Shepway District Council

Proposed Leisure Centre and Mixed-Use Development at Princes Parade Hythe

Environmental Statement

Technical Annex 3

Ecology

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Peter Radmall Associates
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TECHNICAL APPENDIX 7.1
BOTANY REPORT

PRINCES PARADE
HYTHE, KENT

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1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 A National Vegetation Classification survey was undertaken in June and July 2016.

S.3 Based on the survey results and subsequent analysis, the application site supports vegetation that fits most closely with the following NVC plant communities: -

- W1 (*Salix cinerea - Galium palustre* woodland) (tall, willow-dominated scrub);
- W24 (*Rubus fruticosus* agg. - *Holcus lanatus* underscrub) (dense bramble scrub);
- OV25 (*Urtica dioica - Cirsium arvense* community) (tall ruderal vegetation); and
- MC9 (*Festuca rubra - Holcus lanatus* maritime grassland).

S.4 The on-site W1, W24 and OV25 communities (closest fit) are of negligible botanical importance, and have therefore been scoped out of the assessment of 'likely significant effects' associated with the proposed development.

S.5 The on-site 'maritime' grassland community is of 'local' botanical importance and has therefore been carried forwards in the assessment of 'likely significant effects.'

S.6 No Habitats of Principal Importance were recorded on the application site.

S.7 The adjacent section of the Royal Military Canal qualifies as *'Eutrophic standing water',* which is a Habitat of Principal Importance (HPI). The *'Eutrophic standing water'* HPI occupies the same footprint as the Royal Military Canal Local Wildlife Site, and is therefore of county importance. This HPI has been carried forward in the assessment process.

S.8 To ensure the delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to habitats are not detailed in this report. Instead, these measures are detailed in Technical Appendix 7.8.

S.9 Giant hogweed, Japanese rose and Spanish bluebell, which are all non-native plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) were recorded on-site.

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This Technical Appendix details the method and results of a National Vegetation Classification (NVC) survey of the application site, which was undertaken in June and July 2016.

2.3. This Technical Appendix also details the assessment process for allocating NVC communities.

2.4. This Technical Appendix also provides detail of the methods and results of a preliminary habitat assessment of the application site, which was undertaken in September 2015.

2.5. To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to habitats are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

OBJECTIVES

2.6. The objectives of this survey and report are to: -

- Determine the NVC plant communities that are present on the application site, or determine the closest-fitting NVC communities where appropriate;
- Assess the importance of on-site plant communities;
- Determine whether any Habitats of Principal Importance (HPI) are present within the Zone of Influence (ZoI) of the proposed development; and
- Determine whether any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are present on the application site.

3. SURVEY PLAN

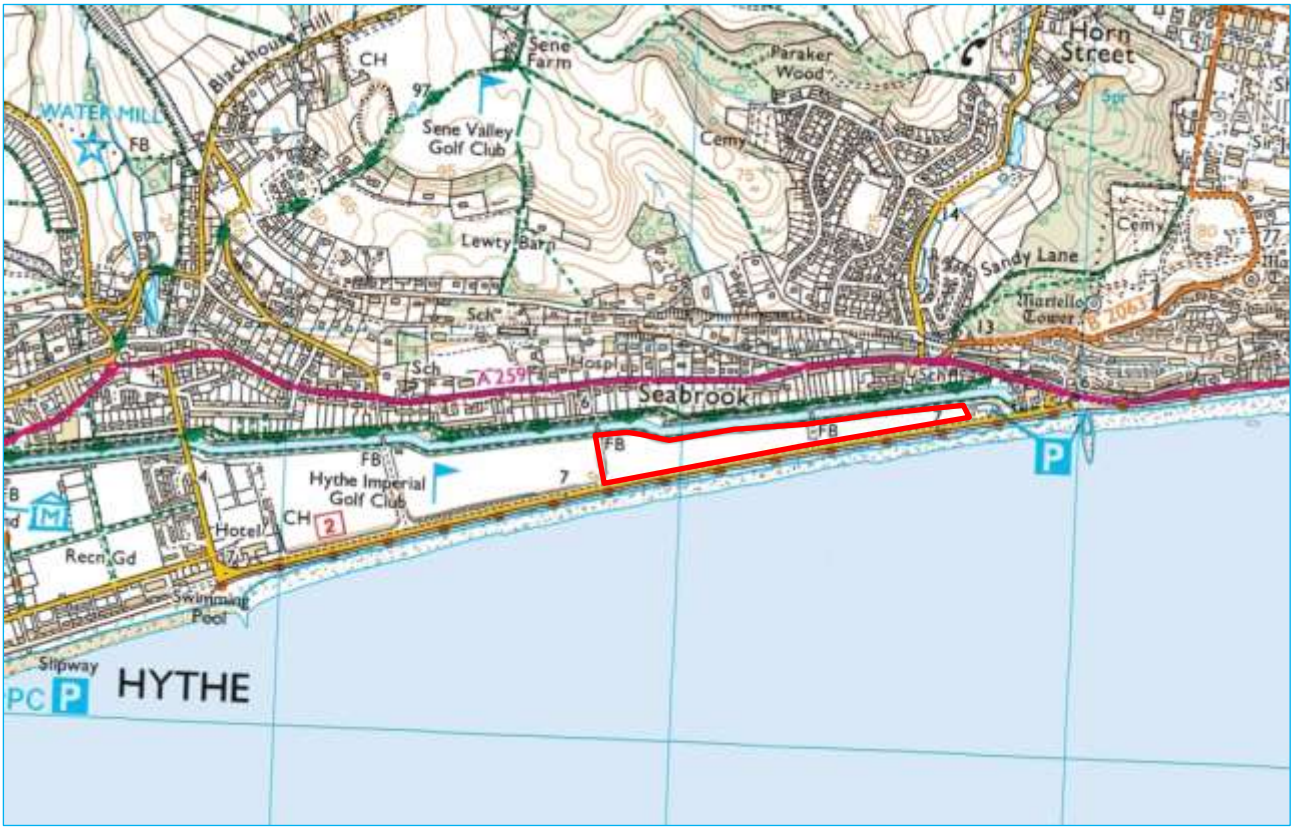

Fig. 1: Approximate extents of NVC survey area (as indicated by the red boundary line) (red boundary line is approximate). Reproduced from Explorer Map 138 (1:25 000) by permission of Ordnance Survey. © Crown Copyright (2015). All rights reserved. AR 100029570.

4. METHOD

DESK STUDY

4.1. A data search was conducted by Kent and Medway Biological Records Centre (KMBRC) in September 2015. A 1km search radius, measured from the application site boundary, was used.

4.2. The data set obtained through this search includes records of legally protected plant species, 'nationally rare' and 'nationally scarce' plant species, plant SPIs and HPIs.

4.3. Records obtained within the ten-year period prior to the date of the record search are considered 'recent.' Records older than this are considered 'historic.'

4.4. *A New Atlas of the Kent Flora* (Philp, 2010) was also consulted for background information on the known distributions of plant species within Kent. The Assessing Regional Habitat Change (ARCH) website was also consulted (ARCH, undated).

4.5. The Multi Agency Geographic Information for the Countryside (MAGIC) website was used to obtain information about HPI located within 100m of the application site. The information obtained from the MAGIC website was cross-referenced with relevant Priority Habitat Descriptions and the online list of priority habitats provided by the Joint Nature Conservation Committee (JNCC) (JNCC, 2016a).

4.6. Finally, the information provided in the *Geo-Environment - Land Contamination and Ground Conditions* Chapter of the Environmental Statement has been used to understand the historical use of the site and therefore how this may influence the ecological importance of the site for flora.

PRELIMINARY HABITAT ASSESSMENT

4.7. An initial ecological assessment of the application site, and the adjacent canal section, was undertaken by David W. Smith BSc (Hons), PhD, MCIEEM on 14th September 2015.

4.8. David is a full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over ten years of ecological consultancy experience.

4.9. Vegetation was classified based on standardised habitat descriptions (JNCC, 2010). Where appropriate, habitat descriptions were adapted to better describe the habitats present on-site.

4.10. Any presence of HPI, or invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was recorded during the visit.

NATIONAL VEGETATION CLASSIFICATION SURVEY

4.11. A NVC survey of the application site was undertaken in June and July 2016. Survey visits were completed on 17th June, 24th June and 15th July 2016.

4.12. The survey was undertaken by Samuel Durham BSc, who is an Associate member of CIEEM (ACIEEM), and Kathryn Tennant BSc (Hons), ACIEEM.

4.13. At the time of the survey, Samuel had over six years of experience in habitat survey and plant identification. Kathryn had over four years of experience in habitat survey and plant identification.

4.14. The survey methodology was based on guidance set out within JNCC (2006).

4.15. A detailed walkover of the site was conducted at the start of the survey - to map obvious boundaries between different habitat types.

4.16. The resultant base maps were used to select approximate locations for sampling.

4.17. A representative sampling approach was employed. Surveyors used their professional judgement to select sampling points typical of each broad habitat type. In line with JNCC (2006) guidance, graduated edges between habitat types were not sampled.

4.18. Quadrats were marked out using string and sturdy pegs. Quadrat size was varied based on vegetation height and type.

4.19. For tall, scrubby areas, 10m x 10m quadrats were used. For tall ruderal herb areas, 4m x 4m quadrats were used. For grassland areas, 2m x 2m quadrats were used.

4.20. The number of quadrats taken within each broad habitat type was determined based on the approximate total on-site area for that habitat type, and the degree of variation noted within each habitat type during the walkover.

4.21. For tall scrub areas, five quadrats were sampled. For tall ruderal areas, six quadrats were sampled. For grassland areas, five quadrats were sampled.

4.22. The baseline information recorded for each quadrat included: -

- Location (grid reference);
- Approximate slope;
- Aspect;
- Soil depth (where possible to estimate);
- Soil profile;
- Approximate stand area (for the vegetation stand that the quadrat was taken within);
- Sample area (quadrat size);
- Vegetation layers present, and approximate average height for each layer;
- The approximate area covered by each layer (as a percentage of the total quadrat area);
- Plant species present; and
- The approximate area covered by each plant species (as a percentage of the total quadrat area).

4.23. The approximate area covered by each plant species was estimated, and then converted using the Domin Scale of Cover / Abundance, to determine a numerical abundance value.

4.24. Table 1 provides detail of the different levels that exist within the Domin Scale.

Table 1: The Domin scale of cover / abundance

Cover (% of total quadrat area covered by a plant species)	Domin value
91 - 100	10
76 - 90	9
51 - 75	8
34 - 50	7
26 - 33	6
11 - 25	5
4 - 10	4
<4 (many individuals)	3
<4 (several individuals)	2
<4 (few individuals)	1

4.25. Even within vegetation which is not conspicuously layered, the total of all the Domin values for a given species can exceed 100% cover, because of structural overlap between plant layers.

4.26. Areas of low, dense scrub were dominated by bramble. In most of these areas, bramble was present at almost 100% cover. Bramble-dominated scrub is easy to categorise using NVC community descriptions (JNCC, 2004a). For this reason, it was not considered necessary to take quadrat samples within these low, dense scrub habitats.

4.27. During both the detailed walkover and the quadrat sampling, any invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act was noted.

ASSESSMENT AND EVALUATION

4.28. A summary of relevant legislation and national planning policy can be found under Appendix A.

Characterising vegetation types

4.29. The results of all quadrat samples taken within a broad habitat type were assessed to determine the closest-fitting NVC community. This process was repeated for each broad habitat type.

4.30. The first stage in this process involved reviewing the quadrat sampling results for each broad habitat type - to determine how frequently each plant species occurred.

4.31. For instance, common nettle (*Urtica dioica*) occurred within all six (100%) of the quadrats taken within tall ruderal habitats. This occurrence rate was then categorised using the NVC Frequency Class Scale (as shown below).

Table 2: NVC Frequency Class Scale

% of quadrats that species is present within	Frequency class	Frequency terminology
1 - 20	I	Scarce
21 - 40	II	Occasional
41 - 60	III	Frequent
61 - 80	IV	Constant
81 - 100	V	Constant

4.32. The Frequency Class value and Domin values of each plant species within a given habitat type were tabulated (see Appendix B) and then cross-referenced with published NVC Floristic Tables.

4.33. NVC Floristic Tables provide lists of plant species that typically occur within a NVC plant community.

4.34. The relevant *British Plant Communities* volumes provide further detail of variation and sub-communities within each NVC community type (Rodwell, 1991; Rodwell, 2000).

4.35. Where a close match existed between the survey data and the published Floristic Tables, the on-site community could be easily identified. The community descriptions provided in *British Plant Communities* were also consulted when determining on-site community types.

4.36. The full range of baseline information recorded within each quadrat was also considered.

4.37. Where a less certain match was obtained between the quadrat sampling results and published Floristic Tables (for the on-site grassland), greater reliance was placed on the supporting descriptions contained within the *British Plant Communities* reference text (Rodwell, 2000).

4.38. The results of the detailed walkover and the quadrat sampling were also used to review whether the application site supports any HPIs.

4.39. The importance of ecological features was assessed within a geographical context, based on CIEEM (2016). The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;
- County;
- Local; and
- ZoI.

4.40. Features assessed as being of importance at the ZoI level have been scoped out of the assessment.

4.41. Only features assessed as being of 'local' importance or greater have been taken forward in the ecological impact assessment process.

ZONE OF INFLUENCE

4.42. The potential impact(s) of a development are not always limited to the boundaries of the site concerned. A development may also have the potential to impact on ecologically important features located beyond the site boundaries. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

4.43. The ZoI is determined by the source / type of impact, the potential pathway(s) for those impacts and the location and sensitivity of the ecologically important feature(s) beyond the site boundary.

4.44. In the absence of mitigation, potential sources of impact associated with the proposed development include direct loss of plant communities, habitat fragmentation and contamination of the adjacent canal. The canal is a HPI, and could act as a pollution pathway to downstream habitats.

4.45. The ZoI of the proposed development for plants and habitats is likely to be confined to the red line boundary of the application site and those areas located just beyond.

SURVEY LIMITATIONS

4.46. Intensive NVC sampling of single sites can exaggerate local peculiarities. Any species that is typically rare or scarce within a NVC community on a regional or national basis may be recorded as a constant at the site level. This is a standard limitation of site-level assessments and has been controlled for by carefully considering the known variations within NVC community types.

4.47. The moss species present on-site were not identified. Moss was absent or very scarce within quadrats and did not form a significant component of on-site plant communities. Furthermore, moss species are not typically important indicators of NVC plant communities within grassland, ruderal and scrub habitats such as those present on the application site.

4.48. The NVC communities attributed to on-site habitats have been determined on a 'closest fit' basis. The primary objective of the survey was to ensure that a thorough botanical survey was undertaken - to inform a robust assessment of the ecological importance of the on-site plant communities. The determination of NVC communities is therefore of secondary importance. Therefore, the use of a 'closest fit' approach is not considered a material constraint to the survey and assessment.

4.49. The footprint of the proposed canoe centre was not included within the NVC survey area, because this area was outside of the original survey brief. However, a walkover of this area confirmed that it supports common and widespread habitats. It's exclusion from the NVC survey and assessment is therefore not of material importance to the ecological impact assessment.

4.50. The above limitations are not considered significant or of material importance to the ecological impact assessment process. The survey work conducted was thorough, robust and adequate for the purposes of this assessment and report.

4.51. This report is therefore suitable for use as a Technical Appendix to the Environmental Statement.

5. RESULTS

DESK STUDY

Legally protected plant species

5.1. The data search returned records of two plant species listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) located within 1km of the application site.

5.2. Historic records of bedstraw broomrape (*Orobanche caryophyllacea*) and recent and historic records of bluebell (*Hyacinthoides non-scripta*) were returned.

5.3. Bedstraw broomrape occurs in stabilised dune grassland, and in scrub and hedge banks on chalk downs and undercliffs (BRC, undated). In lowland habitats, bluebell typically occurs in deciduous woodland, hedgerows and shady banks and on cliffs (BRC, undated).

5.4. The application site does not support any of the habitats that these two species typically occur within. In addition, neither species was recorded on-site during survey work.

Nationally rare and nationally scarce species

5.5. The biological data search returned two recent records of clustered clover (*Trifolium glomeratum*) located within 1km of the application site. These records date from 2013. The JNCC list this species as being *'nationally scarce'* (JNCC, 2016b).

5.6. Clustered clover occurs within short, open plant communities on light, drought-prone, often somewhat acidic sandy or stony soils near the coast. Habitats in which this species is known to occur include path-side banks, seafront lawns and cliff-slopes (BRC, undated).

5.7. The on-site grassland strip that is located adjacent to the existing Princes Parade road is suitable for this species. However, this species was not recorded on-site during survey work.

Habitats of Principal Importance

5.8. One HPI was located within 100m of the application site. This is *'Eutrophic standing water'*, which comprises the Royal Military Canal (JNCC, 2008a).

Land-use history

5.9. Kent Wildlife Trust have previously stated that the site supports fixed sand dunes with herbaceous vegetation (KWT, 2013), and this is also shown on the ARCH website.

5.10. However, Chapter 9 of the Environmental Statement details that the site is an historic EA landfill (reference SH6) that received both inert and commercial waste between 1946 and 1974. The landfill site was closed in 1975.

5.11. Chapter 9 confirms that previous and existing assessments indicate that the layer of 'made ground' on-site ranged from 2.8m to 4.8m thick, and that the survey work found evidence of landfill use.

5.12. An investigation in May 2017 found that made ground ranged in thickness from 0.2 to > 3m below ground level (bgl). The made ground predominately comprises an upper stratum of topsoil, which sits over brown sandy gravelly silt / clay with frequent rootlets. The Chapter 9 assessment also describes the composition of other materials that were found.

5.13. The ground investigations demonstrate the former uses of the site, particularly with reference to landfilling, which in turn have resulted in widespread contamination. In addition, the Environment Agency's waste and landfill mapping tool identifies the site as being a 'historic landfill site' (EA, 2017).

5.14. Therefore, this brings into serious doubt the habitat classification of 'fixed sand dune' for on-site habitats. It is possible that the imported materials (made ground) replicated this habitat type. However, the ecological importance of any such habitats will be significantly less compared to a naturally created 'fixed sand dune' habitat.

5.15. In addition, the vegetation present on-site is not indicative of any of the vegetation types included within the JNCC Priority Habitat Description for *'Coastal Sand Dunes'* (JNCC, 2008b).

PRELIMINARY HABITAT ASSESSMENT

Habitats and flora

5.16. The preliminary habitat assessment identified the following broad habitat types on-site: -

- Low, dense scrub dominated by bramble (*Rubus fruiticosus* agg.);
- Tall scrub dominated by willow (*Salix* sp.), with elder (*Sambucus nigra*) present;
- Extensive areas of tall ruderal herbs dominated by common nettle and hogweed (*Heracleum sphondylium*);
- Semi-improved maritime grassland; and
- Hardstanding.

5.17. The preliminary habitat assessment also identified the following broad habitat types located within the adjacent canal corridor, between the application site and the canal's southern edge: -

- Low, dense scrub dominated by bramble (on the canal bank);
- Tall ruderal herbs (on the canal bank);
- Heavily managed semi-improved grassland (on the canal tow path); and
- Marginal vegetation (on the canal bank).

5.18. In addition, mown amenity grassland, semi-improved grassland (mown and unmown), ruderal herbs and scrub were identified within the canoe centre footprint, which is outside of the NVC survey area.

Habitats and Species of Principal Importance

5.19. The preliminary habitat assessment did not identify any HPI or plant SPI on the application site.

5.20. The adjacent section of the Royal Military Canal was identified as a HPI.

5.21. Based on published criteria, this canal section has been categorised as *'Eutrophic standing water'*, which is a HPI. The observed algal cover, the broad habitat types present and local water hardness all factored into the identification of the canal as a *'Eutrophic standing water'* body.

Invasive flora

5.22. The preliminary habitat assessment did not identify any plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) on the application site.

NVC SURVEY

Detailed walkover

5.23. The detailed walkover confirmed that the application site supports the following broad habitat types: -

- Low, dense scrub;
- Tall scrub;
- Tall ruderal herbs; and
- Semi-improved, maritime grassland.

5.24. Giant hogweed (*Heracleum mantegazzianum*), which is listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), was identified on-site. See target note 1 (T1) on the NVC Survey Plan in Appendix C for the approximate location of the observed plants.

5.25. Spanish bluebell (*Hyacinthoides hispanica*), which is also listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was identified on-site. See T2 on the NVC Survey Plan for the approximate locations of the observed plants.

5.26. Japanese rose (*Rosa rugosa*), which is also listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) was identified on-site. See T4 on the NVC Survey Plan for the approximate locations of the observed plants.

Quadrat sampling

5.27. Detailed quadrat sampling results can be found in Appendix B. Descriptions of plant communities are provided below, along with detail of the closest-fitting NVC community.

Tall scrub

5.28. Tall scrub is present in large blocks across the northern and central parts of the application site. These blocks reach between 4m and 6m in height, and total approximately 1ha in area.

5.29. The canopy layer of these tall scrub habitats is dominated by grey willow (*Salix cinerea*), with abundant and locally dominant goat willow (*Salix caprea*). Both species were constant across the quadrats taken within tall scrub. Large bindweed (*Calystegia sepium*) was also constant across the tall scrub quadrats, whilst elder (*Sambucus nigra*) was occasional. The understorey included frequent large bindweed, and the sub-shrub layer supported frequent pendulous sedge (*Carex pendula*), common nettle, hogweed and cleavers (*Galium aparine*). The ground layer within these habitats included frequent hogweed and occasional cleavers.

5.30. The closest-fitting NVC plant community for this habitat is W1 (*Salix cinerea - Galium palustre* woodland).

5.31. Marsh bedstraw (*Galium palustre*), which is listed as a constant of W1, was not recorded during the survey.

5.32. The constant presence of grey willow and the frequent presence of pendulous sedge within quadrats, and the presence of standing water and water-matted vegetation in March-April 2016, indicate that the northern part of the site retains sufficient water to support some damp ground species. However, the ground was thoroughly dry at the time of the NVC survey (June and July 2016), which limits the ability of the site to support some damp ground plant species, such as marsh bedstraw.

5.33. *A New Atlas of the Kent Flora* (Philp, 2010) indicates that marsh bedstraw has not been recorded within 5km of the application site.

Low, dense scrub

5.34. Patches of low, dense scrub dominated by bramble are scattered across the application site. These patches are between 0.5m and 2m in height, and total approximately 0.96ha in area.

5.35. During the initial NVC walkover, Yorkshire fog (*Holcus lanatus*) was identified within and close to several bramble patches.

5.36. The closest-fitting NVC community for this habitat is W24 (*Rubus fruticosus* agg. - *Holcus lanatus* underscrub).

5.37. There are no possible alternative community types within the NVC.

Tall ruderal herbs

5.38. Most of the application site is dominated by tall ruderal herbs. These ruderal habitats total approximately 3.63ha in area.

5.39. Common nettle and hogweed were constant within quadrats, and were typically the most dominant species within each quadrat. Creeping thistle (*Cirsium arvense*) and mugwort (*Artemisia vulgaris*) were also constant across quadrats. Field bindweed (*Convolvulus arvensis*), cleavers and black horehound (*Balllota nigra*) were frequent.

5.40. **The closest-fitting NVC community for this habitat is OV25 (*Urtica dioica - Cirsium arvense* community).**

5.41. Both creeping thistle and common nettle are listed as constant species for this NVC community type, and typically occur at Domin values similar to those recorded within the quadrats.

Semi-improved maritime grassland

5.42. A band of grassland habitat is present in the southern half of the application site. This band is typically between three and six metres wide, with a broader area present at the western end of the application site. This grassland totals *c*.1.42ha in area, and sits between the OV25 community and the hardstanding of Princes Parade. This grassland extends into the ditch and bund in places.

5.43. The sward adjacent to Princes Parade is subject to regular mowing and, at the time of survey, ranged between 5cm and 25cm in height. Grasses are taller at the margin with the adjacent OV25 community and where they are present on the ditch and bund.

5.44. The substrate within the strip along Princes Parade contains a greater proportion of small stones, gravel and sand than the substrates recorded in other on-site quadrats. The soil depth in quadrats taken within this grassland was between 3cm and 8cm.

5.45. Red fescue (*Festuca rubra*), creeping bent (*Agrostis stolonifera*) and cock's foot (*Dactylis glomerata*) were constant across the quadrats taken within grassland. Perennial ryegrass (*Lolium perenne*), common bird's foot trefoil (*Lotus corniculatus*), white clover (*Trifolium repens*), black medic (*Medicago lupulina*) and ribwort plantain (*Plantago lanceolota*) were frequently recorded. Red fescue was the most dominant herb species present (covering between 70 and 90% of each quadrat), whilst creeping bent was recorded at markedly lower cover (between 10% and 30% cover).

5.46. The closest-fitting NVC community for this habitat is MC9 (*Festuca rubra - Holcus lanatus* maritime grassland).

5.47. Thrift (*Armeria maritima*), which is listed as a constant within MC9, was not recorded in the grassland quadrats. Yorkshire fog, which is also listed as constant species for MC9, was scarce.

5.48. Under the NVC, MC9 is listed as a 'maritime cliff community'. However, the on-site grassland occurs on level ground away from any cliffs.

5.49. Despite these discrepancies, the general species composition, and Domin values for other herbs, mean that MC9 is the closest-fitting NVC vegetation community type for the on-site grassland.

HABITATS OF PRINCIPAL IMPORTANCE

5.50. No HPIs were identified on the application site.

5.51. MC9 grassland occurs within the HPI category 'Maritime cliff and slopes' (JNCC, 2014). However, to qualify as a HPI, the MC9 grassland needs to occur on a maritime cliff or slope. The Priority Habitat Description for 'Maritime cliff and slopes' states that:

'Maritime cliffs and slopes comprise sloping to vertical faces on the coastline where a break in slope is formed by slippage and/or coastal erosion' (JNCC, 2014).

5.52. The habitats on the application site do not fulfil the above criteria.

5.53. As the on-site example of MC9 grassland does not occur within a cliff or slope environment, it does not qualify as a HPI. Whilst the closest-fitting NVC community is MC9, the on-site grassland is not typical of this NVC community. It has been identified as MC9 grassland on a 'closest-fit' basis only.

INDIVIDUAL PLANT SPECIES

5.54. Bee orchid (*Ophrys apifera*) and pyramidal orchid (*Anacamptis pyramidalis*) were recorded within the MC9 grassland. These species are not SPIs, are not legally protected and are not listed as 'nationally rare' or 'nationally scarce'. However, these plants are likely to be of amenity value to existing residents of the local area. The approximate locations in which these plants were recorded are shown at T3 on the NVC Survey Plan.

6. PHOTOGRAPHS

Photo 1: View west along maritime grassland. Located between Prince's Parade and OV25 ruderal vegetation.

Photo 2: View north across on-site ruderal vegetation (OV25). On-site willow scrub (W1) visible in background.

Photo 3: Sample quadrat within maritime grassland.

Photo 4: Tall, on-site ruderal vegetation (OV25).

Photo 5: Pyramidal orchid within maritime grassland. Of local amenity interest.

Photo 6: View west along off-site canal section (Eutrophic standing water HPI). On-site ruderal (OV25) and scrub (W1) communities on left of photo

7. EVALUATION

7.1. The following on-site plant communities, and / or their dominant constituent species, are common and widespread at the ZoI (surveyor observation), regional (Philp, 2010) and national (Rodwell 1991; Rodwell 2000) scales: -

- W1 (*Salix cinerea - Galium palustre* woodland);
- W24 (*Rubus fruticosus* agg. - *Holcus lanatus* underscrub); and
- OV25 (*Urtica dioica - Cirsium arvense* community).

7.2. W1 is a community type that is widely scattered throughout the lowlands of Britain. The on-site example is young and scrubby. W24 and OV25 are common and widespread across Britain.

S.10 For these reasons, the on-site W1, W24 and OV25 communities are of botanical importance at the ZoI level, and they have therefore been scoped out of the assessment of 'likely significant effects' associated with the proposed development.

7.3. The on-site grassland is not characteristic of MC9 grassland communities. However, the on-site grassland community is not common within the immediate local landscape. For this reason, the on-site grassland community is of local botanical importance. This plant community has therefore been carried forwards in the assessment of 'likely significant effects'.

7.4. The *'Eutrophic standing water'* HPI occupies the same footprint as the Royal Military Canal Local Wildlife Site (LWS). The LWS designation is equivalent to a County Wildlife Site designation. The adjacent canal HPI is therefore of county importance. This HPI has therefore been carried forwards in the assessment of 'likely significant effects'.

7.5. Given the previous land use history of the site as a former landfill, it is unlikely that the site supports a fixed sand dune habitat.

8. REFERENCES

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9. APPENDIX A: LEGISLATION AND NATIONAL PLANNING POLICY

9.1. The specific legal protection afforded to individual plant species can be found within the relevant sections and schedules of the legislation.

9.2. Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) lists plant species for which it is an offence (subject to exceptions) to *'intentionally pick, uproot or destroy'.*

9.3. Schedule 9 of The Wildlife and Countryside Act 1981 (as amended) lists plant species for which it is an offence for a person to plant, or otherwise cause to grow in the wild.

9.4. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

9.5. S41 lists 56 Habitats of Principal Importance and 943 Species of Principal Importance.

National Planning Policy Framework (NPPF)

9.6. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed - Conserving and enhancing the natural environment (Paragraphs 109 to 125).

9.7. Of relevance are the following statements: -

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things… *'minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, ...'* (Paragraph 109); and
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Paragraph 113).

9.8. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Paragraph 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequate mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

9.9. The presumption in favour of sustainable development (Paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Paragraph 119).

9.10. The above policies 'encourage' ecological improvements 'where possible.' Therefore, this is not an absolute requirement at planning.

10. APPENDIX B: FLORISTIC TABLES

10.1. The below Floristic Tables provide detail of individual plant species recorded on-site during the NVC quadrat sampling. For each species, the following detail is provided: -

- The number of quadrats that a plant species occurred within, as a proportion of the total number of quadrats taken within the relevant community type. (This provides a Frequency Class value for the relevant plant species); and
- The range of % cover values for a species, within the quadrats where it occurred. (This provides a range of Domin values for the relevant plant species).

10.2. The closest-fitting NVC plant community is given at the base of each table.

Table 3: Floristic Table for tall scrub habitats.

Layer	Species common name	Species scientific name	NVC Frequency Value	Frequency description	Range of Domin values within occupied quadrats	Range of % cover within occupied quadrats	Notes
Canopy	Grey willow	Salix cinerea	V	Constant	7 - 8	50 - 75	
	Goat willow	Salix caprea	V	Constant	5 - 7	25 - 50	
	Large bindweed	Calystegia sepium	V	Constant	4	4 - 10	
	Elder	Sambucus nigra	II	Occasional	4 - 7	10 - 35	
	Sycamore	Acer pseudoplatanus	I	Scarce	4	0 - 5	
Understorey	Large bindweed	Calystegia sepium	V	Frequent	4	4 -10	
Sub-shrub layer	Pendulous sedge	Carex pendula	V	Frequent	5 - 7	20 - 50	
	Common nettle	Urtica dioica	V	Frequent	4 - 7	5 - 40	
	Hogweed	Heracleum sphondylium	V	Frequent	5 - 6	10 - 30	
	Cleavers	Galium aparine	III	Frequent	4 - 5	5 - 20	
	Large bindweed	Calystegia sepium	II	Occasional	2	<4	
	Garlic mustard	Alliaria petiolata	I	Scarce	2	<4	
	Water dropwort sp.	Oenanthe sp.	I	Scarce	1	<4	
Ground layer	Hogweed	Heracleum sphondylium	V	Constant	4 - 6	25 - 30	
	Cleavers	Galium aparine	II	Occasional	4	5 - 10	
	Creeping buttercup	Ranunculus repens	I	Scarce	4	10	
	Ivy	Hedera helix	I	Scarce	5	15	
	Willowherb sp.	Epilobium sp.	I	Scarce	2	<4	
	Lords and ladies	Arum maculatum	I	Scarce	1	<4	
Closest fitting NVC community: W1 (*Salix cinerea - Galium palustre* woodland)							

Table 4: Floristic Table for tall ruderal habitats.

Layer	Species common name	Species scientific name	NVC Frequency Value	Frequency description	Range of Domin values within occupied quadrats	Range of % cover within occupied quadrats	Notes
Shrub	Elder	Sambucus nigra	I	Scarce	1	4	
Field	Common nettle	Urtica dioica	V	Constant	8 - 10	55 - 95	
	Hogweed	Heracleum sphondylium	V	Constant	5 - 8	15 - 70	
	Creeping thistle	Cirsium arvense	IV	Constant	4 - 6	5 - 30	Absent from quadrats taken on northern embankment
	Mugwort	Artemisia vulgaris	IV	Constant	2 - 4	<4 - 5	
	Field bindweed	Convolvulus arvensis	III	Frequent	4 - 5	10 - 20	
	Cleavers	Galium aparine	III	Frequent	4 - 5	10 - 15	Absent from quadrats taken on northern embankment
	Large bindweed	Calystegia sepium	II	Occasional	2 - 4	<4 - 10	
	Common reed	Phragmites australis	II	Occasional	4	10	Absent from quadrats taken in south and centre of site ('level' plateau)
	Russian comfrey	Symphytum × uplandicum	II	Occasional	5 - 7	20 - 45	Absent from quadrats taken in south and centre of site ('level' plateau) Locally abundant outside of quadrats on northern embankment
	Bramble sp.	Rubus fruticosus agg.	II	Occasional	5 - 7	20 - 40	
	False oat grass	Arrhenatherum elatius	II	Occasional	5	15	
	Garlic mustard	Alliaria petiolata	II	Occasional	0 - 4	0 - 5	
	Greater burdock	Arctium lappa	II	Occasional	3	<4	
	Pendulous sedge	Carex pendula	I	Scarce	1	4	
	Wild teasel	Dipsacus fullonum	I	Scarce	1	<4	
Field / ground	Cleavers	Galium aparine	III	Frequent	4 - 5	10 - 15	
	Black horehound	Ballota nigra	III	Frequent	4	0 - 5	
	Winter heliotrope	Arrhenatherum elatius	II	Occasional	7	35	Only present on northern embankment. Locally abundant
	False oat grass	Arrhenatherum elatius	II	Occasional	5	15	
	Ground ivy	Glechoma hederacea	I	Scarce	4	5	
	Large bindweed	Calystegia sepium	I	Scarce	2	<4	
	Creeping buttercup	Ranunculus repens	I	Scarce	1	<4	
Closest fitting NVC community: OV25 (*Urtica dioica-Cirsium arvense* community)							

Table 5: Floristic Table for grassland habitats

Layer	Species common name	Species scientific name	NVC Frequency Value	Frequency description	Range of Domin values within occupied quadrats	Range of % cover within occupied quadrats	Notes
Field (grasses)	Red fescue	Festuca rubra	V	Constant	8 - 9	70 - 90	
	Creeping bent	Agrostis stolonifera	IV	Constant	4 - 6	10 - 30	
	Cock's foot	Dactylis glomerata	IV	Constant	1 - 4	<4 - 10	
	Perennial ryegrass	Lolium perenne	III	Frequent	1 - 6	<4 - 30	
	Sea couch	Agropyron pungens	I	Scarce	6	30	
	Yorkshire fog	Holcus lanatus	I	Scarce	3	<4	
	Annual meadow grass	Poa annua	I	Scarce	3	<4	
Field (herbs)	Common bird's foot trefoil	Lotus corniculatus	III	Frequent	4 - 5	10 - 25	
	White clover	Trifolium repens	III	Frequent	5	15	
	Black medic	Medicago lupulina	III	Frequent	4 - 5	10 - 15	
	Ribwort plantain	Plantago lanceolota	III	Frequent	2 - 3	<4	
	Hogweed	Heracleum sphondylium	II	Occasional	3 - 4	<4 - 10	
	Field pepperwort	Lepidium campestre	II	Occasional	3 - 4	<4 - 10	
	Creeping thistle	Cirsium arvense	II	Occasional	4	<4 - 5	
	Wild carrot	Daucus carota	II	Occasional	2 - 3	<4	
	Dandelion sp.	Taraxacum agg.	II	Occasional	3	<4	
	Daisy	Bellis perennis	II	Occasional	2	<4	
	Spear thistle	Cirsium vulgare	I	Scarce	3	<4	
	Smooth hawksbeard	Smooth hawksbeard	I	Scarce	3	<4	
	Hoary cress	Lepidium draba	I	Scarce	2	<4	
	Yarrow	Achillea millefolium	I	Scarce	2	<4	
	Bristly oxtongue	Helminthotheca echioides	I	Scarce	2	<4	
	Common vetch	Vicia sativa	I	Scarce	2	<4	
Field (other plants)	Blackthorn	Prunus spinosa	I	Scarce	4	<4 - 10	Short suckers
Closest fitting NVC community: MC9 (*Festuca rubra - Holcus lanatus* maritime grassland)							

11. APPENDIX C: NVC SURVEY PLAN

SEE OVERLEAF

NVC Survey Plan

Princes Parade, Hythe

Shepway District Council

LEGEND:

- Sharp Boundary
- Diffuse Boundary
- Gradual Transition
- Convoluted Boundary with Islands
- Semi-Improved Grassland *Festuca rubra* maritime grassland Total Area Approx. 1.42 ha.
- Low Dense Scrub & Shrubs W24 (*Rubus fruticosus agg.* - Holcus lanatus underscrub) Total Area Approx. 0.96 ha.
- Tall Dense Scrub W1 (*Salix cinerea* - Galium palustre woodland) Total Area Approx. 1.00 ha.
- Tall Ruderals OV25 (*Urtica dioica* - Cirsium arvense community) Total Area Approx. 3.63 ha.
- Target Note
- Site Boundary

Target Notes

1. Giant hogweed recorded.
2. Spanish bluebell recorded.
3. Bee orchid and pyramidal orchid recorded.
4. Japanese rose recorded.

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revision note.
-

drawing no. ***3609_DR_004***

client & project.
Shepway District Council
Princes Parade, Hythe

drawing title.
NVC Survey Plan

status. ***PLANNING***
scale. ***N.T.S.*** drawn by. ***DM***
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AN INVERTEBRATE SURVEY

OF

LAND BESIDE

PRINCES PARADE,

HYTHE,

KENT

Dr Jonty Denton FRES FLS CEcol MCIEEM

August 2016

INTRODUCTION

The survey brief was to carry out a baseline invertebrate survey of the site.

METHODOLOGY

Because it is impracticable to survey all the potential invertebrates within any given site, only specific groups of species were examined during fieldwork. These groups are sufficiently well known as to allow meaningful comparisons to be made with other sites, both locally and nationally. They are also important as indicators of the quality of a site and the habitats present (see Brooks 1993).

Groups covered during the survey were;

- Mollusca (slugs and snails)
- Arachnida (spiders, harvestmen & pseudoscorpions)
- Isopoda (woodlice)
- Thysanura (bristletails)
- Ephemeroptera (mayflies)
- Odonata (dragonflies & damselflies)
- Plecoptera (stoneflies)
- Orthoptera (grasshoppers & crickets)
- Dictyoptera (cockroaches)
- Dermaptera (earwigs)
- Hemiptera-Heteroptera (true-bugs)
- Hemiptera-Homoptera (hoppers)
- Neuroptera (lace-wings)
- Mecoptera (scorpion-flies)
- Lepidoptera (butterflies & moths)
- Trichoptera (caddis flies)
- Diptera (true flies)
- Aculeate Hymenoptera (ants, bees & wasps)
- Coleoptera (beetles)

The main emphasis of the survey was to find as many rare and notable species as possible within the reviewed groups.

The site was visited on the following dates: 17th and 26th May, and 27th July 2016

Terrestrial sampling

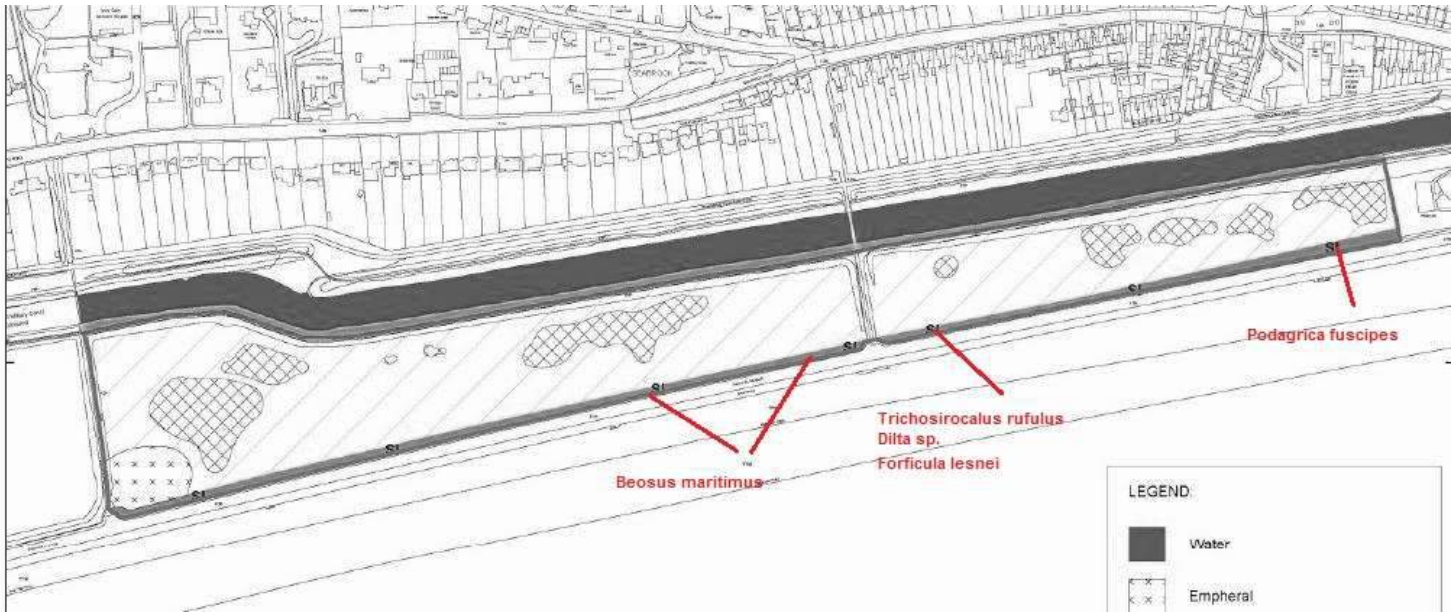
Standard field techniques were employed to sample the invertebrate fauna across the site:
These included sweep netting, use of a beating tray for tree foliage. Grubbing, sieve and sort etc.

Wetland sampling

A 0.5mm GB nets pond net was employed to sample the canal for invertebrates.

RESULTS

The invertebrate species recorded are listed in Appendix 2. The distribution of rare and notable taxa is shown on fig 1. In all, this survey found 226 taxa. The status definitions for nationally notable species are given in Appendix 2. The Nationally Notable species are listed below: -



NATIONALLY NOTABLE SPECIES

DERMAPTERA

Forficula lesnei **– Lesnei's Earwig.** (Nationally Scarce B). Smaller and more reddish than the ubiquitous common earwig, and with no wings. This species is associated with open warm sunny hedgerows and bramble patches, it is local in southern England and Wales.

CHRYSOMELIDAE (leaf beetles)

Podagrica fuscipes. (Nationally Scarce A). A distinctive blue and red flea beetle with black legs which feeds on mallow. Local in southern England.

CURCULIONIDAE (weevils)
Trichosirocalus dawsoni (Nationally Scarce A)
A small patterned weevil associated with plantains. Very local in South East England. Found on edge of path along promenade.

HABITAT ASSESSMENT

The herb rich strip alongside the road / promenade supported the nationally scarce weevil *Trichosirocalus rufulus,* and other local species included the Bristletail *Dilta* species and lygaeid bug *Beosus maritimus*, and the leaf beetle *Chrysolina banksi.*

Much of the higher ground and north slope is dominated by dense nettle beds which were species poor.

The canal side is quite diverse and the canal itself supports important species including the Hairy Dragonfly *Brachytron pratense.*

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APPENDIX 1. SPECIES LIST FOR 2016

.	Family	Species	English name		Scrub / tall herb areas	open grassy areas	canal
Mollusca	Discidae	Discus rotundatus	Rounded snail	common	1	1	
Mollusca	Bithyniidae	Bithynia tentaculata	Common Bithynia	common			1
Mollusca	Lymnaeidae	Lymnaea peregra	wandering snail	common			1
Mollusca	Planorbiidae	Planorbis planorbis	Keeled ramshorn	common			1
Mollusca	Agriolimacidae	Deroceras reticulatum	Field slug	common		1	
Mollusca	Clausiidae	Clausilia bidentata	common door snail	common	1		
Mollusca	Helicidae	Cernuella virgata	striped snail	common	1	1	
Mollusca	Helicidae	Monacha cantiana	Kentish snail	common	1	1	
Mollusca	Helicidae	Cepaea hortensis	Whie-lipped snail	common	1	1	
Mollusca	Helicidae	Cornu aspersum	Garden snail	common	1	1	
Mollusca	Helicidae	Helicella itala	Heath Snail	local		1	
Amphipoda	Gammaridae	Gammarus pulex	water shrimp	common			1
Chilopoda	Lithobiidae	Lithobius forficatus	a centipede	common			
Isopoda	Oniscidae	Oniscus asellus	a woodlouse	common	1		
Isopoda	Philosciidae	Philoscia muscorum	a woodlouse	common	1	1	
Isopoda	Armadilliidae	Armadillidium vulgare	a pill woodlouse	common	1	1	
Isopoda	Porcellionidae	Porcellio scaber	a woodlouse	common	1	1	
Araneae	Theridiidae	Neottiura bimaculata	a comb-footed spider	common	1		
Araneae	Theridiidae	Paidiscura pallens	a comb-footed spider	common	1		
Araneae	Theridiidae	Platnickia tinctum	a comb-footed spider	common	1		
Araneae	Theridiidae	Enoplognatha ovata	a comb-footed spider	common	1	1	
Araneae	Linyphyiidae	Erigone atra	a money spider	common		1	
Araneae	Linyphyiidae	Linyphia triangularis	a money spider	common	1		
Araneae	Tetragnathidae	Tetragnatha extensa	a long-jawed orb spider	common	1		1
Araneae	Tetragnathidae	Tetragnatha montana	a long-jawed orb spider	common	1		
Araneae	Tetragnathidae	Metallina mengei	a long-jawed orb spider	common	1		
Araneae	Tetragnathidae	Metallina segmentata	a long-jawed orb spider	common	1	1	
Araneae	Araneidae	Araneus diadematus	common garden spider	Common	1	1	
Araneae	Araneidae	Larinoides sclopetarius	Bridge spider	local			1
Araneae	Araneidae	Nuctenea umbratica	an orb weaver	common	1		
Araneae	Lycosidae	Pirata piraticus	a wolf spider	common			1
Araneae	Agelenidae	Tegenaria sp	a House spider	local		1	
Araneae	Dysderidae	Dysdera crocata	woodlouse spider	local		1	
Araneae	Amaurobiidae	Amaurobius ferox	a lace-webbed spider	common		1	
Araneae	Clubionidae	Clubiona brevipes	a foliage spider	common	1		
Araneae	Philodromidae	Philodromus dispar	a running crab spider	common	1		
Araneae	Philodromidae	Philodromus cespitum	a running crab spider	common	1		

Araneae	Thomisidae	Xysticus cristatus	a crab spider	common	1	1	
Araneae	Thomisidae	Ozyptila simplex	a crab spider	local		1	
Araneae	Salticidae	Heliophanus flavipes	a jumping spider	common		1	
Araneae	Salticidae	Euophrys frontalis	a jumping spider	common		1	
Opiliones	Phalangiidae	Dicranopalpus ramosus	a harvestman	common	1		
Opiliones	Phalangiidae	Phalangium opilio	a harvestman	common		1	
Thysanura	Machilidae	Dilta hibernica/littoralis	a bristletail	local		1	
Odonata	Coenagriidae	Pyrrhosoma nymphula	Large Red Damsel	common			1
Odonata	Coenagriidae	Enallagma cyathigerum	Common-blue damsel	common			1
Odonata	Coenagriidae	Coenagrion puella	Azure damselfly	common			1
Odonata	Coenagriidae	Isnhnura elegans	blue tailed damselfly	common			1
Odonata	Aeshnidae	Brachytron pratense	Hairy dragonfly	local			1
Odonata	Aeshnidae	Aeshna mixta	Migrant Hawker	local			1
Odonata	Aeshnidae	Aeshna cyanea	Southern Hawker	common			1
Odonata	Aeshnidae	Aeshna grandis	Brown Hawker	common			1
Odonata	Libellulidae	Sympetrum striolatum	common darter	common			1
Orthoptera	Tettigoniidae	Pholidoptera griseoaptera	Dark Bush-cricket	common	1	1	
Orthoptera	Tettigoniidae	Metrioptera roeselii	Roesel's Bush-cricket	common	1		
Orthoptera	Tettigoniidae	Conocephalus discolor	Long-winged Conehead	common	1		
Orthoptera	Tettigoniidae	Leptophyes punctatissima	Speckled Bush-cricket	common	1		
Orthoptera	Acridiidae	Chorthippus brunneus	Field Grasshopper	common		1	
Dermaptera	Forficulidae	Forficula auricularia	common earwig	common	1	1	
Dermaptera	Forficulidae	Forficula lesnei	Lesnei's earwig	Notable B		1	
Ephemeroptera	Baetidae	Baetis rhodani	a mayfly	common			1
Heteroptera	Nepidae	Nepa cinerea	Water scorpion	common			1
Heteroptera	Hydrometridae	Hydrometra stagnorum	Water Measurer	common			1
Heteroptera	Veliiidae	Microvelia reticulata	minute Water Cricket	common			1
Heteroptera	Notonectidae	Notonecta maculata	a water boatman	local			1
Heteroptera	Gerridae	Gerris odontogaster	toothed pondskater	common			1
Heteroptera	Tingidae	Physatocheila dumetorum	a lace	common	1		
Heteroptera	Tingidae	Tingis ampliata	thistle lacebug	common	1		
Heteroptera	Miridae	Deraeocoris ruber	a plantbug	common	1	1	
Heteroptera	Miridae	Plagiognathus arbustorum	a plantbug	common	1	1	
Heteroptera	Miridae	Plagiognathus chrysanthemi	a plantbug	common	1	1	
Heteroptera	Miridae	Dicyphus epilobii	a plantbug	common	1	1	
Heteroptera	Miridae	Heterotoma planicornis	a plantbug	common	1	1	
Heteroptera	Miridae	Orthotylus marginalis	Sallow mirid	common	1		
Heteroptera	Miridae	Liocoris tripustulatus	a plantbug	common	1		
Heteroptera	Miridae	Orthops campestris	a plantbug	common	1	1	
Heteroptera	Miridae	Notostira elongata	a grass bug	common	1		
Heteroptera	Miridae	Stenodema calcarata	a grass bug	common	1		
Heteroptera	Miridae	Tuponia mixticolor	Tamarisk plantbug	local	1		
Heteroptera	Miridae	Tuponia brevirostris	Tamarisk plantbug	local	1		
Heteroptera	Nabidae	Himacerus mirmicoides	Ant damselbug	common	1	1	
Heteroptera	Nabidae	Nabicula lineatus	reed damslebug	common			1
Heteroptera	Anthocoridae	Anthocoris nemorum	an anthocorid bug	common	1		
Heteroptera	Anthocoridae	Orius majusculus	an anthocorid bug	common	1		
Heteroptera	Lygaeidae	Kleidocerys resedae	a seed bug	common			
Heteroptera	Lygaeidae	Ischnodemus sabuleti	European chinch bug	common	1		
Heteroptera	Lygaeidae	Heterogaster urticae	Nettle ground bug	common	1		
Heteroptera	Lygaeidae	Scolopostethus thomsoni	a ground bug	common	1		
Heteroptera	Lygaeidae	Beosus maritimus	a ground bug	local		1	

Heteroptera	Cydnidae	Sehirus bicolor	Pied shield bug	common	1		
Heteroptera	Pentatomidae	Podops inuncta	European turtle bug	common	1	1	
Heteroptera	Pentatomidae	Eysarcoris fabricii	a shield bug	local	1		
Homoptera	Cercopidae	Aphrophora salicina	a froghopper	local	1		
Homoptera	Cercopidae	Philaenus spumarius	Common Froghopper	common	1		
Homoptera	Cicadellidae	Opsius stactogalus	tamarisk hopper	local	1		
Homoptera	Cicadellidae	Eupteryx aurata	a hopper	common	1		
Homoptera	Cicadellidae	Eupteryx stachydearum	a hopper	common		1	
Homoptera	Cicadellidae	Eupteryx urticae	a hopper	common		1	
Homoptera	Psyllidae	Psylla alni	a jumping plant louse	common	1		
Homoptera	Psyllidae	Trioza urticae	a jumping plant louse	common	1	1	
Neuroptera	Chrysopidae	Chrysoperla carnea	a green lacewing	common		1	
Neuroptera	Sialidae	Sialis lutaria	an alder fly	common			1
Neuroptera	Sisyridae	Sisyra fuscata	an sponge fly	common			1
Lepidoptera	Adelidae	Adella reamurella	a micro-moth	common	1		
Lepidoptera	Nepticulidae	Stigmella aurella	a micro-moth	common	1		
Lepidoptera	Choreutidae	Anthophila fabriciana	a micro-moth	common	1		
Lepidoptera	Glyphipterigidae	Glyphipterix simpliciella	Cocksfoot moth	common	1		
Lepidoptera	Pyralidae	Nomophila noctuella	Rush Veneer	common	1		
Lepidoptera	Pyralidae	Pleuroptya ruralis	Mother of Pearl	common	1		
Lepidoptera	Lymantridae	Orgyia antiqua	Vapourer	common	1		
Lepidoptera	Pieridae	Anthocharis cardamines	Orange Tip	common	1	1	
Lepidoptera	Pieridae	Pieris rapae	Small white	common	1	1	
Lepidoptera	Lycaenidae	Polyommatus icarus	Common Blue	common		1	
Lepidoptera	Nymphalidae	Vanessa atalanta	Red Admiral	common	1		
Lepidoptera	Nymphalidae	Aglais urticae	Small Tortoiseshell	common	1	1	
Lepidoptera	Nymphalidae	Inachis io	Peacock	common	1	1	
Lepidoptera	Satyridae	Pyronia tithonus	Gatekeeper	common	1	1	
Lepidoptera	Satyridae	Maniola jurtina	Meadow Brown	common	1	1	
Lepidoptera	Erebidae	Eilema lurideola	Common Footman	common	1		
Lepidoptera	Erebidae	Xanthorhoe montanata	Silver ground carpet	common	1		
Lepidoptera	Geometridae	Eupithecia ultimaria	Channel Islands Pug	local	1		
Lepidoptera	Arctiidae	Tyria jacobaeae	Cinnabar	common	1		
Lepidoptera	Noctuidae	Autographa gamma	Silver Y	common	1	1	
Diptera	Rhagionidae	Chrysopilus cristatus	Black snipefly	common	1		
Diptera	Stratiomyidae	Beris chalybata	A soldierfly	common	1		
Diptera	Stratiomyidae	Chloromyia formosa	Broad centurion	common	1		
Diptera	Stratiomyidae	Pachygaster atra	A soldierfly	common	1		
Diptera	Chironomidae	Demeijerea rufipes	a chironomid fly	common			1
Diptera	Syrphidae	Episyrphus balteatus	marmalade hoverfly	common	1	1	
Diptera	Syrphidae	Eristalis pertinax	a dronefly	common	1		
Diptera	Syrphidae	Eristalis tenax	a dronefly	common	1	1	
Diptera	Syrphidae	Eupeodes corollae	a hoverfly	common	1	1	
Diptera	Syrphidae	Helophilus pendulus	a hoverfly	common	1	1	1
Diptera	Syrphidae	Scaeva pyrastri	a hoverfly	common	1	1	
Diptera	Syrphidae	Sphaerophoria scripta	a hoverfly	common		1	
Diptera	Syrphidae	Syritta pipiens	a hoverfly	common	1		
Diptera	Syrphidae	Syrphus ribesii	a hoverfly	common		1	
Diptera	Calliphoridae	Lucillia caesar	greenbottle	common	1		
Diptera	Sarcophagidae	Nyctia halterata	a sarcophagid fly	common		1	
Hymenoptera	Tenthridinidae	Servilia serva	a sawfly	common		1	
Hymenoptera	Formicidae	Myrmica scabrinodis	An ant	common		1	

Hymenoptera	Formicidae	Formica cunicularia	an ant	local		1	
Hymenoptera	Formicidae	Myrmecina graminicola	an ant	local		1	
Hymenoptera	Formicidae	Lasius flavus	yellow meadow ant	common		1	
Hymenoptera	Formicidae	Lasius niger s. s.	an ant	common		1	
Hymenoptera	Vespidae	Vespula vulgaris	Common wasp	common	1	1	
Hymenoptera	Andrenidae	Andrena haemorrhoa	a solitary bee	common	1		
Hymenoptera	Halictidae	Lasioglossum calceatum	a solitary bee	common	1		
Hymenoptera	Halictidae	Lasioglossum villosulum	a solitary bee	common	1		
Hymenoptera	Megachilidae	Megachile willughbiella	a solitary bee	common	1		
Hymenoptera	Anthophoridae	Nomada flava	a wasp bee	common		1	
Hymenoptera	Apidae	Bombus lapidarius	a bumblebee	common	1	1	
Hymenoptera	Apidae	Bombus lucorum agg	a bumblebee	common	1	1	
Hymenoptera	Apidae	Bombus pascuorum	a bumblebee	common	1	1	
Hymenoptera	Apidae	Bombus pratorum	a bumblebee	common	1		
Hymenoptera	Apidae	Bombus terrestris	a bumblebee	common	1	1	
Hymenoptera	Apidae	Apis mellifera	Hive bee	Domesticated	1	1	
Coleoptera	Carabidae	Nebria brevicollis	a ground beetle	common	1		
Coleoptera	Carabidae	Amara aenea	common sun beetle	common		1	
Coleoptera	Carabidae	Harpalus rubripes	a ground beetle	local		1	
Coleoptera	Carabidae	Harpalus affinis	a ground beetle	common		1	
Coleoptera	Carabidae	Demetrius atricapillus	a ground beetle	common	1		
Coleoptera	Carabidae	Paradromius linearis	a ground beetle	common		1	
Coleoptera	Carabidae	Syntomus foveatus	a ground beetle	common		1	
Coleoptera	Noteridae	Noterus clavicornis	the larger noterus	common			1
Coleoptera	Haliplidae	Haliplus lineatocollis	a haliplid beetle	common			1
Coleoptera	Helophoridae	Helophorus brevipalpis	a water beetle	common			1
Coleoptera	Hydrophilidae	Anacaena limbata	a water beetle	common			1
Coleoptera	Hydrophilidae	Enochrus testaceus	a water beetle	common			1
Coleoptera	Staphylinidae	Paederus littoralis	a rove beetle	common	1	1	
Coleoptera	Staphylinidae	Drusilla canaliculata	a rove beetle	common		1	
Coleoptera	Staphylinidae	Stenus clavicornis	a camphor beetle	common	1		
Coleoptera	Staphylinidae	Stenus juno	a camphor beetle	common			1
Coleoptera	Cantharidae	Rhagonycha fulva	a soldier beetle	common	1	1	
Coleoptera	Cantharidae	Malthinus flaveolus	a soldier beetle	common	1		
Coleoptera	Scirtidae	Odeles marginata	a marsh beetle	local			1
Coleoptera	Scirtidae	Cyphon coarctatus	a marsh beetle	common		1	
Coleoptera	Melyridae	Corydelphus viridis	a malachite beetle	local	1	1	
Coleoptera	Nitidulidae	Brachypterus glaber	a pollen beetle	common	1	1	
Coleoptera	Nitidulidae	Brachypterus urticae	a pollen beetle	common	1	1	
Coleoptera	Nitidulidae	Meligethes aeneus	a pollen beetle	common	1	1	
Coleoptera	Nitidulidae	Meligethes symphyti	comfrey pollen beetle	local	1	1	
Coleoptera	Phalacridae	Olibrus aeneus	a phalcrid beetle	common	1		
Coleoptera	Coccinellidae	Subcoccinella 24-punctata	24-spot ladybird	common		1	
Coleoptera	Coccinellidae	Rhyzobius litura	a ladybird	common		1	
Coleoptera	Coccinellidae	Psyllobora vigintiduopunctata	a ladybird	common	1		
Coleoptera	Coccinellidae	Tytthaspis sedecimpunctata	16-spot ladybird	common	1	1	
Coleoptera	Coccinellidae	Coccinella septempunctata	7-spot ladybird	common	1	1	
Coleoptera	Coccinellidae	Calvia quattuordecimguttata	Cream spot ladybird	common	1		
Coleoptera	Cryptophagidae	Antherophagus pallens	a cryptophagid beetle	local		1	
Coleoptera	Scraptidae	Anaspis maculata	a tumbling flower beetle	common	1		
Coleoptera	Scraptidae	Anaspis regimbarti	a tumbling flower beetle	common	1		
Coleoptera	Scraptidae	Anaspis rufilabris	a tumbling flower beetle	common	1		

Coleoptera	Oedemeridae	Oedemera lurida	an Oedemerid beetle	common	1		
Coleoptera	Oedemeridae	Oedemera nobilis	Thick kneed beetle	common	1	1	
Coleoptera	Cerambycidae	Grammoptera ruficornis	a longhorn beetle	common	1		
Coleoptera	Bruchidae	Bruchus rufimanus	a bean weevil	common	1		
Coleoptera	Chrysomelidae	Chrysolina banksi	a leaf beetle	local		1	
Coleoptera	Chrysomelidae	Phyllotreta atra	a leaf beetle	common	1		
Coleoptera	Chrysomelidae	Phyllotreta nigripes	a flea beetle	common	1		
Coleoptera	Chrysomelidae	Longitarsis melanocephalus	a flea beetle	common			
Coleoptera	Chrysomelidae	Longitarsis parvulus	a flea beetle	common	1		
Coleoptera	Chrysomelidae	Longitarsis rubiginosus	a flea beetle	common	1		
Coleoptera	Chrysomelidae	Podagrica fuscipes	mallow flea beetle	Notable A		1	
Coleoptera	Chrysomelidae	Crepidodera aurata	a flea beetle	common	1		
Coleoptera	Chrysomelidae	Cassida rubiginosa	common tortoise beetle	common	1		
Coleoptera	Rhynchitidae	Neocoenorrhinus aequatus	a weevil	common	1		
Coleoptera	Apionidae	Pseudapion rufiriostre	a weevil	common		1	
Coleoptera	Apionidae	Aspidapion aeneum	a weevil	common		1	
Coleoptera	Apionidae	Aspidapion radiolus	a weevil	common		1	
Coleoptera	Apionidae	Malvapion malvae	a weevil	common	1	1	
Coleoptera	Apionidae	Protapion fulvipes	a clover weevil	common	1	1	
Coleoptera	Apionidae	Oxystoma pomonae	a clover weevil	common		1	
Coleoptera	Curculionidae	Otiorhynchus rugostriatus	a weevil	common	1		
Coleoptera	Curculionidae	Sitona hispidulus	a weevil	common		1	
Coleoptera	Curculionidae	Sitona lineatus	a weevil	common	1	1	
Coleoptera	Curculionidae	Hypera plantaginis	a weevil	common		1	
Coleoptera	Curculionidae	Trichosirocalus dawsoni	a weevil	Notable B		1	
Coleoptera	Curculionidae	Trichosirocalus troglodytes	a weevil	common		1	
Coleoptera	Curculionidae	Ceutorhynchus contractus	a weevil	common	1		
Coleoptera	Curculionidae	Ceutorhynchus turbatus	a weevil	local		1	
Coleoptera	Curculionidae	Parathelcus pollinarius	a weevil	common		1	
Coleoptera	Curculionidae	Nedyus quadrimaculatus	a weevil	common	1	1	
Coleoptera	Curculionidae	Tychius meliloti	a weevil	local	1	1	
Coleoptera	Curculionidae	Tychius picirostris	a weevil	common		1	
Coleoptera	Curculionidae	Mecinus pascuorum	a weevil	common		1	

APPENDIX 2. STATUS CATEGORIES FOR RARE AND UNCOMMON TAXA

Nationally Scarce Category A - Notable A (Na)

Definition.
Taxa which do not fall within **RDB** categories but which are none-the-less uncommon in Great Britain and are thought to occur in 30 or fewer 10 km squares of the National Grid or, for less well recorded groups, within seven or fewer vice-counties.

Nationally Scarce Category B - Notable B (Nb)

Definition.
Taxa which do not fall within **RDB** categories but which are none-the-less uncommon in Great Britain and are thought to occur in between 31 and 100 10 km squares of the National Grid or, for less well recorded groups, within eight and twenty vice-counties.

Nationally Scarce - Notable (N)

Definition.
Taxa which do not fall within **RDB** categories but which are none-the-less uncommon in Great Britain and are thought to occur in between 16 to 100 10 km squares of the National Grid. Species within this category are often too poorly known for their status to be more precisely estimated.

Local

Definition
Species which are not Nationally Notable or rare but which are restricted in distribution. e.g. Species widespread in Southern England but absent from Northern England and Scotland

The species list uses the statuses from the most recent version of Recorder.

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TECHNICAL APPENDIX 7.3
AMPHIBIAN REPORT

PRINCES PARADE
HYTHE, KENT

REF: 3609-LLB-ZZ-XX-RP-EC-0005

STATUS: PLANNING

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1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 There is a negligible risk of great crested newt presence on the application site. For this reason, no great crested newt survey was undertaken.

S.3 A common toad survey was undertaken in March and April 2016. This survey encompassed the section of the Royal Military Canal that is located adjacent to the application site and the Hythe Imperial golf course, and relevant terrestrial habitats.

S.4 Based on the survey results, a 'low' population of common toads utilise the surveyed canal section, the golf course and habitats on the application site.

S.5 Common toad breeding was recorded within the canal adjacent to the application site.

S.6 The Royal Military Canal and adjoining habitats, including the application site, are of ecological importance for common toads at a 'local' level.

S.7 To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to common toad are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This report details the methods and results of a common toad (*Bufo bufo*) survey.

2.3. This survey encompassed the section of the Royal Military Canal that is located adjacent to the application site and the Hythe Imperial golf course, and relevant terrestrial habitats.

2.4. This Technical Appendix also provides an assessment of the ecological importance of the application site and the adjacent canal section for common toad.

2.5. There is a negligible risk of great crested newt (*Triturus cristatus*) presence on the application site. For this reason, this species has been scoped out of the impact assessment process.

2.6. Detail of the scoping process for this species is included within this report.

2.7. To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to common toad are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

OBJECTIVES

2.8. The objectives of the survey and report are to: -

- Assess the risk of great crested newt and/or common toad presence on the application site;
- Confirm the presence or likely absence of common toad from the adjacent section of the Royal Military Canal and associated bankside habitats;
- Should common toad be present, provide a population size class estimate for this species;
- Determine whether common toad breed within the adjacent canal section; and
- Assess the ecological importance of the application site and adjacent canal for common toad.

3. SURVEY PLAN

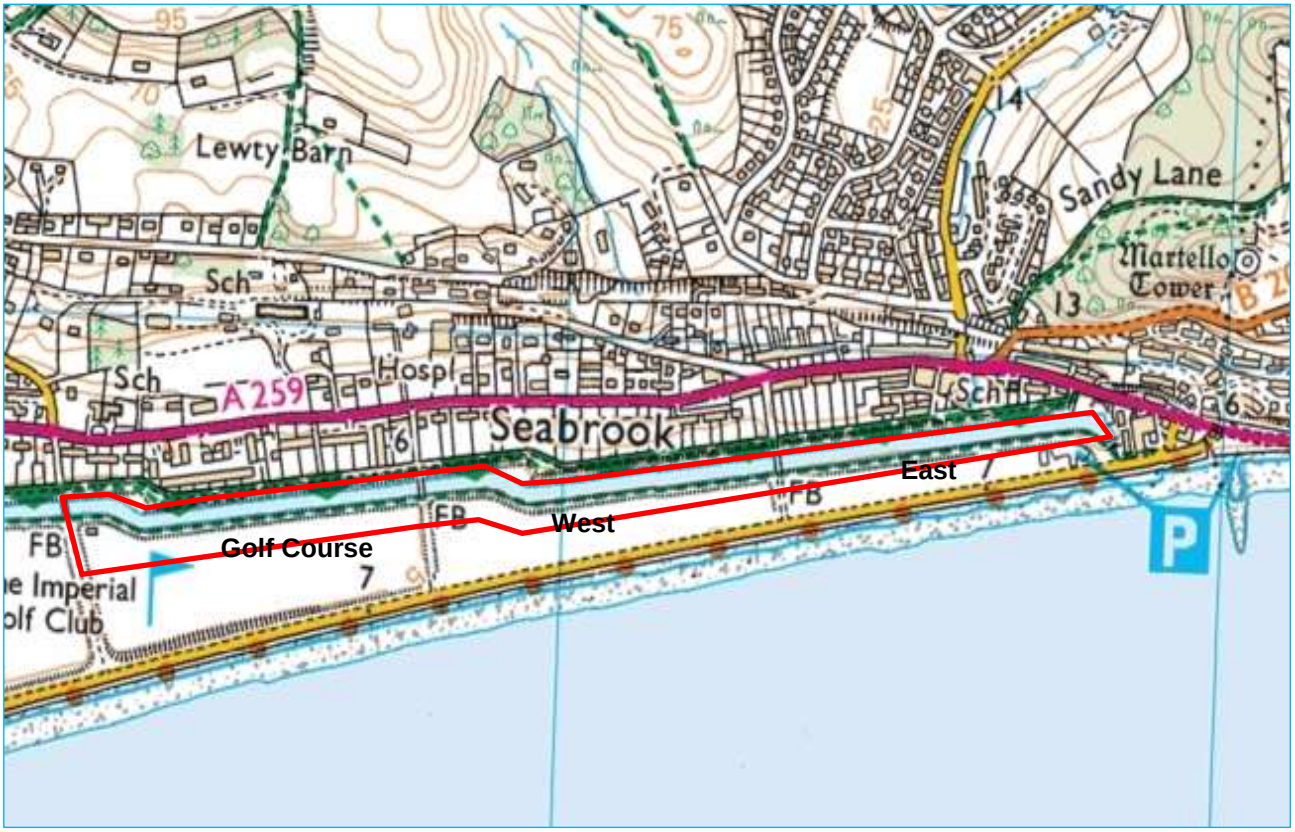

Fig. 1: Survey area indicated by (approximate) red line. The survey area was split into three sections. The east and west sub-sections are located adjacent to the application site. The canal section located adjacent to Hythe Imperial golf course was also surveyed. Reproduced from Explorer Map 138 (1:25 000) by permission of Ordnance Survey. © Crown Copyright (2015). All rights reserved. AR 100029570.

4. METHOD

DESK STUDY

4.1. A data search was undertaken by Kent and Reptile Amphibian Group (KRAG) in September 2015.

4.2. A 2km radius, measured from the indicative application site boundary, was used to search for records of reptiles and amphibians within 2km of the application site.

4.3. Records obtained within the ten-year period prior to the date of the record search are considered 'recent.' Records older than this are considered 'historic.'

4.4. An evaluation of recent and historic aerial images and Ordnance Survey maps was also undertaken as part of the desk study.

HABITAT ASSESSMENT

4.5. An initial ecological assessment of the application site, and the adjacent canal section, was undertaken by David W. Smith BSc (Hons), PhD, MCIEEM on 14th September 2015.

4.6. David is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over ten years of ecological consultancy experience.

4.7. This initial assessment was used to determine the suitability of the application site for reptiles.

Great crested newts

4.8. Based on a search of aerial imagery and Ordnance Survey maps, two inland waterbodies were identified within 500m of the application site.

4.9. These are the Royal Military Canal and a stream basin. The stream basin is located *c*.40m north of the canal. These two waterbodies are connected via a culvert.

4.10. These waterbodies were assessed as being of 'poor' suitability for great crested newts.

4.11. Detail of the habitat suitability assessment is provided in Appendix B of this report. Due to the connectivity of the canal and the basin, Appendix B relates to both waterbodies.

Common toad

4.12. There is no published method for objective assessment of the quality of habitats for common toad, or the likelihood of common toad presence within habitats. However, published research details factors positively associated with common toad presence. These factors include: -

1. The distance between waterbodies and terrestrial habitats, and water body density within the landscape (Salazar, 2016);
2. The availability of suitable breeding sites (waterbodies). Breeding sites should provide cover and suitable conditions for developing larvae (JNCC, 2003);
3. Availability of terrestrial habitats that provide shelter from extremes of temperature and provide suitable foraging resources (JNCC, 2003). These habitats may include, but are not limited to, woodland, hedgerows, pastures (Hartel, *et al.,* 2008), brash and deadwood, scrub, sedge beds and tussocky grassland (JNCC, 2003); and
4. Presence of terrestrial habitats with sufficiently high humidity at ground level (Beebee, 2012).

PRESENCE / LIKELY ABSENCE SURVEY

Migration / amplexus checks

4.13. Prior to conducting the full survey, two amplexus (breeding) and migration checks were undertaken, on 16th and 21st March 2016. These checks were undertaken to identify toad migration routes towards waterbodies and to record toads in amplexus. The methodology for these checks was informed by guidance provided in JNCC (2003), ARC (2011) and ARC (2013).

4.14. Common toads are known to commence daily migration bouts immediately after and even before sunset (Beebee and Griffiths, 2000). For this reason, checks were commenced shortly after sunset.

4.15. Mild, damp nights, when the night-time air temperature was predicted to be above 5°C were targeted, as these conditions are favourable for common toad migration (ARC, 2011).

4.16. These checks lasted *c.*70 minutes and involved a visual search of the adjacent section of the Royal Military Canal, its banks and the surrounding vegetation using a high-powered (1 million candle power) torch. Two surveyors walked a transect route along the southern canal towpath.

4.17. Areas searched included the towpath on the southern side of canal, the northern embankment of the application site and the adjacent golf course.

4.18. Any presence of common toad(s) in terrestrial and aquatic habitats was recorded. Migration routes and direction of travel (if apparent) were also recorded.

4.19. Once first amplexus was recorded, the full survey commenced immediately - during the same visit.

4.20. See Table 1 for detail of timing, weather conditions and temperatures for each check.

Full survey visits

4.21. Four full survey visits were conducted over a 14-day period, as per best practice guidance (ARC, 2011). Survey visits were undertaken during periods when overnight ambient air temperatures did not drop below 5°C, under suitable weather conditions as per ARC (2011).

4.22. Two surveyors walked transects along the southern bank of the Royal Military Canal on the 23rd, 27th and 30th March and the 6th April 2016. The transect route was reversed for each successive survey visit, to account for any timing bias. The visits lasted between 65 and 90 minutes.

4.23. The total number of toads observed, the number of toads in amplexus or mating balls, and any presence of toad spawn were recorded.

4.24. The survey data was analysed after each visit, to ensure that subsequent survey visits were timed to record the peak breeding population if possible.

4.25. Table 1 provides details of timing, weather conditions and temperatures for each survey visit.

Table 1: Details of common toad survey visits. The first two dates relate to the amplexus / migration checks. The last four dates relate to the full survey visits.

Date	Start / Stop	Time after sunset that survey was commenced	Duration	Air temperature (start / stop)	Water temperature	Weather
16.03.2016	18:25 / 19:35	18 minutes	70 mins	6.5 / 6°C	8°C	No rain. 0% cloud cover
21.03.2016	18:17 / 19:21	1 minute	64 mins	9 / 8.8°C	8.5°C	No rain. 100% cloud cover
23.03.2016	19:05 / 20:10	36 minutes	65 mins	9 / 7°C	9.5°C	No rain. 100% cloud cover
27.03.2016	19:45 / 21:15	19 minutes	90 mins	8.5 / 8°C	9.2°C	Light rain. 90% cloud cover
30.03.2016	20:00 / 21:05	29 minutes	65 mins	8.3°C	-	No rain. 100% cloud cover
06.04.2016	20:07 / 21:20	24 minutes	73 mins	7.5°C	9.4°C	No rain. 0% cloud cover

ASSESSMENT AND EVALUATION

4.26. A summary of relevant legislation and national planning policy can be found under Appendix A.

4.27. Guidelines for interpretation of common toad survey data are provided in JNCC (2003) and ARC (2011). Guidelines for establishing population size class estimates are provided in ARC (2011).

4.28. The assessment of the ecological importance of the application site for commo toad has been informed by guidance set out within CIEEM (2016).

4.29. The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;
- County;
- Local; and
- Zone of Influence (ZoI).

4.30. Features assessed as being of importance at the ZoI level have been scoped out of the assessment of likely significant effects associated with the proposed development.

4.31. Only features assessed as being of 'local' importance or greater have been taken forward in the ecological impact assessment process.

ZONE OF INFLUENCE (ZOI)

4.32. The potential impact(s) of a development are not always limited to the boundaries of the site concerned. A development may also have the potential to impact on ecologically important features located beyond the site boundaries. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

4.33. The ZoI is determined by the source / type of impact, the potential pathway(s) for those impacts and the location and sensitivity of the ecologically important feature(s) beyond the site boundary.

4.34. In the absence of mitigation, potential sources of impact associated with the proposed development include loss of terrestrial habitat, fragmentation of the local habitat network, illumination of aquatic and terrestrial habitats, contamination of aquatic (breeding) habitat, and impacts on individual animals during the construction phase. Potential sources of impact also include increased predation of animals by domestic cats during the occupation phase.

4.35. Research by Salazar *et al*., (2016) indicates that common toads are most likely to occur in wooded habitats located within 50m of waterbodies. This research indicates that beyond this distance, the relative probability of common toad occurrence declines substantially. This research also indicates that common toads tend to select habitat close to the water body that they use for breeding.

4.36. The ZoI for common toad is likely to be confined to the red-line boundary of the application site, and habitats within the adjacent canal section that are used by this species.

SURVEY LIMITATIONS

4.37. The common toad survey was conducted during the appropriate season, under suitable weather conditions using best-practice survey methods. It is likely that the peak count of breeding common toads was recorded for the surveyed population, demonstrating appropriate survey effort.

4.38. The survey work conducted was thorough, robust and adequate for the purposes of this assessment and report. There are no material limitations to the robustness of the survey or assessment.

4.39. This report is therefore suitable as a Technical Appendix to the Environmental Statement.

5. RESULTS

DESK STUDY

5.1. The data search did not return any recent records of common toad located within 2km of the application site.

5.2. Historic (1998) records of common toad (tadpoles) were returned. These records relate the adjacent section of the Royal Military Canal.

5.3. In addition, publicly available information indicated that the Royal Military Canal supports breeding common toads.

HABITAT ASSESSMENT

5.4. The adjacent section of the Royal Military Canal provides suitable breeding habitat for common toad.

5.5. The on-site terrestrial habitats (scrub, ruderal vegetation and grassland) are suitable for common toad. These habitats provide foraging, shelter and hibernation opportunities for this species.

SURVEY RESULTS

Migration routes

5.6. Common toads were recorded migrating across the Hythe Imperial golf course towards the canal on the 27th and 30th March 2016.

5.7. Common toads were recorded migrating from the western half of the application site to the canal on 23rd, 27th and 30th March and 6th April 2016.

Breeding population

5.8. The maximum number of common toads recorded within the survey area during a single visit was 82. This peak count was recorded on 30th March 2016.

5.9. Of these 82 animals, 54 were recorded in the canal section adjacent to the golf course (three animals within terrestrial habitat and 51 within the canal) and 28 were recorded in the canal sections located directly adjacent to the application site (all within canal). Of the 28 animals recorded directly adjacent to the application site, 22 were recorded in the western half and six were recorded in the eastern half.

5.10. Amplexus was recorded on the 23rd March 2016, in the canal section that is located adjacent to the western half of the application site. Two pairs were recorded in amplexus.

5.11. Amplexus was not recorded in the canal sections located adjacent to the eastern half of the application site or the golf course.

5.12. Table 2 provides detailed survey results.

Table 2: Summary of results: Counts of common toads. The first number in each cell is the cumulative count for animals recorded within terrestrial and aquatic habitats. Numbers given in brackets represent the proportion of these animals that were recorded within terrestrial habitats. The peak count for the survey (maximum number of animals recorded in a single visit) is given in bold.

Date	Animals directly adjacent to eastern half of application site	Animals directly adjacent to western half of application site	Animals adjacent to golf course	Total count for visit	Number of pairs in amplexus
16th March 2016	0	0	0	0	0
21st March 2016	0	0	0	0	0
23rd March 2016	1	9 (5)	0	10	2
27th March 2016	0	41 (28)	1 (1)	42	0
30th March 2016	4	24 (6)	54 (3)	**82**	0
6th April 2016	0	0	3	3	0

OTHER RESULTS

5.13. Large coarse fish were recorded within the Royal Military Canal during the toad survey visits.

5.14. Large coarse fish, including tench (*Tinca tinca*), common carp (*Cyprinus carpio*) and pike (*Esox lucius*) were recorded in the canal section adjacent to the application site during bat survey work.

5.15. The presence of these fish species was factored into the habitat suitability assessment for great crested newts that is provided in Appendix B.

6. PHOTOGRAPHS

Photo 1: View west along canal towpath (on southern bank). On-site terrestrial habitats (ruderal vegetation and scrub) visible on left.

Photo 2: Central point between east and west survey sections. Most common toads were recorded west of this point.

7. EVALUATION

7.1. A peak count of 82 common toads was recorded within the surveyed section of the Royal Military Canal corridor (within aquatic and terrestrial habitats).

7.2. Based on ARC (2011) guidelines, this constitutes a 'low' population of common toad.

7.3. Based on the survey results, and the extent and types of habitat present, the surveyed section of the Royal Military Canal and the application site are of 'local' importance for common toad.

7.4. Great crested newts are unlikely to be present on the application site. In the unlikely event that a great crested newt is found on-site prior to or during works, Technical Appendix 7.8 includes a works protocol to address this scenario (immediate cessation of works).

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9. APPENDIX A: SUMMARY OF LEGISLATION AND NATIONAL PLANNING POLICY

The Natural Environment and Rural Communities Act 2006 (as amended)

9.1. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

9.2. S41 lists 56 habitats and 943 species of Principal Importance.

9.3. Common toad is listed as a Species of Principal Importance.

National Planning Policy Framework (NPPF)

9.4. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed - Conserving and enhancing the natural environment (Paragraphs 109 to 125).

9.5. Of relevance are the following statements:

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things… *'minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, ...'* (Paragraph 109); and
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Paragraph 113).

9.6. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Paragraph 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequate mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

9.7. The presumption in favour of sustainable development (Paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Paragraph 119).

9.8. The above policies 'encourage' ecological improvements 'where possible.' Therefore, this is not an absolute requirement at planning.

10. APPENDIX B: ASSESSMENT OF HABITAT SUITABILITY FOR GCN: RM CANAL AND BASIN

Great Crested Newt Survey — 1. Pond Details

Project	**Prince's Parade, Hythe**
Project number/reference	
Site	
Pond number/reference	Royal Military Canal
OS Grid reference	
Location details	
Access instructions	
Landowner name	
Address/email	
Telephone	

Habitat Suitability Index

				SI value
SI1.	Map location	**A/B/C**	A	*1.00*
SI2.	Surface area	**rectangle/ellipse/irregular**	irregular	
		length (m)		
		width (m)		
		OR estimate (m^2) if irregular	50,000	
		area (m^2) =	*50000*	*0.01*
SI3.	Dessication rate	**never/rarely/sometimes/frequently**	never	*0.90*
SI4.	Water quality	**good/moderate/poor/bad**	moderate	*0.67*
SI5.	Shade	% of margin shaded 1m from bank	15	*1.00*
SI6.	Waterfowl	**absent/minor/major**	minor	*0.67*
SI7.	Fish population	**absent/possible/minor/major**	major	*0.01*
SI8.	Pond density	number of ponds within 1km	3	*0.68*
SI9.	Terrestrial habitat	**good/moderate/poor/isolated**	good	*1.00*
SI10.	Macrophyte cover	%	40	*0.71*

***Note**: Guidance in undertaking the HSI is available at www.narrs.org.uk.*
HSI calculation formulae adapted from Rob Oldham

HSI score = **0.34**

Pond suitability = **poor**

General description/notes/comments

Abundant population of large coarse fish present. Common carp, tench and pike recorded during bat surveys and through observing fishermen

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ecology
arboriculture

TECHNICAL APPENDIX 7.4
REPTILE REPORT

PRINCES PARADE
HYTHE, KENT

REF: 3609-LLB-ZZ-XX-RP-EC-0004

STATUS: PLANNING

DOCUMENT ISSUED: 14/08/2017

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CONTENTS

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Checked and approved by	David W. Smith BSc (Hons), PhD, MCIEEM

1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 Most on-site habitats are of negligible suitability for reptiles.

S.3 *c.*1.4ha of reptile habitat is present on-site. This habitat is located at the western and eastern ends of the application site and along the southern boundary with Princes Parade.

S.4 A reptile presence / likely absence survey was conducted on-site in May and June 2016.

S.5 The survey results indicate that the application site supports 'good' populations of slow worm and common lizard and a 'low' population of grass snake.

S.6 Based on the reptile survey results and a habitat assessment, the application site is of 'local' importance for reptiles.

S.7 To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to reptiles are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This report details the method and results of a reptile presence / likely absence survey that was conducted across suitable on-site habitats in May and June 2016.

2.3. This Technical Appendix also provides an assessment of the ecological importance of the application site for reptiles.

2.4. To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to reptiles are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

OBJECTIVES

2.5. The objectives of the survey and report are to: -

- Determine whether reptiles are present on the application site;
- If reptiles are present, determine the species present and estimate population size classes; and
- Assess the importance of on-site habitats for reptiles.

3. METHOD

DESK STUDY

3.1. A data search was undertaken by Kent and Reptile Amphibian Group (KRAG) in September 2015. A 2km radius, measured from the indicative application site boundary, was used to search for records of reptiles and amphibians within 2km of the application site.

3.2. Records obtained within the ten-year period prior to the date of the record search are considered 'recent.' Records older than this are considered 'historic.'

3.3. An evaluation of recent and historic aerial images and Ordnance Survey maps was also undertaken as part of the desk study.

HABITAT ASSESSMENT

3.4. An initial ecological assessment of the application site, and the adjacent canal section, was undertaken by David W. Smith BSc (Hons), PhD, MCIEEM on 14th September 2015.

3.5. David is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over ten years of ecological consultancy experience.

3.6. This initial assessment was used to determine the suitability of the application site for reptiles.

3.7. There is no published method that can be used to objectively assess the quality of habitat for reptiles or the potential for presence of reptiles. However, there are habitat characteristics known to influence the suitability of habitats for reptiles, which comprise: -

- Location of site in relation to species geographic range;
- Vegetation structure and type;
- Habitat management;
- Insolation (sun exposure);
- Aspect;
- Topography;
- Surface geology;
- Connectivity to nearby 'good quality' habitat;
- Prey abundance;
- Refuge opportunity;
- Availability of suitable hibernation habitat;
- Presence / absence of predators such as domestic cats and pheasant (*Phasianus colchicus*);
- Disturbance levels; and
- Availability of suitable egg laying sites (egg laying reptile species only).

3.8. The above factors were used to assess the suitability of the on-site habitats for reptiles.

PRESENCE / LIKELY ABSENCE SURVEY

3.9. A reptile presence / likely absence survey was conducted by John Young, Katy Tennant BSc (Hons), MSc, Grad CIEEM and Sam Durham BSc (Hons), ACIEEM between 3rd May and 22nd June 2016.

3.10. Forty-four artificial Cover Objects (ACOs) - comprising sheets of felt, corrugated tin and corrugated onduline, were placed within areas of suitable reptile habitat on 23rd March 2016 (see Appendix B of this report for locations of ACOs).

3.11. The ACOs were left to 'bed-down' for 40 days, to allow time for reptiles to discover them and begin using them as preferential basking spots. The ACOs and other suitable basking areas were then checked periodically for reptiles during May and June 2016, under suitable weather conditions, when the ambient air temperature was between 14ºC and 19ºC. When it was too cold, windy or hot, or when it was raining (excluding 'occasional spots' of rain), survey visits were not conducted.

3.12. Seven survey visits were conducted, in line with recommendations for reptile presence / likely absence surveys included in Froglife (1999).

3.13. Each visit comprised a visual search for basking reptiles that involved walking slowly and quietly around the site, checking for reptiles on and beneath ACOs, debris and natural basking sites.

3.14. Any amphibians found under ACOs were also recorded.

3.15. ACOs were distributed to the west and east of the central hard standing footpath, with 26 to the west and 18 to the east of this path.

3.16. The dates and times of survey visits, and temperatures and weather conditions recorded during each visit, are detailed in Table 1.

Table 1: Dates and times, temperatures and weather conditions for reptile survey visits

Date	Start time	Temp start / stop (°C)	Percentage cloud cover	Precipitation / ground conditions	General weather conditions
03/05/2016	10:27	14 / 14	50	No rain. Ground dry.	Dry with strong breeze.
09/05/2016	17:40	16 / 14	100	Occasional spots of rain. Most ground dry.	Weak hazy sunshine with moderate breeze.
12/05/2016	10:15	16 / 19	30	No rain. Ground dry.	Dry and hazy with strong sun. Light breeze.
19/05/2016	17:30	14 / 14	10	No rain. Ground dry.	Sunny and warm with moderate breeze.
24/05/2016	13:50	16 / 16	50	No rain. Ground dry.	Dry with sunny spells, with cool breeze.
27/05/2016	14:26	19 / 18	10	No rain. Ground dry.	Dry with hazy sun and cool breeze.
22/06/2016	12:20	19 / 19	100	No rain. Ground dry.	Dry and humid. Hazy sun with light breeze.

ASSESSMENT AND EVALUATION

3.17. The survey methodology was based on guidance provided in Froglife (1999).

3.18. Gent and Gibson (2003) indicate that surveys for common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*) can be conducted between 9ºC and 18ºC and surveys for grass snake (*Natrix natrix*) between 12ºC and 20ºC.

3.19. Froglife (1999) recommends that surveys should be conducted between 9ºC and 18ºC.

3.20. During Lloydbore survey work at other sites, reptiles have been consistently recorded in temperatures exceeding 20ºC.

3.21. For the purposes of this assessment, site visits were conducted between 14ºC and 19ºC. Based on the above survey guidance, these temperatures are considered appropriate for reptile survey.

3.22. The terminology used within Froglife (1999) has been used to describe the estimated population size classes for reptile species recorded during the presence / likely absence survey.

3.23. Population size class estimates for reptiles are based on the 'peak counts' of adult animals recorded for each species during a presence / likely absence survey.

3.24. The assessment of the ecological importance of the application site for reptiles has been informed by guidance set out within CIEEM (2016).

3.25. The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;
- County;
- Local; and
- Zone of Influence (ZoI).

3.26. Features assessed as being of importance at the ZoI level have been scoped out of the assessment of likely significant effects associated with the proposed development.

3.27. Only features assessed as being of 'local' importance or greater have been taken forward in the ecological impact assessment process.

ZONE OF INFLUENCE

3.28. The potential impact(s) of a development are not always limited to the boundaries of the site concerned. A development may also have the potential to impact on ecologically important features located beyond the site boundaries. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

3.29. The ZoI is determined by the source / type of impact, the potential pathway(s) for those impacts and the location and sensitivity of the ecologically important feature(s) beyond the site boundary.

3.30. In the absence of mitigation, sources of impact associated with the proposed development include loss of habitat, fragmentation of the local habitat network and impacts on individual animals during the construction phase. Potential sources of impact also include increased predation of animals by domestic cats during the occupation phase.

3.31. The ZoI for reptiles is likely to be confined to the red-line boundary of the application site and areas of connected suitable habitat within the canal corridor as far west as Twiss Road.

3.32. Twiss Road, and the heavily managed embankments to the west of this road, act as a barrier to reptile movement. Any reptile populations located west of this road are unlikely to be affected by site development and are therefore outside of the ZoI of the proposed development.

SURVEY LIMITATIONS

3.33. The footprint of the proposed new canoe centre at the eastern end of the Royal Military Canal supports *c.*0.05ha of habitat suitable for reptiles (tall grassland and scrub).

3.34. This area was not surveyed during the reptile presence / likely absence survey, because it was not within the original survey brief.

3.35. The grassland in this area is mown on at least an annual basis and is less suitable for reptiles than the areas of reptile habitat that were surveyed.

3.36. The presence of this additional area of suitable habitat is not considered a material limitation to the population size class estimate for common lizard.

3.37. A peak count of seven adult animals was recorded for this species. The threshold between a 'good' and an 'exceptional' population of common lizard is a peak count of 20 animals (Froglife, 1999). The recorded peak count for this species is therefore well within the 'good' population size class.

3.38. Given the small size (*c.*0.05ha) and lower quality of the suitable habitat within the canoe centre footprint, this area is unlikely to support sufficient animals to affect the population size class estimate for common lizard.

3.39. The peak count recorded for slow worm was 20. The threshold between a 'good' and an 'exceptional' population of slow worm is a peak count of 21 animals or more (Froglife, 1999). Therefore, if slow worms are present in the *c.*0.05ha of suitable habitat within the canoe centre footprint, the population size class for slow worms on the application site may in fact be 'exceptional.'

3.40. This survey limitation has been considered when designing reptile mitigation measures. The Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8) proposes a reptile mitigation solution that can address this limitation (by providing *c.*1.4ha of compensatory off-site reptile habitat).

3.41. Given the small area and lower quality of habitats within the canoe centre footprint, the application site is still assessed as being of 'local' importance for reptiles.

3.42. This report provides an assessment of the site's importance for reptiles, and is suitable for submission as a Technical Appendix to the Environmental Statement.

4. RESULTS

DESK STUDY

4.1. The data search returned records of slow worm and common lizard within *c.*200m of the application site. Grass snake is known to use the Royal Military Canal.

HABITAT ASSESSMENT

4.2. The location and distribution of reptile habitat on the application site is shown in Figure 2.

4.3. The southern section of the site, adjacent to Princes Parade, supports a *c.*2-3m wide grass verge, which is well managed and of poor suitability for reptiles. The northern edge of this verge is less intensively managed and provides some shelter and basking opportunities for reptiles.

4.4. A dry ditch and bund are located immediately north of the verge. These features support tall grassland, ruderal vegetation and bramble (*Rubus fruticosus* agg.) scrub suitable for reptiles.

4.5. An area of tall grassland is located at the western end of the site, north of the bund. This area contains scattered concrete blocks, which provide additional shelter, basking and potentially hibernation opportunities for reptiles.

4.6. Two isolated areas of rough grass suitable for reptiles occur within the ruderal habitats described below. One patch is present in the eastern half of the site and one is present in the western half.

4.7. On-site habitats suitable for reptiles comprise *c.*0.65ha to the west of the central footpath and *c.*0.25ha east of this path (including habitat suitable for reptiles within the canoe centre footprint).

4.8. The remainder of the site is dominated by dense, tall ruderal vegetation and willow (*Salix* sp.) and elder (*Sambucus nigra*) scrub. These habitats are of negligible suitability for reptiles.

SURVEY RESULTS

4.9. Slow worm, common lizard and grass snake were recorded during the survey.

4.10. Table 2 provides the peak counts of adult animals recorded for each of these species.

4.11. Detailed survey results are provided in Appendix C.

Table 2: Peak counts of adult reptiles, and population estimates

	Slow worm	Common lizard	Grass snake
Peak count of adult animals	20	7	2
Population estimate	Good	Good	Low

4.12. No amphibians were recorded during the reptile survey visits.

5. SURVEY PLAN

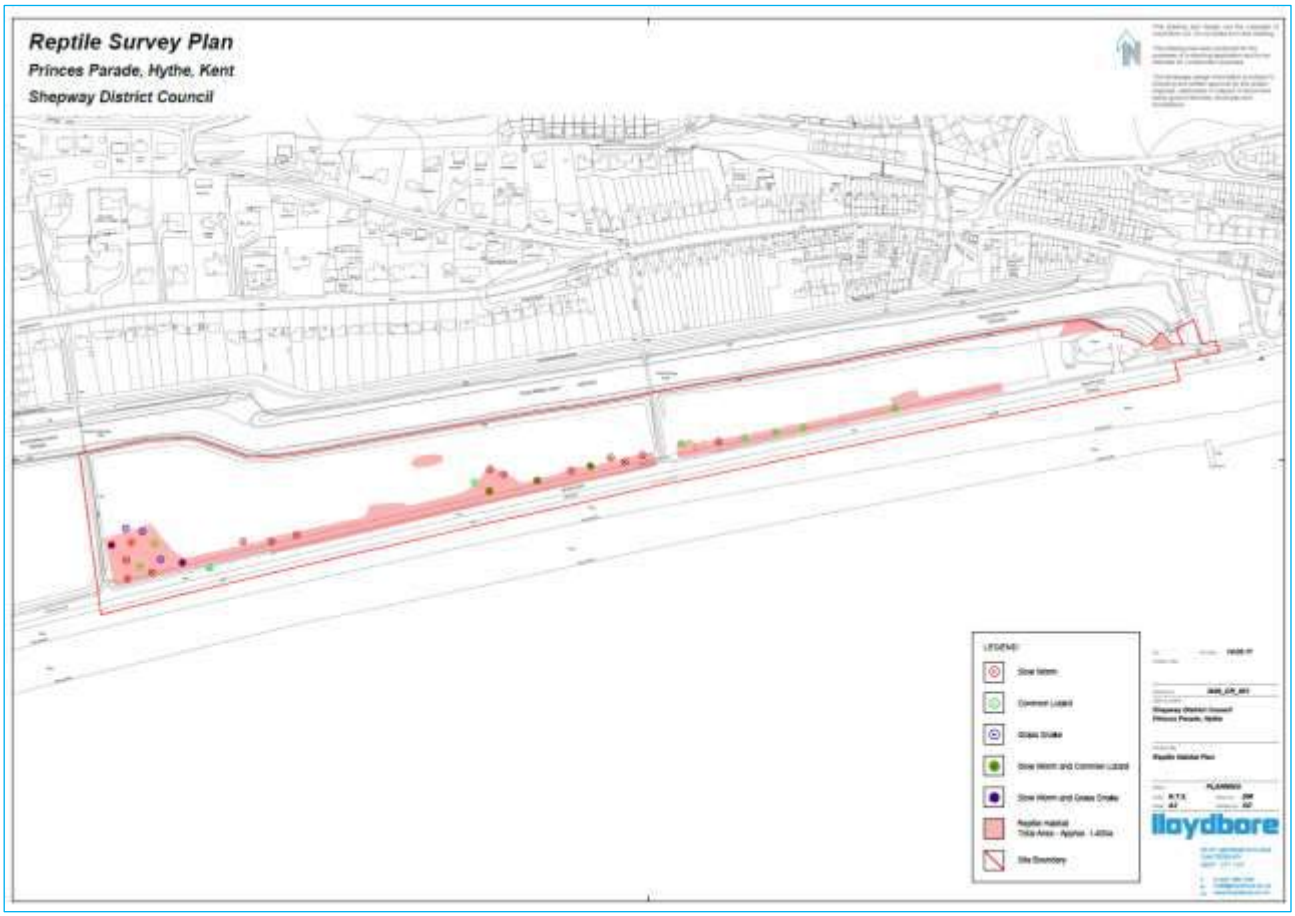

Fig. 1: Plan showing locations where reptiles were recorded under ACO's. A number is only shown for ACO's where reptiles were recorded. The locations of other ACOs are shown in Appendix B. Plan also shows extent of reptile habitat present on-site.

6. PHOTOGRAPHS

Photo 1: Grass verge on left. Reptile habitat along ditch and bund on right.

Photo 2: Dense areas of tall ruderal vegetation dominate the site. Bund shown in foreground.

Photo 3: Occupied reptile habitat on southern ditch - tall grassland and bramble scrub.

Photo 4: Suitable reptile habitat at western end of site - tall grassland.

.

7. EVALUATION

7.1. The application site supports *c.*1.4ha of reptile habitat (occupied and suitable). The rest of the *c.*10.7ha application site is of negligible suitability for reptiles.

7.2. A 'good' population of slow worm, a 'good' population of common lizard and a 'low' population of grass snake were recorded within on-site habitats, in the locations detailed in this report.

7.3. Based on the number of species present, the number of individuals recorded for each species, and the extent of suitable on-site habitat, the application site is of 'local' importance for reptiles.

8. REFERENCES

CIEEM (2016). *Guidelines for ecological impact assessment in the United Kingdom and Ireland: Terrestrial, Freshwater and Coastal*. 2nd Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

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9. APPENDIX A: SUMMARY OF LEGISLATION AND NATIONAL PLANNING POLICY

Legislation

9.1. The specific legal protection afforded to reptiles can be found within the Sections and Schedules of the relevant legislation and relevant case law.

9.2. Slow worm (*Anguis fragilis*), common lizard (*Zootoca vivipara*), grass snake (*Natrix natrix)* and adder (*Vipera berus*) are the four most common reptile species in the UK. These species are protected from intentional and reckless killing and injury under the Wildlife and Countryside Act 1981 (as amended).

9.3. The habitat of slow worm, common lizard, grass snake and adder is not legally protected. However, if great crested newts (*Triturus cristatus*) are present, the habitat supporting reptiles might be protected because of the legal protection afforded to great crested newts.

9.4. Actions affecting multiple animals can be construed as separate offences and therefore penalties can be applied per animal impacted.

9.5. The sand lizard (*Lacerta agilis*) and smooth snake (*Coronella austriaca*), including their habitat, are fully protected by the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended). However, these species are restricted to narrow geographies and specific habitat types not found on or near the application site. Therefore, they are not considered further in this assessment.

9.6. All reptiles and amphibians held in captivity are legally protected by the Protection of Animals Act 1911 (as amended) and adder is listed by the Dangerous Wild Animals Act 1976 (as amended). This may be of relevance during reptile translocation works.

9.7. Licences to capture and move the four most common UK reptile species are not required.

9.8. The Wildlife and Countryside Act (1981) as amended, includes certain defences that may apply in some specific circumstances.

9.9. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

9.10. S41 lists 56 habitats and 943 species of Principal Importance.

9.11. Slow worm (*Anguis fargilis*), common lizard (*Zootoca vivipara*) and grass snake (*Natrix natrix*) are all listed as Species of Principal Importance.

National Planning Policy Framework (NPPF)

9.12. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed - Conserving and enhancing the natural environment (Paragraphs 109 to 125).

9.13. Of relevance are the following statements:

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things… *'minimising impacts on biodiversity and providing net gains in biodiversity*

where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, ...' (Paragraph 109); and

- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Paragraph 113).

9.14. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Paragraph 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequate mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

9.15. The presumption in favour of sustainable development (Paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Paragraph 119).

9.16. The above policies 'encourage' ecological improvements 'where possible.' Therefore, this is not an absolute requirement at planning.

10. APPENDIX B: LOCATION OF ACO'S

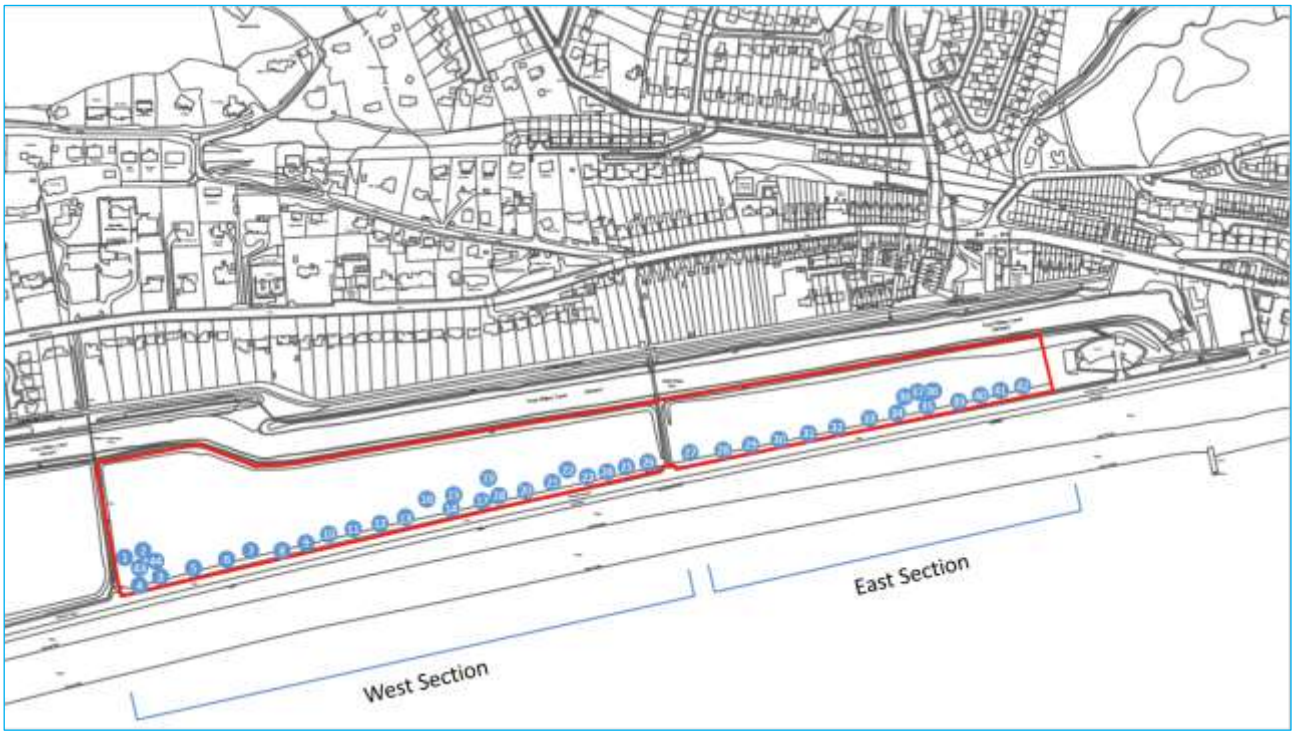

Fig. 2: Location of 44 Artificial Cover Objects (ACO's) (blue circles).

11. APPENDIX C: DETAILED SURVEY RESULTS

Table 3: Detailed survey results for slow worm

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
1	03/05/2016	Wooden sheet			1		1	
1	03/05/2016	43	1				1	
1	03/05/2016	2	1				1	
1	03/05/2016							3
2	09/05/2016	1	1				1	
2	09/05/2016	5		2			2	
2	09/05/2016	18	1				1	
2	09/05/2016	Black rubber		1			1	
2	09/05/2016							5
3	12/05/2016	2	2				2	
3	12/05/2016	8	2				2	
3	12/05/2016	9		3			3	
3	12/05/2016	19		1			1	
3	12/05/2016	23		1			1	
3	12/05/2016							9

Detailed survey results for slow worm, continued

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
4	19/05/2016	1	1				1	
4	19/05/2016	5	1				1	
4	19/05/2016	21	1				1	
4	19/05/2016	23	1				1	
4	19/05/2016	26	2				2	
4	19/05/2016							6
5	24/05/2016	23	1				1	
5	24/05/2016	9	1				1	
5	24/05/2016	8	1				1	
5	24/05/2016	2	1				1	
5	24/05/2016							4
6	27/05/2016	4	1				1	
6	27/05/2016							1
7	22/06/2016	1		3			3	
7	22/06/2016	2		1			1	
7	22/06/2016	3	1				1	
7	22/06/2016	5		2			2	

Detailed survey results for slow worm, continued

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
7	22/06/2016	7	1				1	
7	22/06/2016	8	1				1	
7	22/06/2016	18	1				1	
7	22/06/2016	Road works sign	1	1			2	
7	22/06/2016	21	1	1			2	
7	22/06/2016	23	2				2	
7	22/06/2016	24	1				1	
7	22/06/2016	25	1	1			2	
7	22/06/2016	28		1			1	
7	22/06/2016							20

Table 4: Detailed survey results for common lizard

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
1	03/05/2016	27			3		3	
1	03/05/2016	29			1		1	
1	03/05/2016	30				1		
1	03/05/2016	24	1				1	
1	03/05/2016							5
2	09/05/2016	Bin bag	1				1	
2	09/05/2016							1
3	12/05/2016	21		1			1	
3	12/05/2016	27		1			1	
3	12/05/2016	Bin bag		1			1	
3	12/05/2016				2			
4	19/05/2016		0	0	0	0	0	
4	19/05/2016							0
5	24/05/2016	29		1	1		2	
5	24/05/2016	31				1		
5	24/05/2016	Concrete block				1		
5	24/05/2016							2

Detailed survey results for common lizard, continued

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
6	27/05/2016		0	0	0	0	0	
6	27/05/2016							0
7	22/06/2016	Black bag			1		1	
7	22/06/2016	Black bag						1

Table 5: Detailed survey results for grass snake

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
1	03/05/2016		0	0	0	0	0	
1	03/05/2016							0
2	09/05/2016		0	0	0	0	0	
2	09/05/2016							0
3	12/05/2016		0	0	0	0	0	
3	12/05/2016							0
4	19/05/2016		0	0	0	0	0	
4	19/05/2016							0

Detailed survey results for grass snake, continued

Visit	Date	ACO no.	Adult			Non-adult	Total Adult	Visit Total Adult
			Male	Female	Unsexed			
5	24/05/2016	Basking in grass			2		2	
5	24/05/2016	Basking in grass				1		
5	24/05/2016							2
6	27/05/2016	5				1		
6	27/05/2016							0
7	22/06/2016	1				2		
7	22/06/2016	5			1		1	
7	22/06/2016							1

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TECHNICAL APPENDIX 7.5
BREEDING BIRD REPORT

PRINCES PARADE
HYTHE, KENT

REF: 3609-LLB-RP-EC-0007-S4-P01

STATUS: PLANNING

DOCUMENT ISSUED: 14/08/2017

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CONTENTS

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1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 A breeding bird survey of the site was conducted between the 12th April and 15th June 2016.

S.3 The survey visits were conducted by an experienced bird surveyor and used territory mapping to estimate the number of pairs of each bird species within the site. Additional bird sightings seen during other ecology survey work has also been incorporated into this report.

S.4 Of the species that used the site, four are red status species. These are song thrush, starling, house sparrow and linnet. An additional seven species are amber status species.

S.5 Of the bird species that use the site, six are Species of Principal Importance and two species are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

S.6 Ten bird species were recorded as 'confirmed breeders', eight were 'probable breeders' and eight were possible breeders

S.7 The site is of ecological importance at a Local level for Cetti's warbler (which is also listed by the Rare Breeding Birds Panel as a regular breeder), house sparrow (foraging only) and reed bunting.

S.8 At least one Schedule 1 listed bird species, Cetti's warbler, is likely to nest within the ZoI of the development.

S.9 To ensure delivery of a coordinated and integrated ecology strategy, avoidance, mitigation and compensation measures relating to birds are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This report details the method and results of a breeding bird survey of the application site associated with the proposed development.

2.3. This Technical Appendix also assesses the ecological importance of the site for breeding birds.

2.4. To ensure delivery of a coordinated and integrated ecology strategy, mitigation, compensation and enhancement measures relating to reptiles are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2.5. The on-site habitats are not suitable for use by passage or wintering species associated with the Special Protection Areas (SPAs) at Dungeness and Sandwich.

2.6. Whilst individual birds may occasionally use the beach habitat close to the site, historical bird sightings and the suitability of the site indicate that the off-site area of beach habitat is not likely to be of importance or used regularly by a significant number of breeding, passage or wintering bird species associated with the above SPAs. Any birds passing by off-shore, will not be impacted by the development proposals.

2.7. Based on the above, wintering and passage birds were scoped out of the assessment.

OBJECTIVES

2.8. The objectives of the survey and report are to: -

- Record the bird species using the site to breed;
- Estimate the breeding status of each bird species and the number of pairs likely to be breeding within the site; and
- Assess the ecological importance of the site for breeding birds.

3. METHOD

BREEDING BIRD SURVEY

3.1. The breeding bird survey of the site was conducted by David Smith BSc (Hons), PhD and MCIEEM. David has over twenty years' experience of conducting bird surveys and over nine years of completing them to inform construction related projects.

3.2. During 2016, five site visits were conducted. These occurred on the 12th and 22nd April, 4th and 19th May and on the 15th June.

3.3. All bird species seen during the surveys were recorded. However, most effort was focussed on recording those bird species that have either been listed as Species of Principal Importance or those that are red status species (see Eaton *et al.*, 2015) and/or are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

3.4. The area was surveyed on foot so that the surveyor passed within 50m of most points within the site. The survey area and the transect walked is shown in Appendix B.

3.5. During the survey visits all species either seen or heard were recorded and any signs of breeding activity were noted. Breeding evidence was assigned to four categories: confirmed; probable; possible and non-breeding. These are based on the standard British Trust for Ornithology (BTO) criteria (see Table 4).

Table 1: Associated weather conditions during each survey visit during 2016.

Date	Start time and weather
12/04/2016	Start time: 06:45. Dry, still, overcast (100% cloud) with sunny spells later.
22/04/2016	Start time: 06:30. Dry, moderate breeze, 100% cloud cover.
04/05/2016	Start time: 07:10. Dry, still, clear sky.
19/05/2016	Start time: 07:15. Dry, light breeze, overcast (100% cloud), then clearing.
15/06/2016	Start time: 06:45. Dry, light breeze, 65% to 80% cloud.

ASSESSMENT AND EVALUATION

3.6. Breeding birds are afforded protection by the Wildlife and Countryside Act 1981 (as amended). See Appendix A for further details.

3.7. Although it does not offer any legal protection, The Birds of Conservation Concern 4 (Eaton *et al.*, 2015) provides guidance on the conservation status of UK bird species. Therefore, it can be used to inform judgements on the ecological value of bird populations and the habitats that they rely on, particularly at a local level. Red status species are those species of highest conservation concern and green status species are those of low or no conservation concern. Amber status species are those species of some conservation concern.

3.8. Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 has been used to identify species considered to be of conservation priority on a national scale. These are also called Species of Principal Importance. The value of these species is recognised in the National Planning Policy Framework (NPPF).

3.9. The ecological importance of the site for breeding birds (and the potential ecological impacts of the proposed development) has been assessed in accordance with industry standard guidelines (CIEEM, 2016).

3.10. The importance of the habitats within the survey area for birds was assessed within a geographical context, based on CIEEM (2016). The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;
- County;
- Local; and
- ZoI.

3.11. Only when ecological features within the site and/or Zone of Influence are valued at a local level or above, have they have been taken forward in the assessment process. When they are valued below this, for example at the level of the Zone of Influence, they have been scoped out of the assessment process.

ZONE OF INFLUENCE

3.12. The potential impact(s) of a development are not always limited to the boundaries of the site concerned. A development may also have the potential to impact on ecologically important features located beyond the site boundaries. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

3.13. The ZoI is determined by the source / type of impact, the potential pathway(s) for those impacts and the location and sensitivity of the ecologically important feature(s) beyond the site boundary.

3.14. In the absence of avoidance, mitigation and compensation measures, potential sources of impact include impacts on individuals, direct habitat loss and disturbance during the construction phase.

3.15. During the operational phase, disturbance or predation pressure arising from domestic cats may also increase.

3.16. The ZoI in relation to breeding birds is likely to be restricted to the red-line boundary of the site and those habitats that fall within *c*.100-200m beyond this (Summers-Smith, 1963; Brickle and Peach, 2004). However, for certain bird species, such as starling (*Sturnus vulgaris*), Cetti's warbler (*Cettia cetti*) and kingfisher (*Alcedo atthis*) distances greater than this were considered. For example, male Cetti's wablers may patrol territories up to 450m within which one or more females may breed (Bibby, 1992 in Gilbert *et al*., 1998).

SURVEY LIMITATIONS

3.17. Surveys were not conducted at night, shortly prior to sunrise or at dusk. Therefore, species that are most active during this period, such as owl species, were unlikely to be recorded.

3.18. Bird surveys were conducted within the optimum period for breeding birds and overall there are no significant limitations to the survey results.

4. RESULTS

4.1. In 2016, 39 bird species were recorded during the five survey visits. Of these, the following were only seen flying over the site and making no other use of it: shelduck (*Tadorna tadorna*), herring gull (*Larus argentatus*), swift (*Apus apus*), yellow wagtail (*Motacilla flava*), swallow (*Hirundo rustica*) and house martin (*Delichon urbicum*). Therefore, 33 species were recorded using the site or adjacent canal during the breeding bird survey.

4.2. An additional three species, water rail (*Rallus aquaticus*), short-eared owl (*Asio flammeus*) and kingfisher (*Alcedo atthis*), were recorded during additional site visits in both 2015 and 2016. Therefore, 36 bird species have been recorded using the site or adjacent canal.

4.3. Of the 36-species recorded using habitats with the ZoI of development, four are red status species. These are song thrush (*Turdus philmelos*), starling, house sparrow and linnet (*Carduelis cannabina*). An additional seven species are amber status species.

4.4. Of the species that use the site, six are Species of Principal Importance and two species are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

4.5. Of the species that use the site, ten species were recorded as 'confirmed breeders', eight were 'probable breeders' and eight were possible breeders.

4.6. Table 2 provides the detailed survey results.

Table 2: Summary of 2016 survey results. Five survey visits were conducted between 12th April and 15th June. Additional 2015 (only kingfisher) and 2016 casual bird records are also included in the Table below. Unless stated all dates relate to 2016.

Species	Conservation Status	Notes
Mute swan (*Cygnus olor*)	Amber	Confirmed breeder. Pair raised four cygnets. Active nest on canal on 12/04, 22/04 and 04/05. Eggs within the nest were seen on 19/05 and young birds were on the canal on 15/06.
Shelduck (*Tadorna tadorna*)	Amber	Non-breeder. Bird flew over site on 12/04.
Mallard (*Anus platrhynchos*)	Amber	Possible breeder. Birds seen in suitable habitat. Maximum count of 4 on 22/04. No evidence of breeding observed.
Pheasant (*Phasianus colchicus*)	No status	Possible breeder. Singing male on 12/04 and a male observed on 19/05.
Moorhen (*Gallinula chloropus*)	Green	Possible breeder. Birds seen in suitable habitat.
Water rail (*Rallus aquaticus*)	Green	Bird calling on 23/03 within ZoI. Recorded by John Young.
Herring gull (*Larus argentatus*)	Red Section 41 species	Non-breeder. Observed flying over the site on 4 out of 5 dates.
Woodpigeon (*Columba palumbus*)	Green	Confirmed breeder. Recently fledged birds on 15/06.
Collared dove (*Streptopelia decaoto*)	Green	Possible breeder. Two birds in suitable habitat on 12/04 on opposite of canal (but within ZoI).
Short-eared owl (*Asio flammeus*)	Amber	Flushed from scrub on 06/04. This species (or a long-eared owl *A.otus*) flew over the canal at night on the 23/03. Both birds recorded by John Young.
Swift (*Apus apus*)	Amber	Migrant. Birds migrating over the site and along canal on 19/05.

Kingfisher (*Alcedo atthis*)	Amber Schedule 1	Recorded on 22/09/2015 during the Preliminary Ecological Appraisal. Local birdwatcher reported breeding along the canal, west of the site but the nest was probably predated.
Green woodpecker (*Picus viridus*)	Green	Non-breeder. Birds seen on opposite side of canal on 12/04 and 15/06. Birds moving through or flying past.
Pied wagtail (*Motacilla alba yarrellii*)	Green	Non-breeder. Observed flying over the site, with a single bird on 10/06.
Yellow wagtail (*Motacilla flava*)	Red Section 41 species	Migrant. Bird flew high over the site, and along the canal, on 22/04.
Wheatear (*Oenanthe oenanthe*)	Green	Migrant. Female on 12/04.
Dunnock (*Prunella modularis*)	Amber Section 41 species	Probable breeder. 8-10 breeding territories across the site. Permanent territory.
Robin (*Erithacus rubecula*)	Green	Possible breeder. 0-2 breeding territories. Singing male and bird/s in suitable habitat.
Song thrush (*Turdus philmelos*)	Red Section 41 species	Possible breeder. 1 breeding territory. Singing male in suitable habitat.
Blackbird (*Turdus merula*)	Green	Confirmed breeder. 5-6 breeding territories across the site and birds observed carrying food on 12/04, 19/05 and 15/06. Recently fledged young on 15/06.
Swallow (*Hirundo rustica*)	Green	Migrant. Birds seen migrating over site and along canal on 22/04, 04/05 and 19/05.
House martin (*Declichon urbicum*)	Amber	Migrant. Bird migrating over site on 19/05.
Cetti's warbler (*Cettia cetti*)	Green Schedule 1	Probable breeder. 1-2 territories along canal (and within ZoI). Birds used the site on 19/05 and 15/06. Permanent territory. Young birds being fed were reported by local birdwatcher.
Long-tailed tit (*Aegithalos caudatus*)	Green	Confirmed breeder. 1-2 pairs. Bird carrying nest material on 04/05.

Blackcap (*Sylvia atricapilla*)	Green	Probable breeder. 5-6 breeding territories across the site. Permanent territories.
Whitethroat (*Sylvia communis*)	Green	Confirmed breeder. c.5 breeding territories across the site. Adult carrying food on 19/05 and 15/06/06.
Sedge warbler (*Acrocephalus schoenobaenus*)	Green	Migrant. Singing bird on-site on 22/04.
Reed warbler (*Acrocephalus scirpaceus*)	Green	Confirmed breeder. 10-11 breeding territories along the canal (and within ZoI). Bird carrying food on 15/06.
Willow warbler (*Phylloscopus trochilus*)	Amber	Migrant. Adult singing on 12/04. Not recorded on other visits.
Chiffchaff (*Phylloscopus collybita*)	Green	Probable breeder. 3-4 breeding territories across the site. Permanent territory.
Wren (*Troglodytes troglodytes*)	Green	Probable breeder. 11-13 breeding territories across the site. Permanent territories.
Great tit (*Parus major*)	Green	Possible breeder. 1 territory. Pair in suitable habitat and permanent territory.
Blue tit (*Cyanistes caeruteus*)	Green	Probable breeder. Birds observed across the site and in suitable breeding. Juveniles (but not recently fledged) observed off-site on 15/06.
Magpie (*Pica pica*)	Green	Confirmed breeder. Recently fledged young on 15/06, but on opposite side of canal (but within ZoI).
Jackdaw (*Corvus monedula*)	Green	Non-breeder. Birds flew over site and foraged on the adjacent golf course on 04/05, 19/05 and 15/06. Max count on the golf course was 15 birds.
Carrion crow (*Corvus corone*)	Green	Non-breeder. Flew over the site on 04/05 and 15/06. One bird within site on 22/04.
Starling (*Sturnus vulgaris*)	Red Section 41 species	Confirmed breeder beyond the site boundary. Small number of birds (up to 3) used the site to forage. 30+ birds used golf course adjacent to the site to the west. 10 birds used the play area to the east. Young birds on 19/05.

House sparrow (*Passer domesticus*)	Red Section 41 species	Confirmed breeder, but off-site. Birds observed in suitable breeding habitat (houses with associated gardens) on opposite side of canal. Birds foraged on-site and carried food to off-site houses.
Chaffinch (*Fringilla* coelebs)	Green	Probable breeder. 5-6 breeding territories. Permanent territory.
Linnet (*Carduelis cannabina*)	Red Section 41 species	Possible breeder. 0-1 pairs. Observed in suitable breeding habitat and singing male recorded.
Goldfinch (*Carduelis carduelis*)	Green	Probable breeder. 1-2 breeding territories. Permanent territory.
Reed bunting (*Emberiza schoeniclus*)	Amber Section 41 species	Confirmed breeder. 1 breeding territory. Singing in suitable habitat, pair of birds seen and bird carrying nest material on 15/06.

Table 3: Evidence used to assign breeding status.

Non-Breeder	Possible Breeder	Probable Breeder	Confirmed Breeder
Migrant	Observed in suitable habitat	Pair in suitable habitat	Distraction behaviour
Summering	Singing male	Permanent territory	Used nest or eggshells found from this season
		Courtship and display	Recently fledged young or downy young
		Visiting probable nest site	Adults entering or leaving nest-site indicating occupied nest
		Agitated behaviour	Adults carrying faecal sac or food for young
		Brood patch on incubating bird	Nest containing eggs
		Nest building or excavating	Nest with young seen or heard

5. EVALUATION

5.1. The site is of ecological importance at a Local level for Cetti's warbler (which is also listed by the Rare Breeding Birds Panel as a regular breeder), house sparrow (foraging only) and reed bunting.

5.2. At least one Schedule 1 listed bird species, Cetti's wabler, is likely to nest within the ZoI of the development.

5.3. For all other bird species, the site is of importance at the ZoI level only, or even of negligible value. Therefore, these bird species have been scoped out of the Ecological Impact Assessment (EcIA) process.

6. REFERENCES

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7. APPENDIX A: SUMMARY OF LEGISLATION AND NATIONAL PLANNING POLICY

7.1. The level of protection afforded to protected species varies dependent on the associated legislation. A full list of protected species and their specific legal protection is provided within the Schedules and/or Sections of the associated legislation. Case law may further clarify the nature of the legal protection afforded to species.

7.2. The legal protection afforded to protected species overrides all planning decisions.

The Wildlife and Countryside Act 1981 (as amended)

7.3. All active bird nests, eggs and young are protected by the Wildlife and Countryside Act 1981 (as amended) from intentional destruction.

7.4. Schedule 1 listed birds are also protected from intentional and reckless disturbance whilst breeding.

The Natural Environment and Rural Communities Act 2006 (as amended)

7.5. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

7.6. S41 lists 56 habitats and 943 species of Principal Importance.

7.7. Section 42 of the NERC Act relates to Wales.

National Planning Policy Framework (NPPF)

7.8. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed '*Conserving and enhancing the natural environment*' (Sections 109 to 125).

7.9. Of relevance are the following statements:

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things, '*minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity....'* (Section 109); and
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Section 113).

7.10. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Section 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

7.11. The presumption in favour of sustainable development (para. 14 of the Framework) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Section 119).

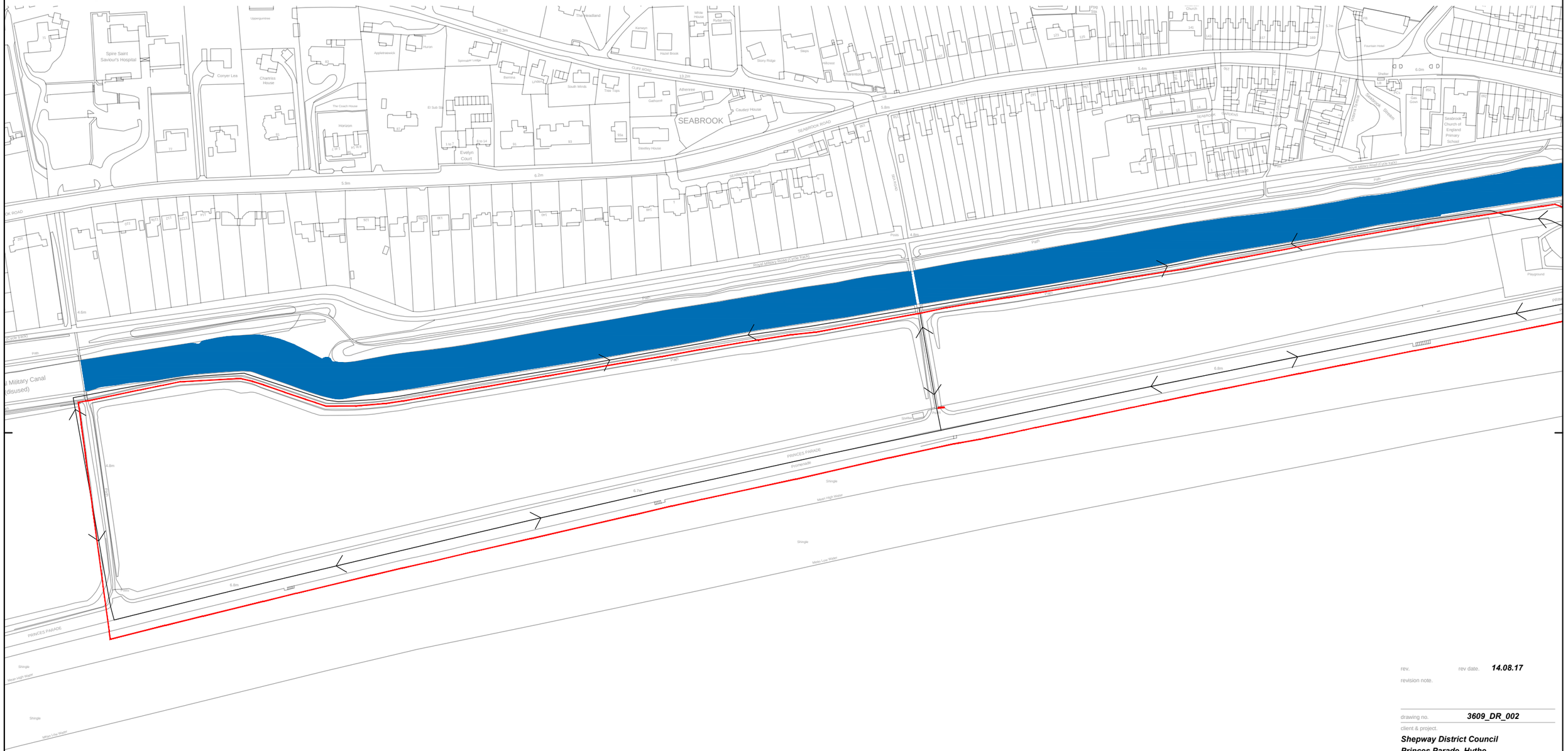
8. APPENDIX B: BIRD SURVEY TRANSECT

See overleaf

Bird Survey Plan

Princes Parade, Hythe, Kent

Shepway District Council



LEGEND:

- Waterbody
- Transect route
- Site boundary

rev.
rev date. **14.08.17**
revision note.

drawing no. **3609_DR_002**

client & project.
Shepway District Council
Princes Parade, Hythe

drawing title.
Bird Survey Plan

status. ***PLANNING***
scale. ***N.T.S.*** drawn by. ***TB***
sheet. ***A3*** checked by. ***DS***

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TECHNICAL APPENDIX 7.6
MAMMAL REPORT

PRINCES PARADE
HYTHE, KENT

REF: 3609-LLB-ZZ-XX-RP-EC-0006

STATUS: PLANNING

DOCUMENT ISSUED: 14/08/2017

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1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 A mammal walkover survey of the application site was conducted in February 2016. Three large mammal burrow systems were identified on the application site during this walkover.

S.3 These burrow systems were subsequently monitored for almost five months between May and September 2016 - to determine whether they were in 'current use' by badger. No evidence of 'current use' by badger was recorded on any of the three burrow systems.

S.4 One burrow system was confirmed as a disused (historic) badger sett. The other two burrow systems showed no evidence of recent or historic use by this species.

S.5 A water vole presence / likely absence survey was conducted on the adjacent section of the Royal Military canal. Two site visits were conducted. One in early July 2016 and one in September 2016.

S.6 No evidence of water vole or otter presence was recorded during the survey. In addition, the Royal Military Canal is outside of the known range of otter in Kent, and American mink (which are a major predator of water vole) are present on the canal. For these reasons, water vole and otter are likely to be absent from the section of the Royal Military Canal that is adjacent to the application site. This canal section is therefore of negligible ecological importance for water vole and otter.

S.7 Badger is a common and widespread species. It is not a SPI, it is common in Kent where there is suitable habitat for establishment of setts (Young *et al.*, 2015), and is of low conservation importance.

S.8 Given that no active badger setts were identified on the application site and only one badger scat was found on one occasion in the adjacent canal corridor, the application site is likely to be of ZoI level importance for foraging badgers. For this reason, badger has been scoped out of the assessment of 'likely significant effects' associated with the proposed development.

S.9 The application site supports habitats suitable for hedgehog.

S.10 To ensure delivery of a coordinated and integrated ecology strategy, precautionary methods of work relating to water vole, otter, hedgehog and badger are not detailed within this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

S.11 This report does not include any detail relating to the bat survey work undertaken. Bat survey methods and results are detailed in the Bat Report (Technical Appendix 7.7).

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This Technical Appendix details the methods and results of: -

- A mammal walkover survey of the application site;
- Monitoring of possible badger (*Meles meles*) setts on the application site; and
- A water vole (*Arvicola amphibius*) presence / likely absence survey of the section of the Royal Military Canal that sits adjacent to the application site.

2.3. This Technical Appendix also provides an assessment of the ecological importance of the application site and adjacent canal section for water vole and otter (*Lutra lutra*), and assessed the likelihood of hedgehog (*Erinaceus europaeus*) presence within the ZoI.

2.4. Using the Dormouse Conservation Handbook (2nd edition) (Bright *et al.*, 2006) as a guide, the suitability of on-site habitats for hazel dormouse (*Muscardinus avellanarius*), and the likelihood of this species being present on-site, were assessed.

2.5. This assessment confirmed that the site supports some areas of scrub habitat that are suitable for hazel dormouse. However, the site is isolated from any wider network of suitable habitat, and is outside of the known distribution for this species in Kent (Young *et al*., 2015). The risk of hazel dormouse presence on the application site was therefore assessed as negligible, and this species was scoped out of the EcIA for the proposed development.

2.6. To ensure delivery of a coordinated and integrated ecology strategy, precautionary methods of work relating to water vole, otter, hedgehog and badger are not detailed within this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2.7. This report does not include any detail relating to the bat survey work undertaken. Detail of bat survey methods and results are provided in the Bat Report (Technical Appendix 7.7).

OBJECTIVES

2.8. The objectives of the surveys and this report are to: -

- Confirm presence or likely absence of water vole, otter and badger on-site and/or within the adjacent canal section;
- If these species are present, provide an assessment of the population size and/or estimate the type of use by these species - for example, whether they use the application site for breeding;
- Report any evidence of presence of American mink (*Neovison vison*) (which is a major predator of water voles); and
- Assess the importance of the application site and adjacent section of canal for water vole and otter, and determine the likelihood of hedgehog presence.

3. SURVEY PLAN

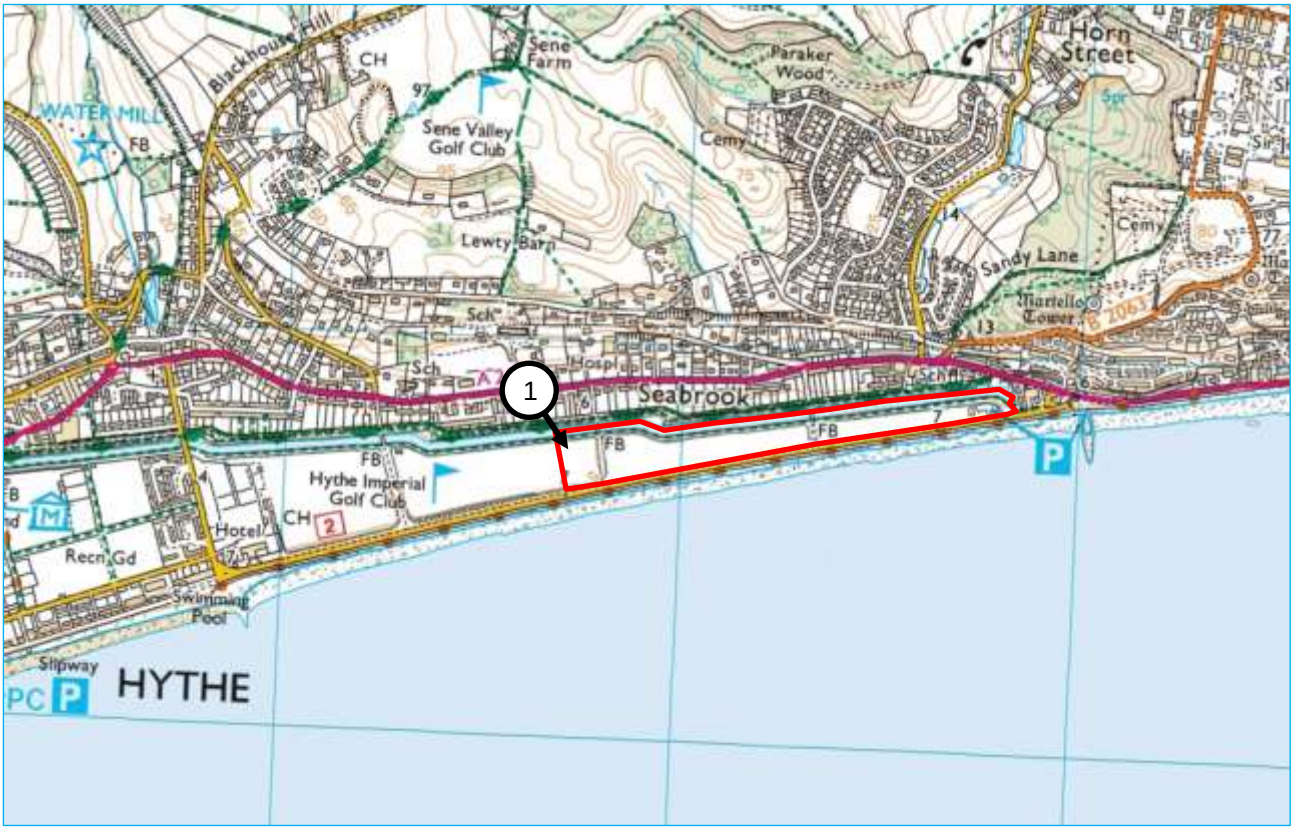

Fig. 1: Approximate extents of mammal survey area (as indicated by the red boundary line) (red boundary line is approximate). Reproduced from Explorer Map 138 (1:25 000) by permission of Ordnance Survey. © Crown Copyright (2015). All rights reserved. AR 100029570.

Target notes

1. Approximate location of disused badger sett.

4. METHOD

DESK STUDY

4.1. A data search was conducted by Kent and Medway Biological Records Centre (KMBRC) in September 2015. A 1km search radius, measured from the application site boundary, was applied.

4.2. This included a search for records of legally protected mammal species and mammal Species of Principal Importance (SPI).

4.3. Records obtained within the ten-year period prior to the date of the record search are considered 'recent.' Records older than this are considered 'historic.'

4.4. *Mammals of Kent* (Young *et al*., 2015) was also consulted for information on the distribution of mammal species within Kent.

HABITAT ASSESSMENT

4.5. An initial ecological assessment of the application site, and the adjacent canal section, was undertaken by David W. Smith BSc (Hons), PhD, MCIEEM on 14th September 2015.

4.6. David is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over ten years of ecological consultancy experience.

4.7. This initial assessment was used to determine the suitability of the application site and adjacent canal section for water voles and otters, and record any obvious signs of badger presence.

Badger

4.8. No objective habitat suitability criteria exist for badger.

4.9. General habitat requirements for this species (especially food availability and the type of substrate present) are provided in *Badgers* (Roper, 2010).

4.10. This reference text was used to determine the suitability of the application site for badger.

Water vole

4.11. The suitability of the adjacent canal section for water vole was assessed using criteria set out within Strachan *et al.*, (2011) and Dean *et al.,* (2016). The following criteria were considered: -

- Bank substrate;
- Bordering land use;
- Vegetation cover (type and species composition);
- Disturbance levels (e.g. from human recreation);
- Bank profile; and
- Depth, width, strength of current, and daily water level fluctuations within watercourse.

Otter

4.12. The suitability of the adjacent section of canal for otter was assessed using known habitat preferences for this species, as described in *Otters* (Chanin, 2015).

4.13. The following habitat criteria were considered: -

- Likely availability of fish and other prey items;
- Disturbance levels (e.g. from human recreation);
- Extent of vegetation cover; and
- Availability of suitable holt (den) sites.

Hedgehog

4.14. The suitability of the application site and canal corridor for hedgehog was assessed using criteria provided in Cresswell *et al.*, (2012). The following criteria were considered: -

- Likely availability of invertebrates and other prey items;
- Availability of suitable hibernation sites (e.g. dense leaf litter / debris piles / burrows); and
- Extent of suitable summer nesting opportunities (places of shelter, and nesting materials).

ADDITIONAL SURVEYS

Mammal walkover

4.15. A mammal walkover of the application site was undertaken by John Young of Lloydbore Ltd in February 2016.

4.16. John is an experienced mammal surveyor, and is the county mammal recorder for Kent.

4.17. All on-site habitats, and all terrestrial habitats located within 30m of the application site, were searched for badger field signs - such as setts, latrines, faeces, hair, prints and snuffle holes.

4.18. The locations of any burrows of common and widespread mammal species such as red fox (*Vulpes vulpes*) and European rabbit (*Oryctolagus cunniculus*) were also recorded during the walkover.

Monitoring of mammal burrows

4.19. The monitoring method detailed below was informed by badger survey guidance in Harris *et al.*, (1994) and SNH (undated).

4.20. Three mammal burrow networks identified during the above walkover were subsequently monitored for almost five months between 2nd May 2016 and 20th September 2016 - to determine whether these burrows were in 'current use' by badger.

4.21. This monitoring was undertaken by Samuel Durham BSc (Hons), ACIEEM, who has over seven years of badger survey experience.

4.22. On 2nd May 2016, burrow systems were 'soft blocked' using sturdy sticks. Sticks were hammered firmly into the ground in front of each burrow entrance. Sticks were positioned to avoid trapping any animals within burrows.

4.23. In addition, pads of loose earth and sand were placed in burrow entrances, to record mammal prints.

4.24. Monthly site visits were then conducted to check if these sticks had been dug out, check for badger prints within the soil / sand pads and search for any evidence of badger presence around these burrow systems. The final monitoring visit was undertaken on 20th September 2016.

Water vole presence / likely absence survey

4.25. The water vole survey method was based on guidance contained within Strachan *et al*., (2011) and Dean *et al.,* (2016). The survey comprised two separate site visits.

4.26. Each visit comprised a search of bankside habitats for diagnostic water vole field signs - such as latrines, scattered faeces, burrows, feeding stations and ball nests.

4.27. Both visits were timed to fall within the typical breeding season for water voles in south-east England (mid-March to the end of September) (Dean *et al.,* 2016).

4.28. The survey focussed on the southern bank of the Royal Military Canal, adjacent to the application site. An inspection of the northern bank was undertaken using close-focussing binoculars.

4.29. During both site visits, any field signs indicative of otter or American mink presence - such as spraints (faeces), prints or feeding remains, were also recorded.

Visit 1

4.30. The first survey visit was undertaken by John Young and David Smith on 12th July 2016.

4.31. David has over seven years of experience of water vole survey experience. John has over three years of water vole survey experience.

4.32. The survey was conducted on foot, from the southern bank of the canal.

4.33. The banks were inspected wherever gaps in vegetation allowed surveyor access. The surveyors searched a *c.*2-3m wide section either side of each access point.

Visit 2

4.34. The second survey visit was conducted by Samuel Durham on 19th September 2016. Samuel has over seven years of experience of water vole survey.

4.35. The survey was conducted from a boat, which allowed close inspection of the water margin and bankside habitats for water vole field signs.

4.36. The surveyor conducted detailed checks at approximately 10m intervals along the entire *c*.900m length of the southern canal bank. A 2-3m wide section either side of each survey point was searched. In this manner, approximately 50% of the bankside was searched metre-by-metre for water vole field signs. The remaining *c.*50%, located between search points, was inspected using close-focussing binoculars as the boat passed slowly along the canal.

ASSESSMENT AND EVALUATION

4.37. A summary of relevant legislation and national planning policy can be found under Appendix A.

4.38. Strachan *et al.,* (2011) and Dean *et al.,* (2016) provide guidance on using the results of field sign surveys to estimate the size and density of water vole populations.

4.39. The importance of ecological features was assessed within a geographical context, based on CIEEM (2016). The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;

- County;
- Local; and
- Zone of Influence (ZoI).

4.40. Features assessed as being of importance at the ZoI level have been scoped out of the assessment of likely significant effects associated with the proposed development.

4.41. Only features assessed as being of 'local' importance or greater have been taken forward in the ecological impact assessment process.

ZONE OF INFLUENCE (ZOI)

4.42. The potential impacts of a development are not always limited to the boundaries of the site concerned. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

4.43. The ZoI is determined by the source / type of impact, the presence of any potential pathways for that impact and the location and sensitivity of any ecologically important off-site features.

4.44. In the absence of mitigation, potential sources of impact associated with the proposed development include direct loss of habitats suitable for hedgehog and impacts upon individual animals (if present).

4.45. The ZoI for hedgehog (if present) is likely to be confined to the red-line boundary of the application site and those areas located just beyond the site boundary.

SURVEY LIMITATIONS

4.46. Only the southern bank of the canal was surveyed for evidence of water vole presence. However, the proposed development will not impact upon the northern bank, and will only have limited impacts upon the southern bank. Furthermore, any water voles occupying the northern bank are also likely to utilise the southern bank. Therefore, if water voles were present in the adjacent canal section, it is likely that this would have been detected during the survey work undertaken.

4.47. In addition, field signs indicating the presence of other small rodents - such as field vole (*Microtus agrestis*) and brown rat (*Rattus norvegicus*), were recorded during both survey visits. This indicates that the survey would have detected water vole field signs if they were present.

4.48. Dean *et al.,* (2016) state that water vole surveys associated with development / planning applications should include two site visits - one within the first half of the water vole breeding season (mid-April to June, inclusive), and one within the second half (July to September, inclusive). The first water vole survey visit was conducted on 12th July 2016, which is just outside of the first half of the water vole breeding season. However, this difference of *c.*2 weeks is not considered significant. Furthermore, the second survey visit was conducted during late summer / autumn - when water voles are typically present at greater population densities (Strachan *et al*., 2011). Survey visits conducted during this period are therefore more likely to detect water vole signs.

4.49. The survey work undertaken for water vole allowed a robust assessment of presence / likely absence of this species within the ZoI of the proposed development.

4.50. Due to the practical difficulties associated with surveying for hedgehog, no detailed species-specific survey was conducted. This is a standard limitation for this species. This limitation is addressed through the inclusion of precautionary methods of work and enhancement measures for hedgehog within Technical Appendix 7.8. In addition, no hedgehogs were recorded on or near to the

application site during the extensive nocturnal bat and toad survey work, or during the diurnal reptile and mammal site survey visits.

4.51. The above limitations are not considered significant or of material importance to the ecological impact assessment process. This report is therefore suitable as a Technical Appendix to the Environmental Statement.

5. RESULTS

DESK STUDY

5.1. The data search returned one record of badger located within 1km of the application site. This record dates from 2012 and was located *c*.200m east of the application site.

5.2. The data search did not return any records of water vole, otter or hedgehog within 1km of the application site.

5.3. The application site and adjacent canal section are outside of the known distribution for otter in Kent (Young *et al.*, 2015).

5.4. American mink has been recorded on the Royal Military Canal (Young *et al.*, 2015).

HABITAT ASSESSMENT

Badger

5.5. The application site provides burrowing opportunities for badger.

Water vole

5.6. The adjacent section of the Royal Military Canal is suitable for water vole.

5.7. The steep soil banks, dense emergent and marginal vegetation, and deep canal channel provide suitable burrowing, shelter and foraging opportunities.

5.8. The application site itself does not support any waterbodies. However, the on-site habitats provide terrestrial foraging opportunities for water vole, including suitable winter forage in the form of grey willow (*Salix cinerea*) and goat willow (*Salix caprea*).

Otter

5.9. The habitat characteristics described above, in combination with the abundant fish population within the Royal Military Canal, make this watercourse section suitable for otter.

5.10. The application site itself does not support any waterbodies. However, the on-site habitats provide terrestrial foraging opportunities and suitable shelter (vegetation and mammal burrows) for otter. Large mammal burrows provide opportunities for denning.

Hedgehog

5.11. The application site provides cover, foraging, nesting and hibernation opportunities for hedgehog. Existing large mammal burrows provide the most suitable hibernation sites.

ADDITIONAL SURVEYS

Badger

5.12. When first located, during the mammal walkover, the three burrow systems did not appear to be in use by any large mammal species. Twigs, leaves and loose soil were present in tunnel entrances.

5.13. During the subsequent monitoring of these burrows over almost a five-month period, no evidence of 'current use' by badger was observed.

5.14. One of the burrow systems was confirmed as a disused (historic) badger sett. Badger hair was found in compacted earth in one tunnel entrance (see Target note 1 on Figure 1).

5.15. No evidence of recent or historic use of the other two burrow systems by badger was identified during the monitoring period.

5.16. Badger faeces were recorded on the canal towpath adjacent to the application site during one of the bat survey visits (6th June 2016).

Water vole

5.17. No evidence of water vole presence was recorded during the survey.

Otter

5.18. No evidence of otter presence was recorded during the survey.

American mink

5.19. No evidence of American mink presence was recorded during the survey.

ADDITIONAL INFORMATION

5.20. Correspondence with Laura Pinkham, the Grounds Maintenance Manager for Shepway District Council confirmed that an American mink population is present on the Royal Military Canal (L Pinkham, *pers. comm.*, 13th September 2016).

5.21. In conversation, local birdwatchers also reported presence of American mink on the canal section that is located adjacent to the application site.

6. PHOTOGRAPHS

Photo 1: View west along southern bank of Royal Military Canal. Bankside habitats are suitable for water vole and hedgehog.

Photo 2: View east along southern bank of Royal Military Canal. Bankside habitats are suitable for water vole and hedgehog. On-site habitats (right of picture) are suitable for hedgehog.

Photo 3: Mammal burrow in north-west corner of application site (T1). Badger hair found in entrance. Sturdy sticks secured over entrance for monitoring purposes.

Photo 4: On-site habitats (grass, ruderal herbs and scrub) suitable for hedgehog.

7. EVALUATION

Badger

7.1. No active badger setts were recorded on-site.

7.2. Badger is a common and widespread species. It is not a SPI, it is common in Kent where there is suitable habitat for establishment of setts (Young *et al.*, 2015), and is of low conservation importance.

7.3. Badgers use the adjacent canal towpath for foraging and may also use on-site habitats for foraging.

7.4. Given that no active badger setts were identified on the application site and only one badger scat was found on one occasion in the adjacent canal corridor, the application site is likely to be of ZoI-level importance for foraging badgers. For this reason, badger has been scoped out of the assessment of 'likely significant effects' associated with the proposed development.

Water vole

7.5. No evidence of water vole was recorded on the adjacent section of the Royal Military Canal.

7.6. In addition, there is a population of American mink present on the Royal Military Canal, which further decreases the likelihood of water vole presence.

7.7. Based on a likely absence of water vole within the ZoI of the proposed development, this species has been scoped out of the assessment of likely significant effects for the proposed development.

Otter

7.8. No evidence of otter was recorded on the adjacent section of the Royal Military Canal.

7.9. In addition, the survey area is outside of the known distribution of otter in Kent.

7.10. Based on a likely absence of otter within the ZoI of the proposed development, this species has been scoped out of the assessment of likely significant effects for the proposed development.

Hedgehog

7.11. No hedgehogs were recorded during nocturnal / diurnal surveys that were undertaken for other species. In addition, the data search did not return any records of hedgehog located within 1km of the application site.

7.12. However, hedgehog presence has been recorded within 5km of the application site (Young *et al.*, 2015), and the application site provides suitable habitat for this species.

7.13. The adjoining Royal Military Canal corridor provides an extensive area of suitable habitat for hedgehog. This canal corridor connects on to numerous residential gardens, as well as to scrub, hedgerow, farmland and grassland habitats.

7.14. Therefore, if hedgehog is present in the local landscape, this species may utilise on-site habitats.

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9. APPENDIX A: SUMMARY OF LEGISLATION AND NATIONAL PLANNING POLICY

9.1. The specific legal protection afforded to water vole, otter, badger and hedgehog can be found within the Sections and Schedules of the relevant legislation and relevant case law.

Water vole

9.2. Water vole is listed on the Wildlife and Countryside Act 1981 (as amended), and it receives 'full' legal protection. The Act includes the following offences: -

- Intentional killing, taking (capture) or injury of a water vole;
- Possession or control of any live or dead water vole, or any part or derivative;
- Intentional or reckless damage or destruction of a water vole's place of shelter or protection;
- Intentional or reckless disturbance of a water vole whilst it is occupying a structure or place which it uses for shelter and / or protection; and
- Intentional or reckless obstruction of access to a water vole's place of shelter and / or protection.

Otter

9.3. European otter is protected by the Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended). This legislation includes the following offences: -

- Damage or destruction of a breeding or resting place used by otter;
- Deliberate capture, injury or killing of an otter;
- Deliberate disturbance of an otter, and in particular disturbance likely to impair an animal's ability to survive, breed or nurture young, and disturbance likely to have a significant effect on local distribution and abundance;
- Intentional or reckless disturbance of an otter whilst it is occupying a structure or place used for shelter and / or protection (Wildlife and Countryside Act 1981 (as amended)); and
- Intentional or reckless obstruction of access to any structure or place that an otter uses for shelter and / or protection (Wildlife and Countryside Act 1981 (as amended)).

Badger

9.4. Badgers are protected by The Protection of Badgers Act 1992 (as amended). This legislation includes the following offences: -

- Wilful killing, injury, ill-treatment or taking (capture) of a badger;
- Interference with a badger sett (including damage, destruction and / or obstruction of access); and
- Disturbance of a badger whilst it is occupying a sett.

American mink

9.5. Schedule 9 of The Wildlife and Countryside Act 1981 (as amended) lists plant species for which it is an offence for a person to plant, or otherwise cause to 'grow in the wild', and animal species for which it is an offence to 'release into the wild'.

9.6. American mink is listed on Schedule 9 of The Wildlife and Countryside Act 1981 (as amended).

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

9.7. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

9.8. S41 lists 56 Habitats of Principal Importance and 943 Species of Principal Importance.

9.9. Hedgehog, water vole and otter are listed as Species of Principal Importance.

National Planning Policy Framework (NPPF)

9.10. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed - Conserving and enhancing the natural environment (Paragraphs 109 to 125).

9.11. Of relevance are the following statements:

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things… *'minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, ...'* (Paragraph 109); and
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Paragraph 113).

9.12. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Paragraph 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequate mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

9.13. The presumption in favour of sustainable development (Paragraph 14) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Paragraph 119).

9.14. The above policies 'encourage' ecological improvements 'where possible.' Therefore, this is not an absolute requirement at planning.

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TECHNICAL APPENDIX 7.7
BAT REPORT

PRINCES PARADE
HYTHE, KENT

REF: 3609-LLB-ZZ-XX-RP-EC-0003

STATUS: PLANNING

DOCUMENT ISSUED: 14/08/2017

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CONTENTS

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1. EXECUTIVE SUMMARY

S.1 The total hybrid application site is c.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

S.2 There are no structures or trees suitable for roosting bats on the application site.

S.3 The application site supports negligible, low, moderate and high-quality bat foraging habitat. The adjacent section of the Royal Military Canal supports high-quality foraging habitat.

S.4 A bat activity survey was undertaken on the application site and the adjacent canal section in the period May to September 2016 (inclusive). This survey comprised activity transects, fixed-point survey visits and static monitoring (use of unmanned detectors).

S.5 The survey area was divided into two survey compartments. Survey compartment one comprises the adjacent section of the Royal Military Canal and vegetation on the northern embankment on the application site. Survey compartment two comprises the remainder of the application site - south of the northern embankment.

S.6 The key findings of the survey and assessment are: -

- Eight bat species were confirmed using the survey area. It is possible that additional Myotis species are also present;
- There was a significant difference in the recorded levels of bat activity between the survey compartments. Bat activity was higher within survey compartment one;
- Four species of bat were recorded 'regularly' foraging within survey compartment one. Multiple animals were typically recorded foraging within this survey compartment;
- One bat species was recorded regularly foraging within compartment two. Occasional passes by individual animals were recorded within this compartment;
- Survey compartment one is of county importance for foraging bats; and
- Survey compartment two is of ZoI level importance for foraging bats.

S.7 It is acknowledged that, due to the difficulties associated with detecting brown long-eared bats during field surveys, this species could forage within survey compartment two. If this species does utilise compartment two for foraging, this compartment would in fact be of local importance for foraging bats. This uncertainty is addressed in the Ecology Chapter of the Environmental Statement.

S.8 Survey compartment one is also suitable for commuting bats, although no evidence of regular commuting was recorded during the survey visits.

S.9 To ensure delivery of a coordinated and integrated ecology strategy, avoidance, mitigation and compensation measures relating to bats are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

2. INTRODUCTION

APPLICATION SITE

2.1. The total hybrid application site is *c*.10.7ha in area. It is bounded to the north by the Royal Military Canal, to the east by residential housing and flats, to the south by Princes Parade and to the west by the Hythe Imperial golf course.

SCOPE OF TECHNICAL APPENDIX

2.2. This report details the method and results of a bat activity survey of the application site and the adjacent section of the Royal Military Canal in the period May to September 2016.

2.3. This Technical Appendix also provides an assessment of the ecological importance of the application site and the adjacent canal section for foraging and commuting bats - including a comparative assessment of the importance of these two areas.

2.4. To ensure delivery of a coordinated and integrated ecology strategy, avoidance, mitigation, and compensation measures relating to bats are not detailed in this report. Instead, these measures are detailed in the Ecological Mitigation and Enhancement Plan (Technical Appendix 7.8).

OBJECTIVES

2.5. The objectives of the survey and report are to: -

- Identify any opportunities for bat roosting on the application site;
- Determine whether foraging and/or commuting bats utilise habitats within the Zone of Influence (ZoI) of the proposed development (see ZoI section for details of ZoI extent);
- Determine which bat species utilise habitats within the ZoI of the proposed development;
- Determine whether any bat species 'regularly' utilise habitats within the ZoI for foraging and, if so, which species; and
- Assess the importance of on-site habitats, and the adjacent section of canal for foraging and commuting bats - including a comparative assessment of these two survey areas.

3. METHOD

DESK STUDY

3.1. A data search was conducted by Kent and Medway Biological Records Centre (KMBRC) in September 2015. A 1km search radius, measured from the application site boundary, was applied.

3.2. The data search included a search for records of bats (roosts and general activity).

3.3. A search of the Multi-Agency Geographic Information for the Countryside (MAGIC) website was also undertaken - to identify any records of granted bat European Protected Species Mitigation (EPSM) licences located within 5km of the application site.

HABITAT ASSESSMENT

3.4. An initial ecological assessment of the application site, and the adjacent canal section, was conducted by David W. Smith BSc (Hons), PhD, MCIEEM on 14th September 2015.

3.5. David is a full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has over ten years of ecological consultancy experience.

3.6. The results of this initial assessment were used to determine the suitability of the application site, and the adjacent canal section for roosting, foraging and commuting bats.

BAT ACTIVITY SURVEY

3.7. A bat activity survey was undertaken between May and September 2016 (inclusive). This survey encompassed the application site and the adjacent section of the Royal Military Canal (from the footbridge adjacent to the western end of the application site to the eastern end of the canal).

3.8. The activity survey was designed and led by Samuel Durham BSc (Hons), ACIEEM. Samuel has over seven years of bat survey experience, including design and implementation of bat activity surveys. Samuel was present on every survey visit conducted by surveyors.

3.9. The survey method was based on BCT (2016) guidance and the professional judgement of an experienced ecologist. The survey was designed to provide sufficient information to answer the questions posed in the objectives section of this report.

3.10. Three separate survey methods were used. Experienced bat surveyors were used for each visit.

3.11. To allow comparative assessment of the importance of different habitats for foraging and/or commuting bats, the survey area was divided into two compartments.

3.12. Survey compartment one comprises the canal corridor, including the vegetation on the northern embankment on the application site (the slope between the site 'platform' and the canal towpath).

3.13. Survey compartment two comprises the main area of the application site, south of the northern embankment.

3.14. The locations of these survey compartments are shown on the survey plan.

Activity transects

3.15. Activity transects were undertaken between May and September (inclusive). One survey visit was completed by two surveyors in each month across this period.

3.16. Two transect routes were followed, one within each survey compartment - to allow a comparative assessment of use between these areas by foraging and/or commuting bats.

3.17. During each visit, two surveyors walked the pre-determined routes (one surveyor per route) and recorded bat activity.

3.18. Transect route 1 followed the footpath on the southern edge of the Royal Military Canal, from the eastern end of the canal up to the footbridge adjacent to the western end of the application site. The surveyor observed and recorded bat activity on the canal and along the northern edge of the application site - including any movement of bats between the two survey compartments.

3.19. Transect route 2 followed the earth bund that is located adjacent to Princes Parade, from the eastern end of the application site to the western end of the application site. The surveyor observed and recorded bat activity on the application site. The bund acted as a vantage point over on-site habitats.

3.20. Each transect route comprised ten pre-determined sampling points and nine walks between these points. Surveyors spent six minutes at each survey point and six minutes on each walk.

3.21. Transects commenced at sunset and concluded 90 to 120 minutes after sunset.

3.22. The transect route was reversed every survey visit, to account for any time-space recording bias.

3.23. Surveyors were equipped with a BatBox Duet bat detector and an Edirol Recording device. Surveyors recorded bat activity on a standard Lloydbore bat activity survey sheet.

3.24. The activity transects, in combination with the use of static bat detectors, generated sufficient survey data to allow an assessment of use of the application site by foraging and/or commuting bats.

3.25. The transect routes are shown on the survey plan that is provided in this report.

Fixed-point survey visits

3.26. Fixed-point visits were undertaken within survey compartment one between June and September 2016 (inclusive). One visit was completed by three surveyors in each month across this period.

3.27. During each visit, surveyors were positioned at pre-determined points (one surveyor per point) on the canal towpath. Fixed-point 1 was located at the eastern end of the canal, south of the play area. Fixed-point 2 was located adjacent to / on the footbridge in the centre of the survey area. Fixed-point 3 was located adjacent to / on the footbridge at the western end of the application site.

3.28. Survey visits commenced either fifteen minutes before sunset or at sunset, and concluded 90 to 120 minutes after sunset.

3.29. Surveyors were equipped with a BatBox Duet bat detector and an Edirol Recording device. During the September visit, one surveyor was equipped with a Batlogger M (combined bat detector and recording device). Surveyors recorded bat activity on a standard Lloydbore bat activity survey sheet.

3.30. These visits were required to allow an assessment of use of the canal corridor by bats - including the direction from which bats entered the survey area.

3.31. Based on the development proposals, this information was required to inform the assessment of 'likely significant effects' upon bats.

3.32. The locations of the fixed survey points are shown on the survey plan that is provided in this report.

3.33. Table 1 provides detail of survey dates, times, temperatures and weather conditions for both the activity transects and the fixed-point survey visits.

Table 1: Details of survey visits undertaken

Date	Survey method	Areas covered	Sunset time	Start time	End time	Weather conditions	Surveyors
16.05.2016	Transect	Both survey compartments	20:46	20:46	22:40	11°C, cloudy, light breeze, no rain.	Samuel Durham Kathryn Tennant
06.06.2016	Transect	Both survey compartments	21:06	21:06	23:00	15°C, light breeze, no rain.	Samuel Durham Davey Monk
27.06.2016	Fixed-point	Survey compartment one	21:14	21:14	23:15	17°C, cloudy, still, no rain.	Samuel Durham Kathryn Tennant Davey Monk
18.07.2016	Fixed-point	Survey compartment one	21:01	20:46	22:31	19°C, no cloud, still, no rain.	Samuel Durham Kathryn Tennant Lucy Lincoln
19.07.2016	Transect	Both survey compartments	21:00	21:00	22:54	23°C, no cloud, light breeze, no rain.	Samuel Durham Kathryn Tennant
22.08.2016	Transect	Both survey compartments	20:08	20:08	22:02	16°C, no cloud, breezy, no rain.	Samuel Durham Kathryn Tennant
23.08.2016	Fixed-point	Survey compartment one	19:59	19:59	21:58	23°C, no cloud, still, no rain.	Samuel Durham Kathryn Tennant James Madden
19.09.2016	Transect	Both survey compartments	19:00	19:00	20:54	17°C, 30% cloud, still, no rain.	Samuel Durham Kathryn Tennant
20.09.2016	Fixed-point	Survey compartment one	18:58	18:59	20:28	14°C, 80% cloud, light breeze, no rain.	Samuel Durham Kathryn Tennant Lucy Lincoln

Static detectors

3.34. To provide additional survey data and generate a comprehensive 'species list' as possible, SongMeter3 (SM3) static bat detectors were positioned on the application site and the adjacent canal section. Two detectors were left *in situ* between 22nd and 26th June 2016 (inclusive), 24th and 28th August 2016 (inclusive) and 22nd and 26th September 2016 (inclusive). This work was conducted by Corylus Ecology.

3.35. The data generated by these static detectors was also used for comparative analysis of bat activity within the two survey compartments. This entailed a comparison of the number of bat passes recorded of each species in each compartment during each deployment of the SM3 detectors.

3.36. One SM3 detector was positioned within bankside habitats on the southern bank of the canal, *c*.20m east of the central footbridge. This was static sampling point one, within survey compartment one.

3.37. As second SM3 detector was positioned in the approximate east-west centre of the application site, *c*.20m east of the central pathway, on the southern edge of a block of tall, dense scrub. This was static sampling point two, within survey compartment two.

3.38. The detectors were deployed during periods of suitable weather. The weather remained suitable for bat activity for all three of the deployment periods.

3.39. The locations of the static sampling points are shown on the survey plan provided in this report.

Sound analysis

3.40. To assist with species identification, targeted sound analysis was undertaken on recordings made during the activity transects and fixed-point surveys.

3.41. BatSound 4.2 and BatExplorer sound analysis software was used for recordings made using BatBox Duets and Edirols.

3.42. Kaleidoscope sound analysis software was used for the recording made using the Batlogger M.

3.43. Detailed sound analysis was also undertaken on the recordings generated by the SM3 detectors. The sound analysis of the SM3 recordings was conducted by Corylus Ecology.

ASSESSMENT AND EVALUATION

3.44. The Bat Conservation Trust's Survey Guidelines (2016) and the Bat Workers Manual (JNCC, 2004) have been used to: -

- Assess the suitability of the application site and the adjacent section of the Royal Military Canal for foraging and commuting bats; and
- Inform the scope of the survey work required to assess bat use of the application site and adjacent canal section.

3.45. BCT (2016) was used to inform an assessment of the importance of the surveyed habitats for foraging and commuting bats.

3.46. In addition, published selection criteria for Local Wildlife Sites (LWS) in Kent (KNP, 2015) were used to determine whether the application site and adjacent canal section are of county-level importance for foraging bats. This document states that a site can be designated as a LWS if it is used as a *'regular feeding and foraging site for an assemblage of four species or more.'* Therefore, 'regular' feeding / foraging by four or more bat species was taken as a threshold for county importance.

3.47. Survey sheets and sound files generated during the activity transects and fixed-point surveys were analysed to determine which species were recorded foraging during each visit. Any recorded 'feeding buzzes', or behaviour indicative of foraging, was taken as evidence of foraging.

3.48. For the purposes of this assessment, if several individuals of a species were confirmed foraging within three or more separate months within the survey period, this was classed as 'regular foraging.'

3.49. The importance of the habitats within the survey area for foraging and/or commuting bats was assessed within a geographical context, based on CIEEM (2016). The levels of importance used in this assessment are: -

- International and European;
- National;
- Regional;
- County;
- Local; and
- ZoI.

ZONE OF INFLUENCE (ZOI)

3.50. The potential impact(s) of a development are not always limited to the boundaries of the site concerned. A development may also have the potential to impact on ecologically important features located beyond the site boundaries. The area over which a development may impact ecologically important features is known as the Zone of Influence (ZoI).

3.51. The ZoI is determined by the source / type of impact, the potential pathway(s) for those impacts and the location and sensitivity of the ecologically important feature(s) beyond the site boundary.

3.52. Potential sources of impact include direct loss of low, moderate and high-quality bat foraging habitats, and degradation and fragmentation of high-quality bat foraging habitat within the canal corridor through light spill and/or water-borne pollution.

3.53. Published data regarding the Core Sustenance Zones (CSZs) (BCT, 2016) of bat species recorded during the survey was used to inform the ZoI for foraging bats.

3.54. The survey data was also used to inform the ZoI for foraging bats.

3.55. The bat species most frequently recorded within the survey area - and likely to be most dependent on habitats within the canal corridor, were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*) and Daubenton's bat (*Myotis daubentonii*).

3.56. High levels of Nathusius' pipistrelle (*P. nathusii*) activity were also recorded during static monitoring.

3.57. BCT (2016) gives CSZs for these species as 2km, 3km, 2km and 3km respectively.

3.58. Bats were recorded entering the survey area from the west (along the canal corridor). It is therefore likely that bats that roost to the west of the application site commute along the canal to forage within survey compartment one.

3.59. No bats were directly observed entering the survey area from the north and east. In addition, the M20 motorway - which may act as a semi-permeable barrier to bat movement, is located *c*.2km north of the application site.

3.60. Any impacts upon the adjacent canal corridor (e.g. through lighting of what is currently high-quality, dark bat foraging habitat) may therefore indirectly impact upon bats that roost within these distances.

3.61. For these reasons, the ZoI of the proposed development for foraging and/or commuting bats is likely to extend to *c.*3km west of the application site (along the canal corridor), and 2km north and east.

3.62. The presence of a linear waterway (the canal) may mean that bats commute to the survey area from further afield. However, the above ZoI is considered appropriate and proportionate to the potential impacts of development.

SURVEY LIMITATIONS

3.63. Brown long-eared bat (*Plecoutus autitus*) can be difficult to record in the field. The calls of this species can be quiet and hard to detect. This species can also forage without calling. It is a 'later emerging' species (BCT, 2016), which means that it may not commence foraging until it is too dark for a surveyor to identify the species visually.

3.64. This species was detected once during a fixed-point survey visit and was not recorded during activity transects. This low recording rate is likely to be an underrepresentation of activity by this species. However, this species was recorded via the static monitoring in both late June and August and the static data has been used to inform an assessment of use of the survey area by this species. Multiple passes by this species were recorded. In addition, this species was recorded in early June during an activity survey visit. For these reasons, it is likely that this species regularly uses the canal as a foraging site and this has been factored into the assessment of 'likely significant effects' on bats.

3.65. Daubenton's bat can be identified in the field through observation of its foraging technique. However, other Myotis species cannot be easily and reliably differentiated during field work or via sound analysis. It is likely that other Myotis species utilise habitats within the survey area.

3.66. For instance, the EPSM search identified a record of a roost of whiskered bats (*M. mystacinus*) located within *c.*220m of the application site. It is therefore probable that this species (if still present) forages within the survey area. However, the presence of additional bat species would not affect the geographic level of importance attributed to habitats within the survey area for foraging bats, and would not materially affect the mitigation proposed within Technical Appendix 7.8.

3.67. In addition, the application site is outside of the known range of 'rare' bat species listed on Annex II of the European Commission's Habitats Directive (Council Directive 92/43/EEC) (Young *et al.*, 2015). For these reasons, the potential for presence of additional bat species is not considered a material limitation to the assessment of 'likely significant effects' on bats.

3.68. It is likely that the static detectors recorded some passes by bats that were outside of the survey compartment in which they were located. However, the static detector data has been used to give a broad overview of comparative bat activity patterns between the survey compartments. It has not been used to generate definitive counts of recorded bat passes within a given area. For this reason, this limitation is not considered material to the assessment of 'likely significant effects' upon foraging bats.

3.69. There are no material limitations to the survey or assessment.

4. SURVEY PLAN

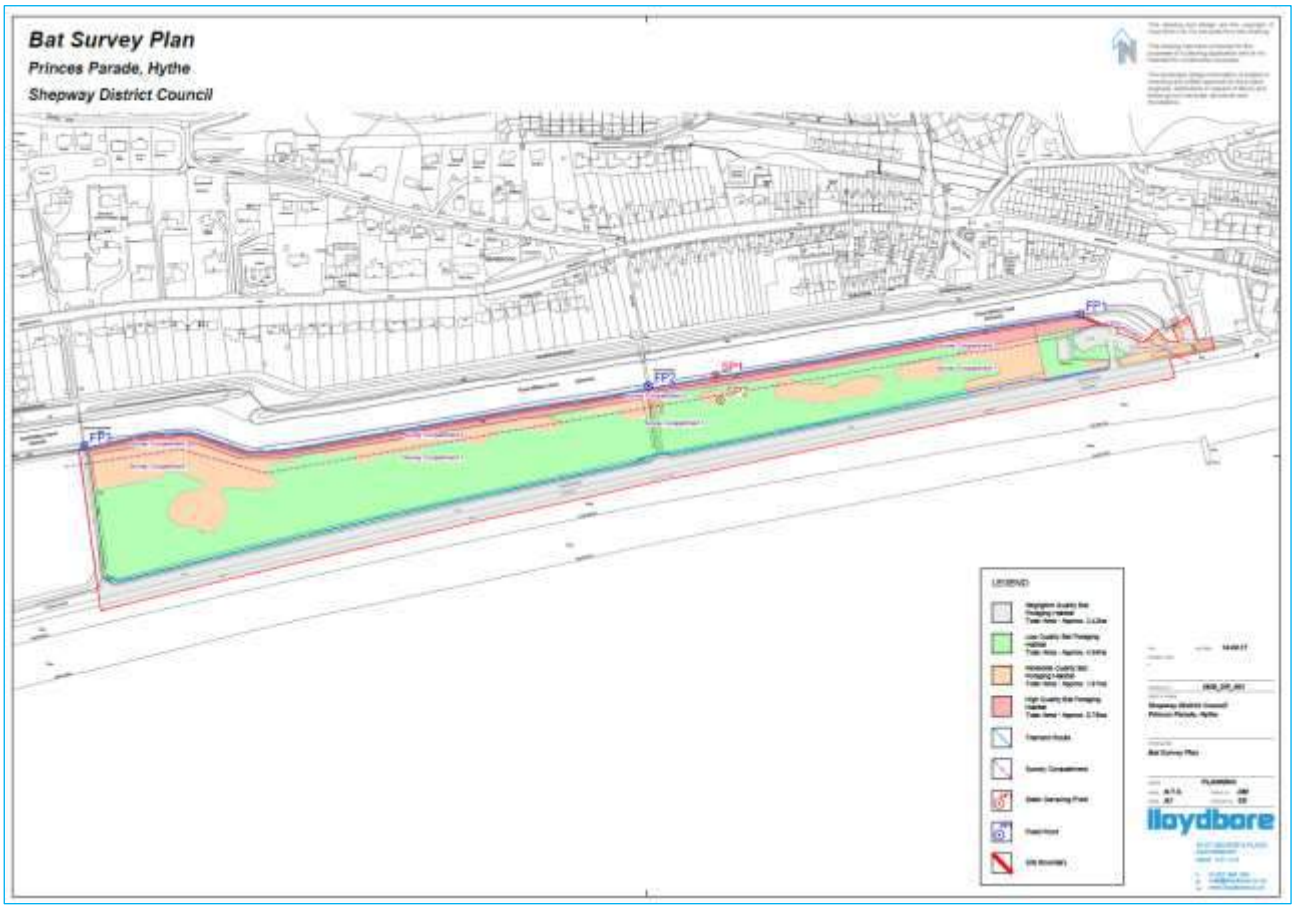

Fig. 1: Plan showing location and arrangement of negligible, low, moderate and high-quality bat foraging habitats. Survey compartments, transect routes, fixed survey points and static sampling points also shown. A larger version of this survey plan is provided in Appendix D.

5. PHOTOGRAPHS

Photo 1: View west along southern bank of Royal Military Canal.

Photo 2: View east along southern bank of Royal Military Canal.

Photo 3: Grassland along southern edge of survey site, adjacent to Princes parade. Northern scrub visible on left.

6. RESULTS

DESK STUDY

6.1. The data search returned records of nine bat species located within 5km of the application site. These included three recent records of bat maternity roosts.

6.2. One of these records relates to a common pipistrelle maternity roost comprising one animal in 2008. The grid reference for this record places it on the application site. However, the application site does not support any features suitable for bat roosting. In addition, based on a review of historic aerial imagery, the application site did not support any structures in 2008. For these reasons, this record is likely to be inaccurate, and is therefore not considered in the ecological impact assessment on bats.

6.3. A 2008 record of a long-eared bat (*Plecotus* sp.) maternity roost was identified *c.*15m north of the application site. The grid reference provided with this record places it within the channel of the Royal Military Canal. It is therefore assumed that this record could relate to a property north of the canal.

6.4. A 2011 record of a soprano pipistrelle maternity roost, comprising 51 animals, was identified *c.*2.2km linear distance west of the application site, close to the Royal Military Canal. The length of canal between the application site and the approximate location of this record is *c.*2.3km.

6.5. The data search did not return any recent records of bat hibernation or swarming roosts within 5km of the application site.

6.6. A search of the MAGIC website identified three records of non-breeding bat roosts located within 5km of the application site.

6.7. The closest EPSM record was a roost of Daubenton's bat and whiskered bat located within 500m of the northern boundary of the application site.

6.8. The other records relate to a roost of brown long-eared bat and common pipistrelle located *c.*1.5km north-east of the application site, and a roost of common pipistrelle and Nathusius' pipistrelle located *c.*1.9km west of the application site.

6.9. If still present, bats using the above roost sites may also use habitats within the survey area for foraging and/or commuting.

HABITAT ASSESSMENT

6.10. There are no structures present on the application site, and there are no trees suitable for roosting bats on the application site. For these reasons, the application site does not provide any opportunities for bat roosting.

6.11. Survey compartment one provides high-quality bat foraging habitat. The canal, and the associated aquatic, emergent, marginal and scrub vegetation, provide a range of opportunities for invertebrates - which in turn provide prey items for bats.

6.12. Survey compartment two supports low and moderate-quality bat foraging habitat. The ruderal vegetation that dominates this compartment provide less extensive and diverse opportunities for invertebrates than those provided within survey compartment one. Survey compartment two therefore provides a less substantial foraging resource for bats.

ACTIVITY SURVEY

6.13. A concise summary of bat activity within the survey area is provided in this report section.

6.14. A detailed summary of the results of the activity transects and fixed-point survey visits is provided in Appendix B. A detailed summary of the results of the static monitoring is provided in Appendix C.

Survey compartment one

6.15. In total, eight species of bat were confirmed using survey compartment one.

6.16. Regular foraging by multiple animals was recorded for Daubenton's bat and common pipistrelle. Low numbers of soprano pipistrelle, noctule and serotine were regularly recorded foraging. A foraging brown long-eared bat was recorded. Nathusius' pipistrelle was recorded but foraging was not confirmed for this species during the activity transects or fixed-point survey visits.

6.17. The static monitoring confirmed that survey compartment one is regularly used by common, soprano and Nathusius' pipistrelle and Myotis species. Noctule (*Nyctalus noctula*), serotine (*Eptesicus serotinus*), Leisler's bat (*Nyctalus leisleri*) and brown long-eared bat were also recorded.

6.18. For all species recorded by the static detectors, the average number of bat passes per hour was considerably higher at sampling point one (on the canal) than it was at sampling point two (on the application site south of the northern embankment) during the same monitoring periods.

6.19. Based on the results of the static monitoring, activity transects and fixed-point survey visits, bat activity was considerably lower in September than it was between June and August.

Survey compartment two

6.20. In total, seven species of bat were confirmed using habitats in or close to survey compartment two.

6.21. Common pipistrelle, serotine and noctule were recorded during activity transects.

6.22. Very low levels of common pipistrelle activity (occasional passes by individual animals) were recorded across the transect visits. Most of these bats were recorded foraging close to the northern boundary scrub. It is likely that these bats were also foraging within the adjacent canal corridor.

6.23. On one occasion, a single common pipistrelle was recorded foraging along the on-site grassland adjacent to Princes Parade.

6.24. Very low levels of serotine and noctule activity (occasional high passes by low numbers of animals) were recorded across the survey period. These passes were by bats that were also foraging over the adjacent canal corridor.

6.25. A comparison of static monitoring data confirmed that common pipistrelle, soprano pipistrelle and serotine were all recorded less frequently at sampling point two (detector located on application site) than they were at sampling point one (detector located in adjacent canal section).

6.26. Low levels of activity by other species were recorded at sampling point two during the static monitoring. A single pass by a Leisler's bat was recorded on one occasion, a minor peak in Nathusius' pipistrelle activity was recorded in August and low numbers of brown long-eared bat passes were recorded in June.

6.27. As per the limitations section of this report, it is important to note that the static detector may have picked up calls emitted by bats outside of survey compartment two.

7. EVALUATION

7.1. Four bat species - common pipistrelle, soprano pipistrelle, noctule and Daubenton's bat were regularly recorded foraging within survey compartment one.

7.2. In addition, serotine and brown long-eared bats were recorded foraging on individual occasions.

7.3. The number of Nathusius' pipistrelle passes recorded at static sampling point one indicates that this species is very likely to forage within survey compartment one.

7.4. Based on the high quality of the habitats present, the levels of bat activity recorded, and the number of species confirmed or likely to be foraging within survey compartment one, habitats within this survey compartment are assessed as being of county importance for foraging bats.

7.5. Only one bat species (common pipistrelle) was confirmed foraging within survey compartment two. Most bat activity was concentrated along the northern edge of this compartment. These bats were observed moving back and forth between the two survey compartments, and it is likely that they were also foraging within survey compartment one.

7.6. On one occasion, a single common pipistrelle bat was recorded foraging away from the northern edge of survey compartment two (i.e. it was recorded foraging exclusively within compartment two). This bat was recorded foraging over the strip of grassland that is located adjacent to Princes Parade.

7.7. The other two species recorded within this compartment (i.e. compartment two) by field surveyors (noctule and serotine) were in fact observed foraging over the adjacent canal. These species were detected during the activity transect of compartment one because of the height and volume of their calls.

7.8. Based on the low and moderate quality of the habitats present, the low levels of bat activity recorded, and the low number of species confirmed foraging within survey compartment two (one species - common pipistrelle), habitats within this survey compartment are assessed as being of ZoI level importance for foraging bats.

7.9. It is acknowledged that, due to the difficulties associated with detecting brown long-eared bats during field surveys, this species could forage within survey compartment two. If this species does utilise compartment two for foraging, this compartment would in fact be of local importance for foraging bats. This uncertainty is addressed in the Ecology Chapter of the Environmental Statement.

7.10. The canal corridor is suitable for commuting bats. However, no evidence of regular commuting by bats was observed during the surveys. In addition, the assessment of 'likely significant effects' upon foraging bats, and the mitigation and compensation measures proposed in Technical Appendix 7.8, will effectively account for any use of this habitat by commuting bats.

8. REFERENCES

Bat Conservation Trust (BCT) (2016) *Bat surveys: Good Practice Guidelines*. 2nd edition. Bat Conservation Trust, London.

Chartered Institute for Ecology and Environmental Management (CIEEM) (2013). *Guidelines for Preliminary Ecological Appraisal*. Chartered Institute for Ecology and Environmental Management, Winchester.

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Kent Nature Partnership (KNP) (2015). *Local Wildlife Sites in Kent: Criteria for Selection and Delineation.* Version 1.5 (August 2015).

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

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9. APPENDIX A: LEGISLATION AND NATIONAL PLANNING POLICY

9.1. The Conservation of Habitats and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended) afford legal protection to bats.

9.2. The specific legal protection afforded to bats can be found within the Sections and Schedules of the relevant legislation and relevant case law.

9.3. In general, any person and/or activity that: -

- Damages or destroys a breeding or resting place of bats. (This is sometimes referred to as the strict liability or absolute offence);
- Deliberately captures, injures or kills a bat/s;
- Deliberately disturbs bats, and in particular disturbance likely to impair animals ability to survive, breed or nurture young, their ability to hibernate and migrate and disturbance likely to have a significant effect on local distribution and abundance;
- Intentionally or recklessly disturbs a bat/s while occupying a structure or place used for shelter and/or protection (Wildlife and Countryside Act 1981 (as amended)); and
- Intentionally or recklessly obstructs access to any structure or place that bat / bats use for shelter or protection (Wildlife and Countryside Act 1981 (as amended)).

…may be guilty of an offence.

9.4. The legislation applies to bat roosts even when they are not occupied.

9.5. Actions affecting multiple animals can be construed as separate offences and therefore penalties can be applied per animal impacted.

9.6. There are some very specific defences associated with the Conservation of Habitats and Species Regulations 2010 (as amended), however these are unlikely to apply to construction related projects. The Sections of the Regulations provide further details of these defences.

9.7. The Wildlife and Countryside Act (1981) includes defence for those aspects of the legislation that apply to bats. These defences are unlikely to apply to construction related projects and do not apply to those acts included in the Conservation of Habitats and Species Regulations 2010 (as amended). The Schedules of the Act provide further details of defences.

9.8. Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006) requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers, including local and regional authorities, in implementing their duty under Section 40 of the act to have regard to the conservation of biodiversity in England when carrying out their normal functions.

9.9. S41 lists 56 Habitats of Principal Importance and 943 Species of Principal Importance.

9.10. Seven species of bat are listed as Species of Principal Importance under Section 41 of this Act. These are: -

- Barbastelle (*Barbastella barbastellus*);
- Bechstein's bat (*Myotis bechsteinii*);
- Noctule (*Nyctalus noctula*);

- Soprano pipistrelle (*Pipistrellus pygmaeus*);
- Brown long-eared bat (*Plecotus auritus*);
- Greater horseshoe (*Rhinolophus ferrumequinum*); and
- Lesser horseshoe (*Rhinolophus hipposideros*).

National Planning Policy Framework (NPPF)

9.11. In addition to primary legislation, the government published the National Planning Policy Framework on 27 March 2012 to make the planning system less complex and more accessible. Within this, Chapter 11 is headed '*Conserving and enhancing the natural environment'* (Sections 109 to 125).

9.12. Of relevance are the following statements:

- That the planning system should contribute to and enhance the natural and local environment by, amongst other things, '*minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity....'* (Section 109); and
- Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife…will be judged (Section 113).

9.13. When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (Section 118):

- If significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; and
- Opportunities to incorporate biodiversity in and around developments should be encouraged.

9.14. The presumption in favour of sustainable development (para. 14 of the Framework) does not apply where development requiring appropriate assessment under the Birds or Habitats Directives is being considered, planned or determined (Section 119).

10. APPENDIX B: DATA SUMMARY: TRANSECTS AND FIXED-POINTS

Table 2: Summary of survey data recorded within survey compartment one during transects and fixed-point survey visits

Date	Survey method	Species recorded	Foraging / feeding confirmed?	Summary of activity
16.05.2016	Transect	Common pipistrelle	Yes	Regular passes by multiple animals from *c.*20mins after sunset to end of visit.
		Noctule	Yes	Occasional high passes by one to two animals for first half of visit.
		Daubenton's bat	Yes	Near constant foraging by at least five animals from c.70mins after sunset to end of visit.
06.06.2016	Transect	Common pipistrelle	Yes	Near constant foraging by one to three animals from *c.*55mins after sunset to end of visit.
		Soprano pipistrelle	Yes	Occasional foraging by at least two animals from *c.*60mins after sunset to end of visit.
		Noctule	No	Occasional passes by one to two animals from *c.*25mins after sunset to *c.*80mins after sunset.
		Daubenton's bat	Yes	Near constant foraging by multiple animals from *c.*1hr after sunset to end of visit.
27.06.2016	Fixed-point	Common pipistrelle	Yes	Frequent passes by at least three animals from *c.*45mins after sunset to end of visit.
		Soprano pipistrelle	Yes	Occasional passes by one to two animals.
		Noctule	Yes	Occasional high passes by one to three animals from *c.*40mins after sunset.
		Serotine	No	Occasional high passes by one to two animals from *c.*30mins after sunset.
		Daubenton's bat	Yes	Regular foraging activity by at least three animals from *c.*1hr after sunset to end of visit.

		Brown long-eared bat	Yes	Occasional passes recorded. Behaviour indicative of foraging.
18.07.2016	Fixed-point	Common pipistrelle	Yes	Regular passes by low numbers of animals from *c*.40mins after sunset to end of visit. Likely to have entered survey area from west.
		Serotine	No	Single pass by one bat *c*.50mins after sunset.
		Daubenton's bat	Yes	Regular foraging passes by low numbers of animals from *c*.1hr after sunset to end of visit. Likely to have entered survey area from west.
19.07.2016	Transect	Common pipistrelle	Yes	Low number of passes by individual animals.
		Serotine	Yes	Single bat briefly foraging over canal at *c*.15mins after sunset.
		Daubenton's bat	Yes	Occasional passes by low numbers of animals from *c*.1hr after sunset to end of visit.
22.08.2016	Transect	Common pipistrelle	Yes	Occasional foraging passes by one to three bats from *c*.55mins after sunset to end of visit
		Soprano pipistrelle	Yes	Regular foraging passes by two to three bats from *c*.55mins after sunset to end of visit
		Daubenton's bat	Yes	Regular foraging passes by two to four bats from *c*.45mins after sunset to end of visit
23.08.2016	Fixed-point	Common pipistrelle	Yes	Constant foraging activity by multiple animals from *c*.45mins and *c*.90mins after sunset. Regular foraging from *c*.90mins to end of visit.
		Soprano pipistrelle	Yes	Constant foraging activity by multiple animals from *c*.45mins and *c*.90mins after sunset. Regular foraging from *c*.90mins to end of visit.
		Nathusius' pipistrelle	No	Brief pass by single animal.
		Noctule	No	Brief pass by single animal.
		Serotine	No	Brief passes by single animal.

		Daubenton's bat	Yes	Constant foraging activity by multiple animals from *c.*45mins and *c.*90mins after sunset. Regular foraging from *c.*90mins to end of visit.
19.09.2016	Transect	Common pipistrelle	Yes	Intermittent activity by one to two bats from c.35mins after sunset to end of visit.
		Soprano pipistrelle	Yes	Intermittent activity by one to two bats from c.35mins after sunset to end of visit.
		Noctule	Yes	Occasional high passes by one to two animals from *c.*15mins to *c.*65mins after sunset.
		Serotine	No	Single high pass by one animals *c.*30mins after sunset.
		Daubenton's bat	No	Intermittent activity by one to two bats from c.80mins after sunset to end of visit.
20.09.2016	Fixed-point	Common pipistrelle	Yes	Intermittent passes by one to four bats from *c.*40mins to *c.*1hr after sunset. Activity reduced to occasional passes by one to two bats between *c.*1hr after sunset and end of visit.
		Soprano pipistrelle	Yes	Intermittent passes by one to two bats from *c.*35mins after sunset to end of visit.
		Serotine	No	Occasional passes *c.*30mins after sunset
		Daubenton's bat	Yes	Intermittent passes by one to three bats from *c.*40mins to *c.*1hr after sunset. Activity reduced to occasional passes by one to three bats between *c.*1hr after sunset and end of visit.

Table 3: Summary of survey data recorded within survey compartment two during activity transects

Date	Survey method	Species recorded	Foraging / feeding confirmed?	Summary of activity
16.05.2016	Transect	Common pipistrelle	Yes	Occasional passes by single animal along northern scrub. Very low activity.
06.06.2016	Transect	Common pipistrelle	No	Very occasional passes by single animal along northern scrub. Very low activity.
19.07.2016	Transect	Common pipistrelle	No	Three brief passes between 90 and 100mins after sunset. Bat possibly not on application site.
22.08.2016	Transect	Common pipistrelle	Yes	Occasional foraging passes by single animal along northern scrub.
		Serotine	No	High occasional passes by single animal.
19.09.2016	Transect	Common pipistrelle	Yes	Occasional foraging passes by single animal along northern scrub. Single animal also recorded foraging over grassland near Princes Parade road.
		Noctule	No	Occasional high passes.

11. APPENDIX C: DATA SUMMARY: STATIC DETECTORS

Table 4: Summary of survey data recorded at static sampling point one, within survey compartment one, using an SM3 static detector. Data provided by Corylus Ecology.

June 2016

SOURCE DATA:	Hythe_2016-06_SMP1_22nd to 26th June 2016												223.93	
													Average Nightly	
Species Ratios:	0.00	0.00	0.38	0.00	0.04	0.00	0.03	0.29	0.25	0.00	0.00	1.00	Passes per Hour	
Sum of Number	Column Labels													
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.pip	P.pyg	P.sp	Pl.aur	Grand Total		
22/06/2016			344	9			111	467	462		6	1399	187.79	
23/06/2016		4	512	3	11		16	466	299		2	1313	176.24	
24/06/2016			719		43		34	405	471			1672	223.93	
25/06/2016		3	534		173		16	424	365			1515	202.90	
26/06/2016			383		52		10	175	53			673	89.93	6572
(blank)	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	7	2492	12	279	0	187	1937	1650	0	8	6572	176.11	

August 2016

SOURCE DATA:	Hythe Data SMP1_24th to 30th August 2016_1min.txt												208.32	
DETECTOR:	N/A												Maximum Nightly	
Species Ratios:	0.00	0.00	0.01	0.00	0.02	0.00	0.02	0.10	0.33	0.50	0.00	0.00	1.00	Passes per Hour
Sum of Number	Column Labels													Average Nightly
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.nath?	P.pip	P.pyg	P.sp	Pl.aur	Grand Total	Passes per Hour
23/08/2016			13		11	4	19	291	388	711		4	1441	144.34	
24/08/2016			8		1	6	53	156	331	453		3	1011	100.76	
25/08/2016		2	20		58	2	47	185	653	1131		6	2104	208.32	
26/08/2016			24		35	4	24	54	351	443		3	938	92.41	
27/08/2016			37		9	1	15	63	483	722			1330	130.18	6824
28/08/2016			10		10		22	41	298	472			853	83.08	
29/08/2016			6		14		10	63	245	220			558	54.09	
(blank)	0	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	2	118	0	138	17	190	853	2749	4152	0	16	8235	115.88	
														Overall Average
														Passes per Hour

September 2016

SOURCE DATA:	Hythe Data SMP1_23rd to 28th September 2016_1min.txt												9.47	
DETECTOR:	N/A												Maximum Nightly	
Species Ratios:	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.03	0.18	0.41	0.01	0.00	1.00	Passes per Hour
Sum of Number	Column Labels													Average Nightly
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.nath?	P.pip	P.pyg	P.sp	Pl.aur	Grand Total	Passes per Hour
22/09/2016							9			1			10	0.84	
23/09/2016							51	4	21	36	1		113	9.47	
24/09/2016							8	2	6	27			43	3.58	
25/09/2016					1		7		10	19	1		38	3.15	
26/09/2016							6			8			14	1.15	218
27/09/2016									4				4	0.33	
(blank)	0	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	0	0	0	1	0	81	6	41	91	2	0	222	3.08	
														Overall Average
														Passes per Hour

Table 5: Summary of survey data recorded at static sampling point two, within survey compartment two, using an SM3 static detector. Data provided by Corylus Ecology.

June 2016

SOURCE DATA:	Hythe_2016-06_SMP2_22nd to 26th June 2016												48.19	
													Average Nightly	
Species Ratios:	0.00	0.08	0.00	0.00	0.02	0.00	0.00	0.46	0.43	0.00	0.01	1.00	Passes per Hour	
Sum of Number	Column Labels													
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.pip	P.pyg	P.sp	Pl.aur	Grand Total		
22/06/2016			1					159	166		5	331	44.43	
23/06/2016		3			5		2	176	171		2	359	48.19	
24/06/2016					10		1	55	51		1	118	15.80	
25/06/2016		72		1	4			53	28		3	161	21.56	
26/06/2016								12	14			26	3.47	995
(blank)	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	75	1	1	19	0	3	455	430	0	11	995	26.66	

August 2016

SOURCE DATA:	Hythe Data SMP2_24th to 30th August 2016_1min.txt												26.53	
DETECTOR:	N/A												Maximum Nightly	
Species Ratios:	0.00	0.00	0.00	0.00	0.06	0.00	0.01	0.07	0.31	0.53	0.00	0.00	1.00	Passes per Hour
Sum of Number	Column Labels													Average Nightly
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.nath?	P.pip	P.pyg	P.sp	Pl.aur	Grand Total	Passes per Hour
23/08/2016					1			2	17	45			65	6.51	
24/08/2016					3	1	1	7	45	70			127	12.66	
25/08/2016					22	1		10	83	152			268	26.53	
26/08/2016					21		1		24	58			104	10.25	
27/08/2016					2	1	7	12	60	107			189	18.50	
28/08/2016					6		3	33	42	29			113	11.01	801
29/08/2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
(blank)	0	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	0	0	0	55	3	12	64	271	461	0	0	866	12.19	
														Overall Average	
														Passes per Hour	

September 2016

SOURCE DATA:	Hythe Data SMP2_23rd to 28th September 2016_1min.txt												2.70	
DETECTOR:	N/A												Maximum Nightly	
Species Ratios:	0.00	0.00	0.00	0.00	0.02	0.00	0.32	0.08	0.22	0.35	0.02	0.00	1.00	Passes per Hour
Sum of Number	Column Labels													Average Nightly
Row Labels	B.bar	E.ser	M.sp	N.lei	N.noc	N.sp	P.nath	P.nath?	P.pip	P.pyg	P.sp	Pl.aur	Grand Total	Passes per Hour
22/09/2016					1		15	2	6	7	1		32	2.70	
23/09/2016							5	3		4			12	1.01	
24/09/2016									7	7			14	1.17	
25/09/2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
26/09/2016									1	4			5	0.41	63
27/09/2016	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
(blank)	0	0	0	0	0	0	0	0	0	0	0	0	0		
Grand Total	0	0	0	0	1	0	20	5	14	22	1	0	63	0.87	
														Overall Average	
														Passes per Hour	

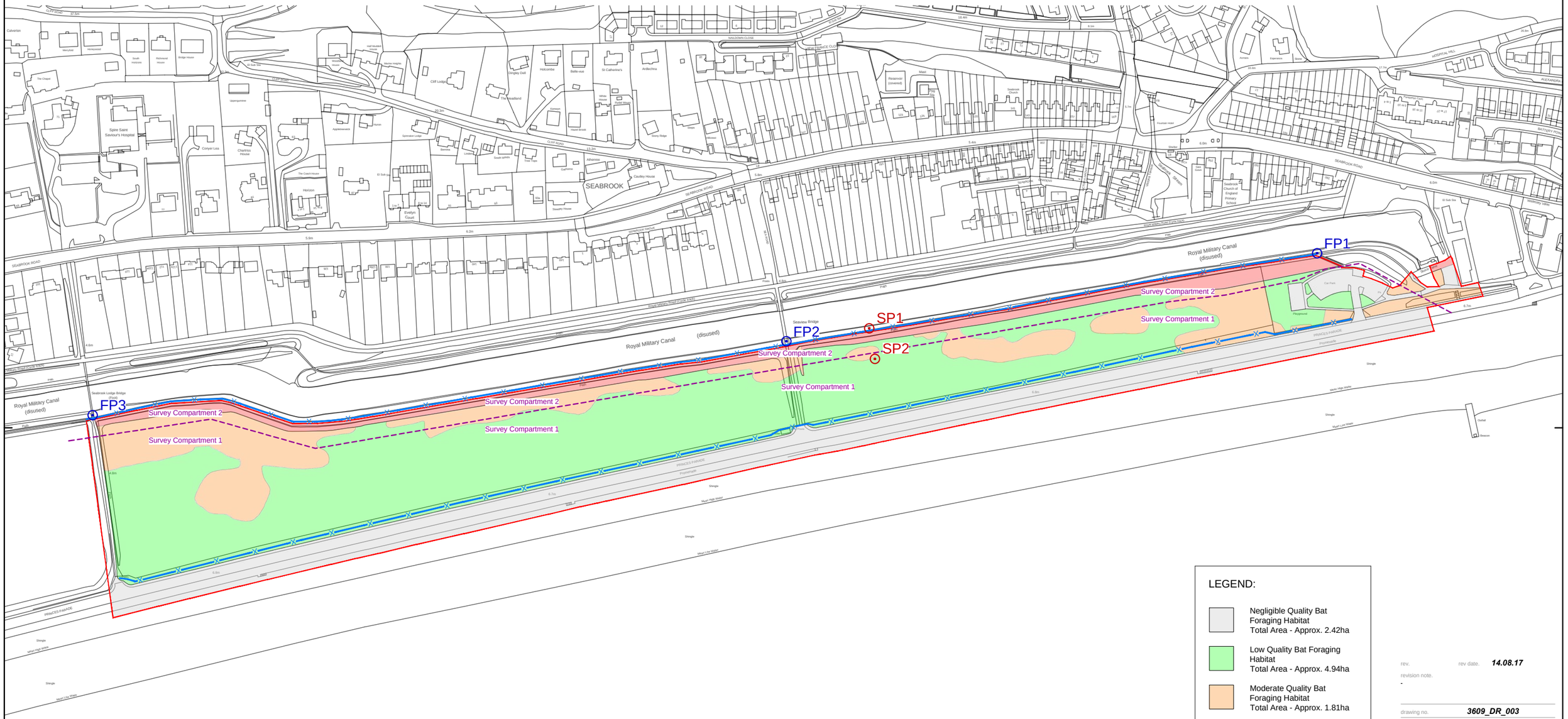
12. APPENDIX D: SURVEY PLAN (LARGE COPY)

See overleaf

Bat Survey Plan

Princes Parade, Hythe

Shepway District Council



LEGEND:

- Negligible Quality Bat Foraging Habitat
  Total Area - Approx. 2.42ha
- Low Quality Bat Foraging Habitat
  Total Area - Approx. 4.94ha
- Moderate Quality Bat Foraging Habitat
  Total Area - Approx. 1.81ha
- High Quality Bat Foraging Habitat
  Total Area - Approx. 0.78ha
- Transect Route
- Survey Compartment
- SP1 — Static Sampling Point
- FP1 — Fixed Point
- Site Boundary

rev. — rev date. ***14.08.17***

revision note.
-

drawing no. ***3609_DR_003***

client & project.
Shepway District Council
Princes Parade, Hythe

drawing title.
Bat Survey Plan

status. ***PLANNING***

scale. ***N.T.S.*** drawn by. ***DM***

sheet. ***A3*** checked by. ***SD***

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TECHNICAL APPENDIX 7.8
ECOLOGICAL MITIGATION AND ENHANCEMENT PLAN

PRINCE'S PARADE

REF: 3609-LLB-ZZ-XX-RP-EC-0002

STATUS: PLANNING

DOCUMENT CREATED: 14/08/2017

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CONTENTS

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1. INTRODUCTION

PROPOSED DEVELOPMENT

1.1. The proposed development will comprise a new leisure centre, *c*.4.9ha of public open space, 150 new homes, new public parking and commercial uses.

1.2. Almost half of the site will be retained as open space, which will comprise: -

- A large informal western space which will be adjacent to the proposed replacement public parking, and potentially contain a strategic play space;
- A central open space which will link with the existing central footbridge that connects to Seabrook Road and provides pedestrian access from the footbridge to the promenade and seafront;
- A linear open space that connects the two larger spaces along the canal bank;
- A hard-landscaped space east of the leisure centre building that will host the relocated existing children's play area; and
- The promenade - which will comprise over a kilometre of widened public promenade.

1.3. Commercial uses are likely to be contained within a single building near the central open space.

1.4. The Prince's Parade road will be realigned from its current location. The realigned road will be located to the north of the proposed built development areas.

1.5. The height of buildings varies across the proposed development. Buildings in the south-east of the site, facing onto the promenade adjacent to the leisure centre, will be a maximum of 3-4 storeys in height. Buildings facing onto the canal in the eastern development zone will be a maximum of 3 storeys. The commercial building on the central open space will be a maximum of 4 storeys. Buildings within the western development zone will typically be a maximum of 2.5 storeys - with a limited amount of 3 storey development facing the central open space and the promenade.

1.6. The detailed description of the proposed development is provided in the submitted Planning Design and Access Statement (PDAS) and the Environmental Statement (ES).

1.7. Copies of relevant Parameter Plans are included in this Technical Appendix. A Parameter Plan showing the boundary between the detailed and outline application sites is included. A Land Use Parameter Plan is also included.

1.8. The total hybrid application site is *c.*10.7ha in area. It is bounded to the north by the Royal Military Canal (RMC), to the south by Princes Parade and to the west by the Hythe Imperial golf course. A plan showing the red-line boundary for the application site is provided within the PDAS.

1.9. The only known off-site impact (i.e. impact beyond the red-line boundary of the application site) is the installation of new surface water drainage infrastructure on the beach. This off-site impact is addressed within this document and, where appropriate, reference has been made to the control measures that will be used. Additional consultation will also be undertaken, to minimise adverse ecological effects upon shingle / foreshore / marine habitats.

SCOPE OF TECHNICAL APPENDIX

1.10. This Technical Appendix details ecological avoidance, mitigation and compensation measures associated with the proposed development at Prince's Parade, Hythe.

1.11. These measures have been designed, and will be implemented, in line with the mitigation hierarchy as set out under Paragraph 118 of the National Planning Policy Framework (NPPF).

1.12. This strategy also details the ecological enhancement measures that have been designed to maximise the importance of the application site for Species of Principal Importance (SPI).

1.13. These enhancement measures have been developed in line with Paragraph 109 of the NPPF, which states that the planning system should contribute to and enhance the natural and local environment by, amongst other things *'providing net gains in biodiversity **where possible***', and Paragraph 118 of the NPPF, which states that *'opportunities to incorporate biodiversity in and around developments should be encouraged'*.

1.14. A single Technical Appendix has been produced to ensure that the measures proposed for different species do not conflict, and that an integrated and coordinated approach is followed.

1.15. The planning submission will comprise a full application for the proposed new leisure centre and an outline application for the remainder of the proposed scheme. However, the entire hybrid application site will be cleared within Phase 1. For this reason, within this document the construction-phase impacts of development have been considered on an entire-site basis. The operational stage impacts of development have also been considered on an entire-site basis.

1.16. Avoidance, mitigation, compensation and enhancement measures have also been proposed for the entire hybrid application site.

OBJECTIVES

1.17. The objectives of this Technical Appendix are to: -

- Document the changes to the layout of the proposed development that have been made because of ecological constraints (see Appendix A);
- Describe the avoidance, mitigation, compensation and enhancement measures incorporated within the proposed development (see Appendix B);
- Examine the balance of habitats available to common toad (*Bufo bufo*), reptiles, breeding birds and foraging and commuting bats prior to and post-development (see Appendix C);
- Describe the potential residual impacts on habitat availability and connectivity (see Appendix D); and
- Provide evidence that the proposed development can maintain the 'favourable conservation status' of local bat populations.

1.18. Only ecological features (species, species groups, habitats and designated sites) that are located within the Zone of Influence (ZoI) of the proposed development and are of 'local' or greater importance are addressed within this document. These features have been carried forward in the assessment of 'likely significant effects' that is detailed in the Environmental Statement.

1.19. Features of ZoI-level importance have not been carried forward in the assessment of 'likely significant effects' in the Environmental Statement. Where applicable, precautionary methods of work relating to these features have been provided within this technical appendix.

1.20. Detail of these features is provided within the ecology chapter of the Environmental Statement and in the relevant ecology Technical Appendices.

2. DEVELOPMENT PLAN

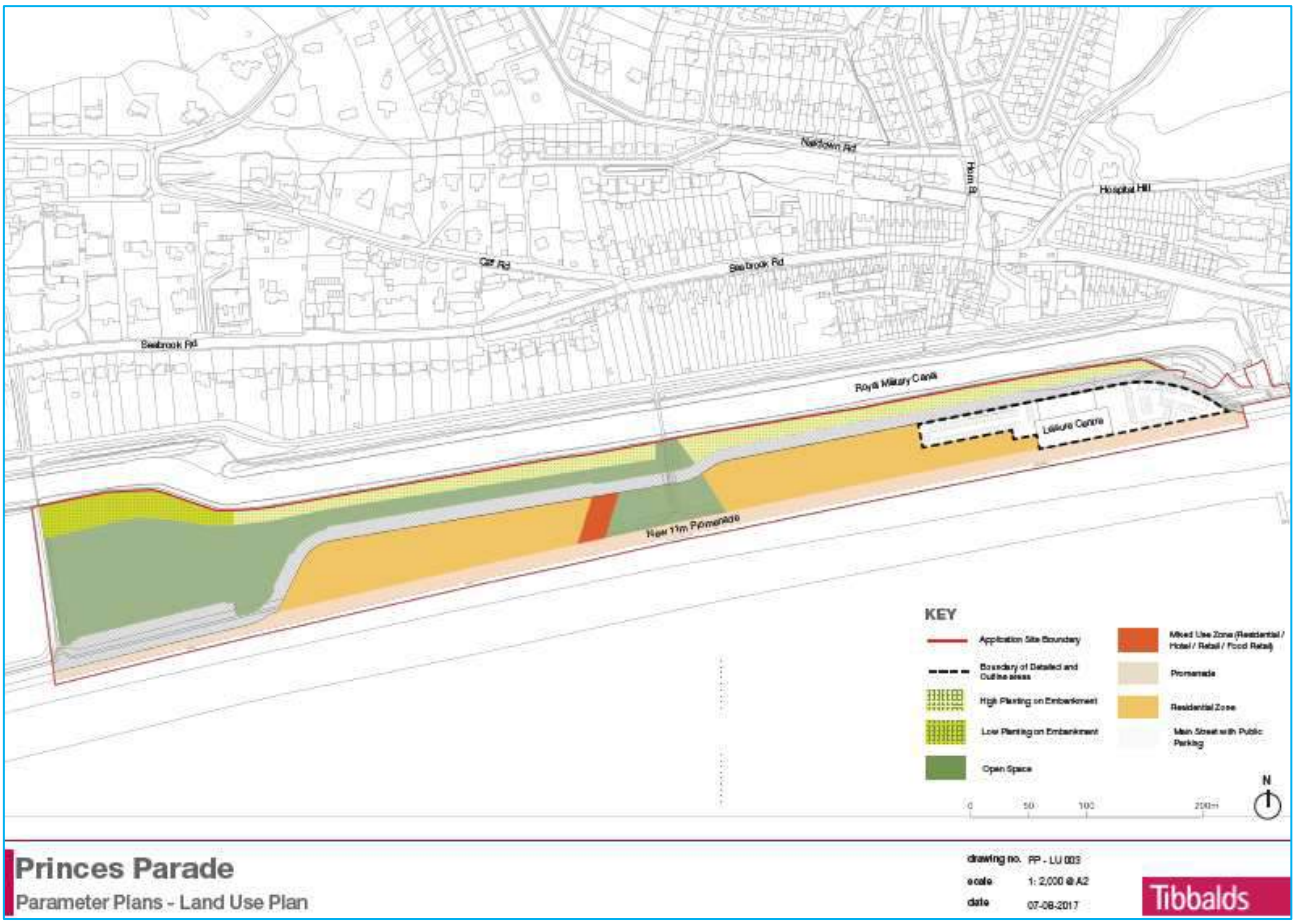


Fig. 1: Parameter plan (Drawing PP - LU 003, Prince's Parade Parameter Plans - Land Use Plan, dated 19.06.207, Tibbalds), including the red-line boundary of the hybrid planning application. A larger copy of this plan is provided in Appendix B of this document.

3. WORKS PHASING

3.1. This assessment is based on the following sequencing and timescales / phases for the proposed development, as provided in outline form by the applicant in August 2017.

Phase 1: June 2018 to May 2019

- Site remediation works.

Phase 2: June 2019 to November 2020

- Construction of leisure centre.
- Realignment of Princes Parade and construction of western car park.
- Relocation of existing rising main along realigned Princes Parade.
- Provision of new promenade.
- Construction of new linear park and installation of planting along the northern embankment.

Phase 3: June 2020 to December 2021

- Construction of character area east (residential) and central open space.

Phase 4: January 2021 to July 2022

- Construction of character area west (residential and commercial) and western open space.

4. AVOIDANCE, MITIGATION AND COMPENSATION MEASURES

4.1. The development layout shown on the Land Use Parameter Plan incorporates ecological avoidance measures. These measures have been informed by the results of ecological survey work conducted in 2015 and 2016 (as detailed in Technical Appendices 7.1 to 7.7 inclusive).

4.2. During the master planning process, three main options were considered for the layout of the development.

4.3. The locations of important ecological features in relation to each layout option were considered.

4.4. By comparing these earlier layout options to the submitted version of the Land Use Parameter Plan, it provides evidence that the scheme has avoided impacts by design.

4.5. The three main layout options that were previously considered are provided in Appendix A.

4.6. Furthermore, the proposed phasing of site works will ensure that key green infrastructure is reinstated as soon as possible (in Phase 2 of the construction stage), and that off-site compensation measures are delivered prior to the start of construction.

4.7. This is in accordance with best practice and is particularly important in: -

- Ensuring that, prior to the commencement of reptile translocation works, the reptile receptor site provides suitable habitat that can accommodate translocated animals; and
- Ensuring that habitat connectivity is maintained for foraging bats and common toad adjacent to the application site and is not lost at any point during the construction stage.

4.8. Relevant detail of works phasing is provided in this document. Full detail of works phasing is provided within the Environmental Statement and the Planning Design and Access Statement.

4.9. Given that the precise detailed design of the wider site is not known at this stage, additional detail of ecological measures for the wider site will be provided at the Reserved Matters stage.

NON-STATUTORY DESIGNATED SITE

Avoidance

4.10. The eastern development zone (built development) will be located at least 25m from the northern red line boundary, to allow for a set back from the RMC Local Wildlife Site (LWS).

4.11. The western development zone will be located at least 39m from northern red line boundary, to allow for increased set back from the LWS.

4.12. In line with the Flood Risk Assessment (FRA) submitted with the planning application, the surface water drainage system will outfall to the beach. The proposed development has thereby minimised the risk occupation-phase of contamination of the LWS through sensitive master planning.

4.13. These avoidance measures reduce the risk that the construction and operation of the proposed development would result in pollution and/or damage to habitats within the LWS.

Mitigation

4.14. In the absence of mitigation, site works could result in contamination of the RMC LWS and damage habitats within the LWS.

4.15. Relevant best practice will be followed with regards to the storage of chemicals / materials on-site and the management of site runoff.

4.16. In addition, rigid site hoarding and/or propped Heras fencing (or similar) fitted with debris netting will be used to minimise the risk of materials and machinery entering the LWS.

4.17. These measures will minimise the risk of construction-phase impacts upon the LWS.

4.18. Additional detail of construction-phase habitat protection, and pollution prevention and control measures will be provided in the Construction Environmental Management Plan (CEMP).

4.19. In addition, the new Linear Park - which will be planted during Phase 2 of the construction stage, will provide a habitat buffer between the development areas and the RMC LWS.

4.20. The location of this Linear Park is shown within the PDAS.

HABITATS OF PRINCIPAL IMPORTANCE

Avoidance

4.21. The setting back of the development zones from the RMC and the positioning of surface water drainage outfalls will minimise the risk of pollution of and/or damage to the canal HPI during the construction and operational stages.

4.22. In addition, all development (except for the site drainage outfalls) will be set back at least 12m from the seawall. This will minimise the risk of operational stage impacts upon the beach (except for the potential effects of site drainage, which are addressed below).

Mitigation

4.23. In the absence of mitigation, the construction and operation of the proposed development could result in damage and/or pollution of habitats within the RMC HPI.

4.24. The mitigation measures outlined for the LWS will also minimise the risk of damage and/or pollution of the RMC HPI.

4.25. The CEMP, which will be submitted at the Reserved Matters stage, will provide additional detail of measures that will be employed to protect the RMC HPI during the construction stage.

OTHER HABITATS AND FLORA

Avoidance

4.26. Total clearance of vegetation from the application site will be required to facilitate the capping of contaminated ground.

4.27. For this reason, direct impacts upon the on-site grassland community cannot be avoided.

Mitigation

4.28. The new habitats within the Western Open Space and the Linear Park will include grass and forb species present in the pre-development grassland community. New compensatory grassland habitats will cover at least 1.4ha of the proposed new open spaces (within the Western Open Space and Linear Park combined).

4.29. In addition, a living roof will be installed on the roof of the pool hall, which forms part of the leisure centre. The substrate and seed mix used in this living roof will replicate the substrate and species composition of the existing grassland that is located adjacent to Princes Parade as far as possible.

4.30. The above measures will part-compensate for the loss of the on-site grassland. These measures will not deliver a like-for-like replacement of the grassland community that will be lost to development. However, they will seek to create grassland of comparable conservation importance, and will deliver a net gain in the total area of grassland habitat present on the application site.

4.31. The location of the Western Open Space is shown within the PDAS.

INVERTEBRATES

Avoidance

4.32. Total clearance of vegetation from the application site will be required to facilitate the capping of contaminated ground.

4.33. For this reason, direct impacts upon the on-site grassland adjacent to Princes Parade (which is of local importance for invertebrates) cannot be avoided.

Mitigation

4.34. The compensation measures detailed for the grassland plant community (see *'Other habitats and flora'* section) will also provide some level of compensation for invertebrates associated with this grassland. The living roof on the leisure centre will be designed to provide habitat suitable for a diverse range of invertebrate species, including maritime grassland species.

4.35. In addition, areas of gravelly substrate overlain with a thin layer of soil and seeded with a maritime grassland mix will be provided within the Western Open Space - most likely adjacent to the new public parking that will be provided on the main street. The final location of this area will be determined at the detailed design stage. This area will be maintained as a short grass sward.

4.36. The invertebrate assemblage present within the grassland cannot be replicated or re-created through delivery of new habitats. However, invertebrate assemblages are dynamic and the proposed new habitats will provide a range of new opportunities for invertebrates, including maritime grassland species.

4.37. The Ecological Mitigation Strategy (EMS), which will be submitted at the Reserved Matters stage, will provide additional detail of habitat creation measures for invertebrates.

4.38. The Landscape and Ecology Management Plan (LEMP), which will also be submitted at the Reserved Matters stage, will provide additional detail of the habitat management prescriptions that will be adopted and implemented to benefit invertebrates in the long-term.

COMMON TOAD

4.39. Whilst common toad does not receive specific legal protection, it is listed as an SPI under Section 41 of the Natural Environment and Rural Communities Act 2006 (as amended).

4.40. Under Section 40 of the same Act, it is stated that the local authority must, *'in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'*. Consideration of impacts upon SPIs is relevant to this requirement.

Avoidance

4.41. Total clearance of vegetation from the application site will be required to facilitate the capping of contaminated ground.

4.42. For this reason, direct impacts upon common toad terrestrial habitat cannot be avoided.

Mitigation

4.43. In the absence of mitigation, there is a high risk that works undertaken during the construction stage will result in the killing and injury of individual common toads. Works could also result in the pollution of and/or physical impacts upon the recorded common toad breeding site (the RMC).

4.44. To minimise these risks, mitigation measures will be adopted and implemented.

4.45. On-site habitats will be cleared under ecological supervision, which will help to minimise the killing and/or injury of common toads during the construction stage. Any common toads discovered during clearance (or during the pre-clearance reptile trapping visits) will be translocated to the reptile receptor area (as detailed below).

4.46. Herptile (reptile and amphibian) exclusion fencing will also be installed along the northern boundary of the application site. This will help to minimise the risk of common toads entering works areas.

4.47. The CEMP and a detailed EMS - which will be submitted at the Reserved Matters stage, will provide additional detail of measures designed to minimise the risk of killing and/or injury of individual common toads during the construction stage.

4.48. The risk of impacts upon common toad habitat (terrestrial and aquatic) outside of the application site during the construction stage will be minimised through implementation of the measures outlined in the *Non-Statutory Designated Site* section.

4.49. The pollution prevention and control measures outlined for the LWS will also minimise the risk of damage and/or pollution of off-site common toad terrestrial and aquatic habitats.

4.50. Additional detail of construction-phase habitat protection, and pollution prevention and control measures will be provided in the CEMP, which will be submitted at the Reserved Matters stage.

4.51. The proposed development will deliver an amphibian-friendly road scheme, through inclusion of features such as wildlife or ACO kerbs and slit drains or other amphibian-friendly drainage solutions.

4.52. This will minimise the risk of killing / injury of common toads during the operational stage. A detailed specification for the amphibian-friendly road design will be confirmed at the Reserved Matters stage.

4.53. The proposed development will also include pollution interceptors on drainage outflows, and a Sustainable Drainage System (SuDS). The proposed development has thereby minimised the occupation-phase risk of contamination of the canal, which is a common toad breeding site.

4.54. Phase 1 of the construction stage will result in a total loss of common toad terrestrial habitats from the application site. New compensatory habitats suitable for common toad will be delivered in Phase 2 of the construction stage - to help compensate for the loss of existing habitats.

4.55. At least 0.6ha of new compensatory habitats suitable for common toad (scrub and tall grassland) will be delivered within the Linear Park as soon as possible after site clearance. These new habitats will provide foraging and shelter opportunities for common toad close to the recorded breeding site (RMC). This habitat will be created during Phase 2 of the construction stage.

4.56. At least 1.4ha of new scrub and tall grassland habitats will also be delivered within the Western Open Space. These habitats will also provide new compensatory terrestrial habitats suitable for common toad. This habitat will be created during Phase 4 of the construction stage.

4.57. Amphibian refugia piles and hibernacula will be installed within the new terrestrial habitats.

4.58. The above will not fully compensate for the loss of common toad terrestrial habitat from the application site. However, the above will ensure that new terrestrial habitat suitable for common toad, and new refuge and hibernation opportunities, are provided close to the recorded breeding site.

4.59. The new habitats will be managed to ensure that they continue to provide foraging and shelter opportunities for common toad post-development. Management operations will be designed to minimise the risk of killing or injury of common toads.

4.60. Management prescriptions will be confirmed in the detailed LEMP, which will be delivered at the Reserved Matters stage.

REPTILES

4.61. All native UK reptile species are afforded legal protection from intentional or reckless killing or injury by the Wildlife and Countryside Act 1981 (as amended).

Avoidance

4.62. Total clearance of vegetation from the application site will be required to facilitate the capping of contaminated ground.

4.63. For this reason, direct impacts upon reptile habitat cannot be avoided.

Mitigation

4.64. In the absence of mitigation, there is a high risk that works undertaken during the construction stage would result in the killing and injury of individual reptiles.

4.65. To mitigate against the risk of killing and injury of individual reptiles, a programme of reptile trapping and translocation will be undertaken.

4.66. This will involve the capture of reptiles from the application site by suitably experienced ecologists and the translocation of captured animals to an off-site receptor habitat.

4.67. The receptor habitat will be located within the RMC corridor, between the application site and Twiss Road - most likely on the northern side of the canal.

4.68. Reptile trapping and translocation will be completed before the commencement of Phase 1 of the construction stage (site clearance).

4.69. Once the trapping programme has been completed, a suitably experienced ecologist will supervise site clearance works and will capture and translocate any reptiles discovered during this process.

4.70. Herptile exclusion fencing will be used to prevent reptiles from re-entering the construction zones after site clearance.

4.71. If the receptor habitat is located on the northern side of the canal, the project will explore the option of using the application site as a post-development receptor site for other development projects once the on-site habitats have become established. Alternatively, it will allow natural colonisation by animals on the southern side of the canal. On-site monitoring work will be used to inform the options that are employed. If no reptiles colonise the site naturally, then the option of using the habitats as a receptor site will be employed.

4.72. Additional detail of these measures will be confirmed in the CEMP and the detailed EMS, which will be delivered at the Reserved Matters stage.

4.73. The construction-phase clearance will result in loss of *c.*1.4ha of reptile habitat from the application site. Compensation for this loss of habitat will be delivered in two ways.

4.74. Firstly, new reptile habitat will be created, and existing habitats suitable for reptiles will be enhanced, within the off-site receptor area.

4.75. Habitat creation and enhancement measures will be targeted to deliver new foraging, shelter, basking, refuge and hibernation opportunities for slow worm, common lizard and grass snake.

4.76. These habitats will provide sufficient habitat for the translocated reptile population and any reptiles already present within the receptor area.

4.77. The above will be informed by a reptile presence / likely absence survey of the off-site receptor area.

4.78. Given the extent of habitats present within the RMC corridor that could be enhanced for reptiles, the above approach is likely to provide sufficient compensation for loss of on-site habitats.

4.79. The creation and enhancement of these off-site habitats will be completed prior to translocation of reptiles from the application site.

4.80. Secondly, at least 1.4ha of new on-site compensatory habitat suitable for reptiles (tall grassland and low scrub) will be delivered within the Western Open Space.

4.81. This will provide long-term compensation for the loss of on-site habitats, and will help to account for any adverse effects of translocation upon the local reptile population.

4.82. The new and enhanced reptile habitats within the off-site receptor area and the on-site Western Open Space will connect on to a wider network of suitable reptile habitat within the RMC corridor.

4.83. Full detail of these measures, including the location of the receptor site, the management strategy for receptor habitats, and detail of post-translocation monitoring will be confirmed in the detailed EMS, which will be delivered at the Reserved Matters stage.

4.84. The new habitats will be managed to ensure that they continue to provide foraging, shelter, basking and hibernation opportunities for reptiles post-development.

4.85. Management prescriptions will be confirmed in the detailed Landscape and Ecology Management Plan (LEMP), which will be delivered at the Reserved Matters stage.

BREEDING BIRDS

4.86. Nesting birds, and their nests, eggs and chicks are afforded legal protection from intentional or reckless destruction by the Wildlife and Countryside Act 1981 (as amended).

4.87. In addition, bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) are afforded protection from disturbance whilst breeding.

Avoidance

4.88. Total clearance of vegetation from the application site will be required to facilitate the capping of contaminated ground.

4.89. For this reason, direct impacts upon the habitat available to breeding birds cannot be avoided.

Mitigation

4.90. In the absence of mitigation, there is a high risk that works undertaken during the construction stage would result in destruction of active bird nests. To mitigate this risk, the following measures are proposed.

4.91. Wherever possible, clearance of scrub and ruderal vegetation will be undertaken within the period mid-September to February (inclusive) - which is outside of the typical bird nesting period.

4.92. If this is not possible, prior to habitat clearance a check for nesting birds will be undertaken by a suitably experienced ecologist. Any active nest will be left *in situ* until birds have stopped using it.

4.93. The precise timing and methods of habitat clearance works will be subject to reptile mitigation requirements.

4.94. Habitats suitable for nesting birds within the adjacent section of the RMC will be protected using rigid site hoarding and/or propped Heras fencing (or similar) fitted with debris netting.

4.95. This protection will be maintained until all construction works that could result in damage of these off-site habitats have been completed.

4.96. Additional detail of mitigation measures relating to nesting birds will be included within the CEMP and the EMS, which will be submitted at the Reserved Matters stage.

4.97. New tall scrub and tree habitat will be provided within the Linear Park and the 'high planting on embankment' areas (as shown on the Land Use Parameter Plan). The entire embankment will be planted with dense, tall scrub, with lower scrub present adjacent to the canal towpath. (The existing embankment supports a mixture of scrub and tall ruderal forbs). These habitats will be delivered during Phase 2 of the construction stage.

4.98. Tall and low scrub will also be provided within the Western Open Space. Low scrub will be provided within the 'low planting on embankment' areas (as shown on the Land Use Parameter Plan). These habitats will be delivered during Phase 4 of the construction stage.

4.99. These habitats will provide dense cover, foraging and nesting opportunities for song thrush (*Turdus philomelos*), reed bunting (*Emberiza schoeniclus*), linnet (*Linaria cannabina*) and other birds. They will also provide dense cover and foraging opportunities for house sparrow (*Passer domesticus*), starling (*Sturnus vulgaris*) and Cetti's warbler (*Cettia cetti*).

4.100. Delivery of these new scrub habitats will effectively compensate for the loss of pre-clearance scrub habitats from the application site during Phase 1 (site clearance).

4.101. Further detail of plantings will be provided in the detailed EMS, which will be delivered at the Reserved Matters stage.

BATS

Avoidance

4.102. The arrangement of the proposed development (as per the Land Use Parameter Plan) has been informed by a need to minimise light-related impacts upon foraging bats.

Mitigation (Lighting)

4.103. In the absence of mitigation, the proposed development is likely to result in light spill into off-site high-quality bat foraging habitats within the adjacent RMC corridor.

4.104. The Lighting Impact Assessment (LIA) produced by Elementa was used to inform the mitigation and compensation measures in relation to foraging bats.

4.105. In the absence of mitigation, the construction works and the operation of the proposed development could also result in contamination of the canal, which is an important bat foraging resource.

4.106. The mitigation measures for common toad will address the risk of contamination of the RMC.

Construction stage

4.107. The risks of light-related impacts upon foraging and commuting bats during the construction stage are likely to be low because, in general, construction works during the main period of bat activity are

unlikely to occur so late in the day that it coincides with dusk or night. During the winter period, when construction lighting is likely, bats are not active or their activity levels are low. However, the below contents details mitigation measures to minimise the potential risk of impacts on foraging and commuting bats.

4.108. In general, The Institution of Lighting Professionals (ILP) *Guidance Notes for the Reduction of Obtrusive Light* (GN01:2011) will be adhered to during the construction stage. This will prevent 'sky glow' and will minimise the amount of spill light into off-site bat foraging habitats.

4.109. The type of equipment employed, including lamp type and optics will be carefully selected to limit the luminous intensity of site lighting to below 10,000 Candelas (cds), as per GN01:2011.

4.110. In general, floodlights required for site works will be LED units mounted around the perimeter of the works areas and directed inwards - to avoid direct light being projected into off-site habitats.

4.111. The type and positioning of the floodlights will be carefully considered to minimise light spill.

4.112. Any additional site lighting will be low power, low intensity LED units with zero upward light output ratio (ULOR). This will ensure that light is directed downwards, towards the task plane such as pathways, steps and stairs - resulting in zero upward light ratio (ULR) from the site.

4.113. In addition to the above, the following principles will be adhered to for construction stage lighting: -

- The site will be lit using narrow spectrum lighting with no UV content and/or white (preferably 'warm white' LED lighting);
- Timers and motion sensors will be used to minimise the duration of any nocturnal illumination;
- All lighting will be directed to ground and light spill will be minimised through use of optics;
- Use of tall lighting columns will be avoided wherever possible;
- A dusk lighting curfew will be imposed during the period May to September (inclusive) - as this is an important time period for bat foraging; and
- A physical barrier (e.g. site hoarding) will be maintained between the construction zones and the retained off-site bat foraging habitats. Once the 'tall planting on embankment' has established, this planting will also provide a screen between construction stage lighting and the canal.

4.114. In general, construction stage lighting will follow the principles outlined in Sections 6.4 and 6.5 of *Bats and Lighting: Overview of current evidence and mitigation*, and will only be used where necessary.

4.115. No lighting will be installed within or immediately adjacent to the RMC.

Operational stage

4.116. It is important to note that, in the absence of detailed design information, the LIA assessment for the operational stage of the proposed development was based on a 'worst case' scenario (which would result in negligible - minor adverse effect upon off-site habitats during the operational stage).

4.117. Therefore, the lighting mitigation measures set out below have been selected to mitigate the effects of a 'worst case' scenario.

4.118. In line with the recommendations of the LIA, mitigation measures will be implemented to reduce the effects of light spill upon foraging bats - by reducing illumination of bat foraging habitat (adjacent canal section and re-vegetated northern embankment) to an average illuminance of below 1 lux.

4.119. These measures include: -

- Building façade lighting or signage will adhere to the CIE 150:2003 (*Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations*) limits of 0-5 cd/m2 and 50-400 cd/m2 respectively for E1 environmental zone, and any building façade lighting will adhere to the E1 limitations from GN01:2011. Hence, the average surface luminance will not exceed 0 cd/m²;
- The overall upward light ratio for the entire site lighting should be 0%;
- Luminaires will be carefully positioned to minimise light spill onto boundary habitats;
- External areas will be lit using narrow spectrum lighting with no UV content and/or white (preferably 'warm white' LED lighting);
- All lighting will be directed to ground and light spill will be minimised through use of optics;
- Use of tall lighting columns will be avoided wherever possible;
- Timers and motion sensors will be used to minimise the duration of any post-curfew illumination; and
- The 'tall planting on embankment' (as shown on the Land Use Parameter Plan) will be used to further reduce light spill into the adjacent canal section.

4.120. In general, operational stage lighting will follow the principles outlined in Sections 6.4 and 6.5 of *Bats and Lighting: Overview of current evidence and mitigation*, and will only be used where necessary.

4.121. No lighting will be installed within or immediately adjacent to the RMC. There will be some level of light trespass from the internal road lighting scheme, but this will be at a level of 1lux or less (Elementa, 2017).

4.122. The detailed lighting strategy for the operational stage of the proposed development will be produced at the detailed design stage, and will adhere to the above principles, whilst also considering all relevant health and safety and security considerations.

4.123. The detailed lighting strategy will be subject to further computer analysis - to ensure that significant adverse effects upon foraging bats can be avoided and minimised by design.

Mitigation (Habitat)

4.124. In the absence of compensation, the proposed development will result in direct loss of on-site bat foraging habitat (low, moderate and high-quality).

4.125. The new plantings of tall scrub on the northern embankment and within the Western Open Space will compensate for the loss of high and moderate quality bat foraging habitat.

4.126. The new plantings of tall grassland within the Western Open Space will part-compensate for the loss of low-quality bat foraging habitat from the application site.

4.127. These new plantings will be designed to maximise cover of pollen, nectar and berry producing species. These plantings will attract invertebrates, which in turn provide a foraging resource for bats.

SUMMARY

4.128. The Land Use Parameter Plan, and the impact assessment set out within the ecology chapter of the Environmental Statement, demonstrate that the proposed development has avoided adverse ecological effects through sensitive master planning wherever possible.

4.129. Where adverse impacts upon the LWS, HPIs, grassland plant community, invertebrates, common toad, reptiles, breeding birds and foraging bats cannot be totally avoided by design, effective

implementation of the mitigation and/or compensation measures will further ensure that the adverse impacts of development upon these ecological features are minimised.

5. AREA MEASUREMENTS

5.1. This section of the report attempts to quantify impacts upon common toad terrestrial habitat, reptile habitat, bat foraging habitat and breeding bird territories.

COMMON TOAD

5.2. The proposed development will result in a net loss of approximately 10.7ha of common toad terrestrial habitat from the application site.

5.3. The proposed development will require total removal of this terrestrial habitat, to facilitate the capping and site preparation works.

5.4. The new dense scrub and tall grassland habitats that will be delivered within the Western Open Space and Linear Park, and the dense scrub habitat that will be delivered on the northern embankment will reduce the long-term net amount of common toad habitat lost to development.

5.5. These areas will deliver at least 2ha of compensatory habitat for common toad.

5.6. When these measures are taken into consideration, the proposed development will result in an overall net loss of up to 8.7ha of common toad terrestrial habitat.

5.7. However, reinstatement of habitats on the northern embankment will ensure the availability of on-site terrestrial habitat suitable for this species adjacent to the recorded breeding site in the long-term.

5.8. The inclusion of refugia piles and amphibian hibernacula within these habitats will reduce the severity of the net loss in the total area of common toad terrestrial habitat.

REPTILES

5.9. The southern half of the hybrid application site supports *c.*1.4ha of reptile habitat.

5.10. The proposed development will require total removal of this reptile habitat, to facilitate the capping and site preparation works.

5.11. This habitat will be replaced with an equivalent area of new and/or enhanced reptile habitat within the off-site reptile receptor area.

5.12. In addition, the delivery of at least 1.4ha of new tall grassland and low scrub, which will provide suitable reptile habitat on the application site (within the Western Open Space) will further compensate for the loss of habitat.

5.13. This will also deliver a net enhancement of the local area for reptiles, as detailed in the *Enhancements* section of this Technical Appendix.

BREEDING BIRDS

5.14. The reinstatement of scrub habitats on the northern embankment, and the creation of new scrub habitats within the Western Open Space and Linear Park, will ensure no net loss of scrub habitats suitable for breeding birds.

5.15. The planting of scrub vegetation across the entire northern embankment (which currently supports a mixture of scrub and ruderal habitats) will deliver an increased and denser shelter, foraging and nesting resource for a range of bird species in this location.

5.16. The above habitat reinstatement and changes in the habitat cover will ensure that there is no net change in the number of pairs that the ZoI can support for each species in the long-term.

BATS

5.17. Effective implementation of the mitigation and compensation measures outlined in this document (avoidance of light spill, habitat reinstatement on the northern embankment and habitat creation in the Western Open Space) will result in no net loss (direct or indirect) of high and moderate quality bat foraging habitat in the long-term.

5.18. This will ensure that all habitats that form part of the area that is of 'county' importance for foraging bats will be protected (off-site vegetation in canal corridor) or reinstated (northern embankment).

5.19. The proposed development will result in loss of 4.94ha of low-quality bat foraging habitat from the application site.

5.20. Based on the results of the bat activity survey, this low-quality habitat is of ZoI-level importance and has therefore not been carried forwards in the assessment of 'likely significant effects'.

6. RESIDUAL IMPACTS

6.1. Most of the potential significant impacts / effects upon important ecological features have been reduced by mitigation to a level that is not considered significant in Environmental Impact Assessment (EIA) terms.

6.2. However, after mitigation, the proposed development will result in minor adverse effects upon a grassland plant community, an invertebrate assemblage and on breeding reed bunting.

6.3. Additional detail of these residual effects is provided in the ecology chapter of the ES.

7. PRECAUTIONARY METHODS OF WORK

7.1. Water voles (*Arvicola amphibius*) are afforded 'full' legal protection by the Wildlife and Countryside Act 1981 (as amended).

7.2. Otters (*Lutra lutra*) are afforded legal protection by the Conservation of Habitat and Species Regulations 2010 (as amended) and the Wildlife and Countryside Act 1981 (as amended).

7.3. A check of riverbanks adjacent to the application site will be conducted by a suitably experienced ecologist prior to the commencement of any works within five metres of the bank top.

7.4. The ecologist will search for any field signs indicative of the presence of water vole and any evidence of otter denning within bankside habitats.

7.5. In the unlikely event that water vole field signs and/or otter holts (dens) are identified, appropriate avoidance and mitigation measures will be devised by a suitably experienced ecologist. If necessary, mitigation will be conducted under licence from Natural England.

7.6. Given the low to negligible risk of impacts upon these species, the adoption of these precautionary working methods is considered appropriate and proportionate.

7.7. A check for active badger setts will be undertaken by a suitably experienced ecologist at least four months prior to the commencement of site clearance works. This check will focus on the dense scrub area around Building 14.

7.8. Badgers are afforded protection by the Protection of Badgers Act 1992 (as amended).

7.9. In the unlikely event that an active badger sett is discovered, all works within 30m of the sett will cease immediately and a suitably experienced ecologist will be contacted for advice.

7.10. If any hedgehogs (*Erinaceus europaeus*) are found during site clearance, these will be carefully moved to a suitable area of retained habitat cover within the adjacent canal corridor, away from roads and the construction zone.

7.11. Giant hogweed (*Heracleum mantegazzianum*), Japanese rose (*Rosa rugosa*) and Spanish bluebell (*Hyacinthoides hispanica*) have been recorded on the application site. Prior to the commencement of the construction stage, a detailed invasive plant survey of the application site will be undertaken. The findings of this survey will be used to inform invasive plant remediation measures. Additional detail will be provided in the CEMP and EMS, which will be submitted at the Reserved Matters stage.

8. OFF-SITE IMPACTS

8.1. Two new surface water drainage outfalls will be provided as part of the proposed development. At present, these outfalls are the only known off-site works (i.e. the only works that are planned beyond the red-line boundary of the application site). These new outfalls will include pollution interceptors.

8.2. The existing surface water drainage from Princes Parade outfalls to the beach. It is not known whether these existing outfalls include pollution interceptors.

8.3. Based on observations made during survey visits, the beach does not support any HPI. The beach does not qualify as the HPI *'Coastal vegetated shingle'*.

8.4. No detailed survey or assessment of the beach habitats has been undertaken at this early stage of planning.

8.5. In the absence of mitigation, the installation of two new surface water drainage outfalls within the beach may result in impacts upon shingle, foreshore and/or marine habitats, flora and fauna.

8.6. The design and precise location of the surface water drainage outfalls to the beach is not known. However, it will be informed by consultation with the Marine Management Organisation. These outfalls will be fitted with pollution interceptors and will be located (if possible) in a location that avoids impacting the most sensitive shingle, foreshore and marine habitats.

8.7. The outfall locations will be informed by ecological baseline survey(s) of the drainage works footprint and associated ZoI.

8.8. In addition, the proposed development will also include a Sustainable Drainage System (SuDS), which will help to minimise pollution risk at source.

8.9. Furthermore, the proposed development provides an opportunity to install new and effective pollution interceptors, which would control contaminant inputs to the shingle, foreshore and marine habitats.

8.10. The above off-site impacts are not captured within the Environmental Statement. However, the above sets out the protocol for addressing and controlling the potential ecological risks associated with these off-site impacts.

9. ENHANCEMENT MEASURES

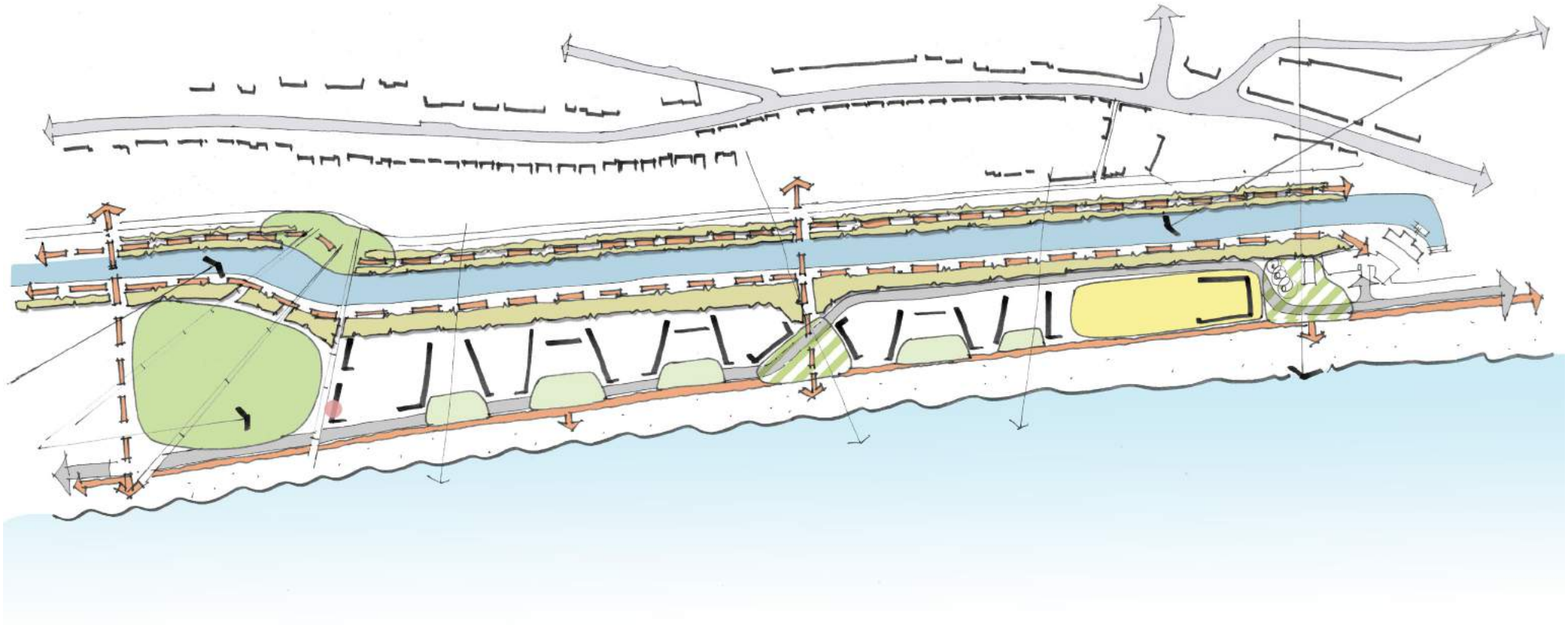
9.1. Creation of reptile refuge piles and hibernacula within the Western Open Space will provide an enhancement for reptiles.

9.2. At least 20 house sparrow nest boxes and ten starling nest boxes will be installed on the application site, on buildings located adjacent to informal open space areas and/or boundary habitats. This will deliver an enhancement of the application site for house sparrow and starling, which are both SPI.

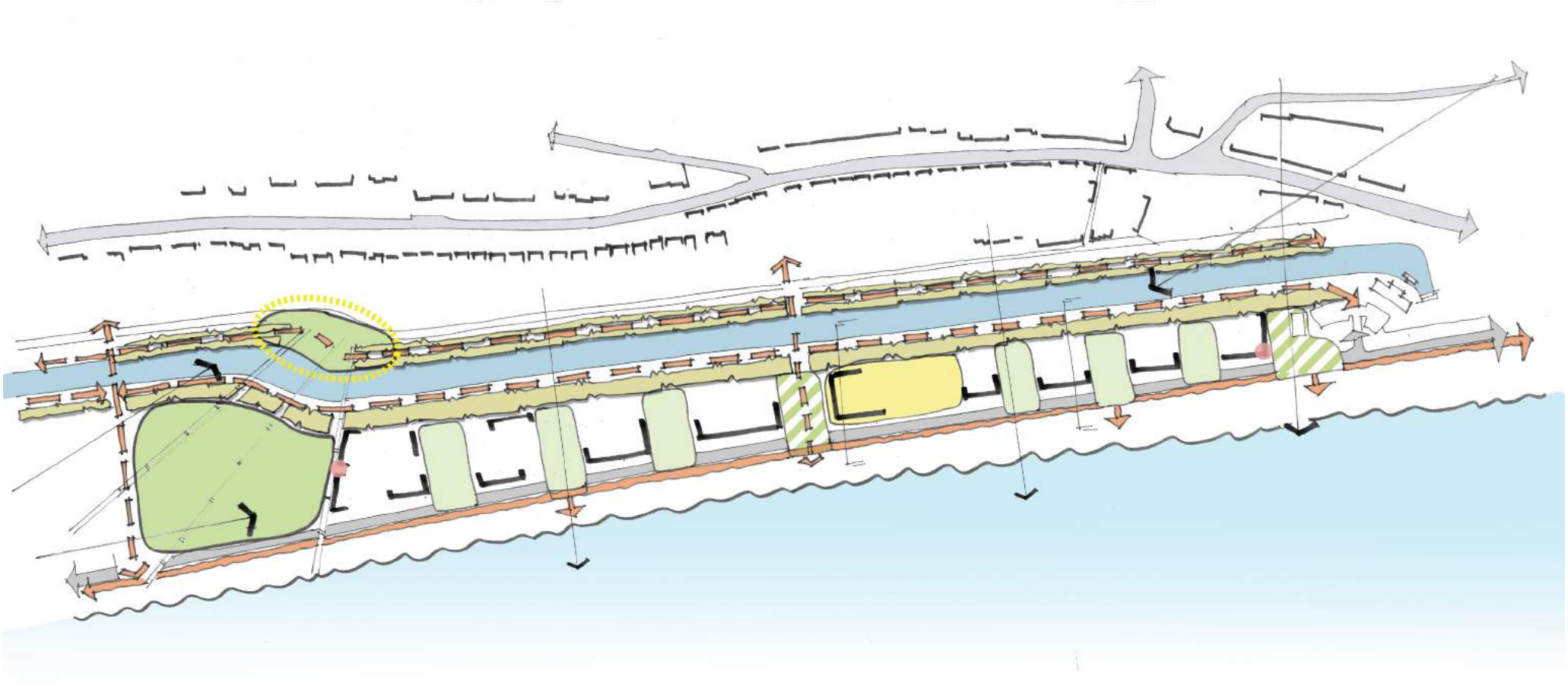
9.3. The implementation of a long-term LEMP will also ensure that the long-term ecological importance of on-site habitats is maintained and maximised, and that these habitats are managed in a wildlife-friendly manner.

10. APPENDIX A: PREVIOUS (REJECTED) OPTIONS FOR THE DEVELOPMENT PROPOSAL

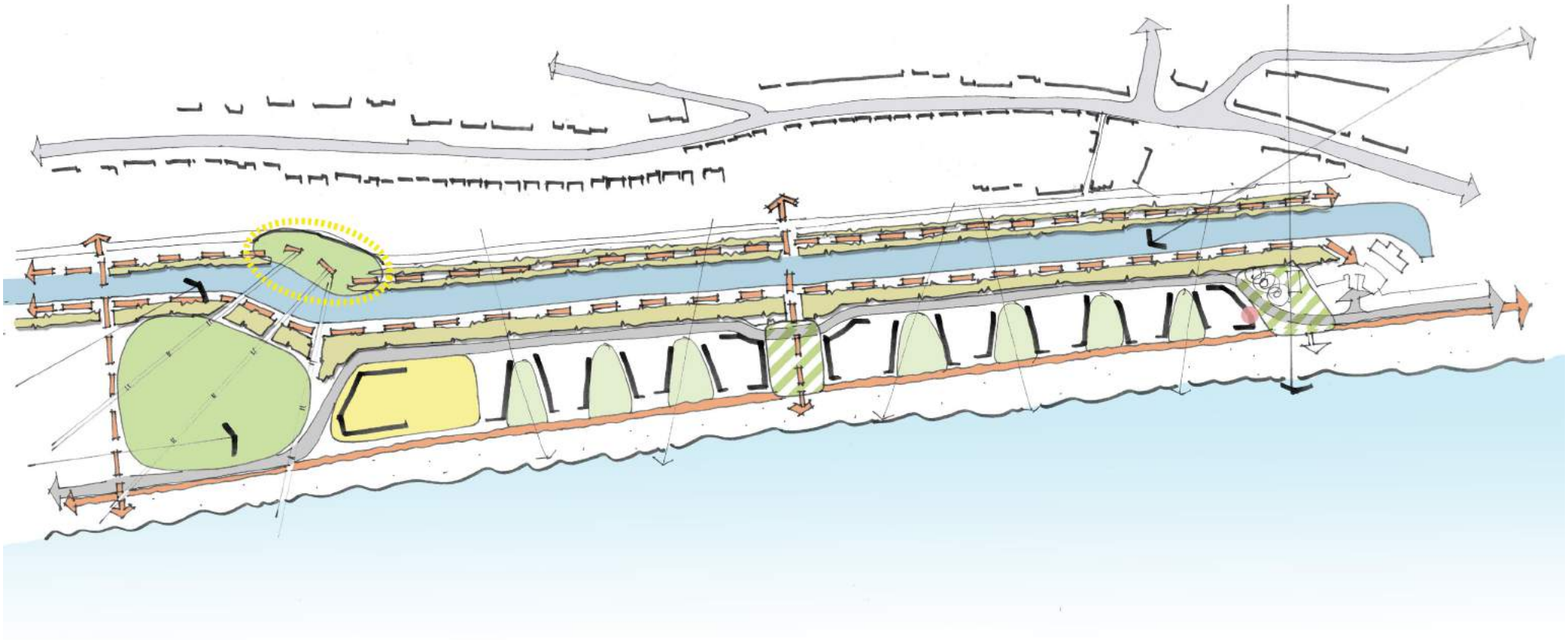
See overleaf



Initial concept (July 2016) Option 1



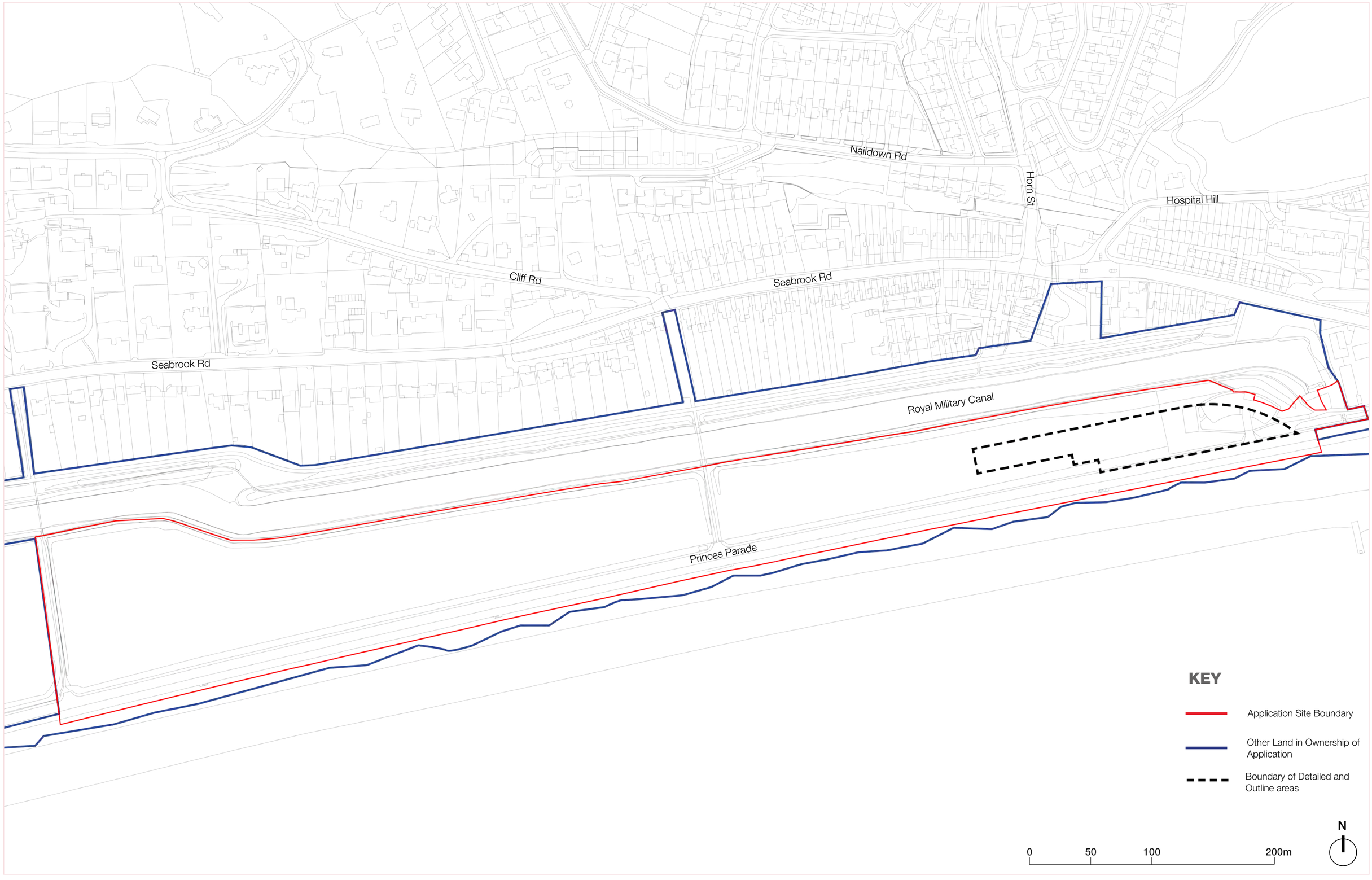
Initial concept (July 2016) Option 2



Initial concept (July 2016) Option 3

11. APPENDIX B: PARAMETER PLAN: APPLICATION SITE AREA - RED LINE

See overleaf



Princes Parade

Parameter Plans - Application Site Area - Red Line

drawing no. PP - ASA 001

scale 1: 2,000 @ A2

date 07-08-2017

Tibbalds

12. APPENDIX C: PARAMETER PLAN: LAND USE

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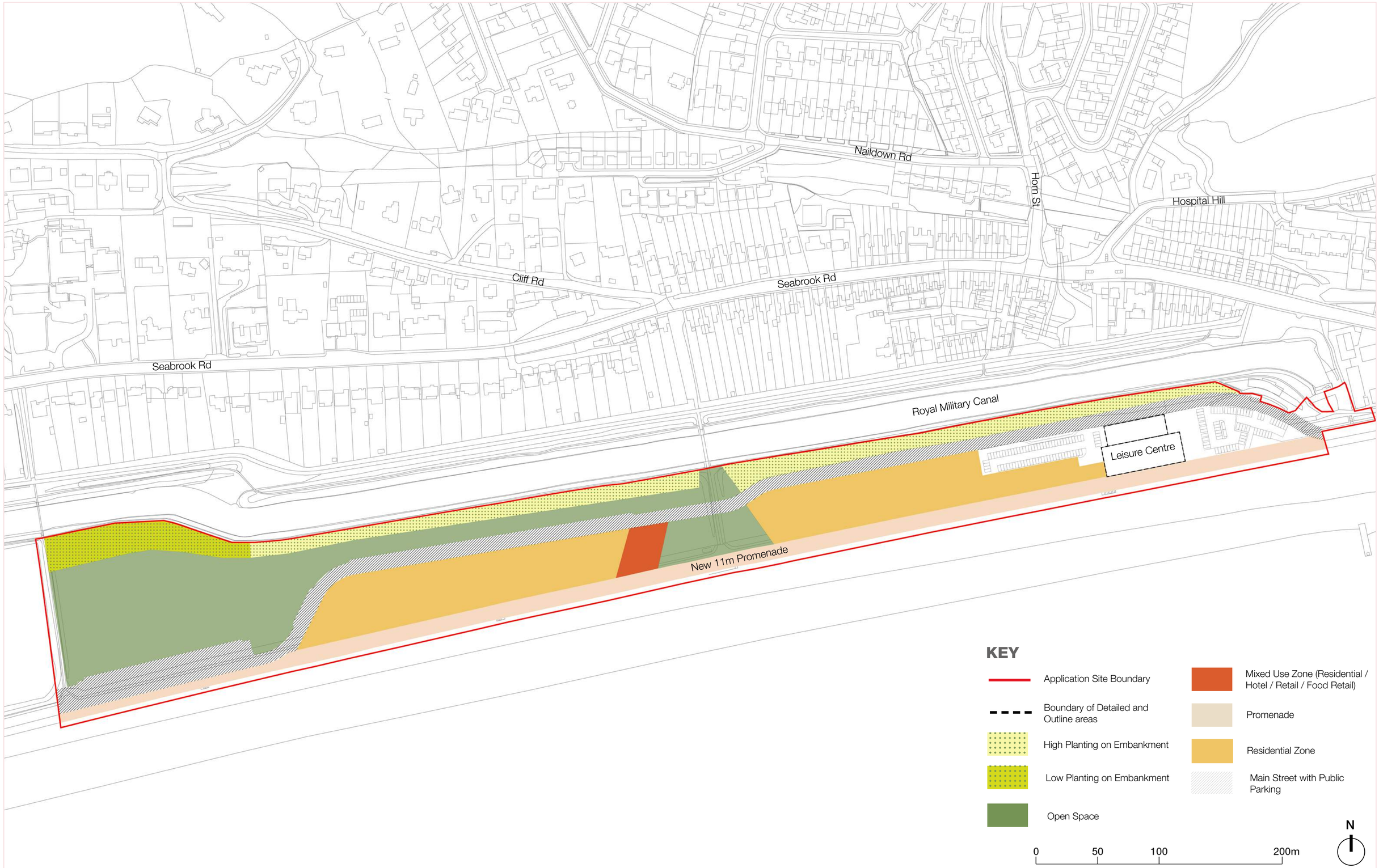

Princes Parade

Parameter Plans - Land Use Plan

drawing no. PP - LU 003

scale 1: 2,000 @ A2

date 07-08-2017

Tibbalds