2012, Hampshire County Integrated Character Assessment: Gosport and Fareham Coastal Plain (Area 9f), May 2012

Institute for Archaeologist, 2008, *Standard and Guidance for archaeological field evaluation*, Institute for Archaeologist

Institute for Archaeologist, 2009, *Standard and Guidance for the creation, compilation, transfer and deposition of archaeological archives*, Institute for Archaeologist

Leigh, D., Watkinson, D. and Neal, V., 1998, *First Aid for Find: Practical Guide for Archaeologists*, United Kingdom Institute for Conservation of Historic & Artistic Works

SMA, 1993, *Selection, Retention and Dispersal of Archaeological Collections*, Society of Museum Archaeologists

SMA, 1995, *Towards an Accessible Archaeological Archive*, Society of Museum Archaeologists

Wessex Archaeology, 2013, CEMAST, HMS Daedalus, Lee-on-Solent, Hampshire: Post-Excavation Assessment Report. Unpublished Client Report Ref: 89351.02**,** November 2013

Wessex Archaeology 2014a, Waterfront and Hangers West areas, Daedalus Airfield, Lee-on-Solent, Hampshire Written Scheme of Investigation for Archaeological Evaluation. Unpublished Client Report Ref:104760.01, July 2014

Wessex Archaeology, 2014b, Airfield Hangers East, Phase 1C, Daedalus Airfield, Lee-on-Solent, Hampshire, Archaeological Evaluation Report. Unpublished Client Report Ref: 89353.03, April 2014

Wessex Archaeology, 2014c, MCA Coastal Safety Training Hub and Coastguard Rescue Station, Daedalus Airfield, Lee-on-Solent, Hampshire, Archaeological Evaluation Report. Unpublished Client Report Ref: 89354.03, June 2014

Wessex Archaeology, 2014d, iESE New Innovation Centre, Daedalus Airfield, Lee-on-Solent, Hampshire: Post-Excavation Assessment and Updated Project Design Unpublished Client Report Ref: 89352.03, September 2014

APPENDICES

Appendix 1: Trench summary tables

TRENCH 55 (Waterfront)			
Dimensions: 25.5m x 1.5m	**Max. depth:** 0.42m	**Ground level:** 7.85m aOD	
Coordinates (NGR)	X=455589.7753, Y=101463.5596 (centre)		
Context	**Description**		**Depth (m)**
5501	Topsoil	Pale greyish brown silty loam with very rare sub rounded flint inclusions. Well established turf and roots	0-0.16m
5502	Subsoil	Light yellowish brown silty clay with sparse sub-rounded flint pebbles. Large fragments of marble, unstratified	0.16m – 0.34m
5503	Natural	Light orangey yellow silty clay with sub rounded flint pebbles throughout. Occasional manganese flecks	0.34m +

TRENCH 56 (Waterfront)			
Dimensions: 25.6 x 1.5m	**Max. depth:** 0.41m	**Ground level:** 7.93m aOD	
Coordinates (NGR)	X=455630.7400, Y=101479.0856 (centre)		
Context	**Description**		**Depth (m)**
5601	Topsoil	Pale greyish brown silty loam with very rare sub-rounded flints and well established turf and roots	0-0.17m
5602	Subsoil	Light yellowish brown silty clay with very rare sub-rounded flint pebbles. Occasional fragments of CBM	0.17m – 0.36m
5603	Natural	Light orangey yellow silty clay with sub rounded flint pebbles throughout. Occasional manganese flecks	0.36m +

TRENCH 58 (Waterfront)			
Dimensions: 26m x 1.5m	**Max. depth:** 0.38m	**Ground level:** 7.91 m aOD	
Coordinates (NGR)	X=455708.3068, Y=101480.2992 (centre)		
Context	**Description**		**Depth (m)**
5801	Topsoil	Pale greyish brown silty loam with clear band of sub-rounded flint gravel inclusions	0 – 0.19m
5802	Subsoil	Pale yellowish brown silty loam very compact. Occasional sub rounded flint and occasional CBM inclusions	0.19m – 0.34m
5803	Natural	Pale yellowish brown silty clay with occasional sub-rounded flint inclusions. Occasional manganese inclusions	0.34m +

TRENCH 5 (Waterfront)			
Dimensions: 17m x 1.5m	**Max. depth:** 0.44m	**Ground level:** 8.13m aOD	
Coordinates (NGR)	X=455709.4455, Y=101428.9164 (centre)		
Context	**Description**		**Depth (m)**
5901	Topsoil	Pale greyish brown silty loam with sparse sub-rounded flint pebbles. Well established turf and roots	0 - 0.24m
5902	Layer	Rolled/compact layer. Pale yellowish brown silty clay with rare angular chalk fragments, rare CBM and occasional charcoal flecks	0.24m – 0.39m
5903	Natural	Pale yellowish brown silty clay with sparse sub-rounded flint pebbles	0.39m +
5904	Cut	Refuse pit	
5905	Fill	Deliberate backfill of refuse pit [5904]	

TRENCH 60 (Waterfront)			
Dimensions: 19.5 x 1.5m		**Max. depth:** 0.48m	**Ground level:** 8.05 m aOD
Coordinates (NGR)	X=455692.1369, Y=101416.6132 (centre)		
Context	**Description**		**Depth (m)**
6001	Topsoil	Pale greyish brown silty loam with sparse sub-rounded flint pebbles. Well established turf and roots	0 – 0.19m
6002	Layer	Pale yellowish brown silty loam with rare angular chalk fragments. Rare CBM fragments and occasional charcoal flecks	0.19m – 0.39m
6003	Natural	Pale yellowish brown silty clay with sparse sub rounded pebble inclusions throughout	0.39m +

TRENCH 61(Waterfront)			
Dimensions: 10m x 1.5m		**Max. depth:** 0.8m	**Ground level:** 8.33m aOD
Coordinates (NGR)	X=455686.3664, Y=101323.6263 (centre)		
Context	**Description**		**Depth (m)**
6101	Topsoil	Mid greyish brown silty loam with frequent sub-rounded flint inclusions. Well established turf and roots	0 – 0.23m
6102	Layer	Made ground / levelling. Mid orangey brown silty clay with frequent sub-rounded flint pebbles. Distinct, compacted flint gravel to base	0.23m – 0.42m
6103	Layer	Rolled / compacted layer. Pale greyish brown silty loam with sparse rounded flints. Very compact. Occasional CBM and charcoal inclusions	0.42m – 0.66m
6104	Natural	Mid greyish brown silty clay with moderate numbers of rounded flint pebble inclusions	0.66m +

TRENCH 63 (Waterfront)			
Dimensions: 28.5 x 1.5m		**Max. depth:** 0.42m	**Ground level:** 7.85m aOD
Coordinates (NGR)	X=455779.2159, Y=101487.8589 (centre)		
Context	**Description**		**Depth (m)**
6301	Topsoil	Pale greyish brown silty loam with sparse rounded flint inclusions	0 -0.21m
6302	Layer	Rolled / compacted layer. Light orangey brown silty loam with rare charcoal flecking	0.21m – 0.36m
6303	Natural	Pale greyish brown silty clay with sparse rounded flint inclusions	0.36m +
6304	Cut	Cut of possible animal burial	-
6305	Fill	Deliberate backfill of [6304]	-

TRENCH 65 (Waterfront)			
Dimensions: 29.4m x 1.5m		**Max. depth:** 0.48m	**Ground level:** 7.88m aOD
Coordinates (NGR)	X=455882.3227, Y=101529.7204 (centre)		
Context	**Description**		**Depth (m)**
6501	Topsoil	Pale greyish brown silty loam with rare rounded flint pebble inclusions	0 – 0.24m
6502	Layer	Rolled / compacted layer. Pale yellowish brown silty loam, very compact with occasional rounded flint and rare CBM fragments	0.24m – 0.43m
6503	Natural	Pale yellowish brown silty clay with rare manganese flecking	0.43m +

TRENCH 66 (Waterfront)		
Dimensions: 28m x 1.5m	**Max. depth:** 0.43m	**Ground level:** 7.94m aOD

Coordinates (NGR)		X=455925.8540, Y=101498.1943(centre)	
Context	**Description**		**Depth (m)**
6601	Topsoil	Pale greyish brown silty loam with rare rounded flint pebble inclusions and well established turf	0 – 0.21m
6602	Layer	Rolled / compacted layer. Pale yellowish brown silty loam, very compacted with very rare rounded flint inclusions	0.21m – 0.37m
6603	Natural	Pale yellowish brown silty clay with patchy manganese flecking	0.37m +

TRENCH 67 (Waterfront)			
Dimensions: 27.4m x 1.5m		**Max. depth:** 0.45m	**Ground level:** 7.91 m aOD
Coordinates (NGR)		X = 455981.9373 Y = 101461.7002 (centre)	
Context	**Description**		**Depth (m)**
6701	Topsoil	Mid grey silty clay with very rare rounded flint inclusions and moderate rooting	0 – 0.22m
6702	Subsoil	Mid greyish brown silty clay with sparse sub-angular and sub rounded flint inclusions. Sparse CBM, shell and chalk flecks	0.22m – 0.4m
6703	Natural	Mid orangey brown silty clay containing sparse sub angular and sub rounded flint and manganese inclusions	0.4m +

TRENCH 68 (Waterfront)			
Dimensions: 29.3m x 1.5m		**Max. depth:** 0.47m	**Ground level:** 7.85m aOD
Coordinates (NGR)		X = 456002.0753 Y = 101517.6748 (centre)	
Context	**Description**		**Depth (m)**
6801	Topsoil	Pale grey brown silty loam with rare sub angular flint inclusions. Occasional chalk flecking to base of layer	0 – 0.29m
6802	Layer	Rolled / compacted layer. Pale yellowish brown silty loam. Very compact. Rare sub angular flint inclusions. Patchy gritty manganese inclusions throughout	0.29m – 0.44m
6803	Natural	Mid orangey brown silty clay with sparse sub-rounded flint inclusions	0.44m +

TRENCH 6 (Waterfront)			
Dimensions: 31.6 x 1.5m		**Max. depth:** 0.43m	**Ground level:** 7.90m aOD
Coordinates (NGR)		X = 456084.8118 Y = 101536.0490 (centre)	
Context	**Description**		**Depth (m)**
6901	Topsoil	Pale grey silty loam with rare sub-angular flint inclusions. Well established turf	0 – 0.2m
6902	Layer	Rolled / compact layer. Pale orangey brown silty loam. Very compact. Occasional modern glass and CBM inclusions	0.2m – 0.34m
6903	Natural	Light orangey brown silty clay with occasional rounded flint inclusions. Patchy manganese flecking throughout	0.34m +

TRENCH 70 (Waterfront)			
Dimensions: 29m x 1.5m		**Max. depth:** 0.42m	**Ground level:** 7.87m aOD
Coordinates (NGR)		X = 456129.8324 Y = 101481.9760 (centre)	
Context	**Description**		**Depth (m)**
7001	Topsoil	Pale grey silty loam, with a band of sub-angular flint gravel inclusions to base of layer. Well established turf	0 – 0.22m
7002	Layer	Rolled / compact layer. Pale orangey brown silty loam. Very compact. Rare sub-angular flint inclusions and occasional modern	0.22m – 0.36m

		glass, iron etc inclusions	
7003	Natural	Light brown with orange hue silty clay with occasional rounded flint inclusions and manganese flecking throughout	0.36m +

TRENCH 72 (Waterfront)			
Dimensions: 11m x 1.5m		**Max. depth:** 0.68m	**Ground level:** 8.43m aOD
Coordinates (NGR)	X = 456202.7518 Y = 101310.9556 (centre)		
Context	**Description**		**Depth (m)**
7201	Topsoil	Mid-dark greyish brown silty loam with sparse sub-angular flint inclusions. Well established turf	0 – 0.16m
7202	Layer	Made ground. Yellowish brown silty clay with modern CBM/brick/concrete inclusions. Very compact	0.16m – 0.44m
7203	Layer	Buried Subsoil. Pale yellowish brown silty clay with rare rounded flint pebbles inclusions and rare charcoal flecking	0.44m – 0.65m
7204	Natural	Mid yellowish brown silty clay with sparse rounded flint inclusions	0.65m +

TRENCH 73 (Waterfront)			
Dimensions: 13m x 1.5m		**Max. depth:** 0.44m	**Ground level**: 8.25m aOD
Coordinates (NGR)	X = 456105.9799 Y = 101270.5049 (centre)		
Context	**Description**		**Depth (m)**
7301	Topsoil	Mid greyish brown silty loam with sparse sub rounded flint inclusions. Well established turf	0 -0.15m
7302	Subsoil	Mid brown silty clay with sparse sub rounded flint inclusions and occasional CBM fragments	0.15m – 0.34m
7303	Natural	Mid orangey brown silty clay with sparse sub-rounded flint inclusions and patchy manganese flecking throughout	0.34m +

TRENCH 75 (Waterfront)			
Dimensions: 8m x 1.5m		**Max. depth:** 0.5m	**Ground level:** 8.25m aOD
Coordinates (NGR)	X = 455992.8089 Y = 101315.4726 (centre)		
Context	**Description**		**Depth (m)**
7501	Topsoil	Dark greyish brown silty loam with sparse angular flint inclusions and well established turf	0 – 0.25m
7502	Layer	Demolition debris. Mid greyish brown silty clay with high quantity of modern demolition debris.	0.25m +
		Unable to reach natural due to presence to a wall footing	

TRENCH 76 (Waterfront)			
Dimensions: 5m x 1.5m		**Max. depth:** 0.93m	**Ground level:** 8.46m aOD
Coordinates (NGR)	X = 455889.2787 Y = 101295.9260 (centre)		
Context	**Description**		**Depth (m)**
7601	Topsoil	Pale greyish brown silty loam with rare sub rounded flint pebble inclusions.	0 – 0.19m
7602	Layer	Made ground / levelling. Layers of very compacted silty clay with frequent construction debris	0.19m – 0.7m
7603	Layer	Pale greyish brown silty clay with sparse sub-rounded flint and patchy charcoal flecking throughout	0.7m – 0.88m
7604	Natural	Mid orangey brown silty clay with moderate rounded pebble inclusions	0.88m +

TRENCH 77 (Waterfront)			
Dimensions: 8m x 1.5m	**Max. depth:** 0.55m	**Ground level:** 8.42m aOD	
Coordinates (NGR)	X = 456008.1147 Y = 101252.5677 (centre)		
Context	**Description**		**Depth (m)**
7701	Topsoil	Mid-dark greyish brown silty loam with sparse sub-rounded flint inclusions and well established turf	0 - 0.24m
7702	Subsoil	Subsoil/Made ground? Pale greyish brown silty clay with frequent angular flint inclusions, with occasional construction debris throughout	0.24m – 0.48m
7703	Natural	Mid orangey brown silty clay with sparse angular chalk fragments and sparse rounded flint inclusions. Occasional manganese flecking throughout	0.48m +

TRENCH 7 (Waterfront)			
Dimensions: 21.3 x 1.5m	**Max. depth:** 0.62m	**Ground level:** 8.57m aOD	
Coordinates (NGR)	X = 456007.7102 Y = 101180.9747 (centre)		
Context	**Description**		**Depth (m)**
7901	Topsoil	Mid greyish brown silty loam with sparse sub-rounded flint. Well established turf inclusions	0 – 0.24m
7902	Subsoil	Made ground? Mid yellowish brown silty clay with frequent sub-rounded flint inclusions and rare fragments of CBM and manganese inclusions	0.24m – 0.52m
7903	Natural	Mid orangey brown silty clay with sparse sub-rounded flint and manganese fleck inclusions	0.52m +

TRENCH 80 (Waterfront)			
Dimensions: 17.4m x 1.5m	**Max. depth:** 0.64m	**Ground level:** 8.41m aOD	
Coordinates (NGR)	X = 456002.1135 Y = 101085.2714 (centre)		
Context	**Description**		**Depth (m)**
8001	Topsoil	Dark greyish brown silty loam with occasional sub rounded flint inclusions. Well established turf	0 – 0.18m
8002	Subsoil	Mid greyish brown silty clay loam with occasional sub-rounded flint inclusions.	0.18m – 0.37m
8003	Subsoil	Subsoil-natural interface. Pale yellowish brown silty clay with rare sub-rounded flint inclusions and occasional manganese flecking	0.37m – 0.54m
8004	Natural	Mid orangey brown silty clay with sparse sub-rounded flint inclusions and patchy manganese inclusions	0.54m +

TRENCH 81 (Waterfront)			
Dimensions: 25.5m	**Max. depth:** 1.5m	**Ground level:** 8.57m aOD	
Coordinates (NGR)	X = 455933.1875 Y = 101034.4240 (centre)		
Context	**Description**		**Depth (m)**
8101	Topsoil	Mid greyish brown silty loam with rare sub rounded flint inclusions. Well established turf	0 – 0.15m
8102	Subsoil	Mid grey brown silty clay with rare sub-rounded flint inclusions and very rare CBM fragments	0.15m – 0.34m
8103	Natural	Light - mid orangey brown silty clay with very frequent sub-rounded flints	0.34m +

TRENCH 82 (Waterfront)			
Dimensions: 29m x 1.5m	**Max. depth:** 0.45m	**Ground level:** 8.44m aOD	
Coordinates (NGR)	X = 455899.4020 Y = 101054.2440 (centre)		
Context	**Description**		**Depth (m)**
8201	Topsoil	Pale greyish brown silty loam with rare sub-rounded flint inclusions and well established turf	0 – 0.14m
8202	Layer	Subsoil/ made ground. Pale yellowish brown silty clay with rare sub-rounded flints and very rare CBM fragments and rare clinker fragments	0.14m – 0.37m
8203	Natural	Pale yellowish brown silty clay with sparse rounded flint inclusions and patchy manganese flecks	0.37m +
8204	Cut	Cut of shallow NE-SW modern gully	0.12m
8205	Fill	Fill of gully [8204]	
8206	Cut	Cut of modern Posthole	0.33m
8207	Fill	Fill of posthole [8206]	

TRENCH 83 (Hangers West)			
Dimensions: 25mx 1.5m	**Max. depth:** 0.66m	**Ground level:** 9.36m aOD	
Coordinates (NGR)	X = 455555.1903 Y = 101955.1759 (centre)		
Context	**Description**		**Depth (m)**
8301	Topsoil	Pale greyish brown silty loam. No inclusions and well established turf	0 – 0.13m
8302	Layer	Rolled / compacted layer. Pale orangey brown silty clay with frequent sub rounded flint inclusions. Angular fragments of CBM and iron	0.13m – 0.34m
8303	Layer	Levelling layer / made ground. Mid-dark grey brown sandy silt with angular flint inclusion and some modern debris, including a spent 9mm round	0.34m – 0.57m
8304	Natural	Pale yellowish brown silty clay with rare rounded flint pebble inclusions, and patchy manganese inclusions.	0.57m +
8305	Cut	Cut of hollow	
8306	Fill	Fill of [8305]	
8307	Layer	Brick hard-core sealed by tarmac layer	
8308	Layer	Sand layer with CBM fragments	

TRENCH 84 (Hangers West)			
Dimensions: 27.5m x 1.5m	**Max. depth:** 0.56m	**Ground level:** 9.21m aOD	
Coordinates (NGR)	X = 455578.1660 Y = 101993.1712		
Context	**Description**		**Depth (m)**
8401	Topsoil	Pale greyish brown silty loam with very rare sub-rounded flint inclusions and well established turf	0 – 0.12m
8402	Subsoil	Mid greyish brown silty clay with very rare sub-rounded flint inclusions	0.12m – 0.3m
8403	Subsoil	Pale grey with orange / brown mottling silty clay with rare sub-rounded flint inclusions	0.30m – 0.51m
8404	Natural	Pale yellowish brown silty clay with occasional rounded flint inclusions and patchy manganese inclusions	0.51m +

TRENCH 85 (Hangers West)			
Dimensions: 22.5m x 1.5m	**Max. depth:** 0.38m	**Ground level:** 8.69m aOD	
Coordinates (NGR)	X = 455616.1154 Y = 102010.0016		
Context	**Description**		**Depth (m)**

8501	Topsoil	Pale greyish brown silty loam with very rare sub-rounded flint inclusions and well established turf	0 – 0.12m
8502	Subsoil	Mid greyish brown silty clay with very rare sub-rounded flint inclusions and rare CBM fragments	0.12m – 0.33m
8503	Natural	Light orangey brown silty clay with sparse sub-rounded flint inclusions and manganese inclusions throughout	0.33m +

TRENCH 86 (Hangers West)			
Dimensions: 29.2m x 1.5m		**Max. depth:** 0.44m	**Ground level:** 8.88m aOD
Coordinates (NGR)	X = 455600.1131 Y = 102058.3257		
Context	**Description**		**Depth (m)**
8601	Topsoil	Pale greyish brown silty loam with very rare sub-rounded flint inclusions and well established turf	0 – 0.12M
8602	Subsoil	Mid greyish brown silty clay with very rare sub-rounded flint inclusions	0.12m – 0.35m
8603	Natural	Light orangey brown silty clay with sparse sub-rounded flint inclusions and manganese inclusions throughout	0.35m +
8604	Cut	Cut of hollow with demolition rubble. Same as [8305]	
8605	Fill	Fill of [8604]	

TRENCH 87 (Hangers West)			
Dimensions: 28.4m x 1.5m		**Max. depth:** 0.4m	**Ground level:** 8.75m aOD
Coordinates (NGR)	X = 455665.6713 Y = 102055.1407		
Context	**Description**		**Depth (m)**
8701	Topsoil	Pale greyish brown silty loam with no inclusions and well established turf	0 – 0.14m
8702	Subsoil	Pale grey silty clay with very rare sub-rounded flint inclusions and occasional angular CBM fragments and patchy manganese inclusions	0.14m - 0.32m
8703	Natural	Light orangey brown silty clay with sparse rounded flint inclusions and patchy manganese inclusions throughout	0.32m +

TRENCH 8 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.65	**Ground level:** 9.311m aOD
Coordinates (NGR)	X = 455830.9836 Y = 102287.2708		
Context	**Description**		**Depth (m)**
8901	Topsoil	Mid yellowish brown silty clay with greyish hue. Loose compaction	0-0.1m
8902	Subsoil	As above. Moderate-loose compaction	0.1m-0.2m
8903	Layer	As above. Very firmly compacted. Probable rolled ground	0.2m-0.4m
8904	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 0 (Hangers West)			
Dimensions: 27x 1.8m		**Max. depth:** 0.5m	**Ground level:** 9.14m aOD
Coordinates (NGR)	X = 455868.3477 Y = 102256.2364		
Context	**Description**		**Depth (m)**
9001	Topsoil	Mid greyish brown silty clay with a yellowish hue. Loose compaction	0-0.1m
9002	Subsoil	As above. Moderate / loose compaction. Very rare small sub	0.1m-

		angular flint inclusions	0.25m
9003	Layer	As above. Very firmly compacted. Probable rolled ground	0.25m-0.4m
9004	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 1 (Hangers West)			
Dimensions: 22 x 1.8m		**Max. depth:** 0.45m	**Ground level:** 9.32m aOD
Coordinates (NGR)	X = 455896.7263 Y = 102302.1222		
Context	**Description**		**Depth (m)**
9101	Topsoil	Mid yellowish brown silty clay with greyish hue. Loose compacted.	0-0.1m
9102	Subsoil	As above. Moderate / loose compaction	0.1m-0.2m
9103	Layer	As above. Very firmly compacted, probable rolled ground. Very rare sub-angular small flint inclusions.	0.2m-0.35m
9104	Natural	Mid yellowish brown brick earth	0.35m +

TRENCH 2 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.52m	**Ground level:** 9.55m aOD
Coordinates (NGR)	X = 455701.7897 Y = 102394.1138		
Context	**Description**		**Depth (m)**
9201	Topsoil	Mid greyish brown silty clay with yellowish hue. Loose compaction with very rare sub-rounded small flint	0-0.15m
9202	Subsoil	As above. Moderate compaction with very rare sub-rounded small flint inclusions.	0.15m-0.3m
9203	Layer	As above. Rare sub-angular small and medium flint inclusions. Rare –moderate CBM. Very firmly compact, probable rolled ground	0.3m-0.5m
9204	Natural	Mid orangey brown brick earth	0.5m +

TRENCH 3 (Hangers West)			
Dimensions: 28m x 1.8m		**Max. depth:** 0.65m	**Ground level:** 9.96m aOD
Coordinates (NGR)	X = 455735.0620 Y = 102434.9705		
Context	**Description**		**Depth (m)**
9301	Topsoil	Mid greyish brown silty clay. Loose compaction. Rare small sub-rounded flint inclusions	0-0.15m
9302	Subsoil	As above. Moderate compaction	0.15m – 0.2m
9303	Layer	As above. Yellowish hue. Sparse sub-rounded small to medium flint inclusions. Rare moderate pottery and CBM inclusions. Very firmly compact, probable rolled ground.	0.2m – 0.4m
9304	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 4 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.35m	**Ground level:** 9.51m aOD
Coordinates (NGR)	X = 455817.7251 Y = 102404.9176		

Context	Description		Depth (m)
9401	Topsoil	Mid greyish brown with yellowish hue silty clay. Loose compaction. Rare sub-rounded stone inclusions	0-0.1m
9402	Subsoil	As above. Moderate compaction. Rare tarmac fragments	0.1m-0.15m
9403	Layer	As above. Sparse tarmac fragments, small sub-rounded gravel, rare ceramic (fragments). Very firmly compacted, probable rolled ground	0.15m – 0.35m
9404	Natural	Light yellowish brown brick earth	0.35m +

TRENCH 5 (Hangers West)			
Dimensions: 26m x 1.8m	**Max. depth:** 0.45m	**Ground level:** 9.57m aOD	
Coordinates (NGR)	X = 455882.2316 Y = 102351.3490		
Context	**Description**		**Depth (m)**
9501	Topsoil	Mid grey sandy silt loam	0-0.12m
9502	Subsoil	Mid yellowish brown compact sandy silt with occasional rubble inclusions. Probable rolled ground	0.12m – 0.32m
9503	Natural	Light brownish yellow brick earth with occasional chalk patchy inclusions and scarce small sub-rounded pebble and flint inclusions, poorly sorted.	0.32m +

TRENCH 6 (Hangers West)			
Dimensions: 27m x 1.8m	**Max. depth:** 0.42m	**Ground level:** 9.27m aOD	
Coordinates (NGR)	X = 455948.1043 Y = 102350.8677		
Context	**Description**		**Depth (m)**
9601	Topsoil	Light grey sandy silt friable loam	0 -0.1m
9602	Subsoil	Mid yellowish brown sandy silt with scarce compact rubble pieces	0.1m-.34m
9602	Natural	Mid brownish yellow sandy silt brick earth with occasional small chalk inclusions	0.34m +

TRENCH 7 (Hangers West)			
Dimensions: 28m x 1.8m	**Max. depth:** 0.35m	**Ground level:** 9.23m aOD	
Coordinates (NGR)	X = 455933.5694 Y = 102390.8669		
Context	**Description**		**Depth (m)**
9701	Topsoil	Light-mid grey sandy silt loam	0-0.12m
9702	Subsoil	Mid yellowish brown sandy silt	0.12m-0.3m
9703	Natural	Light brownish yellow brick earth	0.3m +

TRENCH 8 (Hangers West)		
Dimensions: 25m x 1.8m	**Max. depth:** 0.59m	**Ground level:** 9.20m aOD
Coordinates (NGR)	X = 455988.1873 Y = 102404.6903	

Context	Description		Depth (m)
9801	Topsoil	Mid grey sandy silt loam	0 -0.1m
9802	Subsoil	Brick rubble layer / deposit	0.1m – 0.33m
9803	Layer	Light yellowish grey sandy silt. Rolled and heavily compacted	0.33m-0.55m
9804	Natural	Light brownish yellow brick earth.	0.55m +

TRENCH (Hangers West)			
Dimensions: 28m x 1.8m	**Max. depth:** 0.42	**Ground level:** 9.36m aOD	
Coordinates (NGR)	X = 455992.2645 Y = 102500.8605		
Context	**Description**		**Depth (m)**
9901	Topsoil	Mid grey sandy silt loam	0 – 0.2m
9902	Layer	Rolled layer mid grey sandy silt loam, frequent charcoal and moderate CBM.	0.2m – 0.32m
9903	Natural	Light yellowish brown sandy silt loam brick earth	0.32m +

TRENCH 100 (Hangers West)			
Dimensions: 30.1 x 1.8m	**Max. depth:** 0.5m	**Ground level:** 9.42m aOD	
Coordinates (NGR)	455994.6710 Y = 102532.5120		
Context	**Description**		**Depth (m)**
10001	Topsoil	Mid greyish brown silt. Loose compaction	0 – 0.1m
10002	Subsoil	As above silty clay. Moderate compaction. Very rare sub rounded small gravel inclusions	0.1m – 0.25m
10003	Layer	As above silty clay. Very firm compaction. Rolled ground with layers of degraded marine shell	0.25m – 0.28m
10004	Natural	Light orangey grey brick earth	0.28m +

TRENCH 101 (Hangers West)			
Dimensions: 15.4 x 1.8	**Max. depth:** 0.54	**Ground level:** 9.76m aOD	
Coordinates (NGR)	X = 456079.0048 Y = 102530.7906		
Context	**Description**		**Depth (m)**
10101	Topsoil	Mid yellowish brown silt with greyish hue. Sparse med gravel. Moderate compaction.	0-0.2
10102	Subsoil	Mid yellowish brown silty clay with greyish hue. Common med gravel and sparse CBM rubble.	0.2-0.34
10103	Layer	Mid yellowish brown silty clay with greyish hue. Very rare med gravel. Very firm compaction – rolled ground	0.34-0.54
10104	Natural	Light yellowish brown brick earth with greyish hue.	0.54+

TRENCH 102 (Hangers West)		
Dimensions: 32 x 1.8	**Max. depth:** 0.5	**Ground level:** 9.69m aOD

Coordinates (NGR)		X = 456058.5616 Y = 102593.2916	
Context	**Description**		**Depth (m)**
10201	Topsoil	Mid yellowish brown silt with greyish hue. Sparse med gravel. Moderate compaction.	0-0.13
10202	Subsoil	Mid yellowish brown silty clay with greyish hue. Common med grave land sparse CBM rubble. Moderate compaction	0.13-0.26
10203	Layer	Mid yellowish brown silty clay with greyish hue. Very rare med gravel. Sparse Mg staining towards bottom of layer. Very firm compaction – rolled ground	0.26-0.5
10204	Natural	Light yellowish brown brick earth with greyish hue.	0.5+

TRENCH 103 (Hangers West)			
Dimensions: 30.8 x 1.8		**Max. depth:** 0.4	**Ground level:** 9.76m aOD
Coordinates (NGR)		X = 456103.9942 Y = 102575.4375	
Context	**Description**		**Depth (m)**
10301	Topsoil	Mid grey sandy silt loam	0.0-0.2
10302	Subsoil	Rolled layer mid grey sandy silt loam, frequent charcoal and moderate CBM.	0.2-0.35
10303	Natural	Light yellowish brown sandy silt loam brick earth	0.35+

TRENCH 104 (Hangers West)			
Dimensions: 31 x 1.8		**Max. depth:** 0.5	**Ground level:** 10.0m aOD
Coordinates (NGR)		X = 456158.1392 Y = 102583.6284	
Context	**Description**		**Depth (m)**
10401	Topsoil	Mid yellowish brown silt with greyish hue. Sparse med gravel (flint). Loose compaction.	0.0-0.15
10402	Subsoil	Mid yellowish brown silty clay with greyish hue. Rare small gravel. Moderate compaction	0.15-0.3
10403	Layer	Mid yellowish brown silty clay with greyish hue. Very rare CBM. Very firm compaction – rolled ground	0.3-0.5
10404	Natural	Light yellowish grey brick earth.	0.5+

TRENCH 105 (Hangers West)			
Dimensions: 20 x 1.8		**Max. depth:** 0.8	**Ground level:** 10.04m aOD
Coordinates (NGR)		X = 456204.3535 Y = 102612.4324	
Context	**Description**		**Depth (m)**
10501	Topsoil	Mid yellowish brown silt with greyish hue. Sparse small/med rounded gravel. Loose compaction.	0-0.12
10502	Layer -Made Ground	Mid brown silty clay with greyish hue. Common med gravel and CBM rubble, concrete bits.	0.12-0.5
10503	Buried soil	Dark brown silty clay. Abundant rooting. Sparse tarmac frags	0.5-0.56
10504	Buried soil	Mid greyish brown silty clay – leached subsoil	0.56-0.8
10505	Natural	Light yellowish brown brick earth with greyish hue.	0.8+

TRENCH 106 (Hangers West)

Dimensions: 30 x 1.8		**Max. depth:** 0.8	**Ground level:** 10.46m aOD
Coordinates (NGR)		X = 456240.1738 Y = 102656.9602	
Context	**Description**		**Depth (m)**
10601	Topsoil	Mid greyish brown silty clay. Common rounded med gravel. Loose compaction.	0-0.15
10602	Subsoil	Mid greyish brown silty clay. Common rounded med gravel. Patched of common CBM and tarmac frags. Moderate to loose compaction.	0.15-0.5
10603	Layer	Mid yellowish brown silty clay with greyish hue. Very rare med gravel. Sparse CBM and charcoal. Very firm compaction – rolled ground	0.5-0.8
10604	Natural	Light yellowish grey clay.	0.8+

TRENCH 107 (Hangers West)			
Dimensions: 18 x 1.8		**Max. depth:** 0.6	**Ground level:** 10.12m aOD
Coordinates (NGR)		X = 456256.4038 Y = 102651.2664	
Context	**Description**		**Depth (m)**
10701	Topsoil	Mid greyish brown silty clay. Common rounded med gravel. Loose compaction.	0-0.15
10702	Subsoil	Mid greyish brown silty clay. Common rounded med gravel. Patched of common CBM and tarmac frags. Moderate to loose compaction.	0.15-0.5
10703	Layer	Mid yellowish brown silty clay with greyish hue. Very rare med gravel. Sparse CBM and charcoal. Very firm compaction – rolled ground	0.5-0.8
10704	Natural	Light yellowish grey clay.	0.8+

TRENCH 108 (Hangers West)			
Dimensions: 15m x 1.8m		**Max. depth:** 0.5m	**Ground level:** 10.20m aOD
Coordinates (NGR)		X = 456269.6835 Y = 102672.5655	
Context	**Description**		**Depth (m)**
10801	Topsoil	Mid greyish brown silt. Rare sub-rounded flint inclusion. Loose compaction	0-0.15m
10802	Subsoil	Mid greyish brown silty clay. Rare medium gravel and CBM inclusions. Moderate compaction	0.15- 0.3m
10803	Layer	Mid yellowish grey silty clay. Rare medium gravel and CBM inclusions. Very firmly compact, probable rolled ground.	0.3m – 0.5m
10804	Natural	Mid yellowish grey brick earth	0.5m +

TRENCH 10 (Hangers West)			
Dimensions: 30m x 1.8		**Max. depth:** 0.6m	**Ground level:** 10.23m aOD
Coordinates (NGR)		X = 456152.7202 Y = 102620.9427	
Context	**Description**		**Depth (m)**
10901	Topsoil	Mid yellowish brown silt with greyish hue. Loose compaction	0-0.15m
10902	Layer	Mid yellowish brown silty clay with greyish hue. Very firmly compact. Areas of abundant CBM, rubble, sparse small gravel inclusions. Probable rolled ground/ Made ground	0.15m - 0.2m
10903	Buried	Strip of buried turf with roots intact	0.2m –

	topsoil		0.4m
10904	Natural	Light greyish orange brick earth	0.4m +

TRENCH 110 (Hangers West)			
Dimensions: 29m x 1.8m		**Max. depth:** 0.5m	**Ground level:** 10.26m aOD
Coordinates (NGR)	X = 456142.6770 Y = 102679.8109		
Context	**Description**		**Depth (m)**
11001	Topsoil	Mid greyish brown silt, rare CBM, rare medium gravels, loose compaction	0-0.18m
11002	Layer	Mid greyish brown silty clay with yellow hue. Sparse CBM, tarmac, stone, rubble. Moderate compaction. Made ground	0.18m - 0.30m
11003	Layer	Mid greyish brown silty clay with yellowish hue. As above. Very firmly compact. Rolled ground. Rare marine shell	0.3m – 0.4m
11004	Natural	Mid yellowish brown brick earth	0.4m +

TRENCH 111 (Hangers West)			
Dimensions: 32m x 1.8m		**Max. depth:** 0.6m	**Ground level:** 10.01m aOD
Coordinates (NGR)	X = 456110.0508 Y = 102631.7088		
Context	**Description**		**Depth (m)**
11101	Topsoil	Mid greyish brown silt, loosely compact with rare CBM and rounded small gravel inclusions	0 – 0.15m
11102	Layer	Mid yellowish brown silty clay with greyish hue and patches of demolition. Abundant CBM, rare tarmac, sparse medium sized gravel, sparse marine shell. Loose compaction. Made ground	0.15m – 0.4m
11103	Layer	Mid yellowish brown silty clay with greyish hue. Sparse marine shell fragments and rare tarmac inclusions. Very firmly compact. Possible rolled ground.	0.4m- 0.5m
11104	Natural	Mid yellowish brown brick earth with greyish hue	0.5m+`

TRENCH 112 (Hangers West)			
Dimensions: 27m x 1.8m		**Max. depth:** 0.5m	**Ground level:** 10.15m aOD
Coordinates (NGR)	X = 456013.2715 Y = 102641.3551		
Context	**Description**		**Depth (m)**
11201	Topsoil	Mid yellowish brown silt with greyish hue. Rare small gravel inclusions. Moderately compact.	0 – 0.15m
11202	Layer	Mid yellowish brown silty clay with greyish hue. Common medium sized gravel inclusions and common tarmac, CBM and glass rubble. Made ground.	0.15m - 0.30m
11203	Layer	Same as 11202 description. Very firm compaction. Possible rolled ground/ subsoil	0.30m – 0.50m
11204	Natural	Light yellowish orange brick earth with greyish hue.	0.5m +
11205	Cut	Cut of very shallow E-W possible ditch. Modern	0.09
11206	Fill	Secondary fill of [11205]	0.09
11207	Cut	Cut of possible E-W possible gully, Modern	0.05
11208	Fill	Secondary fill of [11207]	0.05

TRENCH 113 (Hangers West)			
Dimensions: 31m x 1.8m		**Max. depth:** 0.51m	**Ground level:** 10.30m aOD
Coordinates (NGR)	X = 456011.0646 Y = 102690.2115		
Context	**Description**		**Depth (m)**

11301	Topsoil	Mid yellowish brown silt with greyish hue. Sparse medium sized gravel inclusions	0 – 0.15m
11302	Layer	Mid yellowish brown silty clay with greyish hue. Common medium sized gravel inclusions, and rare CBM, tarmac, charcoal, ceramic inclusions. Moderate-loose compaction. Made ground	0.15m – 0.26m
11303	Layer	As above. Very firmly compact. Possible rolled ground/ subsoil	0.26m – 0.4m
11304	Natural	Light yellowish orange brick earth with greyish hue, with rare flint inclusions	0.4m +

TRENCH 114 (Hangers West)			
Dimensions: 15m x 1.8m		**Max. depth:** 0.35m	**Ground level:** 9.98m aOD
Coordinates (NGR)	X = 456066.5916 Y = 102688.7091		
Context	**Description**		**Depth (m)**
11401	Topsoil	Mid yellowish brown silt with greyish hue. Loose compaction	0 – 0.15m
11402	Layer	Mid yellowish brown silty clay with greyish hue. Common medium sized gravel, CBM, tarmac, charcoal and rubble inclusions. Very firmly compact. Rolled ground	0.15m – 0.30m
11403	Natural	Light yellowish brown brick earth with greyish hue.	0.35m +

TRENCH 116 (Waterfront)			
Dimensions: 13.4m x 1.5m		**Max. depth:** 0.52m	**Ground level:** 7.87m aOD
Coordinates (NGR)	X = 455606.3305 Y = 101520.9679		
Context	**Description**		**Depth (m)**
11601	Topsoil	Pale greyish brown silty loam with very rare sub-rounded flint inclusions and well established turf.	0 – 0.18m
11602	Subsoil	Light yellowish brown silty clay with rare sub rounded flint pebble inclusions	0.18m – 0.44m
11603	Natural	Mid yellowish brown silty clay with occasional sub angular and sub rounded flint inclusions and occasional manganese flecks	0.44m +

TRENCH 118 (Hangers West)			
Dimensions: 28m x 1.8m		**Max. depth:** 0.6m	**Ground level:** 9.90m aOD
Coordinates (NGR)	X = 456302.2816 Y = 102590.2080		
Context	**Description**		**Depth (m)**
11801	Topsoil	Mid greyish brown silty clay, loosely compact, with very rare small to medium sized stone inclusions	0 – 0.15m
11802	Subsoil	As above. Moderately compact	0.15m – 0.4m
11803	Layer	Mid greyish brown silty clay with yellowish hue. Very firmly compact, probably rolled ground.	0.4m – 0.6m
11804	Natural	Mid orangey brown brick earth	0.6m +

TRENCH 11 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.52m	**Ground level:** 9.53m aOD
Coordinates (NGR)	456170.0598 Y = 102463.9194		
Context	**Description**		**Depth (m)**

11901	Topsoil	Mid greyish brown silty clay, loosely compact, with rare small sized gravel inclusions	0 – 0.15m
11902	Subsoil	As above. Moderately compact	0.15m – 0.35m
11903	Layer	Mid yellowish brown silty clay with greyish hue. Very firmly compact, probably rolled ground	0.35m – 0.52m
11904	Natural	Mid orangey brown brick earth	0.52m +

TRENCH 120 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.45m	**Ground level:** 9.29m aOD
Coordinates (NGR)	X = 456154.7137 Y = 102415.7310		
Context	**Description**		**Depth (m)**
12001	Topsoil	Mid greyish brown silty clay, loosely compact, with rare small sized gravel inclusions.	0 – 0.15m
12002	Subsoil	As above. Moderately compact	0.15m – 0.25m
12003	Layer	Mid yellowish brown silty clay. Very firmly compact, probably rolled ground	0.25m – 0.45m
12004	Natural	Mid orangey brown brick earth	0.45m +

TRENCH 121 (Hangers West)			
Dimensions: 30m xx 1.8m		**Max. depth:** 0.4m	**Ground level:** 8.75m aOD
Coordinates (NGR)	X = 456108.2547 Y = 102352.2615		
Context	**Description**		**Depth (m)**
12101	Topsoil	Mid greyish brown silty clay, loosely compact, with very rare small sized sub-rounded gravel inclusions.	0 – 0.1m
12102	Subsoil	As above. Moderately compact.	0.1m – 0.2m
12103	Layer	Mid greyish brown silty clay with abundant small gravel/ sand inclusions	0.4m thick
12104	Layer	Same as 12102. Very firmly compact, probably rolled ground.	0.2m – 0.4m
12105	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 122 (Hangers West)			
Dimensions: 29m x 1.8m		**Max. depth:** 0.5m	**Ground level:** 9.01m aOD
Coordinates (NGR)	X = 456006.9035 Y = 102274.0654		
Context	**Description**		**Depth (m)**
12201	Topsoil	Mid greyish brown silty clay with yellowish hue. Loose compaction	0 – 0.1m
12202	Subsoil	As above. Moderate to loose compaction. Rare sib-rounded flint and CBM inclusions	0.1m – 0.2m
12203	Layer	Mid yellowish brown silty clay. Rare sub-rounded small flint and CBM inclusions. Sparse marine shell, probably rolled ground	0.2m – 0.45m
12204	Natural	Mid orangey brown brick earth	0.45m +

TRENCH 123 (Hangers West)			
Dimensions: 29m x 1.8m		**Max. depth:** 0.55m	**Ground level:** 8.98m aOD
Coordinates (NGR)	X = 455938.1914 Y = 102277.3252		
Context	**Description**		**Depth (m)**

12301	Topsoil	Mid greyish brown silty clay. Loose compaction	0 – 0.1m
12302	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12303	Layer	Mid yellowish brown silty clay. Rare small sub-rounded flint and CBM inclusions. Very firmly compact. Probable rolled ground	0.2m – 0.4m
12304	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 124 (Hangers West)			
Dimensions: 30.4 x 1.8m		**Max. depth:** 0.4m	**Ground level:** 8.95m aOD
Coordinates (NGR)	X = 455952.6714 Y = 102231.4219		
Context	**Description**		**Depth (m)**
12401	Topsoil	Mid greyish brown silty clay. Loose compaction	0 – 0.1m
12402	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12403	Layer	Mid yellowish brown silty clay. Very firmly compact. Probable rolled ground	0.2m – 0.4m
12404	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 125 (Hangers West)			
Dimensions: 30m x 1.8m		**Max. depth:** 0.45m	**Ground level:** .09m aOD
Coordinates (NGR)	X = 455887.6806 Y = 102213.3182		
Context	**Description**		**Depth (m)**
12501	Topsoil	Mid greyish brown silty clay. Loose compaction	0 – 0.1m
12502	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12503	Layer	Mid yellowish brown silty clay. Very firmly compact. Probable rolled ground	0.2m – 0.45m
12504	Natural	Mid orangey brown brick earth	0.45M +

TRENCH 126 (Hangers West)			
Dimensions: 30m X 1.8m		**Max. depth:** 0.4m	**Ground level:** 9.02m aOD
Coordinates (NGR)	X = 455924.6676 Y = 102176.0218		
Context	**Description**		**Depth (m)**
12601	Topsoil	Mid greyish brown silty clay. Loose compaction. Very rare sub-rounded flint inclusions	0 – 0.1m
12602	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12603	Layer	Mid yellowish brown silty clay. Very firmly compact. Probable rolled ground	0.2m – 0.35m
12604	Natural	Mid orangey brown brick earth	0.35m +

TRENCH 127 (Hangers West)			
Dimensions: 27m X 1.8m		**Max. depth:** 0.45m	**Ground level:** 9.17m aOD
Coordinates (NGR)	X = 455851.1277 Y = 102169.5201		
Context	**Description**		**Depth (m)**
12701	Topsoil	Mid greyish brown silty clay. Loose compaction. Very rare sub-rounded flint inclusions	0 – 0.1m

12702	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12703	Layer	Mid yellowish brown silty clay. Very firmly compact. Probable rolled ground. Very rare sub-rounded small gravel inclusions	0.2m – 0.4m
12704	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 128 (Hangers West)			
Dimensions: 28m X 1.8m		**Max. depth:** 0.45m	**Ground level:** 8.98m aOD
Coordinates (NGR)	X = 455861.6991 Y = 102119.2153		
Context	**Description**		**Depth (m)**
12801	Topsoil	Mid greyish brown silty clay. Loose compaction.	0 – 0.1m
12802	Subsoil	As above. Moderate to loose compaction.	0.1m – 0.2m
12803	Layer	Mid yellowish brown silty clay. Very firmly compact. Probable rolled ground.	0.2m – 0.35m
12804	Natural	Mid orangey brown brick earth	0.35m +

TRENCH 12 (Hangers West)			
Dimensions: 29m X 1.8m		**Max. depth:** 0.55m	**Ground level:** 9.10m aOD
Coordinates (NGR)	455643.3289 Y = 101988.1287		
Context	**Description**		**Depth (m)**
12901	Topsoil	Mid greyish brown silty clay. Loose compaction.	0 – 0.1m
12902	Subsoil	As above. Moderate to loose compaction. Sparse small gravel inclusions	0.1m – 0.2m
12903	Layer	As above. Sparse small gravel, glass and CBM fragment inclusions. Very firmly compact. Rolled ground	0.2m – 0.45m
12904	Natural	Mid yellowish brown brick earth with greyish hue	0.45m +

TRENCH 130 (Hangers West)			
Dimensions: 30m X 1.8m		**Max. depth:** 0.4m	**Ground level:** 9.61m aOD
Coordinates (NGR)	X = 455559.0079 Y = 101906.9132		
Context	**Description**		**Depth (m)**
13001	Topsoil	Mid greyish brown silty clay. Loose compaction. Very rare sub-rounded small gravel inclusions	0 – 0.1m
13002	Subsoil	As above. Moderate compaction	0.1m – 0.2m
13003	Layer	Mid orangey brown silty clay with rare CBM and chalk inclusions. Very firmly compacted. Probably rolled ground.	0.2m – 0.35m
13004	Natural	Mid orangey brown brick earth	0.35m +

TRENCH 131 (Hangers West)			
Dimensions: 28m X 1.8m		**Max. depth:** 0.4m	**Ground level:** 9.29m aOD
Coordinates (NGR)	X = 455642.1791 Y = 101879.1599		
Context	**Description**		**Depth (m)**
13101	Topsoil	Mid greyish brown silty clay. Loose compaction.	0 – 0.1m
13102	Subsoil	As above. Moderate compaction, with sparse manganese inclusions	0.1m – 0.15m

13103	Layer	Mid orangey brown silty clay, with sparse small sub-rounded gravel inclusions. Very firmly compact. Probably rolled ground	0.15m – 0.4m
13104	Natural	Mid orangey brown brick earth	0.4m +

TRENCH 132 (Hangers West)			
Dimensions: 29m X 1.8m		**Max. depth:** 0.4m	**Ground level:** 9.29m aOD
Coordinates (NGR)	455642.2736 Y = 101879.2786		
Context	**Description**		**Depth (m)**
13201	Topsoil	Mid greyish brown silty clay. Loose compaction.	0 – 0.1m
13202	Subsoil	As above. Firmly compact.	0.1m – 0.2m
13203	Layer	Mid orangey brown silty clay. Very firmly compact. Probably rolled ground	0.2m – 0.35m
13204	Natural	Mid orangey brown brick earth	0.35m +

Appendix 2: Oasis Summary

OASIS ID: wessexar1-18 74

Project details	
Project name	Waterfront and Hangers West areas, Daedalus Airfield,
Short description of the project	Wessex Archaeology has been commissioned by Campbell Reith Consulting Engineers on behalf of the Homes and Communities Agency (HCA) to undertake an archaeological trial trench evaluation of two areas (Hangers West and Waterfront) located at the Daedalus Airfield, Lee-on-Solent, Hampshire, centred on NGR 455867 101346 (Waterfront) and 455878 102174 (Hangers West)..A small quantity of heavily abraded Late Bronze Age pottery (13 sherds/89g) was recovered from the subsoil layers within Trenches 86 and 87 in the south of Hangers West. No evidence of associated features was found within the Site.
Project dates	Start: 28-07-2014 End: 12-08-2014
Previous/future work	Yes / No
Any associated project reference codes	104760 - Contracting Unit No.
Type of project	Field evaluation
Site status	None
Current Land use	Transport and Utilities 2 - Other transport infrastructure
Monument type	NONE None
Significant Finds	POTTERY Late Bronze Age
Methods & techniques	"Targeted Trenches"
Development type	Extensive green field commercial development (e.g. shopping centre, business park, science park, etc.)
Prompt	Direction from Local Planning Authority - PPS
Position in the planning process	After outline determination (eg. As a reserved matter)
Project location	
Country	England
Site location	HAMPSHIRE GOSPORT GOSPORT Daedalus Airfield
Postcode	PO13 9NS
Study area	40.00 Hectares
Site coordinates	SU 558 022 50.8160926528 -1.20782994956 50 48 57 N 001 12 28 W Point
Site coordinates	SU 558 012 50.807099946 -1.20798204715 50 48 25 N 001 12 28 W Point
Height OD / Depth	Min: 8.00m Max: 8.00m
Project creators	
Name of Organisation	Wessex Archaeology
Project brief originator	Hampshire County Council
Project design	Wessex Archaeology

originator	
Project director/manager	Andrew Manning
Project supervisor	Matt Kendall
Type of sponsor/funding body	Developer
Name of sponsor/funding body	Homes and Communities Agency

Project archives

Physical Archive recipient	Hampshire County Museums Service
Physical Contents	"Ceramics"
Digital Archive recipient	Hampshire County Museums Service
Digital Contents	"none"
Digital Media available	"Images raster / digital photography","Spreadsheets","Survey","Text"
Paper Archive recipient	Hampshire County Museums Service
Paper Contents	"none"
Paper Media available	"Context sheet","Miscellaneous Material","Notebook - Excavation',' Research',' General Notes","Photograph","Plan","Report","Section"

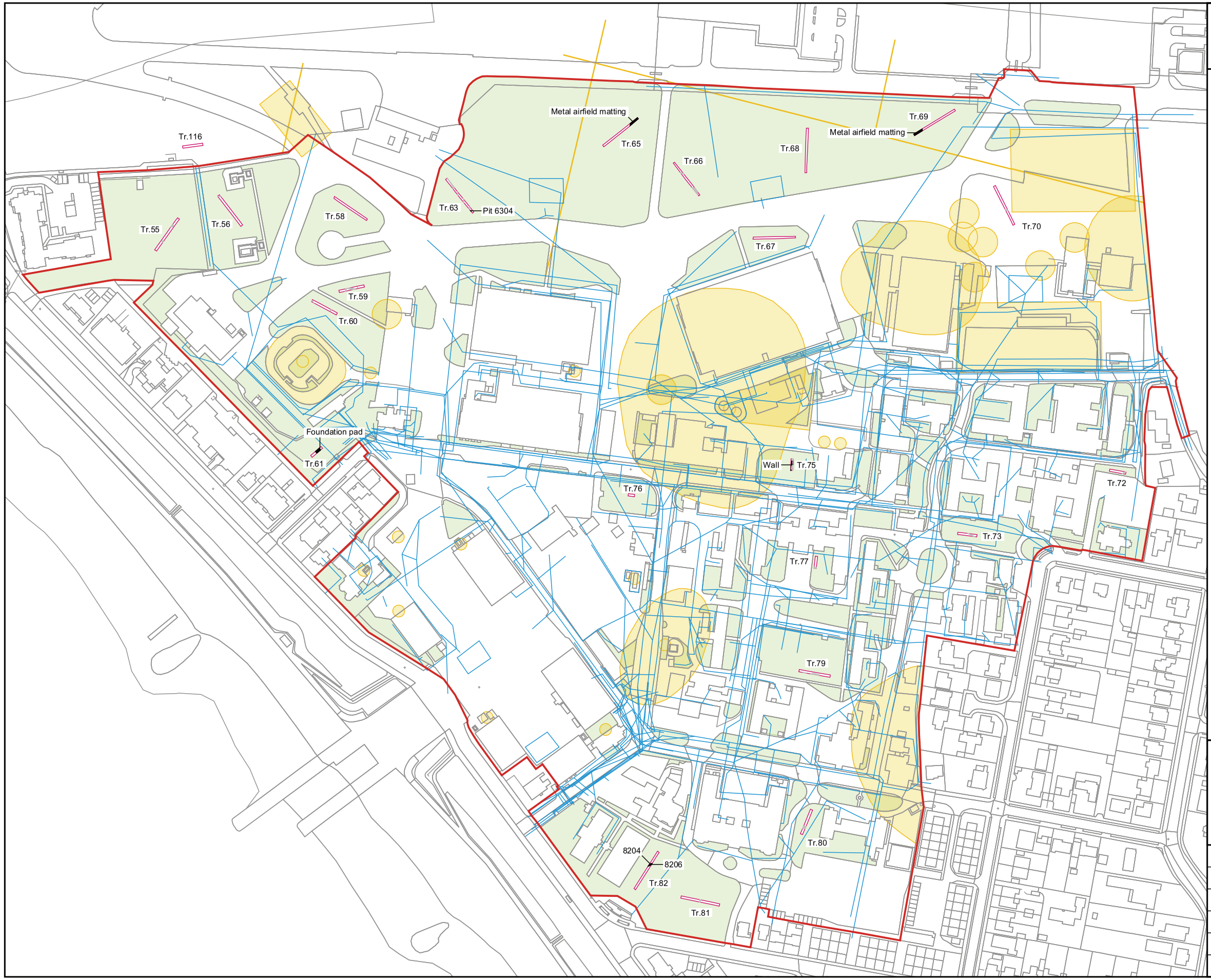
Project bibliography 1

Publication type	Grey literature (unpublished document/manuscript)
Title	Waterfront and Hangers West areas, Daedalus Airfield,
Author(s)/Editor(s)	Wakeham, G
Other bibliographic details	104760.02
Date	2014
Issuer or publisher	Wessex Archaeology
Place of issue or publication	Salisbury
Description	Soft back illustrated standard evaluation report c. 36 pages
Entered by	Andrew Manning (a.manning@wessexarch.co,uk)
Entered on	12 September 2014



Site location plan

Figure 1



Site outline

Possible area of evaluation

Contaminated area

Mapped location of pipemines (1943)

Recorded services (accuracy not guaranteed)

Evaluation trench

Modern feature

Disturbance

0 100 m

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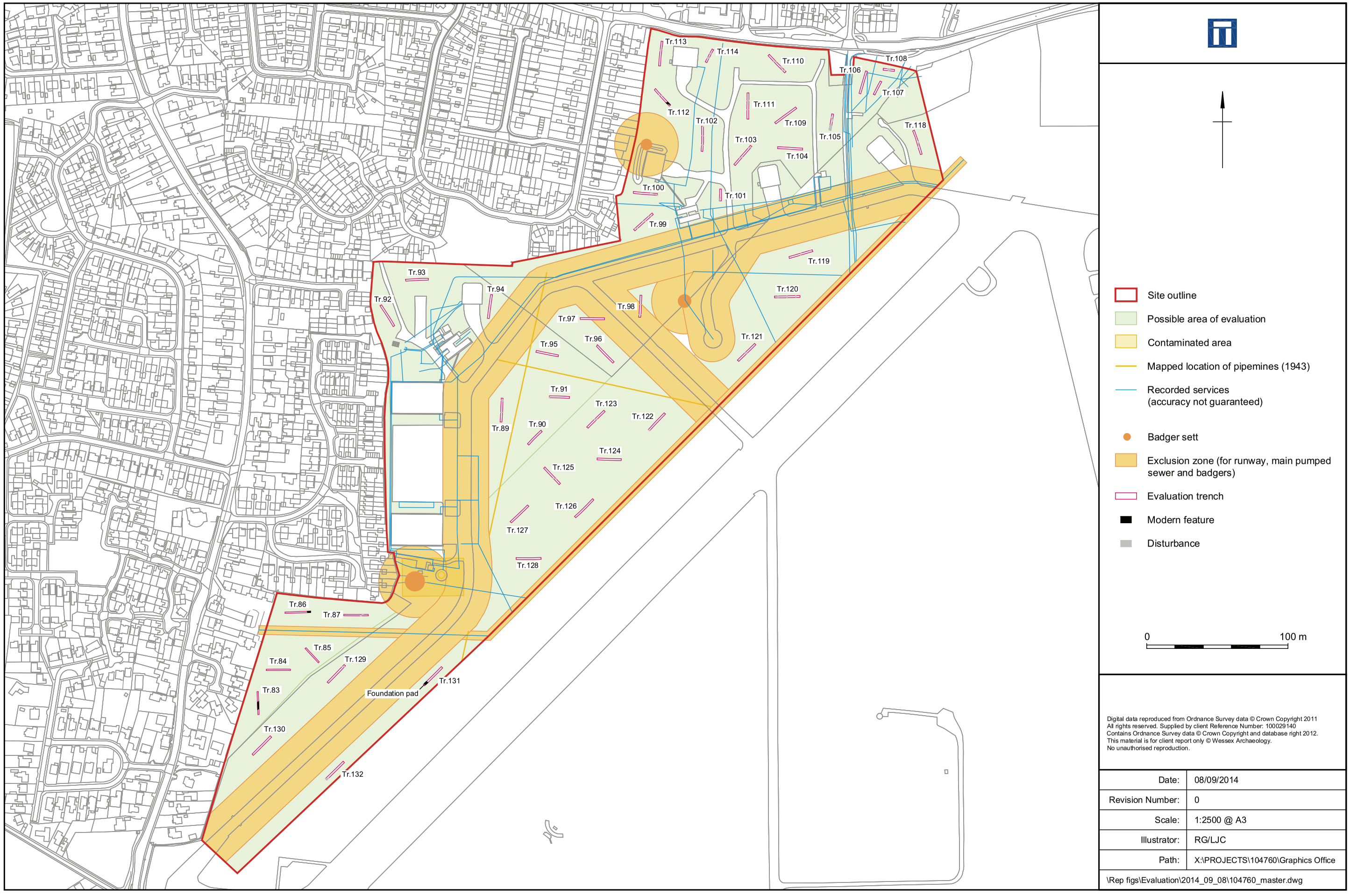
Trench location plan for Waterfront

Figure 2



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Trench location plan for Hangers West

Figure 3



Plate 1: Section through modern posthole 8206 cut into gully 8204.



Plate 2: View of metal airfield matting in Trench 65.

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Plate 3: View of wall foundation in Trench 75.



Plate 4: View of concrete foundation pad in Trench 61.

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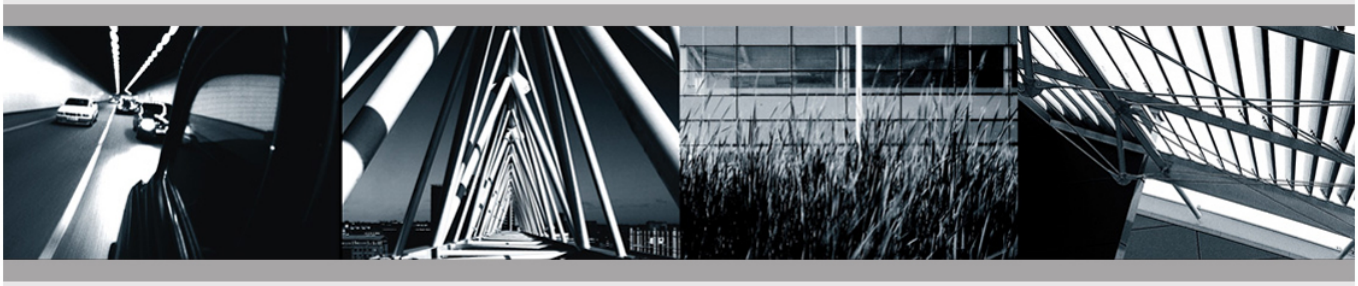

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