

To whom it may concern

24/04/2023 v1.0

**Our Ref: SCH12/FC06/SI Tender**

Dear Sirs,

East Suffolk Water Management Board (the 'Client') would like to invite you to tender for site investigation work as part of our Upper Alde and Ore Estuary Embankment Improvement project in Suffolk.

The detail of required site investigation work is included within the document entitled "Specification for Ground Investigation Alde Estuary Flood Defences: Flood Cell 6, Snape Maltings."

The deadline for return of electronic tender information is Friday 5<sup>th</sup> May 2023 at 16:00. Returns should be made to the undersigned email address.

Only requests for clarifications made direct to the Client's representative will be responded to. Any technical queries can be submitted and will be responded to as soon as possible. The deadline after which tender clarifications will not be answered is Friday 28<sup>th</sup> April 16:00.

The Client's representative is Pete Roberts. [pete.roberts@wlma.org.uk](mailto:pete.roberts@wlma.org.uk) 07557 143072.

The Client's contracting and commercial approach in respect of the required services will be by purchase order.

No accompanied site visits will be offered by the Client. All areas of work are openly accessible, and it is the tenderer's risk to visit site or not as part of the return preparation.

The tenderer is responsible for obtaining all information necessary for preparation of their tender response and for all costs and expenses incurred in preparation of the tender response.

The Client has the right to cancel or vary this procurement process. By issuing this tender, entering into clarification communications with potential suppliers or by having any other form of communication with potential suppliers the Client organisation is not bound in any way to enter into any contractual or other arrangement with you or any other potential supplier.

All information supplied to you by the Client organisation, including this tender and all other documents relating to this procurement process, either in writing or orally, must be treated in confidence and not

Jane Marson (Chairman) Michael Paul (Vice-Chairman)

Phil Camamile (Chief Executive)

Constituted by The East Suffolk Internal Drainage Board Order 2008, Statutory Instrument 2008 No 750.  
Last re-constituted by The East Suffolk Internal Drainage Board Order 2023, Statutory Instrument 2023 No 364.



disclosed to any third party (save to your professional advisers and/ or sub-contractors strictly for the purposes only of helping you to participate in this procurement process and/ or to prepare your tender response) unless the information is already in the public domain or is required to be disclosed under any applicable laws.

You should not disclose, copy or reproduce any information supplied to you as part of this procurement process other than for the purposes of preparing and submitting a tender response.

This tender and its accompanying documents shall remain the property of the Client organisation and must be returned on demand.

The tendering organisation shall fully comply with all relevant current health and safety legislation. Refer to site investigation specification for CDM(2015) roles.

Please complete sections A) to G) below.

Please complete information and return electronically the accompanying document entitled FC06 Snape Maltings - SI Tender Return Costs.xls

The site investigation services required are detailed in accompanying document entitled 65208756-SWE-XX-XX-T-GE-0001-C02-FC6-GI\_Spec.pdf

Additional site access information is provided in drawing number SCH12\_FC06\_1\_005.pdf

A) Award Criteria

Most Economically Advantageous: 70% price, 30% quality and any mandatory Pass/Fail requirements.

Tender subject area	Score
Price	70
Experience and Skills (see below for breakdown)	30
Insurance	Pass/Fail
Financial Viability	Pass/Fail

B) Summary of Key Dates

Tender release*	24/04/2023
Tender Clarifications deadline*	28/04/2023 16:00
Tender Submission deadline*	05/05/2023 16:00
Tender evaluation period*	09/05/2023 to 12/05/2023
Tender outcome / award*	15/05/2023
Contract commencement	16/05/2023

\*The Board reserves the right to change these dates

C) Supplier Details

Company:	[Please complete]
Address:	[Please complete]

Registered Address (only complete if different to address above)	[Please complete]
Company registration Number	[Please complete]
Contact Name/Position:	[Please complete]
Telephone Number:	[Please complete]
Email Address:	[Please complete]

#### D) Pricing

Prices should be fully inclusive of all overheads, fixed for the duration of the contract and must be pounds sterling. The price should be the net price excluding any taxation.

The formula below demonstrates how your pricing score is calculated:

$$\text{PRICING SCORE} = \frac{\text{lowest price}}{\text{bidder price}} \times \% \text{ available}$$

Please complete the Rate and Cost columns in the pricing template below and then enter your total bid value in both numbers and words below.

#### E) Quality questions

The below is the marking scheme used by all evaluators to score each question:

<b>Criteria Marking Scheme</b>	
0	No response/ No evidence provided
1	Very poor. Little evidence of experience/skill/understanding/ability to deliver
2	Weak. Limited evidence of experience/skill/understanding/ability to deliver
3	Satisfactory. Sufficient evidence of experience/skill/understanding/ability to deliver
4	Good. Considerable evidence of experience/skill/understanding/ability to deliver
5	Very good. Exceptional evidence of experience/skill/understanding/ability to deliver more than project requirements or with innovation or added value.

Scores achieved for each question under this marking scheme will then be divided by 10 and multiplied by the points available for that question as identified in the award criteria.

All compliant bids will be evaluated and scored by a panel appointed by the Client organisation. Scores for quality questions will then be moderated. If there is more than one bid with an equal number of points, then the deciding criteria will be the lowest price.

Do not exceed the maximum word count specified for a response; any words over the limit will not count towards your answer.

Quality Assessment Response:

Question	Experience and Skills 30% overall.
----------	------------------------------------

a)	Provide concise CVs for the staff proposed to supply the services to demonstrate that they have the skills and experience required to deliver the service. Attachments allowed. 15% of score available.
	[Answer]
b)	Demonstrate experience of providing similar services. Attachments allowed. (Word Limit 600). 7% of score available.
	[Answer]
c)	Explain how the proposed resources will be resilient to changes in personnel over the duration of the contract. (Word Limit 600). 4% of score available.
	[Answer]
d)	Explain how you will manage and ensure appropriate resources are allocated, and outcomes delivered in a timely fashion in accordance with the Client organisation expectations. Inclusion of indicative works programme. Attachments allowed. (Word Limit 600). 4% of score available.
	[Answer]

#### F) Financial Information

To establish your financial capability to deliver the work in this tender please:

- complete the following table
- confirm an audited statement of accounts for the past 12 months is available on Companies House **or provide** alternative means of demonstrating financial status if not available e.g., annual accounts, balance sheet, or similar.
- If audited accounts are more than 6 months old additional financial information for the company is advised to provide a more up to date position.

Failure to provide any financial information will result in your tender being rejected.

Financial Contact Name	[Please complete]
Contact Position	[Please complete]
Contact Phone Number	[Please complete]
Contact Email	[Please complete]
I confirm that a minimum of two years' accounts is available on Companies House website. [Delete as applicable]	
OR	
I confirm I have attached the required financial information as requested above. [Delete as applicable]	

<p>As a minimum, Tenderers are required to hold the following insurance levels:</p> <ul style="list-style-type: none"> <li>• £5 Million Public Liability</li> <li>• £5 Million Employers Liability</li> <li>• £1 Million Professional Indemnity</li> </ul>	<p><b>YES</b>, I hold this level of insurance/ <b>NO</b> (if no please state if you will increase current levels)</p>
--	---

G) Authorisation

Bidding organisations authorised signatory.

Print name	[Please complete]
Signature	Please ensure an electronic or handwritten signature here. Failure to sign the document will result in the bid being non-compliant
Position in Bidding Organisation	[Please complete]
Date	[Please complete]

---

Specification for Ground Investigation

Alde Estuary Flood Defences: Flood Cell 6,  
Snape Maltings

Sweco UK Limited  
Wellington House  
East Road, Petersfield  
Cambridge, CB1 1BH  
+44 1223 632 800

---

21/04/2023  
Project Reference: 65208756  
Document Reference: 65208756-SWE-XX-XX-T-GE-0001  
Revision: C02  
Prepared For: East Suffolk Water Management Board

## Status/Revisions

Rev.	Date	Reason for issue	Prepared		Reviewed		Approved	
C01	13.04.23	Draft for comments	HC	12.04.23	SC	12.04.23	JM	13.04.23
C02	21.04.23	Final	HC	20.04.23	JM	20.04.23	JM	20.04.23

© Sweco 2021. This document is a Sweco confidential document; it may not be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, photocopying, recording or otherwise disclosed in whole or in part to any third party without our express prior written consent. It should be used by you and the permitted disclosees for the purpose for which it has been submitted and for no other.

## Table of contents

1	Introduction.....	1
1.1	Name of Contract.....	1
1.2	Project Team.....	1
1.3	General Standards.....	1
1.4	Tender Submission.....	2
1.5	Description of Site.....	2
1.6	Proposed Development.....	2
1.7	Geology and Ground Conditions.....	3
2	Scope of Works.....	4
2.1	Ground Investigation.....	4
2.2	Laboratory Testing.....	5
2.3	Reporting.....	6
3	Ground Investigation Requirements.....	7
3.1	General.....	7
3.2	Programme of Works.....	7
3.3	Quality Management System.....	7
3.4	Additional Information on Services.....	7
3.5	Reinstatement.....	8
3.6	Hygiene.....	8
3.7	Security of Site.....	8
3.8	Contamination avoidance and/or aquifer protection measures required.....	8
3.9	Prevention of Discharges to Water Courses and Sewers.....	8
3.10	PAS 128:2014 Survey and Inspection Pits.....	9
3.11	Accuracy of Exploratory Hole Locations.....	9
3.12	Deep Boreholes.....	9
3.13	Shallow Boreholes.....	9
3.14	Pitting and Trenching.....	10
3.15	Sampling.....	10
3.16	In Situ Testing.....	11
3.16.1	Standard Penetration Tests.....	11
3.16.2	Hand Vane Shear Strength Test.....	11
3.17	Other.....	11
3.18	Photographic requirements.....	11



3.19	Retention and disposal of samples.....	11
3.20	Contamination Sampling and Testing.....	11
4	Exploratory Holes.....	13
5	Costs.....	15
5.1	Main Works.....	15
5.2	Rate Items.....	15

## Appendices

### Figures

Figure 1 – Site Location Plan

### Drawings

65208756-SWE-XX-XX-D-GE-0001-C02: Indicative Exploratory Hole Location Plan

# 1 Introduction

This Specification has been prepared by Sweco UK Ltd on the instructions of East Suffolk Water Management Board (Client).

This document sets out the specification for the undertaking of a ground investigation and provision of a factual ground investigation report.

The objective of the proposed ground investigation is to provide an assessment of ground conditions with respect to the proposed works to raise embankment heights and reconstruct flood defences in Snape Maltings. It will provide information on material properties of proposed source materials for the earthworks and information to allow slope stability assessments to be undertaken.

The works do not allow for any contaminated land investigation except for testing to mitigate against risk to construction workers as part of CDM Regulations.

## 1.1 Name of Contract

The Contract title is 'Alde Estuary Flood Defences: Flood Cell 6, Snape Maltings'.

## 1.2 Project Team

**Table 1.1 Project Team**

Role	Company	Contact	Contact Details
Client	East Suffolk Water Management Board	Pete Roberts	Pete.roberts@wlma.org.uk
Principal Designer	Sweco	Kate Ho	Kate.ho@sweco.co.uk
Principal Contractor	East Suffolk Water Management Board	Alastair Bloomfield	alastair.bloomfield@wlma.org.uk
Investigation Supervisor	Sweco UK Ltd	Hester Carter	07825 797660 hester.carter@sweco.co.uk

## 1.3 General Standards

The ground investigation shall as appropriate be undertaken following current best practice, including the requirements of the following, but as instructed and under the direction of the Sweco Investigation Supervisor:

- The UK Specification for Ground Investigation published by Thomas Telford Services Ltd, Second Edition in 2012
- BS10175:2011 Code of Practice for investigation of potentially contaminated sites
- BS5930:2015 Code of Practice for Ground Investigations
- BS 1377:1990 Methods of test for soils for civil engineering purposes

- BS EN 1997-1:2004+A1:2013 Eurocode 7: Geotechnical Design – Part 1: General Rules
- BS EN 1997-2:2007 Eurocode 7: Geotechnical Design – Part 2: Ground investigation and testing (incorporating corrigendum 2010)

#### 1.4 Tender Submission

As part of the tender submission, the Contractor shall provide a programme of works, detailing the sequence of investigations and methodologies to be used. This is to inform the Client of likely duration of works and requirements for Supervising Engineer.

The Contractor shall provide a draft or example of previous RAMS at the tender return stage for similar comparable type and scale of work.

#### 1.5 Description of Site

The site is located at Snape Maltings, Suffolk, with works proposed South of the River Alde, along the existing embankment and south in the area west of the B1069, and along the river front and along the eastern edge of the developed area. The perimeter of the site is approximately 750m.

The western area is currently undeveloped land, bisected by ditches and with a roadway leading up and round to the River Alde at the top. Access over existing ditches into the central area of this part of the site will need to be determined prior to the ground investigation works being undertaken. There is an embankment linking the existing sluice on the River Alde back to Snape Bridge, with a pedestrian footpath along the top.

East of the B1069 is the development of Snape Maltings, with levels fairly consistent along the riverfront, which comprises a mixture of paving stone and concrete surfacing along the front, with car parking along this section adjacent to the existing river wall. Ground levels fall away to the south of this area. There is a green space in the northeast, adjacent to the River Alde, which is bounded to the east with a ditch, with a bridge and a path connecting the two areas. The land in the east has higher ground levels.

Along the eastern perimeter is a strip of grassland along the buildings, with areas of marshy ground at a lower level to the east. The grassed section extends south towards the south eastern car parking area.

The National Grid Reference for the approximate centre of the site is 639233E, 257582N.

A location plan of the site is presented as Figure 1.

#### 1.6 Proposed Development

It is understood that the proposed scheme will include:

- The removal of the top metre from the existing flood defence to the west of the road, followed by increasing the embankment height and crest width using recompacted site won soils. The crest will be widened to 3m with a 1:3 slope away from the river.
- The newly completed section will tie into a new berm, which will follow the haul road down to the south.

- A crane pad will be installed adjacent to the existing sluice location for future repair works to be undertaken.
- To the east of the road a new approximately 3m high retaining wall will be constructed adjacent to Snape Bridge.
- This will tie in to a proposed 1.5m high temporary flood barrier, which is proposed along the River Alde waterfront.
- Inspections of the existing wall will be undertaken as part of the works to confirm existing construction.
- Bund to be located to east of Snape Maltings, to run down to the car park in the southeast.
- A retaining structure will be constructed as part of this in the vicinity of existing underground gas tanks

## **1.7 Geology and Ground Conditions**

The geological map of the area shows the site to be underlain by tidal flat deposits (clay and silt), overlying Lowestoft Formation (sand and gravel). The Tidal Flat Deposits are shown to become Alluvium (clay, silt, sand and gravel) to the west of the site. These deposits are shown to be underlain by solid geology comprising Red Crag Formation (sand).

British Geological Society online borehole scans ref. TM35NE84 and TM35NE85, which were undertaken adjacent to the concert hall in the east of the site. In this location they encountered between 1.0m and 1.1m made ground, comprising clayey silty sands and ashy sand with clinker, brick and concrete gravel. These were underlain by what is logged as Alluvial Clay comprising soft silty clays to depths of 2.30m and 3.0m bgl, at which depth silty sand is present to the base of the boreholes at 6.0m bgl.

## 2 Scope of Works

### 2.1 Ground Investigation

The following section provides the proposed scope for the intrusive investigation, laboratory testing, monitoring and reporting. The scope of works may require review and amendment if there are changes to the proposed works.

#### Fieldwork

- Provision of risk assessments and method statements suitable to support the Clients application for a Flood Risk Activity Permit (FRAP) from the Environment Agency, within one week of appointment notification (No work will commence on site until we have been granted a FRAP by the EA).
- Site walkover to facilitate access to the proposed exploratory hole locations
- Provision of barriers to protect the working areas
- Provision of suitable welfare facilities
- Utilities clearance at exploratory holes to meet health and safety requirements
- Record ground levels and coordinates of all exploratory hole locations to OS Grid. Ground penetrating radar (GPR) survey of the wall to look for possible tie rods
- Coring or breaking out to facilitate trial pit construction through any hardstanding or slab area along the harbour wall
- Excavation of six 2m long foundation inspection pits, to be taken to 1.2m bgl by hand and then extended deeper if required with a mini excavator, to expose the harbour wall foundations in the north and both sides of wall foundations in the east.
- Excavation of four hand pits to a maximum depth of 1.20m bgl for recovery of material from the existing embankment.
- Excavation of thirteen hand dug inspection pits at the proposed drilling locations to a maximum depth of 1.2m to confirm the absence of near surface buried services
- Boring of two deep boreholes to a maximum depth of 25m, with SPTs and U100s, as appropriate at 1m centres to 5m, then at 2m centres
- Boring of eleven shallow boreholes to recover soil cores in continuous liners up to maximum depths of 6m, with SPTs at 1m intervals
- Driving of six CPT holes to 5m using digital piezo static cone penetrometer. A mini rig to be used. The reporting requirements of cone penetration testing, including friction cones and piezocones data specified in BS EN ISO 22476-1:2012 shall be provided, including measured parameters, corrected parameters and calculated parameters. It's envisaged the tests will be undertaken in a day. Additional positions to be agreed with Sweco if time available.
- Excavation of nine trial pits to depths of up to 3m by mechanical excavator
- Supervision and logging of exploratory holes by a qualified geoenvironmental engineer, with minimum 5 years' experience.
- Reinstatement of exploratory hole locations to original standard, especially in hardstanding areas in Snape Maltings.

- Removal of excess spoil and materials from site.

Detailed requirements and methodologies are described in section 3. All exploratory hole locations are presented on drawing ref. 65208756-SWE-XX-XX-D-GE-0001.

## 2.2 Laboratory Testing

The following geotechnical laboratory testing is proposed, however the numbers may vary depending on the findings of the ground investigation:

**Table 2.1 Geotechnical Testing**

Test	Indicative Numbers required
Natural moisture content	35
Atterberg Limits	35
One dimensional oedometer consolidation	6
Swelling pressure	6
Triaxial compression strength	8
Particle size distribution	12
Compaction testing with 2.5kg rammer – including hand shear vane tests on all points, including as dug moisture	12
3 point CBR tests (on optimum and two points either side) [Tests undertaken on alluvium only]	12
Moisture Condition value (MCV) calibration tests	12
Full BRE sulphate suite	18

Chemical testing may be undertaken subject to the presence of made ground being encountered during the ground investigation, and therefore these tests are representative of what may be required, to be provided as a rate only.

### Geoenvironmental Testing – Soils

Test	Indicative Numbers required
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	Rate only
PAH (speciated USEPA 16)	Rate only
Petroleum hydrocarbons (speciated TPHCWG)	Rate only

Test	Indicative Numbers required
Total phenols	Rate only
Total cyanide	Rate only
Soil organic matter	Rate only
Presence of asbestos fibres	Rate only
Asbestos Quantification	Rate only
Waste acceptance criteria testing	Rate only

#### Geoenvironmental Testing - Groundwater

Test	Indicative Numbers required
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	Rate only
PAH (speciated USEPA 16)	Rate only
Petroleum hydrocarbons (speciated TPHCWG)	Rate only
Hardness	Rate only

#### Geoenvironmental Testing – Soil Leachate

Test	Indicative Numbers required
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	Rate only
PAH (speciated USEPA 16)	Rate only
Petroleum hydrocarbons (speciated TPHCWG)	Rate only

### 2.3 Reporting

A Ground Investigation Report shall be prepared in accordance with the following:

- Factual data from the intrusive investigations and laboratory testing
- AGS laboratory and borehole data to be provided

## 3 Ground Investigation Requirements

### 3.1 General

Costs shall be based on continuous uninterrupted working Monday to Friday, 09.00-17.00 hours.

Access to exploratory hole locations is subject to agreement with the Clients representative. Types of rig and access to proposed hole locations is to be confirmed prior to the start of site works, especially in the west of the site where access will need to be arranged over ditches currently present in this part of the site.

The exploratory holes may be made in any order commensurate with the timely completion of the works. However, once an exploratory hole has commenced, it shall be completed continuously and without undue delay.

A secure compound in Heras fencing or similar in which to store all vehicles, plant and equipment not in use and/or overnight, shall be required.

Prior to commencing on site, the Contractor shall provide detailed risk assessments and method statements for the undertaking of the ground investigation. These will be required two weeks before the start of the site works, and no works shall commence until the risk assessments and method statements have been approved by the Client or Clients advisors.

### 3.2 Programme of Works

Within one week of appointment notification, the Contractor must provide final RAMS to support the application for a Flood Risk Activity Permit (FRAP) from the Environment Agency. No work can commence on site until this has been granted.

Two weeks prior to the start of the ground investigation, the Contractor is to provide a detailed programme of the works.

### 3.3 Quality Management System

The Contractor is required to work to a Quality Management system established in accordance with BS EN ISO 9001:2000, BS EN ISO 14001 and BS OSHAS 18001.

All laboratory testing shall be undertaken by a UKAS accredited laboratory.

All drilling operatives (Lead Drillers and Drillers) employed on the contract shall hold a valid and current CSCS blue skilled (Land Drilling) card as issued by Construction Skills Certification Scheme Limited or an equivalent body in a State of the European Union.

### 3.4 Additional Information on Services

The Client will provide copies of all known buried services below the site, however it is the Contractors responsibility to satisfy himself as to the location of any existing underground services, culverts, tunnels etc. that might be affected by the investigation and take appropriate measures to ensure that no damage is done to any such infrastructure.

For guidance, appropriate measures could include services clearance using CAT and GPR techniques.



### **3.5 Reinstatement**

All exploratory holes in which an instrument is not required shall be backfilled immediately after completion with arisings and compacted to ensure that no surface depression is left or subsequently occurs due to collapse of the backfill.

Reinstatement of surfacing shall be to original standard, especially in areas of hardstanding along the Snape Maltings waterfront.

### **3.6 Hygiene**

The Contractor shall provide all necessary hygiene (welfare) facilities for the personnel involved in the undertaking of the ground investigation, including the Sweco Supervising Engineer.

### **3.7 Security of Site**

The Contractor shall be responsible for implementing adequate measures to secure the Site of each exploratory hole and the immediate environs during and outside of working hours to ensure the safety of the site personnel.

### **3.8 Contamination avoidance and/or aquifer protection measures required**

The ground investigation works should be undertaken in such a way to avoid the spread of any contamination encountered.

All ground investigation plant and equipment shall be clean and freshly washed on arrival.

The Contractor must always ensure protection of the underlying ground and groundwater and where contamination has been observed in shallow soils, this includes implementation of appropriate aquifer protection measures.

The Contractor may only use vegetable oil-based lubricants.

Where it is necessary to add water, only clean water of drinking water standard shall be allowed.

### **3.9 Prevention of Discharges to Water Courses and Sewers**

The Contractor shall not discharge or allow any discharge into drainage systems of adjacent surface courses. All water generated on site from forming the exploratory holes shall be taken and disposed of off-site by an appropriate licensed carrier.

All reasonable precautions shall be taken to prevent leaks and spillages on site. Particular care must be applied to the storage of diesel fuel, oil, waste oil, chemicals and other hazardous liquids and control of pollution by oil and grease from the Contractor's plant and slurry from the drilling of rotary boreholes.

The contractor shall ensure that any pumps, barrels or tanks on the site are kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism, protected by an impermeable temporary bund with a capacity of 110% of the stored volume. Diesel pumps shall be located in depressions fitted with impermeable membranes.

The Contractor shall submit a clear method statement describing the effects his temporary works proposals will have on existing watercourses and site drainage systems.

### **3.10 PAS 128:2014 Survey and Inspection Pits**

Each exploratory hole (with the exception of trial pits) shall commence with inspection pits hand dug to 1.2m bgl. The area of each hand-dug inspection pit shall cover the base area for the final borehole.

The Contractor shall consult all utility drawings of existing utilities, including those obtained directly from the statutory undertakers and the Client.

The Contractor shall ensure that a safe system of work following the guidance set out in HSG47 (Avoiding Danger from Underground Services) is in place during the ground investigation works. This shall comprise as a minimum survey clearance using CAT and GENNY scan.

The survey shall be followed by a hand dug service inspection pit excavated to a depth of 1.20m before checking at the base of the hole with CAT and GENNY scan. The operator shall be trained and experienced in the use of such equipment in accordance with HSG 47 (2014).

### **3.11 Accuracy of Exploratory Hole Locations**

All exploratory hole locations shall be undertaken at the positions indicated on drawing ref. 65208756-SWE-XX-XX-D-GE-0001. Any change of position shall be agreed by the Client/Clients advisor prior to moving to that position.

Final exploratory hole locations may need be moved subject to agreement with an Ecological Clerk of Works, in co-operation with the Supervision Engineer on site, in the event of nesting Schedule 1 bird species or similar.

The elevation of the ground at each as-built exploratory hole shall be in relation to Ordnance Datum and shall be established to a tolerance of  $\pm 50$ mm.

### **3.12 Deep Boreholes**

The proposed method of drilling can be determined by the contractor, subject to obtaining full depths required and the required in situ testing and sampling is achieved to the satisfaction of the Sweco engineer.

The Contractor is to confirm the drilling methodology to the Sweco engineer two weeks in advance of the site works.

The borehole shall be started in sufficient casing diameter to enable the borehole to be progressed to the scheduled depth.

The Contractor shall be responsible for supplying water to be used in progressing the drilling of the borehole.

All exploratory holes shall be CAT scanned and a 1.2m deep hand-dug inspection pit excavated. The responsibility for locating services rests with the Contractor regardless of any information provided to the Contractor to assist in their location.

### **3.13 Shallow Boreholes**

Windowless sampling or similar shall be carried out using hollow steel tubes incorporating a removable plastic liner and cutting shoe in order to recover a nominally continuous soil sample for retention.

The Contractor shall take digital photographs of the cores recovered from the windowless sampler liner.

All exploratory holes shall be CAT scanned and a 1.2m deep hand-dug inspection pit excavated. The responsibility for locating services rests with the Contractor regardless of any information provided to the Contractor to assist in their location.

### **3.14 Pitting and Trenching**

No man entry is permitted into any open excavations unless a suitable risk assessment and method statement has been undertaken which puts in place measures to protect workers from confined space entry and collapse of excavation sides.

The Contractor shall hand excavate inspection pits of sufficient size for the location of underground services at all borehole locations. Insulated tools shall be used at all times.

Along the waterfront the Contractor shall hand excavate observation pits of sufficient size for the exposure, photographing and logging of the foundations of the existing building. Insulated tools shall be used at all times. These are to be taken deeper with a mini digger if depths greater than 1.20m bgl are required to expose the foundations of the harbour wall.

The Contractor shall take digital photographs of the observation pits clearly showing the details of the exposed foundations including all dimensions and depth to base.

Trial pits undertaken within the area of the proposed borrow pit shall be excavated by machine to the required depth to enable visual examination and sampling as required from outside of the pit.

### **3.15 Sampling**

Sampling requirements will be confirmed by the Supervising Engineer prior to the start of the ground investigation. As a guide the following strategy is likely:

Disturbed soil samples shall be obtained from the topsoil/surface soils and at each exploratory hole, from each stratum encountered on first encountering it and then at 1.0m centres throughout the stratum to allow accurate description of the soils encountered.

Large bulk soil samples will be required from the trial pits for earthworks relationship testing, with sufficient bulk disturbed samples to be recovered from each soil stratum encountered for undertaking three relationship tests, with sufficient samples to be taken from each strata every other pit. The relationship tests will comprise 2.5kg compaction with undrained shear strength and CBR tests and MCV calibration tests.

In cohesive soils, the first U100 sample shall be recovered at a depth of 1.2m (instead of the SPT), and then alternated with the SPTs.

At least one representative sample shall be recovered from any made ground stratum encountered less than 1.0m thick. Additional samples should be recovered where visual or olfactory evidence of contamination is observed, or where made ground is greater than 1.0m thick. A minimum of one sample at 1.0m depth intervals shall be recovered from the made ground. The Contractor shall notify Sweco within 7 days of sampling so Sweco can make arrangements for testing to provide information for Health and Safety Risk Assessment during construction.

### **3.16 In Situ Testing**

#### **3.16.1 Standard Penetration Tests**

The energy ratio certificates for the Standard penetration test (SPT) equipment adopted shall be provided to the Engineer prior to commencement of the site works. Where more than one set of SPT equipment is on site, the specific set of equipment utilised for any particular test or borehole shall be shown on the daily report.

In windowless sampler boreholes standard penetration tests shall be undertaken at 1.0m intervals, starting at the base of the inspection pit.

In deep boreholes standard penetration tests to be undertaken at 1.0m intervals starting at the base of the inspection pit, to 5.0m bgl. Thereafter standard penetration tests to be undertaken at 1.5m intervals.

NB. U100 samples to be recovered in cohesive soils every 4.5m, replacing the scheduled SPT.

#### **3.16.2 Hand Vane Shear Strength Test**

During the excavation of the trial pits, hand shear vane strength tests shall be undertaken at 0.5m depth intervals in cohesive strata.

### **3.17 Other**

During the services clearance additional GPR scanning of the hardstanding along the waterfront is required, to look for any evidence of tie rods in this area.

### **3.18 Photographic requirements**

Photographs are required of all pits, including inspection and utility pits, and arisings therefrom.

The Contractor shall take a minimum of three photographs for each trial pit: two different faces and the spoil heap, and two photographs of the utility pits; one of the face and one of the arisings.

Additional photographs shall be taken where the faces in a pit differ in stratigraphic levels and/or strata. Each photograph of a pit or of pit arisings shall include a stout, clearly legible photographic board with details of the project name, project ID, exploratory hole number and date.

### **3.19 Retention and disposal of samples**

Samples shall not be disposed of until 28 days after submission of the approved final factual report. The Investigation Supervisor shall be given notice of at least 1 week before disposal of the samples.

### **3.20 Contamination Sampling and Testing**

At this stage, no contamination sampling or testing is required, but Contractor to provide rates for both. In the event that sampling is required, it is likely to follow the strategy set out below:

At least one representative sample shall be recovered from any made ground stratum encountered less than 1.0m thick. Additional samples should be recovered where visual or olfactory evidence of contamination is observed, or where made ground is greater than 1.0m thick. A minimum of one sample at 1.0m depth intervals shall be recovered from the made ground. The Contractor shall notify Sweco within 7

days of sampling so Sweco can make arrangements for testing to provide information for Health and Safety Risk Assessment during construction.

## 4 Exploratory Holes

Hole Ref	Type	Scheduled Depth (m)	In Situ Tests and Installation Details	Remarks
BH (2 No.)	To be confirmed by the Contractor	25.0	<p>Standard penetration tests every metre to 5.0m then at 1.5m centres</p> <p>U100s every 4.5m in cohesive soils</p> <p>Backfilled with arisings on completion</p> <p>Geotechnical and contamination land sampling in accordance with Section 3.15</p>	Hand dug inspection pit to 1.2m required
WS (11 No.)	Windowless sampler	6.0	<p>Standard penetration tests at 1.0m intervals</p> <p>Geotechnical and contamination land sampling in accordance with Section 3.15</p>	<p>Hand dug inspection pit to 1.2m required</p> <p>Photographs of cut liners</p>
TP (9 No.)	Trial pit	3.0	<p>Hand vane shear strength tests at 0.5m intervals in cohesive soils</p> <p>Geotechnical and contamination land sampling in accordance with Section 3.15, with large bulks required for earthworks testing</p>	Machine dug
OP (6 No.)	Observation pit	>1.2	<p>Hand vane shear strength tests at 0.5m intervals in cohesive soils</p> <p>To be hand dug to 1.20m bgl with option to extend deeper if required with mini digger</p> <p>Geotechnical and contamination land sampling in accordance with Section 3.15</p>	Machine/hand dug

Hole Ref	Type	Scheduled Depth (m)	In Situ Tests and Installation Details	Remarks
HP (4 No.)	Hand pit	<1.2	<p>Hand vane shear strength test at 0.5m bgl if possible.</p> <p>Sample to be taken from side of existing embankment, with one at the crest and one mid-way down the landward side of the embankment at each location</p> <p>Geotechnical and contamination land sampling in accordance with Section 3.15</p>	Hand dug
CPT (6 No.)	Digital piezo static cone penetrometer	5m	Calculated parameters to include SPT, undrained shear strength and coefficient of volume compressibility	Tracked mini rig

## 5 Costs

### 5.1 Main Works

The fees for the ground investigation shall be fixed and should include for all expenses.

Description	Cost (£)
Ground Investigation	
Fieldwork	
Laboratory Testing	
Provision of Factual Report and AGS Data	
Total Tender:	

### 5.2 Rate Items

#### Ground investigation activities

Test	Rate (£)
Extra day window sampling	
Extra day trial pitting	
Extra day with CPT rig	
Additional items (TBC)	

#### Geotechnical Testing

Test	Rate (£)
Natural moisture content	
Atterberg Limits	
One dimensional oedometer consolidation	
Swelling pressure	
Triaxial compression strength	
Particle size distribution	
pH, water soluble sulphate, total sulphate and total sulfur	
Dry density/moisture content relationship	



Test	Rate (£)
Compaction testing with 2.5kg rammer – including hand shear vane tests on all points, including as dug moisture	
3 point CBR tests (on optimum and two points either side)	
Moisture Condition value (MCV) calibration tests	
Full BRE sulphate suite	

### Geoenvironmental Testing – Soils

Test	Rate (£)
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	
PAH (speciated USEPA 16)	
Petroleum hydrocarbons (speciated TPHCWG)	
Total phenols	
Total cyanide	
Soil organic matter	
Presence of asbestos fibres	
Asbestos Quantification	
Waste acceptance criteria testing	

### Geoenvironmental Testing - Groundwater

Test	Rate (£)
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	
PAH (speciated USEPA 16)	
Petroleum hydrocarbons (speciated TPHCWG)	
Hardness	

**Geoenvironmental Testing – Soil Leachate**

Test	Rate (£)
Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B, Cr Hex)	
PAH (speciated USEPA 16)	
Petroleum hydrocarbons (speciated TPHCWG)	

## **Figures**

Figure 1 – Site Location Plan



C02	20.04.2023	-	AT	HC	HC
REV	DATE	REVISION	MADE	CHK	APP
DRAWING STATUS					
<b>FINAL ISSUE</b>					
SUITABILITY DESCRIPTION					
SUITABLE FOR INFORMATION					

Sweco UK Ltd  
Wellington House  
East Road  
Petersfield  
Cambridge  
CB1 1BH  
Tel: +44 (0)1223 632 800  
Web: www.sweco.co.uk

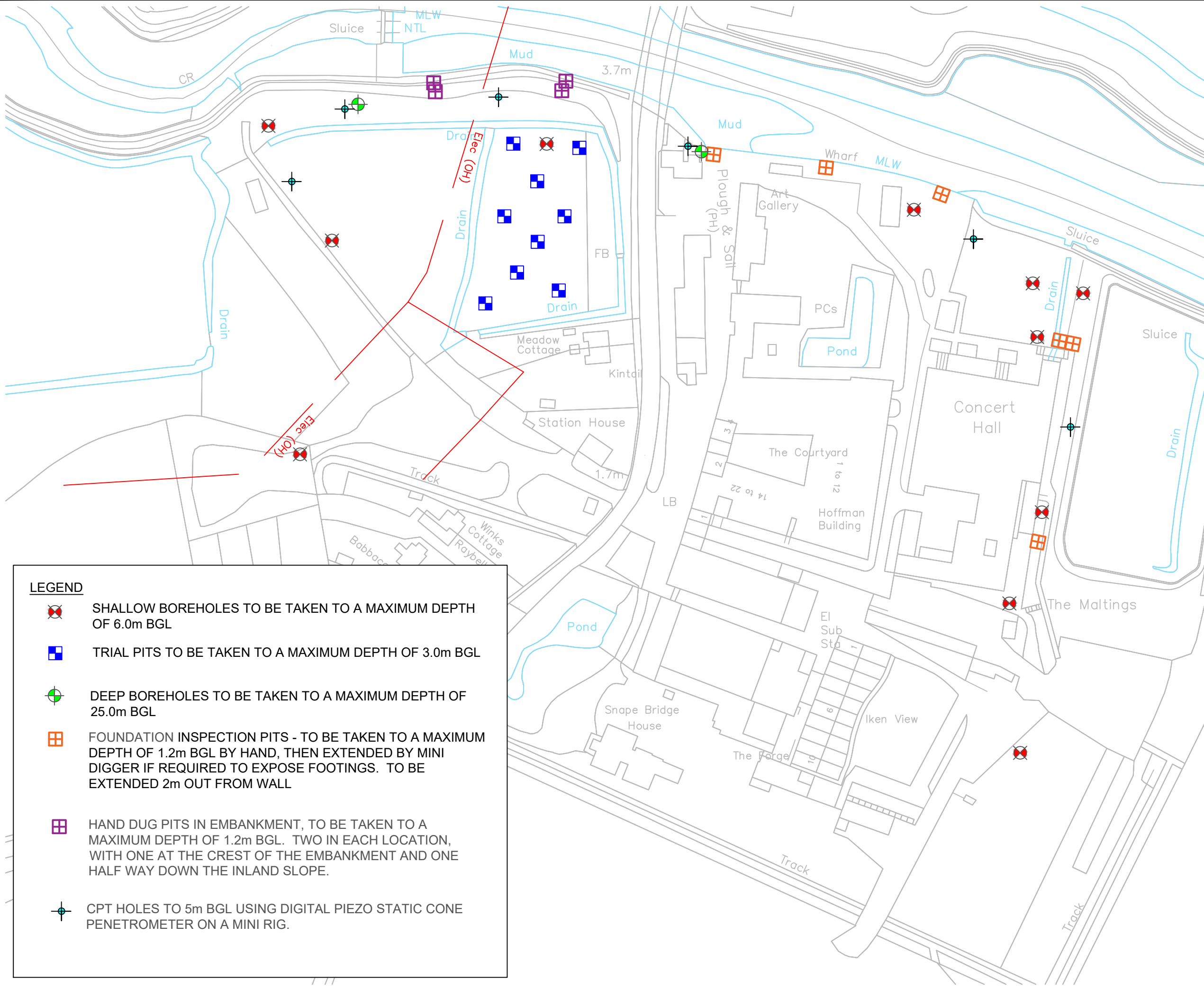


CLIENT	EAST SUFFOLK WATER MANAGEMENT BOARD
PROJECT	ALDE ESTUARY FLOOD DEFENCES: FLOOD CELL 6, SNAPE MALTINGS

DRAWING TITLE							SITE LOCATION PLAN			
SCALE		SWECO REF.		STATUS		REVISION				
NTS @A3		65208756		S2		C02				
PROJECT	ORIGINATOR	VOLUME/ SYSTEM	LEVELS & LOCATIONS	TYPE	ROLE	NUMBER				
65208756	SWE	XX	XX	D	GE	FIG 1				

## **Drawings**

65208756-SWE-XX-XX-D-GE-0001-C02: Indicative Exploratory Hole Location Plan



**LEGEND**

- SHALLOW BOREHOLES TO BE TAKEN TO A MAXIMUM DEPTH OF 6.0m BGL
- TRIAL PITS TO BE TAKEN TO A MAXIMUM DEPTH OF 3.0m BGL
- DEEP BOREHOLES TO BE TAKEN TO A MAXIMUM DEPTH OF 25.0m BGL
- FOUNDATION INSPECTION PITS - TO BE TAKEN TO A MAXIMUM DEPTH OF 1.2m BGL BY HAND, THEN EXTENDED BY MINI DIGGER IF REQUIRED TO EXPOSE FOOTINGS. TO BE EXTENDED 2m OUT FROM WALL
- HAND DUG PITS IN EMBANKMENT, TO BE TAKEN TO A MAXIMUM DEPTH OF 1.2m BGL. TWO IN EACH LOCATION, WITH ONE AT THE CREST OF THE EMBANKMENT AND ONE HALF WAY DOWN THE INLAND SLOPE.
- CPT HOLES TO 5m BGL USING DIGITAL PIEZO STATIC CONE PENETROMETER ON A MINI RIG.

**NOTES**

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS, ARCHITECTS AND SPECIALISTS DRAWINGS AND THE SPECIFICATION.
2. DO NOT SCALE FROM THIS DRAWING MANUALLY OR ELECTRONICALLY. WRITTEN PERMISSION MUST BE OBTAINED FROM SWECO PRIOR TO SCALING ELECTRONICALLY OR USING THIS ELECTRONIC FILE.
3. BASE PLAN PROVIDED BY THE CLIENT.

C02	20.04.2023	CLIENT NAME REQUESTED	AT	HC	HC
C01	12.04.2023	FIRST ISSUE	AT	HC	HC
Rev	Date	Amendment Details	Dr'n	Chk'	App'

This drawing should not be relied on or used in circumstances other than those for which it was originally prepared and for which Sweco UK Limited was commissioned. Sweco UK Limited accepts no responsibility for this drawing to any party other than the person by whom it was commissioned. Any party which breaches the provisions of this disclaimer shall indemnify Sweco UK Limited for all loss or damage arising therefrom. COPYRIGHT © Sweco 2021

Sweco UK Ltd  
Wellington House  
East Road  
Petersfield  
Cambridge  
CB1 1BH  
Tel: +44 (0)1223 632 800  
Web: www.sweco.co.uk



Client  
**EAST SUFFOLK WATER MANAGEMENT BOARD**

Project Title  
**ALDE ESTUARY FLOOD DEFENCES: FLOOD CELL 6, SNAPE MALTINGS**

Drawing Title  
**INDICATIVE PROPOSED EXPLORATORY HOLE LOCATION PLAN**

Purpose Of Issue <b>FINAL ISSUE</b>			
Status S2	Status Description <b>SUITABLE FOR INFORMATION</b>		
Designed HC	Drawn AT	Checked HC	Approved HC
Sheet Size A3	Scale 1:1500	SWECO Ref 65208756	Revision C02

Drawing Number  
**65208756-SWE-XX-XX-D-GE-0001**

© Crown Copyright and database right (2023).  
All rights reserved OS licence number 100052704

- Key:**
- EA Main River
  - Existing embankment approximate crest centreline (and chainage)
  - - - Access Route (4\*4)
  - Access Gate
  - - - Public Footpath
  - - - UKPN Overhead cable route

- Notes:**
1. No dimensions to be scaled from this drawing.
  2. All measurements in metres unless stated otherwise.
  3. Field numbers based on ESIDB system for identification only, to be reconciled against landowner system.
  3. Any questions regarding the logistics and design of this work to be to Pete Roberts 07557 143072.

PRELIMINARY DESIGN

Rev	By	Chkd	Apprv	Date	Description

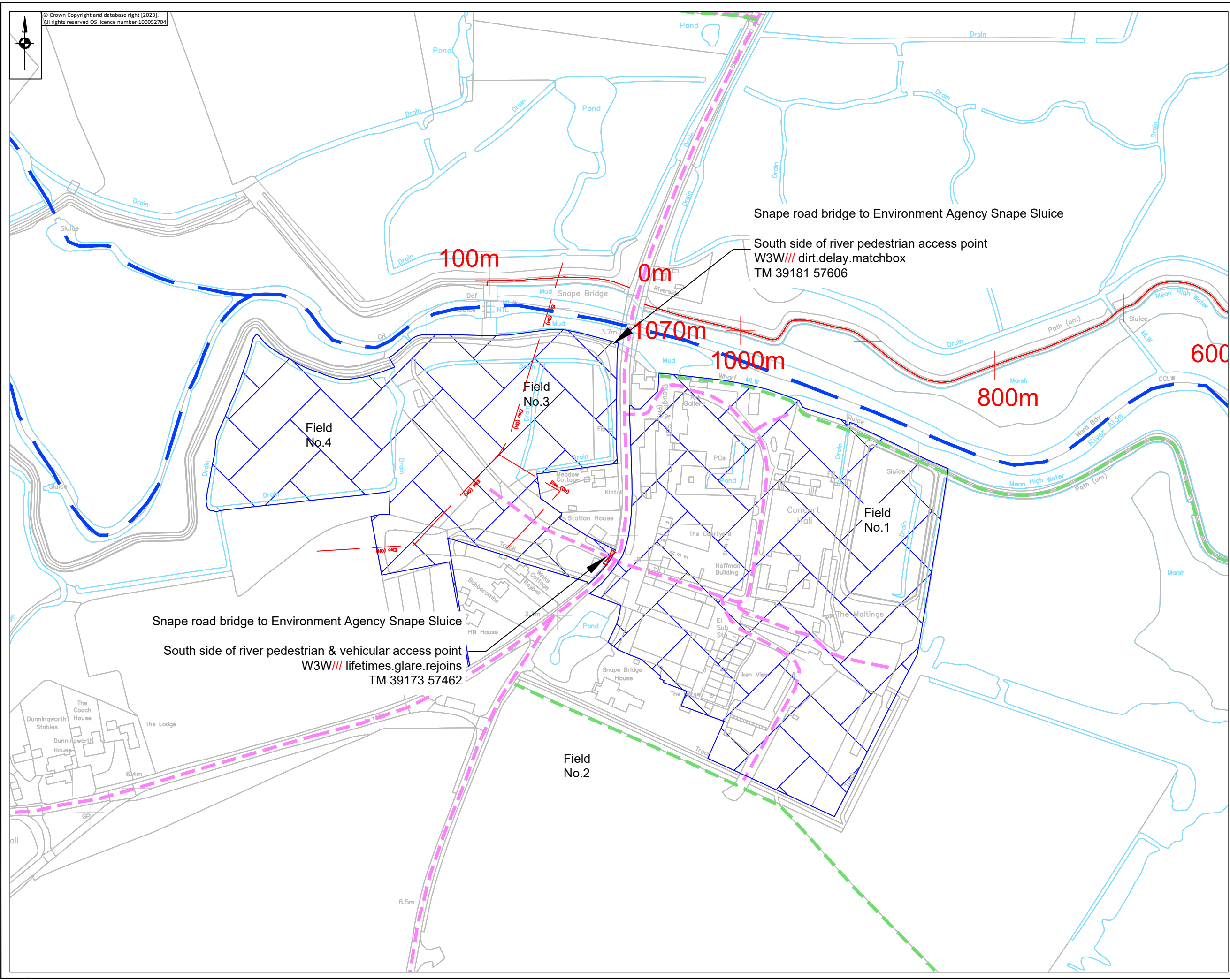
Project: **Upper Alde & Ore Estuary Embankment Improvements SCH12**

Drawing: **Upper Alde & Ore Estuary Embankment Improvements Flood Cell 6 - Snape Maltings Survey Access Overview**

Drawn by: PER Date: 21/04/2023  
Checked by: - Date: -  
Approved by: - Date: -

Drawing No. <b>SCH12_FC06_1_005</b>	Revision: -
-------------------------------------	-------------

Drawing Scale: 1:2,500 at A3



C:\Users\peter\AppData\Local\Temp\AS\Print\1\_38868 SCH12\_FC06\_1\_005.dwg  
Plot: 21/4/2023 - 4:23 pm