Princes Parade, Hythe

Baseline Environmental Report: Draft, Work-in-Progress

August 2012

47063285

Prepared for:
GVA & Shepway District Council

UNITED KINGDOM & IRELAND
## REVISION RECORD

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EXECUTIVE SUMMARY

This report has been produced to document the understood and observable environmental conditions of the site at Princes Parade in Hythe, Kent. It identifies the principal factors and constraints to any possible future development at the site, and is considered suitable for the purposes of assessing the potential for a site allocation by Shepway District Council.

Ground Conditions

Historic mineral extraction and use of the site as a landfill have lead to the ground conditions at the site being a mix of natural and man-made materials. There is a presence of contaminated land, particularly at the centre of the site, which would require further investigation and treatment, although it is considered that addition of clean top soil could allow domestic or community infrastructure use, given the nature of these conditions.

Historically the site was excavated for gravels. The site has also operated as a landfill for a variety of materials, and as a storage facility for highway maintenance. It has most recently hosted canal dredging. The ground now includes a range of man made materials.

Potentially toxic material has been recorded in low concentrations at shallow depths close to the surface. More elevated concentrations were found at greater depths, particularly in the central area of the site.

Recommended responses to contamination include: passive gas control measures; the placement of clean imported topsoil in domestic gardens; installation of a sub-surface membrane and the application of standard health and safety measures during construction.

Therefore, presence of toxic material is limited but can be addressed.

The underlying geotechnical conditions suggest a robust piling approach to foundations would be required.

Flood Risk and Drainage

The Strategic Flood Risk Assessment (carried out in 2009) determines the site is in Flood Zone 1 (based on risk of breach of existing defences and extreme tide event), although the EA still designate the site as Flood Zone 3. This is based on an assumption of no defences and extreme tide event. It is likely the sequential test will be applied to any future application. Work to reconcile the designations could proceed in advance.

Waves overtopping the existing seas defences have been recorded locally in the past, so it is recommended at this stage to maintain a set back buffer along the coastal edge.

Surface water flood risk management would be required should any development occur at the site, and it is recommended that Sustainable Drainage Systems (swales, etc) be included within any future proposals. These are likely to require impervious linings to prevent spread of underlying contamination.

The Royal Military Canal is ‘a main watercourse’ and therefore requires an 8m buffer along the canal from the top of its bank to be left.

Ecology
The site is not a statutorily designated ecological or wildlife conservation site, and there has been fairly recent establishment of mostly scrub vegetation across much of the site. The canal corridor provides diverse vegetation, and there is evidence of bird life and insects.

There is a potential for the site to be used by protected species, such as amphibians, bats and reptiles. However, none were directly observed or recorded during the Phase 1 habitat survey undertaken by URS, nor have they been recorded in previous known surveys.

Any potential future development would be required to mitigate loss, enhance and manage the most valuable habitat. A wildlife corridor along the canal is suggested.

Heritage

The Royal Military Canal adjacent to the site is a Scheduled Monument, and potential development will be required to not adversely affect this, its setting, or other heritage assets.

In particular, views along the canal, to the beach and to Martello Towers are considered particularly important.

Any development would require enhancement of the use and setting of the Scheduled Monument, such as through lowering ground levels to reveal currently obstructed views (such as those to the beach), and improve public information and interpretation.

Transport

The site has a long extent of straight frontage along Princes Parade which is relatively unconstrained. Any potential development would need at least two points of access, and can be safely accommodated in accordance with the Design Manual for Roads and Bridges.

The surrounding road network has been examined and it is recommended that ‘ghost island’ junctions be provided should development take place.

The pedestrian environment is also important, and it is recommended that any potential development would have footpaths integrated within the wider framework and new pedestrian crossings on Seabrook Road.
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APPENDIX A – LANDMARK ENVIROCHECK REPORT
APPENDIX B – DETAILS OF ECOLOGICAL DESIGNATIONS AND WILDLIFE RECORDS IN THE SURROUNDING AREA
APPENDIX C – GAZETTEER OF HERITAGE ASSETS
APPENDIX D – TRANSPORT SECTION PHOTOGRAPHS
APPENDIX E – TRAFFIC FLOW DIAGRAM
INTRODUCTION AND PURPOSE

This report has been produced in order to provide a summary of the documented and observable environmental conditions at the site at Princes Parade, near Hythe in Kent. The suitability of the site for possible allocation for future development will be assessed by Shepway District Council (SDC), with a view to its possible inclusion within the forthcoming Site Allocations Development Plan Document (DPD). This document is intended to form part of the evidence base to allow a decision on the allocation to be made.

The following topics have been investigated:

- Ground Conditions (including contamination);
- Flood Risk and Drainage;
- Ecology;
- Cultural Heritage; and
- Transportation and Access.

For each topic, the following is provided:

- Evidence base (information reviewed);
- Description of baseline conditions;
- Future trends (if applicable);
- Implications for site development;
- Required and suggested mitigation;
- Further Work (uncertainty and data gaps).

GROUND CONDITIONS AND CONTAMINATION

2.1 Evidence Base (information reviewed)

Information reviewed to inform this section of the report has included the following:

- Landmark Information Group Envirocheck® report 39921393_1_1 (included as Appendix A to this document);
- British Geological Society (BGS) website, www.bgs.ac.uk , ‘Geology of Britain Viewer’ and ‘Borehole Record Viewer’ tools;
- BGS 1:50,000 Series Geological Maps, Sheet 305 ‘Folkestone’ and Sheet 306 ‘Dover A’; and
- Ground Solutions Group Ltd, October 2002: Phase 2 Geo-environmental Investigation, Princes Parade, Seabrook, Kent.
2.2 **Description of Baseline Conditions**

**Geology**

Published geological mapping for the site, provided with the Envirocheck® report, indicates that it is underlain by drift deposits of Storm Beach Gravels over the bedrock of Weald Clay. The Storm Beach Gravels are described as consisting of gravels with some sand which have been thrown up into ridges by wave action. The mapping indicates that there are thin bands of marine alluvium in the area which generally comprise brown and blue clays. It is likely that these were formed in slight depressions and hollows between shingle ridges. A thin layer of clay coinciding with the easternmost section of the RMC is likely to be alluvium associated with the Seabrook Stream which formerly flowed into the harbour at Hythe.

The interface between the Storm Beach Gravels and underlying Weald Clay is often marked by a band of disturbed ground generally comprising clays intermixed with gravel to cobble and occasional boulder sized fragments of sandstone/limestone. This is thought to represent an accumulation of ancient landslip debris from the degradation of the Hythe Beds escarpment which is now some distance to the north of the site.

The depth to the Weald Clay is reported to be variable in this area and is described as varying from orange and grey in colour.

Intrusive investigations undertaken by Ground Solutions Group (GSG) at the site in 2002 on behalf of SDC indicated the following stratigraphic sequence underlying the site:

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth to Base of Stratum (m)</th>
<th>Thickness (m)</th>
</tr>
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<tbody>
<tr>
<td><strong>Made Ground</strong> – variable deposits comprising clays, sands and gravels with brick, concrete, ash, clinker, glass, rubber and general domestic refuse. Some boulder size concrete fragments and large pieces of timber were encountered.</td>
<td>2.8 – 4.2 Where proved</td>
<td>2.8 – 4.2 Where proved</td>
</tr>
<tr>
<td><strong>Possible Made Ground/Marine Alluvium</strong> – Medium dense fine to coarse rounded to angular sand and gravel with occasional cobbles. Bands of soft, soft to firm and firm gravelly clay with occasional black organic mottling and decomposed plant matter wither within or at the base of this horizon.</td>
<td>7.0 – 7.5</td>
<td>3.4 – 3.8</td>
</tr>
<tr>
<td><strong>Beach Gravels</strong> – Medium dense at the surface rapidly becoming dense or very dense fine to coarse rounded to subrounded and occasionally subangular sandy gravel.</td>
<td>Base not proven at 7.0 – 7.5</td>
<td>0.5 proved in 2No. exploratory hole locations</td>
</tr>
</tbody>
</table>

The Weald Clay was not encountered during the GSG investigation. The geological succession encountered by GSG broadly confirms the published geology outlined in the Envirocheck® report.

**Geotechnical Hazards**

The Envirocheck® report provides information on the levels of potential geotechnical hazards identified at the site which are summarised as follows:

<table>
<thead>
<tr>
<th>Hazard Type</th>
<th>Reported Hazard Potential</th>
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<tbody>
<tr>
<td>Collapsible Ground Stability Hazard</td>
<td>No Hazard (north of the site) to Very Low (south of the site)</td>
</tr>
<tr>
<td>Compressible Ground Stability Hazards</td>
<td>Moderate (north of the site) to No Hazard (south of the site)</td>
</tr>
<tr>
<td>Potential for Ground Dissolution Stability Hazards</td>
<td>No Hazard</td>
</tr>
<tr>
<td>Potential for Landslide Ground Stability Hazards</td>
<td>Very Low</td>
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Potential for Shrinking or Swelling Clay Ground Stability Hazards

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<th>Potential for Shrinking or Swelling Clay Ground Stability Hazards</th>
<th>Low</th>
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Radon Affected Area

<table>
<thead>
<tr>
<th>Radon Affected Area</th>
<th>The site is in a lower probability radon area, as less than 1% of homes are above the action level</th>
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GSG compiled a ground model as part of their desk based assessment in 2002 which identified the following geotechnical hazards with respect to preliminary foundation options for future development:

- Variable soil type and locally low strength and highly compressible nature of the near surface natural deposits in this area and the unknown but potentially variable depth to competent natural ground due to landfilling. GSG considered that this would influence the depth and type of foundations that can be used.

- An anticipated high and tidally influenced groundwater level and groundwater likely to have been affected by saline intrusion. GSG consider that the groundwater level variation should be taken into consideration in the design of any foundations as it could have an influence on soil strength and compressibility. In addition to this GSG indicated that the saline nature of groundwater should be considered with respect to aggressive chemical attack on buried concrete.

- There may be stability issues and foundation performance associated with any construction that may be planned at shallow depth close to the site boundary adjacent with the Royal Military Canal.

Hydrogeology

From 1st April 2010 new aquifer designations replaced the old system of classifying aquifers as Major, Minor and Non-Aquifer. This system is in line with the EA Groundwater Protection Policy (GP3) (Ref. 1) and the Water Framework Directive (WFD) (Ref. 2) and is based on British Geological Survey mapping. These designations reflect the importance of aquifers in terms of groundwater as a resource (drinking water supply) but also their role in supporting surface water flows and wetland ecosystems.

The drift deposits of Storm Beach Gravels underlying the site are classified as a Secondary A aquifer by the EA. These are defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The Weald Clay bedrock is classified as Unproductive Strata which is defined as rock layers with low permeability that have negligible significance for water supply or river base flow.

The site is not located on an EA designated Source Protection Zone (SPZ) for the protection of drinking water supply. It should be noted that there are three separate Inner SPZs (Zone 1) located approximately 230 m north east, 270 m north west and 310 m north of the site respectively.

Groundwater vulnerability mapping indicates that the site is located over an area that has soils considered to have high leaching potential (HU) with little ability to attenuate diffuse sources pollutants and in which non-absorbed diffuse source pollutants and liquid discharges have the potential to move rapidly to underlying strata or shallow groundwater. This, however, is a worst case scenario classification due to sparse data available for urban areas.

There are no licensed groundwater abstractions or discharges reported as being located on the site.

There are 3 No. licensed groundwater abstractions recorded as being located with a 500 m radius of the site boundary. These are situated approximately 230 m north east, 270 m north west and 310 m north of the site respectively. These relate to the public drinking water
abstraction boreholes operated by Veolia Water Southeast Limited. The Zone 1 SPZs described in the paragraphs above are associated with these public water supply boreholes.

The close proximity of the site to the sea would result in the groundwater beneath the site being tidally influenced and possibly affected by saline intrusion. Tidal fluctuations are likely to affect both groundwater levels and quality.

Groundwater levels observed in boreholes installed as groundwater monitoring wells by GSG in 2002 indicated that groundwater levels beneath the site varied from 5.14 to 6.47 m bgl.

**Hydrology**

The site is bordered immediately to the north by the RMC. There are no licensed surface water abstractions or discharges reported as being located on the site.

A surface water discharge consent is recorded as being located approximately 10 m east of the site. This is reported as being operated by Southern Water Services Ltd (UK) for the discharge of storm sewage overflow. The receiving water is recorded as the ‘Strait of Dover’.

A surface water abstraction consent is reported as being located approximately 300 m north of the site. This is recorded as being operated by Folkestone & Dover Water Services Ltd for public water supply with the abstraction coming from a pond or lake.

The Envirocheck® report records 2 No. pollution incidents to controlled water, one of which is reported to have occurred on site, the second approximately 10 m to the east of the site boundary. The receiving waters for the on-site incident are reported as the Royal Military Canal with the incident being classified as a Category 3 – Minor Incident and occurring in 1989. The pollutant type is not recorded. The incident recorded as having occurred approximately 10 m to the east of the site is also classified as a Category 3 – Minor Incident relating to the release of oils in 1998. The receiving waters are not reported in this case.

**Historical Land Use**

Historic mapping obtained as part of the Envirocheck® report together with the GSG report were reviewed to provide a summary of the historic development of the site.

Earliest available mapping (1872) indicates that the site was excavated for gravels. By 1931 part of the western half of the site (adjacent to the footpath – Seaview Bridge) appears to have been converted into a recreation ground. The eastern half of the site still appears to have been in use as a gravel pit in 1931.

By 1958, the recreation ground is no longer in evidence and the gravel pit is still annotated, however by 1976 it is no longer shown. No significant changes in land use are identified in any subsequent map editions.

Information reviewed in the Envirocheck® report indicates that the site was an historical and British Geological Survey recorded landfill site. It is noted by GSG in their 2002 report that SDC provided them with a letter giving the results of a search of Kent landfill sites. This identified that the site was operating as Princes Parade landfill until 1975 and received Category B and C wastes. Category B wastes included slowly degradable waste (B1) and scrap metal (B2), whilst Category C wastes are those that are putrescible or difficult. The depth of the landfill was reported to be 5m below ground level (bgl).

Information reviewed in the SDC’s objection to the village green application in 2010 provided further information on the historical use of the site, including the deposition of arisings from dredging activities associated with the RMC. It was reported that between 1982 and 2002, the western end of the site was used for the storage of ground maintenance materials, including soil and road plainings from the Highways Department. The area was also used for the burning of waste materials from the ground maintenance operations. During the 1980’s the council are reported to have arranged for silt dredged from the RMC to be deposited on the
eastern half of the site, i.e. eastwards of the footpath leading to Seaview Bridge. In October 2002, the whole site was fenced off and silt dredgings from the canal were spread across it. Further localised areas of dredgings deposition were carried out in 2003 and 2004 and September 2007. No information on the quantity or quality of the dredgings was provided in the SDC’s objection letter.

RPS carried out a review of existing environmental reports for the site in March 2003. One of the reports they reviewed was the 1999 Scott Wilson Kirkpatrick & Co Ltd investigation of the sediments within the Royal Military Canal. They estimated that approximately 150,000 m³ of sediment had previously been dredged from the canal over a period of 40 years. They indicated that no records of contamination testing were undertaken. They did however report that, in accordance with EA requirements, one sample was analysed every 500 m along the canal stretch (every 250m in the vicinity of Hythe) for the ICRCL 59/83 range of contaminants, polychlorinated biphenyls (PCBs), pesticides and nutrients. Scott Wilson Kirkpatrick & Co concluded that the materials were generally free from contamination although some samples reported elevated concentrations of sulphate and chloride.

GSG also reported that dredgings from the canal were disposed of onto the site. They indicated that no data exists in relation to the quantity or quality of these dredgings. Notwithstanding, they reported that the SDC provided them with recent analytical data from tests carried out on the canal sediments which indicated that the concentrations of potential contaminants were generally low.

Historical development in the immediate vicinity of the site has included the building of the RMC (completed circa 1809) and the construction of the Hythe and Sandgate Branch of the South Eastern Railway to the north. 1877 mapping indicates that a Gas Works was located approximately 150m to the north of the eastern section of the site. This is no longer in evidence in subsequent map editions.

The conurbation of Seabrook appears in the 1898 map edition and is located within 250m north of the site. This has developed westwards over subsequent years with development appearing to be predominantly residential in nature.

Potential for Contamination

Contaminated land is defined as land which appears to contain substances which could result in significant harm being caused, for example through ingestion of toxic substances by people, plants and animals or by polluting controlled waters. To determine this, GSG carried out an intrusive investigation of the site in 2002 on behalf of SDC. The works comprised the following:

- 4No. cable percussion boreholes drilled to a maximum depth of 7.5 m bgl;
- Installation of combined groundwater/gas monitoring standpipes in 3No. of the cable percussion boreholes and subsequent monitoring;
- 30No. machine excavated trial pits to depths of between 3.3 and 5.0 m bgl; and
- Installation of 10No. gas monitoring standpipes in a selection of the trial pits together with subsequent monitoring.

Olfactory evidence of contamination was noted by GSG in 5No. trial pit locations within the Made Ground materials. One of these was described as being a slight hydrocarbon odour with the remaining four locations described as emitting a landfill odour consistent with organic esters. Visual evidence of contamination was noted in all trial pits which consisted of general household refuse including plastic sacks, glass, metal, crockery and textiles. In addition to this, sterile unused stomach tubes were reported as being present in one trial pit location.

Seventy soil samples were submitted for analysis for the following parameters:
A section of piping was also recovered by GSG from one trial pit location and submitted for asbestos testing. Results of this analysis indicated that the asbestos type chrysotile was present.

Leachate testing was also conducted on selected soil samples for the same suite of analysis as outlined in the table above.

Groundwater samples collected from the installed wells were also tested for the same suite of analysis as outlined in the table above. Soil gas monitoring was also undertaken at the site by GSG in both the piezometers and the boreholes.

Soil and groundwater samples were assessed by GSG to determine their risk to human health and environmental receptors. The assessment criteria utilised included a combination of the guidance note ICRCL (Inter-departmental Committee on the Redevelopment of Contaminated Land), ‘Contaminated Land Exposure Assessment’ (CLEA) guidance and Dutch contaminated land assessment criteria.

Soil gas data obtained by GSG was assessed against guidance contained within the Building Research Establishment (BRE) Report 212 and Approved Document C of the Building Regulations (1991).

Further review of the Envirocheck® report indicates that an operational petrol station is located approximately 100m east of the site.

### Geotechnical Considerations

In addition to the drilling and installation of boreholes and the excavation of trial pits and installation of piezometers, GSG carried out 10No. static cone penetration tests (CPTs).

A number of obstructions were locally encountered at shallow depths during the GSG site investigation that prevented borehole and CPT progress. The trial pits were generally unstable indicating low strength/loose ground. The CPTs indicated variability in the in-situ strength/density profile both laterally and with depth. GSG anticipated that the variability in strength and settlement characteristics if the made ground and local presence of biodegradable material would make it unsuitable as a bearing horizon for foundations due to the potential for significant total and differential settlement. GSG also indicated that the irregular surface of the site suggests that the fill is undergoing self weight settlement.

In addition to this a number of samples were taken and scheduled for the following geotechnical parameters:

- Moisture content;
- Liquid and plastic limits;
- Particle size distribution (PSD) by wet sieving;

<table>
<thead>
<tr>
<th>Metals</th>
<th>Inorganic Compounds</th>
<th>Organic Compounds</th>
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<tbody>
<tr>
<td>Arsenic</td>
<td>pH</td>
<td>Total Polyaromatic Hydrocarbons (PAH)</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Water Soluble Sulphate</td>
<td>Total Petroleum Hydrocarbons (TPH)</td>
</tr>
<tr>
<td>Chromium</td>
<td></td>
<td>Gasoline Range Organics</td>
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<td>Lead</td>
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<td>Diesel Range Organics</td>
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<td>Water Soluble Boron</td>
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• Undrained shear strength, single stage tests on U100 samples; and
• Consolidation properties in an oedometer cell (i.e. soil compression).

Laboratory testing of the clays indicated high moisture contents, in the range of 49 to 61% and plasticity indices of 43 to 51%. The clays were classified as intermediate to high plasticity. Within one borehole the undrained shear strength of the clay was 17 kN/m² (kilonewton per metre squared), soft, and oedometer results indicated that the clay was highly compressible.

The Beach Gravels generally showed a rapid increase in the in-situ density with depth comprising dense and very dense sand and gravels which were proved to the full depth of the GSG investigation. Standard Penetration Test (SPT) ‘N’ values within this horizon varied from 11 to 21 locally at or near the surface of the deposits but generally ranged between 45 and 50 before refusal. The SPT test is an in situ dynamic penetration test designed to provide information on the geotechnical engineering properties of soil. The main purpose of this test is to provide an indication of the relative density of granular deposits such as sands and gravels.

2.3 Implications for Site Development

A review of the baseline information for the site would indicate that the environmental setting of the site is considered to be of moderate to high sensitivity, based on the site overlying a Secondary-A aquifer and it’s proximity to the coast. Based on the information reviewed for the baseline it is considered that the potential for contamination at the site is moderate to high. This is based on the site’s former use as a landfill and the results of the intrusive investigation undertaken by GSG in 2002.

It is understood at this stage that the uses being investigated for the site include a residential end use and a school, considered to be medium to high sensitivity, and a sports centre, considered to be low to medium sensitivity.

In general terms, the level of contamination risk and sensitivity of the end use directly influences the level of ‘abnormal costs’ related to remediation works associated with making the Site safe for redevelopment, as indicated in the Table 4.

<table>
<thead>
<tr>
<th>End Use Sensitivity</th>
<th>Contamination Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>M</td>
<td>L</td>
</tr>
<tr>
<td>H</td>
<td>M</td>
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</tbody>
</table>

Key: L = Low; M = Moderate, H = High
* = Abnormal Costs related to Remediation works

Although suitable for the purposes of assessing the potential for a site allocation, given the age and the limited nature of the data currently available for the site, there is a potential financial risk of not carrying out further assessment of the soil, groundwater and soil gas conditions at the site, to inform the economic feasibility of the final scheme design. An example of this being that if a sensitive end use such as residential with gardens is planned for an area which is later identified as posing a high contamination risk, the potential costs
associated with cleaning up the site to a standard suitable for the proposed land use may be much higher than expected.

Further work will allow areas of low, moderate and high contamination risk to be identified which will assist in informing any possible future planning application. It is generally recommended that highly sensitive land uses are located in areas of low risk and less sensitive land uses are better located in areas of moderate/high risk. Notwithstanding this, areas that are given a moderate/high contamination risk rating can be developed to a residential end use, although abnormal costs would be likely to increase and be higher than for commercial end use.

From a geotechnical perspective, the GSG investigation carried out at the site was preliminary in nature. Further, more detailed geotechnical investigation works would need to be carried out in order to provide more detailed information for detailed foundation design. However, the information provided is considered suitable for the purposes of assessing the potential for a site allocation.

2.4 Required and Suggested Mitigation

Contamination

The conclusions of the risk assessment conducted by GSG in 2002 and their subsequent recommendations are summarised below:

- Gas monitoring carried out in the piezometers and the boreholes indicated that methane concentrations were generally low across the eastern end of the site, however elevated concentrations of methane were recorded in the western end. The concentrations of carbon dioxide were elevated across the site. GSG considered that the use of passive gas control measures should be considered in future development. This will further aid in reducing the limited potential for the build up of asphyxiating and explosive gases in any of the proposed buildings.

- Concentrations of metals potentially toxic to humans were low in samples recovered at shallow depths (ground level to 1.0 m bgl) across the site and are not considered to pose a significant risk to occupants of future properties. However, elevated concentrations of arsenic, nickel and lead were recorded at greater depth in the central area of the site. GSG considered that the placement of ‘clean’ imported topsoil in proposed domestic garden areas would be sufficient to ameliorate the marginal risk posed by the metals at shallow depths.

- The concentrations of potentially phytotoxic metals (boron, copper and zinc) were elevated at shallow depths (ground level to 1.0 m bgl) generally in the central area of the site. The soil pH across the whole of the site ranged from 7.4 to 8.5 and under such conditions the chemical solubility of metals and therefore their bioavailability and potential for plant uptake is reduced. GSG considered that the potential risks to plants are low.

- Site workers involved in any current or future development of the site could be exposed to a variety of pathways such as direct skin contact, ingestion and inhalation. GSG considered that the provision and use of appropriate Personal Protective Equipment (PPE), hygiene facilities and implementation of normal dust suppression measures would be considered appropriate control measures to minimise the potential health risks.

- Results from the leachate analysis indicated that copper and PAHs exceeded their respective Leachate Quality Threshold (LQT) concentrations. However the LQT for copper and PAHs used by GSG were based on maximum admissible concentration from the Water Supply (Water Quality) Regulations (1989). The pH recorded in the soil samples was in the range of 7.4 to 8.5 indicating that the soil is neutral to alkaline.
GSG considered that such a pH would reduce the solubility of any metals adsorbed to soil particles.

- GSG indicated that general construction activities are likely to generate surplus materials which may require off-site disposal at an appropriately licensed waste management facility. GSG considered that a formal classification would be sought from the EA prior to disposal.

**Structural**

From a geotechnical perspective, GSG made the following preliminary conclusions and recommendations following their 2002 investigation:

- The site is underlain by Made Ground, possible Made Ground/marine alluvium and Beach Gravels at depth.

- The Made Ground was consistent with landfill deposits. The possible Made Ground/marine alluvium appeared to be closely related to the local geology but bands of variable strength clay may represent dredgings from the RMC or natural deposits of marine alluvium. The Beach Gravels were found at depths of between 7.0 and 7.5 m bgl in the boreholes drilled. The Beach Gravels were generally dense to very dense and boreholes were terminated a short distance into this horizon. SPTs progressed a little further into the deposit before no further blows penetrated the strata (i.e. met refusal).

- Groundwater was not encountered within the boreholes or trial pits during the investigation but standpipe monitoring indicated a shallowest recorded groundwater level at 5.14 m bgl in one borehole.

- The soil profile was found to be unsuitable for a shallow strip/trenchfill foundation type.

- The GSG recommended foundation option for the site is piles. GSG indicate that these should be constructed within the Beach Gravels, the surface of which was identified in the boreholes. However, the thickness of the Beach Gravels would need to be determined prior to final design when the proposed development layout has been determined. If the thickness of the Beach Gravels is limited or laterally variable, piles would have to be constructed to a greater depth within the underlying Weald Clay.

- GSG considered that ground improvement would be required beneath areas of the site proposed for access roads and infrastructure corridors to avoid unacceptable total and differential settlement. Flexible connections would be required where services enter buildings constructed on piles.

- GSG recommend further geotechnical intrusive investigation prior to the finalisation of and foundation design.

To inform any future planning application at the site, further geotechnical investigation could be run in tandem with any further environmental investigation in order to reduce mobilisation costs and programme constraints.

### 2.5 Uncertainty and Data Gaps

The site investigation undertaken by GSG in 2002 identified a number of issues with respect to soil and groundwater contamination and the presence of soil gas. The copy of the GSG report provided to URS to review was not complete. It was missing the appendices and figures and as such it was not possible to determine the positions and distribution of exploratory holes across the site or review the raw laboratory data.
GSG indicated that they submitted a sample of some piping to determine whether it contained asbestos. Given the former use of the site, it is anticipated that asbestos sampling would be required across the site as a whole.

The guidance documents utilised by GSG to carry out their risk assessment have since been superseded. ICRCL and Contaminated Land Research (CLR) documents 7 to 10 have now been withdrawn and superseded by Human Health Toxicological Assessment of Contaminants in Soil, Science Report SC050021/SR2 (2009). In addition to this the guidance on soil gas utilised in the GSG assessment has also been superseded by CIRIA document C665. Assessing risks posed by hazardous ground gases to buildings (2007).

The geotechnical aspects of the GSG investigation were only preliminary in nature. As discussed above more a more detailed geotechnical investigation will be required in order to inform detailed foundation design.

URS broadly agree with the conclusions of the GSG investigation, however, it is considered that the report is now out of date.

Although the information provided in this report is considered suitable for the purposes of assessing the potential for a site allocation, it is anticipated that significant further intrusive works would be required at the site in order to support any future planning application. If a planning application is submitted without the benefit of additional and more up to date intrusive investigation data, it is likely that a number of planning conditions relating to dealing with land contamination will be attached to any permission granted. These are likely to include:

- Phase 2 Intrusive investigation and groundwater/soil gas monitoring
- Remediation Strategy; and
- Validation.

It is anticipated that a large volume of arisings from any construction activities will require disposal. Where surplus soils need to be disposed of, they will need to be disposed of to an appropriate, licensed landfill facility, in accordance with current Duty of Care responsibilities and other statutory requirements. This should include the sampling and testing necessary for classification (Waste Acceptance Criteria - WAC) and disposal. This will need to follow the methodology described in the EA publications ‘Framework for the Classification of Contaminated Soils in Hazardous Wastes’, version 1 (Ref. 3) and ‘Waste Acceptance at Landfills: Guidance on waste acceptance procedures and criteria’ (Ref. 4). Should soil for off-site disposal be classified as hazardous waste, then the Hazardous Waste (England and Wales) Regulations (2005) (amended 2009) (Ref. 5) will need to be adhered to.
3 FLOOD RISK AND DRAINAGE

3.1 Evidence Base

In determining issues and opportunities relevant to the site the following documents have been reviewed:

- Shepway District Council Strategic Flood Risk Assessment 2009 (Ref. 6)
- Environment Agency Flood Zone Maps
- Environment Agency Bathing Water Profile, Sandgate, Kent 2012
- Princes Parade Site Allocation DPD Consultant’s Brief 2012
- Romney and Rother Catchment Flood Management Plan Summary 2009
- Southern Water Quality Enhancement – Schedule of continuous discharge projects 2009
- Folkestone to Cliff End Flood and Erosion Management Strategy – Consultation Summary Report 2009
- River Basin Management Plan South East River Basin District 2009
- RPS Response to Geotechnical Information 2005
- ERM Environmental Statement 2005 (referenced within RPS document)
- South Foreland to Beachy Head Shoreline Management Plan 2006
- 2004 Hythe to Folkestone Coastal Protection Scheme - Scheme Review (URS 2011)
- Shepway District Council Project Appraisal Report 2008– Annual Beach Recycling Works

In addition, the local Environment Agency office has also been consulted for clarification regarding the flood risk to the site.

3.2 Description of the Baseline Conditions

The 7.2 hectare site is located on the Kent coastline and previous activities on the site (i.e. landfill dredging and spoil application) have increased the level of the site above its surroundings by 4 to 5 metres.

Flood risk to the site

Fluvial Flood Risk

A watercourse, the Seabrook Stream discharges via a silt trap into the eastern end of RMC near Horn Street. The Strategic Flood Risk Assessment (SFRA) (2009) identifies that during previous storm events (August 1996), surcharging of culverted sections and bank overtopping occurred along the stream. The SFRA also notes that work has been undertaken to improve the outfall and increase bank height which now offers protection from flood events up to a
standard of 1 in 25 years (August 96 represented a 1 in 500 year event). Flood risk arising from the RMC is discussed below in the Artificial Sources Flood Risk section.

Tidal Flood Risk

The Environment Agency’s flood maps identify the site lies in Flood Zone 3 which would mean that development of the site would not normally be permitted. However, mapping available in the SFRA (2009) shows the site as being located almost entirely in Flood Zone 1.

Following consultation, the Environment Agency has confirmed their position that the site lies within Flood Zone 3 which is defined assuming there are no flood defences present and the extrapolation of an extreme tide level.

Mapping from the SFRA presents the flood hazard to the site reflecting the defences that do exist and in the event of a breach of local flood defences under an extreme tide event. Whilst useful for determining the hazard to the site and for use in application of the ‘sequential’ and ‘exception’ tests, this information can not be used to reclassify the flood zone for the site per se. Any future planning application will need to be considered in light of the sequential and exceptions test.

Wave Overtopping

The formal sea defences in front of this site consist of a concrete vertical seawall with a setback wave wall (Plate 1). To compliment the wall a beach re-nourishment scheme was completed in 2004 to provide a wide gravel beach which protects the wall from erosion and wave overtopping (Plate 2). To maintain the beach width bi-annual beach recycling is conducted by SDC and funded by the Environment Agency.

Evidence from the SFRA identifies that prior to the 2004 coastal protection scheme wave overtopping resulted in flooding of Albert Road in Hythe (approximately 2km west of the site). Since the scheme overtopping has been limited to a single event in March 2008 when a lack of funding prevented beach recycling operations and the beach levels fell below design levels. The wave overtopping associated with this event was localised and mostly contained to the promenade area.

The URS Hythe to Folkestone Coastal Protection Scheme - Scheme Review (2011) concluded that provided beach levels were maintained, the defence standard currently exceeds 1:200 years.
Plate 1: View illustrating formal sea defences

Plate 6-2: View illustrating gravel beach protection to sea defences
Groundwater Flood Risk

Reports by ERM (2005) and RPS (2005) note high ground water levels at the site, which have the potential to be tidally influenced (i.e. vary semi-diurnally). There is no evidence of groundwater levels having caused flooding at the site.

Surface Water Flood Risk

There is currently no known risk of surface water flooding to the site.

Sewer (foul) Flood Risk

There is currently no known risk of sewer flooding to the site.

Artificial Sources Flood Risk

The RMC, forming the northern boundary of the site is a potential source of flooding. Environment Agency flood maps (accessed 21/6/12) place the site entirely in Flood Zone 3. This is most likely due to tidal flooding and issues with this data have been discussed in the Tidal Flood Risk sections. High water levels in the canal have been known to cause flooding but this has been mainly located in low lying areas in the west of Hythe.

3.3 Implications for Site Development

Flood Risk arising from the Development

Despite the location of the site in Flood Zone 3, the low hazard associated with the site as evidenced in the SFRA means development of the site will have no impact on the flood risk to neighbouring properties for fluvial, tidal, groundwater or artificial flood sources.

Any potential development would benefit from the existing maintained sea defences. It should be anticipated that the Environment Agency would require a financial contribution towards the annual defence maintenance costs as set out in the Defra Flood and Coastal Resilience Partnership Funding Policy.

Constraints on Development

Locating Development Types

The location of the site within Flood Zone 3 means there would be a presumption against development for more vulnerable types of development (e.g. housing, schools) in favour of developing sites within the Shepway administrative area at lower risk of flooding.

Where SDC can demonstrate through application of the 'sequential test' and 'exception test' (detailed in the National Planning Policy Framework (NPPF) that there are no other alternative or more suitable sites for development within the borough, then it would be possible to develop the site. Part of the evidence that would be used to inform the exception test would be data on the hazard to the site.

Should development of the site proceed based on the current SFRA Flood Zone 1 hazard classification of the site, data on the hazard should also be used to ensure the most vulnerable types of development are guided to the areas of lowest hazard within the site. Hazard mapping should be used to assist the siting of development types across the site, this would categorise the flood hazards present on the site arising from a flood (i.e breach of local coastal defences) enabling Master Planners to site vulnerable development types (e.g. housing) in those areas of the site with the lowest hazards, whilst areas of relatively greater hazard could be used for other low risk land uses such as car parks, leisure facilities or public open space.

Therefore, given the need to provide flood storage for attenuating site discharges it is recommended siting development types in keeping with the principles of the sequential test, i.e. outside of areas prone to flooding, either directly or from wave overtopping / breaching of
defences. Areas identified as being at high hazard (i.e. the coastal fringe of the site and the lowest lying areas) could be used as amenity areas and / or for siting any storage ponds required as part of the drainage strategy.

Despite the presence of coastal defences maintained to high standards, wave overtopping during storm events can give rise to hazardous conditions in coastal areas. As a consequence it is recommended that a buffer (blue dot and dashed line in Figure 1) is maintained along the coastal edge of the site to safeguard development and residents from hazards associated with wave overtopping.

The RMC is categorised as a main watercourse by the Environment Agency and as such, it will be necessary to provide an 8m wide sterile (of development) buffer strip from the top of bank (indicated as the green line in Figure 1). As the canal is also designated as a Scheduled Monument development of the site will require consultation with English Heritage. It should be remembered that new crossings of the canal (including bridge abutments) must avoid the canal’s buffer zone.

**Surface Water Management**

It will be necessary to attenuate surface water discharges from the site to greenfield discharge rates. The site surface water drainage network will be required to demonstrate how it controls flooding for events up to the 1 in 100 year including the effects of climate change. Figure 2 shows how runoff varies with the amount of impermeable area and also how much storage is required to return runoff to greenfield rates, appropriate for discharge.

The drainage strategy will need to demonstrate how the site proposes to manage surface water originating from rainfall and any ingress of water to the site resulting from sea defence overtopping/breaching, including allowances for site discharge points being tide-locked. Given the likelihood of a tidally influenced high water table, discharge to ground is unlikely to be practical.

In addition, the potentially contaminative history of site and the tidal interaction of groundwater, surface water quality will have to be ensured prior to discharge. Therefore, any SuDS proposed by a development will need to be lined so as to prevent saline water intrusion and leaching of contamination on site.
Figure 1: Principal site constraints and location for SUDS

Figure 2: Preliminary runoff rates and storage volumes required to maintain a greenfield runoff rate with varying levels of impermeable cover (based on the Princes Parade site).
**Emergency Response Planning**

While the flood risk to the site has some uncertainty, flood risk to surrounding areas is clearly understood. Flooding of lower lying land surrounding the site has the potential to effectively turn the site into an island in the event of a flood. Therefore, consideration must be given to emergency access and egress arrangements, including allowance for the impact of wave overtopping of coastal defences impacting the safety of access on the coastal frontage and warning and evacuation time using available infrastructure. Figure 1 indicates (red double headed arrow) an access / egress route that may be suitable under flood and or coastal overtopping scenarios.

**Opportunities for Development**

It is recommended to use surface water features (swales, ponds etc) as SuDS, as they feature higher in the SuDS hierarchy and will be preferable to the Environment Agency, whilst at the same time contributing to local ecology and water quality treatment. There is potential for part of the buffer zone along the canal (green line in Figure 1) to be used for this purpose.

**3.4 Required and Suggested Mitigation**

Should development occur at the site, surface water flood risk will need to be addressed via a drainage strategy which will need to demonstrate management of surface water generated on the site for flood events up to the 1 in 100 year plus climate change standard. Surface water generated by the site could potentially be discharged to the RMC. A topographic survey would be required to ensure that pumping is not required to discharge to the watercourse data relating to the variability of water levels in the canal when tide locked. Any surface water drainage strategy for the site would need to consider the implications on flood storage during tide-locked conditions, this can significantly increase the volume of surface water requiring storage during a storm event.

**3.5 Further Work (uncertainty & data gaps)**

Information available to determine the flood zone for the site appears contradictory. The Environment Agency is confident that the site lies within Flood Zone 3, however information from the SDC SFRA indicates the site lies within Flood Zone 1 which appears to align with the history of land levels being raised at the site, as can be seen by comparison with the level of the neighbouring golf course. It is recommended that determination of the flood zone for site is undertaken through reconciliation of the Environment Agency flood map and mapping available from the SDC SFRA, ). This would involve a full topographic survey of the site and comparison of ground levels to the extreme tide level used by the Environment Agency to determine flood zones. It is also recommended that Hazard Mapping is undertaken during this reconciliation process to support the possible siting of development types within the site.

The current coastal defences provide a good standard of protection against wave overtopping, provided that current beach levels are maintained. The level of potential developer contribution required to maintain this standard and any proposals to modify the existing defences to facilitate improved beach access from the site should be discussed with the Coastal Engineers at SDC.

The consequence of surface water management for the site could be significant in terms of the volumes of attenuation it is required to provide on site. This could impact on developable area. It is recommended that a more detailed assessment of surface water management is undertaken once target development densities are known.

The ecology section of this report explains the need to undertake further protected species surveys to inform a wildlife mitigation and enhancement strategy. This would also help to inform the best location and type of SuDS.
4 ECOLOGY

4.1 Evidence Base (information reviewed)

Desk Study

Kent and Medway Biological Records Centre (KMBRC) were contacted on 4th July 2012 for records of nature conservation sites and rare, protected or notable species within 2km of the site. Only records from within the last ten years are considered here. Further details of the reasons for notifying the statutory sites were obtained from the Multi-Agency Geographical Information for the Countryside (MAGIC) database.

As this section only considers the ecological value of the site itself, details regarding the other designated sites and protected species records within 2km are provided in Appendix B.

Field Survey

A field survey was undertaken on 6th July 2012 to identify and map the habitats on the site using Phase 1 methodology (Ref. 7). The dominant plant species for each habitat type were recorded as were any rare, notable or invasive plants. The survey was extended to record signs of, or the potential for notable or protected species to occur on the site.

4.2 Description of Baseline Conditions

Desk Study

Designated Sites

The site itself is not designated for its ecological and wildlife value, although it is adjacent to RMC, which is designated by Kent Wildlife Trust as a non-statutory Site of Nature Conservation Importance (SNCI) mainly on the basis of the presence of locally and nationally scarce plant species and diverse habitats (described further in Appendix B).

Field Survey

The habitats recorded on the site visit are listed below along with their alpha-numeric habitat codes:

- Tall ruderal (C3.1);
- Scrub (A2); and
- Ephemeral (J1.3).

The locations of the habitats and any target notes are presented on Figure 3. Detailed descriptions of habitats and features are set out below.
Tall Ruderal

The majority of the site comprised tall ruderal habitat which was interspersed with blocks of scrub (Plate 3). The sward had a dense, closed structure and no bare ground was noted. The dominant plant species were couch-grass Elytrigia repens, cocksfoot Dactylis glomerata, false oat-grass Arrenatherum elatius, wall barley Hordeum murinum, hogweed Heracleum spondylium, wild angelica Angelica sylvestris, cow parsley Anthriscus sylvestris, curled dock Rumex crispus, common nettle Urtica dioica, redshank Polygonum persicaria, spear thistle Cirsium vulgare, teasel Dipsacus fullonum, doves-foot cranes bill Geranium molle, common comfrey Symphytum officinale, cleavers Galium aparine, hedge bindweed Calystegia sepium and hedge mustard Sisymbrium officinale.

Tall ruderal habitats are common and widespread; however, such extensive areas provide an important source of seeds for migrating and wintering birds.

Several species of birds were recorded using this habitats and it is likely to provide nest sites and foraging opportunities for breeding birds. Furthermore, this habitat is likely to support a range of invertebrate which in turn could attract foraging bats. The habitat would also provide optimal foraging and refuge for reptiles and amphibians.

Plate 3: Tall ruderal habitat
**Scrub**

Extensive blocks of continuous and scattered scrub have developed on the site (Plate 4). The dominant species were blackthorn Prunus spinosa and bramble Rubus fruticosus agg., elder Sambucus nigra, common alder Alnus glutinosa, goat willow Salix caprea and crack willow Salix fragilis.

Whilst scrub is a common and widespread habitat such large, undisturbed blocks provide optimal nest sites and foraging opportunities for birds

**Plate 4: Dense continuous scrub**

**Ephemeral**

Ephemeral plants had established around the edges of the site where the land had been trampled by pedestrians (Plate 5). Early successional plants, typical of disturbed ground, had
colonised patches of bare ground. The dominant plants species included annual meadow grass Poa annua, pineappleweed Matricaria matricarioides, scentless mayweed Tripleurospermum inodorum, white clover Trifolium repens, common chickweed Stellaria media, bugle Ajuga reptans, bucks-horn plantain Plantago coronopus, and common bird’s-foot trefoil Lotus corniculatus.

The areas of ephemeral habitats were small in area and disturbed by pedestrians and this limits their value to wildlife. However, these areas may provide some pollen and nectar sources for invertebrates.

**Plate 5: Ephemeral species on bare ground**

Protected Species

The purpose of the phase 1 survey was not to determine whether any of the following species were present. Comment has however been made on the habitat identified which could support them and where species were present, a record was made.

**Birds**

KMBRC identified a range of bird species that may use the site and its surrounds throughout the year. The habitats on site could support numerous species of breeding birds by providing both nest sites and invertebrates and seeds for feeding. The following bird species were recorded during the survey; chiffchaff Phylloscopus collybita, reed warbler, whitethroat Sylvia communis, song thrush Turdus philomelos, house sparrow, dunnock Prunella modularis, long-tailed tit Aegithalos caudatus, blue tit Parus caeruleus, pheasant Phasianus colchicus and blackbird Turdus merula. All of these species are likely to nest on the site. Furthermore, the site is likely to provide important foraging opportunities for migrating and wintering birds.

**Bats**

The site has no features suitable for roosting bats, although it would provide an extensive area of foraging habitat. A number of records of bats, including bat roosts are known to occur in the wider area, and the adjacent RMC provides a corridor into the wider landscape which would encourage bats to use the site.
Invertebrates

Several butterflies and dragonflies were noted during the site survey, and it is likely that the site supports a diverse range of invertebrates. A number of rare and notable invertebrates have also been recorded in the area.

Badger

No evidence of badgers was recorded during the site visit and there was only one record of badgers within 2km.

Water Vole and Otter

There are no records of water vole and otter at the site.

Reptiles

KMBRC provided records of common reptiles in the area and the site would provide extensive foraging, refuge and hibernation opportunities for these animals. No reptiles were identified during the site visit, however as stated above this was not the purpose of the phase 1 survey.

Amphibians

Due to the proximity of the canal, the site is likely to provide terrestrial habitat for amphibians. KMBRC provided records of amphibians in the wider area. No species were found during the site survey.

Other mammals

The dense vegetation on the site would provide refuge and foraging opportunities for a range of mammals such as hedgehog Erinaceus europaeus, fox Vulpes vulpes and rodents, however none of these species were observed during the site visit.

4.3 Future Trends

The site supports a large expanse of dense, species-rich and relatively undisturbed vegetation that would provide refuge and year-round food for a range of animals. However, these are early successional, transient habitats and without management it would be expected that, over time, scrub would encroach more of the site and reduce the diversity of the habitats but this could lead to opportunities for different species to colonise the area.

4.4 Implications for Site Development

The site itself is not statutorily designated for its ecological or wildlife conservation value, and it is not a European Site (i.e. a RAMSAR, Special Protection Area or Special Area of Conservation). Therefore, the site is suitable for development, pending agreement with the relevant consultees such as Natural England, who are likely to require a number of mitigation measures to be incorporated into any masterplan, site specific planning guidance and eventual planning application. Required and suggested mitigation, and uncertainty is discussed below.

4.5 Required and Suggested Mitigation

The site clearly supports a wide range of habitats and species, and measures to mitigate any loss, and to enhance and manage the most valuable habitat will need to be incorporated into the conceptual masterplan for the site (and any future planning application).

Prior to allowing any development, it will be important to undertake a range of additional ecological surveys set out in the next section to further identify the presence of any protected species, in accordance with wildlife legislation. A more targeted set of mitigation measures can then be established.
In the absence of this information, it is suggested that, due to the proximity of the RMC along the northern boundary of the site, which is subject the most uncertainty in terms of its potential for protected species and the fact that it is a designated SNCI, it is considered that this would be an ideal location for maintaining existing vegetation in the form of a wildlife corridor.

In addition to this, to accord with the statutory requirements on land drainage, it is likely that Sustainable Drainage Systems (SUDS) will be required to attenuate surface water run-off (see Section on Flood Risk and Drainage section). To enhance the ecological value of the site, it is suggested that SUDS measures such as reed beds and swales could be considered.

4.6 Uncertainty and Data Gaps

In order to better evaluate the ecology of the site, surveys for the following protected species should be undertaken as part of evidence in support of a planning application:

- A breeding bird survey should be conducted between March and June to establish the species and numbers of birds use the site and its immediate surrounds during the breeding season. The survey should follow a Common Bird Census methodology (Ref. 8).
- A wintering bird survey should be conducted between September and March to establish the importance of the site and its surrounds to migrating and wintering birds (Ref. 8).
- A bat activity survey should be undertaken between April and September to determine which species of bats use the site and in what numbers. The bat activity surveys should follow the Bat Conservation Trust Guidelines (Ref. 9).
- A survey of terrestrial invertebrates should be undertaken on three occasions between April and September using standard methodologies (Ref. 10).
- A survey of reptiles should be undertaken following the guidelines set out in Gent, T. & Gibson, S. (2003) (Ref. 11).
- A great crested newt presence/absence survey should be carried out on the canal between April and June with two visits between mid-April and mid-May, consistent with Natural England guidelines (2001) (Ref. 12).
- The canal banks should be surveyed for signs of water voles and otters in accordance with standard survey guidelines (Ref. 13) in April and September.
- A badger survey should be undertaken of the site, and a minimum 30m buffer (where access allows) to map signs of badger activity including setts, latrines, snuffle-holes and tracks to confirm conditions. Any badger setts should be assessed to determine whether they are currently active, and classified in accordance with the nomenclature developed by Harris et al (1991) (Ref. 14).
5 CULTURAL HERITAGE

5.1 Evidence Base

This appraisal of cultural heritage has been carried out in accordance with the published Standard and Guidance for Desk-based Assessment (IfA 2011) (Ref. 15) and the Code of Conduct (IfA 2010) (Ref. 16) of the Institute for Archaeologists. In order to establish the known heritage baseline conditions for the site the following information and sources were reviewed:

- Designated heritage assets recorded on the English Heritage National Heritage List for England (Ref. 17);
- Known designated and non-designated heritage assets, archaeological sites, features and findspots recorded on the Kent County Council Historic Environment Record (KCC HER);
- The Hythe Extensive Urban Survey Archaeological Assessment Report (KCC/English Heritage 2004) (Ref. 18);
- RPS review of existing environmental evidence (RPS 2003) (Ref. 19);
- Shorncliffe Redoubt, Sir John Moore Barracks, Shorncliffe, Folkestone, Kent Archaeological Evaluation and Assessment of the Results (Wessex Archaeology 2006) (Ref. 20);
- Readily available historic Ordnance Survey map evidence (Envirocheck historic mapping);
- Information for Conservation Areas designated by SDC;
- The Royal Military Canal Management Plan (2012) prepared by SDC;
- The Kent Landscape Information System (www.kent.gov.uk/klis/home.htm) (Ref. 21);
- English Heritage Pastscape database (www.pastscape.org.uk) Magic Interactive map resource (http://magic.defra.gov.uk) (Ref. 22);

Study Area

The study area for the appraisal was defined as a 1km radius from the centre of the site. Within this study area all known heritage assets were identified using the data sources listed above.

All known heritage assets within the study area are referred to in the text as numbers in parentheses in bold [A1] and can be cross referenced to the catalogue (found in the table in Appendix E) and located on Figure 4.
Figure 4: Locations of Heritage Assets Surrounding the Site
5.2 Description of Baseline Conditions

Designated Assets

A review of data held by the National Heritage List has identified seven designated heritage assets within the 1km study area. This includes four Scheduled Monuments and three listed buildings.

There are no World Heritage Sites, Registered Parks and Gardens, Registered Battlefields or Conservation Areas within the study area.

Scheduled Monuments

Three of the Scheduled Monuments comprise sub-sections of the RMC which extends east to west along the northern boundary of the site.

The RMC is a unique and nationally important historical defensive structure reflected by its designation as a Scheduled Monument. The canal was originally conceived in 1804 by Lt. Colonel John Brown, Assistant Quartermaster General and Commandant of the Royal Staff Corp of Field Engineers. Facing the threat of invasion by the French army led by Napoleon Brown devised the canal as an alternative defence to flooding Romney Marsh. The canal was designed by Sir John Rennie and supported by the then Prime Minister William Pitt (Kent County Council Monument Report dated 05/07/12).

The canal was originally 45km (28 miles) in length stretching from Seabrook in the east to Cliff End near Hastings in the west. It originally measured 19m in width at the surface, 13.5m wide at its base and 3m metres deep. Construction started at Seabrook on 30th October 1804 and by August 1806 the canal was open from Seabrook to the River Rother, although the full length was not completed until 1809 (ibid).

The canal was designed with a defensive bank on its northern side comprising a parapet and bank, behind which lay a military road and government drain. On the southern side lay a towpath second drain. A further defensive feature included bends spaced every 0.56km at which point 18-pounder cannon were positioned on firing platforms (ibid).

By the time the canal had been completed the threat of invasion had passed and in 1810 it was opened for public use. Tolls were also collected for the use of the military road between Iden, Rye and Winchelsea and a barge service ran between Hythe and Rye (www.royalmilitarycanal.com/pages/history.asp) (Ref. 23). By the late 19th century sections of the canal had been sold off.

In 1812 the defences of the left flank of the Shorncliffe Battery were completed by excavating the canal under a projecting escarpment to a depth of approximately 7.3m and a drawbridge built to carry the Hythe-Folkestone road across the newly cut canal (Kent County Council Monument Report dated 05/07/12).

During both the First and Second World Wars the canal was commandeered by the military and gun emplacements established on the sites of the original 18-pounders. During the Second World War the defensive line of the RMC was also strengthened by a series of Pillboxes.

*Seabrook Lodge Bridge to Seabrook Sluice 3 [A23] (NHL No. 1003260)*
This section of the monument runs east to west along the northern boundary of the site. The RMC is described as being slightly silted at this point, forming a broad watercourse. On the northern side of the canal the parapet survives with some new trees along its northern edge, beyond which runs a path. To the south of the canal's bank a scarp slope rises to the adjacent rough ground of the site between the canal and Princes Parade. Evidence for a concrete pillbox or gun emplacement survives at the northeast end of the canal, the north bank of which is revetted in stone at this point (ibid).

**Twiss Road Bridge to Seabrook Lodge Bridge [A24] (NHL No. 1003127)**

Immediately to the northwest of the site lies the Twiss Road Bridge to Seabrook Lodge Bridge section of the RMC. This section of the canal is bounded to the south by lower lying land than further to the east. There is a slight slope downwards from the towpath to the golf course. To the north of the canal the parapet appears to have been altered, being widened to c. 12m in width and is bounded by a small scarp slope to the level of the path which runs along the rear of the defensive works. The boat houses to the east of the Twiss Road Bridge are excluded from the scheduling.

**Shorncliffe Battery Wall [A13] (NHL No. 1005117)**

Located approximately 75m to the east of the site, the Shorncliffe Battery Wall comprises two separate land parcels (Figure 4). The Shorncliffe Battery was constructed c.1793 it was described in 1804 as a defensive “work commanding the beach and the end of the sea wall”.

The battery wall is shown on the Ordnance Survey First Series of 1816 as a v-shaped wall with the battery and barrack buildings located on the hill above to the north (http://www.pastscape.org.uk/hob.aspx?hob_id=619776) (Ref. 22).

The monument forms part of a series of Napoleonic defences other surviving elements include four Martello towers on the edge of the cliff, three south of Martello Road and a fourth to the northwest of the ‘Girls’ Technical School in Coolinge Lane.

**Martello Tower No 9 [A6] (NHL No. 1017226)**

The fourth Scheduled Monument is Martello Tower No 9 which is situated on the cliffs overlooking the site some 316m to the northeast (Figure 5). The monument comprises a Martello Tower set within a dry moat and outer glacis (inclined earthen slope). The tower itself is also designated a Grade II listed building (NHL No. 1081167).

The Martello Towers were originally built to defend the southeast coast of England from seaborne invasion by Napoleonic forces and were based on the design of a fortified tower at Mortella Point in Corsica. Martello Tower No 9 is the western most of a cliff top series of moated Martello Towers constructed to defend the towns of Hythe and Folkstone (http://list.english-heritage.org.uk/resultsingle_print.aspx?uid= 1017226) (Ref. 16).

The tower itself is slightly elliptical, measuring approximately 13m in diameter externally and survives to its original height of c.10m. The upper half of the tower stands above the moats outer retaining wall some 10m from the base of the tower. On the outer side of the retaining wall the earthen bank or ‘glacis’ also survives to a distance of up to 24m from the edge of the moat. The tower was constructed on three levels with ground floor magazine and store rooms, first floor accommodation for the garrison of 24 men and one officer and circular roof space designed to accommodate a single 24-pounder cannon. The 24-pounder was mounted on a wooden traversing carriage, which provided a 360 degree field of fire to a range of c. 1.5km (ibid).
The monument is a well surviving example of the southern Martello Towers and retains many of its original features. The later addition of two magazines on the first floor is unique and illustrates the development of individual towers. The monument also has group value as one of the six surviving cliff top towers and forms an integral part of the strategic defences of Britain in the early 19th century (ibid).

**Figure 5: Extract of the 1824 Plan of Government Ground at Shorncliffe (National Archives, PRO, ref. works 43/1(10), showing Martello Tower No. 9, the Shorncliffe Battery Wall and eastern end of the RMC (reproduced in Wessex Archaeology 2006).**

**Listed Buildings**

The remaining two designated assets identified within the study area are both Grade II listed buildings:

- Mill House on Horn Street [A18] (NHL No. 1068956) located c.310m to the north of the site; and

- The Black Cottage [A30] (NHL No. 1393476) located c.260m to the northwest of the proposed site (refer to Figure 5).

**Non-Designated Assets**

A total of 26 non-designated archaeological and historical assets have been identified within the study area, four of which are located wholly within the site itself.
The following summary of the baseline archaeological resource within the study area is presented chronologically by period.

**Palaeolithic to Bronze Age (c. 500,000– 700 BC)**

The KHER holds no record of Palaeolithic, Mesolithic, Neolithic or Bronze Age remains within the study area.

**Iron Age and Roman (700 BC – AD 410)**

The KHER records a single site within the study area from which Iron Age and Roman occupation evidence has been recorded. The findspot comprised fragments of Belgic pottery (dated 50 BC to 50 AD) and Roman tile associated with a possible occupation layer [A29]. The artefacts were found in 1935 during excavations on the site of ‘New House’.

**Early Medieval and Medieval (AD 410 to 1540)**

There are no recorded heritage assets of early medieval date recorded within the study area.

The KHER records a single isolated chance find of a medieval silver penny [A15] to the east of the site.

**Post-medieval (AD 1540 to 1901)**

It is during the post-medieval period that the area surrounding the site began to be developed with the construction of the RMC and the system of Napoleonic anti-invasion defences which extend along the south coast of Kent.

To the east of the site lies the remains of the Shorncliffe Battery [A10], now largely occupied by modern housing development. The battery was constructed c.1793 and was originally armed with ten (later seventeen) 24-pounders. The battery was ordered to be dismantled in 1817, but in 1854, it was planned to re-arm the battery with twelve 24-pounders on traversing platforms. Archaeological investigations undertaken in 1998 revealed the remains of the eastern [A9] and western [A11] flanking line of gun emplacements. The 24-pounders of the battery’s western flank would have had a field of fire extending across the site.

To the north of the Shorncliffe Battery Wall, the 1998 archaeological investigations also recorded the remains of the brick foundations for the laundry building of the ‘Female Hospital’ [A12].

The KHER also records two assets associated with the 19th century development of a railway in the form of the route of the former Sandgate branchline [A32] which ran between Sandling and Sandgate. The HER also records the site of the former Sandgate Station [A16].

A review of readily available Ordnance Survey mapping has been undertaken to establish the post-medieval and modern changes in land-use and the potential for and extent of previous ground disturbance.

The 1870 First Edition maps appear to show that the site was located at the rear of the shingle beach, above the high water line and bounded to the north by the RMC.

By 1898 the east-west road now known as Princes Parade had been constructed along the southern boundary of the site severing it from the beach, although, much of the eastern half of the area remained storm shingle.
The 1908 1:10,560 Ordnance Survey map shows that the western half of the site had by this time been infilled, levelled and later becoming a recreation ground. The eastern side of the site appears to remain unaltered until the early 1950s, when it too was infilled and levelled.

The 1958 1:1,250 and 1961 1:10,000 Ordnance Survey maps clearly show an open quarry within the eastern half of the site, immediately to the east of the Seaview Bridge (Figure 6). The quarry appears to be relatively short lived, with map evidence suggesting it operated until the late 1960’s. The 1966 Ordnance Survey map shows that the eastern side of the site has been infilled and levelled.

Figure 6: Extract from the 1958 1:1,250 Ordnance Survey Map showing the extent of quarrying with the site.

The 1980s and 1990s Ordnance Survey mapping shows no change or development within the proposed site.

Modern (AD 1901 to Present)

A number of heritage assets dating to the Modern period have been identified within the study area. These assets principally comprise pillboxes and anti-invasion defences of the Second World War. The remains of four pillboxes [A19], [A20], [A22] and [A25], are recorded within the site itself. The KHER records that concrete rubble survives at the location of [A19] and [A25], possibly resulting from their demolition. The remains of two more pillboxes; [A21] and [A26], were located along the RMC immediately to the north of the site boundary.

A further eight pillboxes are recorded on the KHER forming a defensive line along the sea front. These eight assets are summarised in the catalogue of heritage assets presented in the table in Appendix C and shown of Figure 4.
The site of a Second World War fortified house [A7] is also recorded to the northeast of the site.

A related military heritage asset is recorded by the KHER in the form of a firing range [A5] close to the Shorncliffe Redoubt also to the northeast of the site.

The KHER also records a single ‘civilian’ asset of modern date within the study area comprising a red George VI pillar box [A2] on Springfield Way.

Unknown Date

A single undated asset is recorded by the KHER comprising the circular cropmark of a ring ditch [A1] measuring some 7m in diameter. The feature has been identified on aerial photographs to the east of the Sene Valley golf course. A dark ‘spot’ at its centre may suggest that it represents the remains of a Bronze Age barrow.

Previous Ground Disturbance

A review of historic map sources (described previously) and the 2003 review of existing environmental reports prepared by RPS, has been undertaken to establish the impact of previous ground disturbance on the archaeological resource within the site.

Historic map evidence appears to show that the site formed part of the storm shingle beach above the high water line until the construction of Princes Parade in the 1890s. Since that time the site has been used for landfill and levelled.

Evidence for quarrying activity (shown on Ordnance Survey mapping) dating from the late 1950s and 1960s. A small gravel quarry was located immediately to the east of the Seaview footbridge (see Figure 6 above).

The RPS report summarises the results of several previous intrusive investigations which recorded made ground across the site at depths in excess of 2.8 to 4.6m, and dredged material from the RMC had been spread over the site, meaning that the site generally stood 4 to 5m above the surrounding land parcels.

On the basis of the above evidence it appears that localised removal of potential archaeological deposits will have occurred in the areas of gravel quarrying. Across the remainder of the site made ground has been used to level and then raise the ground surface, sealing the natural beach gravels.

5.3 Implications for Site Development

This high level appraisal of the heritage resource has identified a number of designated and non-designated heritage assets that will have implications for site development.

Designated Assets

The sections of the RMC designated as scheduled monuments [A23] and [A24] form the principal heritage constraint on the future development of the site.

The RMC is a unique and nationally important monument of the highest significance in terms of its historic, aesthetic and communal value. The research potential of the monument is also
highlighted in the Hythe Extensive Urban Survey which sets out the following key research aims for the post-medieval period:

- The impact of the military on the development of the town; and
- The construction of the 19th century defence structures and their impact on the character and development of the town (KCC 2004).

Seabrook Lodge Bridge to Seabrook Sluice 3 [A23]

This section lies adjacent to the northern boundary of the proposed site and is the key heritage asset in terms of constraints:

- Any proposed development will, to various degrees, impact the setting, views and significance of the monument. Paragraph 132 of the NPPF is clear that weight should be given to the asset’s conservation. Substantial harm to such assets arising from the loss of significance through harm, loss, alteration, destruction or development within their setting should be wholly exceptional (DCLG 2012; p31);
- The RMC and the site form part of a wider post-medieval and modern military landscape of anti-invasion defences and as such have added group significance;
- The views towards the beaches and fields of fire from the RMC and surrounding defensive assets are key to their original function and contribute to the understanding of their setting and significance;
- When originally constructed the RMC would have had clear unimpeded views towards the sea. The use of the site for landfill has raised the ground level within the site with the effect that the RMC appears to run through a cutting at this point. Any development that overlooks the RMC could prevent views southwards and further degrade the setting of the monument therefore any approach to development at Princes Parade should seek to enhance views to the beach from the canal area; in addition
- Any development within the boundary of the monument will require Scheduled Monument Consent.

The RMC, particularly the Seabrook Lodge Bridge to Seabrook Sluice 3 section [A23]

This section also presents a considerable opportunity for any well considered and sympathetic development; such as:

- The RMC can be used to provide a strong sense of place for any new development;
- Should a linear park be proposed, it would enhance the use of the monument (eg through public information/educational panels) and open it further to the public in the form of a local attraction;
- New development offers the opportunity to lower the current ground level of the site potentially revealing any surviving elements of the monument's fabric or associated features that have been buried, reinstating views southwards and enhancing the setting of the monument; and
- There would be an opportunity to enhance existing publically displayed information for the RMC, which would provide opportunities for further engagement and
understanding of the monument’s function, historic associations and relationships to other near-by heritage assets.

The Shorncliffe Battery Wall [A13] and Martello Tower No. 9 [A6]

This section is located to the east and northeast respectively will also be heritage constraints. Both monuments form part of the integrated system of defensive structures dating from the Napoleonic period. Both were armed with 24 pounder canon with a range of 1.5km and a field of fire that covered the proposed development site and the beaches toward Hythe. These monuments are likely to retain inter-visibility with the RMC and the site which may also form part of their setting. Any future development of the site has the potential to impact on those views and wider setting of each monument.

The listed buildings [A18] and [A30] are situated within areas of residential development to the north of the site. Future development of the site will not impact on the fabric of either building and it is considered unlikely that their setting will be affected. As a result neither of these listed structures is considered to form a heritage constraint.

Non-designated Assets

The site lies to the east of Hythe and the early historic settlement focus provided by the Roman fort and harbour of the Classis Britannica and Saxon mint situated at Lympne and Hythe itself which was one of the original Cinque Ports.

The location of the site and historic map evidence suggest that for much of its history it would have formed part of the beach. Consequently the archaeological potential of the site is likely to be limited.

The review of available sources, notably the KHER, has identified four non-designated heritage assets within the site, comprising the locations of four Second World War pillboxes. Two of these are recorded as being beneath concrete rubble. These remains will constitute a minor constraint and opportunity for future development.

Development of the site has the potential to remove or damage any surviving remains of the Second World War pillboxes. This would require appropriate archaeological investigation and mitigation to record the remains.

If coherent remains survive there is the opportunity to conserve them in situ and incorporate them into any future development. This would enhance the historic dimension of the site and form a link to the defensive importance of the anti-invasion defences across the local area.

The sites of two further pillboxes are recorded adjacent to the Seabrook Lodge bridge and Seaview bridges across the RMC. If visible above ground remains of these pillboxes survive, the setting of these assets may also form a constraint and opportunity for any development.

5.4 Required and Suggested Mitigation

Paragraph 128 of the NPPF establishes a clear direction for Local Planning Authorities to require any party applying for planning permission to “describe the significance of any heritage assets affected including the contribution made by their setting” (DCLG 2012; p30).

In order to fulfil this requirement, a detailed cultural heritage assessment and detailed setting assessment (possibly including photomontages) will be required for any potential planning
application at the site. The purpose of these assessments will be to establish the character, extent and significance of the heritage resource, particularly the fabric and setting of the RMC and other related near-by designated assets.

For any proposed development to be successful a high quality masterplan and design will be required. Any masterplan will need to enhance the setting of the RMC and incorporate/retain sufficient views southwards to the beach and the related defensive structures to the east and northeast. This is likely to be the only way to address the concerns of key stakeholders such as English Heritage and the KCC Heritage Conservation Group. Early and ongoing consultation with these stakeholders will be key to the success of any proposed development.

In terms of construction ground reduction, landscaping or restoration works within the boundary of the Scheduled Monument will require Scheduled Monument Consent and an appropriate programme of archaeological investigation and mitigation. Any works immediately adjacent to the RMC that have the potential to impact on the fabric of the monument or any associated features will also require an appropriate programme of archaeological investigation and mitigation.

A requirement for archaeological investigation within the site itself is likely to be limited to the investigation/mitigation of potential impacts on the remains associated with Second World War pillboxes are of interest.

5.5 Uncertainty and Data Gaps

This section of the report has been prepared using the evidence base set out above. At the time of writing a site visit has not been undertaken by the technical authors. As a result it should be understood that the conclusions presented, notably those with reference to views and setting are limited by the datasets available.
6 TRANSPORTATION AND ACCESS

6.1 Description of Baseline Conditions

Hythe town centre lies to the west and is a little over two kilometres from the centre of the site while the centre of Sandgate is a similar distance to the east. There are also several footpaths, cycleways and bridleways that run in an east-west direction both to the north and south of the site and these are described below.

Surrounding Highway Network

Princes Parade is a single carriageway with a general width of 7.3 m. It runs along the seafront between Seabrook Road in the east and Twiss Road in the west and has a straight alignment. It is subject to a 40mph speed restriction and has a continuous footway on its north side, which is also marked for use by bicycles. On the south side the footway/cycleway is beyond the sea wall and is part of Route 2 of the National Cycle Network. Locally this facility is surfaced, has a width of 5.0 metres and provides a high quality route along the seafront for pedestrians and cyclists between Sandgate and Hythe.

At its eastern end Princes Parade forms a priority junction with Seabrook Road. The junction operates in a one-way loop in a clockwise direction around a large island containing the petrol filling station and the Indian restaurant. Traffic turning into Princes Parade does so at the eastern end of the island where there is a ghost island on Seabrook Road to facilitate the right turn. Traffic turning out of Princes Parade does so at the western end of the island where it is required to give way to traffic on Seabrook Road. The junction is shown from several perspectives in photographs 1, 2 and 3 within Appendix D.

At its western end where it passes the Imperial Hotel, Princes Parade turns sharply to the north and is renamed Twiss Road. There is no junction to mark the transition between these two roads, and Twiss Road continues in a northerly direction to form a ‘Stop’ junction with Seabrook Road. From here the town centre is only a short distance to the west.

Seabrook Road is part of the A259 which is the main coastal route between Folkestone and Eastbourne. The section of Seabrook Road that passes to the north of the site is a wide single carriageway subject to a 30mph speed restriction. It benefits from street lighting and has a 2.0 metre footway on its north side and a 1.0 m footway on its south side. The surrounding land use is mostly residential with a mix of detached, semi-detached and terraced housing. There is also a hospital (Spire St Saviours), two schools and at the eastern end close to the junction with Horn Street there is a small parade of shops including a newsagent and a public house.

Seabrook Church of England Primary School is located on the south side of Seabrook Road just to the east of its junction with Hospital Hill. It does not appear to have any off street staff or visitor car parking and on-street parking in the vicinity of the school is limited by parking restrictions to the west and demands for resident parking to the east. Although conditions were not observed during the school drop off and pick up periods the indications are that the area around the school could become congested at the beginning and end of the school day. Seabrook Road is shown from several perspectives in photographs 4, 5 and 6 shown in Appendix D.

Local Car Parking
At the eastern end of the site there is a small car park for the visitors to the RMC and a children’s play area. The car park has capacity for 23 cars including two spaces for the disabled. The car park operates on a pay and display basis with a pricing structure of just over £1 per hour up to six hours. There is a maximum stay of 12 hours for which there is a charge of £7.90.

Parking is permitted on the south side of Princes Parade along most of its length while there are double yellow lines on the north side preventing parking or waiting at any time. This restriction is reinforced by signs that are regularly spaced confirming that vehicles are not permitted to wait at any time. Cars parked on the south side of Princes Parade reduce the carriageway width to approximately 5.0 metres which is sufficient to allow two cars to pass without having to stop. However during the site visit it was observed that some drivers travelling in a westbound direction wait for a gap in the eastbound flow before proceeding. The likelihood of having to stop increases with the presence of larger vehicles and where parked vehicles leave a wide gap to the sea wall. Photographs 7, 8 and 9 show the general highway conditions along Princes Parade.

To the east of the junction there is a small pay and display car park with a capacity for 29 cars including two for the disabled. There is also an area set aside for motorcycle parking. The car park which is accessed from Princes Parade operates the same pricing structure as the car park for the RMC.

**Peak Hour Traffic Observations**

To provide an indication of the traffic conditions on Seabrook Road and Princes Parade peak hour traffic counts were undertaken at the junction on Wednesday 4 July 2012. Counts were undertaken from 7.30am to 9.30am and 4.30pm to 6.30pm and included all movements at the junction including movements to and from Battery Point.

The AM and PM peak hours occurred between 8am and 9am and 5pm and 6pm and the existing peak hour traffic flows are presented in Figure 2.1 in Appendix E. The count at the junction also allowed the link flows on Princes Parade and Seabrook Road to be established although it is acknowledged that the flow on Seabrook Road is likely to vary considerably along its length due to the amount of frontage development and the number of side roads. The absence of any frontage development on Princes Parade means that the flow recorded at the junction is unlikely to change significantly between Seabrook Road in the east and Twiss Road in the west.

Referring to Figure 2.1 it can be seen that the two-way flows on Princes Parade were 369 and 392 during the AM and PM peaks respectively. The corresponding two-way flows on Seabrook Road to the west of its junction with Princes Parade were 698 and 695. It can also be seen
that the flow on Seabrook Road during the AM peak was tidal with the dominant flow being in an eastbound direction towards Folkestone while during the PM peak the flows were more balanced. There was little evidence of tidality in traffic flows on Princes Parade although during both peaks the westbound flow was marginally higher.

During the traffic counts, site observations were also undertaken at the Seabrook Road/Princes Parade junction and during both peaks there were no significant queues or capacity issues to report. A general site visit of the area surrounding the site was undertaken on the same day between midday and 3pm and again there were no significant traffic issues to report.

Public Transport

There are currently no bus services operating on Princes Parade. However there are seven regular services operating on Seabrook Road all of which are operated by Stagecoach. A list of the bus services operating on Seabrook Road is summarised in Table 5, while a more general description of each route is provided below the table. A bus route map for Hythe is presented in Appendix F.

Table 5 provides a summary of the route and shows peak and off-peak service frequency together with the operating times of the first and last buses. Information relating to service frequency and times of operation are shown separately for Monday to Saturday and Sunday.
### Table 5: Summary of Bus Services

<table>
<thead>
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<th>Route Details</th>
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<th></th>
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<td></td>
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<td>Last Bus</td>
<td>Off Peak</td>
<td>First Bus</td>
<td>Last Bus</td>
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<td>2</td>
<td>2</td>
<td>06:05</td>
<td>18:05</td>
<td>2</td>
<td>06:05</td>
<td>18:05</td>
</tr>
<tr>
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<td>2</td>
<td>06:30</td>
<td>18:46</td>
<td>1/2</td>
<td>06:30</td>
<td>18:46</td>
</tr>
<tr>
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<td>2</td>
<td>08:49</td>
<td>18:02</td>
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<td>2</td>
<td>08:47</td>
<td>16:52¹</td>
<td>1</td>
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<tr>
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<td>16:50</td>
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</tr>
<tr>
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<td>17:25</td>
<td>1</td>
<td>07:55</td>
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</tbody>
</table>

Routes 10 and 10A operate between Folkestone and Ashford and on a Monday to Saturday basis there are two services per hour between 6am and 8pm. On a Sunday there are four services operating at more or less two hourly intervals between 9am and 4pm. From the bus stops outside the Fountain Public House the journey time to Hythe is seven minutes while to Folkestone it is around 13 minutes. Ashford can be reached in a little over one hour from where there are connecting bus services to Maidstone on Route 10X.

Routes 16 and 16A operate between Hythe and Canterbury and on a Monday to Saturday basis there are two services per hour between 9am and 6pm. There is no Sunday service from Hythe. The journey time from the Fountain to Canterbury is a little over one hour. Between Folkestone and Canterbury Routes 16 and 16A are more frequent and operate four services per hour between 7am and 5pm and then either one or two service per hour until after 10pm. There is an hourly Sunday service between Folkestone and Canterbury between 9am and 6pm.

Routes 101 and 102 operate between Dover and Lydd on Sea via Folkestone, Hythe, Dymchurch and New Romney. On a Monday to Saturday basis there are four services per hour between 6am and 9pm although particularly at the beginning and towards the end of the day some services only operate on part of the route. There is also a good service on a Sunday.

¹ There is a service from Folkestone bus station to Hythe at 22:39. This runs as Route 102.
with two services per hour between 8am and 6pm. The journey time between the Fountain and Dover is around 40 minutes while it takes around 45 minutes to travel between the Fountain and Lydd-on-Sea. At Lydd the route number changes to 100 and continues on to serve Rye and Hastings. A change of bus is not normally required and the complete journey is possible using a single ticket.

Route 160 operates between Folkestone, Seabrook and Hythe and on a Monday to Saturday basis there is one service per hour between 8am and 6pm. There is no Sunday service on this route. Route 111 operates between Ashford and Folkestone on a Thursday only. It stops on Seabrook Road and there is a single return service leaving Ashford at 09:30 and returning from Folkestone at 13:17.

There are several pairs of bus stops on Seabrook Road and the most convenient are located only a short distance from where the footpaths that cross the site join Seabrook Road. For example the pedestrian route at the western end of the site joins Seabrook Road opposite Spire St Saviours Hospital where there is a pair of bus stops approximately 100 metres to the east.

The footpath the passes through the centre of the site joins Seabrook Road close to its junction with Cliff Road where the bus stop serving eastbound services is only a short distance to the east. The stop serving westbound services is approximately 100 metres to the west of the pedestrian access. The final pair of bus stops serving the site is located close to Seabrook Primary School where the Royal Military Road joins Seabrook Road.

None of the bus stops on Seabrook Road have seating or a shelter although timetable information is provided.

Pedestrian and Cycle Facilities

The site is well served by pedestrian and cycle facilities with numerous footpaths, cycleways and bridleways either running parallel to or crossing the site. One of the most significant routes, located to the south of Princes Parade, is a segregated shared cycleway/footway which forms part of Route 2 of the National Cycle Network. Route 2 is a long distance cycle route that when complete will link Dover in Kent to St Austell in Cornwall. Locally this facility is surfaced, has a width of 5.0 m and provides a high quality route along the seafront for pedestrians and cyclists between Folkestone and Hythe.

On the north side of Princes Parade there is a 2.0 m footway that is also marked for use by bicycles. This facility runs the full length of Princes Parade from Battery Point to the Imperial Hotel where direct connections are made to existing footways on Seabrook Road and Twiss Road respectively.

Heading in a northerly direction from Princes Parade there are two footways that cross the site and lead directly to Seabrook Road. The one that passes through the centre of the site is surfaced throughout but not lit. At its northern end it passes through an informal parking area that is used by residents of Seabrook Road and this section of the route is a little uneven.

The route that runs along the western edge of the site and adjacent to the golf course is only partially surfaced, has no lighting and in places has become overgrown with vegetation.

Both routes that pass through the site cross over the RMC. Running parallel to the canal on its north side is the Royal Military Road, which to the north of the site is a public bridleway for the use of pedestrians, cyclists and horse riders. Between Seabrook and Hythe the Royal Military
Road is a broad shale path which from observation is a popular leisure route for pedestrians and cyclists in the summer.

There are two other footpaths that locally follow the route of the canal, one to the north of the canal and one to the south. These routes are narrow and not surfaced and are clearly signed to prohibit their use by horses, bicycles and motorcycles. The pedestrian routes described above are shown below in photographs 10 to 12 in Appendix D.

To the north of the site Seabrook Road has footways on both sides although between the two footpaths that link the site to Seabrook Road, the facility on the south side is narrow at around 1.0 m. There is a marked lack of pedestrian crossing facilities on Seabrook Road between the eastern end of the site and Hythe town centre. The only dedicated facility is a signal controlled crossing just to the west of Horn Street opposite the newsagents.

6.2 Implications for Site Development

The potential development site is owned by SDC and the objective is to assess the potential for a site allocation for mixed use development potentially including housing, leisure and community facilities in the Site Allocation Development Plan Document. The Council’s vision is to link the coastal strip between Battery Point in the east and the Hythe Imperial Hotel to the west, to the RMC by providing a linear strip of parkland. Additional community benefits could include housing, a new swimming pool and a replacement school for Seabrook Primary.

Access Arrangements

The site would be accessed from Princes Parade and in view of its linear nature, and, with the mix of uses being considered it would be appropriate to have at least two points of vehicular access. The position of the accesses will be determined as any masterplan evolves but at this stage it would be reasonable to locate one either side of the footway passing through the centre of the site approximately midway between the footway and the eastern and western edges of the site.

One of the benefits of the shape of the site is that it has an extensive amount of frontage onto Princes Parade and this coupled with a straight alignment mean that there should be few constraints to providing the optimum access strategy.

According to TD 42/95 ‘Geometric Design of Major/Minor Priority Junctions’ (Design Manual for Roads and Bridges Volume 6) a road subject to a 40mph speed limit has a requirement for a driver approaching on the side road to have an unobstructed view over 120m in both directions from an appropriate setback. The distance from the footpath passing through the centre of the site to the edge of the site is over 500m in both directions and therefore two points of access could be readily provided within the space available.

The setback on the minor road from which the visibility splay is measured should ideally be 9m but for lightly trafficked simple junctions this can be reduced to 4.5m and in exceptionally difficult circumstances to 2.4m. For the scale and mix of development being considered a setback of 4.5m is considered appropriate.

To establish the appropriate form of junctions to serve the site reference is again made to TD 42/95. Figure 2/2 of TD 42/95 shows approximately the various levels of junction which may be applicable for different combinations of flows on the main and side roads. In paragraph 2.15 of TD 42/95 it states:

“Simple junctions are appropriate for most minor junctions on single carriageway roads, but must not be used for wide single carriageways. For new rural junctions they shall only be used
when the design flow on the minor road is not expected to exceed about 300 vehicles 2-way AADT (Annual Average Daily Traffic), and that on the major road is not expected to exceed 13,000 vehicles 2-way AADT”.

While the 2-way AADT on Princes Parade is likely to be well below the level at which a ghost island is recommended the flow on the minor roads is less certain and will depend on the scale and mix of development. As an example, if the site were to deliver 100 residential units the 2-way AADT would be around 500 vehicles which even if split equally between the two points of access would be approaching the threshold above which a ghost island is recommended. If traffic generated by the other potential community uses including a school and a swimming pool is included there is potential that the flow on both minor roads would exceed the level beyond which a ghost island is recommended.

The benefits of providing a ghost island rather than a simple junction are that they minimise disruption to traffic on the major road, they tend to have a better safety record and they allow cost effective pedestrian facilities to be incorporated into the junction in the form of dropped kerbs and pedestrian refuge islands. The latter would enhance pedestrian and cycle connectivity between the site and the seafront and provide access to Route 2 of the National Cycle Network.

Within the vicinity of both access junctions there would be a need to restrict parking on the south side of Princes Parade. This would be achieved by replicating the measures that prevent parking on the north side of Princes Parade. The parking restrictions would need to extend to a point where vehicles parked on Princes Parade did not interfere with the free flow of traffic passing through the junction. Both junctions would also need to be lit.

The movement strategy including the form and location of the access junctions would be discussed with the Highway Authority as the project continues to evolve. At this stage any refinements can be made to ensure that the proposals are compatible with the aspirations of the Highway Authority and that they meet the needs of the development and of the full range of road users on Princes Parade.

Off-Site Highway Impacts

As the purpose of this study is to provide evidence for the purposes of assessing the potential for a site allocation, details of the scale and mix of the development have not been fixed and it is therefore difficult to predict the impact and hence the need for any mitigation on the surrounding highway network. However given that there are other technical constraints that may limit the site’s development potential, the density across the site is likely to be low. Furthermore by relocating Seabrook Primary School onto the site there will be an opportunity to transfer the impact from a currently constrained site with limited parking availability on Seabrook Road to a more spacious site with dedicated off-street parking within the development.

Improvements to Sustainable Transport Links

The site is well situated to make use of existing sustainable transport opportunities with regular bus services operating on Seabrook Road to the north and a section of the National Cycle Route Network to the south. There are also several footpaths and cycleways that cross the site providing access to Seabrook Road, the seafront and Hythe town centre.
Pedestrian access to the bus stops on Seabrook Road would be via the existing footpaths that cross the site from north to south. These would need to be upgraded to provide an even tarmac surface throughout and they would also need to be lit. Any overhanging or encroaching vegetation would need to be removed to enhance the conspicuity of the footpaths.

Because of its shape and the fixed location of the pedestrian links onto Seabrook Road, the distance to the nearest bus stops varies considerably across the site. Preliminary measurements taken from Google Maps indicate that the distance ranges from around 150m along the northern edge of the site to 600m along its southern edge.

Typically Highway Authorities seek to ensure that all new development is within 400m of a bus stop although there is often some flexibility in this distance, particularly where there are high quality pedestrian links and a frequent bus service. However it will be important to ensure that as much of the residential development as possible is within the 400m threshold with the most densely developed housing located in the most accessible areas.

New footpaths within any development will need to be laid out to maximise the integration with the existing footpaths crossing the site. Routes will need to be direct, well lit and constructed to a high standard and, where practicable, be able to accommodate cyclists. The objective should be to prioritise the movement of pedestrians and cyclists over vehicles in accordance with current best practice and at the same time to discourage excessive speeds.

There is a general lack of pedestrian crossing facilities on Seabrook Road in the vicinity of the site with one signal controlled crossing towards the eastern end of the site just to the west of Horn Street. Furthermore between the two footpaths that link the site to Seabrook Road the footway on the south side is narrow at around 1m, making it difficult for pedestrians walking in opposite directions to pass without stepping onto the road. The width of the pavement also restricts the space for passengers waiting at bus stops on the south side of Seabrook Road.

In view of the current shortfall in pedestrian provision there is the potential that the Highway Authority will request new controlled crossing facilities on Seabrook Road. To serve the site effectively these should be located close to where the footpaths that cross the site connect with Seabrook Road. In these locations the new crossing facilities would serve existing bus stops on the north side of Seabrook Road. Where practicable there may also be a requirement to widen the footway on the south side of Seabrook Road.

There are currently no pedestrian crossing facilities on Princes Parade although the low traffic flows and straight alignment mean that it is reasonably safe for pedestrians to cross unaided. However pedestrian refuge islands and dropped kerbs would be provided as part of the proposed site access arrangements thus improving accessibility to the seafront including Route 2 of the National Cycle network. Additional facilities may also be required where the footpaths that cross the site join Princes Parade. The form that these crossings take would be discussed with the Highway Authority.

It is considered unlikely that the Highway Authority will request improvements to off-site cycle facilities as there are already good connections to Hythe and Folkestone both to the north and south of the site. There will however be a need to provide cycle parking at the new development in accordance with local standards.

### 6.3 Uncertainty and Data Gaps

Although this report provides sufficient information to assess the potential for a site allocation, the Highway Authority will probably require capacity assessments to be undertaken at the
Seabrook Road/ Princes Parade and Seabrook Road/ Twiss Road junctions as part of any future planning application. This is based on recent experience of working in a number of counties where even modest increases in traffic have resulted in requests for detailed junction analysis.

The need to provide off-site junction improvements will become apparent once the results of the junction analysis are known and the nature and impact of the development has been established. The expectation is that the increase in traffic will not justify a request for large scale improvements although there could be a requirement for relatively minor junction upgrades or for contributions towards wider strategic highway improvements.

7 CONCLUSIONS

This report has been produced to provide evidence to for the purposes of assessing the potential for a site allocation within SDC’s forthcoming Site Allocations DPD.

The documented and observed conditions has been presented in the previous sections, and a number of constraints and opportunities have been identified which have informed the conceptual masterplan produced by AMUP.

Clearly, more details are required to support any possible future planning application (should the site be allocated and a development opportunity arises) and a broad description of these are provided in the Uncertainty & Data Gaps sections.

8 REFERENCES

Ref. 1 Environment Agency (EA) (2008), Groundwater Protection: Policy and Practice (GP3)


Ref. 3 The Environment Agency, Framework for the Classification of Contaminated Soils in Hazardous Wastes

Ref. 4. The Environment Agency, Waste Acceptance at Landfills: Guidance on waste acceptance procedures and criteria


Ref. 6 Shepway District Council (2009): SDC Strategic Flood Risk Assessment


Ref. 15. Institute for Archaeologists, (2011); Standards and Guidance for Archaeological Desk-Based Assessment.

Ref. 16. Institute for Archaeologists, (2010); Code of Conduct

Ref. 17. English Heritage http://list.english-heritage.org.uk


Ref. 20. Wessex Archaeology. 2006. Shorncliffe Redoubt, Sir John Moore Barracks, Shorncliffe, Folkestone, Kent Archaeological Evaluation and Assessment of the Results


Ref. 22. Pastscape; www.pastscape.org.uk

Ref. 23. The Royal Military Canal; www.royalmilitarycanal.com