## Wignall, Peter

**From:** [redacted]
**Sent:** 26 July 2016 14:32
**To:** [redacted]
**Subject:** Princes Parade - Principle Designer
**Attachments:** Informal Principle Designer Brief Princes Parade.docx

Hi [redacted]

As discussed, I've attached an outline brief for the scheme, and would be grateful if you could provide an indicative cost for the work.

As I mentioned, GT3 Architects have offered to provide this service (we don't know how much yet), but we wanted a reference point from a firm we have a working past with.

Best regards

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]
www.shepway.gov.uk

# Brief for Consultants

## 1 Introduction

1.1 This brief describes the Principle Designer services required for a mixed use project to develop land in the ownership of Shepway District Council at Princes Parade, Hythe.

## 2 Location and Site

2.1 Shepway District Council is in the process of preparing an application for planning permission for land in its ownership at Princes Parade, Hythe (see attached site location plan). The site is linear in form, extending to 7 hectares in total, and is a former refuse site now overgrown with scrub.

2.2 To the south of site is an area of shingle beach, bordered to north by a road connecting Seabrook to Hythe and running in parallel to the A259. To the north of the site lies the Royal Military Canal, a scheduled ancient monument. To the east lies a compact golf course that extends to the boundary of Hythe Imperial Hotel and associated residential development. To the west lies a recently completed residential development and a complex consisting of a petrol station and local restaurant.

2.3 Due to the land raising, associated with the former refuse site use, the site lies approximately 4.5 metres higher than the adjoining golf course and the Royal Military Canal. The canal itself is a Scheduled Monument and there are therefore significant heritage sensitivities associated with the development of the site.

## 3 The Project

3.1 The Council have appointed Tibbalds Planning and Urban Design to provide specialist planning advice and oversee the preparation of an application for planning permission. On 13th April 2016 the Council's Cabinet agreed that the project consist of the following uses and extent of uses.

- Residential development of up to 150 units to meet the need of local area (including affordable housing, starter homes and homes for elderly
- A leisure centre including a main swimming pool, teaching pool, sports hall and gym based on the Affordable Recreation Centre (ARC) model.
- Possible water sports related uses including accommodate the proposed Seapoint Canoe Centre facility towards the eastern end of the site.

- Some commercial leisure – cafes, bars etc.
- A significant area of public open space including improvements to the promenade and setting of the Royal Military Canal.

3.2 The proposed planning application will consist of a hybrid application (with detailed consent sought for the ARC), supported by the following information:

- *An illustrative masterplan;*
- *Development specification document (covering public realm and design guidelines/codes);*
- *Illustrative examples of residential development;*
- *Illustrative and parameter plan drawings including; Land uses, movement hierarchy, massing drawings (including maximum/minimum heights and set back), computer generated imagery (CGI) examples*
- *A detailed design for the ARC.*

3.3 In addition to the documentation outlined above the application will be supported by a range of other information including:

- A design and access statement.
- An environmental statement
- A transport assessment and statement, travel plan and parking, servicing and waste collection assessment.
- A bio-diversity/ecology assessment (including Habitat Regulations Assessment).
- Contamination assessment.
- Heritage assessment.
- Flood risk assessment.
- Landscape and visual impact assessment (LVIA)
- Construction (Design and Management) 2015 Regulations Assessment.

## 4 Project Brief

4.1 The Principle Designers duties will be to execute the role as per the Construction (Design and Management) Regulations 2015 with the scope as advised by the Health & safety executive. The current role will be expected to carry through to pre-construction on site.

4.2 In particular give help and advice where required in the preparation of pre construction information. This will require close liaison with the architecture and master planning team, the architect preparing the design of the (ARC) Sports centre and the heritage consultant, giving advice on Health and Safety issues and guidance required to meet CDM regulation 2015.

4.3 Generally the following will be required of the appointed consultant:

- plan, manage, monitor and coordinate health and safety during the pre-construction phase;
- ensure the team work to reduce risks, coordinate information, and generate solutions for construction, maintenance and cleaning that are as risk free and obvious as possible;
- generate and organise information for the health and safety file and hand this over at the end of their commission;
- organise and ensure circulation of all pre-existing information on the project; and
- ensure that coherent pre-construction information regarding the project both prior to the current work and as generated by the team is handed over to the principal contractor.

## 5 Timescales

5.1 We are currently at the Feasibility stage which we expect to complete by October 16 and submit a planning application by the end of November 16. If successful we expect to appoint a contractor by May 2017.

5.2 At this stage we are seeking indicative costs for the work between now and appointing a contractor in May 2017. Please submit the following:

- Details of relevant experience.
- An estimate of cost – a percent of the build cost is acceptable.
- A methodology including an outline of the steps that would need to be taken to prepare the Pre-Construction Information package.

**Please respond to:**

[redacted]

Project Manager

Strategic Development Projects

Direct Dial: [redacted]

Mobile: [redacted]

Fax: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY

e:mail: [redacted]

**www.shepway.gov.uk**

**Wignall, Peter**

**From:** [redacted]
**Sent:** 26 July 2016 15:18
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer
**Attachments:** image906000.png; image809001.png; image599002.png; image507003.png

[redacted]

Thanks, we will take a look. Do you also need us to provide a fee for preparing an initial cost plan?

Going forward with the scheme, on the basis that you are using Scape which uses an NEC3 contract, you are likely require the services of a Contract Project Manager, which we also have experience of. Tonbridge & Malling Borough Council will give us good recommendation I believe. If this is a possibility, we could provide a joint offering for PM/PD, and could assist as we are on your framework for these services.

Thanks,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


Celebrating 30 years 1986 - 2016



**From:** [redacted]
**Sent:** 26 July 2016 14:32
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e:mail: [redacted]
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## Wignall, Peter

**From:** [redacted]
**Sent:** 26 July 2016 15:28
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer
**Attachments:** image001.png; image002.png; image003.png; image004.png

Yes – the kit and caboodle:

- Residential development of up to 150 units to meet the need of local area (including affordable housing, starter homes and homes for elderly
- A leisure centre including a main swimming pool, teaching pool, sports hall and gym based on the Affordable Recreation Centre (ARC) model.
- Possible water sports related uses including accommodate the proposed Seapoint Canoe Centre facility towards the eastern end of the site.
- Some commercial leisure – cafes, bars etc.
- A significant area of public open space including improvements to the promenade and setting of the Royal Military Canal.

Post-feasibility – a good point. I'll make a note.

Thanks

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
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e:mail: [redacted]
www.shepway.gov.uk

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**From:** [redacted]
**Sent:** 26 July 2016 15:24
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer

Sorry. Can I also check that the project is the whole scheme including residential, leisure centre etc.

Can I also suggest you might want to consider someone client side, post feasibility work.

Thanks,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


Celebrating 30 years 1986 - 2016



**From:** [redacted]
**Sent:** 26 July 2016 15:21
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer

[redacted]

Initial Cost Plan – yes please – it will save time.

Wilmot Dixon are providing the PM as part of the feasibility work, but thanks anyway.

Regards

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
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e:mail: [redacted]
www.shepway.gov.uk

**Wignall, Peter**

**From:** [redacted]
**Sent:** 01 August 2016 14:29
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer
**Attachments:** B&M - Princes Parade - PD Submission 010816.pdf

[redacted]

Further to your request below, please find attached our Principal Designer offering for the Princes Parade project.

The attached document provides our fee % for the services, a schedule of services (so that you can see our methodology), some information regarding our experience and a CV for our proposed member of staff. We have also included our standard terms and conditions. I would hope this would provide you with everything you need, but let me know otherwise.

In respect of providing a fee for preparing an initial cost plan report for the scheme, on the basis that this will require a number of meetings with the design team, followed by production of a RIBA Stage 2 cost plan report, our fee would be £6,000 (exc. VAT). We have previously carried out similar exercise for Canterbury City Council on a scheme which is procured under Scape, so are fully experienced in the process of this framework. I believe that they have found this to be a very important document, to help in controlling and monitoring the project budget expectations, as the scheme goes forward.

We would also be happy to meet to further discuss our specific experiences of Scape as client advisors, recently for KCC, CCC, and others.

If you have any queries, please do not hesitate to contact me.

Kindest regards,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]

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The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


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# Princes Parade, Hythe

## Fee Proposal
## and Appointment Document

## Principal Designer Services

**BETTERIDGE & MILSOM**

***28th July 2016***

T: (01227) 471186
W: www.betteridge-milsom.co.uk

**Project Name: Princes Parade, Hythe**

## Contents

**Project Name: Princes Parade, Hythe**

## Fee Proposal Particulars

This proposal is made on the 28th day of July, 2016.

**The Client,** Shepway District Council

of

Civic Centre
Castle Hill Avenue
Folkestone
Kent
CT20 2QY

**The Consultant,** Betteridge & Milsom Limited (referred to as "We")

of

The Old Bakehouse
18a Ivy Lane
Canterbury
Kent
CT1 1TU

**Project:** Princes Parade Development, Hythe

This response is in accordance with the "Informal Principal Designer Document" issued by [redacted] by email dated 26th July 2016.

**Basic Services:** We, subject to the Conditions of this Appointment, propose to perform the services relating to the Project, being those indicated in the attached B&M Schedule(s) of Services (Appendix A) , as identified below:

- [ ] Employer's Agent
- [ ] Quantity Surveyor
- [ ] Clerk of Works
- [X] ~~CDM Advisor/~~Principal Designer (adjust as necessary)

**Fee:** The total amount of the Fee for the Basic Services is **0.05%**, which would be based on a prepared construction estimate, and is exclusive and subject to VAT.

**Payment Terms:** We will invoice in stages, according to the activity schedule set out below (further details are contained in the schedule of services appended to this document):

| Schedule | Proportion of Fee for the Basic Services (%) | Comments |
|---|---|---|
| **RIBA 0** – Strategic Definition | 0% | Not applicable – we assume the strategic brief stage has already been completed. |
| **RIBA 1** – Preparation & Brief | 30% | Based on estimated completion of this stage around October 2016 |
| **RIBA 2** – Concept Design | 40% | Based on estimated completion of this stage in January 2017 |
| **RIBA 3** – Developed Design | 30% | Based on estimated completion of this stage around May 2017 |
| **RIBA 4** – Technical Design | 0% | Not applicable – we assume that at this stage the D&B contractor will have entered into a building contract, and they will take over the PD role. |
| **RIBA 5** – Construction | 0% | Not applicable – ditto |
| **RIBA 6** – Handover & Close Out | 0% | Not applicable – ditto |
| **RIBA 7** – In Use | 0% | Not applicable - ditto |

If the dates, work stages or activities are not set out, the Fee is payable in instalments at intervals of not less than one month, the first instalment being one month from the date the Consultant first commences performance of the Basic Services.

**Reimbursable Expenses:**

Reasonable expenses are included within the fee, including travel, subsistence and printing.

**Payment for Additional Services:** We would be entitled to be paid an additional fee at the following rates (which are exclusive of VAT) for any Additional Services performed under this Appointment:

| Role/Position | Hourly Rate (£) | Daily Rate (£) |
|---|---|---|
| Director | [redacted] | [redacted] |
| Senior | [redacted] | [redacted] |
| Assistant | [redacted] | [redacted] |

This Fee Proposal document becomes a bono fide Appointment document, on agreement by signing the following page of this document.

**Limitation of Liability:** The maximum aggregate liability of the Consultant is five million pounds and zero pence (5,000,000).

**Professional Indemnity Insurance:** The Consultant maintains professional indemnity insurance in the sum of five million pounds and zero pence (£5,000,000) in the aggregate.

Signed by or on behalf of the parties.

**Signature by or on behalf of the Client**

Use where the Client is a limited company, partnership, limited partnership or limited liability partnership. The signatory should print his/her name in the space in square brackets, sign where indicated and state his/her position, e.g. director, partner etc., by deleting the inappropriate wording in brackets.

**SIGNED** by [ ] _____

(Directory/Secretary/Partner/Member)

for and on behalf of the **CLIENT**

Use where the Client is an individual

**SIGNED** by the **CLIENT** _____

**Signature by or on behalf of the Consultant**

Use where the Consultant is a limited company, partnership, limited partnership or limited liability partnership. The signatory should print his/her name in the space in square brackets, sign where indicated and state his/her position, e.g. director, partner etc., by deleting the inappropriate wording in brackets.

**SIGNED** by [redacted] [redacted]

(Director)

for and on behalf of the **Betteridge & Milsom Ltd.**

## Appendix A
## Schedule of Services/Methodology

**Betteridge & Milsom**
**Principal Designer (PD Services)**

## Core Services

### 1.1 Generally

☒ 1.1.1 Attend Client, Design, Project, Site and other meetings as provided under this appointment.

☒ 1.1.3 Advise the Principal Designer of its duties under the CDM Regulations.

### 1.2 Preparation & Brief

☒ 1.2.1 Included below.

### 1.3 Concept & Developed Design

☒ 1.3.1 Ascertain the information required under the CDM Regulations for the Project.

☒ 1.3.2 Advise the Client on the adequacy of the arrangements proposed for complying with the CDM Regulations for the Project.

☒ 1.3.3 Review the information available from the Client and all designers. Advise the Client of any additional information, inspections, surveys or tests that may be required in connection with the CDM Regulations.

☒ 1.3.4 Agree the health and safety file format with the Client.

☒ 1.3.5 Liaise between the Client and Designers to establish the programme and the information required to complete the health and safety file for the Project.

☒ 1.3.6 Advise on information required from the Client and the Designers to prepare and maintain the health and safety file for the Project.

☒ 1.3.7 Liaison with the Client for the provision of project and design information required in connection with the CDM Regulations.

☒ 1.3.8 Advise the Client on the health and safety implications of the design proposals.

☒ 1.3.9 Overview upon the compliance with Regulations 9(2), 9(3), 9(4) of the CDM Regulations.

☒ 1.3.10 Set up and attend specific design review workshops with the Client and the Designers in connection with the CDM Regulations.

☒ 1.3.11 Implement and comply with Regulation 8 (General Duties) of the CDM Regulations.

### 1.4 Technical Design (including Pre Construction Services)

☒ 1.4.1 Liaise between the Client and Designers to establish the programme and the information required to complete the pre-construction information for the project.

☒ 1.4.2 Advise the Client on information required from the Client and the Designers to prepare and maintain the pre-construction information for the Project.

☒ 1.4.3 Advise the Client upon appropriate provisions for the Principal Contractor's mobilisation.

☒ 1.4.4 Advise on the contents of the pre-construction information required under the CDM Regulations.

☒ 1.4.5 Assist with/compile, the pre-construction information required under the CDM Regulations.

☒ 1.4.6 Obtain the information required from the Client and the Design Team as required for the Principal Contractor's construction phase health and safety plan for the Project.

☒ 1.4.7 Advise the Client on the Principal Contractor's proposals for the construction phase health and safety plan.

### 1.5 Construction (RIBA Outline Plan of Work 2007)

☐ 1.5.1 Advise the Client on the development of the design of the Project in connection with the CDM Regulations.

☐ 1.5.2 Liaise with the Client, the Designers and the Principal Contractor to establish the programme and the information required to complete the health and safety file for the Project.

☐ 1.5.3 Assist with obtaining the information required from the Client, the Designers and the Principal Contractor and assist with the preparation and maintenance of the health and safety file for the Project.

☐ 1.5.4 Advise on information required for providing the Client with a completed health and safety file for the Project.

☐ 1.5.5 Liaise with the Client, Designers and the Principal Contractor to provide the Client with a completed health and safety file for the Project.

☐ 1.5.6 Liaise with the Client, the Principal Designer, the Designers and the Principal Contractor upon a handover plan, or similar management tool, identifying the roles and responsibilities of the Client, the Professional Team and the Principal Contractor under the CDM Regulations. Establish review, approval, variation and reporting procedures. Prepare recommendations for the Client's approval.

### 1.6 Use (RIBA Outline Plan of Work 2007)

☐ 1.6.1 Not applicable to this service.

## Supplementary Services

### 2.1 General

☐ 2.1.1 Provide services for the Client's and/or any third party's fitting-out or direct works contracts.

☐ 2.1.2 Provide Client with services in connection with insurance claims.

☐ 2.1.3 Attend and contribute to early warning and risk reduction meetings.

☐ 2.1.4 Carry out an inspection and report to the Client on the Principal Contractor's proposals for managing workplace and health and safety aspects of the Project.

☐ 2.1.5 Carry out an audit and report to the Client on the Principal Contractor's performance in managing workplace and health and safety aspects of the Project

☐ 2.1.6 Visit the Site periodically during the construction phase and report to the Client on the Principal Contractor's compliance with the CDM Regulations.

### 2.2 Project-Specific Services

☒ 2.2.1 Enter or attach Project-specific services agreed with the Client.

**We have based of offering on the basis of commencing our services in August 2016 and completed in May 2017. We would assume that design/client meetings will be at fortnightly intervals.**

**Project Name: Princes Parade, Hythe**

**Appendix B**
**Details of Experience**

# Herne Bay Court

## Sector: Residential

| | |
|---|---|
| Client: | Bethel Retirement Village |
| Location: | Herne Bay, Kent |
| Description: | Retirement Village: including leisure facilities |
| Value: | circa £40M |
| Gross Floor Area: | 16,800m2 |
| Contract Form: | JCT Design & Build |
| Appointment Date: | June 2012 |
| Start on Site: | currently in pre-con stage |
| Completion Date: | Not applicable |

**Betteridge & Milsom Staff**

| | |
|---|---|
| Project Director: | [redacted] |
| Employer's Agent: | [redacted] |
| Quantity Surveyor: | [redacted] |
| CDM Services: | [redacted] |

## Project Description

Bethel Retirement Villages' first project in the UK is Herne Bay Court Retirement Village in Kent with 117 one and two bedroom high-quality, secure and adaptable residential Independent Living apartments and maisonettes, 45 Assisted Living care suites as well as a specialist on-site Dementia Care Unit.

Herne Bay Court incorporates a luxurious Clubhouse, including a chef's restaurant, bistro, lounge, library, and a comprehensive Health and Wellness Centre, including a Spa and hydrotherapy complex, fitness suite, and medical centre.

Designed as a home for life, the Village's retirement apartments and maisonettes are designed to offer people hassle free living, providing access to a full range of on-site flexible care, support and medical services.

The leisure facilities are designed to incorporate a swimming pool, spa treatment offerings, and fitness suite/gym.

The dining facilities include a restaurant, and lounge and bar.

## Services Provided

Betteridge & Milsom have carried out the role of Employer's Agent, Quantity Surveyors and CDM Services for this scheme.

This included preparation of initial cost plans, developing option appraisals, and guiding the client through the procurement process. The role also included supporting the client in preparing funding document for the scheme.

The scheme is currently in pre-construction design stage and is envisaged to be commenced on site early 2017.

## Challenges

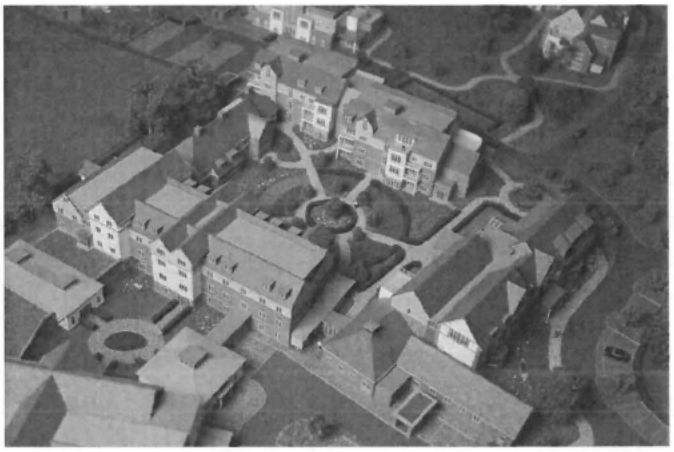
The scheme is situated on a large area of land on the outskirts of Herne Bay and includes green pastures, a myriad of trees and therefore careful consideration was required to ensure that the scheme melded the new scheme into the existing land.

As usual with projects of this size and complexity, challenges included ensuring that suitable surveys were carried out at the early project stage to inform planning and cost risk. This includes archaeology, ecology, incoming services, contamination and geo-tech surveys.

## Innovation

The project has been designed with consideration to its likely occupants, and therefore the residential units include structure to allow for hoists and other requirements for Life Time Homes and aged living.

The project also attempts to encompass the feeling of a village style living environment through carefully considered design, both in respect of the building fabric and the external areas. This includes the introduction of pathways meandering through the site, "allotments" for self-sustained village areas, and areas of waterways/streams.

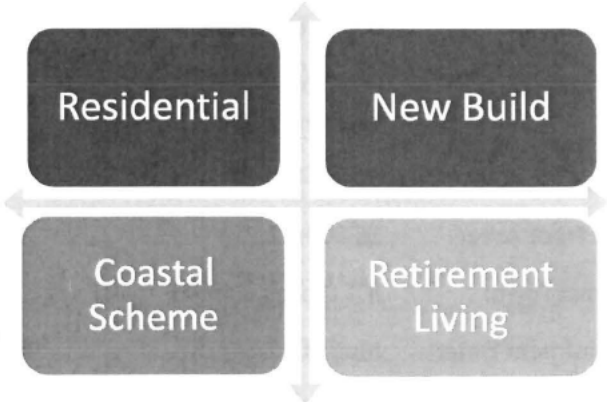


## Collaborative Working

The scheme has been evolving over the last few years and we have been working closely with our client to develop the feasibility and concept of the scheme, prior to planning submission.

Planning submission, along with architectural design was provided by Lee Evans Partnership, a Canterbury based Architectural Practice.

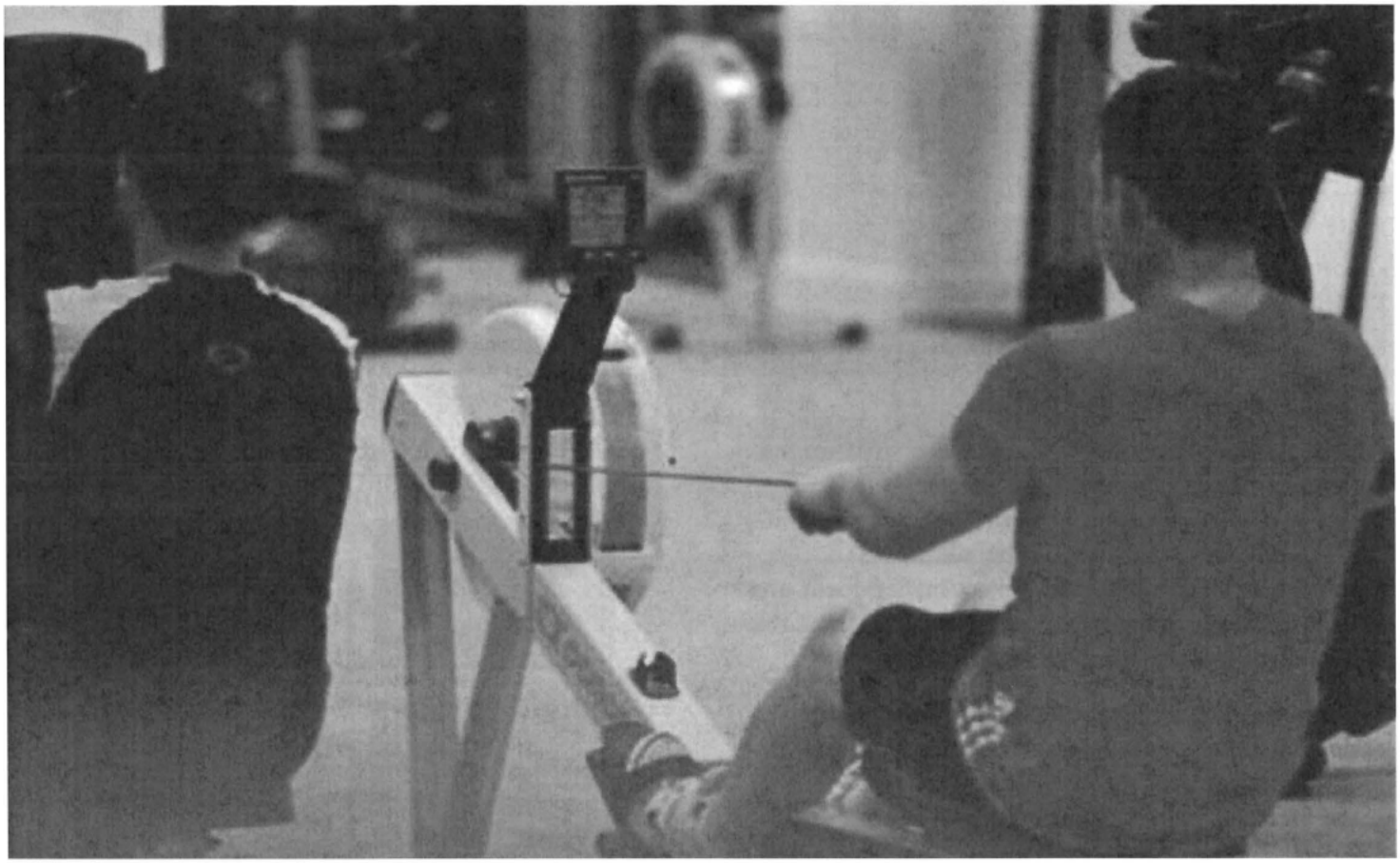
## Key Facts




## Client Testimonial

*"For Herne Bay, it will certainly be a catalyst for regeneration and make a considerable contribution towards transforming the town."*

[redacted] – Bethel Retirement Villages



# Strood Sports Centre

## Sector: Community (Leisure)

| | |
|---|---|
| Client: | Medway Council |
| Location: | Strood, Kent |
| Description: | Remodelling/Refurbishment of Sports Centre |
| Value: | £1.9M |
| Gross Floor Area: | 1291m2 |
| Contract Form: | JCT Design & Build |
| Appointment Date: | December 2014 |
| Start on Site: | June 2105 |
| Completion Date: | April 2016 |

**Betteridge & Milsom Staff**

| | |
|---|---|
| Project Director: | [redacted] |
| Employer's Agent: | [redacted] |
| Quantity Surveyor: | [redacted] |
| CDM Co-ordinator: | [redacted] |

## Project Description

Strood Sports Centre has undergone a major refurbishment worth £1.9 million, transforming it into a more modern, spacious and inviting facility for all of Medway to enjoy.

The state-of-the-art fitness suite is double the size of the previous one, and there are new fitness studios that will host an exciting new programme of classes.

A brand new reception space has been formed, to provide the centre with a modern and clean entrance, welcoming the visitors to the facilities. Works on the changing areas and café facilities mean that the sports centre is more bustling than ever before.

The centre boasts more than 100 cardiovascular equipment, free weights and abdominal strengthening stations, along with new equipment including a Functional training zone, a Trixter indoor cycling and a power plate.

The centre also has a new health suite with sauna and steam room.

## Services Provided

Betteridge & Milsom provided project management and full construction consultant services, to ensure that this project was a great success.

This included preparation of initial cost plans, developing option appraisals, and guiding the client through the procurement process.

The role included agreeing the contract sum with the contractor and dealing with post contract variations and settlement of the final account.

We also carried out CDM and Clerk of Works duties, to provide a complete package of services.

## Challenges

Throughout the development of this project, the main driver was to ensure that the sports centre kept running throughout the construction phase. Therefore, a logistics plan was implemented and the scheme split into a number of distinct phases. This allowed the centre to continue and maximise their revenue stream throughout the period.

The scheme also included replacement of the et changing room cubicles, poolside, and this required careful time allocation during the installation period.

## Innovation

The project required a clear understanding of the client's requirements in respect of capturing the brief for the leisure provision, especially the linking the requirements up with the commercial business case. This included consideration of flow of customers, equipment usage and heating/ventilation solutions.

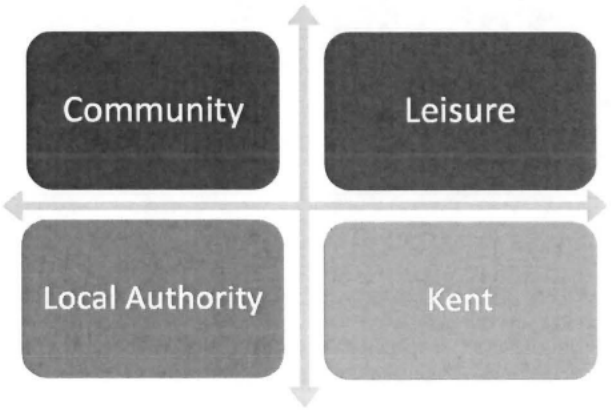
The innovation for the scheme was to achieve the correct solutions using the existing building fabric, and clever design, to maximise the desired result.

## Collaborative Working

We worked closely with Medway Council's property team to ensure the scheme was a great success. The design team was headed up by HMY Architects, who brought their design and planning expertise to the scheme.

The project also received input from Pulse Fitness Equipment who were once procured were able to provide invaluable input to the logistics and requirements for the fitness spaces.

## Key Facts




# Sibson Building (Kent Business School & SMSAS)

## Sector: Education

| | |
|---|---|
| Client: | University of Kent |
| Location: | Canterbury, Kent |
| Description: | University Academic Building |
| Value: | circa £27M |
| Gross Floor Area: | 8215m2 |
| Contract Form: | JCT Design & Build |
| Appointment Date: | June 2014 |
| Start on Site: | August 2015 |
| Completion Date: | December 2016 |

**Betteridge & Milsom Staff**

| | |
|---|---|
| Project Director: | [redacted] |
| Employer's Agent: | Not applicable |
| Quantity Surveyor: | [redacted] |
| Principal Designer: | [redacted] |

## Project Description

The new academic building for Kent Business School (KBS) and the School of Mathematics, Statistics & Actuarial Science (SMSAS) will create a vibrant new campus destination, bringing together academics, students, researchers and administrative staff from KBS and SMSAS.

The building will accommodate departmental space for Kent Business School and the School of Mathematics, Statistics & Actuarial Science, including academic workspaces, researchers' workspace and administration and reception areas. It will also house teaching and learning spaces, including 3 lecture theatres, seminar rooms and dedicated MBA and IT suites. The scheme will include new social learning spaces, along with a café, breakout spaces and a staff terrace.

The envisaged hub of teaching, learning and working will allow two of the University of Kent's most successful departments to expand and improve their current activities, as well as strengthen their position within the higher education market place. Most importantly, it will offer KBS and SMSAS a new home to express their identity and character.

## Services Provided

Betteridge & Milsom are carrying out the role of Quantity Surveyor for this scheme, along with Principal Designer role.

This included preparation of initial cost plans, developing option appraisals, and guiding the client through the procurement process.

The role also included dealing with CDM Regulations, which changed part way through the design stage. As CDM Co-ordinators, Betteridge & Milsom took up the Principal Designer role, and lead the team through the necessary changes required.

## Challenges

The site of the new building is situated in the heart of the university's campus and is contained in the Park Wood area, which is home to important woodland and ecological habitat. Through careful consideration and design, the scheme evolved and has been able to be carefully constructed to maximise the potential of the site, whilst minimising any issues around ecology and arbrocultural matters.

## Innovation

The building is designed with a panelled system, with architectural fins, which accentuates the aesthetics of the external fabric. The scheme also includes green roofs, passive ventilation, and flexible work spaces within the office zones.

The building is built in concrete, allowing for the thermal mass of the structure to maximise heat retention in the winter in minimise overheating in the summer.

The spaces formed inside the building are grand in their scale, whilst toned to provide a comfortable space to learn and teach.

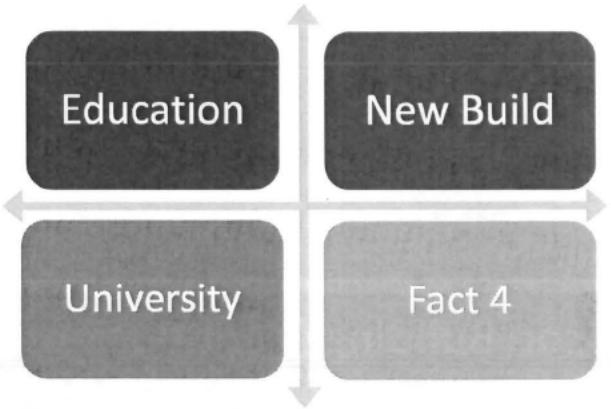
## Collaborative Working

The scheme was designed by London based architect Penoyre & Prasad, with further design input by Max Fordham and Price & Myers.

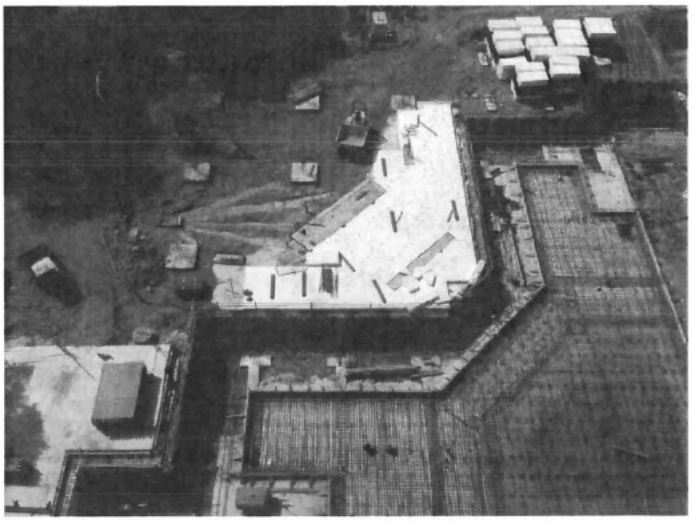
Willmott Dixon are currently construction the scheme, and the commitment to quality and health & safety has been excellent.

With support from the University's own estates department, and BNP Paribas as project managers, the scheme looks to exceed the client's brief of providing an excellent new academic building, nestled in the heart of the university's campus.

## Key Facts







## Appendix C
## Standard Terms and Conditions

## Terms and Conditions

### 1 Appointment

**1.1** The Client appoints the Consultant to provide the Services (which include the Basic Services and any Additional Services) as described in Clause 6 below) and the Consultant accepts such appointment upon and subject to these Conditions (the "Appointment"). The Appointment takes effect on the date when the Consultant first commenced performance of the Services, irrespective of the date of this Appointment.

**1.2** The Consultant regularly liaises and consults as necessary with the Contractor and other members of the Professional Team set out in the Appointment Particulars.

### 2 Standard of Care

The Consultant, when performing the Services, exercises the reasonable skill and care to be expected of an appropriately qualified professional consultant of the same discipline as the Consultant holding itself out as having the competence and resources to perform the Services.

### 3 Statutory Requirements

When performing the Services, the Consultant complies with the requirements of all statutes and legislation relevant to the Project. In particular, the Consultant complies with the Construction (Design and Management) Regulations 2007, to the extent they apply to the Project.

### 4 Prohibited Materials

The Consultant, exercising the required standard of care:

(a) does not specify for use in connection with the Project any materials which by their nature or application contravene any British Standard or EU equivalent current at the time of specification or which are otherwise generally known within the construction and engineering industry at the time of specification to be harmful to health and safety or to the durability of works in the particular circumstances in which they are specified for use; and

(b) insofar as reasonably practicable and having regard to the nature and extent of the Services, sees that such materials are not used in the construction of those parts of the Project to which the services relate.

### 5 Fee

As consideration for the performance of the Basic Services, the Client pays the Consultant the Fee and the Reimbursable Expenses set out in the Appointment Particulars. The Fee is adjusted if the performance of the Basic Services is materially delayed and/or disrupted for any cause outside the Consultant's reasonable control. The parties agree the adjustment to the Fee and the timing of its payment. If not agreed, such adjustment is based on the rates set out for the Basic Services and, if no rates are set out, on the rates set out for the Additional Services. The Fee is then the Fee as adjusted.

## 6 Additional Services

If at any time the Client requires the Consultant to perform any services which are not identified as Basic Services in the services listed in the Schedule ("Additional Services"), the Client pays the Consultant for such Additional Services at the rates set out in the Appointment Particulars unless otherwise agreed. If the Client requires any Additional Services, the Consultant informs the Client of the likely additional fee to be charges. Unless otherwise agreed, the additional fee is payable after performance of the relevant Additional Service.

## 7 Payment of Remuneration and Reimbursable Expenses

**7.1** The Consultant submits to the Client a VAT invoice in respect of the Fee, any additional fee payable for Additional Services and the Reimbursable Expenses on each instalment date or on completion of each activity or work stage set out in the Appointment Particulars. All invoices are accompanied by such supporting documents, records and receipts reasonably necessary for checking each invoice. The invoices and supporting documents, records and receipts (if any) specify the sum that the Consultant considers to be due to it on the payment due date under this Clause and the basis on which that sum is calculated. The payment due date is the date the Client receives the relevant invoice (the "due date").

**7.2** Not later than 5 days after the due date, the Client gives notice in writing to the Consultant of the sum that the Client considers to have been due at the due date in respect of the payment and the basis on which that sum is calculated.

## 8 Final Date for Payment

**8.1** The Client, subject to any pay less notice (referred to below), pays the Consultant the sum referred to in the Client's payment notice under Clause 7.2 (or, if the Client has not given notice under Clause 7.2, the sum stated in the invoice referred to in Clause 7.1) (the "notified sum") on or before the final date for payment of the invoice. The final date for payment is 14 days after the due date.

**8.2** If the Client intends to pay less than the notified sum, it gives the Consultant notice of that intention not later than 7 days before the final date for payment by specifying the amount the Client considers to be due to the Consultant at the date the notice is given and the basis on which that sum is calculated (the "pay less notice"). Where a pay less notice is given, the payment to be made on or before the final date for payment is not less than the amount stated as due in the pay less notice. Provided that this Clause does not apply where the Client is a residential occupier under the Housing Grants, Construction and Regeneration Act 1996 (as amended).

**8.3** In relation to the requirements for the giving of notices under Clauses 7 and 8, it is immaterial that the amount then considered to be due may be zero.

## 9 Default, Interest and Suspension

If the Client fails to pay the notified sum (or, where a pay less notice is issued in accordance with and where necessary under Clause 8.2, the amount specified in that notice) by the final date for payment:

(a) the Client pays the Consultant simple interest on the unpaid amount for the period from the final date for payment until the date of actual payment, calculated on a daily basis at the rate of 4% above the base rate set from time to time by the Bank of England's Monetary Policy Committee (or any successor to it);

(b) where such failure continues for 7 days after the Consultant has given the Client notice in writing of its intention to suspend performance of any or all of the Services and the ground or grounds on which it intends to suspend performance, the Consultant may suspend such performance until such amount is paid;

(c) the Consultant may be notice in writing to the Client suspend the copyright licence under Clause 12 until such amount is paid.

## 10 Limitations of Liability

**10.1** Except for liability for death or personal injury, the maximum aggregate liability of the Consultant to the Client under or in connection with this Appointment (whether in contract or tort (including negligence) or for breach of statutory duty) is limited to the amount specified in the Appointment Particulars. If no such amount is specified, such liability is limited to the amount of the Consultant's professional indemnity insurance specified in Clause 11.1.

**10.2** Without prejudice to the above limitation or any other exclusion or limitation of liability available to the Consultant, the Consultant's liability for loss or damage suffered by the Client in the event of any breach of this Appointment is limited to the proportion of such loss or damage that it would be just and equitable to require the Consultant to pay having regard to the extent of responsibility of the Consultant for the same and on the assumptions that:

(a) all contractors and sub-contractors and other members of the Professional Team have provided contractual undertakings to the Client on terms no less onerous than those set out in this Appointment in respect of the carrying out of their obligations in connection with the Project;

(b) there are no exclusions or limitations of liability nor joint insurance or co-insurance provisions between the Client and any such persons; and

(c) all such persons have paid to the Client such sums as it is just and equitable for them to pay having regard to the extent of their responsibility for such loss or damage.

Provided always that the Consultant does not assert that it has no or a reduced liability to the Client under this Appointment solely by reason of the fact that the Contractor accepts responsibility for the design of the Project, to the extent that such design is undertaken by the Consultant.

**10.3** No action or proceedings for any breach of this Appointment may be commenced against the Consultant after the expiry of 6 years from practical completion of the Project.

## 11 Insurance

**11.1** The Consultant maintains professional indemnity insurance in the sum specified in the Appointment Particulars, subject to such insurance being available in the insurance market on reasonable terms and rates.

**11.2** The Consultant produces written evidence that this insurance is being maintained whenever reasonably requested to do so by the Client.

## 12 Copyright

**12.1** Copyright in all drawings, plans, details, specifications, bills of quantities, schedules, reports, records, calculations and all other documents including computer software and revisions of the same ("Documents") prepared by the Consultant for the purposes of the Project remains the property of the Consultant. Subject to Clause 9(c), the Consultant grants to the Client a royalty-free, irrevocable, non-exclusive licence to use and reproduce the Documents and any designs contained in them for any purpose relating to the Project including the construction, completion, maintenance, operation, letting, sale, reinstatement, mortgaging, refurbishment and repair of the Project (but not for any extension of the Project without the Consultant's written consent).

**12.2** The Consultant is not liable for any use of the Documents for any purpose other than that for which they were originally prepared.

## 13 Suspension of the Services

**13.1** The Client may at any time give notice in writing to the Consultant requiring it to suspend all or part of the Services.

**13.2** The Consultant resumes performance of the Services which have been suspended as soon as reasonably practicable after it receives written notice to do so from the Client.

**13.3** If the suspension continues for more than 3 months, either party may give notice in writing to the other terminating the Consultant's engagement under this Appointment.

## 14 Termination of Engagement

**14.1** The Client may terminate the Consultant's engagement under this Appointment at any time by giving the Consultant 14 days' prior notice in writing

**14.2** If a party is in material breach of its obligations under this Appointment and fails to remedy such breach within 7 days after the other party gives it written notice to do so, the party which gave such notice may immediately thereafter terminate the Consultant's engagement under this Appointment by giving written notice to that effect to the party in breach.

**14.3** If a party becomes insolvent (that is, deemed unable to pay its debts under Sections 123 or 268 of the Insolvency Act 1986), then the other party may immediately terminate the Consultant's engagement under this Appointment by giving written notice to the insolvent party.

## 15 Payment upon Suspension or Termination

**15.1** Upon any suspension or termination, the Client pays the Consultant in accordance with Clauses 7 and 8 (without prejudice to any rights the Client has in respect of any breach by the Consultant of its obligations under this Appointment):

(a) that part of the Fee, the Additional Services Fee (if any) and any other sums which have accrued due up to the date of suspension or termination (as the case may be) and a fair and reasonable proportion of the next instalment of the Fee and any additional fee payable for Additional Services commensurate with the Services performed, less any amounts previously paid to the Consultant; and

(b) (save where such suspension or termination is due to the Consultant being in breach) all reasonable costs, disbursements and expenses reasonably incurred by the Consultant (including any costs incurred in suspending and/or resuming performance of any or all of the Services) as a direct result of such suspension or termination.

**15.2** Upon payment of the amount due under Clause 15.1, the Consultant hands over to the Client the Documents, subject to the terms of the copyright licence under Clause 12 and payment of the Consultant's reasonably copying charges.

**15.3** Termination of the Consultant's engagement under this Appointment does not affect the accrued rights and remedies of the parties.

## 16 Assignment and Sub-Contracting

**16.1** The Consultant does not assign or sub-contract any of its rights or obligations under this Appointment without the prior consent in writing of the Client (which consent is not to be unreasonably withheld or delayed).

**16.2** The benefit of this Appointment may be assigned by the Client by way of an absolute legal assignment to any person providing finance or re-finance to the Client in connection with the Project or to any person (A1) acquiring the Client's interest in the Project and by A1 to another person (A2) acquiring A1's interest in the Project. No further or other assignment is permitted and, in particular, A2 is not entitled to assign this Appointment.

## 17 Disputes

**17.1** Notwithstanding any other provision of this Appointment, either party may at any time refer any dispute under it to adjudication under the Scheme for Construction Contracts (England and Wales) Regulations 1998, Part 1 (as amended).

**17.2** The Adjudicator's decision is binding until the dispute or difference is finally determined by litigation. The Client and the Consultant attempt to agree the identity of the Adjudicator. If the parties fail to reach such agreement within 5 days after one party notifies the other that it wishes to agree the identity of the Adjudicator, the Adjudicator is appointed by the President or Vice-President for the time being of RICS. Any dispute or difference in connection with the enforcement of a decision of the Adjudicator is referred to the Courts.

## 18 General

**18.1** This Appointment supersedes any previous agreements or arrangements between the parties in respect of the Project.

**18.2** Nothing in this Appointment confers or purports to confer any right to enforce any of its terms on any person who is not a party to it. Only the Client (and the Client's permitted assignees) and the Consultant can take action to enforce the terms of this Appointment.

**18.3** Any reference to a statute or statutory provision is construed as a reference to that statute or provision as amended, consolidated, supplemented or re-enacted (with or without modifications) from time to time.

**18.4** Where any Clause requires an act to be done within a specified period after or from a specified date, the period begins immediately after that date. Where the period includes Christmas Day, Good Friday or a day which, under the Banking and Financial Dealings Act 1971, is a bank holiday in England and Wales, that day is excluded.

## 19 Notices

**19.1** Any notice under this Appointment is deemed to be given if it is in writing and delivered by hand or sent by pre-paid, recorded or special delivery post to the Client or the Consultant (as the case may be) at the address set out for each party in this Appointment or any other address notified by one party to the other in accordance with this Clause.

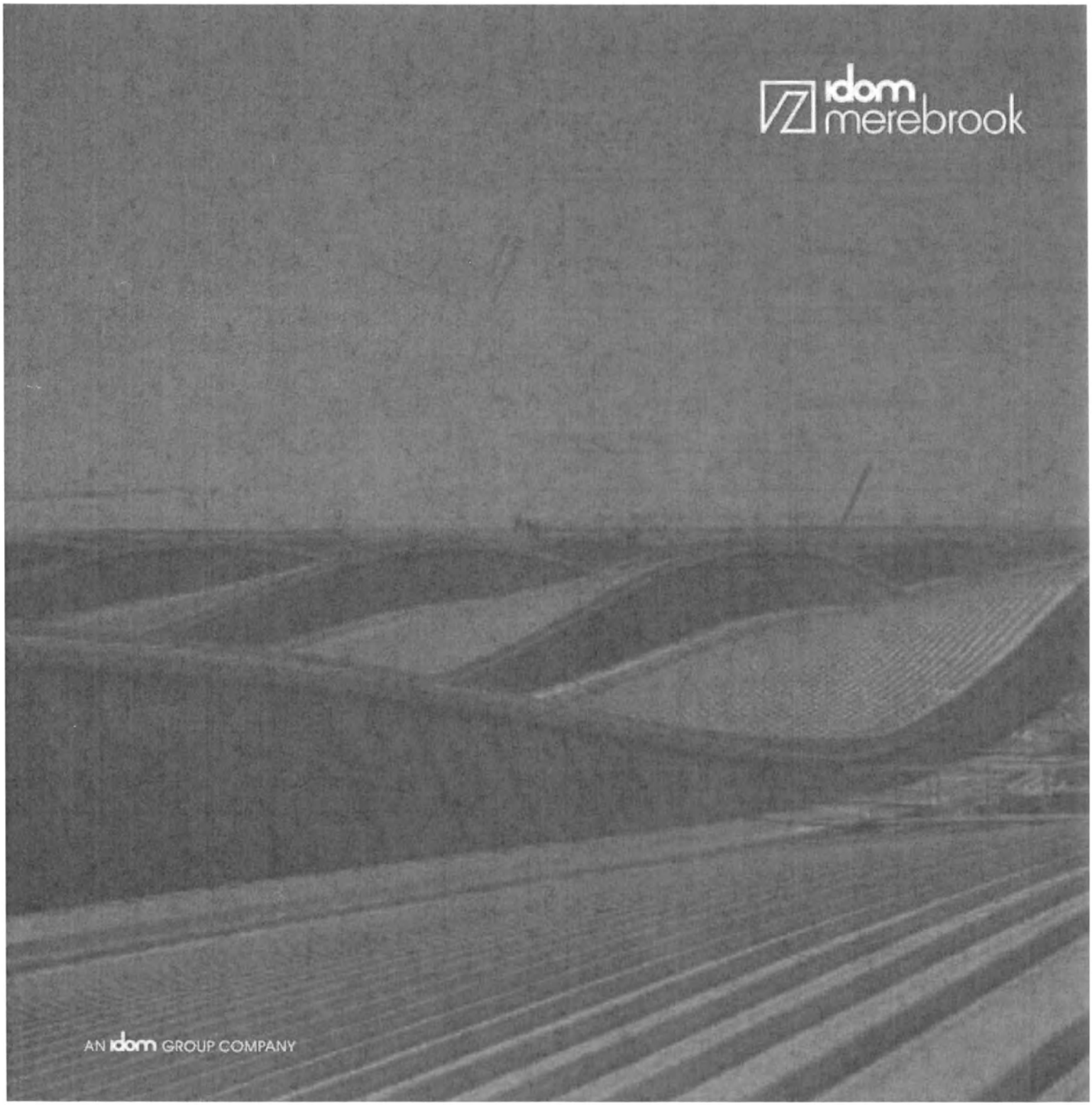
**19.2** Any notice sent by hand is deemed received upon actual receipt by the party to whom it is addressed.

**19.3** Any notice sent by a postal method described in Clause 19.1 is deemed received 48 hours after it was posted.

## 20 Governing Law and Jurisdiction

This Appointment is governed by and construed in accordance with English law and the parties submit to the exclusive jurisdiction of the Courts of England and Wales.

# GEO-ENVIRONMENTAL ASSESSMENT
# PRINCES PARADE
# HYTHE, KENT
# SHEPWAY DISTRICT COUNCIL
# GEA-17436AI-15-193
# JULY 2015



GEO-ENVIRONMENTAL ASSESSMENT
PRINCES PARADE
HYTHE, KENT
SHEPWAY DISTRICT COUNCIL
GEA-17436AI-15-193
JULY 2015

Current Document Details

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**Approved by**

[redacted]

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**Document Revisions**

| Rev | Date | Author | Checked | Approved |
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Report issued from

KENT 1 Leonard Place, Westerham Road, Keston. BR2 6HQ Tel: 01689 889 980

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## EXECUTIVE SUMMARY

A Geo-Environmental Assessment was requested by Shepway District Council. The purpose of the assessment was to identify any contaminative or geotechnical issues associated with former land use at *Princes Parade, Hythe, Kent* which might impact on the site's redevelopment.

| SITE DETAILS | |
|---|---|
| Approximate site area | 7.5 ha |
| Current/previous use | Overgrown disused council-owned land, formerly an inert landfill |
| Proposed use | Development options comprise either a leisure centre or housing scenarios. |

| PHASE 1 NON-INTRUSIVE INVESTIGATION | |
|---|---|
| Expected geology | Made ground / Storm Beach Deposits / Tidal Flat Deposits to the north / Weald Clay Formation |
| Groundwater | Secondary 'A' Aquifer within the superficial strata. Not located within a Source Protection Zone. |
| Surface water | Surface water receptors in vicinity / abstractions / flooding |

| PHASE 2 EXPLORATORY INVESTIGATION | |
|---|---|
| Contamination | Contamination comprising metals, PAH, TPH and asbestos was encountered in made ground. PAH contamination in natural stratum immediately below made ground was encountered, consistent to overlying made ground. |

| RECOMMENDATIONS | |
|---|---|
| Geotechnical | Geotechnical recommendations comprised foundation solutions such as ground improvement (vibro stone / concrete columns) or a piled solution to be considered. Due to variable thicknesses of made ground it is recommended suspended floor slabs should be adopted. |
| Remediation | A 450 mm clean cover is recommended in landscaped areas under both scenarios to break linkages for human health and to supply a suitable growing medium. |

## SECTION 1 INTRODUCTION

1.1 Shepway District Council (SDC) proposes to develop an area of land located at Princes Parade, Hythe for mixed-use development purposes. A Cabinet Report, dated January 2014, provided by SDC indicates various development options. Development options discussed comprise a swimming pool and leisure facility with associated car parking and soft landscaping. Two housing scenario options are also referenced. Scenario 1 comprises 12 single storey low-rise homes and scenario 2 comprises 36 town-homes. Idom Merebrook Limited (Merebrook) has been commissioned by SDC to undertake preliminary site investigation works and to advise on the geo-environmental implications of the redevelopment of the site for the proposed end use.

1.2 The objectives of the investigation are to:

*i.* Assess surface and sub-surface ground conditions present at the site;

*ii.* Identify hazards associated with ground contamination which may place constraints on the site and the proposed development;

*iii.* Evaluate the risks associated with any identified hazards;

*iv.* Provide preliminary recommendations for the mitigation of any significant risks identified; and

*v.* Provide preliminary geotechnical recommendations.

1.3 A Phase 1 (Non-intrusive Investigation) and a Phase 2a (Preliminary Exploratory Investigation) have been undertaken for the subject site.

1.4 This report presents the findings of the geo-environmental investigation and provides an interpretation of the geo-environmental conditions that exist at the site. The contaminative status of the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment. This report uses a Tier 1 risk assessment to ascribe a conservative qualitative appraisal of the hazards associated with the site.

1.5 This report has been prepared for Shepway District Councilfor the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Shepway District Council and Merebrook as to the extent to which the findings may be appropriate for their use

## SECTION 2 PHASE 1 (NON-INTRUSIVE INVESTIGATION)

### 2.1 INTRODUCTION

2.1.1 The non-intrusive investigation has been conducted with reference to the documents and sources detailed in Table 1 below:

Table 1: Published Data and Information Sources

| SOURCE DATA | GROUNDSURE DATA |
|---|---|
| BGS 1:50,000 Series Geological Sheet 305 | Ordnance Survey (OS) historical maps scaled at 1:10,560, 1:10,000, 1:2,500 and 1:1,250 dated 1872 - 2014 |
| BGS Geology of Britain 1:50,000 online maps | Water abstraction, discharge and pollution data |
| Radon: guidance on protection measures for new dwellings | Registered waste management sites |
| Environment Agency (EA) online data maps | Mining records and natural ground stability data |
| UK National Air Quality Archive, online | Protected areas of environmentally sensitive land use or conservation |
| Planning Records | Other relevant designations and/or authorisations and Trade Directory entries |

2.1.2 The above sources are all authoritative and it is believed that they are reasonably reliable. However, independent verification of the information supplied has not necessarily been carried out and Merebrook cannot be held liable for inaccuracies or deficiencies in the information.

### 2.2 SITE LOCATION AND SETTING

2.2.1 The site is located to the north of Princes Parade, Hythe, CT21 5QT.

2.2.2 The site occupies an area of approximately 7.5 hectares located at National Grid Reference 618523, 134832 and indicated on drawing 17436ai-304-001, presented in Appendix 1 of this report.

2.2.3 The site is bounded by the Royal Military Canal to the north, residential flats (under construction) to the east, Princes Parade Road and the beach to the south and a golf course to the west.

2.2.4 The majority of the site is disused and fenced off to the public. The site is an overgrown former inert landfill with much of the site comprising rough grass, weeds, scrubland and trees. A gated entrance onto the site is located in the southwestern corner with historical hardstanding noted in this area. The eastern portion of the site is developed with Seapoint Canoe Centre, playground and picnic

area identified. A pathway was identified north of Princes Parade through the central portion of the site and across the canal. A pathway encircles the western, northern and eastern perimeter of the site. No invasive species were noted during the site walkover, however, sporadic littering was noted on the site.

2.2.5 The elevation of the site is generally low-lying, ranging from 2.5 metres above Ordnance Datum (m AOD) to 5.0 m AOD.

## 2.3 SITE HISTORY

2.3.1 The site history, based on a review of the historic and current maps, dating from 1872 to 2014 is summarised below. Potentially contaminative land uses are shown in bold. Copies of key maps used in this review are provided in Appendix 2.

Table 2: Summary of the key features shown on historic maps

| DATA SOURCE | SITE / SURROUNDINGS |
|---|---|
| 1872 (1:10,560 scale). | The site was identified as undeveloped. A footpath was located in close proximity to the northern boundary. |
| | A station house was identified in close proximity to the eastern boundary while the **Royal Military Canal** was illustrated along the northern boundary of the site. The village of Seabrook was illustrated 75 m to the northeast. A **gas works** was noted 50 m to the northeast, while a **waterworks** was identified 260 m to the north. The Royal Military Road was noted 100 m to the northwest. |
| 1897 (1: 10,560 scale). | Vegetation and a central pathway were noted on the site. |
| | Further residential development was noted in the village of Seabrook, while the gasworks was no longer identified. The **Hythe and Sandgate rail tracks** were developed 250 – 200 m to the north, with **Sandgate Station** 200 m to the northeast. A **gravel pit** was noted 50 m to the north. A **police station** was identified 60 m to the east while a **hospital** was developed 500 m to the east. Two **old quarries** were noted 250 m to the north and 400 m to the northwest. |
| 1945 –1946 (1: 10,560 scale). | The central portion of the site was identified as a recreational ground. |
| | The railway tracks 200 m to the north of the site were removed. There was further residential development to the north of the site in Seabrook. |
| 1961(1:10,560 scale). | A drain was identified along the northern portion of the western part of the site. An entrance into the site was constructed in the southwestern portion of the site with a slope also noted indicating that the site was being used. |
| | A large residential development was constructed 250 m to the north. |
| 1973-75 (1:10,560 | No significant changes identified to the site. |
| | A depot was constructed 200 m to the northwest of the site |

| DATA SOURCE | SITE / SURROUNDINGS |
|---|---|
| scale). | while a hospital was developed 250 m to the northwest of the site. Several buildings were developed along the former location of the railway tracks. |
| 1987-89 (1:10,000 scale). | No significant changes to the site identified. |
| | No significant changes to the surrounding land uses. |
| 2010 & 2014 (1:10,000 scale) | A car park was constructed in the eastern portion of the site. |
| | The site adjacent to the western boundary was identified as part of the golf course. |

2.3.2 In summary, historic plans show that the majority of the site was undeveloped. A track and entrance onto the site was identified in 1963 which would indicate the presence of some site activity. A carpark was developed in the eastern portion of the site prior to 2010.

2.3.3 The historic maps indicate the presence of potentially significant contaminative land uses within 250 m of the site. These include:

*i.* An historic gasworks 50 m north of the site;

*ii.* The Royal Military Canal (possible presence of UXOs); and

*iii.* The historic rail tracks and associated station 200 – 250 m to the north / northwest.

2.3.4 Given the nature of the historical mapping process (scale, representation of conditions at discrete time intervals frequency etc.), any such maps and plans may not provide a comprehensive account of a site's history. Identification of pertinent land uses and associated potentially contaminative activities, may therefore be absent from mapping records.

## 2.4 GEOLOGY

2.4.1 The published geological map indicates the presence of superficial drift deposits of Storm Beach Deposits comprising gravel underlying the majority of the site. Tidal Flat Deposits comprising clay and silt are likely to underlie the northern portion of the site.

2.4.2 The underlying bedrock geology comprises clay and mudstone of the Weald Clay Formation.

2.4.3 The closest relevant British Geological Survey (BGS) historical borehole is a shallow 4.0 m borehole located 50 m to the northeast of the site (BGS Ref: TR13SE23). Topsoil was encountered to approximately 0.4 m bgl, with gravel encountered to 2.8 m bgl. This was underlain by silty sandy clay.

2.4.4 The Groundsure report did not make any reference to made ground, however, the report indicated that an historic landfill was located on the site.

## 2.5 HYDROGEOLOGY

2.5.1 The superficial geology underlying the site is classified by the Environmental Agency (EA) as a Secondary 'A' Aquifer. This indicates that the aquifer has 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.

2.5.2 The underlying Weald Clay Formation is classified by the EA as Unproductive Stratum.

2.5.3 The site is not located within a Groundwater Protection Zone.

2.5.4 According the Groundsure Report, there are three groundwater abstraction licences within one kilometre of the site. All three licences are related to potable water abstraction with the closest licence associated with Veolia and located 276 m to the north of the site. An additional Veolia licence is located 761 m to the north, while another licence is relating to Hotel Imperial and is located 847 m to the west.

## 2.6 HYDROLOGY

2.6.1 The closest surface water feature is the Royal Military Canal located three metres to the north of the site. A culverted watercourse flows into the central portion of the canal, while a tertiary river flows into the western portion of the canal. This canal flows in an eastern direction along the boundary of the site, before flowing into the Hythe Bay 50 m to the south.

2.6.2 There are no surface water abstractions within one kilometre of the site.

2.6.3 According the EA's Risk of Flooding from Rivers and Seas (RoFRaS), the site is located in an area at risk from flooding. The majority of the northern and eastern portion of the site is identified as having a medium to high RoFRaS risk. The surrounding areas are also identified as having a high RoFRaS risk from flooding.

2.6.4 The site is not located in an area benefitting from flood defences.

2.6.5 According to the Groundsure Report, the site is located within an area of susceptible to groundwater flooding (superficial deposits flooding). This is due to the shallow unconsolidated sedimentary aquifer which overlies an unproductive aquifer.

## 2.7 CURRENT SITE ISSUES

2.7.1 Potentially significant environmental issues have been investigated within relevant distances of the site, based on the database of records supplied by Groundsure. These relate to the following searches:

*i.* Water discharge or pollution incidents within 250 m of the site;

*ii.* Waste management sites within 250 m of the site;

*iii.* Statutory authorisations within 50 m of the site;

*iv.* Trade directory entries of possible contaminative use within 50 m of the site;

*v.* Special protection or conservation areas within 50 m of the site; and

*vi.* Any other relevant issues.

2.7.2 Potentially significant environmental issues identified by the above searches are summarised in Table 3 below.

Table 3: Potentially significant environmental issues

| ENVIRONMENTAL CATEGORY | DESCRIPTION |
|---|---|
| Water discharge or pollution incidents within 250 m | There is one current and three revoked discharge consents relating to one sewer storm overflow located 16 m to the southeast.<br>One historic pollution incident was identified on the site. This was related to crude sewage on site with no significant impact identified.<br>One unspecified pollution incident was identified 24 m to the northeast, with no significant impact identified. |
| Waste management sites within 250 m | The site was identified as an historic EA landfill (reference SH6) receiving both inert and commercial waste between December 1946 – December 1974. |
| Statutory authorisations within 50 m | There are no statutory authorisations within 50 m of the site. |
| Trade directory entries of possible contaminative use within 50 m | There are no potentially contaminative land uses within a 50 m radius of the site.<br>An electricity substation was, however, identified 60 m to the northeast while a service station was noted 110 m to the northeast. |
| Special protection or conservation areas within 50 m | Hythe Bay located 50 m to the south which is a marine conservation zone. |

## 2.8 INDICATIVE GROUND STABILITY HAZARDS

2.8.1 The site has been classified by the BGS as having a negligible to low risk from clay shrink swells, landslides, soluble rocks and collapsible ground. A moderate to high risk has been identified for compressible deposits and running sand in the northern portion of the site.

2.8.2 The Groundsure Report has indicated that rare localised small-scale iron ore mining may have occurred on the site.

## 2.9 RADON GAS

2.9.1 The site does not lie within a Radon Affected Area as defined by the Health Protection Agency (1% of houses are above the action level) and therefore no radon protective measures are required.

## 2.10 AIR QUALITY

2.10.1 The site does not lie within a designated Air Quality Management Area (AQMA) for the Shepway Local Authority.

## 2.11 ECOLOGY

2.11.1 Information from environmental and ecological datasets was obtained from a review of the MAGIC (Multi-Agency Geographic Information for the Countryside) website and the Groundsure report. The data assessed indicates that several environmentally sensitive features are located within one kilometre of the site. This includes Hythe Bay located 50 m to the south which is a marine conservation zone. The Royal Military Canal to the north is identified as a scheduled monument, while deciduous woodlands were located 150 m to the northeast and 300 m to the northwest of the site.

2.11.2 The data also indicates that species of grey partridges and redshank have been recorded in close proximity to the site.

2.11.3 Information provided by Shepway District Council has indicated the presence of badger setts on the site.

## 2.12 PREVIOUS INVESTIGATIONS

2.12.1 A Phase 1 Assessment was undertaken by Ground Solutions Group Limited (GSG) in 2002 on behalf of Shepway District Council (Report ref: 44518_1/OJR). This report included a soil spike survey undertaken across the site.

2.12.2 The survey returned concentrations of methane ($CH_4$) below the instruments detection limit (<0.25 %v/v) with carbon dioxide ($CO_2$) was detected to a maximum of 7.0 % v/v. Thirty-seven locations recorded $CO_2$ between 1.5 to 5.0 v/v, with only five location recording concentrations greater than 5 % v/v.

## 2.13 PRELIMINARY CONCEPTUAL SITE MODEL AND RISK ASSESSMENT

2.13.1 From the Phase 1 assessment a preliminary site conceptual model and risk assessment have been produced using the framework established in Part IIA of the *Environmental Protection Act 1990* and detailed in Contaminated Land Report *CLR11 - Model Procedures for the Management of Land Contamination*.

2.13.2 Risk from contamination has been assessed using the source-pathway-receptor and pollutant linkage methodology, whereby a risk can only exist if all elements of: source, pathway and receptor, are present.

2.13.3 Potential Sources

*i.* Elevated concentrations of metals, PAH and TPH from the historic infilling across the site and the potential for associated soil gas / vapour generation;

*ii.* Soil and groundwater contamination associated with the site's former use as a landfill;

*iii.* Asbestos containing material (ACM) within the fill material imported to the site;

*iv.* Soil and groundwater contamination associated with historic off-site sources which includes the Royal Military Canal three metres to the north, within potential risk from UXO's and the historic gas works located 50 m to the north.

2.13.4 Potential Pathways

*i.* Direct contact;

*ii.* Ingestion and inhalation of contaminated soil and dust;

*iii.* Vertical migration to the underlying Secondary Aquifer to the south of the site;

*iv.* Vertical and horizontal migration to off-site surface water receptors; and

*v.* Accumulation of ground gas vapour ingress into buildings and voids.

2.13.5 Potential Receptors

*i.* The general public and current site users;

*ii.* Residents of future development;

*iii.* Construction workers;

*iv.* Groundwater in underlying Secondary Aquifer; and

*v.* Off-site surface water receptor the Royal Military Canal located to the north of the site and Hythe Bay 50 m to the south.

2.13.6 Pollutant Linkages and Risk Ratings

2.13.6.1 From the Phase 1 assessment a preliminary site conceptual model has been produced as Table 4 which identifies the potential pollutant linkages. These have

been used to inform the Phase 2 intrusive investigation presented in the subsequent sections.

Table 4: Preliminary Conceptual Model

| POSSIBLE POLLUTANT LINKAGE | | | RISK CHARACTERISATION |
|---|---|---|---|
| **POTENTIAL SOURCES** | **PATHWAYS** | **RECEPTORS** | |
| Heavy metals and hydrocarbons (made ground and landfill material) | Contact with contaminated soil | Human health (current users) | **Moderate risk identified** Potential for made ground and landfill material which can contain elevated metals and hydrocarbons. |
| | Ingestion and inhalation of contaminated soil and dust | Human health (current users) | |
| Heavy metals and hydrocarbons (made ground and landfill material) | Contact with contaminated soil | Human health (future residents and construction workers) | **Moderate risk identified** Potential for made ground and landfill material which can contain elevated metals and hydrocarbons. |
| | Ingestion and inhalation of contaminated soil and dust | Human health (future residents and construction workers) | |
| Asbestos (made ground and landfill material) | Ingestion and inhalation of contaminated soil and dust | Human health (future residents and construction workers) | **Moderate risk** Potential for made ground and landfill material to contain asbestos. |
| Contamination (all forms) | Vertical migration to aquifer | Controlled waters | **Moderate risk identified** Potential for contamination to affect shallow gravel aquifer south of the site. |
| Contamination (all forms) | Horizontal migration to surface water | Controlled waters | **Moderate risk identified** Royal Military Canal located to the north of the site. |
| Hydrocarbons | Direct contact | Plastic water pipes | **Moderate risk identified** Cannot rule out presence of hydrocarbon contamination at this stage. |
| Hazardous Gas/Vapours In soil | Ingress into buildings and voids | Human health (future residents and construction workers) | **Moderate risk identified** Potential for made ground and landfill material which could act as source of hazardous gas. Cannot rule out fuel spillages as source of vapours |

## SECTION 3 SITE INVESTIGATION RATIONALE

3.1.1 A site investigation rationale has been devised in accordance with the findings of the Phase 1 investigation and the resultant preliminary conceptual site model and risk assessment. Priority contaminants were identified as heavy metals, hydrocarbons, PAHs and asbestos.

3.1.2 Intrusive sampling locations were chosen on the basis of providing broad spatial coverage of the site while also targeting the areas of suspected landfill material.

3.1.3 It should be noted that intrusive locations were limited due access restrictions ecological considerations. This included the steep slopes and bund surrounding the site, dense vegetation and the presence of nesting birds and possible badger setts identified in the northwestern and southeastern portion of the site.

### 3.2 SITE INVESTIGATION METHODS

3.2.1 An intrusive investigation was carried out by Merebrook on from 17 to 18 June 2015 and comprised the following scope of work:

*i.* Seven shallow windowless sample probe holes (MW1 to MWS7) to a maximum depth of 5.45 m bgl; and

*ii.* Five machine-dug trial holes (MTP1 to MTP5) to a maximum depth of 3.0 m bgl.

3.2.2 Exploratory hole locations are indicated on drawing 17436ai-304-001 in Appendix 1. Logging of exploratory holes was undertaken by a Merebrook Officer. Exploratory hole logs are contained in Appendix 3.

3.2.3 All intrusive locations were assessed by a representative from Ordtek due to the proximity to the Royal Military canal and the risk from potential unexploded ordnance (UXO). Additionally, a representative from Middlemarch Environmental supervised the site works due to the sensitive ecological receptors identified on site.

3.2.4 A tracked windowless sampling rig was used to advance MWS1 to MWS7. This comprised a rig-mounted drop hammer to drive a hollow steel barrel into the ground. The barrel is recovered along with a removable plastic sleeve, which lines the barrel and holds a core of soil which is retracted for logging and sampling. SPTs were performed at approximate 1 m intervals in all windowless sample holes.

3.2.5 MWS1, MWS4, MWS6 and MWS7 were installed to 4.0 m bgl for groundwater and gas monitoring.

3.2.6 Representative soil samples were taken from various depths and strata to assess the contaminative status of the site. Soil samples were submitted to an MCERTS/ UKAS accredited laboratory for chemical analysis of a broad suite of potential contaminants. The results are provided in Appendix 4.

## SECTION 4 GROUND CONDITIONS

### 4.1 SURFACE GROUND CONDITIONS

4.1.1 The surface of the site was predominantly uneven and comprised rough grass, waist-high vegetation brambles, scrubland and medium-sized trees. A bund surrounded the site to the south, while steep densely vegetated slopes bounded the western and northern portion of the site.

### 4.2 SUB-SURFACE GROUND CONDITIONS

4.2.1 A significant proportion of infilled material was encountered within the former landfilled areas across the site. The areas where underlying natural geology was encountered were generally consistent with the published geology.

4.2.2 A summary of the ground conditions encountered is presented in Table 5, whilst a more detailed assessment of the strata is contained in the following sections of the report.

Table 5: Summary of Sub-surface Ground Conditions

| STRATA | DEPTH TO TOP RANGE (m bgl) | THICKNESS RANGE (m) |
|---|---|---|
| Made Ground | 0.0 | 0.2 – >3.0 m |
| Clay | 0.6 | 2.0 m |
| Drift – Tidal Flats Deposits | 2.0 | >1.0 m |
| Drift – Storm Beach Deposits | 1.9 – 2.8 | >2.1 |
| Solid – Weald Clay Formation | Not encountered | - |

4.2.3 Made Ground

4.2.3.1 As the majority of the site was a former landfill, a significant amount of made ground was revealed across the site, ranging in thickness from 0.2 to > 3.0 m bgl, as the depth was not proven in MTP1 to MTP5. Made ground predominantly comprised an upper stratum of topsoil over made ground composed of brown sandy gravelly silt / clay with frequent rootlets. Gravel-sized materials consisted of minor quantities of flint, brick, concrete occasional glass, whole bricks and bituminous pieces. This was underlain by what appeared to be a layer of compacted silty clayey gravelly sand / sandy gravel with frequent whole red bricks, brick and concrete fragments occasional glass, slate and wooden fragments.

4.2.3.2 This was underlain by made ground comprising silty sandy gravelly clay / clayey gravel with variable quantities of red brick, concrete, ash, cinders and bituminous pieces. Significant quantities of landfill waste were encountered in MTP1 to MTP5. This included frequent whole red bricks, concrete fragments, wooden, metal and

bituminous fragments, glass bottles, plastic waste material (bags, bottles etc.) and ceramics.

4.2.3.3 Infilled material was revealed across the site, with landfill waste predominantly encountered at MTP1 to MTP5. Suspected asbestos clad pipe was encountered at MTP1 at 1.1 m bgl, while asbestos fragments were also encountered at MTP2 at 0.4 m bgl and MTP5 at 0.6 m bgl. Frequent quantities of ash, cinders, clinkers and bituminous pieces were encountered at MWS1 (0.4 – 1.6 m bgl), MWS2 (0.25 – 0.8 m bgl), MWS6 (0.1 – 2.5 m bgl) and MWS7 (0.4 – 1.1 m bgl). Minor quantities were encountered at MWS1 (2.2 – 2.7 m bgl), MWS2 (0.80 – 2.0 m bgl), MWS3 (0.3 – 1.8 m bgl) and MWS5 (1.5 – 1.9 m bgl).

4.2.3.4 Groundwater was encountered within the made ground at MWS6 at 3.5 m bgl.

4.2.3.5 SPTs carried out within predominantly cohesive made ground revealed 'N' values ranging from 4 to 9, indicating the presence of soft and firm (low and medium strength) ground conditions. SPT 'N' values of 4 and 5 were recorded in granular made ground suggesting loose conditions, whilst an 'N' value of 18 was obtained in MWS1, indicating medium dense conditions.

4.2.4 Natural Ground

4.2.4.1 Storm Beach Deposits were encountered beneath the made ground at MWS1, MWS2, MWS3, MWS4, MWS6 and MWS7 at depths ranging from 1.9 to 2.8 m bgl. The stratum was typically described as brown sandy gravel. The gravel content comprised fine to coarse sub rounded to rounded flint.

4.2.4.2 Firm greyish brown mottled orange clay was encountered at MWS5 from 0.6 to 2.6 m bgl. This was underlain by suspected Tidal Flats deposits comprising silty sandy gravel and soft grey clayey silt revealed to 3.0 m bgl.

4.2.4.3 The Weald Clay Formation was not encountered during the site investigation.

4.2.4.4 No visual or olfactory evidence of contamination was noted in the natural ground during the site investigation.

4.2.4.5 Groundwater was encountered at MWS1 to MWS6, within the superficial Storm Beach Deposits, ranging in depths from 2.5 – 3.5 m bgl.

4.2.4.6 SPTs performed within the granular soils recorded 'N' values generally in the range 4 to 16, indicating the presence of loose and medium dense ground conditions, whilst locally at depths of 4.0 and 5.0 m bgl SPT 'N' values of 28 and 35 were obtained. SPTs undertaken within cohesive deposits encountered in MWS5 recorded 'N' values of between 5 and 12, suggesting soft and firm (low and medium strength) ground conditions.

## SECTION 5 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

### 5.1 FOUNDATIONS

5.1.1 The proposed development comprises a swimming pool and leisure facility with associated car parking and soft landscaped areas.

5.1.2 The recent ground investigation has revealed ground conditions consisting of typically significant thicknesses of made ground (0.2 - > 3.0 m) underlain by superficial deposits of sand and gravel (locally silt / clay). SPTs performed in the made ground revealed soft / firm (low / medium strength) and loose ground conditions, whilst the natural granular deposits were found to be loose and medium dense in nature. Localised deposits of natural cohesive soil were found to be soft and firm (low and medium strength) in nature.

5.1.3 Based on the ground conditions revealed across the site, traditional shallow foundations are considered unlikely to be feasible for the new structure (s). It is recommended that an alternative solution, such as ground improvement or piles is considered.

5.1.4 Ground improvement would involve techniques such as stone columns or vibro concrete columns (VCC). These would be installed along the lines of all load bearing walls and keyed into an underlying competent stratum in order to provide a more uniform founding medium. This would enable strip footings to be constructed on the improved ground. Allowable bearing pressures of around 100 kN/m² are likely to be achievable for footings up to 1 m wide. Light mesh reinforcement would need to be installed in all footings constructed on vibro treated ground. In order to assess the suitability of using ground improvement a specialist contractor should ideally be invited to attend site to view the ground conditions for themselves.

5.1.5 Alternatively, a piled solution could be adopted at the site. It is envisaged that bored / Continuous Flight Auger (CFA) piles will be feasible at the site. Driven piles could possibly be considered as they have the advantage that no arisings are generated, however, the effects of noise / vibrations are likely to be an issue given the proximity of the existing residential development and a canal.

5.1.6 The advantage of using bored / CFA piles is the low noise / vibration of the system, however, arisings are generated by this system. Piles would need to be taken through made ground and superficial deposits to found within an underlying competent stratum.

5.1.7 It is recommended that the advice of a specialist contractor be sought in order to determine the most appropriate / cost effective system and to advise on pile diameters, depths and safe working capacity. Ideally, boreholes would need to be undertaken to determine ground conditions at depth and to obtain parameters for pile design.

5.1.8 Any ground improvement or piling activities would need to consider their impact on the Royal Military Canal.

5.1.9 If a housing scenario is to be adopted as mentioned in the cabinet report similar ground geotechnical recommendations will need to be adopted, given the depth of made ground across the site. Detailed development plans were not provided within the cabinet report document and should such plans be made available recommendations may need to be reviewed.

## 5.2 EXCAVATIONS AND GROUNDWATER

5.2.1 Based on the ground conditions observed at the site, any shallow excavations have the potential to become unstable in the short term. Therefore, if man-entry is required excavations should be supported by shoring or otherwise battered back to a safe angle in order to protect the workforce from possible collapse.

5.2.2 Groundwater was encountered in the windowless sample holes at depths ranging from 2.3 to 3.6 m bgl. It is therefore possible that groundwater ingress could occur in any shallow excavations, and provision for dewatering during the construction period should be considered.

## 5.3 FLOOR SLABS

5.3.1 Due to the significant thicknesses of made ground present across the site it is recommended that suspended floor slabs are adopted for proposed new structures.

## 5.4 BURIED CONCRETE

5.4.1 Recommendations given in BRE Special Digest 1:2005 "Concrete in aggressive ground" have been followed in order to give recommendations with respect to buried concrete.

5.4.2 Water soluble sulphate analysis was carried out on eighteen soil samples obtained from depths of between 0.2 and 3.5 m bgl with soil pH determination also carried out on these samples. Water soluble sulphate contents ranged between 0.022 and 1.8 g/l. In accordance with BRE guidelines the characteristic value is calculated by determining the mean of the highest 20 % of results. In this case the characteristic value is 1.48 g/l. On this basis the Design Sulphate Class is DS-2.

5.4.3 The pH values in the soil samples varied between 7.2 and 9.0. The mean of the lowest 20 % of values is 7.4 which represents the characteristic value. Mobile groundwater conditions have been assumed and on this basis the Aggressive Chemical Environment for Concrete (ACEC) class for the site is AC-2.

## 5.5 ROADS AND PAVED AREAS

5.5.1 For preliminary design purposes a California Bearing Ratio (CBR) value of < 2 % should be assumed for roads / hardstanding at existing ground levels.

### 5.6 SOAKAWAYS

5.6.1 The presence of significant thicknesses of made ground beneath the site is likely to preclude the use of shallow soakaways for the proposed development.

## SECTION 6 ENVIRONMENTAL ASSESSMENT

### 6.1 SOIL QUALITY

6.1.1 A total of eighteen soil samples were submitted to the laboratory for chemical analysis, including two samples from natural ground and sixteen samples from made ground. The laboratory chemical analysis certificates are contained in Appendix 4. The results of the analysis are summarised in Table 6 and 7.

6.1.2 An initial screening exercise has been undertaken whereby contaminant concentrations recorded in soils have been assessed against *Suitable for Use Levels* (S4ULs) published in 2015 by LQM/CIEH[1]. These precautionary screening levels are designed to be representative of minimal risk to human health in a number of land use scenarios. As different development scenarios are proposed, this report has assessed using two sets of screening levels.

*i.* POSresi (POS2) – Referring to the leisure centre with associated car parking and landscaping; and

*ii.* Residential without home-grown produce – Referring to residential scenarios. According to the cabinet report no private gardens are proposed.

6.1.3 For lead the DEFRA Category 4 Screening Level[2] has been used as this is based on updated toxicological data and a low risk to human health.

6.1.4 An additional set of phytotoxin screening levels have been adopted from 'The Code of Agricultural Practice for the Protection of Soil' Ministry of Agriculture, Fisheries and Food (MAFF), 1993, which are protective of healthy plant growth. Landscaped areas are proposed within all scenarios.

Table 6: Summary of Soils Chemical Analysis Results - POSresi (POS2)

| CONTAMINANT | UNITS | MAX | MEAN | No of Tests | SCREENING LEVEL (SL) | No > SL* |
|---|---|---|---|---|---|---|
| HUMAN HEALTH RISK ASSESSMENT | | | | | | |
| Asbestos in soil | - | Detected | - | 5 | Detected | 5 |
| pH | - | 9 | 7.96 | 18 | 5 – 9 | - |
| Arsenic | $mg.kg^{-1}$ | 50 | 16.92 | 18 | 79 | 0 |
| Cadmium | $mg.kg^{-1}$ | 1.1 | 0.32 | 18 | 120 | 0 |

[1] Nathanail, C. P., McCaffrey, C., Gillett, A. G., Ogden, R. C. and Nathanail, J. F. 2015. The LQM / CIEH S4ULs for Human Health Risk Assessment. Land Quality Press, Nottingham. Copyright Land Quality Management Limited reproduced with permission; Publication Number S4UL3100. All rights reserved.

[2] SP1010 *Development of Category 4 Screening Levels Main Report* (Dec 2013) and SP1010 *Policy Companion Document* (Mar 2014).

| CONTAMINANT | UNITS | MAX | MEAN | No of Tests | SCREENING LEVEL (SL) | No > SL* |
|---|---|---|---|---|---|---|
| HUMAN HEALTH RISK ASSESSMENT | | | | | | |
| Chromium (total) | $mg.kg^{-1}$ | 110 | 33.11 | 18 | 1500 | 0 |
| Hexavalent Chromium | $mg.kg^{-1}$ | <4.0 | <4.0 | 18 | 7.7 | 0 |
| Lead | $mg.kg^{-1}$ | 850 | 200.5 | 18 | 630 | 2 |
| Mercury | $mg.kg^{-1}$ | 1.3 | 0.41 | 18 | 120 | 0 |
| Nickel | $mg.kg^{-1}$ | 87 | 33.5 | 18 | 230 | 0 |
| Selenium | $mg.kg^{-1}$ | 2.7 | 1.21 | 18 | 1100 | 0 |
| TPH Aliphatic >$EC_5$ - $EC_6$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 600000 | 0 |
| TPH Aliphatic >$EC_6$ - $EC_8$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 620000 | 0 |
| TPH Aliphatic >$EC_8$ - $EC_{10}$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 13000 | 0 |
| TPH Aliphatic >$EC_{10}$ - $EC_{12}$ | $mg.kg^{-1}$ | 1.2 | 1.01 | 18 | 13000 | 0 |
| TPH Aliphatic >$EC_{12}$ - $EC_{16}$ | $mg.kg^{-1}$ | 35 | 4.03 | 18 | 13000 | 0 |
| TPH Aliphatic >$EC_{16}$ - $EC_{21}$ | $mg.kg^{-1}$ | 62 | 11.18 | 18 | 250000 | 0 |
| TPH Aliphatic >$EC_{21}$ - $EC_{35}$ | $mg.kg^{-1}$ | 120 | 28.25 | 18 | 250000 | 0 |
| TPH Aromatic >$EC_5$ - $EC_7$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 56000 | 0 |
| TPH Aromatic >$EC_7$ - $EC_8$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 56000 | 0 |
| TPH Aromatic >$EC_8$ - $EC_{10}$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 5000 | 0 |
| TPH Aromatic >$EC_{10}$ - $EC_{12}$ | $mg.kg^{-1}$ | 2.7 | 1.25 | 18 | 5000 | 0 |
| TPH Aromatic >$EC_{12}$ - $EC_{16}$ | $mg.kg^{-1}$ | 380 | 30.84 | 18 | 5000 | 0 |
| TPH Aromatic >$EC_{16}$ - $EC_{21}$ | $mg.kg^{-1}$ | 2200 | 217.33 | 18 | 3800 | 0 |
| TPH Aromatic >$EC_{21}$ - $EC_{35}$ | $mg.kg^{-1}$ | 2500 | 328.06 | 18 | 3800 | 0 |
| Benzene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 73 | 0 |
| Toluene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 25000 | 0 |
| Ethylbenzene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 56000 | 0 |
| Xylene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 43000 | 0 |
| Acenaphthene | $mg.kg^{-1}$ | 23 | 2.07 | 18 | 15000 | 0 |
| Acenaphthylene | $mg.kg^{-1}$ | 4 | 0.9 | 18 | 15000 | 0 |
| Anthracene | $mg.kg^{-1}$ | 53 | 5.48 | 18 | 74000 | 0 |
| Benz(a)anthracene | $mg.kg^{-1}$ | 130 | 16.42 | 18 | 29 | 3 |
| Benzo(a)pyrene | $mg.kg^{-1}$ | 91 | 13.29 | 18 | 5.7 | 7 |
| Benzo(b)fluoranthene | $mg.kg^{-1}$ | 110 | 16.03 | 18 | 7.2 | 7 |
| Benzo(ghi)perylene | $mg.kg^{-1}$ | 57 | 6.83 | 18 | 640 | 0 |
| Benzo(k)fluoranthene | $mg.kg^{-1}$ | 56 | 7.72 | 18 | 190 | 0 |
| Chrysene | $mg.kg^{-1}$ | 100 | 13.5 | 18 | 57 | 1 |
| Dibenz(ah)anthracene | $mg.kg^{-1}$ | 11 | 1.58 | 18 | 0.57 | 9 |
| Fluoranthene | $mg.kg^{-1}$ | 300 | 34.82 | 18 | 3100 | 0 |
| Fluorene | $mg.kg^{-1}$ | 22 | 2.26 | 18 | 9900 | 0 |
| Indeno(123-cd)pyrene | $mg.kg^{-1}$ | 50 | 7.61 | 18 | 82 | 0 |
| Naphthalene | $mg.kg^{-1}$ | 1.2 | 0.29 | 18 | 4900 | 0 |
| Phenanthrene | $mg.kg^{-1}$ | 190 | 19.69 | 18 | 3100 | 0 |
| Pyrene | $mg.kg^{-1}$ | 230 | 27.93 | 18 | 7400 | 0 |
| Phenol | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 1300 | 0 |

| CONTAMINANT | UNITS | MAX | MEAN | No of Tests | SCREENING LEVEL (SL) | No > SL* |
|---|---|---|---|---|---|---|
| HUMAN HEALTH RISK ASSESSMENT | | | | | | |
| PHYTOTOXICITY RISK ASSESSMENT | | | | | | |
| | Units | Max | Mean | No of Test | Screening Level (SL) | No > SL |
| Copper | $mg.kg^{-1}$ | 850 | 97.09 | 18 | 200 | 2 |
| Nickel | $mg.kg^{-1}$ | 87 | 33.5 | 18 | 110 | 0 |
| Zinc | $mg.kg^{-1}$ | 1200 | 279.11 | 18 | 300 | 4 |

Notes: * Number of samples exceeding screening level nd = not detected

Table 7: Summary of Soils Chemical Analysis Results – Residential without home-grown produce.

| CONTAMINANT | UNITS | MAX | MEAN | No of Tests | SCREENING LEVEL (SL) | No > SL* |
|---|---|---|---|---|---|---|
| HUMAN HEALTH RISK ASSESSMENT | | | | | | |
| Asbestos in soil | - | Detected | - | 5 | Detected | 5 |
| pH | - | 9 | 7.96 | 18 | 5 – 9 | 0 |
| Arsenic | $mg.kg^{-1}$ | 50 | 16.92 | 18 | 40 | 1 |
| Cadmium | $mg.kg^{-1}$ | 1.1 | 0.32 | 18 | 85 | 0 |
| Chromium (total) | $mg.kg^{-1}$ | 110 | 33.11 | 18 | 910 | 0 |
| Hexavalent Chromium | $mg.kg^{-1}$ | <4.0 | <4.0 | 18 | 6 | 0 |
| Lead | $mg.kg^{-1}$ | 850 | 200.5 | 18 | 310 | 3 |
| Mercury | $mg.kg^{-1}$ | 1.3 | 0.41 | 18 | 56 | 0 |
| Nickel | $mg.kg^{-1}$ | 87 | 33.5 | 18 | 180 | 0 |
| Selenium | $mg.kg^{-1}$ | 2.7 | 1.21 | 18 | 430 | 0 |
| TPH Aliphatic >$EC_5$ - $EC_6$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 160 | 0 |
| TPH Aliphatic >$EC_6$ - $EC_8$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 530 | 0 |
| TPH Aliphatic >$EC_8$ - $EC_{10}$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 150 | 0 |
| TPH Aliphatic >$EC_{10}$ - $EC_{12}$ | $mg.kg^{-1}$ | 1.2 | 1.01 | 18 | 770 | 0 |
| TPH Aliphatic >$EC_{12}$ - $EC_{16}$ | $mg.kg^{-1}$ | 35 | 4.03 | 18 | 4400 | 0 |
| TPH Aliphatic >$EC_{16}$ - $EC_{21}$ | $mg.kg^{-1}$ | 62 | 11.18 | 18 | 110000 | 0 |
| TPH Aliphatic >$EC_{21}$ - $EC_{35}$ | $mg.kg^{-1}$ | 120 | 28.25 | 18 | 110000 | 0 |
| TPH Aromatic >$EC_5$ - $EC_7$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 1400 | 0 |
| TPH Aromatic >$EC_7$ - $EC_8$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 3900 | 0 |
| TPH Aromatic >$EC_8$ - $EC_{10}$ | $mg.kg^{-1}$ | <0.1 | <0.1 | 18 | 270 | 0 |
| TPH Aromatic >$EC_{10}$ - $EC_{12}$ | $mg.kg^{-1}$ | 2.7 | 1.25 | 18 | 1200 | 0 |
| TPH Aromatic >$EC_{12}$ - $EC_{16}$ | $mg.kg^{-1}$ | 380 | 30.84 | 18 | 2500 | 0 |
| TPH Aromatic >$EC_{16}$ - $EC_{21}$ | $mg.kg^{-1}$ | 2200 | 217.33 | 18 | 1900 | 0 |
| TPH Aromatic >$EC_{21}$ - $EC_{35}$ | $mg.kg^{-1}$ | 2500 | 328.06 | 18 | 1900 | 1 |
| Benzene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 1.4 | 0 |
| Toluene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 440 | 0 |
| Ethylbenzene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 3900 | 0 |
| Xylene | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 430 | 0 |
| Acenaphthene | $mg.kg^{-1}$ | 23 | 2.07 | 18 | 6000 | 0 |

| CONTAMINANT | UNITS | MAX | MEAN | No of Tests | SCREENING LEVEL (SL) | No > SL* |
|---|---|---|---|---|---|---|
| **HUMAN HEALTH RISK ASSESSMENT** | | | | | | |
| Acenaphthylene | $mg.kg^{-1}$ | 4 | 0.9 | 18 | 6000 | 0 |
| Anthracene | $mg.kg^{-1}$ | 53 | 5.48 | 18 | 37000 | 0 |
| Benz(a)anthracene | $mg.kg^{-1}$ | 130 | 16.42 | 18 | 15 | 5 |
| Benzo(a)pyrene | $mg.kg^{-1}$ | 91 | 13.29 | 18 | 3.2 | 11 |
| Benzo(b)fluoranthene | $mg.kg^{-1}$ | 110 | 16.03 | 18 | 4 | 11 |
| Benzo(ghi)perylene | $mg.kg^{-1}$ | 57 | 6.83 | 18 | 360 | 1 |
| Benzo(k)fluoranthene | $mg.kg^{-1}$ | 56 | 7.72 | 18 | 110 | 0 |
| Chrysene | $mg.kg^{-1}$ | 100 | 13.5 | 18 | 32 | 2 |
| Dibenz(ah)anthracene | $mg.kg^{-1}$ | 11 | 1.58 | 18 | 0.32 | 11 |
| Fluoranthene | $mg.kg^{-1}$ | 300 | 34.82 | 18 | 1600 | 0 |
| Fluorene | $mg.kg^{-1}$ | 22 | 2.26 | 18 | 4500 | 0 |
| Indeno(123-cd)pyrene | $mg.kg^{-1}$ | 50 | 7.61 | 18 | 46 | 0 |
| Naphthalene | $mg.kg^{-1}$ | 1.2 | 0.29 | 18 | 13 | 0 |
| Phenanthrene | $mg.kg^{-1}$ | 190 | 19.69 | 18 | 1500 | 0 |
| Pyrene | $mg.kg^{-1}$ | 230 | 27.93 | 18 | 3800 | 0 |
| Phenol | $mg.kg^{-1}$ | <1.0 | <1.0 | 18 | 1200 | 0 |
| **PHYTOTOXICITY RISK ASSESSMENT** | | | | | | |
| | **Units** | **Max** | **Mean** | **No of Test** | **Screening Level (SL)** | **No > SL** |
| Copper | $mg.kg^{-1}$ | 850 | 97.09 | 18 | 200 | 2 |
| Nickel | $mg.kg^{-1}$ | 87 | 33.5 | 18 | 110 | 0 |
| Zinc | $mg.kg^{-1}$ | 1200 | 279.11 | 18 | 300 | 4 |

Notes: * Number of samples exceeding screening level nd = not detected

6.1.5 Zootoxic Metals (harmful to human health)

6.1.5.1 With reference to POSresi, two exceedances of lead were recorded in made ground samples at MTP2 (1.9-2.0 m) and MTP5 (1.5 m). Both were samples from within the landfill waste medium.

6.1.5.2 When compared to screening levels for residential without home-grown produce an additional exceedance with reference to lead was also recorded in shallower made ground at MWS2 (0.4-0.6 m). At MTP5 (1.5 m), an elevation of arsenic was also recorded based on a screening level of 40 mg/kg at 50 mg/kg.

6.1.6 Phytotoxic Metals (harmful to plant health)

6.1.6.1 Exceedances of copper and zinc were recorded in made ground across the site at depths ranging from 0.3 to 1.9 m bgl within MTP2, MTP5, MWS2 and MWS6 exploratory holes.

6.1.7 Organic Contaminants

6.1.7.1 Exceedances of polyaromatic hydrocarbons (PAH) were recorded in made ground samples in landfill waste across the site under both scenarios.

6.1.7.2 A sample of natural material tested (MWS2 2.5-2.8 m) immediately below made ground also recorded elevated concentrations of PAH above screening levels under both scenarios. This contamination was consistent with the overlying made ground.

6.1.7.3 An elevation of TPH (aromatic C21-C35) was encountered at MWS1, 1.4 – 1.7 m at a concentration of 2500 mg/kg, when compared to a residential without home-grown produce screening level. This material was above the groundwater level.

6.1.8 Inorganic Contaminants

6.1.8.1 Five samples of made ground were tested for asbestos presence all of which were positive. Asbestos presence was then quantified in three of the five samples tested from depths ranging from 0.3 to 0.9 m bgl. These recorded concentrations ranging from < 0.001 to 0.015 %.

6.1.9 Summary

6.1.9.1 The made ground across the site comprised concentrations of PAH exceeding relevant screening levels for both assessment criteria compared against. Localised metal contamination with reference to lead and arsenic was also encountered within the landfill waste made ground. Five out of five samples tested recorded asbestos presence however where quantified were recorded at non-hazardous concentrations (< 0.1%).

6.1.9.2 Two samples of natural strata were tested immediately below made ground. One sample at MWS2 recorded elevated concentrations when compared to both assessment criteria which suggest contamination has possibly leached to underlying natural geology. The sample was also collected just below where groundwater was encountered therefore it must be considered that contamination recorded could be associated with groundwater contamination.

## 6.2 GROUNDWATER

6.2.1 It is important to mention that although groundwater is likely to be tidally influenced the adjacent Royal Military Canal to the north does not fluctuate with the tide which indicates the groundwater and the canal are not in hydraulic continuity.

## 6.3 HAZARDOUS GAS

6.3.1 Gas monitoring has been undertaken on one occasion in June 2015. Levels of methane, carbon dioxide and oxygen were recorded in each standpipe, together with associated parameters including borehole flow and ambient air pressure. The results of these gas monitoring rounds are contained in Appendix 5.

6.3.2 The monitoring rounds were undertaken at barometric pressures ranging from 1021 to 1022 mb. Positive flow was not recorded during the monitoring round. Methane ($CH_4$) was not detected during the monitoring round however carbon

dioxide ($CO_2$) was detected to a maximum of 9.3 % v/v with a corresponding depleted oxygen concentration of 14.2 % v/v.

### 6.4 WASTE CLASSIFICATION AND OFF-SITE DISPOSAL

6.4.1 Materials, including waste soils which are not to be retained on site, should be removed and disposed of in accordance with all relevant statues including the *Environmental Protection Act 1990*, *The Controlled Waste Regulations 2012* as amended, *The Waste Regulations 2011* as amended, *The List of Wastes Regulations 2005* as amended, *The Hazardous Waste Regulations 2005* as amended, *The Waste Management Regulations 2006* and *The Environmental Permitting Regulations 2010* as amended.

6.4.2 It is a requirement of these regulations that waste sent to landfill should have been subject to measures to reduce the amount of waste, reduce harmful or hazardous properties and facilitate recycling. These requirements may be satisfied by measures such as segregation and screening of wastes to recover suitable fill and material for crushing, segregation of inert materials and putrescible wastes.

## SECTION 7 RISK ASSESSMENT

7.1 The potential sources of contamination at the site and the implications with respect to development have been interpreted in accordance with the current government guidance on source-pathway-receptor risk assessment.

7.2 The investigations demonstrate that the former uses of the site, particularly with reference to landfilling, have resulted in widespread contamination comprising metals, PAH and asbestos. These materials are considered for their potential to act as sources for a number of pollutant linkages.

7.3 The potential impacts of contamination sources have been considered with respect to the following receptors:

*i.* The general public and present site users,

*ii.* Residents of future development,

*iii.* Groundwater,

*iv.* Surface water,

*v.* Construction workers,

*vi.* Adjacent land, and

*vii.* Infrastructure.

7.4 In each case the existence of a pollutant linkage requires a pathway by which the receptor could be exposed to the source. A qualitative assessment of risk is thus

considered in the first instance with respect to the site in its current condition and is summarised in the sections below.

7.5 **The general public and present site users**

7.5.1 As the majority of the site is fenced off to the general public potential exposure is significantly reduced therefore the risk to the general public and current site users is considered to be low.

7.6 **Residents of future development**

7.6.1 Soil contamination (chemical)

7.6.1.1 Soil contamination is widespread particularly within the made ground material. Elevations of PAH, lead, a single elevation of arsenic were recorded within the upper soil profile (upper 1.0 m) across the site. The cabinet report demonstrates the leisure centre development scenario is predominantly surrounded by hardstanding which would break pathways, reducing exposure. No outdoor pitches or play areas are proposed. The risk to future potential residents under the residential scenario is also only marginal due to only a small amount of proposed landscaping and no private gardens being proposed. The risk of exposure for both scenarios is therefore considered to be low to moderate.

7.6.2 Asbestos

7.6.2.1 Asbestos was detected in all samples where tested both in upper and lower profiles. As all samples that were tested for asbestos presence were positive asbestos is expected to be widespread within the made ground. Where concentrations have been quantified, low concentrations were recorded at non-hazardous levels. Due to small amount of proposed landscaped areas the risk of exposure is considered to be low to moderate providing clean cover is used.

7.6.3 Hazardous Soil Gas/Vapours (including hydrocarbon vapours/radon)

7.6.3.1 NHBC guidance has been followed to assess the recorded soil gas and flow conditions. Calculations indicate that a gas screening level (GSV) of 0.0001 l/h for methane and 0.0093 l/h for carbon dioxide based on one round of gas monitoring. This would typically classify the site as 'green' indicating no gas protection measures are required. However, according to the NHBC, if carbon dioxide exceeds five percent it is necessary to increase to 'amber 1'. As shown in the gas monitoring results, carbon dioxide exceeded five percent at MWS1. Further monitoring will be required to confirm this classification and can be undertaken when groundwater samples are recovered. The risk is therefore considered to be moderate based on current monitoring results.

7.6.3.2 As mentioned in section 2.12.1, the Phase 1 Assessment undertaken by Ground Solutions Group Limited also recorded carbon dioxide levels above five percent at five locations.

### 7.7 Controlled waters

7.7.1 Although hydrocarbon contamination was recorded in made ground at concentrations which could pose a risk to human health, the concentrations were not sufficiently mobile to pose a risk to controlled waters. It is considered that groundwater is likely to be tidally influenced and samples are proposed to be collected in July during a period of high tide. Proposed sampling results will clarify risk to the underlying secondary 'A' Aquifer.

7.7.2 The Royal Military Canal to the north is contained and during the site works was observed to not be tidally influenced. The risk of leachable contaminants to migrate to the canal is also considered to be low as it is not in hydraulic continuity with the groundwater. As groundwater is likely to be tidally influenced, this is a dynamic environment where leachate is unlikely to accumulate beneath the site preventing groundwater from being stagnant.

### 7.8 Construction workers

7.8.1 Potentially, construction workers are initially at the greatest risk from exposure to hazardous contamination due to excavation works and during the handling of materials including imported soils. Providing that dust levels are kept within statutory limits and appropriate health and safety procedures are adhered to during the construction phase, the levels of chemical contamination recorded to date are not considered to present an acute risk to human health.

### 7.9 Infrastructure

7.9.1 Phytotoxic metals were detected in exceedance of relevant screening levels across the site in made ground which may affect plant growth. Clean cover will be required in proposed landscaped areas to ensure an adequate growing medium is present.

7.9.2 Contamination with the potential to permeate polymeric services has been identified by this investigation, and it is recommended that the utility provider is consulted with respect to their requirements for water supply pipes.

7.9.3 Utility companies apply strict guideline levels on use of polymeric pipes and may consider all made ground unsuitable for typical plastic pipe materials to be used.

## SECTION 8 UPDATED CONCEPTUAL MODEL

8.1 Following completion of phases 1 and 2 of the investigation and a qualitative risk assessment, the conceptual model for the site, with relation to pollutant linkages, has been updated. The revised model is presented in Table 9 below.

Table 9: Revised Conceptual Model

| POSSIBLE POLLUTANT LINKAGE | | | RISK CHARACTERISATION |
|---|---|---|---|
| **POTENTIAL SOURCES** | **PATHWAYS** | **RECEPTORS** | |
| Heavy metals and hydrocarbons (made ground) | Contact with contaminated soil | Human health (current users) | **Low risk identified** Although made ground does contain elevated metals and hydrocarbons the site is fenced and contained reducing risk of exposure. |
| | Ingestion and inhalation of contaminated soil and dust | Human health (current users) | |
| Heavy metals and hydrocarbons (made ground) | Contact with contaminated soil | Human health (future residents and construction workers) | **Low to Moderate risk identified** Although made ground does contain elevated metals and hydrocarbons, proposed scenarios suggest predominantly hard standing and limited landscaping areas thus reducing exposure risk. |
| | Ingestion and inhalation of contaminated soil and dust | Human health (future residents and construction workers) | |
| Asbestos (made ground) | Ingestion and inhalation of contaminated soil and dust | Human health (future residents and construction workers) | **Low to Moderate risk** Shallow contamination was recorded although limited landscaping is proposed. Providing clean cover is introduced will lower exposure. |
| Contamination (all forms) | Vertical migration to aquifer | Controlled waters | **Moderate risk identified** Given soil contamination being detected, groundwater contamination is possible. Proposed monitoring will clarify and be reported under separate cover. |
| Contamination (all forms) | Horizontal migration to surface water | Controlled waters | **Low risk identified** The Royal Military Canal to the north is contained and is not tidally influenced. |
| Hydrocarbons | Direct contact | Plastic water pipes | **Moderate risk identified** Contamination with the potential to permeate polymeric pipes was detected across the site. |
| Hazardous Gas/Vapours In soil | Ingress into buildings and voids | Human health (future residents and construction workers) | **Low to Moderate risk identified** Elevated carbon dioxide at MWS1 has indicated potential risk however further monitoring is recommended. |

## SECTION 9 PRELIMINARY REMEDIATION STRATEGY

9.1 The identified risks at the site can be mitigated by removal of either; the source, pathway or receptor. With reference to the conceptual model for the site a remediation strategy, based on source or pathway removal, has been designed.

9.2 There are two proposed development scenarios comprising a leisure centre or residential land, both of which include limited landscaped areas. No private gardens are proposed. Contamination has been identified within the made ground and locally in underlying natural ground. Groundwater is yet to be assessed and will be reported under separate cover.

9.3 Remedial measures will be required that are protective of human health and groundwater:

9.4 Human health – Clean cover will be required in areas of soft landscaping. This should comprise 450 mm of clean imported soil in landscaped areas. Material imported for the formation of landscaped areas should be obtained from a validated source. The validation should incorporate an assessment of the provenance of the material and chemical analysis.

9.5 Based on monitoring data to date, ground gas and vapour protection measures will also be required however additional monitoring is recommended to confirm this.

9.6 Potential risks to construction workers have been identified and the adoption of appropriate Health and Safety procedures will ensure that risks to operatives from hazardous materials at the site are minimised. Operatives should not be allowed to eat, drink or smoke on site except in designated areas and should be required to wash all exposed skin at the end of each shift. Operatives should be informed of the potential hazards at the site and should be required to report any observations of suspect material.

9.7 Materials, including waste soils which are not to be retained on site, should be removed and disposed of in accordance with all relevant statues including the *Environmental Protection Act 1990*, *The Controlled Waste Regulations 2012* as amended, *The Waste Regulations 2011* as amended, *The List of Wastes Regulations 2005* as amended, *The Hazardous Waste Regulations 2005* as amended, *The Waste Management Regulations 2006* and *The Environmental Permitting Regulations 2010* as amended.

9.8 Further monitoring is recommended at the detailed design stage to assess the ground gas, groundwater and vapour risk from the site, as well as to ascertain precisely the underlying ground conditions.

9.9 Any observations of ground conditions atypical of those already described should be reported to Merebrook immediately so that an assessment of appropriate action can be made.

## SECTION 10 CONCLUSIONS

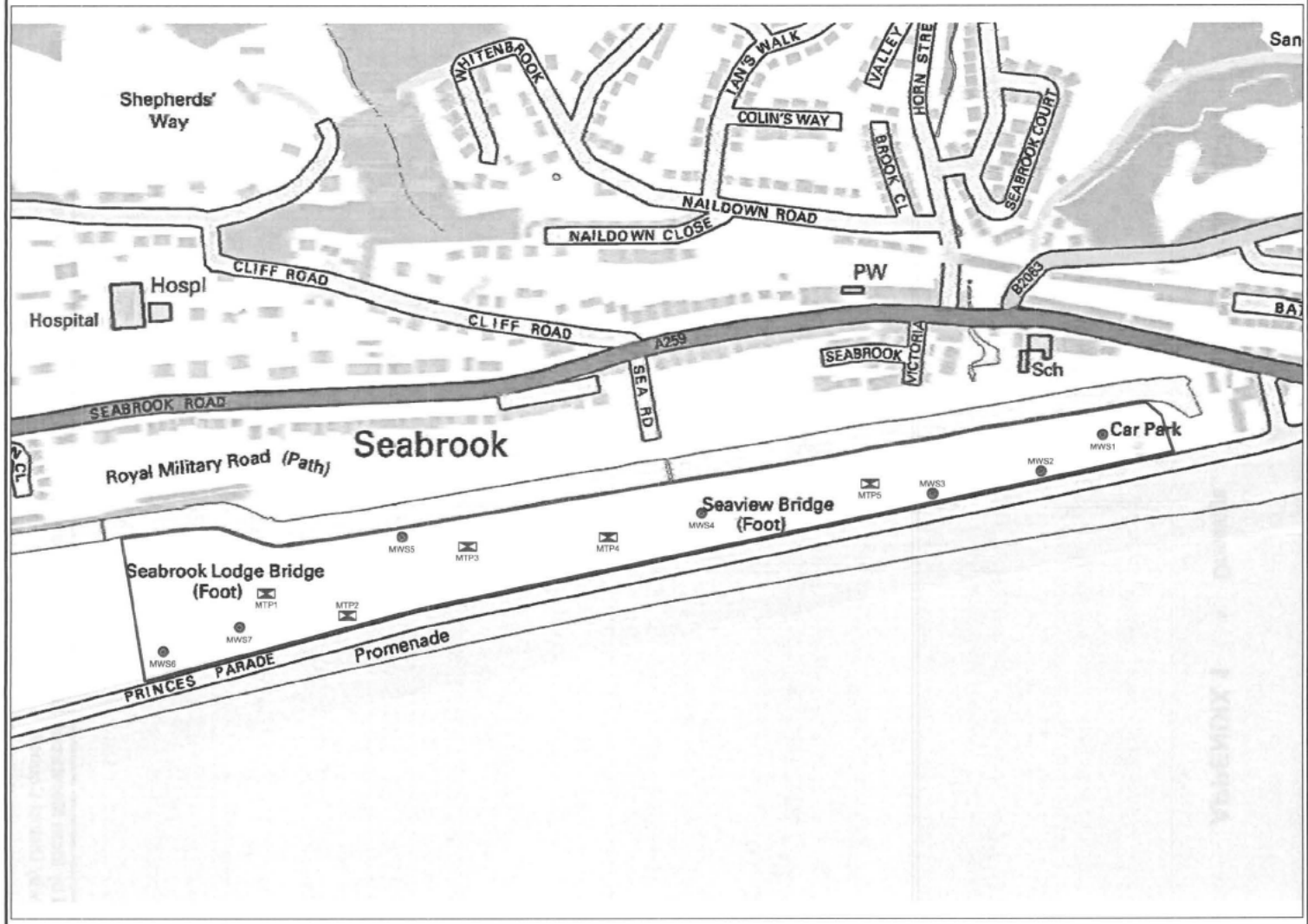
10.1 The ground conditions encountered confirmed published geology along with expected made ground associated with former on site land filling.

10.2 Geotechnical recommendations comprised foundation solutions such as ground improvement (vibro stone / concrete columns) or a piled solution to be considered. Due to variable thicknesses of made ground it is recommended suspended floor slabs should be adopted.

10.3 A 450 mm clean cover is also recommended in landscaped areas under both scenarios break linkages for human health and to supply a suitable growing medium.

10.4 Further groundwater and ground gas monitoring is recommended and will be reported under separate cover.

**APPENDIX 1** ▪ Drawings




Legend

- Site boundary
- MTPref — Merebrook trial pit with location reference
- MWSref — Merebrook window sample with location reference

| Based on OS | 14-07-2015 | - |
|---|---|---|
| | PDT | - |
| Issue Details | Dwn | Chd |

App'd: -

Client/Project

Shepway District Council
Princes Parade
Seabrook, Hythe

Dwg Title

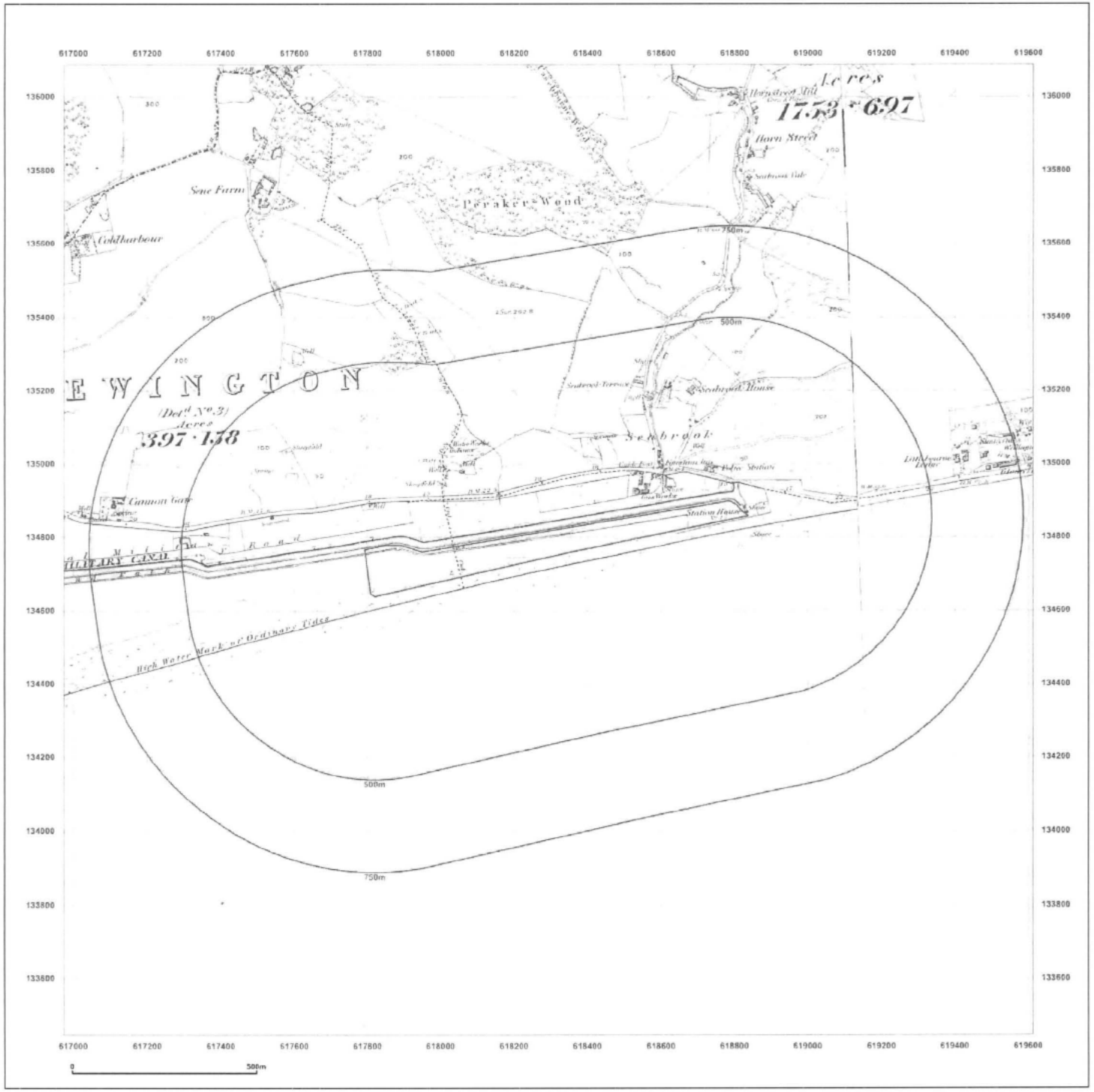
Site Investigation Locations

| Job No. | Dwg No. | Revision |
|---|---|---|
| 17436ai | 304-001 | - |
| Scale: NTS | Date: July 2015 | Frame Dimensions mm: (A3) 400 x 280 |
| Drawn: PDT | Checked: - | Approved: - |

London
Kent
Derby
Cardiff
Manchester

idom merebrook
East Mill, Bridgefoot, Belper, Derbyshire, England. DE56 2UA
tel +44(0)1773 829988 fax +44(0)1773 829393 email info@merebrook.co.uk

**APPENDIX 2** ▪ Historic Plans




Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

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**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** County Series
**Map date:** 1872
**Scale:** 1:10,560
**Printed at:** 1:10,560

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Revised 1872
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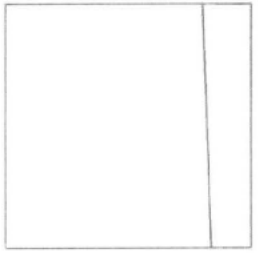

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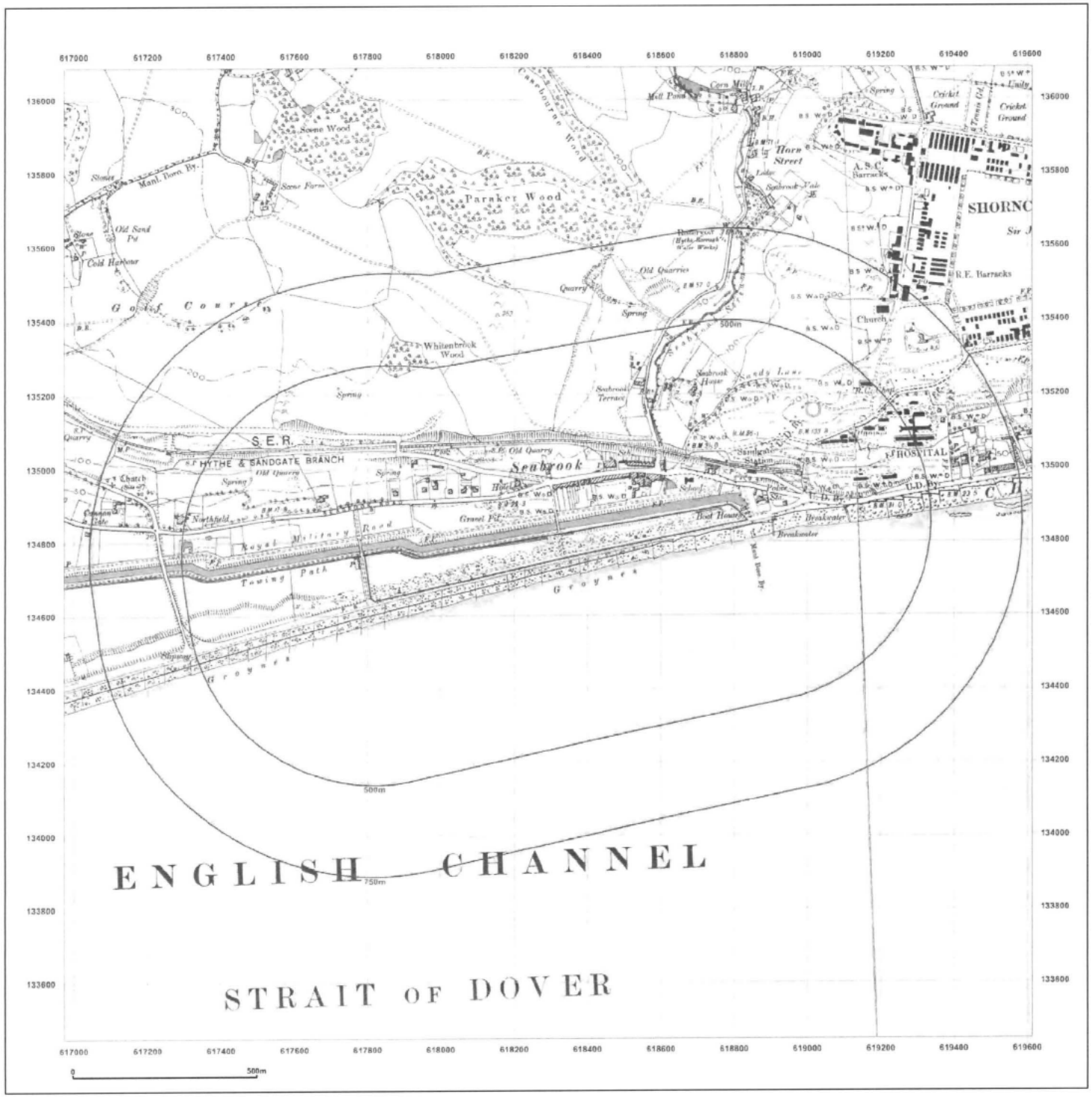


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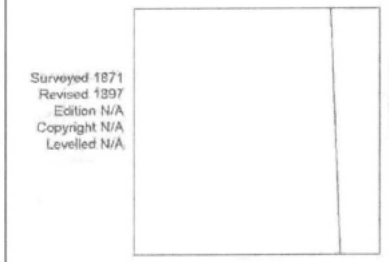


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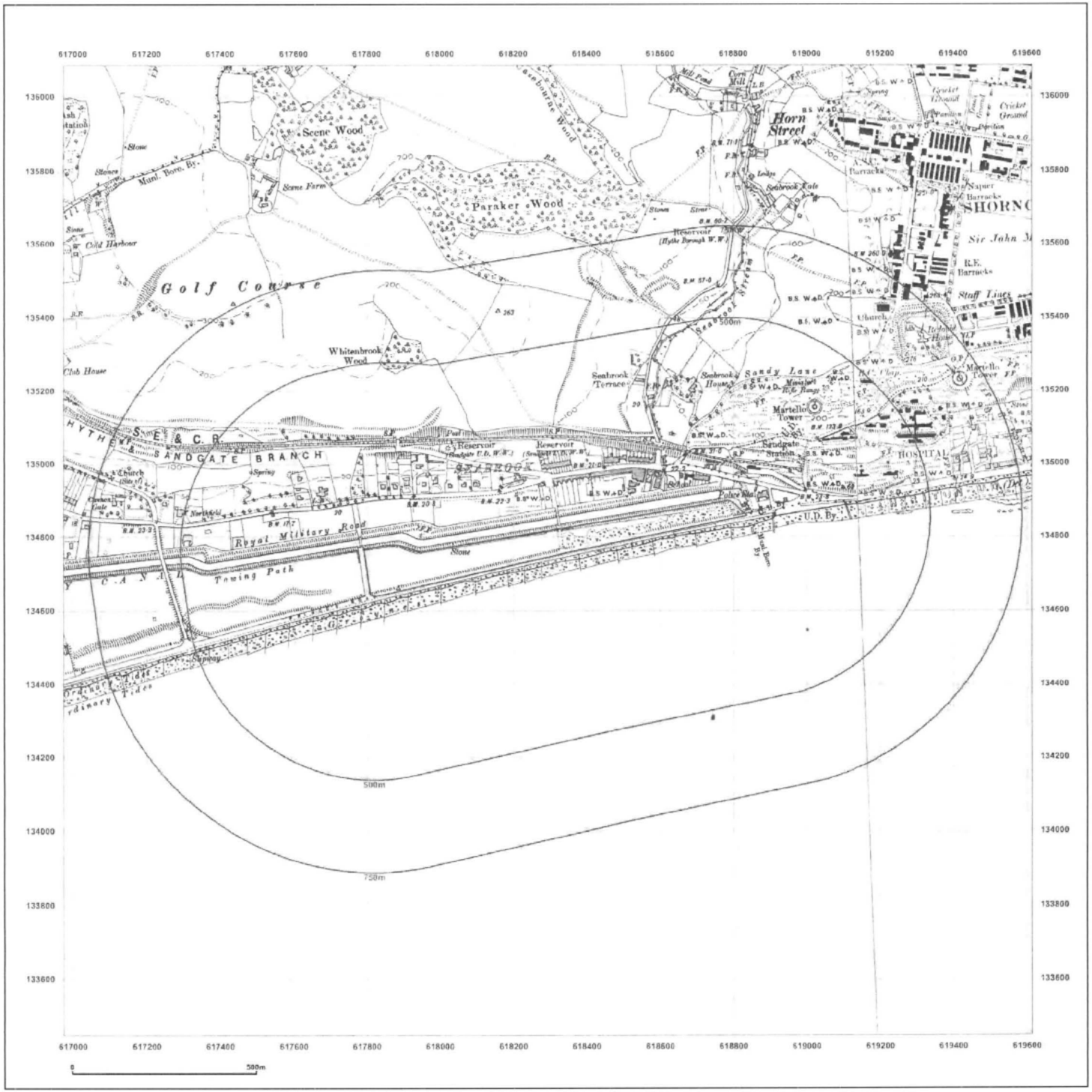


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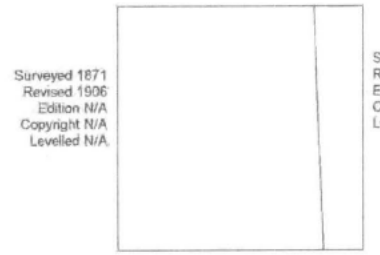


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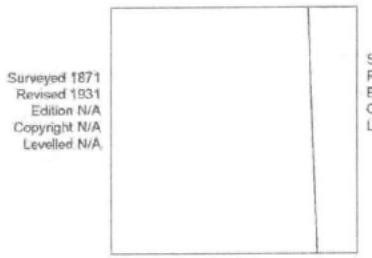


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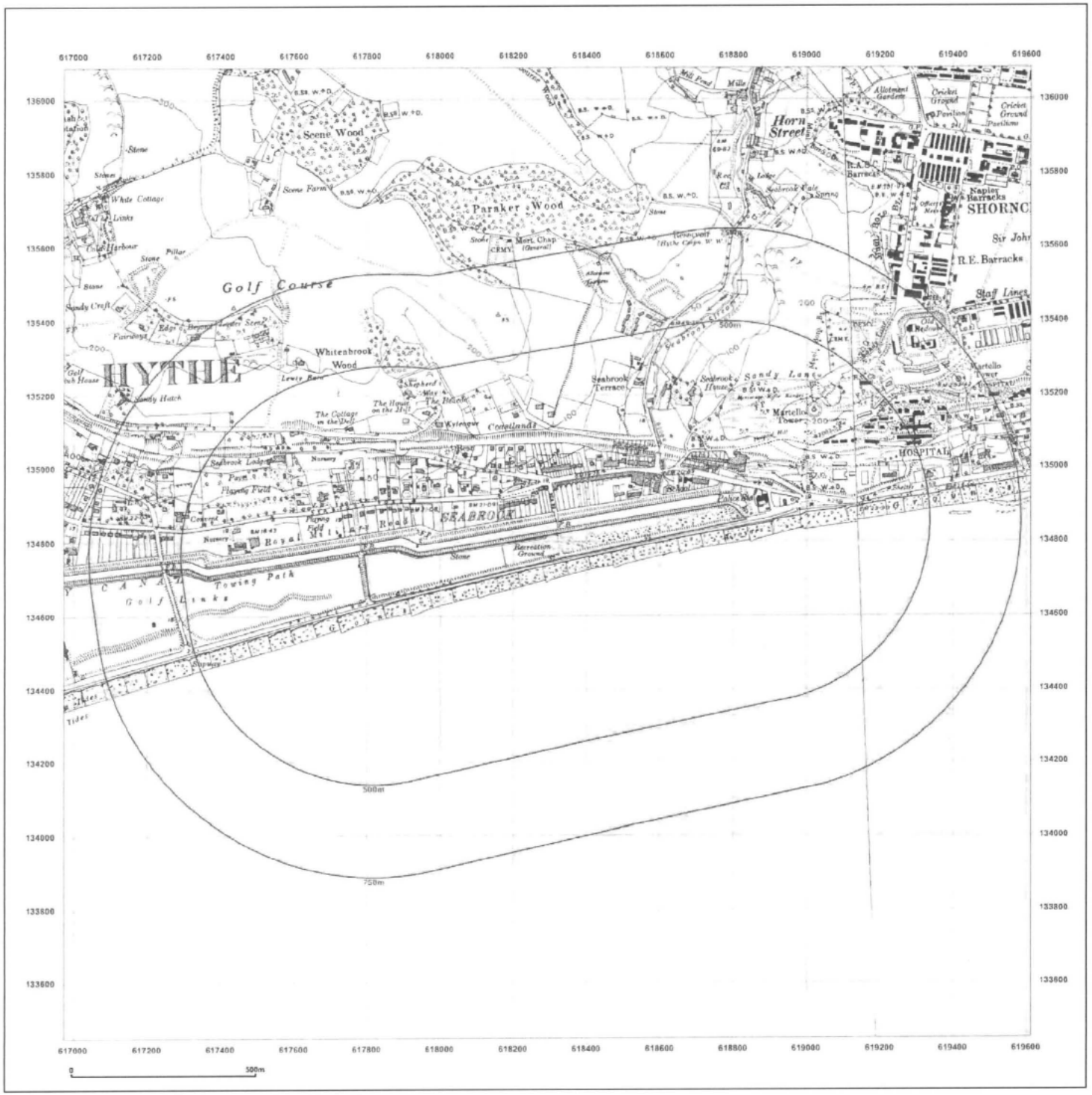


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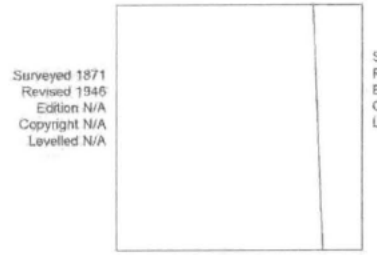


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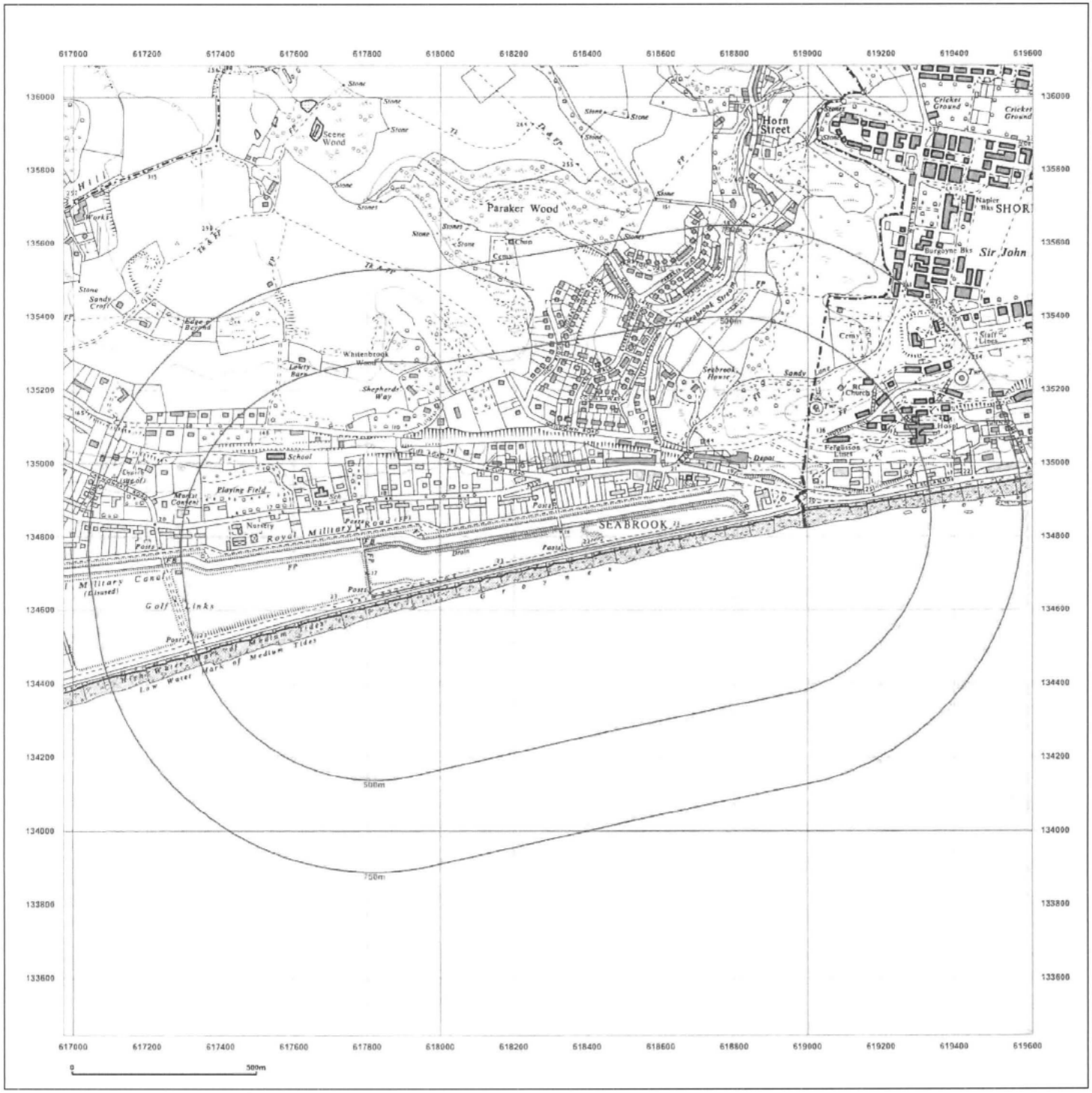


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PRINCES PARADE, SEABROOK,
HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** Provisional
**Map date:** 1961
**Scale:** 1:10,560
**Printed at:** 1:10,560

N
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Surveyed 1871
Revised 1961
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1961
Revised 1961
Edition N/A
Copyright N/A
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Production date: 18 June 2015

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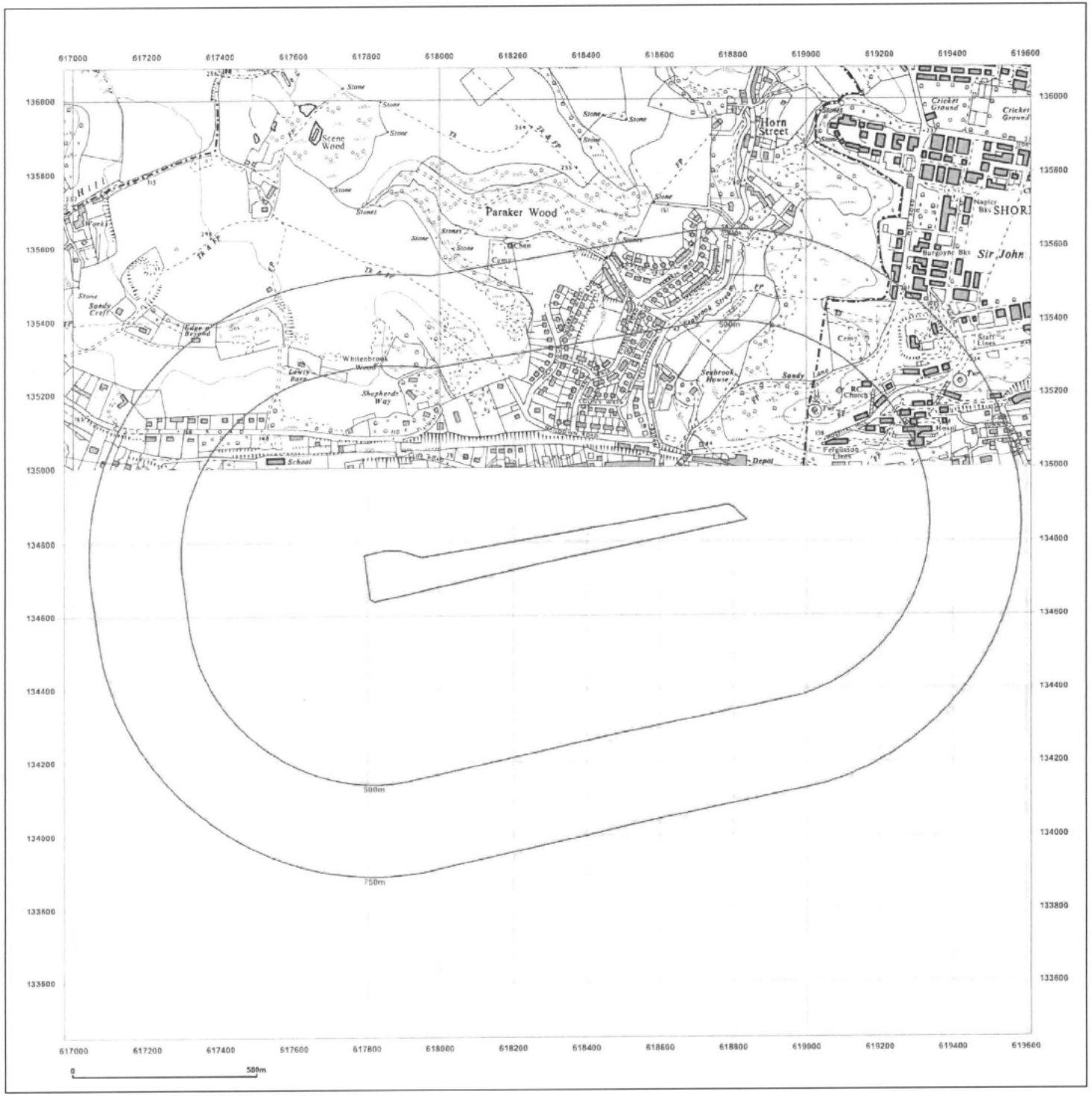


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**Site Details:**

PRINCES PARADE, SEABROOK,
HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** Provisional
**Map date:** 1961
**Scale:** 1:10,560
**Printed at:** 1:10,560

N
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Surveyed 1872
Revised 1961
Edition N/A
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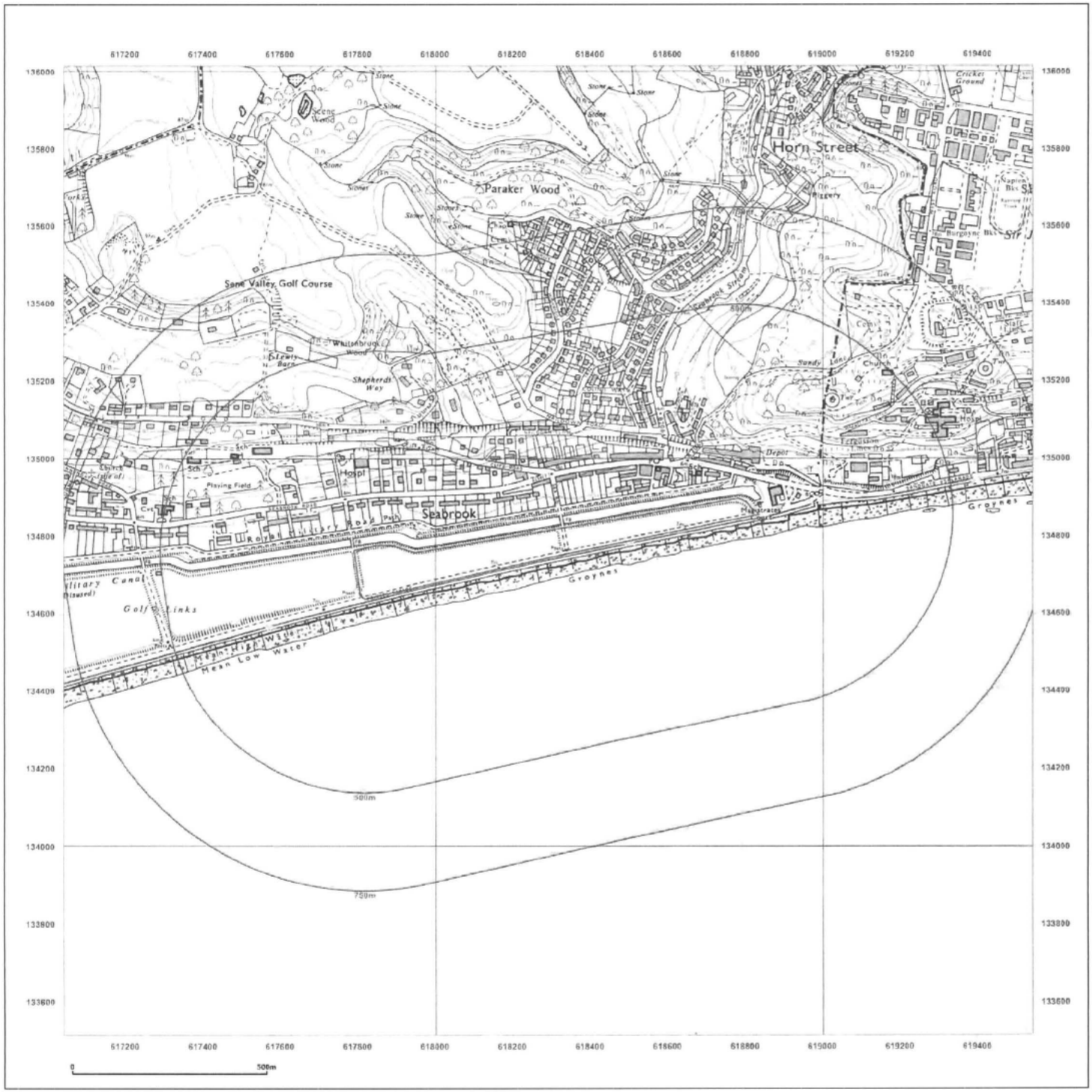


Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** National Grid
**Map date:** 1973-1975
**Scale:** 1:10,000
**Printed at:** 1:10,000

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Surveyed 1973
Revised 1973
Edition N/A
Copyright N/A
Levelled N/A

Surveyed 1974
Revised 1975
Edition N/A
Copyright N/A
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Production date: 18 June 2015

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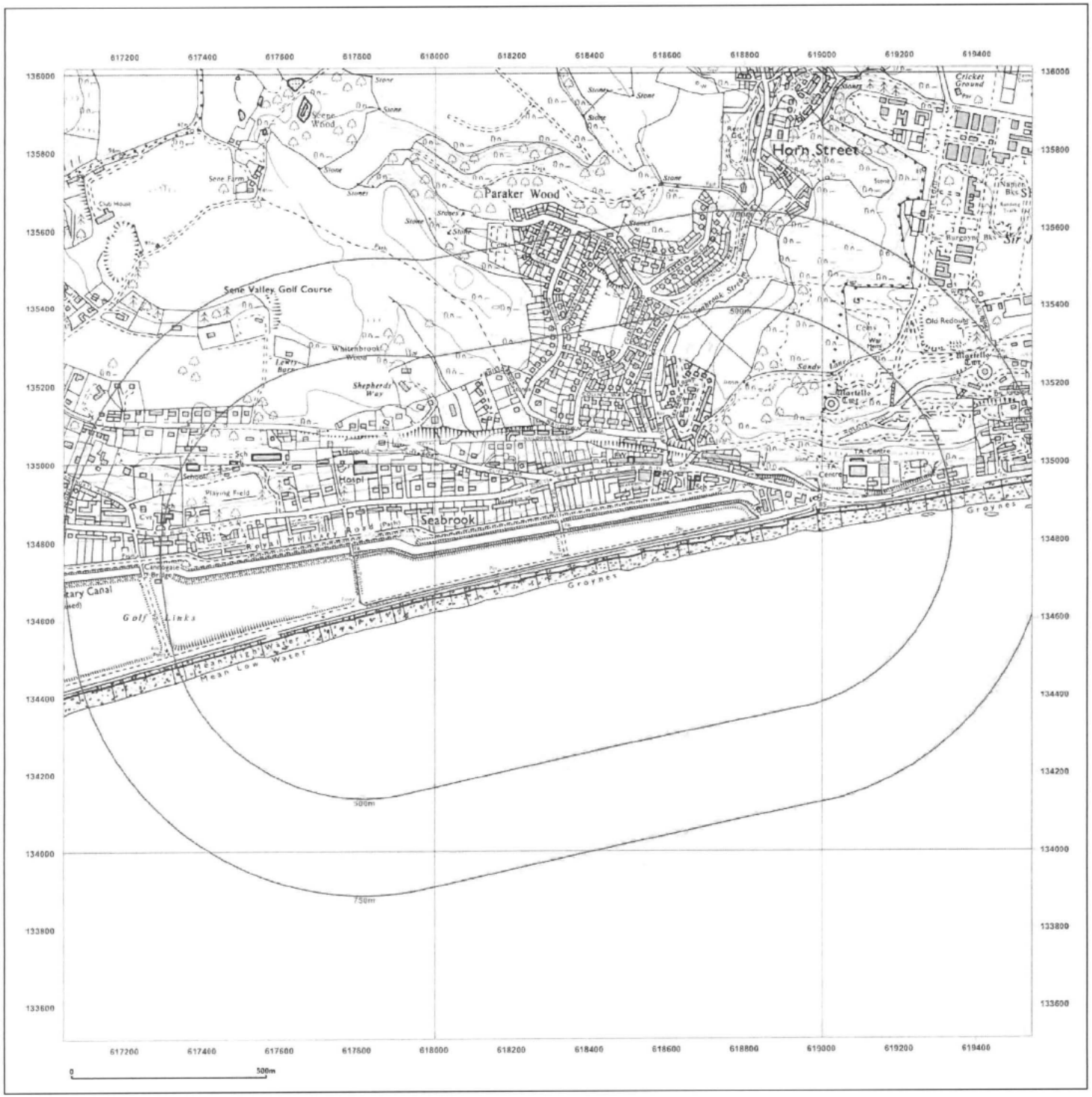


Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** National Grid
**Map date:** **1987-1989**
**Scale:** 1:10,000
**Printed at:** 1:10,000

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Surveyed 1984
Revised 1987
Edition N/A
Copyright N/A
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Surveyed 1987
Revised 1989
Edition N/A
Copyright N/A
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Production date: 18 June 2015

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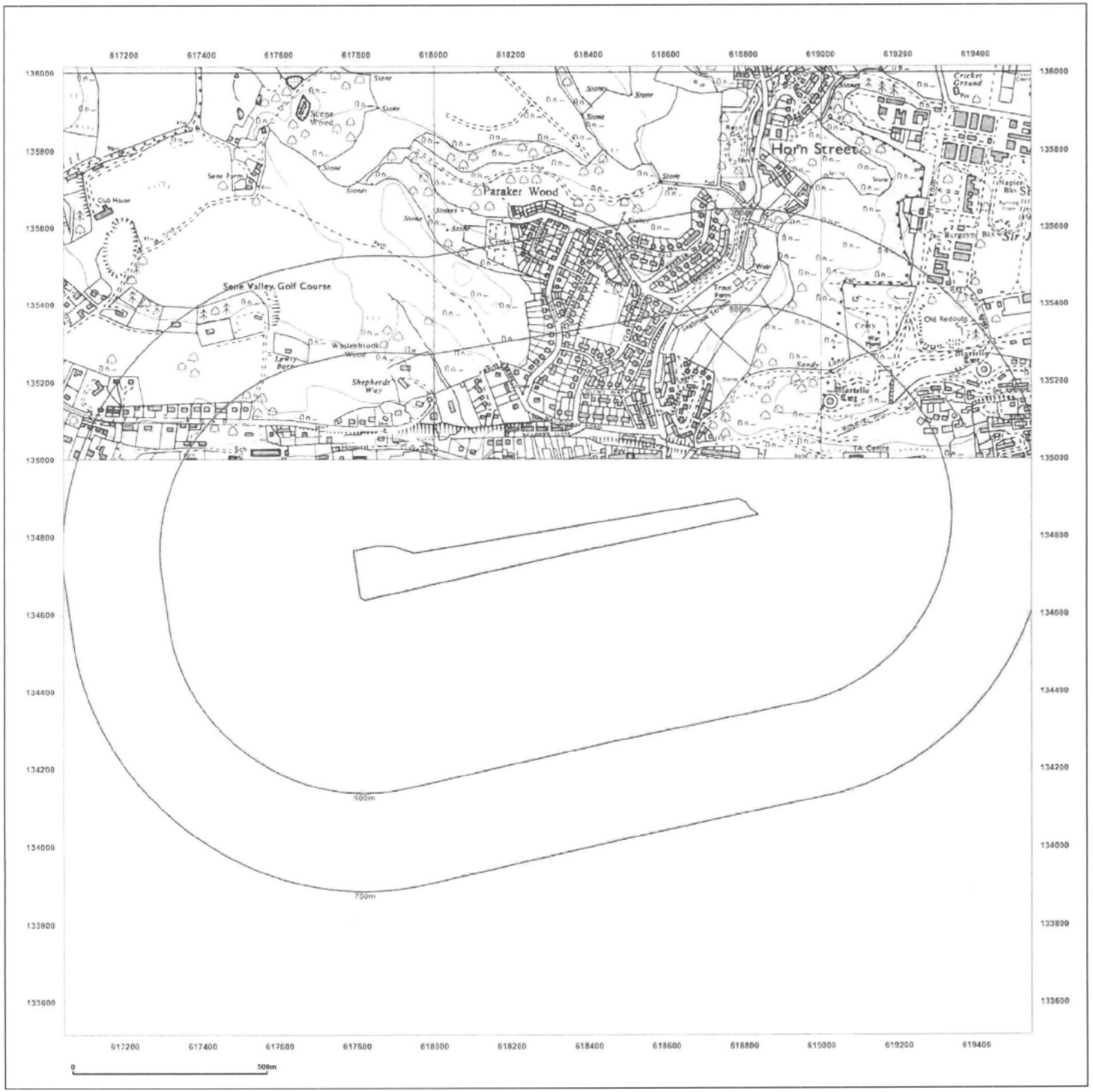


Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** National Grid
**Map date:** 1993
**Scale:** 1:10,000
**Printed at:** 1:10,000

N
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Surveyed 1982
Revised 1993
Edition N/A
Copyright N/A
Levelled N/A

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Production date: 18 June 2015

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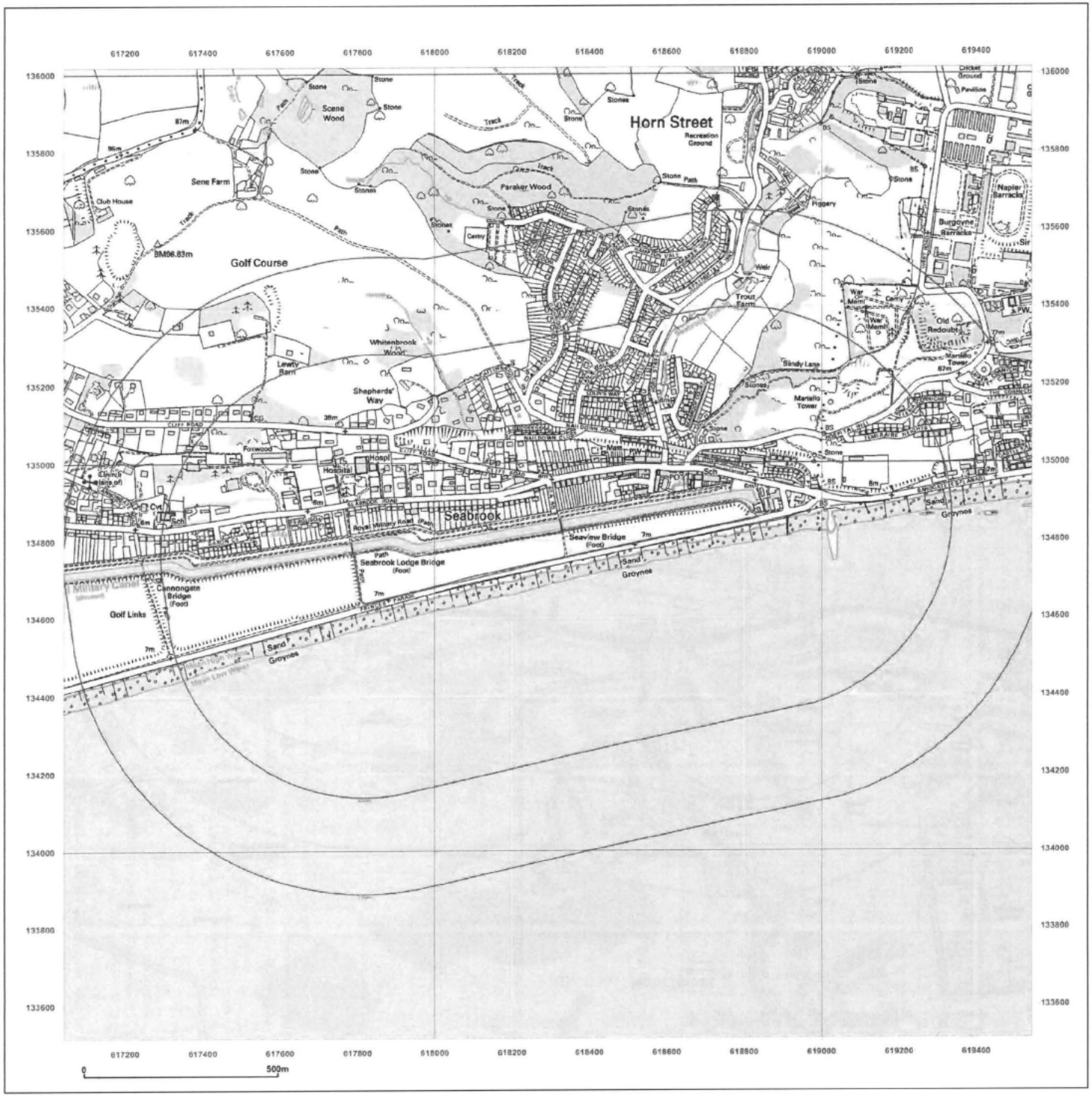


# Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** 1:10,000 Raster
**Map date:** 2002
**Scale:** 1:10,000
**Printed at:** 1:10,000

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Production date: 18 June 2015

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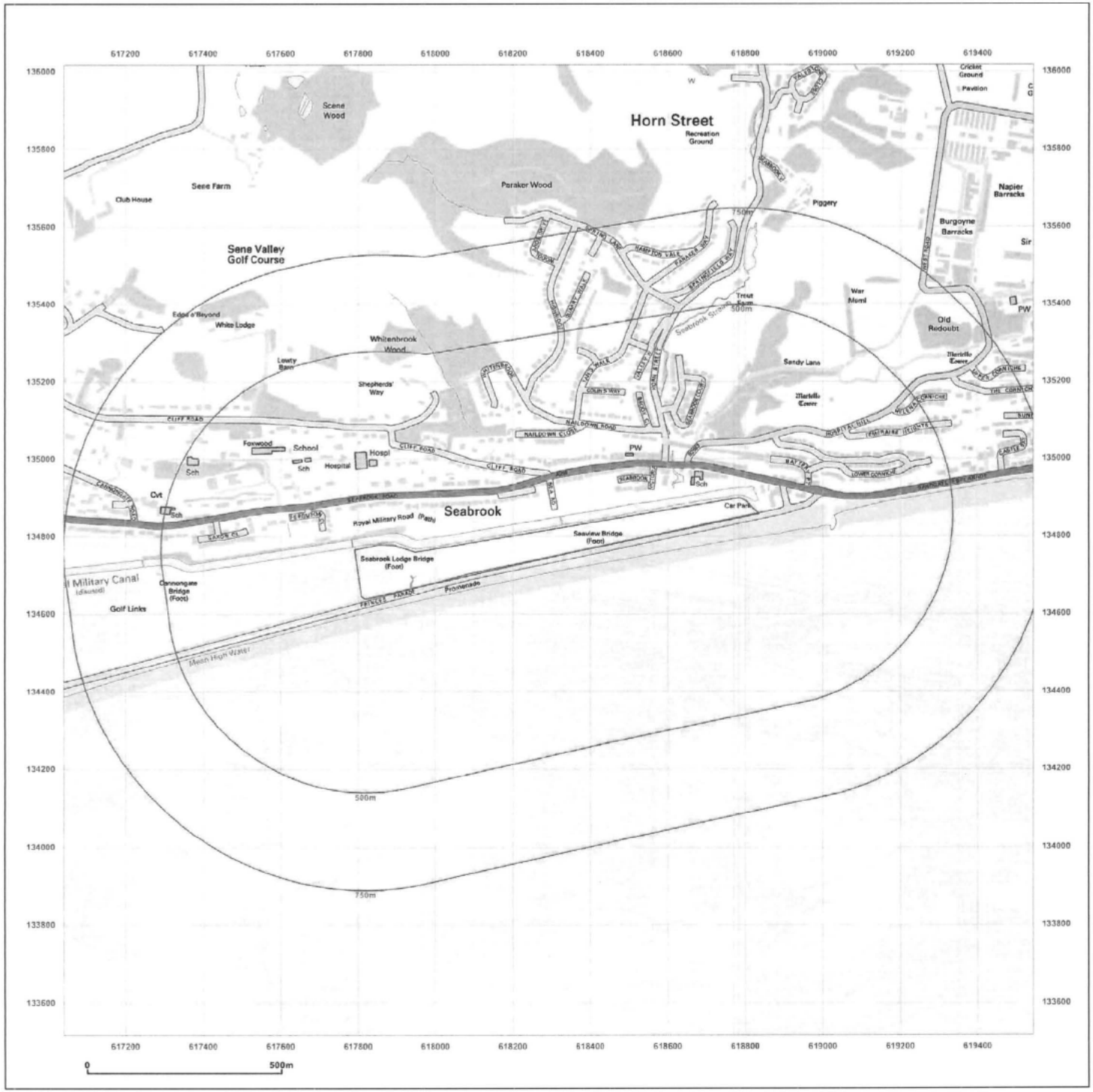


# Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** National Grid
**Map date:** 2010
**Scale:** 1:10,000
**Printed at:** 1:10,000

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**Production date:** 18 June 2015

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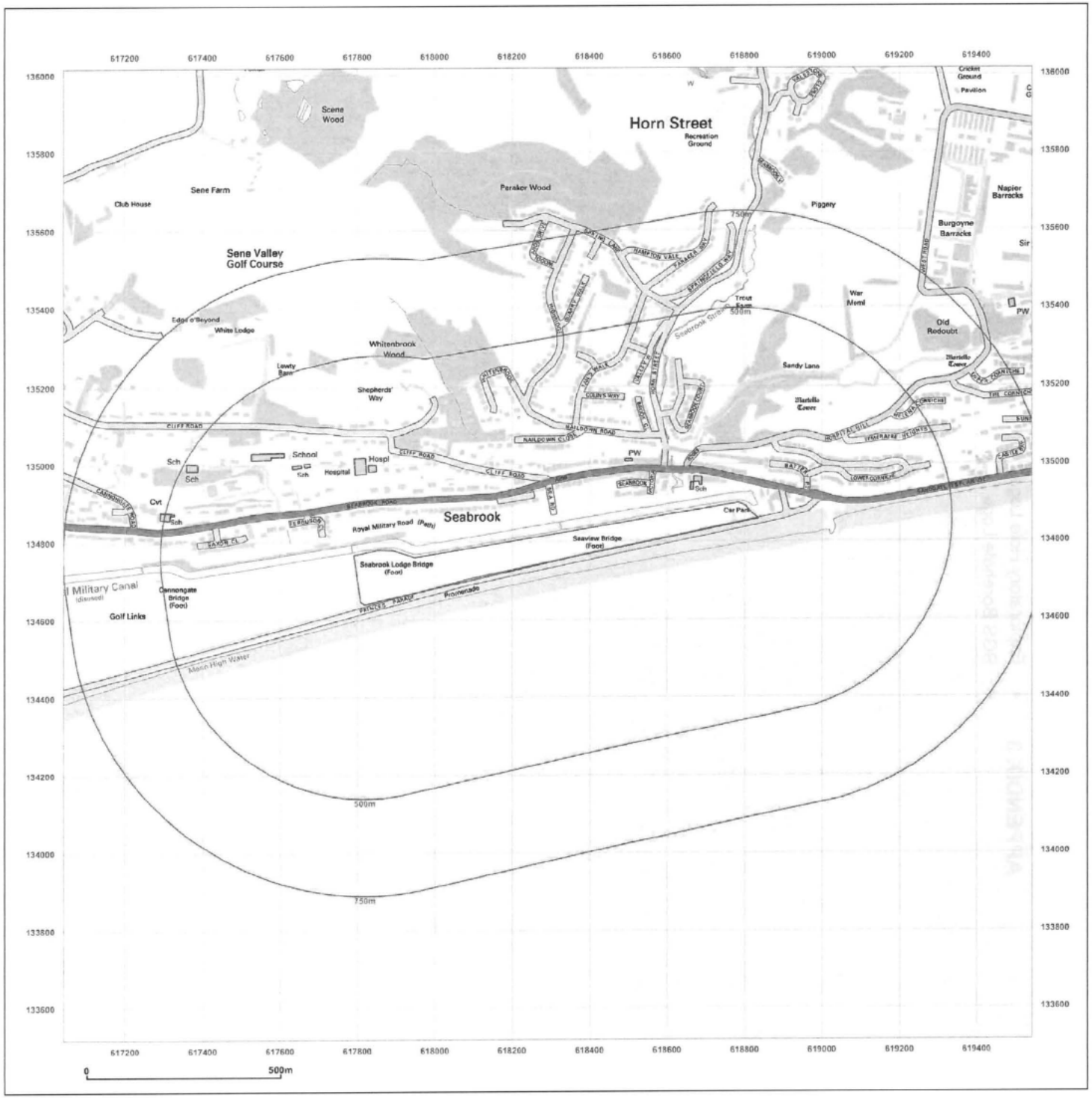


# Groundsure INSIGHTS

**Site Details:**

PRINCES PARADE, SEABROOK, HYTHE

**Client Ref:** 15-S642-FDO-17436ai
**Report Ref:** HMD-154-2188204
**Grid Ref:** 618293, 134766

**Map Name:** National Grid
**Map date:** 2014
**Scale:** 1:10,000
**Printed at:** 1:10,000

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Production date: 18 June 2015

To view map legend click here *Legend*

**APPENDIX 3**

- Exploratory Hole Logs
- BGS Borehole Logs

idom merebrook

Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Plant:** JCB Excavator

**Co-ords:** -

Trialpit No
**MTP1**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Dimensions (m):**


**Depth (m)**
2.60

**Date**
17/06/2015

**Location:** Hythe, Kent

**Scale**
1:25

**Client:** Shepway District Council

**Logged By**
GOB

| Samples & In Situ Testing | | | Water Strike | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|
| Depth (m) | Type | Results | | | | |
| | | | | 0.20 | | Rough grasses over TOPSOIL composed of firm brown slightly sandy clayey SILT with frequent rootlets, gravels and occasional red brick fragments. |
| 0.30-0.40 | D,J | | | 0.40 | | MADE GROUND composed of firm brown slightly sandy clayey SILT with frequent rootlets, gravels, red brick fragments, occasional plastic, glass, rubbish and rare shells and cobbles. |
| | | | | 0.60 | | MADE GROUND composed of dense brown silty sandy GRAVEL with frequent red brick fragments, concrete and rootlets. |
| 1.00-1.20 | D,J | | | (0.90) | | MADE GROUND composed of firm brown silty gravelly CLAY with frequent whole brocks, concrete fragments, cobbles, plastic, glass and rubbish. Large concrete slabs at 0.7 m bgl. Large rusted electrical appliance encountered at 0.8 m bgl. Old wiring at 1.0 m bgl. Suspected asbestos pipe encountered at 1.1 m bgl. Large wooden fragments at 1.3 m bgl. |
| | | | | 1.50 | | MADE GROUND comprised dense brown gravelly clayey SAND with frequent landfill waste. Waste included rusted metals, red bricks, concrete fragments, glass bottles, wooden fragments, batteries, a wheel, textiles, plastic bottles (detergent, bleach, shampoo etc.), aerosol cans. Two large animal bones encountered at 1.9 m bgl |
| 2.00-2.20 | D,J | | | (1.10) | | |
| | | | | 2.60 | | Trialpit Complete at 2.60 m |

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4

**Remarks:** Backfilled with arisings

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

idom merebrook

Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Plant:** JCB Excavator

**Co-ords:** -

Trialpit No
**MTP2**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Dimensions (m):**


**Date**
17/06/2015

**Location:** Hythe, Kent

**Scale**
1:25

**Client:** Shepway District Council

**Logged By**
GOB

| Samples & In Situ Testing | | | Water Strike | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|
| Depth (m) | Type | Results | | | | |
| | | | | (0.50) 0.50 | | Rough grasses / thistles / nettles over TOPSOIL comprised of brown soft to firm clayey sandy slight gravelly SILT with frequent rootlets, occasional red brick fragmeents and glass. Possible asbestos cement fragment encountered at 0.4 m bgl. |
| 0.30-0.50 | D,J | | | | | |
| 0.40 | D | | | | | |
| | | | | (0.40) 0.90 | | MADE GROUND composed of possibly medium dense brown clayey silty slightly sandy GRAVEL with occasional red brick, concrete and wooded fragments, occasional shells and plastics. Large concrete slab recovered at 0.8 m bgl. |
| | | | | | | MADE GROUND comprised brown clayey slightly sandy GRAVEL. Gravel fine to coarse sub angular to sub rounded of mixed lithologies. |
| 1.00-1.20 | D,J | | | 1.10 | | MADE GROUND composed of firm brown silty sandy gravelly CLAY with frequent landfill waste. Wastes included red bricks, plastics, slate, glass bottles and fragments, rusted metals pieces, plastic bottles (detergent, bleach, shampoo etc.). Wastes became more prominent at 1.5 m bgl. Silty ash and clinkers encountered at 1.8 m bgl. |
| | | | | (0.90) 2.00 | | MADE GROUND composed of loose dark grey silty gravelly SAND with frequent red brick and concrete blocks and fragments and occasional glass, plastic and metals. |
| | | | | (0.60) 2.60 | | Trialpit Complete at 2.60 m |
| 3.00 | D,J | | | | | |

**Remarks:** Backfilled with arisings

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

idom merebrook

Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Plant:** JCB Excavator

**Co-ords:** -

Trialpit No
**MTP3**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Dimensions (m):**
2.00
**Depth (m)** 3.00
1.00

**Date**
17/06/2015

**Location:** Hythe, Kent

**Scale**
1:25

**Client:** Shepway District Council

**Logged By**
GOB

| Samples & In Situ Testing | | | Water Strike | Depth in metres (thickness) | | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| Depth (m) | Type | Results | | | | | |
| | | | | (0.60) | 0.60 | | Rough grasses / thistles / nettles over MADE GROUND comprised of brown soft to firm clayey sandy slight gravelly SILT with frequent rootlets and red brick fragments, occasional plastic, tarmac and glass fragmeents, ceramics and whole red bricks. |
| 1.00-1.10 | D,J | | | (0.90) | 1.50 | | MADE GROUND composed of firm dark brown silty sandy gravelly CLAY with frequent landfill waste. Waste included rusted metals, red bricks, concrete, ceramics, glass bottles, wooden fragments, wiring, tarmac, plastic bags, plastic bottles (detergent, bleach, shampoo etc.) and textiles. |
| | | | | | 1.60 | | MADE GROUND composed of firm grey reworked CLAY. |
| | | | | (0.40) | 2.00 | | MADE GROUND composed of firm dark brown silty sandy gravelly CLAY with frequent landfill waste. Waste included rusted metals, red bricks, concrete, ceramics, glass bottles, wooden fragments, wiring, tarmac, plastic bags, plastic bottles (detergent, bleach, shampoo etc.) and textiles. |
| 2.00-2.20 | D,J | | | (0.50) | 2.50 | | MADE GROUND composed of dark brown sandy gravelly SILT with frequent red bricks, tarmac and wooden fragments and plastic landfill waste. Slight hydrocarbon odour. |
| | | | | (0.50) | 3.00 | | MADE GROUND composed of firm brown / dark grey silty gravelly CLAY with lenses of dark grey sandy silt and occasional landfill waste. Waste included glass bottles, ash, clinkers, red bricks, wooden fragments and plastics. Large concrete slab encountered at 2.2 m bgl. |
| | | | | | | | Trialpit Complete at 3.00 m |

**Remarks:** Backfilled with arisings

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Plant:** JCB Excavator

**Co-ords:** -

Trialpit No
**MTP4**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Dimensions (m):**

**Depth (m)**
2.70


**Date**
17/06/2015

**Scale**
1:25

**Location:** Hythe, Kent

**Client:** Shepway District Council

**Logged By**
GOB

| Samples & In Situ Testing | | | Water Strike | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|
| Depth (m) | Type | Results | | | | |
| | | | | (0.40) | | Rough grasses / thistles / nettles over TOPSOIL composed of brown soft to firm clayey sandy slight gravelly SILT with frequent rootlets and occasional red brick fragmeents. |
| 0.30-0.50 | D,J | | | 0.40 | | |
| | | | | | | MADE GROUND composed of possibly medium dense clayey silty sandy GRAVEL with frequent red brick fragments, occasional glass, rootlets, plastics and wooden fragments. |
| | | | | 0.60 | | |
| | | | | | | MADE GROUND composed of possibly loose silty gravelly SAND with frequent red brick fragments, occasional slate and glass. |
| | | | | (0.50) | | |
| 0.90-1.00 | D,J | | | | | |
| | | | | 1.10 | | |
| | | | | | | MADE GROUND composed of brown silty sandy gravelly CLAY with frequent landfill waste. Waste included rusted metals, red bricks, concrete fragments, batteries, glass bottles, wooden fragments, tarmac fragments, plastic bags and bottles (detergent, bleach, shampoo etc.). |
| | | | | (1.60) | | |
| 2.00-2.20 | D,J | | | | | |
| | | | | 2.70 | | |
| | | | | | | Trialpit Complete at 2.70 m |

**Remarks:** Backfilled with arisings

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Plant:** JCB Excavator

**Co-ords:** -

Trialpit No
**MTP5**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Dimensions (m):**


**Depth (m)**
1.70

**Date**
17/06/2015

**Scale**
1:25

**Location:** Hythe, Kent

**Client:** Shepway District Council

**Logged By**
GOB

| Samples & In Situ Testing | | | Water Strike | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|
| Depth (m) | Type | Results | | | | |
| | | | | (0.30) | | Rough grass / nettles / weeds over TOPSOIL composed of brown soft to firm clayey sandy slight gravelly SILT with frequent rootlets and occasional red brick fragmeents. |
| | | | | 0.30 | | |
| 0.40-0.60 | D,J | | | (0.50) | | MADE GROUND composed of firm brown silty sandy gravelly CLAY with occasional rootlets and bricks and rare shells and glass. Suspected asbestos cement fragment encountered at 0.6 m bgl. |
| 0.60 | D | | | | | |
| | | | | 0.80 | | MADE GROUND composed of brown / orange / light brown silty sandy GRAVEL with frequent landfill waste. Waste included red bricks and fragments, glass, metals, wood plastic bags and bottles. |
| | | | | (0.90) | | |
| 1.50 | D,J | | | | | |
| | | | | 1.70 | | Trialpit Complete at 1.70 m |

**Remarks:** Excavator broke down during excavation. Backfilled with arisings

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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Offices:
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Keston: 01689 889980
email: consulting@merebrook.co.uk

**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS1**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
0.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 18/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | (0.40) | | Rough grasses over TOPSOIL composed of firm brown dry slightly sandy gravelly clayey SILT with occasional glass and tarmac pieces. |
| | | 0.40-0.50 | D,J | | 0.40 (0.30) 0.70 | | MADE GROUND composed of firm slightly sandy gravelly silty CLAY with frequent tarmac gravels, ash, clinkers red brick fragments and occasional ceramics |
| | | | | | 0.80 | | MADE GROUND composed of loose black sandy GRAVEL [ash and clinkers]. |
| | | 1.00 | CPT | N=8 (2,2,2,2,2,2) | (0.50) | | MADE GROUND composed of firm slightly sandy gravelly silty CLAY with frequent tarmac gravels, ash, clinkers red brick fragments and occasional ceramics |
| | | | | | 1.30 (0.30) | | MADE GROUND composed of loose black / dark brown sandy GRAVEL [ash and clinkers]. |
| | | 1.40-1.70 | D,J | | 1.60 | | MADE GROUND composed of soft to firm brownish grey mottled orange slightly sandy gravelly CLAY with occasional red brick fragments. Gravels medium to coarse sub angular to sub rounded. |
| | | 2.00 | CPT | N=18 (1,0,1,0,1,16) | (0.60) | | |
| | | | | | 2.20 (0.50) | | MADE GROUND composed of loose dark brown SAND AND GRAVEL with ash, clinkers and red brick fragments. |
| | | 2.50-2.80 | D,J | | 2.70 | | CONCRETE LAYER |
| | | 3.00 | CPT | N=10 (3,4,3,2,2,3) | 2.80 (0.80) | | Medium dense grey clayey sandy GRAVEL. |
| | ▽ | | | | 3.60 (0.50) | | Medium dense brown wet sandy GRAVEL. Gravel is fine to coarse sub angular to sub rounded. Sand fine to coarse. |
| | | 4.00 | CPT | N=4 (2,2,1,1,1,1) | 4.10 (0.50) | | Loose brown wet slightly sandy GRAVEL. Gravel fine to coarse rounded to sub rounded. |
| | | 4.50-4.80 | D,J | | 4.60 | | Medium dense brown wet sandy GRAVEL. Gravel is fine to coarse sub angular to sub rounded. Sand fine to coarse. |
| | | | | | 4.80 | | Grey silty gravelly fine SAND. Gravel fine to medium rounded to |
| | | | Type | Results | | | Continued next sheet |

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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Offices:
Belper: 01773 829988
Keston: 01689 889980
email: consulting@merebrook.co.uk

**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS1**
Sheet 1+ of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
0.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 18/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | 5.00 | CPT | N=14 (6,5,5,3,3,3) | 5.00 | | sub angular. |
| | | | | | | | End of Window Sample at 5.00 m |
| | | | Type | Results | | | |

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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Keston: 01689 889980
email: consulting@merebrook.co.uk

**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS2**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
1.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 19/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | | Rough grasses over TOPSOIL composed of firm brown dry slightly sandy gravelly clayey SILT. |
| | | | | | 0.25 | | CONCRETE LAYER |
| | | 0.40-0.60 | D,J | | 0.50 | | MADE GROUND composed of firm brown / grey friable slightly sandy gravelly CLAY with occasional rootlets, red brick and tarmac fragments. Gravels fine to medium sub angular to angular of mixed lithologies. |
| | | | | | (0.30) | | MADE GROUND composed of dark brown / light brown silty gravelly SAND with frequent red brick and tarmac pieces, ash and cinders. |
| | | | | | 0.80 | | MADE GROUND composed of soft to firm brownish grey mottled orange clayey SILT with occasional lenses of fine grey sand, gravels, rootlets, red brick fragments and rare tarmac gravels. |
| | | 1.00 | CPT | N=4 (1,1,1,1,1,1) | | | 1 |
| | | 1.00-1.50 | D,J | | (0.80) | | |
| | | | | | 1.60 | | Loose grey silty gravelly SAND with occasional red brick and tarmac fragments. |
| | | | | | (0.40) | | |
| | | 2.00 | CPT | N=16 (3,3,4,4,4,4) | 2.00 | | Loose grey silty gravelly fine to coarse SAND. Gravels fine to coarse sub rounded. 2 |
| | ▽ | | | | (0.30) | | |
| | | | | | 2.30 | | Loose brown wet sandy GRAVEL. Gravels fine to coarse rounded to sub rounded. |
| | | | | | (0.40) | | |
| | | 2.50-2.80 | D,J | | 2.70 | | Medium dense brown wet sandy GRAVEL. Gravel is fine to medium sub angular to rounded, with occasional coarse gravels. Sand fine to coarse. |
| | | 3.00 | CPT | N=12 (5,3,3,3,3,3) | | | 3 |
| | | | | | (1.30) | | |
| | | 4.00 | CPT | N=35 (7,9,10,9,8,8) | 4.00 | | End of Window Sample at 4.00 m 4 |
| | | | Type | Results | | | |

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS3**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
2.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 20/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | | Rough grasses over TOPSOIL composed of firm brown dry slightly sandy gravelly clayey SILT with frequent rootlets. |
| | | | | | 0.30 | | |
| | | 0.40-0.50 | D,J | | (0.30) | | MADE GROUND composed of loose light brown silty sandy GRAVEL with occasional red brick fragments and rare bituminous pieces. Large concrete fragment recovered at 0.5 m bgl. |
| | | | | | 0.60 | | MADE GROUND composed of soft light brown sandy gravelly CLAY with occasional glass, red brick, clinkers and concrete fragments. |
| | | 1.00 | CPT | N=4 (1,1,1,1,1,1) | (1.20) | | |
| | | 1.50-2.00 | D,J | | 1.80 | | MADE GROUND composed of loose light brown clayey gravelly SAND. |
| | | 2.00 | CPT | N=5 (2,1,1,1,1,2) | (0.70) | | |
| | ▽ | | | | 2.50 | | Loose greyish brown wet slightly sandy GRAVEL. Gravels fine to coarse rounded to sub rounded. |
| | | | | | (0.40) | | |
| | | 3.00 | CPT | N=28 (6,6,7,7,7,7) | 2.90 | | Medium dense orangish grey sandy GRAVEL. Gravel fine to coarse rounded to sub rounded, fine is fine. |
| | | | | | (0.45) | | |
| | | | | | 3.35 | | End of Window Sample at 3.35 m |

| Type | Results |
|---|---|

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS4**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
3.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 21/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | (0.30) | | Rough grasses / thistles / nettles over TOPSOIL composed of firm brown dry slightly sandy gravelly clayey SILT. |
| | | | | | 0.30 | | |
| | | 0.30-0.50 | D,J | | | | MADE GROUND composed of soft brown mottled orange and grey slightly gravelly silty CLAY [reworked] with occasional sandy, red brick and concrete fragments. |
| | | | | | (1.20) | | |
| | | 1.00 | CPT | N=9 (1,2,2,2,2,3) | | | |
| | | 1.00-2.00 | D,J | | 1.50 | | MADE GROUND composed of soft brown / grey clayey SAND with rare red brick, concrete and tarmac fragments. |
| | | | | | (0.40) | | |
| | | | | | 1.90 | | Loose brown clayey sandy GRAVEL. Gravel fine to coarse sub angular to sub rounded. |
| | | 2.00 | CPT | N=6 (2,2,1,2,2,1) | (0.30) | | |
| | | 2.00-2.50 | D,J | | 2.20 | | Loose brown sandy GRAVEL. Gravel fine to coarse sub angular to sub rounded. |
| | | | | | (0.90) | | |
| | ▽ | 3.00 | CPT | N=15 (3,3,3,4,4,4) | | | |
| | | | | | 3.10 | | Medium dense clayey slightly sandy GRAVEL. Gravel fine to coarse sub angular to sub rounded. |
| | | | | | (0.90) | | |
| | | 4.00 | CPT | N=9 (3,2,2,2,2,3) | 4.00 | | End of Window Sample at 4.00 m |
| | | | Type | Results | | | |

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS5**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
4.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 22/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | | Rough grasses over TOPSOIL composed of firm brown slightly sandy gravelly clayey SILT with frequent rootlets. |
| | | | | | 0.40 | | Firm brown silty sandy gravelly CLAY. |
| | | | | | 0.60 | | Medium dense brown sandy GRAVEL. Gravel fine to coarse sub angular t sub rounded. |
| | | 1.00 | CPT | N=9 (1,2,2,2,2,3) | (2.00) | | Firm greyish brown mottled orange CLAY with occasional sand and gravels. |
| | | 2.00 | CPT | N=12 (1,1,1,1,3,7) | 2.60 | | Medium dense brown wet silty sandy GRAVEL. |
| | ▽ | | | | 2.80 | | Soft grey clayey SILT. |
| | | 3.00 | CPT | N=5 (1,1,1,1,1,2) | 3.00 | | End of Window Sample at 3.00 m |

| Type | Results |
|---|---|

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS6**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
5.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 23/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.10 | | Rough grasses / shrubs over TOPSOIL composed of firm brown slightly sandy gravelly clayey SILT with frequent rootlets and occasional red brick fragments. |
| | | | | | 0.30 | | MADE GROUND composed of dense brown sandy silty GRAVEL with occasional red brick and bituminous fragments. Gravels fine to coarse angular to sub angular. |
| | | 0.40-0.50 | D,J | | 0.50 | | |
| | | | | | 0.55 | | MADE GROUND composed of dark brown / brown sandy gravelly CLAY with occasional red brick and bituminous fragments. |
| | | | | | (0.40) | | TARMAC LAYER |
| | | | | | 0.95 | | MADE GROUND composed of greyish brown clayey gravelly SAND with frequent red brick and bituminous fragments. |
| | | 1.00 | CPT | N=7 (2,3,2,2,2,1) | 1.00 | | CONCRETE COBBLE |
| | | | | | (0.60) | | MADE GROUND composed of soft black / beige sandy gravelly SILT with frequent red brick fragments, glass, ash and clinkers. |
| | | | | | 1.60 | | MADE GROUND composed of loose dark brown / grey sandy GRAVELS with frequent clinkers. |
| | | 2.00 | CPT | N=4 (1,1,1,1,1,1) | (0.90) | | |
| | | | | | 2.50 | | MADE GROUND composed of loose beige / yellow gravelly SAND. |
| | | | | | (0.40) | | |
| | | 3.00 | CPT | N=4 (1,1,2,2,0,0) | 2.90 | | MADE GROUND composed of loose brown sandy GRAVEL with occasional concrete and bituminous fragments. Gravels fine to coarse sub angular to sub rounded of mixed lithologies. |
| | ▽ | | | | (0.70) | | |
| | | | | | 3.60 | | MADE GROUND composed of black / dark brown loose clayey sandy GRAVEL. Gravel fine to coarse sub angular to sub rounded. |
| | | | | | (0.40) | | |
| | | 4.00 | CPT | N=8 (4,3,2,2,2,2) | 4.00 | | Loose brown sandy GRAVEL. Gravel fine to coarse sub rounded to rounded. |
| | | | | | (0.80) | | |
| | | | | | 4.80 | | Soft to firm dark grey clayey sandy SILT. |
| | | | Type | Results | | | End of Window Sample at 5.00 m |

1 2 3 4

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**
Premier windowless sample drilling rig

Window Sample No
**MWS7**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**
WLS

**Location:** Hythe, Kent

**Level**
6.000

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** 24/06/2015

**Logged By**
GOB

| Well | Water Strike | Samples & In Situ Testing: Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | 0.20 | | Rough grasses over TOPSOIL composed of firm brown slightly sandy gravelly clayey SILT with frequent rootlets. |
| | | | | | 0.40 | | MADE GROUND composed of medium dense brown clayey sandy GRAVEL with occasional red brick fragments. |
| | | | | | (0.70) | | MADE GROUND composed of firm dark grey gravelly CLAY with occasional red brick and bituminous fragments. |
| | | | | | 1.10 | | MADE GROUND composed of soft brown / grey slightly sandy clayey SILT with red brick fragments, occasional bituminous fragments and lenses of clayey sand. Possible ashen odour. |
| | | | | | (0.40) | | |
| | | | | | 1.50 | | MADE GROUND composed of dark grey / dark brown clayey silty SAND with occasional gravels and red brick fragments. |
| | | | | | (2.00) | | |
| | | | | | 3.50 | | Soft dark grey slightly sandy clayey SILT. |
| | | | | | (0.30) | | |
| | | | | | 3.80 | | Medium dense dark brown clayey sandy GRAVEL. Gravel fine to coarse rounded to sub rounded, sand medium to coarse. |
| | | | | | (0.40) | | |
| | | | | | 4.20 | | Medium dense brown / dark brown sandy GRAVEL. Gravel fine to coarse rounded to sub rounded, sand medium to coarse. |
| | | | | | (0.80) | | |
| | | | Type | Results | | | End of Window Sample at 5.00 m |

1 2 3 4

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

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**Equipment and Methods**

Window Sample No
**MWS7A**
Sheet 1 of 1

**Project Name**
Princes Parade

**Project No.**
17436A1

**Co-ords**
-

**Hole Type**

**Location:** Hythe, Kent

**Level**
-

**Scale**
1:25

**Client:** Shepway District Council

**Dates:** -

**Logged By**

| Well | Water Strike | Samples & In Situ Testing Depth (m) | Type | Results | Depth in metres (thickness) | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|
| | | | | | | | End of Window Sample at 0.00 m |
| | | 1.00 | CPT | N=4 (1,1,1,1,1,1) | | | |
| | | 2.00 | CPT | N=4 (1,1,1,1,1,1) | | | |
| | | 3.00 | CPT | N=5 (1,1,1,1,1,2) | | | |
| | | 4.00 | CPT | N=18 (5,4,4,4,4,6) | | | |
| | | | Type | Results | | | |

**Remarks:**

IVN - in-situ hand vane
IPP - in-situ pocket penetrometer
SPT - in-situ standard penetration test
PID - in-situ photoionization detector

D - small disturbed sample (tub)
J - amber glass jar (250ml)
V - amber glass jar (60ml)
B - bulk disturbed sample

**APPENDIX 4**

- Soil Chemistry
- Summary Spreadsheet
- Laboratory Analysis Certificates

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# Analytical Report Number : 15-74167

Replaces Analytical Report Number : 15-74167, issue no. 1

| | | | |
|---|---|---|---|
| **Project / Site name:** | Princes Parade , Hythe | **Samples received on:** | 24/06/2015 |
| **Your job number:** | 17436A1 | **Samples instructed on:** | 24/06/2015 |
| **Your order number:** | 15-S2-FDO-LABS | **Analysis completed by:** | 08/07/2015 |
| **Report Issue Number:** | 2 | **Report issued on:** | 08/07/2015 |
| **Samples Analysed:** | 2 bulk samples - 18 soil samples | | |

**Signed:** [redacted]

[redacted]
Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

**Signed:** [redacted]

[redacted]
Assistant Reporting Manager
**For & on behalf of i2 Analytical Ltd.**

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

| | |
|---|---|
| soils | - 4 weeks from reporting |
| leachates | - 2 weeks from reporting |
| waters | - 2 weeks from reporting |
| asbestos | - 6 months from reporting |

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**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458142 | 458143 | 458144 | 458145 | 458146 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MTP1 | MTP1 | MTP2 | MTP2 | MTP3 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.30-0.40 | 1.00-1.20 | 0.20-0.40 | 1.90-2.00 | 0.30-0.50 |
| Date Sampled | | | | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 43 |
| Moisture Content | % | N/A | NONE | 6.0 | 7.1 | 9.6 | 20 | 9.0 |
| Total mass of sample received | kg | 0.001 | NONE | 1.1 | 1.3 | 1.1 | 0.89 | 1.2 |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | - | Amosite & Chrysotile |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | - | Detected |
| Asbestos Quantification | % | 0.001 | ISO 17025 | - | - | - | - | 0.002 |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 7.9 | 7.7 | 7.3 | 7.7 | 8.0 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | < 1 | < 1 |
| Water Soluble Sulphate (Soil Equivalent) | g/l | 0.0025 | MCERTS | 0.16 | 0.12 | 0.044 | 0.87 | 0.13 |
| Water Soluble Sulphate as $SO_4$ (2:1) | mg/kg | 2.5 | MCERTS | 160 | 120 | 44 | 870 | 130 |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | 0.079 | 0.060 | 0.022 | 0.44 | 0.067 |
| Sulphide | mg/kg | 1 | MCERTS | 19 | 1.6 | 2.8 | 2.8 | 3.5 |
| Organic Matter | % | 0.1 | MCERTS | 3.2 | 3.3 | 4.3 | 3.8 | 2.1 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | 0.22 | < 0.05 | < 0.05 | 0.13 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 0.38 | 0.42 | 0.18 | < 0.10 | 0.41 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 0.17 | 0.55 | < 0.10 | < 0.10 | 0.17 |
| Fluorene | mg/kg | 0.1 | MCERTS | 0.17 | 0.83 | < 0.10 | < 0.10 | 0.24 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 2.2 | 7.6 | 1.1 | 0.99 | 2.6 |
| Anthracene | mg/kg | 0.1 | MCERTS | 0.62 | 2.2 | 0.26 | 0.29 | 0.96 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 7.2 | 14 | 2.9 | 2.2 | 8.8 |
| Pyrene | mg/kg | 0.1 | MCERTS | 6.6 | 12 | 2.5 | 1.9 | 7.8 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 3.5 | 7.1 | 1.4 | 1.3 | 5.9 |
| Chrysene | mg/kg | 0.05 | MCERTS | 4.4 | 6.8 | 1.6 | 1.5 | 4.4 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 4.2 | 7.8 | 1.7 | 0.94 | 5.7 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 3.4 | 4.5 | 0.82 | 0.66 | 4.0 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 4.5 | 7.5 | 1.6 | 0.93 | 5.6 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 2.6 | 3.7 | 0.80 | 0.50 | 3.1 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 0.22 | 0.40 | < 0.10 | < 0.10 | 0.75 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 3.4 | 4.9 | 1.1 | 0.59 | 3.7 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 43.5 | 79.9 | 15.8 | 11.8 | 54.2 |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458142 | 458143 | 458144 | 458145 | 458146 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MTP1 | MTP1 | MTP2 | MTP2 | MTP3 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.30-0.40 | 1.00-1.20 | 0.20-0.40 | 1.90-2.00 | 0.30-0.50 |
| Date Sampled | | | | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 14 | 14 | 13 | 35 | 9.1 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | 0.8 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 35 | 24 | 25 | 36 | 18 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 46 | 45 | 27 | 850 | 30 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 150 | 190 | 91 | 150 | 82 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | 1.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 24 | 22 | 25 | 72 | 18 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 150 | 150 | 130 | 710 | 120 |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 52 | < 8.0 | < 8.0 | 48 | < 8.0 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 52 | < 10 | < 10 | 48 | < 10 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | 2.6 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 44 | 46 | < 10 | 14 | 31 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 170 | 100 | 18 | 50 | 67 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 220 | 150 | 18 | 64 | 98 |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458147 | 458148 | 458149 | 458150 | 458151 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MTP3 | MTP4 | MTP5 | MTP5 | MWS1 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 2.00-2.50 | 0.90-1.00 | 0.40-0.60 | 1.50 | 0.40-0.50 |
| Date Sampled | | | | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 | 18/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | 20 | < 0.1 |
| Moisture Content | % | N/A | NONE | 12 | 15 | 16 | 16 | 9.4 |
| Total mass of sample received | kg | 0.001 | NONE | 1.5 | 1.2 | 1.0 | 0.60 | 1.2 |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | Amosite & Chrysotile | - | - | Amosite |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | Detected | - | - | Detected |
| Asbestos Quantification | % | 0.001 | ISO 17025 | - | 0.015 | - | - | < 0.001 |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 7.9 | 7.4 | 7.6 | 7.2 | 8.5 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | 9 | < 1 |
| Water Soluble Sulphate (Soil Equivalent) | g/l | 0.0025 | MCERTS | 0.99 | 3.6 | 0.62 | 3.6 | 0.35 |
| Water Soluble Sulphate as $SO_4$ (2:1) | mg/kg | 2.5 | MCERTS | 990 | 3600 | 620 | 3600 | 350 |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | 0.50 | 1.8 | 0.31 | 1.8 | 0.17 |
| Sulphide | mg/kg | 1 | MCERTS | 11 | < 1.0 | 7.0 | 6.0 | < 1.0 |
| Organic Matter | % | 0.1 | MCERTS | 1.0 | 2.4 | 3.8 | 4.1 | 1.8 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 1.2 | < 0.05 | 0.07 | 0.16 | 0.85 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 0.71 | < 0.10 | 0.24 | 0.27 | 1.4 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 2.7 | < 0.10 | 0.15 | 0.17 | 2.5 |
| Fluorene | mg/kg | 0.1 | MCERTS | 3.6 | < 0.10 | < 0.10 | 0.18 | 2.8 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 20 | 0.89 | 2.2 | 2.4 | 28 |
| Anthracene | mg/kg | 0.1 | MCERTS | 5.5 | 0.30 | 0.70 | 0.95 | 7.8 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 24 | 2.9 | 6.4 | 8.5 | 41 |
| Pyrene | mg/kg | 0.1 | MCERTS | 19 | 2.5 | 5.2 | 7.4 | 33 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 11 | 1.8 | 3.3 | 5.3 | 21 |
| Chrysene | mg/kg | 0.05 | MCERTS | 8.4 | 1.6 | 2.9 | 4.4 | 17 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 9.0 | 2.3 | 2.7 | 5.2 | 22 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 6.0 | 1.0 | 2.5 | 3.8 | 9.6 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 8.2 | 1.8 | 2.7 | 4.9 | 19 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 4.8 | 1.1 | 1.7 | 2.8 | 10 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 0.97 | 0.22 | 0.35 | 0.66 | 2.0 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 5.0 | 1.2 | 1.9 | 3.3 | 12 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 129 | 17.7 | 33.1 | 50.4 | 230 |

**Analytical Report Number: 15-74167**
**Project / Site name: Princes Parade , Hythe**
**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458147 | 458148 | 458149 | 458150 | 458151 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MTP3 | MTP4 | MTP5 | MTP5 | MWS1 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 2.00-2.50 | 0.90-1.00 | 0.40-0.60 | 1.50 | 0.40-0.50 |
| Date Sampled | | | | 17/06/2015 | 17/06/2015 | 17/06/2015 | 17/06/2015 | 18/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| Heavy Metals / Metalloids | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 11 | 15 | 9.7 | 50 | 16 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | 0.3 | 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 | 19 | 23 | 110 | 28 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 12 | 16 | 27 | 210 | 120 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 280 | 63 | 110 | 660 | 190 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | 0.6 | 0.5 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 25 | 19 | 23 | 87 | 44 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | 2.7 | < 1.0 | < 1.0 | 2.2 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 89 | 91 | 120 | 1100 | 230 |
| Monoaromatics | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Petroleum Hydrocarbons | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 2.7 | < 2.0 | < 2.0 | < 2.0 | 2.2 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | 19 | 55 | 16 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | 19 | 55 | 18 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 2.7 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 28 | 2.4 | < 2.0 | < 2.0 | 28 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 150 | 17 | 23 | 19 | 210 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 180 | 39 | 47 | 31 | 260 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 360 | 58 | 70 | 49 | 500 |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458152 | 458153 | 458154 | 458155 | 458156 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MWS1 | MWS2 | MWS2 | MWS4 | MWS6 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.40-1.70 | 0.40-0.60 | 2.50-2.80 | 0.30-0.50 | 0.30-0.50 |
| Date Sampled | | | | 18/06/2015 | 18/06/2015 | 18/06/2015 | 18/06/2015 | 18/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | Units | Limit of detection | Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 6.9 | 4.3 | 3.8 | 11 | 7.5 |
| Total mass of sample received | kg | 0.001 | NONE | 1.3 | 1.3 | 1.2 | 0.87 | 1.3 |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | Chrysotile- Loose fibres | - | - | Chrysotile- Loose fibres |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | Detected | - | - | Detected |
| Asbestos Quantification | % | 0.001 | ISO 17025 | - | - | - | - | - |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 8.5 | 8.5 | 8.6 | 7.8 | 9.0 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | 2 | 1 | < 1 | < 1 |
| Water Soluble Sulphate (Soil Equivalent) | g/l | 0.0025 | MCERTS | 0.37 | 0.29 | 0.25 | 0.055 | 0.54 |
| Water Soluble Sulphate as $SO_4$ (2:1) | mg/kg | 2.5 | MCERTS | 370 | 290 | 250 | 55 | 540 |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | 0.18 | 0.15 | 0.13 | 0.027 | 0.27 |
| Sulphide | mg/kg | 1 | MCERTS | 1.1 | 81 | 11 | < 1.0 | 9.8 |
| Organic Matter | % | 0.1 | MCERTS | 2.9 | 2.7 | 1.7 | 1.0 | 2.3 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.70 | 0.59 | 0.63 | < 0.05 | 0.24 |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 3.4 | 1.9 | 4.0 | < 0.10 | 1.8 |
| Acenaphthene | mg/kg | 0.1 | MCERTS | 23 | 2.2 | 3.0 | < 0.10 | 1.9 |
| Fluorene | mg/kg | 0.1 | MCERTS | 22 | 2.5 | 5.0 | < 0.10 | 2.6 |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 190 | 30 | 41 | 0.21 | 21 |
| Anthracene | mg/kg | 0.1 | MCERTS | 53 | 6.0 | 12 | < 0.10 | 6.8 |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 300 | 76 | 73 | 0.54 | 45 |
| Pyrene | mg/kg | 0.1 | MCERTS | 230 | 63 | 61 | 0.48 | 38 |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 130 | 41 | 32 | 0.27 | 24 |
| Chrysene | mg/kg | 0.05 | MCERTS | 100 | 33 | 30 | 0.31 | 18 |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 110 | 46 | 34 | 0.28 | 28 |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 56 | 20 | 12 | 0.15 | 9.1 |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 91 | 37 | 26 | 0.24 | 21 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 50 | 23 | 15 | < 0.10 | 13 |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 11 | 4.4 | 3.0 | < 0.10 | 3.0 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 57 | 24 | 17 | < 0.05 | 15 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 1430 | 411 | 369 | 2.48 | 248 |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458152 | 458153 | 458154 | 458155 | 458156 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MWS1 | MWS2 | MWS2 | MWS4 | MWS6 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.40-1.70 | 0.40-0.60 | 2.50-2.80 | 0.30-0.50 | 0.30-0.50 |
| Date Sampled | | | | 18/06/2015 | 18/06/2015 | 18/06/2015 | 18/06/2015 | 18/06/2015 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 10 | 10 | 14 | 23 | 16 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | 0.8 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 29 | 35 | 64 | 26 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 150 | 31 | 47 | 4.0 | 48 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 68 | 340 | 110 | 23 | 150 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | 0.5 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 24 | 20 | 56 | 52 | 26 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | 1.9 | < 1.0 | < 1.0 | < 1.0 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 78 | 120 | 170 | 66 | 370 |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 1.2 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 35 | 3.6 | 3.1 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | 62 | 11 | < 8.0 | < 8.0 | 8.2 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 120 | 51 | 29 | < 8.0 | 45 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 220 | 66 | 32 | < 10 | 54 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | 1.5 | 1.7 | 2.1 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 380 | 30 | 38 | < 2.0 | 22 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 2200 | 470 | 340 | < 10 | 250 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 2500 | 1200 | 550 | 12 | 490 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 5000 | 1700 | 930 | 12 | 760 |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458157 | 458158 | 458159 | | |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MWS6 | MWS7 | MWS7 | | |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | | |
| Depth (m) | | | | 1.00-1.50 | 1.00-1.40 | 3.50-3.80 | | |
| Date Sampled | | | | 18/06/2015 | 18/06/2015 | 18/06/2015 | | |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | | |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | | |
| Moisture Content | % | N/A | NONE | 18 | 15 | 19 | | |
| Total mass of sample received | kg | 0.001 | NONE | 1.2 | 1.1 | 1.1 | | |
| Asbestos in Soil Screen / Identification Name | Type | N/A | ISO 17025 | - | - | - | | |
| Asbestos in Soil | Type | N/A | ISO 17025 | - | - | - | | |
| Asbestos Quantification | % | 0.001 | ISO 17025 | - | - | - | | |
| **General Inorganics** | | | | | | | | |
| pH | pH Units | N/A | MCERTS | 7.9 | 8.1 | 7.8 | | |
| Total Cyanide | mg/kg | 1 | MCERTS | 2 | < 1 | < 1 | | |
| Water Soluble Sulphate (Soil Equivalent) | g/l | 0.0025 | MCERTS | 3.5 | 0.16 | 0.95 | | |
| Water Soluble Sulphate as $SO_4$ (2:1) | mg/kg | 2.5 | MCERTS | 3500 | 160 | 950 | | |
| Water Soluble SO4 (BRE SD 2:1 Leach Equivalent) | g/l | 0.00125 | MCERTS | 1.8 | 0.080 | 0.47 | | |
| Sulphide | mg/kg | 1 | MCERTS | 1.1 | < 1.0 | 3.9 | | |
| Organic Matter | % | 0.1 | MCERTS | 1.5 | 1.2 | 2.4 | | |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | 0.11 | < 0.05 | < 0.05 | | |
| Acenaphthylene | mg/kg | 0.1 | MCERTS | 0.52 | < 0.10 | 0.23 | | |
| Acenaphthene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | < 0.10 | | |
| Fluorene | mg/kg | 0.1 | MCERTS | < 0.10 | < 0.10 | < 0.10 | | |
| Phenanthrene | mg/kg | 0.1 | MCERTS | 1.9 | 1.3 | 1.1 | | |
| Anthracene | mg/kg | 0.1 | MCERTS | 0.53 | 0.34 | 0.30 | | |
| Fluoranthene | mg/kg | 0.1 | MCERTS | 7.4 | 2.7 | 4.3 | | |
| Pyrene | mg/kg | 0.1 | MCERTS | 6.4 | 2.2 | 3.7 | | |
| Benzo(a)anthracene | mg/kg | 0.1 | MCERTS | 3.7 | 1.2 | 1.7 | | |
| Chrysene | mg/kg | 0.05 | MCERTS | 4.8 | 1.1 | 2.7 | | |
| Benzo(b)fluoranthene | mg/kg | 0.1 | MCERTS | 5.3 | 0.84 | 2.6 | | |
| Benzo(k)fluoranthene | mg/kg | 0.1 | MCERTS | 3.7 | 0.51 | 1.3 | | |
| Benzo(a)pyrene | mg/kg | 0.1 | MCERTS | 4.7 | 0.63 | 1.9 | | |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.1 | MCERTS | 3.1 | 0.30 | 1.3 | | |
| Dibenz(a,h)anthracene | mg/kg | 0.1 | MCERTS | 0.78 | < 0.10 | 0.23 | | |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | 3.2 | 0.43 | 1.6 | | |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 1.6 | MCERTS | 46.1 | 11.4 | 23.0 | | |

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Your Order No: 15-S2-FDO-LABS**

| Lab Sample Number | | | | 458157 | 458158 | 458159 | | |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | MWS6 | MWS7 | MWS7 | | |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | | |
| Depth (m) | | | | 1.00-1.50 | 1.00-1.40 | 3.50-3.80 | | |
| Date Sampled | | | | 18/06/2015 | 18/06/2015 | 18/06/2015 | | |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | | |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 | 8.7 | 16 | | |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 1.1 | < 0.2 | < 0.2 | | |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | | |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 27 | 25 | 34 | | |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 40 | 8.6 | 36 | | |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 840 | 39 | 73 | | |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | 0.6 | < 0.3 | < 0.3 | | |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 21 | 26 | | |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 1200 | 55 | 75 | | |
| **Monoaromatics** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | | |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | | |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | | |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | 9.5 | < 8.0 | < 8.0 | | |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | | |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | | |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | 1.5 | < 1.0 | | |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | 2.7 | 5.4 | < 2.0 | | |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | 33 | 22 | 23 | | |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | 97 | 32 | 62 | | |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | 130 | 62 | 85 | | |

**Analytical Report Number:** 15-74167
**Project / Site name:** Princes Parade , Hythe
**Your Order No:** 15-S2-FDO-LABS

# Certificate of Analysis - Asbestos Quantification

## Methods:

### Qualitative Analysis

The samples were analysed qualitatively for asbestos by polarising light and dispersion staining as described by the Health and Safety Executive in HSG 248.

### Quantitative Analysis

"The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

Any material greater than 16mm is considered as Bulk sample and reported separately, asbestos content (if any) is not included in the final Quantitative analysis. The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.
Both Qualitative and Quantitative Analyses are UKAS accredited.

| Sample Number | Sample ID | Sample Depth (m) | Sample Weight (g) | Asbestos Containing Material Types Detected (ACM) | PLM Results | Asbestos by hand picking/weighing (%) | Total % Asbestos in Sample |
|---|---|---|---|---|---|---|---|
| **458146** | MTP3 | 0.30-0.50 | 115 | Insulation Lagging & Loose Fibres | **Amosite & Chrysotile** | 0.002 | **0.002** |
| **458148** | MTP4 | 0.90-1.00 | 103 | Insulation Board/Tile & Loose Fibres | **Amosite & Chrysotile** | 0.015 | **0.015** |
| **458151** | MWS1 | 0.40-0.50 | 127 | Loose Fibres | **Amosite** | < 0.001 | **< 0.001** |

Opinions and interpretations expressed herein are outside the scope of UKAS accreditatior

**Analytical Report Number: 15-74167**

**Project / Site name: Princes Parade , Hythe**

| **Lab Sample Number** | | | | 458160 | 458161 | | | |
|---|---|---|---|---|---|---|---|---|
| **Sample Reference** | | | | MTP2 | MTP5 | | | |
| **Sample Number** | | | | None Supplied | None Supplied | | | |
| **Depth (m)** | | | | 0.40 | 0.60 | | | |
| **Date Sampled** | | | | 17/06/2015 | 17/06/2015 | | | |
| **Time Taken** | | | | None Supplied | None Supplied | | | |
| **Analytical Parameter (Bulk Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| Asbestos Identification Name | Type | N/A | ISO 17025 | Chrysotile-Hard/cement type material | Chrysotile-Hard/cement type material | | | |

**Analytical Report Number : 15-74167**

**Project / Site name: Princes Parade , Hythe**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 458142 | MTP1 | None Supplied | 0.30-0.40 | Beige loam and sand with gravel and vegetation. |
| 458143 | MTP1 | None Supplied | 1.00-1.20 | Beige loam and sand with gravel and vegetation. |
| 458144 | MTP2 | None Supplied | 0.20-0.40 | Beige loam and sand with gravel and vegetation. |
| 458145 | MTP2 | None Supplied | 1.90-2.00 | Beige loam and sand with gravel and vegetation. |
| 458146 | MTP3 | None Supplied | 0.30-0.50 | Beige loam and sand with gravel and vegetation. |
| 458147 | MTP3 | None Supplied | 2.00-2.50 | Beige loam and sand with gravel and vegetation. |
| 458148 | MTP4 | None Supplied | 0.90-1.00 | Beige loam and sand with gravel and vegetation. |
| 458149 | MTP5 | None Supplied | 0.40-0.60 | Beige loam and sand with gravel and vegetation. |
| 458150 | MTP5 | None Supplied | 1.50 | Beige loam and sand with gravel and vegetation. |
| 458151 | MWS1 | None Supplied | 0.40-0.50 | Beige loam and sand with gravel and vegetation. |
| 458152 | MWS1 | None Supplied | 1.40-1.70 | Beige loam and sand with gravel and vegetation. |
| 458153 | MWS2 | None Supplied | 0.40-0.60 | Beige loam and sand with gravel and vegetation. |
| 458154 | MWS2 | None Supplied | 2.50-2.80 | Beige loam and sand with gravel and vegetation. |
| 458155 | MWS4 | None Supplied | 0.30-0.50 | Beige loam and sand with gravel and vegetation. |
| 458156 | MWS6 | None Supplied | 0.30-0.50 | Beige loam and sand with gravel and vegetation. |
| 458157 | MWS6 | None Supplied | 1.00-1.50 | Beige loam and sand with gravel and vegetation. |
| 458158 | MWS7 | None Supplied | 1.00-1.40 | Beige loam and sand with gravel and vegetation. |
| 458159 | MWS7 | None Supplied | 3.50-3.80 | Beige loam and sand with gravel and vegetation. |

**Analytical Report Number : 15-74167**

**Project / Site name: Princes Parade , Hythe**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in Bulks | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques. | In house method based on HSG 248 | A001-PL | W | ISO 17025 |
| Asbestos Quantification | The analysis was carried out using documented in-house method based on references. | HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft). | A006 | D | ISO 17025 |
| BTEX and MTBE in soil | Determination of BTEX in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073S-PL | W | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | MCERTS |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| Organic matter in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L023-PL | D | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L099-PL | D | MCERTS |
| Speciated EPA-16 PAHs in soil | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270 | L064-PL | D | MCERTS |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight. | In-house method based on British Standard Methods and MCERTS requirements. | L019-UK/PL | D | NONE |
| Sulphate, water soluble, in soil | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES. | L038-PL | D | MCERTS |
| Sulphide in soil | Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode. | In-house method | L010-PL | D | MCERTS |
| Total cyanide in soil | Determination of total cyanide by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | MCERTS |
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method | L076-PL | W | MCERTS |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**
**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**

**APPENDIX 5**

- Field Monitoring Records
- Groundwater Level Data
- Hazardous Soil Gas Data

| Location Reference | Time | Flow and Pressure Measurements | | | | Gas Measurements | | | | | | | | VOC Measurements | | | | Dip Measurements | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Flow | | Atmospheric Pressure | Differential Pressure | Methane | Methane LEL | Carbon Dioxide | Oxygen | Carbon Monoxide | Hydrogen Sulphide | Hydrogen Sulphide Live Zero | Hydrogen Sulphide Actual | Hexane | PID Compensation Factor | PID | PID Actual | Depth to Water | Depth to Base |
| | | max | steady | | | | | | | | | | | | | | | | |
| | | l hr$^{-1}$ | | mb | Pa | % | % | % | % | ppm | ppm | ppm | ppm | % | units | ppm | ppm | m | m |
| MWS1 | - | 0.0 | 0.0 | 1021 | - | 0.0 | 0.0 | 9.3 | 14.2 | 0 | 0 | 0 | 0 | 0.007 | 1.0 | - | nr | Dry | 4.05 |
| MWS4 | - | 0.0 | 0.0 | 1022 | - | 0.0 | 0.0 | 3.7 | 16.3 | 0 | 0 | 0 | 0 | 0.017 | 1.0 | - | nr | Dry | 3.95 |
| MWS6 | - | 0.0 | 0.0 | 1022 | - | 0.0 | 0.0 | 2.1 | 18.4 | 0 | 0 | 0 | 0 | 0.007 | 1.0 | - | nr | Dry | 4.04 |
| MWS7 | - | 0.0 | 0.0 | 1022 | - | 0.0 | 0.0 | 1.0 | 20.5 | 0 | 0 | 0 | 0 | 0.011 | 1.0 | - | nr | Dry | 4.08 |
| - | - | - | - | - | - | - | - | - | - | - | - | 0 | nr | - | - | - | nr | - | - |
| - | - | - | - | - | - | - | - | - | - | - | - | 0 | nr | - | - | - | nr | - | - |
| - | - | - | - | - | - | - | - | - | - | - | - | 0 | nr | - | - | - | nr | - | - |

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# Princes Parade, Hythe

## Utilities Assessment

On behalf of **Shepway District Council**

Project Ref: 37470/2501 | Rev: A | Date: June 2016

Office Address: Calgarth House, 39-41 Bank Street, Ashford TN23 1DQ
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## Document Control Sheet

**Project Name:** **Princes Parade, Hythe**
**Project Ref:** **37470/2501**
**Report Title:** **Utilities Assessment**
**Date:** **June 2016**

| | Name | Position | Signature | Date |
|---|---|---|---|---|
| Prepared by: | [redacted] | Technician | [redacted] | 30/06/16 |
| Reviewed by: | [redacted] | Associate | | 30/06/16 |
| Approved by: | [redacted] | Partner | | 30/06/16 |
| **For and on behalf of Peter Brett Associates LLP** | | | | |

| Revision | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| - | 07/06/16 | Draft Issue | MW | TH | TW |
| A | 30/06/16 | Final Issue | MW | TH | TW |

# Contents



# Tables



# Appendices

# 1 Introduction

## 1.1 Foreword

Peter Brett Associates LLP has been commissioned by Shepway District Council to undertake a high level Utilities Assessment for land at Princes Parade in Hythe. The site covers an area of approximately 10.9 hectares and is proposed for a mixed use development comprising approximately 150 residential units, 4 restaurants/bars/cafes, 4 retail units/kiosks and a leisure centre.

The site is located along the seafront in Hythe, bounded to the south by Princes Parade and to the north by the Royal Military Canal, The site is centred at approximate National Grid Reference TR182347 and is mainly undeveloped, with a car park and a playground at the eastern end. Records also show a pumping station located within the car park.

A site boundary plan can be found within Appendix A of this report.

A copy of the proposed development layout current at the date of this assessment is attached in Appendix B.

Existing utility infrastructure within and adjacent to the proposed development is presented on PBA's drawing number 37470/2501/001 within Appendix C. This information has been taken from existing asset records provided to us by Shepway District Council.

## 1.2 Scope of Works

This assessment aims to achieve the following: -

- Liaise with all utility suppliers providing services within the proposed development zone.
- Establish the nature, extent and location of any existing utility company distribution infrastructure relating to electricity, gas, telecommunication and water supply.
- Confirm with the utility suppliers the capacity of the existing infrastructure and the requirements for such infrastructure to be diverted, extended, adapted or renewed to cater for the proposed development, and the broad cost estimates.
- Advise the client of the need for any specialist surveys (e.g. network modelling requirements).

## 1.3 Basis of Report

This report has been compiled from correspondence received from the incumbent utility providers (electricity, gas, potable water, telecommunications and foul drainage) with regard to new utility supplies.

A high level desk top study and review of existing utility services information has been completed to identify constraints to the proposed development, and to establish the need for any diversions and protections to the incumbent utility services to accommodate redevelopment.

## 1.4 Requested Loads

Capacity checks were requested from the incumbent distribution network operators in March 2016.

Anticipated loads for this high level assessment have been calculated based upon a representative development quantum as described in the Foreword above. It is expected that the exact development quantum may fluctuate, but this is unlikely to have any significant overall impact on the strategic delivery of utility services to this site.

Table 1: Calculated Utility Loads

| Utility | Energy Demand |
|---|---|
| Electricity | 1,052 kW (with gas heating) |
| Gas | 2,094 kWh peak (6,565 MWh annual) |
| Potable Water | 11.82 l/s peak flow (117.13$m^3$/day) |
| Foul Drainage | 6.94 l/s peak flow for the whole site |

# 2 Contacts Directory

Table 2: Statutory Undertakers Contacts Directory

| Title | Address | Contact Details |
|---|---|---|
| Electricity | UK Power Networks<br>Bircholt Road<br>Park Wood<br>Maidstone<br>Kent<br>ME15 9XH | Tel: 01622 352160 |
| Gas | Southern Gas Networks<br>St Lawrence House<br>Station Approach<br>Horley<br>Surrey<br>RH6 9HJ | Tel: 01293 818143 |
| Potable Water | Affinity Water<br>Developer Services<br>Tamblin Way<br>Hatfield<br>Hertfordshire<br>AL10 9EZ | Tel: 0345 357 2428 |
| Foul Drainage | Southern Water<br>Developer Services<br>Southern House<br>Sparrowgrove<br>Otterbourne<br>Hampshire, SO21 2SW | Tel: 0330 303 0119 |
| Telecommunications | Openreach: Repayments<br>PP B402<br>Becket House<br>4-6 New Dover Road<br>Canterbury<br>Kent CT1 3BB | Email: networkalts.canterbury@openreach.co.uk |

# 3 Utility Infrastructure

## 3.1 Electricity

The incumbent electricity provider is UK Power Networks (UKPN).

A summary of the infrastructure likely to be affected by the proposed development is outlined below.

### 3.1.1 Existing Infrastructure

UKPN records show two existing LV supplies entering the site from the east, connecting to a kiosk and a pumping station within the car park.

The nearest low voltage (LV) and high voltage (HV) networks are located to the north of the site in Seabrook Road.

### 3.1.2 Network Modifications

The existing supplies to the site are likely to be affected by the proposed development, and may require disconnecting or relocating.

### 3.1.3 Network Capacity

It is estimated that the electricity demand for the proposed development would be approximately 1MVA based on gas heated units.

Off-site reinforcement is not envisaged at this stage, but this would be determined by a network assessment at formal quotation stage.

### 3.1.4 New Infrastructure

UKPN has provided a budget estimate of £300,000 exc. VAT to supply the site from their existing 11kV network in Seabrook Road, which includes a new 11kV circuit and two new on-site substations.

A copy of this estimate is included in Appendix D of this report.

### 3.1.5 Legal Tenure (Wayleaves / Easements)

Where electricity lines are to be installed in private land UKPN will require an easement in perpetuity for its electric lines, and in the case of electrical plant the freehold interest in the substation site, on UK Power Network terms, without charge and before any work commences.

Each GRP substation will require a footprint area of 4m x 4m (5m x 5m for a brick built enclosure), and will require provision for 24-hour access directly from the public highway.

### 3.1.6 Financial Considerations

*Procurement Options*

The estimated electricity demand proposed for this development would be of sufficient scale to encourage an "out of area" licensed Distribution Network Operator (DNO) to establish an

embedded system within the incumbent's licensed area and alternative quotations could be procured.

*Contestable / Non Contestable Work*

All new electricity infrastructure from the point of connection to the existing network to the point of metered supply will generally fall under the "contestable" heading allowing "self lay" as an optional procurement route.

All modifications and diversions of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider.

Generally, building and civils work in association is considered to be a contestable element in terms of both new and diversionary work.

A detailed review of the electricity scope of work offered by UK Power Networks should be undertaken once a formal connection offer and quotation has been received.

## 3.2 Gas Infrastructure

The incumbent gas provider is Southern Gas Networks (SGN).

A summary of the infrastructure likely to be affected by the proposed development is outlined below.

### 3.2.1 Existing Infrastructure

SGN records show low pressure (LP) and medium pressure (MP) mains located to the north of the canal and in the carriageway of Seabrook Road to the north of the site. There are no mains or existing services shown within the site boundary.

### 3.2.2 Network Modifications

There are no gas mains shown within or along the site boundary and therefore no diversionary works are anticipated.

### 3.2.3 Network Capacity

It is estimated that a peak hourly demand of approximately 2,094 kWh and an annual demand of approximately 6,565,262 kWh will be required to serve the development.

SGN has not advised of any constraints in their existing network; however, on submission of a formal application they would run further network analysis in order to determine sufficient capacity to serve the new development or whether off-site reinforcement would be required.

### 3.2.4 New Infrastructure

SGN has provided a budget estimate of £192,000 exc. VAT to supply the proposed development, with a point of connection to their existing 8" cast iron (CI) LP main located in Seabrook Road to the north of the site.

A copy of this estimate is included in Appendix D.

### 3.2.5 Financial Considerations

*Contestable / Non Contestable Work*

All new gas infrastructure from the pressure reducing station (PRS) (if applicable) or connection point to the metered supply will generally fall under the "contestable" heading allowing self-lay as an optional procurement route.

All modifications and diversions of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider.

Generally, builder's work associated with the installation is considered to be a contestable element of both new and diversionary work.

## 3.3 Potable Water

The incumbent water provider is Affinity Water (AW).

A summary of the infrastructure likely to be affected by the proposed development is outlined below.

### 3.3.1 Existing Infrastructure

Affinity Water records show an 8" water main running along the northern site boundary, adjacent to the canal.

### 3.3.2 Network Modifications

There are no water mains shown within site boundary and the main along the northern boundary does not appear to be affected by the proposed layout. Therefore no diversionary works are anticipated at this stage.

### 3.3.3 Network Capacity

The estimated peak flow for the proposed development is 11.82/s (117.13$m^3$/day).

AW has advised that there is currently sufficient capacity within their existing network to serve the proposed development and that off-site reinforcement works should not be required to accommodate the estimated demand.

### 3.3.4 New Infrastructure

AW has provided a budget estimate to install a new 125mm HPPE main through the middle of the site, connecting to their existing 8" main along the northern site boundary in order to supply the proposed development.

The estimated cost to supply the proposed development is as follows:

| | |
|---|---|
| Off-site reinforcement | Nil |
| On-site mains (775m of 125mm main) | £100,750* |
| Standard connection charge (£400 per connection) | £ 60,000 |
| Infrastructure charge (£354 per connection) | £ 53,100 |

* AW estimate a developer contribution of 20% of this figure

A copy of this estimate is included in Appendix D.

#### 3.3.5 Financial Considerations

*Procurement Options*

The client (developer) will be required to submit a formal requisition to Affinity Water for potable water supply, under the terms of Section 41 of the Water Industry Act.

*Contestable / Non Contestable Work*

All modifications and diversion of existing apparatus generally fall under a "non-contestable" banner, which must remain under the direct control of the incumbent provider.

Generally, builder's work in association is considered to be a contestable element of both new and diversionary work.

Provision of the offsite works is contestable as a self-lay option.

## 3.4 Telecommunications Infrastructure

A summary of the BT Openreach infrastructure likely to be affected by the proposed development is outlined below.

#### 3.4.1 Existing Infrastructure

BT records show existing underground and overhead lines located to the north of the canal and in the built up areas off of Seabrook Road.

#### 3.4.2 Network Modifications

There is no BT apparatus shown within or around the site boundary, and therefore no diversionary works are anticipated.

#### 3.4.3 Network Capacity

There are no issues with capacity; BT have an obligation to serve new developments with both telecoms and broadband services.

#### 3.4.4 New Infrastructure

It is normal practise for BT to free issue materials for the developer to install, and a rebate of approximately £50/flat and £135/house may apply.

BT Openreach do not provide design proposals prior to planning; they require a design fee to produce a detailed design and estimate, and this can be applied for following outline planning consent and once the detailed technical drawings are prepared.

## 3.5 Cable

#### 3.5.1 Existing Infrastructure

Virgin Media has infrastructure located within both footways of Seabrook Road to the north of the site.

#### 3.5.2 Network Modifications

There is no Virgin Media apparatus shown within or around the site boundary, and therefore no diversionary works are anticipated.

## 3.6 Foul Drainage

### 3.6.1 Existing Infrastructure

Southern Water (SW) sewer network records show a combined rising main running within the site, adjacent to the southern site boundary.

At the far eastern end of the site there is a small surface water sewer shown outfalling to the sea.

### 3.6.2 Network Modifications

According to Southern Water's records the combined sewer runs underneath the footprint of the development buildings shown on the current proposed layout, and is therefore likely to require diverting.

### 3.6.3 Network Capacity

A Level 2 Foul Sewer Capacity Check has been carried out by Southern Water, this has identified insufficient capacity within their existing network to accommodate the proposed foul flow from the development.

SW have identified a point of connection to their existing sewer (the Seabrook SPS rising main) to the south-west of the site in Princes Parade. They propose to install a 160m length of 1400mm main and three new manholes to reinforce the existing network; connected to the existing sewer between MH2401 and MH3501, and connecting back into the original sewer at MH4501. We estimate a budget cost of £224,000 for these works.

Capacity Check Results and a plan showing the proposed reinforcement works can be found in Appendix D of this report. It would be normal to further develop and clarify the extent of these works with Southern Water.

## 3.7 Summary of Budget Estimates

The following utility allowances have been determined via a desktop study based on early and limited information and are offered on the basis that they are broad in nature and for "guidance purposes" only. Should the site progress, PBA would be pleased to procure firm prices and provide a best value utility strategy for the development in which various market discounts may apply from competitive utility infrastructure providers.

Table 3: Summary of Budget Estimates

| | | |
|---|---|---|
| Electricity (UK Power Networks) | Diversions<br>New infrastructure | £ -<br>£ 300,000 |
| Gas (Southern Gas Networks) | Diversions<br>New infrastructure | £ -<br>£ 192,000 |
| Water (Affinity Water)<br><br>* Estimated developer contribution of 20% for on-site mains | Diversions<br>Off-site reinforcement<br>New on-site mains<br>New service connections<br>Infrastructure charges | £ -<br>£ -<br>£ 100,750*<br>£ 60,000<br>£ 53,100 |
| Telecoms (BT) | Diversions<br>New infrastructure | £ -<br>£ - |
| Cable (Virgin Media) | Diversions | £ - |
| Foul Drainage (Southern Water) | Diversions<br>New infrastructure | TBC<br>TBC |

*Note: All prices exclude professional/local authority fees*

# 4 Programme

The programme timescales below are provided for guidance only.

A defined Masterplan will be required to allow detailed estimates to be prepared.

Table 4: Programme Timescales

| | | |
|---|---|---|
| Electricity | Produce firm price<br>Lead in for planning / allocation of materials and labour | 6 weeks<br>8 weeks |
| Gas | Produce firm price<br>Lead in for planning / allocation of materials and labour<br>Lead in for high pressure gas main | 4 weeks<br>6 weeks<br>18 months |
| Water | Produce firm price<br>Lead in for planning / allocation of materials and labour | 6 weeks<br>8 weeks |
| Telecom | Produce firm price<br>Lead in for planning / allocation of materials and labour | 4 weeks<br>4 weeks |
| Foul Drainage | Section 98 requisition<br>Section 104 / Section 106 | 8 months<br>2 months |

# 5 Conclusion

This report shows that there is existing electricity, gas, water and telecom infrastructure within the vicinity of the site that could serve the proposed development. At this stage no off-site reinforcement works have been identified, but further detailed assessments would be carried out by the utilities upon submission of a formal application with an agreed site layout and accommodation schedule.

The existing foul sewer system has insufficient capacity to accommodate the proposed foul flow, and off-site reinforcement works will be required.

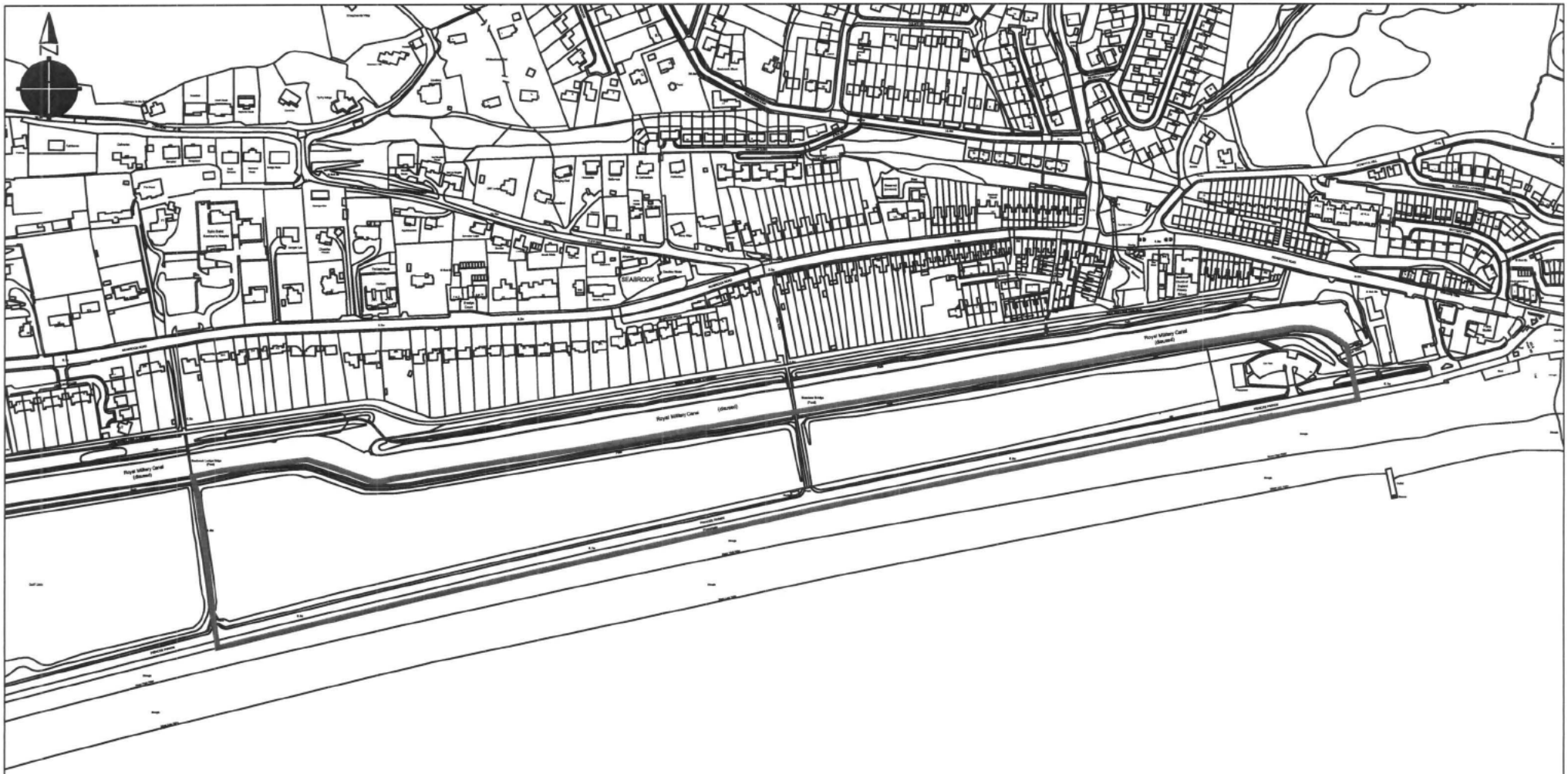
The combined sewer running within the site may require diverting to accommodate the proposed development layout; this would be determined upon submission of an application and an agreed site layout to Southern Water.

The enquiries to the incumbent utility providers to date have been based on direct connection to each unit and will be subject to formal application following planning consent.

New supplies within the site will generally be routed along proposed road corridors. The requirements for easement agreements for supplies located outside of the proposed highway will need to be agreed with the relevant statutory undertaker as part of the design process.

**PBA can design and procure firm prices for new utility infrastructure in which various market discounts may apply. We manage this within the context of the wider infrastructure layout to provide a coherent, coordinated and programme sensitive approach.**

# Appendix A Site Location




Folkestone
Hythe & Romney Marsh
Shepway District Council
www.shepway.gov.uk

Shepway District Council
Strategic Development Team,
Civic Centre, Castle Hill Avenue,
Folkestone, Kent,
CT20 2QY
Tel: 01303 853000



| Scale | Drawing Number | Rev |
|---|---|---|
| 1:5000 | 2015/LV/001 | 00 |

ORIGINAL DRAWING SIZE A4

Project

**Hythe Pool Feasibility**

Drawing Title

**Site option 1 - Princes Parade**

| Revision | | | |
|---|---|---|---|
| 00 | Drawn | LS | First issue |
| | Checked | AJ | |
| | Approved | AJ | |
| | Date | 03/09/15 | |
| Revision | Drawn | | |
| | Checked | | |
| | Approved | | |
| | Date | | |

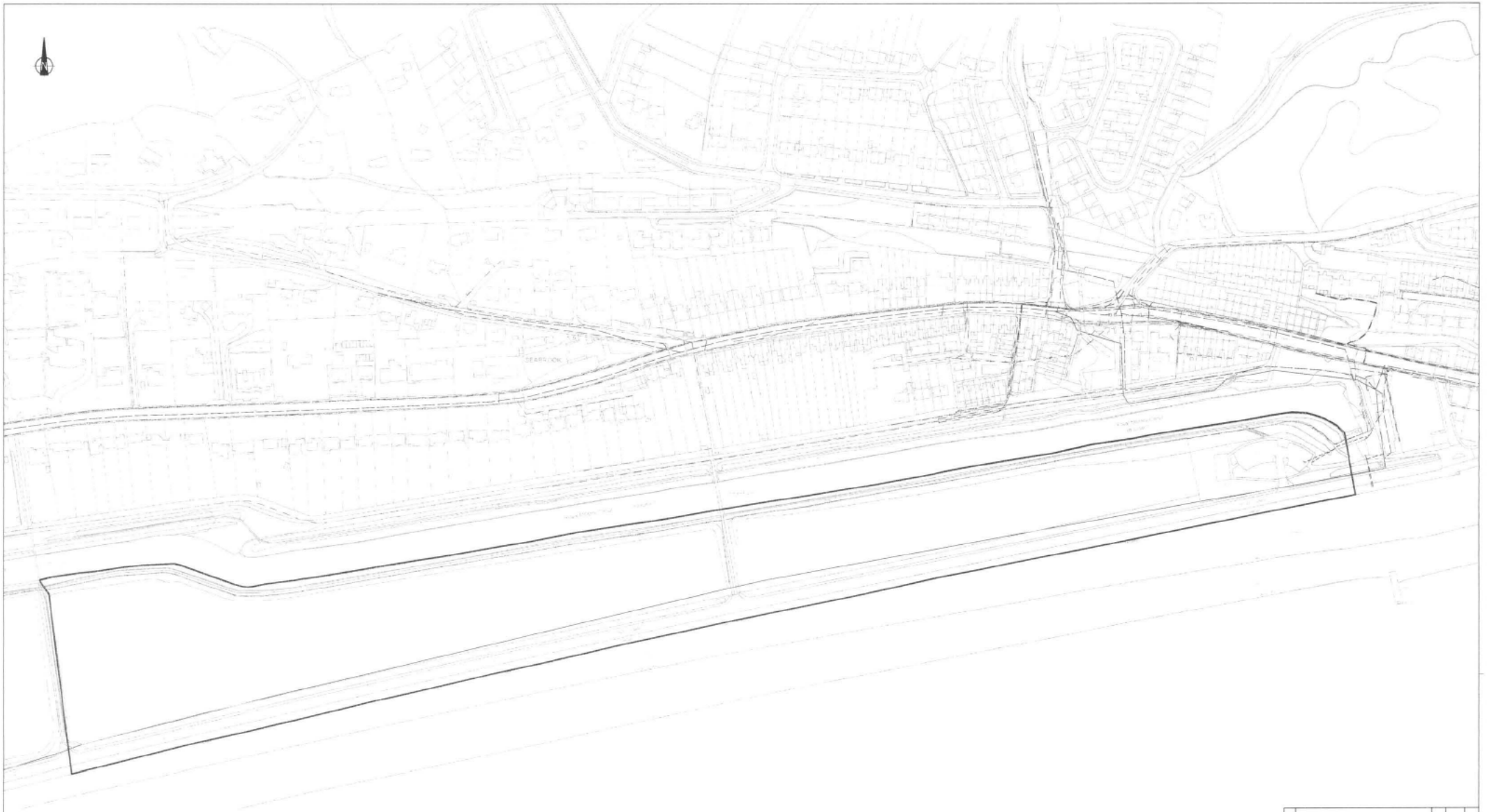
# Appendix B Proposed Development Layout


Development shows 148 units:
92 Flats
56 Houses

Lee Evans Partnership

Proposed Development of Prince's Parade
Sketch Layout of Possible Housing Scheme

# Appendix C Existing Utilities Layout



KEY

- SITE BOUNDARY
- EXISTING ELECTRICITY (LV)
- EXISTING ELECTRICITY (HV)
- EXISTING ELECTRICITY (33kV)
- EXISTING GAS (LP)
- EXISTING GAS (MP)
- EXISTING WATER
- EXISTING BT
- EXISTING BT OVERHEAD
- EXISTING VIRGIN MEDIA
- EXISTING SURFACE WATER SEWER
- EXISTING FOUL SEWER
- EXISTING COMBINED SEWER
- EXISTING COMBINED RISING MAIN



| Mark | Revision | Drawn | Date | Chkd |
|---|---|---|---|---|
| A | APPROVED FOR ISSUE FOR INFORMATION | MW | 20.06.18 | TH |

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also exist which is not shown. The Contractor is responsible for making his own investigations where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR INFORMATION

PRINCES PARADE
HYTHE

EXISTING SERVICES LAYOUT

Client
SHEPWAY DISTRICT COUNCIL

| Date of 1st issue | Drawn by |
|---|---|
| 07.06.18 | MW |
| AO Scale | Checked by |
| 1:1000 | |

Drawing Number: 37470/2501/001
Revision: A

pba peterbrett
Offices throughout the UK and Europe
www.peterbrett.com

# Appendix D Correspondence

Registered Office:
Newington House
237 Southwark Bridge Road London
SE1 6NP

Registered in England and Wales
No: 3870728

Company:
UK Power Networks (Operations) Limited

Peter Brett Associates LLP
Calgarth House
39-41 Bank Street
Ashford
TN23 1DQ

FAO
[redacted]

18/3/2016

Our Ref: 8500029873

Dear [redacted]

**Site Address: Princes Parade, Hythe**

Thank you for your recent enquiry regarding the above premises. I am writing to you on behalf of South Eastern Power Networks PLC the licensed distributor of electricity for the above address trading as UK Power Networks.

I am pleased to be able to provide you with a budget estimate for the work.
It is important to note that this budget estimate is intended as a guide only. It has been carried out without a site visit. No enquiry has been made as to the availability of consent or the existence of any ground conditions that may affect the ground works. It is not an offer to provide the connection and nor does it reserve any capacity on UK Power Networks electricity distribution system.

**1.Budget estimate:**

The budget estimation for the cost of this work is : £300,000.00 (exclusive of VAT). Please see the attached plot for details.

If you would like to proceed to a formal offer of connection then you should apply for a quotation. Please refer to our website https://www.ukpowernetworks.co.uk/internet/en/help-and-advice/documents/the_connection_process.pdf for "The Connection Process" which details our application process. To help our progress of any future enquiry as quickly as possible please quote the UK Power Networks Reference Number from this letter in all correspondence.

This budget estimate is based on the following assumptions:

- The most appropriate Point of Connection (POC) is as described above.
- A viable road cable route exists along the route we have assumed between the Point of Connection (POC) and the substation(s) required on your site. 100 metres of 2 x 11 kV cable laid in the road from the POC to site. 830 metres of 11 kV cable laid on site to the two substations. 13 blocks of flats. 58 houses.

Two complexes of commercial/flats above, one supply to each, 400 Amps, 285 kVA.

- In cases where the Point of Connection (POC) is to be at High Voltage, that a substation(s) can be located on your premises at or close to the position we have drawn on the attached plan.
- Where electric lines are to be installed in private land UK Power Networks will require an easement in perpetuity for its electric lines and in the case of electrical plant the freehold interest in the substation site, on UK Power Networks terms, without charge and before any work commences.
- You will carry out, at no charge to UK Power Networks, all the civil works within the site boundary, including substation bases, substation buildings where applicable and the excavation/reinstatement of cable trenches , including the supply and laying of cable ducts.
- Unless stated in your application, all loads are assumed to be of a resistive nature. Should you intend to install equipment that may cause disturbances on UK Power Networks' electricity distribution system (e.g. motors; welders; etc.) this may affect the estimate considerably.
- All UK Power Networks' work is to be carried out as a continuous programme of work that can be completed substantially within 12 months from the acceptance of the formal offer.

Please note that if any of the assumptions prove to be incorrect, this may have a significant impact on the price in any subsequent quotation. You should note also that UK Power Networks' formal connection offer may vary considerably from the budget estimate. If you place reliance upon the budget estimate for budgeting or other planning purposes, you do so at your own risk.

If you would like to proceed to a formal offer of connection then you should apply for a quotation, Please refer to our website https://www.ukpowernetworks.co.uk/internet/en/help-and-advice/documents/the_connection_process.pdf for '**The Connection Process**' which details our application process. To help our progress any future enquiry as quickly as possible please quote the UK Power Networks Reference Number from this letter on all correspondence.

If you have any questions about your budget estimation or need more information please do not hesitate to contact me. The best time to call is between 9am to 4pm, Wednesday to Friday.
If I am unavailable or engaged on another call when you ring, you can leave a message with another member of staff. I will call you back as soon as I am free.

Your feedback is important to us, and we would be grateful if you would complete a short questionnaire to tell us about the service that you have received in relation to this Budget Estimate. The customer relations team do contact a small number of customers by telephone as well. You can remain anonymous if you prefer when you provide this feedback. Please follow this link to complete the survey; it will take you only a few minutes. Thank you in advance for your help.

I will call you in a couple of days to ensure that you have received the Estimate and that it has met all of your requirements, however if you have any questions in the meantime please contact me.

Yours sincerely

[redacted]

[redacted],

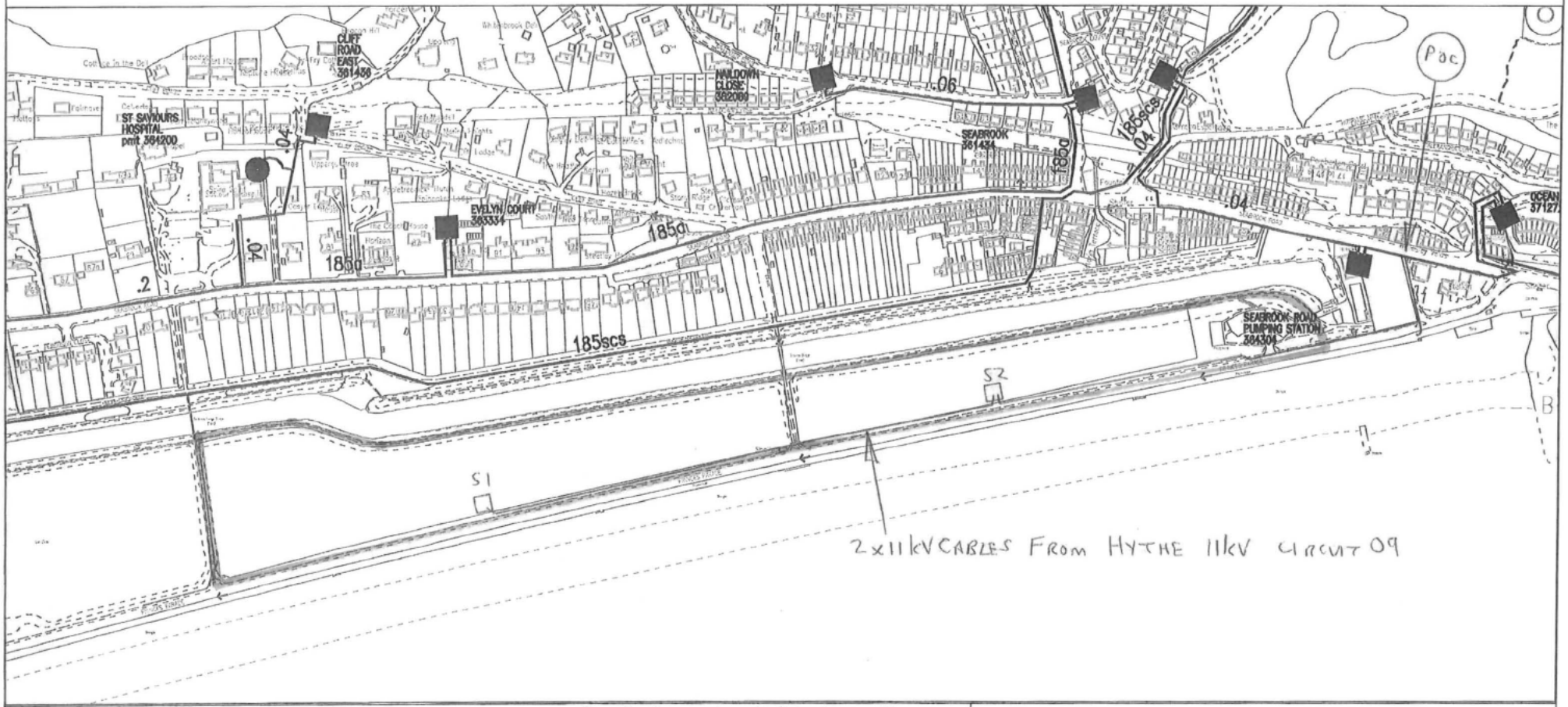
Senior Designer,

[redacted]

Title: Prices Parade, Hythe

JOB NO: 850 002 9873

STANDARD PLOT




0m 100m 200m 300m 400m 500m

The quality and accuracy of any print will depend on your printer, your computer and its print settings. Measurements scaled from this plan may not match measurements between the same points on the ground.

Grid Ref: TR 18326 34843

Scale: 1:5000

(When Plotted at A4)

Plotted on: 18/03/2016

Plotted by: Bob, Alexander

UK Power Networks

LV Cable or Line

HV Cable or Line

EHV Cable or Line
Approx. position

Ductline

Pole & Street Furniture

Substation & Link Box

1. The position of the apparatus shown on this drawing is believed to be correct but the original landmarks may have been altered since the apparatus was installed.
2. The exact position of the apparatus should be verified – use approved cable avoidance tools prior to excavation using suitable hand tools.
3. It is essential that trial holes are carefully made avoiding the use of mechanical tools or picks until the exact location of all cables have been determined.
4. It must be assumed that each property and item of street furniture has an electricity supply. Service cables shown only where known.
6. All cables must be treated as being live unless proved otherwise by UK Power Networks.
6. The information provided must be given to all people working near UK Power Networks plant & equipment. Do not use plans more than 3 months after the issue date for excavation purposes.
7. Please be aware that electric cables/lines belonging to other owners of licensed electricity distribution systems may be present and it is your responsibility to identify their location.

1. UK Power Networks does not warrant that the information provided to you is correct. You rely upon it at your own risk.
2. UK Power Networks does not exclude or limit its liability if it causes the death of any person or causes personal injury to a person where such death or personal injury is caused by its negligence.
3. Subject to paragraph 2 UK Power Networks has no liability to you in contract, in tort (including negligence), for breach of statutory duty or otherwise for any loss, damage, cost, claims, demands, or expenses that you or any third party may suffer or incur as a result of using the information provided whether for physical damage to property or for any economic loss (including without limitation loss of profit, loss of opportunity, loss of savings, loss of goodwill, loss of business, loss of use) or any special or consequential loss or damage whatsoever.
4. This plan has been provided to you on the basis of the terms of use set out in the covering letter that accompanies this plan. If you do not accept and/or do not understand the terms of use set out in the covering letter you must not use the plan and you must return it to the sender of the letter.
5. You are responsible for the security of the information provided to you. It must not be given, sold or made available upon payment of a fee to a third party.

## Plan Provision

CHECK IT OUT BEFORE YOU DIG IT OUT
CALL 0800 056 5866
EMERGENCY– If you damage a cable or line
Phone 0800 096 3766 (24hrs) URGENTLY

LOOK OUT LOOK UP

ALWAYS LOOK UP BEFORE YOU START WORK
Refer to HSE Guidance note GS6

VISITING AN OPEN POINT? Please mark on this plan all locations visited and open points as found, then return updated map to your Business Unit – Thank You.

Contact UK Power Networks on 0800 056 5866 for details of EHV Cable routes before commencing work.

Maps produced at 1:2500 scale are LV Geo-Schematics which show LV mains cables and overhead lines (in some cases all voltages). Prior to carrying out excavations you must refer to the 1:500 records to determine the location of all known underground plant and equipment.

SGN Connections

1 April 2016

Our Ref: 1126065
Your Ref: N/A

SGN Connections
St Lawrence House
Station Approach
Horley
Surrey
RH6 9HJ

Customer Service **0800 912 1700***

[redacted]
Calgarth House 39-41
Bank Street
Ashford
Kent
TN23 1DQ

Dear [redacted]

**New connection at Princess Parade, Seabrook Grove, Hythe, Kent, CT21 5QZ**

Thank you for choosing us to give you a budget indication for a new connection at the above site, and please find our detailed quote below.

**Work to be carried out**
SGN Connections to connect to the existing 8" CI LP main in Seabrook Road and install appropriately sized gas infrastructure to the suitable locations. SGN Connections to carry out all the necessary excavation and reinstatement work up to the site boundary.
No meter/meter housing work is included.

**Your budget indication is £192,000 (excluding VAT)**

Please note that this figure is a budget indication only, based on the information you've given us, and doesn't represent an offer to carry out the work.

We won't be able to give you a more accurate quote until a full design study has been carried out, and there's a charge for this. We'll be able to tell you how much the study will be once you ask us for a firm quote.

We're assuming no easements or third party permissions are required to carry out the work.

Please note that this budget indication doesn't allow for any diversion of our existing infrastructure if we find it's necessary. You can get further detail on this by calling SGN Diversions/Isolations on 0800 912 1722.

If you have any further questions, please feel free to contact me on the number at the top of this letter.

Yours sincerely

[redacted]
Technical Assistant

* All calls are recorded and may be monitored

Affinity Water
Your local supply, on tap

Developer Services
Affinity Water
Tamblin Way
Hatfield
Hertfordshire
AL10 9EZ

Tel: 0345 357 2428
E-Mail: ds@affinitywater.co.uk

14th April 2016

**Scheme No: NC48643**

[redacted]
Peter Brett Associates LLP
Calgarth House
39-41 Bank Street
Ashford
TN23 1DQ

FAO: [redacted]

Dear [redacted]

**Re: Request for a Budget Price for Water Infrastructure at Princes Parade, Hythe CT21 5QZ**

We are pleased to enclose this information in response to your request for a budget estimate to supply your development. As there is no scaled site layout plan with the layout of the properties, this is an indicative budget.

**Your Budget**

| Item | Excavation | Approx. Unit Cost | Approx. Scope | Budget Price | Estimated Contribution |
|---|---|---|---|---|---|
| Onsite (development) water mains | Not included | £130/m | 775m of 125mm HPPE | **£100,750** | **20%** |
| Onsite (development) service connections | Not included | £400 ea | 150 | **£60,000** | **100%** |
| Onsite large diameter (>63mm) services | Not included | £3,000 ea | | **N/A** | **100%** |
| Off Site (in public Highway) (>63mm) services | **Included** | £4000 | N/A | **N/A** | **100%** |
| Offsite water mains laying (e.g. reinforcement) | **Included** | £270/m | N/A | **N/A** | **100%** |
| Offsite (in public highway) Service connections | **Not included** | £2000 ea | N/A. | **N/A** | **100%** |

**Please note the cost information provided in this letter is for budgetary purposes only and is subject to change.**

The developer's contribution for onsite water mains is usually much less than the cost of installation. This is in accordance with the legislation set out by the Water Industry Act 1991 for the recovery of water company costs. The contribution varies significantly from scheme to scheme but **typically ranges from 10 – 30%**. It is not possible to give a more accurate figure without a full water mains requisition, so we would advise using a contribution figure of 30%.

In addition to the above, the following items may be required and **have not been included in the above budget estimate**:

- Infrastructure charges (refer to Affinity Water's current Charges Scheme);
- Traffic management costs (charges vary considerably between Local Authorities);
- Service connections to the existing network, e.g. show home supplies to water mains in the public highway (where Affinity Water is to excavate and reinstate);
- Disconnections of existing water mains and / or service pipes;
- Building water charges and Value Added Tax.

Please note that the cost information provided is an estimate and the actual costs may differ significantly. Detailed design (including full hydraulic analysis to size the water pipes, consultation with statutory bodies, e.g. fire brigades, and local authorities to establish traffic management requirements) and costs are supplied to the developer on correct completion of the appropriate application form(s), available on our website.

**Summary**

We enclose a record plan which shows the approximate positions of our existing water main distribution network in the vicinity of your development. This plan will help give you an indication of the likely connection points to serve your proposed development.

Our budgetary analysis considers whether your development requires any of the following:

- Onsite works: **new water mains**
- Onsite works: **new service connections**
- Onsite works: **large diameter service connections** (greater than 63mm diameter)
- Offsite works: **diversion** of existing assets
- Offsite works: **reinforcement** (upgrade) of the existing network
- Offsite works: **new service connections**

**Onsite works**

**New onsite water mains** laid in High Density Polyethylene (HPDE) up to 180mm outside diameter are typically **£130 per linear metre** where the following conditions are met:

- The trenches for the new water mains are fully excavated by the developer in accordance with the Affinity trench specification (enclosed);
- Other onsite utilities are laid in accordance with NJUG regulations, maintaining the necessary access to the new water mains and safe distances from other utilities.

The approximate scope of works is based on the information you supplied with your budget request. We have indicated our proposal for onsite mains on the record plan enclosed.

For developments with complex proposals, we strongly suggest you complete a full mains requisition to allow us to review in detail and schedule a meeting to discuss your needs.

**New onsite service connections** with an inline meter in Medium Density Polyethylene (MDPE) up to 32mm outside diameter are approximately **£400 each** where the following conditions are met:

- The supply pipe is laid to the correct depth in the material specified by us;
- The trench for the communication pipe is fully excavated by the developer;
- The distance between the property boundary and water main is less than 10 metres;
- The connection point to the onsite water main is exposed by the developer.

Infrastructure charges are be due on new service connections. Please check our website for the current infrastructure charge (search for Affinity Water's Charges Scheme).

## Onsite works: Large diameter service connections

Some types of developments require larger supplies, for example blocks of flats or offices, hospitals, industrial units or a new hotel. The approximate cost of a **single large diameter connection is £3,000**.

Infrastructure charges due on large diameter service connections for commercial premises are calculated using the Relevant Multiplier method, set out in our Charges Scheme. Please note that infrastructure charges are not included in the budget costs in this letter.

## Offsite works

Where our assessment indicates that **diversion and / or reinforcement of the existing water mains network** is required to support your development, mains laid in High Density Polyethylene (HPDE) up to 180mm outside diameter are typically **£270 per linear metre** (including all excavation and reinstatement) where the following conditions are met:

- All works in the public highway (not A roads or motorways);
- Other utilities do not prevent access to the existing network (laid in accordance with NJUG).

The decision to undertake offsite works to support development activity is not taken lightly. The costs for the works are directly proportional to the extra demand required, i.e. we do not charge the developer for anything not related to his development. A basic hydraulic study is undertaken to assess the existing capacity of the network and is considered in our budget cost provided on Page 1 of this letter.

Where offsite reinforcement or diversions are required, it is because at least one of the following criteria applies:

- The existing network as currently sized is not capable of supporting any additional properties.
- The proposed development has a detrimental effect on the water supply to our existing customers.
- The development site proposed is on top of an existing asset and needs to be moved.
- New fittings (valves, washouts etc) are required to enable the connection to the new development to be made.

We would ask you to appreciate that the closest water main to your development may not be the most appropriate main to connect into, and at budget stage we cannot guarantee which main will be used. On receipt of a full mains requisition, we will undertake detailed analysis to identify the most cost effective option for your development; taking into account the above points as well as traffic management requirements.

**New offsite service connections** with an inline meter in Medium Density Polyethylene (MDPE) up to 32mm outside diameter are approximately **£2000 each** where the following conditions are met:

- The supply pipe is laid to the correct depth in the material specified by us to the boundary of the private land;
- The distance between the property boundary and water main is less than 10 metres;

Infrastructure charges are be due on new service connections. Please check our website for the current infrastructure charge (search for Affinity Water's Charges Scheme).

## Offsite works: Large diameter service connections

Some types of developments require larger supplies, for example blocks of flats or offices, hospitals, industrial units or a new hotel. The approximate cost of a **single large diameter connection is £4,000 (for bulk supplies with internal meters for flats of 12 or more please allow an extra charge for installing the meter of £82.33 for each property)**.
Infrastructure charges due on large diameter service connections for commercial premises are calculated using the Relevant Multiplier method, set out in our Charges Scheme. Please note that infrastructure charges are not included in the budget costs in this letter.

## Other useful information

We have provided the cost information in good faith for your budgetary purposes.

Costs will increase when:

- Working in contaminated ground as a barrier pipe is required to protect water quality. Installations in barrier pipe are typically 30 – 50% more expensive than HDPE pipe.

- Larger diameter pipes (>180mm) are required (whether on and / or offsite), as the excavation is greater and the cost of the materials/fittings increases.
- Affinity Water is required to excavate and reinstate onsite works.
- Above ground asset reinforcement is required (e.g. a booster or new reservoir).

We require completion of the appropriate application form(s) and submission of supporting documentation to provide more accurate costs. Please note we cannot proceed if the application form is incomplete and you should estimate items such as loading units and build rates if the actual figures are currently unknown to you.

The start of mains and service connections works on your site is dependent upon our current programme of works, although every effort will be made to accommodate your timetable. It should be noted that construction in the public highway is governed by statutory regulation and under certain circumstances commencement of offsite works may be delayed by up to three months from the receipt of your payment to gain permission from the Local Authority.

If you need any further advice please do not hesitate to contact us.

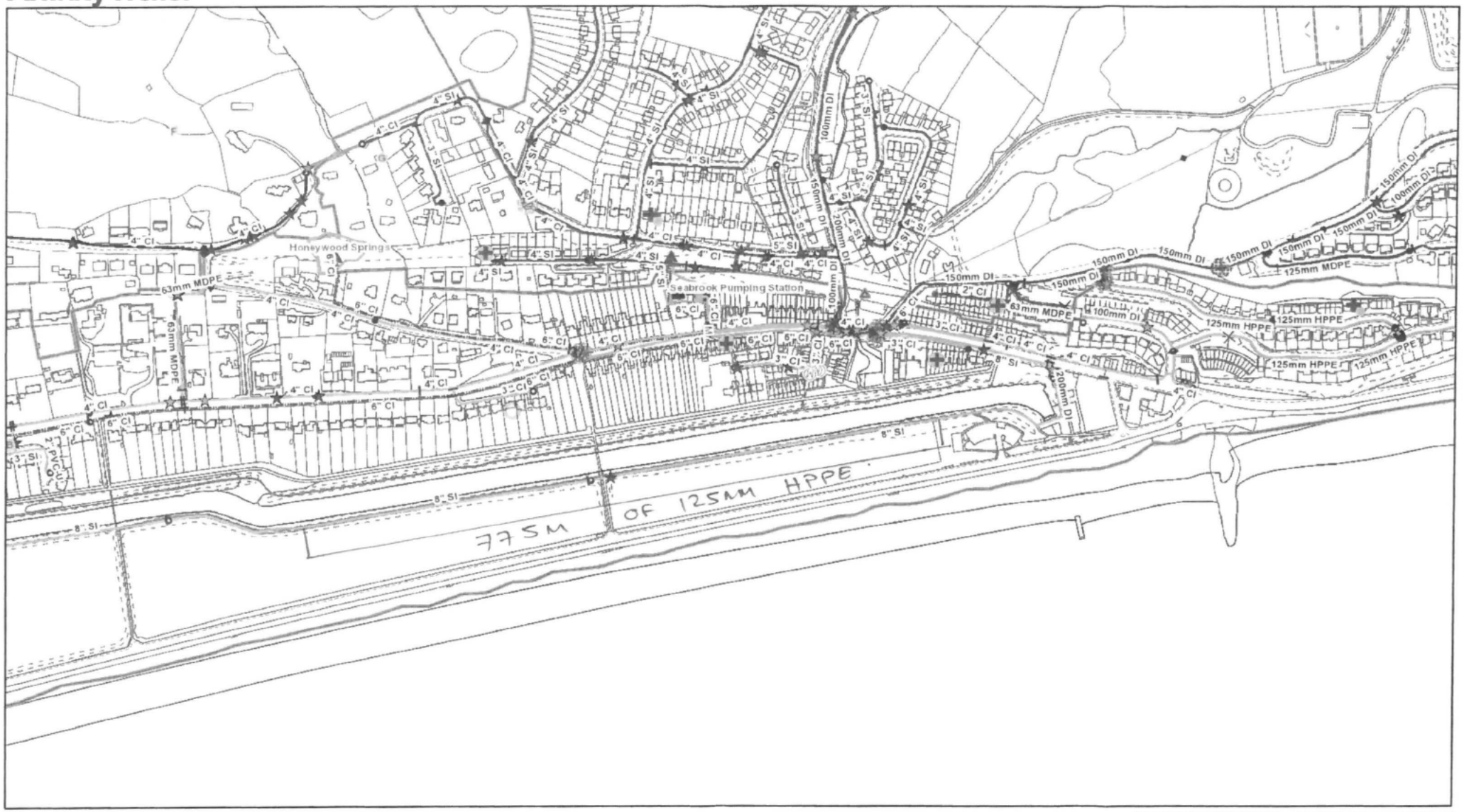
Yours Sincerely,

[redacted]

[redacted]
**Project Manager, Developer Services**

Affinity Water

# NC48643 - Princes Parade





Affinity Water, Tamblin Way, Hatfield, Hertfordshire, AL10 9EZ. Tel: 0845 782 3333 Web: www.affinitywater.co.uk

N

1:4,112

Map Centre

618,474,134,902

**Legend**

- Fire Hydrant
- Washout
- Open Valve
- Pressure Reducing Valve
- Closed Valve
- Air Valve
- Main
- Communication Pipe
- Supply Pipe
- District Meter Zone

Created by - JoblinC

Created on - 11/03/2016 14:38:19

Southern Water

# INFRASTRUCTURE ASSESSMENT FOR FOUL DRAINAGE AT

PRINCES PARADE,

HYTHE

KENT

CT21 5QZ

6th June 2016

REQUESTED:
PETER BRETT ASSOCIATES LLP

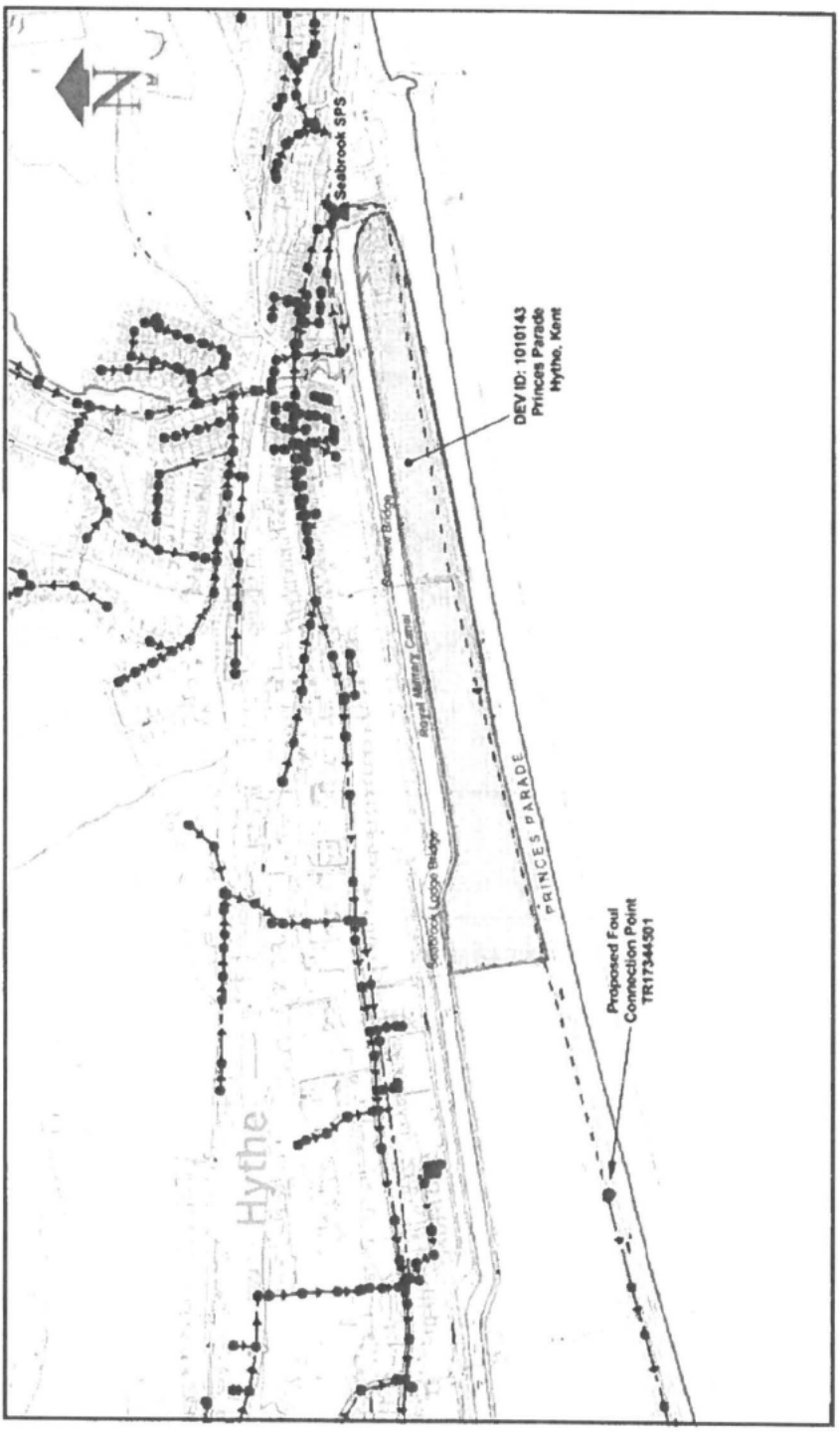
## Infrastructure Assessment for Foul Drainage at Princes Parade, Hythe, Kent

---

### I. Development Details:

The proposal is to discharge foul flow from the proposed development site to the local foul sewerage system at manhole (MH) TR17344501 off Princes Parade and surface water to a new outfall(s) to the Royal Military Canal (disused) or directly to the sea.

**Figure 1 - Proposed Development**



## II. Results and Conclusions:

### Foul Water:

There is currently inadequate capacity within the local foul sewerage network to accommodate the foul flow from the proposed development site at MH TR17344501. The proposed development would increase flows to the local network and as a result existing properties and land may be subject to a greater risk of flooding. Additional off-site sewers or improvements to existing sewers will be required to provide sufficient capacity to service the proposed development as indicated in Figure 2 and Table 2.

**Figure 2 - Proposed Improvement – Foul system**

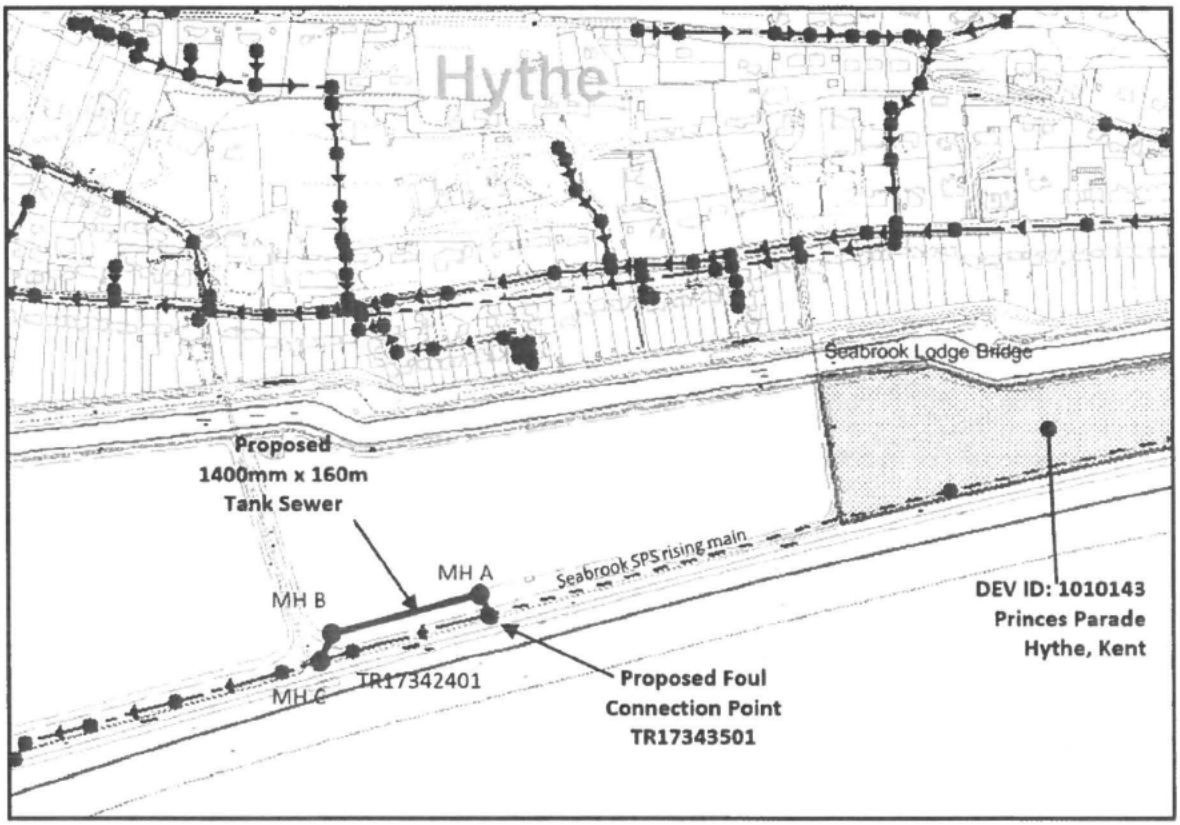



**Table 2 Proposed Improvements Schedule**

| Manhole | Manhole | Sewer Diameter (mm) | | Av. Depth (m) | Length (m) |
|---|---|---|---|---|---|
| | | Existing | Proposed | | |
| MH A | MH B | - | 1400 | 2.3 | 160 |

**Surface Water:**

There is no existing surface water network into which the proposed development can be drained.

Surface water may be discharged to the Royal Military Canal or directly to the sea via an appropriately designed surface water system through single or multiple outfalls subject to the approval of all interested parties.

Before any connections are made, an application form needs to be completed and approved by Southern Water Services.

Please note: The information provided above does not grant approval for any designs /drawings submitted for the capacity analysis. The results are an indicative hydraulic assessment and should not be used as a basis for design. The results quoted above are only valid for 12 months from the date of issue of this letter.

# PUBLIC SEWER RECORD

# SOUTHERN WATER

The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determined on site.



O.S. REF: TR1734NE

Scale: 1:2500

Sewer Plot

WARNING: BAC pipes are constructed of Bonded Asbestos Cement

WARNING: Unknown (UNK) materials may include Bonded Asbestos Cement

N

Printed By: sierrob

Southern Water MapGuide Browser

Requested By:
Sewer Record Extract

Southern Water

Date: 7-6-2016

## Wignall, Peter

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 01 August 2016 14:32
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer
**Attachments:** image001.png; image002.png; image003.png; image004.png

Hi [redacted]

Many thanks for the speedy and helpful response.

Let me speak to colleagues and I'll come back.

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]shepway.gov.uk
www.shepway.gov.uk

---

**From:** [redacted] [mailto[redacted]betteridge-milsom.co.uk]
**Sent:** 01 August 2016 14:29
**To:** [redacted]
**Subject:** RE: Princes Parade - Principle Designer

[redacted]

Further to your request below, please find attached our Principal Designer offering for the Princes Parade project.

The attached document provides our fee % for the services, a schedule of services (so that you can see our methodology), some information regarding our experience and a CV for our proposed member of staff. We have also included our standard terms and conditions. I would hope this would provide you with everything you need, but let me know otherwise.

In respect of providing a fee for preparing an initial cost plan report for the scheme, on the basis that this will require a number of meetings with the design team, followed by production of a RIBA Stage 2 cost plan report, our fee would be £6,000 (exc. VAT). We have previously carried out similar exercise for Canterbury City Council on a scheme which is procured under Scape, so are fully experienced in the process of this framework. I believe that they have found this to be a very important document, to help in controlling and monitoring the project budget expectations, as the scheme goes forward.

We would also be happy to meet to further discuss our specific experiences of Scape as client advisors, recently for KCC, CCC, and others.

If you have any queries, please do not hesitate to contact me.

Kindest regards,

[redacted] | BSc. MRICS
Director

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


**Celebrating 30 years 1986 - 2016**



---

**From:** [redacted]shepway.gov.uk [mailto:[redacted]shepway.gov.uk]
**Sent:** 26 July 2016 14:32
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Subject:** Princes Parade - Principle Designer

Hi [redacted]

As discussed, I've attached an outline brief for the scheme, and would be grateful if you could provide an indicative cost for the work.

As I mentioned, GT3 Architects have offered to provide this service (we don't know how much yet), but we wanted a reference point from a firm we have a working past with.

Best regards

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]shepway.gov.uk
www.shepway.gov.uk

## Wignall, Peter

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 30 August 2016 13:46
**To:** [redacted]
**Subject:** RE: Princes Parade - Initial Cost Plan
**Attachments:** image001.png; image002.png; image003.png; image004.png

Hi [redacted]

Understood – still waiting ☹

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]shepway.gov.uk
www.shepway.gov.uk

---

**From:** [redacted] [mailto[redacted]betteridge-milsom.co.uk]
**Sent:** 30 August 2016 12:48
**To:** [redacted]
**Subject:** RE: Princes Parade - Initial Cost Plan

[redacted]

I trust you are well. Just a quick note to say that if the GT3 information is available then we will be able to prepare cost plan during September, so if you can provide update, much appreciated.

Best wishes,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU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**From:** [redacted]shepway.gov.uk [mailto:[redacted]shepway.gov.uk]
**Sent:** 15 August 2016 11:05
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Subject:** RE: Princes Parade - Initial Cost Plan

[redacted]

I will, but we don't have it yet.

Will let you know.

Thanks

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]shepway.gov.uk
www.shepway.gov.uk

---

**From:** [redacted] [mailto[redacted]gannaway@betteridge-milsom.co.uk]
**Sent:** 15 August 2016 11:03
**To:** [redacted] [redacted]
**Subject:** RE: Princes Parade - Initial Cost Plan

[redacted]

I hope you are well. When we talked last you were awaiting scheme information from GT3, so we can then provide you with fixed fee for Cost Plan work etc.

If you can send over when you have available, then we will provide fee accordingly. As discussed, we would be able to carry out in September.

Best wishes,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E [redacted]@betteridge-milsom.co.uk

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The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


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**From:** [redacted]shepway.gov.uk [mailto[redacted]shepway.gov.uk]
**Sent:** 04 August 2016 10:15
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Subject:** Princes Parade - Initial Cost Plan

Hi [redacted]

Further to your quote for a PD, I thought you might like to think about quoting for an initial cost plan for the Leisure Centre too.

We expect a concept design from GT3 by the end of the week and I'll send that on when we get it – as I may have already mentioned, we have an internal deadline of early October: please indicate whether this would be feasible for you.

I've attached a general brief. We also have a geotechnical report if that would be useful.

Many thanks

[redacted]
Project Manager
Strategic Development Projects
Direct Dial: [redacted]
Mobile: [redacted]
Fax: [redacted]
Shepway District Council, Civic Centre,
Castle Hill Avenue, Folkestone, Kent, CT20 2QY
e:mail: [redacted]@shepway.gov.uk
www.shepway.gov.uk



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## Wignall, Peter

**From:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Sent:** 15 September 2016 14:58
**To:** [redacted]shepway.gov.uk
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** RE: Princes Parade development - Hythe
**Attachments:** image001.png; image002.png; image003.png; image004.png; image529000.png; image935001.png; image859002.png; image896003.png

[redacted]

9.30am on Monday is in my diary. See you then.

Kindest regards,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

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The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU

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**From:** [redacted]shepway.gov.uk [mailto[redacted]shepway.gov.uk]
**Sent:** 15 September 2016 13:02
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** RE: Princes Parade development - Hythe

[redacted]

Thank you for responding so quickly. Suggest we go for 9.30am on Monday.

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

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Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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---

**From:** [redacted] [mailto[redacted]@betteridge-milsom.co.uk]
**Sent:** 15 September 2016 12:14
**To:** [redacted]
**Cc:** [redacted]
**Subject:** RE: Princes Parade development - Hythe

[redacted]

Thank you for the email. Yes, I am sure we can assist, and regularly help put viability reports together. As well as the items mentioned below, I would imagine we can also give construction cost advice for other items.

Happy to come over and meet to discuss further; current availability next week as follows:-

- Monday 19th PM
- Tuesday 20th 9am – 10am
- Wednesday 21st 9am – 10am
- Thursday 22nd AM/PM
- Friday 23rd PM

If you want to let me know what suits.

Best wishes,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

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The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU

Celebrating 30 years 1986 - 2016



**From:** [redacted]shepway.gov.uk [mailto[redacted]shepway.gov.uk]
**Sent:** 15 September 2016 11:40
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** Princes Parade development - Hythe
**Importance:** High

Dear [redacted]

I am currently working with [redacted] on the Princes Parade project for which I understand Betteridge and Milsom are developing a cost plan for the Affordable Recreation Centre. In terms of the broader project we are in the process of considering two basic options (see attached). The first option retains the main access road along its current alignment, adjacent the seawall. The second option diverts the road around the northern boundary of the site, adjacent to the Royal Military Canal. There are a number of planning, commercial and community related pros and cons associated with both these options and we are aiming to be in position to select one of the options within the next week or so. In order to inform our thinking we have asked Savills to undertake some high level viability testing. We will need to feed into this some abnormal development costs in particular the cost of upgrading the existing road (option 1), the cost of realigning the existing road (option 2) and the cost of relocating the rising main currently located along the southern boundary of the site.

I would be grateful if you could let me if your company would be willing to undertake this work in which case I will arrange a time for myself and [redacted] to brief you.

Thanks

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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**Wignall, Peter**

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 19 September 2016 11:19
**To:** [redacted]
**Cc:** [redacted]
**Subject:** RE: RE: Princes Parade development - Hythe
**Attachments:** Utilities Assessment - Rev A Princes Parade Hythe.pdf; GEA-17436AI-15-193.pdf

[redacted]

Further to our discussion please find attached the following :-

- Utilities Assessment prepared by Peter Brett Associates
- Geo-environmental assessment prepared by IDOM Merbrook

I will also ask Tibbalds Planning and Urban Design to provide you with access to box.com which includes topographic data prepared by JC White

Regards

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

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**From:** [redacted] [mailto[redacted]betteridge-milsom.co.uk]
**Sent:** 15 September 2016 14:58
**To:** [redacted]shepway.gov.uk
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** RE: Princes Parade development - Hythe

[redacted]

9.30am on Monday is in my diary. See you then.

Kindest regards,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

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**From:** [redacted]shepway.gov.uk [mailto[redacted]shepway.gov.uk]
**Sent:** 15 September 2016 13:02
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** RE: Princes Parade development - Hythe

[redacted]

Thank you for responding so quickly. Suggest we go for 9.30am on Monday.

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

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---

**From:** [redacted] [mailto:[redacted]betteridge-milsom.co.uk]
**Sent:** 15 September 2016 12:14
**To:** [redacted]
**Cc:** [redacted]
**Subject:** RE: Princes Parade development - Hythe

[redacted]

Thank you for the email. Yes, I am sure we can assist, and regularly help put viability reports together. As well as the items mentioned below, I would imagine we can also give construction cost advice for other items.

Happy to come over and meet to discuss further; current availability next week as follows:-

- Monday 19th PM
- Tuesday 20th 9am – 10am
- Wednesday 21st 9am – 10am
- Thursday 22nd AM/PM
- Friday 23rd PM

If you want to let me know what suits.

Best wishes,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

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The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


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**From:** [redacted]shepway.gov.uk [mailto:[redacted]shepway.gov.uk]
**Sent:** 15 September 2016 11:40
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** Princes Parade development - Hythe
**Importance:** High

Dear [redacted]

I am currently working with [redacted] on the Princes Parade project for which I understand Betteridge and Milsom are developing a cost plan for the Affordable Recreation Centre. In terms of the broader project we are in the process of considering two basic options (see attached). The first option retains the main access road along its current alignment, adjacent the seawall. The second option diverts the road around the northern boundary of the site, adjacent to the Royal Military Canal. There are a number of planning, commercial and community related pros and cons associated with both these options and we are aiming to be in position to select one of the options within the next week or so. In order to inform our thinking we have asked Savills to undertake some high level viability testing. We will need to feed into this some abnormal development costs in particular the cost of upgrading the existing road (option 1), the cost of realigning the existing road (option 2) and the cost of relocating the rising main currently located along the southern boundary of the site.

I would be grateful if you could let me if your company would be willing to undertake this work in which case I will arrange a time for myself and [redacted] to brief you.

Thanks

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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**Wignall, Peter**

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 19 September 2016 11:26
**To:** [redacted]tibbalds.co.uk'
**Cc:** [redacted]
**Subject:** Princes Parade box.com

[redacted]

Grateful if you could provide the following with access to box.com

[redacted]
*Project Manager*
*Strategic Development Projects*
*e:mail:* [redacted]*shepway.gov.uk*

[redacted] | *BSc. MRICS*
*Director*
*Betteridge and Milsom*
*E:mail* [redacted]*betteridge-milsom.co.uk*

Thanks

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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## Wignall, Peter

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 23 September 2016 15:00
**To:** [redacted]
**Subject:** RE: 3375: Princes Parade - Combined Rising Main relocation
**Attachments:** SD00150.pdf

[redacted]

Purchase order attached.

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

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Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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---

**From:** [redacted] [mailto[redacted]betteridge-milsom.co.uk]
**Sent:** 23 September 2016 11:09
**To:** [redacted]
**Subject:** RE: 3375: Princes Parade - Combined Rising Main relocation

[redacted]

£500.00 (exc VAT) – I assume that is acceptable.

Thanks,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

# Betteridge & Milsom

The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU

**Celebrating 30 years 1986 - 2016**



**From:** [redacted]shepway.gov.uk [mailto:[redacted]shepway.gov.uk]
**Sent:** 23 September 2016 11:06
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Subject:** RE: 3375: Princes Parade - Combined Rising Main relocation

[redacted]

Thanks – Can you provide me a price for this work so that I can raise a purchase order.

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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---

**From:** [redacted] [mailto[redacted]betteridge-milsom.co.uk]
**Sent:** 23 September 2016 10:32
**To:** [redacted]
**Subject:** 3375: Princes Parade - Combined Rising Main relocation

[redacted]

Further to your instruction, please find attached our initial cost report to relocate the existing combined rising main into 1) existing Princes Parade and 2) new road. Option 2 incudes forming the new road, so you have a like for like comparison.

Figures are high level, and are based on limited information. We have excluded all other works, and have not included to remove the redundant pipe, as it does not affect comparison of options.

Obvious answer, but Option 2 more expensive as we have included forming a new road, unlike Option 1, where we are installing into existing.

FYI – we did not receive access to Tibbalds' information store, so have based in PBA report and plans.

Any queries, please do not hesitate to contact me (Can we have a Purchase Order to cover works please).

Kindest regards

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


Celebrating 30 years 1986 - 2016

# PURCHASE ORDER

**Purchase Order No: SD00147**

This order number must be quoted on all correspondence and invoices related to this order.

Purchase Order Date: 16/09/16

Page: 1 of 1

**Deliver To / Execute Work At**

PROPERTY & TECHNICAL SERVICES
SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
KENT
CT20 2QY

Folkestone
Hythe & Romney Marsh
Shepway District Council
www.shepway.gov.uk

**Supplier**

BETTERIDGE & MILSOM LTD
THE OLD BAKEHOUSE
18A IVY LANE
CANTERBURY
KENT Supplier Code:309193
CT1 1TU [redacted]@betteridge-milsom.co.uk

**Invoice and Payment**

SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
CT20 2QY
Email: invoices@shepway.gov.uk

**Enquiries To**

[redacted]

[redacted]@shepway.gov.uk

Tel: [redacted]

| Description | Required By | Qty | UOM | Unit Price | Nett Price |
|---|---|---|---|---|---|
| Provide outline cost plan for ARC centre, Princes Parade | 17/09/16 | | | | 1500.00 |

**Conditions of supply**

The terms and conditions of supply that apply to this purchase order can be found on the council's website.
Please go to http://www.shepway.gov.uk/your-council/council-information/payments-to-suppliers

**Total Value (Excl. VAT)** **1500.00**

# PURCHASE ORDER

**Purchase Order No: SD00150**

This order number must be quoted on all correspondence and invoices related to this order.

Purchase Order Date: 23/09/16

Page: 1 of 1

**Deliver To / Execute Work At**

PROPERTY & TECHNICAL SERVICES
SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
KENT
CT20 2QY

Folkestone
Hythe & Romney Marsh
Shepway District Council
www.shepway.gov.uk

**Supplier**

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CT1 1TU [redacted]@betteridge-milsom.co.uk

**Invoice and Payment**

SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
CT20 2QY
Email: invoices@shepway.gov.uk

**Enquiries To**

[redacted]

[redacted]@shepway.gov.uk

Tel: [redacted]

| Description | Required By | Qty | UOM | Unit Price | Nett Price |
|---|---|---|---|---|---|
| Outline costings for combined rising main and road alignment Princes Parade. | 24/09/16 | | | | 500.00 |

**Conditions of supply**

The terms and conditions of supply that apply to this purchase order can be found on the council's website.
Please go to http://www.shepway.gov.uk/your-council/council-information/payments-to-suppliers

**Total Value (Excl. VAT)** **500.00**

# INVOICE

**Betteridge & Milsom Ltd.**
**The Old Bakehouse**
**18A Ivy Lane**
**Canterbury**
**Kent CT1 1TU**

**Project Ref: 3375**
**Invoice No: 6334**
**Date: 27/09/2016**

VAT Reg No: 864 2061 34

**Shepway District Council**
**Civic Centre**
**Castle Hill Avenue**
**Folkestone**
**Kent**
**CT20 2QY**

invoices@shepway.gov.uk

Project: Princes Parade: Rising Main/Road Alignment

Comm No: Purchase Order SD00150

Services: Outline costings for combined rising main and road alignment

Agreed Fee: as PO dated 23rd September 2016

| | | |
|---|---|---|
| Value of Work | £ | - |
| Fee % | | 0.00% |
| Total fee | £ | 500.00 |

| Works Carried out to date: | Fee Split | | To Date | | £ |
|---|---|---|---|---|---|
| RIBA Stage 2: Concept Design | 0% | £ 500.00 | 100% | work complete | 500.00 |
| RIBA Stage 3: Developed Design | 0% | £ - | 0% | | - |
| RIBA Stage 4: Technical Design | 0% | £ - | 0% | | - |
| RIBA Stage 5: Construction | 0% | £ - | 0% | | - |
| RIBA Stage 6: Use & Handover | 0% | £ - | 0% | | - |
| | | £ 500.00 | | | |

| | | | | |
|---|---|---|---|---|
| **Total costs to date** | | | | **500.00** |
| Less Previous Invoice No | N/A | dated | N/A | - |
| Total due excluding VAT | | | | 500.00 |
| VAT @ 20% | | | | 100.00 |
| **Total Due including VAT** | | | | **£ 600.00** |

Payment terms strictly 30 days
Payments by BACS to: Natwest Bank Plc, Account No: 90632257, Sort code: 60-04-27

**Princes Parade, Hythe**

**Review on Combined Rising Main Costs**
**For Options 1 & 2**

**B&M Ref: 3375**

## 1.00 Introduction

**Actions**

1.01 Betteridge & Milsom have been appointed to prepare a review of costs for the Combined Sewer Drain diversion, for Options 1 and 2 of the Princes Parade scheme, in Hythe.

1.02 Options 1 & 2 refer to draft sketch plans prepared by Tibbalds and detailed on four drawings dated 12th September 2016.

1.03 The two scheme options are:

1 – Retention of road alignment as existing
2 – New road alignment to the North of the site

## 2.00 Scope of Cost Assessment

2.01 According to Southern Water's records, the combined sewer runs underneath the footprint of the development buildings shown on the current proposed layout, and is therefore likely to require diverting.

2.02 This cost assessment is solely to compare the cost of diversion of the combined drainage sewer, currently running along the side of Princes Parade.

2.03 This report also does not include any other costs associated with the scheme, for example site wide land remediation, including contaminants, ground water and ground gas remediation; external works; hard/soft landscaping; new drainage provision (see below); or new incoming utility provision.

2.04 It should be noted that a Level 2 Foul Sewer Capacity Check has been carried out by Southern Water, which has identified insufficient capacity within their existing network, to accommodate the proposed flow from the development. Cost for this network upgrade has been budget estimated by Peter Brett Associates as circa £224,000; this cost is not included in our diversion cost calculations.

2.05 It should also be noted that there is no existing surface water network (other than the combined sewer), therefore an appropriate designed surface water system will be required for the development, which is not included in these costs.

## 3.00 Information Used

3.01 The following information has been provided to Betteridge & Milsom and used in our assessment of costs:-

- Tibbalds draft scheme plans and sections (Options 1 & 2) dated 12th September 2016
- Peter Brett Associates' Utility Assessment (Rev A) dated June 2016: specifically
  - PBA drawing 37470/2501/001 Rev A: Existing Services Layout
  - Southern Water foul drainage report dated 6th June 2016
- Idom Merebrook Geo-Environmental Assessment dated July 2015

3.02 We have attached a mark up of the proposed site scheme, showing the extent of the new combined sewer for both options.

(2)

## 4.00 Qualifications/Exclusions

4.01 The costs detailed below are budget figures based on likely costs. The costs are current, without allowance for inflation. Costs exclude fees, surveys, licences, professional fee costs, legal costs and VAT.

4.02 The costs also exclude the removal of the existing combined sewer pipe, as the cost will be identical for either option, and therefore not relevant in terms of option choice.

## 5.00 Option Costs

5.01 Option 1 – Retention of road alignment as existing

5.01a We have assumed for this option that the existing Princes Parade will be closed as part of the overall development, prior to any works taking place to re-align the combined pumped main.

5.01b We have calculated that there is approximately 1075m of new pipe required, from the East end of the site (Seapoint Centre end) to the West end. See attached marked up drawing for extent of pipe. We have assumed that new manhole connections are required at junction with existing runs.

5.01c The budget cost estimate is as follows:-

| Item | Quant | Rate | Cost |
|---|---|---|---|
| New Rising Main pipe; comprising Machine excavation grade bottom, earthwork support, bed and surround, laying and jointing pipes; granular backfill and compact; dispose of excavated material; | | | |
| say 1200mm diameter pipe | [redacted] | [redacted] | [redacted] |
| Extra over for disposal of excavated material (contaminated sub-soil) | [redacted] | [redacted] | [redacted] |
| Manholes and connections to existing system | [redacted] | [redacted] | [redacted] |
| Base course and binder coarse to trench | [redacted] | [redacted] | [redacted] |
| Forming traffic calming along existing Princes Parade road | [redacted] | [redacted] | [redacted] |
| Reinstatement of road surface; including | | | |

| | |
|---|---|
| preparation works; line markings | [redacted] |
| Total Works Cost | [redacted] |
| Main Contractor Preliminaries and Overheads/Profit | [redacted] |
| Total Contract Estimate (Budget) | [redacted] |
| **Say £** | [redacted] |

5.01d It should be noted that these costs include the reinstatement of the existing Princes Parade.

5.02 Option 2 – New road alignment to the North of the site

5.02a We have assumed for this option that the new main will follow the line of the new road formed within the development boundary, with connections into the main route at each end. Similarly, to Option 1, we assume that road closures are required whilst works are carried out on the existing Princes Parade.

5.02b We have calculated that there is approximately 1155m of new pipe required, which includes a number of road intersections.

5.02c We have also allowed for forming the new Princes Parade road to allow like for like comparison of the options. The

5.02d The budget cost estimate is as follows:-

| **Item** | **Quant** | **Rate** | **Cost** |
|---|---|---|---|
| New Rising Main pipe; comprising Machine excavation grade bottom, earthwork support, bed and surround, laying and jointing pipes; granular backfill and compact; dispose of excavated material; | | | |
| say 1200mm diameter pipe | [redacted] | | |
| Extra over for disposal of excavated material (contaminated sub-soil) | [redacted] | | |
| Manholes and connections to existing system | [redacted] | | |

| | |
|---|---|
| Manholes within line of new run; | |
| additional for orientation | [redacted] |
| Formation of new Princes Parade road to the North of the site: including traffic | |
| calming, kerbing and street lighting | [redacted] |
| Extra over for disposal of excavated | |
| material (contaminated sub-soil) | [redacted] |
| Reinstatement of road surface; including | |
| preparation works; line markings (at ends) | [redacted] |
| Total Works Cost | [redacted] |
| Main Contractor Preliminaries and Overheads/Profit | [redacted] |
| Total Contract Estimate (Budget) | [redacted] |
| | [redacted] |

## 6.00 Conclusion

6.01 It can be seen from above that Option 1 (Retention of Road Alignment as Existing) is more cost effective than Option 2 (New Road Alignment). In the main this is due to the additional length of the required new main, but also the fact that a new road is being formed, rather than re-using the existing.

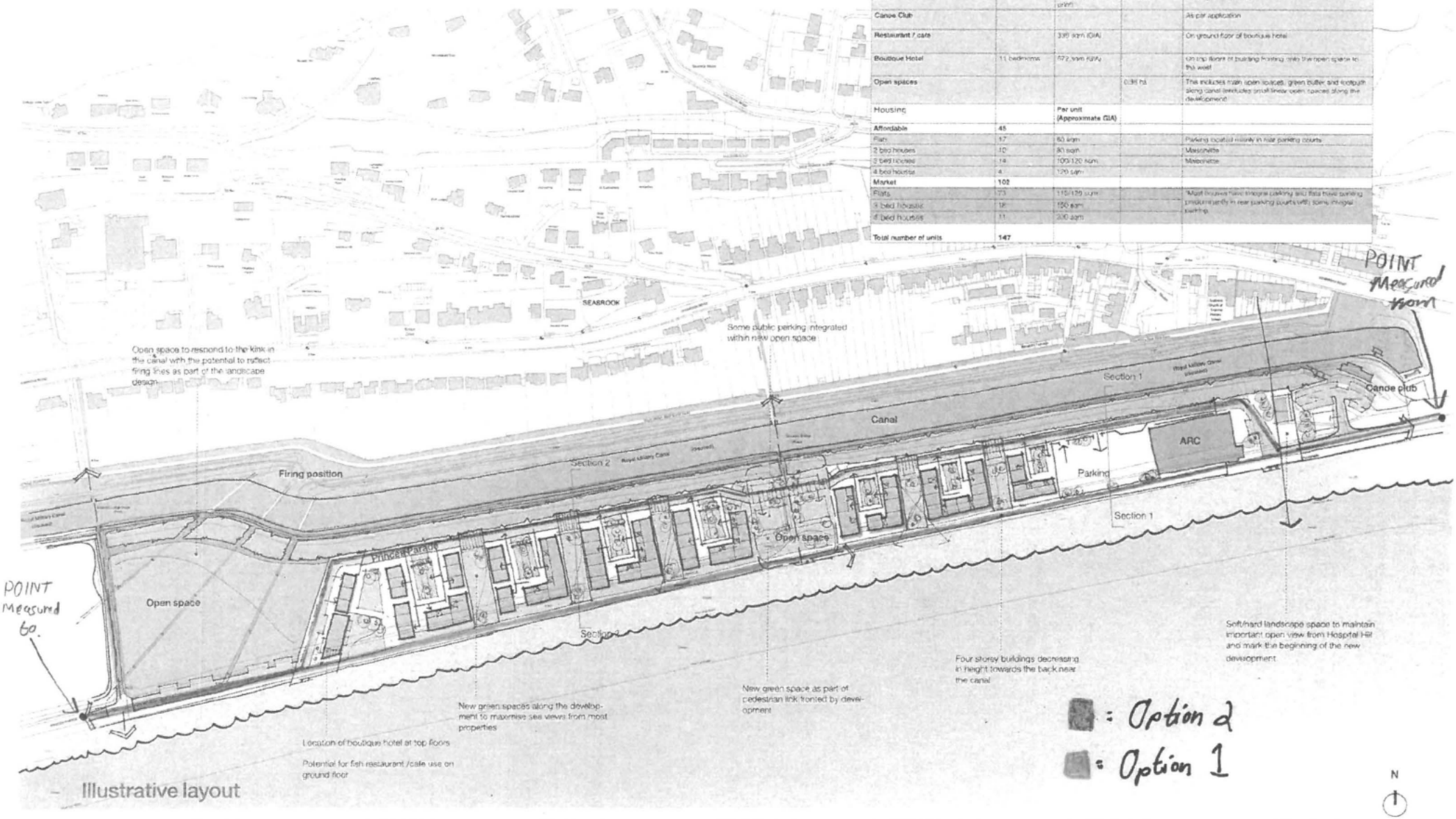
Prepared by:

[redacted]
For Betteridge & Milsom
Date: 23rd September 2016

# OPTION 2

## Schedule of accommodation

| Use | Units | Area (Approximate) | Site area (Approximate) | Comments |
|---|---|---|---|---|
| **Leisure** | | | | |
| ARC | | 2,852 sqm (footprint) | 5,895 sqm | Parking for 150 spaces |
| Canoe Club | | | | As per application |
| Restaurant / cafe | | 339 sqm (GIA) | | On ground floor of boutique hotel |
| Boutique Hotel | 11 bedrooms | 572 sqm (GIA) | | On top floors of building fronting onto the open space to the west |
| Open spaces | | | 0.91 ha | This includes main open spaces, green buffer and footpath along canal (excludes small linear open spaces along the development) |
| Housing | | Per unit (Approximate GIA) | | |
| **Affordable** | **45** | | | |
| Flats | 17 | 60 sqm | | Parking located mainly in rear parking courts |
| 2 bed houses | 10 | 80 sqm | | Maisonette |
| 3 bed houses | 14 | 100/120 sqm | | Maisonette |
| 4 bed house | 4 | 120 sqm | | |
| **Market** | **102** | | | |
| Flats | 73 | 110/130 sqm | | Most houses have integral parking and flats have parking provided partly in rear parking courts with some integral parking |
| 3 bed houses | 18 | 150 sqm | | |
| 4 bed houses | 11 | 200 sqm | | |
| **Total number of units** | **147** | | | |




Illustrative layout

# Princes Parade

## Option 2 - New road alignment to the north of the site

Draft

scale 1: 2,000 @ A2

date 12-09-2016

Tibbalds

## Wignall, Peter

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 03 October 2016 08:56
**To:** [redacted]
**Cc:** [redacted]
**Subject:** RE: Princes Parade - CDM
**Attachments:** image001.png; image002.png; image003.png; image004.png

[redacted]

Thanks – The morning of either 7th or 11th October looks free. 10am on either of those dates?

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

www.shepway.gov.uk

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---

**From:** [redacted] [mailto:[redacted]@betteridge-milsom.co.uk]
**Sent:** 03 October 2016 08:51
**To:** [redacted]
**Cc:** [redacted]
**Subject:** RE: Princes Parade - CDM

[redacted]

Apologies for the delay in responding. I can arrange for one of our CDM advisors to meet with you. When would be suitable, in the next two weeks?

Thanks,

[redacted] | BSc. MRICS
**Director**

T. [redacted]
E. [redacted]betteridge-milsom.co.uk

Betteridge & Milsom
The Old Bakehouse, 18A Ivy Lane, Canterbury, Kent, CT1 1TU


Celebrating 30 years 1986 - 2016



---

**From:** [redacted]shepway.gov.uk [mailto:[redacted]shepway.gov.uk]
**Sent:** 27 September 2016 08:27
**To:** [redacted] <[redacted]betteridge-milsom.co.uk>
**Cc:** [redacted]shepway.gov.uk; [redacted]shepway.gov.uk
**Subject:** Princes Parade - CDM

[redacted]

Further to our discussion last week, and your recent quotation, we would welcome the opportunity to meet with one of your CDM advisors in order to discuss our current requirements and how they might develop as the project develops. Grateful if you could let when an appropriate advisor might be available.

Thanks

[redacted]

[redacted]

Strategic Development Projects Manager

t: [redacted]

m: [redacted]

f: [redacted]

Shepway District Council, Civic Centre,

Castle Hill Avenue, Folkestone, Kent, CT20 2QY.

E: [redacted]shepway.gov.uk

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## Wignall, Peter

**From:** [redacted] <[redacted]shepway.gov.uk>
**Sent:** 03 October 2016 20:40
**To:** [redacted]
**Subject:** Accepted: Shepway Council: Meeting re Princes Parade & Project

# INVOICE

**Betteridge & Milsom Ltd.**
**The Old Bakehouse**
**18A Ivy Lane**
**Canterbury**
**Kent CT1 1TU**

**Project Ref: 3373**
**Invoice No: 6375**
**Date: 27/10/2016**

VAT Reg No: 864 2061 34

**Shepway District Council**
**Civic Centre**
**Castle Hill Avenue**
**Folkestone**
**Kent**
**CT20 2QY**

**invoices@shepway.gov.uk**

Project: ARC Centre: Princes Parade

Comm No: Purchase Order SD00147

Services: Provide outline cost plan for ARC Centre, Princes Parade

Agreed Fee:

| | | |
|---|---|---|
| Value of Work | £ | - |
| Fee % | | 0.00% |
| Total fee | £ | 1,500.00 |

| Works Carried out to date: | Fee Split | | | To Date | £ |
|---|---|---|---|---|---|
| RIBA Stage 1: Preparation/Brief | 0% | £ | - | 0% | - |
| RIBA Stage 2: Concept Design | 100% | £ | 1,500.00 | 100% | 1,500.00 |
| RIBA Stage 3: Developed Design | 0% | £ | - | 0% | - |
| RIBA Stage 4: Technical Design | 0% | £ | - | 0% | - |
| RIBA Stage 5: Construction | 0% | £ | - | 0% | - |
| RIBA Stage 6: Use & Handover | 0% | £ | - | 0% | - |
| | | £ | 1,500.00 | | |

| | | | | |
|---|---|---|---|---|
| **Total costs to date** | | | | **1,500.00** |
| Less Previous Invoice No | N/A | dated | N/A | - |
| Total due excluding VAT | | | | 1,500.00 |
| VAT @ 20% | | | | 300.00 |
| **Total Due including VAT** | | | | **£ 1,800.00** |

Payment terms strictly 30 days
Payments by BACS to: Natwest Bank Plc, Account No: 90632257, Sort code: 60-04-27

# PURCHASE ORDER

**Purchase Order No: SD00168**

This order number must be quoted on all correspondence and invoices related to this order.

Purchase Order Date: 03/11/16

Page: 1 of 1

**Deliver To / Execute Work At**

PROPERTY & TECHNICAL SERVICES
SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
KENT
CT20 2QY

Folkestone
Hythe & Romney Marsh
Shepway District Council
www.shepway.gov.uk

**Supplier**

BETTERIDGE & MILSOM LTD
THE OLD BAKEHOUSE
18A IVY LANE
CANTERBURY
KENT Supplier Code:309193
CT1 1TU [redacted]@betteridge-milsom.co.uk

**Invoice and Payment**

SHEPWAY DISTRICT COUNCIL
CIVIC CENTRE
CASTLE HILL AVENUE
FOLKESTONE
CT20 2QY
Email: invoices@shepway.gov.uk

**Enquiries To**

[redacted]

[redacted]@shepway.gov.uk

Tel: [redacted]

| Description | Required By | Qty | UOM | Unit Price | Nett Price |
|---|---|---|---|---|---|
| CDM Advisor Service<br>(as detailed in fee proposal dated 17th October 2016) | 04/11/16 | | | | 1900.00 |

**Conditions of supply**

The terms and conditions of supply that apply to this purchase order can be found on the council's website.
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**Total Value (Excl. VAT)** **1900.00**