

To whom it may concern

21/05/2023 v1.0

Our Ref: SCH12/FC05/GI 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 05, Iken."

The deadline for return of electronic tender information is Friday 2nd June 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 25th May 16:00.

The Client's representative is Pete Roberts. 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.

The Client will make available a suitable area for works compound.

Please complete sections A) to G) below.

Please complete information and return electronically the accompanying document entitled FC05 Iken - GI Tender Return Costs.xls

The site investigation services required are detailed in accompanying document entitled 65208756-SWE-XX-XX-T-GE-0002-C02-FC5-Iken-GI_Spec.pdf

Additional site access information is provided in drawing number SCH12_FC05_1_001.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*	22/05/2023
Tender Clarifications deadline*	25/05/2023 16:00
Tender Submission deadline*	02/06/2023 16:00
Tender evaluation period*	05/06/2023 to 08/06/2023
Tender outcome / award*	09/06/2023
Contract commencement*	12/06/2023

*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:

Criteria Marking Scheme	
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]	

As a minimum, Tenderers are required to hold the following insurance levels:

- £5 Million Public Liability
- £5 Million Employers Liability
- £1 Million Professional Indemnity

YES, I hold this level of insurance/ NO (if no please state if you will increase current levels)

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 5, Iken

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19/05/23

Project Reference: 65208756

Document Reference: 65208756-SWE-XX-XX-T-GE-0002

Revision: C02

Prepared For: East Suffolk Water Management Board

Status/Revisions

Rev.	Date	Reason for issue	Prepared		Reviewed		Approved	
C01	03.05.23	Draft for comments	HC	26.04.23	SC	02.05.23	JM	03.05.23
C02	19.05.23	Client comments	HC	17.05.23	JM	18.05.23	JM	18.05.23

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65208756-SWE-XX-XX-D-GE-0002-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 within Flood Cell 5, along the Iken stretch of riverfront. 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 5, Iken'.

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 UK Ltd	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	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 the 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 south of the River Alde, comprising a 5.8km length of embankment stretching east from St Botolph's Church.

The section is largely undeveloped, comprising the existing flood embankments with soke dykes on the landward side. Main River joins the River Alde at the site of the existing pumping station, located at 3400m along the section line. Prior to reaching this point the path of the river runs parallel to the southern edge of the embankment for 750m, from approximately chainage 4150m.

The National Grid References for the two ends of the section line are 644654E, 255208N at 0m chainage in the east, and 641359E, 256789N at 5800m chainage in the west.

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

1.6 Proposed Development

It is understood that the proposed scheme will include:

- Increasing the embankment height and crest along the length of the section, using recompacted site won soils. The crest will be widened to a minimum 3m width, with a 1:3 slope away from the river, which will mean backfilling the existing soke dykes along some of the length.
- New soke dykes to be constructed 5m from the base of the new embankment toe, with the dyke to be stepped at the landward side.
- Section of Main River running parallel to the existing embankment to be realigned further south, with cuttings to provide additional source material for embankment.
- Where existing pumping station is present at 3400m, either sheet piles or a gabion wall will be required in place of a wider embankment around the existing infrastructure.

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 the Lowestoft Formation (sand and gravel and clay and silt) in the west of the site.

These overlie the Red Crag Group and Crag Formation deposits (sand) in the west of the site, with the Coralline Crag Formation (calcarenite) deposits in the east of the site which are underlain by the London Clay Formation (clay, silt and sand).

British Geological Society online borehole scan ref. TM45NW10 was undertaken in the east of the section, which encountered Alluvium, comprising very soft grey and black silty clays with organic material and peat to 9.50m bgl, when it became a silty sand and sandy gravel to the base of that deposit at 12.6m bgl. Below that Coralline Crag was encountered to the base of the borehole at 15m bgl.

There are no records showing borehole data online in the west of the section,

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. To be provided 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.
- Excavation of 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 three deep boreholes to a maximum depth of 20m, with SPTs and U100s, as appropriate at 1m centres to 5m, then at 2m centres
- Boring of 29 shallow boreholes to recover soil cores in continuous liners up to maximum depths of 6m, with SPTs at 1m intervals, to be undertaken using an all-terrain rig.
- 66 CPT holes to 6m and then to 12m in every third location along the base of the embankment, using a 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.
- Excavation of 71 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
- 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-0002.

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	75
Atterberg Limits	75
One dimensional oedometer consolidation	2
Swelling pressure	2
Triaxial compression strength	9
Particle size distribution	30
Compaction testing with 2.5kg rammer – including hand shear vane tests on all points, including as dug moisture	20
3 point CBR tests (on optimum and two points either side) [Tests undertaken on alluvium only]	20
Moisture Condition value (MCV) calibration tests	20
Full BRE sulphate suite	20

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
Total phenols	Rate only
Total cyanide	Rate only
Soil organic matter	Rate only
Presence of asbestos fibres	Rate only

Test	Indicative Numbers required
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, including CPT data to be provided. The CPT shall include both measured and interpreted values.

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 themselves 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.

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 Investigation Supervisor.

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 and public.

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-0002. 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 $\pm 50\text{mm}$.

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 Investigation Supervisor.

The Contractor is to confirm the drilling methodology to the Sweco Investigation Supervisor 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.

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.

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 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 the Sweco Investigation Supervisor within 7 days of sampling so they 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 2.0m intervals.

NB. U100 samples to be recovered in cohesive soils every 3.0m, 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 **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.

From the boreholes, the Contractor shall take digital photographs of the cores recovered from the windowless sampler liner.

3.18 **Provision of draft logs**

Draft logs of all exploratory hole positions should be provided within two days of the completion of each location in order to allow for scheduling.

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 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 the Sweco Investigation Supervisor within 7 days of sampling so they 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 (3 No.)	To be confirmed by the Contractor	20.0	<p>Standard penetration tests every metre to 5.0m then at 2.0m centres</p> <p>U100s alternating with SPTs 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 (29 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 (71 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
CPT (66 No. – including 11 to 12m)	Digital piezo static cone penetrometer	6m and 12m (in every third location at base of embankment)	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




C01	24.04.2023	-	AT	HC	HC
REV	DATE	REVISION	MADE	CHK	APP
DRAWING STATUS			FINAL ISSUE		
SUITABILITY DESCRIPTION			SUITABLE FOR INFORMATION		

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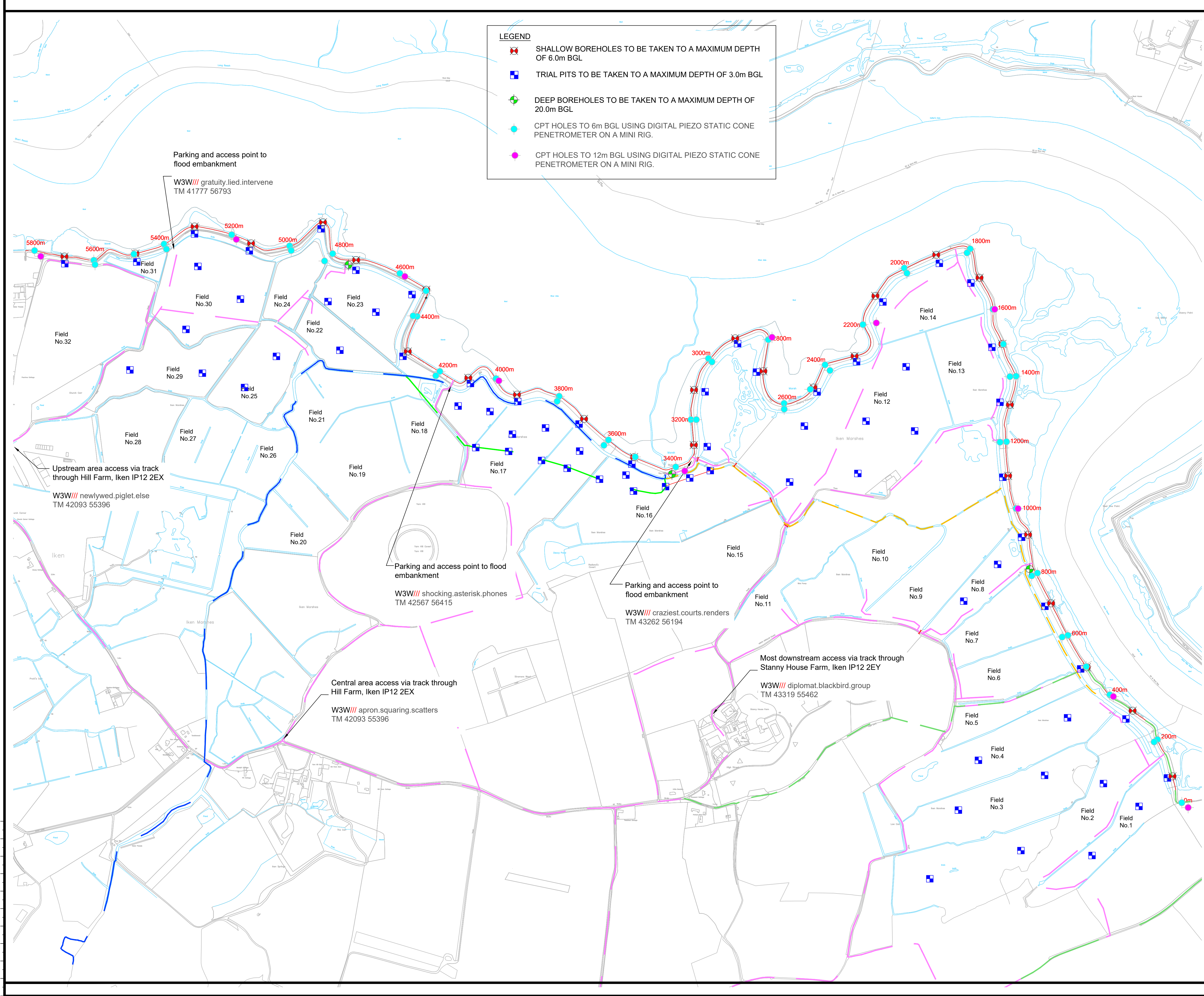


CLIENT	EAST SUFFOLK WATER MANAGEMENT BOARD
PROJECT	ALDE ESTUARY FLOOD DEFENCES: FLOOD CELL 5, IKEN

DRAWING TITLE								
SITE LOCATION PLAN								
SCALE	NTS @A3	SWECO REF.	65208756-002	STATUS	S2	REVISION	C01	
PROJECT	ORIGINATOR	VOLUME/ SYSTEM	LEVELS & LOCATIONS	TYPE	ROLE	NUMBER	FIG 1	
65208756	SWE	XX	XX	D	GE	FIG 1		

Drawings

65208756-SWE-XX-XX-D-GE-0002-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 20.0m BGL
- CPT HOLES TO 6m BGL USING DIGITAL PIEZO STATIC CONE PENETROMETER ON A MINI RIG.
- CPT HOLES TO 12m 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	17.05.2023	FINAL ISSUE		HC	JM	JM
C01	24.04.2023	FINAL ISSUE		AT	HC	HC
Rev	Date	Amendment Details		Dr'n	Chk'	App'

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Client
EAST SUFFOLK WATER MANAGEMENT BOARD

Project Title
ALDE ESTUARY FLOOD DEFENCES: FLOOD CELL 5, IKEN

Drawing Title
INDICATIVE PROPOSED EXPLORATORY HOLE LOCATION PLAN

Purpose Of Issue
FINAL ISSUE

Status	S2	Status Description	SUITABLE FOR INFORMATION				
Designed	HC	Drawn	AT	Checked	HC	Approved	HC
Sheet Size	A1	Scale	1:5000	SWECO Ref	65208756-002	Revision	C01

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

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East Suffolk Internal Drainage Board
Water Management Alliance, Pierpoint House,
28 Horsley's Fields, Kings Lynn, Norfolk PE30 5DD
www.wlma.org.uk

Key:

- EA Main River
- East Suffolk IDB Main Drain
- Existing embankment approximate crest centreline (and chainage)
- Access Route (4*4)
- Access Gate
- Public Footpath
- Bridleway

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

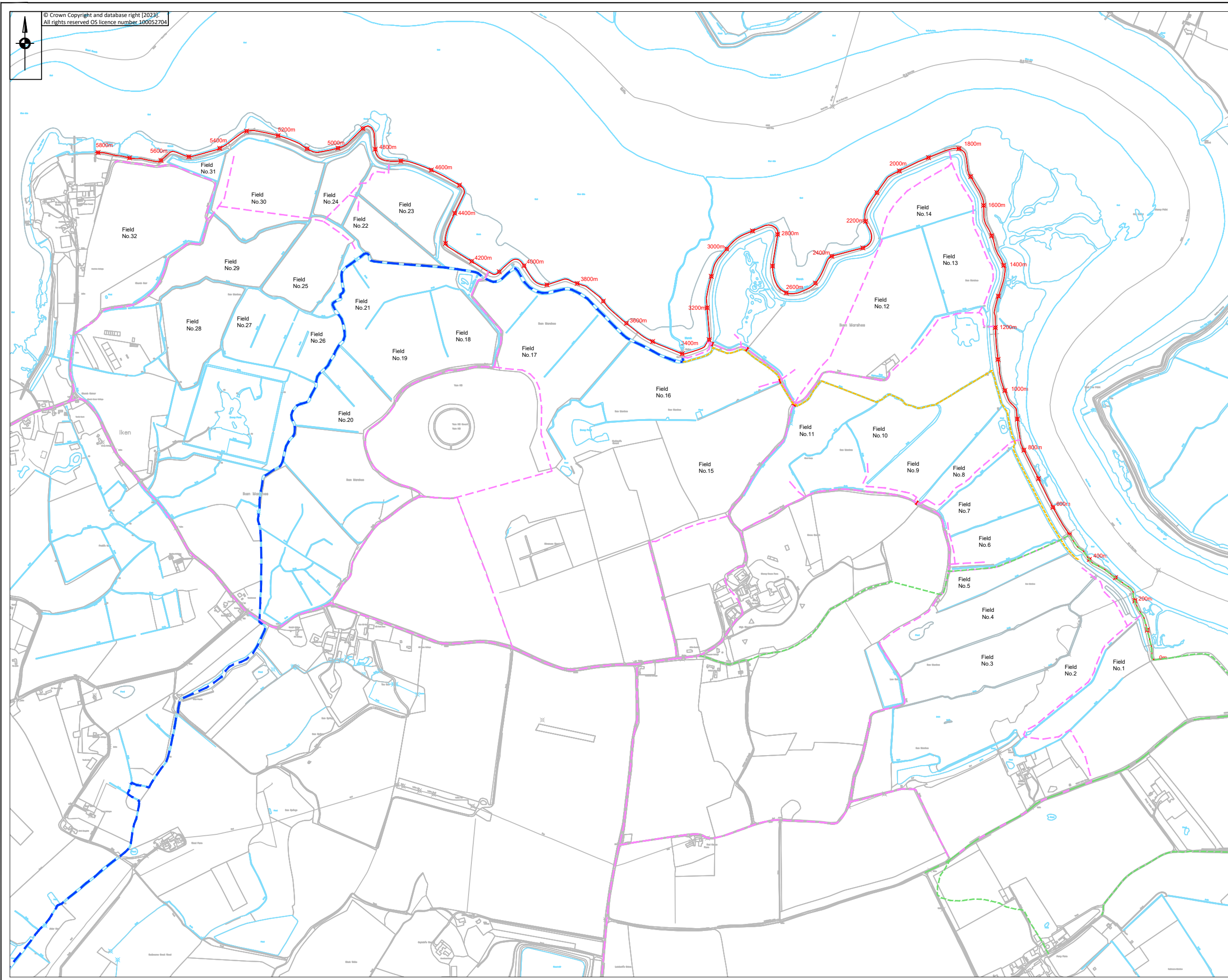
Project
**Upper Alde & Ore Estuary
Embankment Improvements
SCH12**

Drawing
**Upper Alde & Ore Estuary
Embankment Improvements
Flood Cell 5 - Iken
Access Overview**

Drawn by: PER Date: 03/02/2023
Checked by: - Date: -
Approved by: - Date: -

Drawing No. SCH12_FC05_1_001	Revision -
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Drawing Scale: 1:11,000 at A3



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Pete: 9/2/2023 - 9:2 am