



River Arun, Littlehampton

Preliminary Ecological Appraisal

August 2017

GHD





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RT Ecological Appraisal V7.0 13/07/2017

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Drawing Number: 172768/1/dwg1	Phase I Habitat / River Corridor Map 1
Drawing Number: 172768/1/dwg2	Phase I Habitat / River Corridor Map 2

Appendices

Appendix 1	Desk Study Details
Appendix 2	Survey Photographs

Contact Details can be found at the end of this document

1.0 Executive Summary

- 1.1 Proposed works comprise the installation of a section of flood defence walling along the River Arun outside of 47 River Road (riverside autos), Littlehampton. The works will affect an approximate 26.7 metre length of the river bank through installation of a sheetpile wall with a concrete capping beam, and fill behind being proposed.
- 1.2 The site occupies an area of approximately 0.3 hectares and is set in an urban location on the immediate northern bank of the lower River Arun. The site comprises a building, hard standing and bare ground. Intertidal mud/sand habitat is dominant within the adjacent tidal reach of the River Arun, which flows in a north-west to south-east direction.
- 1.3 The following sites/habitats/species have been identified as potential constraints to the proposed development (Refer to *Drawing Number: 172768/5/dwg1 and 172768/5/dwg2*):
- HPI Intertidal Mudflats
 - Running Water – Brackish habitat
- 1.4 Recommendations are:
- Ensuring works on site are conducted in accordance with 'PPG5 - Pollution Prevention Guidelines for works and maintenance in or near water' to prevent potential negative impact to HPI Intertidal Mudflats and Running Water – Brackish habitat. In addition, it is recommended that advice be sought from a suitably qualified expert on pollution impacts as a consequence of mobilisation of minerals from construction materials and movements of groundwater as these elements are beyond the scope of this assessment.
- 1.5 The following actions are recommended as biodiversity enhancement measures:
- The installation of bird box to encourage nesting of bird species within the site boundary which is situated within an urban area largely devoid of nesting opportunities. This may include a Wagtail/Dipper nest box i.e. 'Eco Dipper - Wagtail Nest Box' which would accommodate Pied Wagtail, a species recorded within the wider area during the survey. The nest box may be mounted upon the existing wall of the on-site building/structures facing the river, or on the outside face of the newly constructed wall.

2.0 Introduction

Background

- 2.1 Keystone Ecology was instructed by GHD to undertake a Preliminary Ecological Appraisal (PEA) of land adjacent to the River Arun, Littlehampton (Central OS Grid Reference TQ 02355 02133), including a River Corridor Survey of riverine habitat upstream and downstream of the site.
- 2.2 Previously, in 2013 The Environment Agency (EA) undertook the installation of flood protection works along the River Arun. During this phase, a small section of wall was not installed, located outside of 47 River Road (riverside autos). The proposed works include the construction this additional segment of the wall. The works comprise an approximate 26.7 metre length segment of sheetpile wall with a concrete capping beam, and fill behind.
- 2.3 The works are limited to design and construct of the following elements, as taken from the project Design Basis Report (GHD, 2017):
- Steel sheetside wall;
 - Concrete capping beam;
 - Upstream and downstream concrete return walls; and
 - Temporary works to support capping bam formwork and pile guides.
- 2.4 Works are envisaged to occur with the following process, as taken from the project Design Basis Report (GHD, 2017):
- Sheetpiles will be driven to required toe level utilising a vibratory hammer from a jack up barge;
 - The existing timber wall will then be removed by mobile equipment located on land (TBC);
 - Drainage layer installed within pans of sheetpiles;
 - Initial stage of fill provided between the existing reclamation slope and sheetpile walls;
 - Capping Beam constructed utilising framing off the initial fill, or scaffolding;
 - Fill to ground level (+3.5m OD) and compaction.
- 2.5 It is currently anticipated that the construction phase will take approximately 4-6 weeks and that the works will be programmed winter 2017/18.

Aims and Objectives

- 2.6 The aims and objectives of the PEA are to:

- Provide the results of an Extended Phase I Habitat Survey and desk study;
- Identify key ecological constraints to the proposed development;
- Inform design/working methods to allow significant ecological effects to be avoided or minimised;
- Identify further ecological surveys needed and the scope/design of such surveys;
- Allow likely mitigation or compensation measures to be developed;
- Form the basis for agreeing the scope of an EclA with the relevant consultees (if required) and
- Highlight opportunities for ecological enhancement.

2.7 The following ecological features are relevant to this exercise:

- Statutory and local designated wildlife sites;
- Habitats of Principal Importance (HPI) in England or local Biodiversity Action Plan (BAP) habitats and networks of these habitats;
- Ancient woodland inventory sites;
- Important hedgerows (as defined by The Hedgerows Regulations 1997);
- Veteran trees;
- Legally protected species;
- Species of Principal Importance (SPI) or local BAP species;
- The wider green infrastructure resource; and
- Invasive species.

2.8 This report has been produced with reference to BS 42020:2013 Biodiversity - Code of Practice for Planning and in accordance with CIEEM Report Writing Guidelines (CIEEM, 2015).

Site Context

2.9 The site occupies an area of approximately 0.3 hectares and occupies an urban location off River Road, located on the northern bank of the lower River Arun. The site predominantly comprises buildings, hard standing and bare ground. Intertidal mud/sand habitat is dominant within the immediately adjacent tidal reach of the River Arun, which flows north-west to south-east.

2.10 The urban centre of Littlehampton lies immediately east of the site, and the land to the north and north-east of the site entirely comprises residential and industrial development. South

and west of the site, on the opposite bank of the River Arun, the predominant land use is arable agriculture, and Littlehampton Golf Club lies approximately 250 metres south of the site. Beyond the areas of urban development, upstream of the site, the River Arun flows through pastoral and arable fields within the wider floodplain.

3.0 Methodology

Desk Study

- 3.1 Information from Sussex Biodiversity Record Centre (SxBRC) was received, and Natural England site designations accessed on 15th August 2017. Information obtained was used to provide a background on ecological features in the vicinity of the site. Refer to *Appendix 1* for details of records requested, search radii and sources of information.

Extended Phase I Survey/River Corridor Survey

- 3.2 The Extended Phase I Habitat Survey was undertaken on 14th June 2017 by a Senior Ecologist from Keystone Ecology (Andrew Blincow, MSc, BSc (Hons), ACIEEM). The site boundary is illustrated in *Drawing Number: 172768/1/dwg1 and 172768/1/dwg2*. The Extended Phase I Habitat Survey area was extended upstream and downstream of the works as illustrated in *Drawing Number: 172768/1/dwg1*.
- 3.3 Phase I Habitat Survey (JNCC, 2010) is a standard technique for obtaining baseline ecological information for large areas of land in which the main vegetation types present within the survey area are mapped using a standard set of habitat categories.
- 3.4 In addition to mapping, each of the main habitats within the survey area was described; including details of component plant species abundances (recorded using the DAFOR scale¹).
- 3.5 Incidental observations of protected and/or SPI/local BAP species and the potential for such species to occur on site (and in the surrounding landscape where relevant) were also noted; however, no specific protected/ SPI/local BAP species surveys were undertaken. The potential of the site for foraging/commuting bats has been determined in accordance with Table 4.1 of Collins (2016).
- 3.6 Where applicable, a River Corridor Survey (NRA, 1992) methodology was applied in combination with the Phase I Habitat Survey methodology. River Corridor Survey provides a detailed evaluation of a watercourse and riparian habitat and vegetation within 50 metres of the river bank. Surveyors identify and map the geography, hydrology and general ecology of the watercourse and associated habitats, together with an appraisal of its potential to support protected species and/or the presence of invasive non-native species. The River Corridor/ Phase I Habitat Survey area extended approximately 100 metres upstream and 200 metres downstream of the proposed works as access restrictions allowed.

Nomenclature

- 3.7 The English names of flora and fauna species are given in the main text of this report. Scientific names are used only in the absence of English names. Vascular plants and Charophytes follow the nomenclature of The Botanical Society for the British Isles database (2007) with all other flora and fauna following the UK Species Inventory (Natural History Museum, 2016).

¹ D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Limitations

- 3.8 The results of the survey and assessment work undertaken by Keystone Ecology are representative at the time of surveying.
- 3.9 This document does not contain a comprehensive list of botanical species on site. Only plant species characteristic of each habitat and incidental observations of notable plant species were recorded. In addition, many plant species are only evident at certain times of the year and so some plant species may have gone undetected.
- 3.10 The data held by consultees may not be exhaustive. The absence of records does not necessarily indicate absence of a species/habitat from an area but rather that these have not been recorded or are perhaps under-recorded within the search area.
- 3.11 The accuracy of data held by consultees varies due to the quality and scale that they were digitised to, the supporting information used to define locations/boundaries and also sensitivity of the data itself. Keystone Ecology cannot take responsibility for the accuracy of external data sources and as such discrepancies and inaccuracies may occur.
- 3.12 SxBRC do not hold information on important hedgerows, veteran trees or ancient woodland less than 2 hectares in size.
- 3.13 Unless otherwise stated survey grid references have been recorded using a hand-held GPS receiver (Garmin GPS map 60CSX) with a manufacturer's stated accuracy of 3-5 metres when not in tree canopy, steep terrain or other enclosed environments.
- 3.14 The site boundary and immediate foreshore were directly accessed for the purpose of the survey. Survey of the wider survey area upstream and downstream of the works and on the opposite bank was undertaken where access was feasible, or through the use of high-powered binoculars from vantage points on both banks.

4.0 Results and Evaluation²

Sites and Habitats Identified by the Desk Study

4.1 Sites and habitats identified by the desk study are presented in *Table 1*.

Table 1: Sites and Habitats Identified by the Desk Study

Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
European Statutory Sites			
Pagham Harbour Ramsar Site/SPA	13,540	Pagham Harbour is located approximately 10 km south-east of Chichester. The site comprises an extensive central area of saltmarsh and tidal mudflats with surrounding habitats including lagoons, shingle, open water, reed swamp and wet permanent grassland. The intertidal mudflats are rich in invertebrate and algae, and provide important feeding areas for birds. The lower saltmarsh is dominated by common cord-grass but also includes patches of glasswort. At higher levels sea-purslane is abundant. The area supports internationally important numbers of wintering pintail and nationally important numbers of Dark-Bellied Brent Goose, Grey Plover and Black-Tailed Godwit.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.

² An indication of the ecological value of features present has not been undertaken because those features identified as ecological features that are potential constraints to development will typically require further survey to make this valuation.

Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
Duncton to Bignor Escarpment SAC	11,641	The site is located approximately 10 km north of Littlehampton and measures approximately 211 ha. The site is designated for its Beech forests which occur on steep scarp slopes and on more gently-sloping hillsides in mosaic with Ash woodland, scrub and grassland. Much of the Beech woodland is high forest but with some old pollards. Rare plants present include the White Helleborine, Yellow Bird's Nest and Green Hellebore. The woods also have a rich mollusc fauna.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
Arun Valley Ramsar Site/SPA/SAC	11,087	The Arun Valley consists of 3 component Sites of Special Scientific Interest. Together these sites comprise an area of wet meadows on the floodplain of the River Arun between Pulborough and Amberley. The neutral wet grassland which is subject to winter, and occasional summer, flooding, is dissected by a network of ditches, several of which support rich aquatic flora and invertebrate fauna. The area is of outstanding ornithological importance notably for wintering wildfowl and breeding waders. The Arun Valley SAC is designated for supporting one of the 3 main population centres for Ramshorn Snail in the UK. This site includes 2 of its core sites in the wash lands of the Arun floodplain (Pulborough Brooks and Amberley Wild Brooks SSSIs).	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.

Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
<i>National Statutory Sites Designated for Bats and Birds</i>			
Arundel Park SSSI	5,216	Arundel Park is one of the most important sites in the country for invertebrates including a number of rare and notable species. The area has a particularly diverse breeding bird community and is important for overwintering species. The site also includes examples of species-rich chalk grassland containing several plants uncommon in Sussex. The breeding bird community includes birds of woodland and scrub such as Hobby, Tawny Owl, Nightingale and all 3 British species of woodpecker. On Swanbourne Lake Shelduck, Little Grebe and Tufted Duck are found and there are also important numbers of wintering wildfowl such as Gadwall and Pochard. The reedbed in the Wildfowl Reserve supports a locally notable population of breeding Sedge and Reed Warblers.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.

Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
Climping Beach SSSI	961	The site is a stretch of coast with a vegetated shingle beach, behind which is a sand dune system. The intertidal zone consists of soft muds and sands which support large populations of marine invertebrates. The invertebrates are an important food source for wintering birds. In particular up to 300 Sanderling have been recorded from this site in winter; a figure which represents 1% of the West European population of this bird which breeds in the high Arctic but flies south to winter on sandy coasts and estuaries. Other wintering birds include Grey Plover and Oystercatcher.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
West Beach LNR	747	The LNR is part of the Climping Beach SSSI. It includes:-sand flats, the tide line, shingle, sand dunes and the plants, birds, molluscs, reptiles and mammals which either live or feed on them.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.

National Statutory Sites

Climping Beach SSSI	961	The site is a stretch of coast with a vegetated shingle beach, behind which is a sand dune system. The intertidal zone consists of soft muds and sands which support large populations of marine invertebrates. The invertebrates are an important food source for wintering birds. Including Sanderling, wintering birds include Grey Plover and Oystercatcher.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
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Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
West Beach LNR	747	The LNR is part of the Climping Beach SSSI. It includes:-sand flats, the tide line, shingle, sand dunes and the plants, birds, molluscs, reptiles and mammals which either live or feed on them.	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
Local Wildlife Sites			
Ar06 - Littlehampton Golf Course & Atherington Beach LWS	250	-	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
HPI and Ancient Woodland (No. / Closest)			
Deciduous woodland	1/255	-	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.
Mudflats	15/Adjacent site	-	Yes – the proposed works will not result in direct loss of the HPI habitat as the proposed tidal wall will occupy the same approximate footprint of the existing structure. However, without mitigation, indirect impacts i.e. run-off/pollution may result in localised negative impact.
Coastal saltmarsh	2/275	-	No – considering the distance of the protected site from the site and the nature and scale of the proposed works.

Name	Distance from Proposed Development Site (m)	Details	Potential Constraint
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No ancient woodland within search parameters

Important Hedgerows and Veteran Trees (No. / Closest)

No information on important hedgerow or veteran trees available.

Key to site designations: LNR - Local Nature Reserve; LWS - Local Wildlife Site; NNR - National Nature Reserve; SAC - Special Area of Conservation; SPA - Special Protection Area; SSSI - Site of Special Scientific Interest .

Habitats Identified on Site

- 4.2 The following habitats were identified on site during the course of the field survey (the distribution of these habitats is shown in *Drawing Number: 172768/1/dwg1*).

- Bare Ground
- Buildings
- Coastal Grassland
- Ephemeral Short Perennial
- Hard Standing
- Intertidal Mud/Sand / Brown Algal Beds
- Running Water - Brackish

Bare Ground

- 4.3 Bare ground comprising compacted gravels dominates the site, upon which materials/waste, vehicles and equipment associated with the active on-site automotive garage are stored.

Buildings

- 4.4 An automotive garage and workshop is located within the north-west extent of the site. The building comprises a stone structure with pitched roof topped with asbestos roof tiles. The southern elevation is lined with corrugated metal panels, the remaining elevations comprise stone and mortar. Lean-to structures constructed from sheet metal and corrugated asbestos sheeting are present at the western extent of the structure.
- 4.5 Within the survey area, a mixture of residential and commercial buildings extend upstream and downstream of the site on both banks of the River Arun.

Coastal Grassland

- 4.6 A small area of Coastal Grassland is present within the downstream extent of the survey area on the opposite bank of the River Arun from the site. The habitat is above the normal high water level, however, is likely to become inundated during exceptional tides.

Ephemeral Short Perennial

- 4.7 Scattered within the areas of Bare Ground are discrete areas of Ephemeral Short Perennial habitat. These are dominated by Perennial Rye and False Oat grasses, with vascular species including Bristly Ox Tongue, Hairy Willowherb, Brassica sp, and Daisy sp. occasionally present. Scattered Bramble is occasionally present and immature Buddleia and Sycamore is rarely present at the northern site boundary. Clematis is rarely recorded growing on the external structure of the building to the west of the site.

Hard Standing

- 4.8 A small area of Hard Standing is present at the southern extent of the area of Bare Ground, associated with the existing retaining bank wall/capping.
- 4.9 Within the wider survey area, expansive areas of hard standing associated with residential and commercial buildings extend upstream and downstream of the site on both banks of the River Arun.

Intertidal Mud/Sand / Brown Algal Beds

- 4.10 Intertidal Mud/Sand is present to the south west extent of the site, within the tidal reach of the River Arun. The habitat was predominantly bare substrate, with *Ulva sp.* green algae becoming frequently present along the base of the retaining bank wall. The habitat type becomes more characteristic of Brown Algal Beds, with an approximately 5 metre width band of abundant *Fucus sp.* brown algae present across the foreshore immediately adjacent to the site boundary.

Running Water - Brackish

- 4.11 The River Arun has a normal tidal range of approximately 5 metres within the survey reach. The habitat is classified Running Water Brackish at low tide.

HPI and Local BAP Habitats, and Networks of these Habitats Identified on Site

- 4.12 The area of intertidal mud flats within the tidal range of the River Arun qualify as the HPI 'Intertidal Mudflats'. Mudflats are characterised by high biological productivity and abundance of organisms, but low diversity with few rare species. The mudflat biota reflects the prevailing physical conditions. The surface of the sediment is often apparently devoid of vegetation, although mats of benthic microalgae (diatoms and euglenoids) are common. These produce mucilage (mucopolysaccharides) that binds the sediment. Under nutrient-rich conditions, there may be mats of the macroalgae *Enteromorpha spp.* or *Ulva spp.* Occasional stones or shells may also provide suitable attachment for stands of furoid macroalgae such as *Fucus spp.* The proposed development is unlikely to result in direct or indirect impact to the habitat classified as this HPI.

Protected Species

- 4.13 The possibility that protected species will pose a constraint to the proposed development is evaluated for each of the main protected species/groups in *Table 2*, based on assessment of habitat suitability and other relevant factors, such as:
- National distribution of each species/group;
 - Previous records of species occurrence obtained through the desk study;
 - Connectivity to suitable habitats in the surrounding landscape;

- Field signs (e.g. tracks, droppings, direct sightings) suggesting presence of species within or near to the site;
- Probability of the proposed development having an adverse impact on the species/group if present.

SPI and Local BAP Species

- 4.14 The possibility that SPI or local BAP species will pose a constraint to the proposed development is evaluated in *Table 3* using the same evaluation criteria as *Table 2* (refer to Paragraph 4.13). Given the large number of SPI and local BAP species, these have only been included in the table if present in the desk study records and/or observed on site during the field survey.

Contribution to the Wider Green Infrastructure Resource

- 4.15 The banks of the lower River Arun upon which the site is situated forms part of an important corridor for wildlife, linking marine and terrestrial habitats on the south coast to freshwater and terrestrial habitats and sites inland. This includes sites such as the Arun Valley Ramsar Site/SPA/SAC, cited for wildfowl and wintering birds. In addition, the River Arun provides habitat for a range of species within the otherwise highly urbanised centre of Littlehampton.

Invasive Species

- 4.16 There is 1 record of Japanese Rose, 120 metres from the site.
- 4.17 There are no invasive species recorded within the survey site boundary.

Table 2: Protected Species Constraints Evaluation

Species/ Group	Desk Study Record (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
Bats	Roosting: Bat species (1/890) Common Pipistrelle Bat (3/1,261) Non-roosting: Bat species (3/1,575) Common Pipistrelle Bat (5/1,261) Daubenton's Bat (1/1,646) Long-eared Bat species (1/1,646) Myotis Bat species (1/2,000) Serotine Bat (2/1,280) Soprano Pipistrelle Bat (1/2,000)	✓*	✓*	The building on site offers moderate potential to support roosting bats during the summer. Due to the high levels of ongoing disturbance within the building it is unlikely the building could support hibernating bats. The site offers negligible foraging/commuting potential, although bats may forage/commute along the river corridor within the wider survey area	No evidence of roosting bats was identified during the Bat Roost Inspection Survey of the building and structures on site (Keystone Ecology, 2017). The building is currently subject to a level of disturbance (noise and vibration) not dissimilar to that expected by the proposed localised sheet piling. The project construction phase is proposed to be scheduled winter 2017/18 when bats are not active and considered unlikely to be present.	No
Badger	None within search parameters	x	x	The site contains no habitat for this species.	n/a	No

Species/ Group	Desk Study Record (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
Dormouse	None within search parameters	✓	✓	The site contains no habitat for this species.	n/a	No
Otter	None within search parameters	✓	✓	No suitable habitat for supporting an Otter holt/resting place within the site boundary or within 50 metres of site. The wider survey area provides suitable foraging habitat for the species.	No signs of Otter were recorded within the wider survey area. Proposed construction phase activities and final development will not prevent migration of Otter through the wider survey area.	No
Water Vole	7/1,162	✓	✓	No suitable habitat for supporting Water Vole within the site boundary or within wider survey area.	n/a	No
Specially Protected Birds	Bee-eater (1/280) Kingfisher (1/396)	x	x	No suitable habitat for supporting Bee- eater or Kingfisher within the site boundary.	The Extended Phase 1 Habitat Survey and Bat Roost Inspection Survey (Keystone, 2017) did not record any evidence of nesting birds within the building, river banks or physical structures on site.	No

Species/ Group	Desk Study Record (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
All Other Birds	n/a	n/a ³	n/a ⁴	Potential nesting habitat within the site boundary is limited to the building and potentially existing flood defence wall. These structures could potentially support a range of common and widespread bird species.	The Extended Phase 1 Habitat Survey and the Bat Roost Inspection Survey (Keystone, 2017) did not record any evidence of nesting birds within the building or physical structures on site. The cavity within the existing flood defence wall is subject to regular inundation as indicated by presence of marine algae, greatly reducing likelihood of nesting suitability. The project construction phase is proposed to be scheduled winter 2017/18, avoiding the breeding bird season.	No

³ Refer to *Table 3* for SPI species of Bird

⁴ Refer to *Table 3* for local BAP species of Bird

Species/ Group	Desk Study Record (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
Reptiles	None within search parameters	✓	✓	The Bare Ground and Ephemeral Short Perennial habitats and scattered detritus offer very limited potential foraging, basking and refugia habitat for Common Lizard.	The small area and isolated nature of the site from other suitable habitat limits the suitability for the site to support reptiles. The level of vehicle/plant activity on site will not differ significantly from that currently associated with current site use. There will be no loss of habitat on site.	No
Great Crested Newt	None within search parameters	✓	✓	No suitable habitat for supporting Great Crested Newt (GCN) within the site boundary.	No ponds recorded within 500 metres of site.	No
Invertebrates	White-letter Hairstreak (6/108)	✓	✓	No suitable habitat for supporting White-letter Hairstreak within the site boundary.	n/a	No
White-clawed Crayfish	None within search parameters	✓	✓	No suitable habitat for supporting White-clawed Crayfish within the site boundary. The species is intolerant of brackish conditions.	n/a	No

Species/ Group	Desk Study Record (No. of Records / Closest Minimum Distance from Proposed Development Site (m))	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
Plants	None within search parameters	n/a	n/a	No habitats within the survey site offer potential to support legally protected vascular and non-vascular plant species.	No protected plant species recorded on site.	No

*Status dependant on species

Table 3: SPI and Local BAP Species Constraints Evaluation

Species/ Group	Desk Study Record	SPI	LBAP	Potential Habitat	Other Relevant Factors	Potential Constraint?
Mammals	Hedgehog (1/209)	✓	✓	No suitable habitat for supporting Hedgehog within the site boundary.	n/a	No
Birds	Herring Gull (1/108) Skylark (1/396)	✓	✓	The habitats within the site and wider survey area may provide foraging opportunities for Herring Gull.	Proposed works will not result in loss of foraging habitat and works may only cause temporary localised disturbance.	No

5.0 Relevant Legislation and Policy

- 5.1 This section sets out the wildlife legislation and policy relevant (or potentially relevant pending further survey) to the proposed development based on the findings of the desk study and field survey. Please note that this legal information is a summary and intended for general guidance only. The original legal documents should be consulted for definitive information. Web addresses providing access to the full text of these documents are given in the References Section.
- 5.2 The legislation protection afforded to habitats that could be affected by the proposed development is detailed in *Table 4*.

Table 4: Legislation Protection Afforded to Sites/Habitats that could Potentially be Affected by the Proposed Development

Designated Site/Habitat	Legal Status
Running Water - Brackish	Under the Water Framework Directive 2000 (Directive 2000/60/EC) all member states all European States are committed to achieving good ecological status within all its waterbodies by 2015. An assessment of good ecological status encompasses fish, benthic invertebrates and macrophyte communities, hydro morphology, chemical quality and physio-chemical quality. No development should compromise the achievement of Water Framework Directive targets.

- 5.3 Section 40 of the Natural Environment and Rural Communities Act 2006 (the NERC Act) places a legal duty on public bodies, including planning authorities, to 'have regard' to the conservation of biodiversity when carrying out their normal functions, which includes consideration of planning applications.
- 5.4 In compliance with Section 41 of the NERC Act, the Secretary of State has published a list of species and habitats considered to be of principal importance for conserving biodiversity in England under the UK Post-2010 Biodiversity Framework. This is referred to as the list of Species/Habitats of Principal Importance in England, of which there are 56 habitats (HPI) and 943 species (SPI). The list is used to guide planning authorities in implementing their duty under the NERC Act.

National Planning Policy

- 5.5 The NPPF set out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. This presumption does not apply where development requiring Appropriate Assessment under the Birds or Habitats Directives is being considered, planned or determined.
- 5.6 The NPPF states that:

'When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- 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;
- proposed development on land within or outside a Site of Special Scientific Interest (SSSI) likely to have an adverse effect on a SSSI (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of SSSIs;
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;
- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and
- the following wildlife sites should be given the same protection as European sites: potential Special Protection Areas (SPA) and possible Special Areas of Conservation (SAC); listed or proposed Ramsar sites; and sites identified, or required, as compensatory measures for adverse effects on European sites, potential SPAs, possible SACs, and listed or proposed Ramsar sites.'

5.7 Under the NPPF, the Planning Authority has a responsibility to promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan.

5.8 Also under the NPPF the planning system should contribute to and enhance the natural and local environment by 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, including by establishing coherent ecological networks that are more resilient to current and future pressures.

Regional Planning Policy

5.9 The Arun Local Plan 2011 – 2031 Publication Version sets out the Council's vision for the development of Arun up to 2031. The Plan covers the Arun Local Planning Authority Area (LPA). The LPA is Arun District Council administrative area excluding land within the South Downs National Park Authority boundary. Arun Local Plan contains strategic and development management planning policies which will shape the future of the area and will be used in the consideration of planning applications.

Policy EMP DM3 - Littlehampton Harbour

- 5.10 Development will be encouraged which delivers the comprehensive safeguarding of the harbour including addressing flood risk, contaminated land, access and nature conservation issues and must also be consistent with other Local Plan policies. Such development will:
- h. Protect and improve the surrounding environment and habitats, in respect of the water and air environments serving them; and
 - j. All developments shall provide improvements to habitats for notable species in the area, in particular the Brent Geese population.
- 5.11 Developments shall also be consistent with other Local Plan Policies.

Policy ENV SP1 - Natural environment

- 5.12 Arun District Council will encourage and promote the conservation and enhancement of biodiversity and the natural environment through the development process and particularly through policies for the protection of both designated and non-designated sites. Where possible it shall also promote the creation of new areas for habitats and species. In relation to designated sites, development will be permitted where it protects sites listed in Tables 17.1-17.6 that are recognised for the species and habitats contained within them.

Policy ENV DM5 - Development and biodiversity

- 5.13 Development schemes shall, in the first instance, seek to achieve a net gain in biodiversity and protect existing habitats on site. They shall also however incorporate elements of biodiversity including green walls, roofs, bat and bird boxes as well as landscape features minimising adverse impacts on existing habitats (whether designated or not). Development schemes shall also be appropriately designed to facilitate the emergence of new habitats through the creation of links between habitat areas and open spaces. Together, these provide a network of green spaces which serve to reconnect isolated sites and facilitate species movement.
- 5.14 Where there is evidence of a protected species on a proposed development site, planning applications shall include a detailed survey of the subject species, with details of measures to be incorporated into the development scheme to avoid loss of the species. This involves consideration of any impacts that will affect the species directly or indirectly, whether within the application site or in an area outside of the site, which may be indirectly affected by the proposals. All surveys shall be carried out at an appropriate time of year and shall be undertaken by a qualified and, where appropriate, suitably licensed person.
- 5.15 All developments shall have regard to Natural England's standing advice for protected species.

Policy QE SP1 - Quality of the environment

- 5.16 The Council requires that all development contributes positively to the quality of the environment and will ensure that development does not have a significantly negative impact

upon residential amenity, the natural environment or upon leisure and recreational activities enjoyed by residents and visitors to the District.

- 5.17 The location of existing industrial and commercial uses, including waste management uses, must be taken into consideration when assessing proposals for development sensitive to noise, light, odour and outputs to air. This is to ensure that land allocated for these uses are protected and to ensure that the amenity of new developments and facilities is safeguarded from the impacts of incompatible land uses.

6.0 Discussion and Recommendations

Overview of Potential Ecological Constraints Associated with the Proposed Development

- 6.1 The following habitats have been identified as potential constraints to the proposed development (Refer to *Drawing Number: 172768/1/dwg2*):
- Running Water – Brackish and the HPI Intertidal Mudflats

Further Survey and Mitigation

- 6.2 For each constraint identified, all mitigation options provided follow the established Mitigation Hierarchy as set out in Section 5.2 of BS42020:2013. This seeks as a preference to avoid impacts then to mitigate unavoidable impacts, and, as a last resort, to compensate for unavoidable residual impacts that remain after avoidance and mitigation measures.

Running Water – Brackish and the HPI Intertidal Mudflats

- 6.3 There is potential for HPI Intertidal Mudflats to be indirectly impacted through run-off and/or groundwater pollution of mudflat habitat arising from the proposed construction activities. This could potentially result in significant negative effect upon both ecological receptors at a local level if not mitigated. As works are to be undertaken adjacent to/within a marine environment, works on site should be conducted in accordance with PPG5 - Pollution Prevention Guidelines for works and maintenance in or near water (EA, 2007) to prevent potential negative impact to HPI Intertidal Mudflats and Running Water - Brackish. In addition, it is recommended that advice be sought from a suitably qualified expert on pollution impacts as a consequence of mobilisation of minerals from construction materials and movements of groundwater as these elements are beyond the scope of this assessment.

Opportunities for Biodiversity Enhancement

- 6.4 The following actions are recommended as biodiversity enhancement measures:
- 6.5 The installation of bird boxes and bird perches to encourage the nesting of bird species within the vicinity of the site has been identified as a possible biodiversity enhancement opportunity. This is because the boundary is situated within an urban area usually largely devoid of nesting opportunities. Such opportunities may include a Wagtail/Dipper nest box (Eco Dipper - Wagtail Nest Box) which could accommodate Pied Wagtail, a species recorded within the wider area during the surveys.
- 6.6 The installation of vertipools to assist in enhancing the intertidal rockpool zone has been identified as a possible biodiversity enhancement opportunity. Such opportunities may see vertipools installed on the face of the sheetpiles at various heights to provide habitats for marine dwellers.
- 6.7 The installation of bat boxes to encourage the nesting of bat species within the vicinity of the site has been identified as a possible biodiversity enhancement opportunity. The nest boxes may be mounted within the site boundary, or at a nearby location within the vicinity of the

works depending on discussions with the MMO, District Council, landowners and Environment Agency.

7.0 References

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National Rivers Authority (1992). *River Corridor Surveys. Conservation Technical Handbook 1*. NRA, Bristol.

Natural History Museum (2016). *UK Species Inventory*. Available at:
<http://www.nhm.ac.uk/research-curation/scientific-resources/biodiversity/uk-biodiversity/uk-species/index.html> [Accessed on 16th August 2017].

Web addresses for access to full legislation and policy text:

Birds Directive:
http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

Conservation of Habitats and Species Regulations 2010 (as amended)
<http://www.legislation.gov.uk/ukxi/2012/1927/contents/made>

Countryside and Rights of Way Act 2000:
<http://www.legislation.gov.uk/ukpga/2000/37/contents>

Habitats Directive:

http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

Hedgerow Regulations 1997:

<http://www.legislation.gov.uk/ukxi/1997/1160/contents/made>

National Parks and Access to the Countryside Act 1949:

<http://www.legislation.gov.uk/ukpga/Geo6/12-13-14/97>

National Planning Policy Framework:

<http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf>

Natural Environment and Rural Communities Act 2006:

<http://www.legislation.gov.uk/ukpga/2006/16/contents>

Protection of Badgers Act 1992:

<http://www.legislation.gov.uk/ukpga/1992/51/contents>

UK Post-2010 Biodiversity Framework:

<http://jncc.defra.gov.uk/page-6189>

Wildlife and Countryside Act 1981:

<http://www.legislation.gov.uk/ukpga/1981/69>

Plans

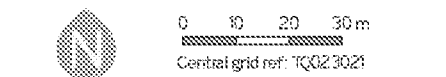


- Key
- Site boundary
 - Habitats surveyed
 - Building
 - Bare ground
 - Ephemeral/short perennial
 - Running water - brackish
 - Intertidal - mud/sand
 - Ba Intertidal - mud/sand - brown algal beds
 - C Coastal grassland
 - Hardstanding
 - Bridge
 - Artificial bank protection
 - Wall
 - Stable earth cliff
 - Scattered tree



GH0
River Arun, Littlehampton
Drawing Number: 172768/1/dwg1
Phase I Habitat Map

Revision	Date	Drawn	Approved
rev0	16/8/2017	RF	AB



No dimensions to be scaled from this drawing
All dimensions are to be checked on site
Measurements displayed are for indicative purposes only

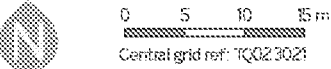


- Key
- Site boundary
 - Habitats surveyed
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GH-D
River Arun, Littlehampton
Drawing Number: 172768/1/dwg.2
Phase I Habitat Map Detail

Revision	Date	Drawn	Approved
rev0	16/8/2017	RF	AB



No dimensions to be scaled from this drawing
All dimensions are to be checked on site
Measurements displayed are for indicative purposes only

Appendices

Appendix 1

Desk Study Details

Record Type	Search Radius (km) ⁵	Source(s) ⁶
<i>Sites and Habitats</i>		
European statutory sites	15	Locations: Natural England GIS Digital Boundary Database: www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
National statutory sites designated for bats and birds	10	Citations: Natural England Site Designations: www.gov.uk/protected-or-designated-areas
National statutory sites	2	
Local wildlife sites designated for bats	2	Local biological records centre
Local wildlife sites, important hedgerows and veteran trees	0.5	Local biological records centre
Habitats of Principal Importance	0.5	Natural England GIS Digital Boundary Database: www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
Ancient woodland	0.5	Natural England GIS Digital Boundary Database ⁷ : www.gis.naturalengland.org.uk/pubs/gis/tech_ds.htm
Waterbodies	0.5	Ordnance Survey Street View Google Maps
<i>Species⁸</i>		
Bats, Otters and Water Voles	2	Local biological records centre
Other Protected species ⁹	0.5	Local biological records centre

⁵ In each case the search included the site and the specified area beyond the site boundary. Search radius was based on the professional judgement of the ecologist leading this appraisal with reference to current guidelines for ecological report writing (CIEEM, 2015).

⁶ Natural England GIS Digital Boundary Database accessed on 2nd January 2016 unless otherwise stated.

⁷ Only ancient woodland sites that were over 2 ha on the 1920's base maps are included on the inventory.

⁸ Records over 10 years old are excluded.

⁹ Birds only included if listed under the Wildlife & Countryside Act Sch 1. All species protected from sale only are excluded.

Record Type	Search Radius (km) ⁵	Source(s) ⁶
SPI and local BAP species	0.5	Local biological records centre ¹⁰

¹⁰ With reference to UK Biodiversity Action Reporting System if local BAP status is not indicated by information provided.

Appendix 2

Site Photographs



Photograph 1. Existing flood defence wall showing upstream and downstream extent of site boundary



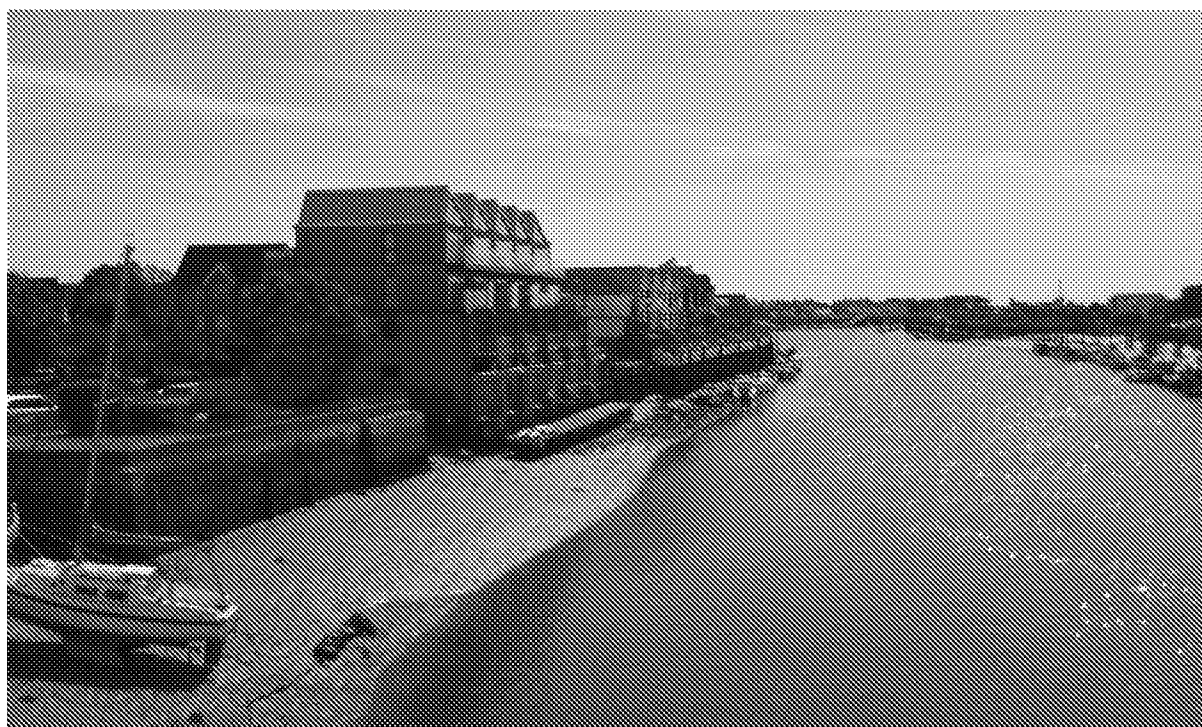
Photograph 2. Eroded cavity within existing flood defence wall. Note likely unsuitability of eroded cavity for nesting birds within breeding bird season (March – September) as indicated by presence of marine algae as evidence of regular inundation.



Photograph 3. Intertidal Mud/Sand – Brown Algal Beds habitat



Photograph 4. Intertidal Mud/Sand habitat



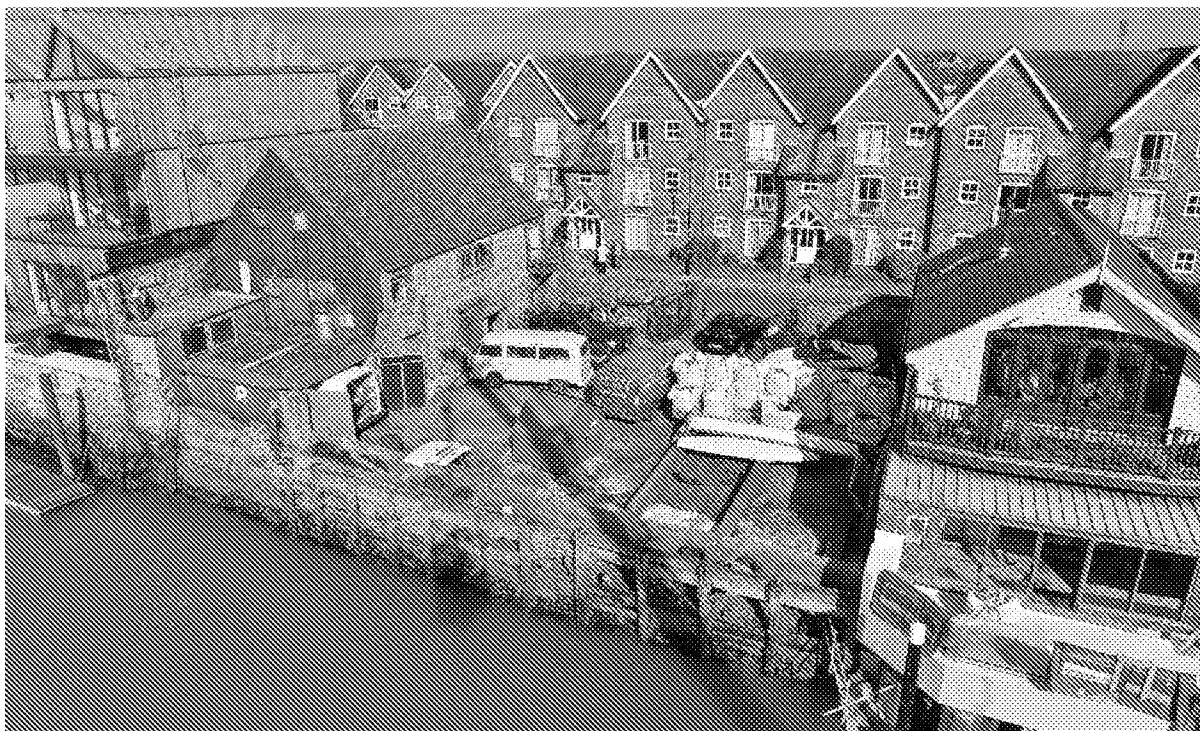
Photograph 5. View of site looking downstream from footbridge, approximately 100m upstream of site.



Photograph 6. View looking at opposite (right hand) bank upstream from footbridge, approximately 100m upstream of site.



Photograph 7. View of opposite (right hand) bank from site



Photograph 8. Elevated view of site, showing location of buildings in relation to site layout.

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