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Marine Renewable Energy Projects in the Territorial Sea and UK Controlled Waters Adjacent to Scotland

Marine (Scotland) Act 2010

IMPORTANT: Before completing this form, please read these notes carefully.

The following numbered paragraphs correspond to the questions on the application form and are intended to assist applicants in completing the form. These explanatory notes are specific to this application and so applicants are advised to read these in conjunction with the General Guidance document. If further clarification is needed please contact Marine Scotland Licensing Operations Team (MS-LOT) on 01224 295579 or email:

MS.MarineLicensing@scotland.gsi.gov.uk

Please refer to the General Guidance for information regarding payment methods.

Explanatory Notes

2. Applicant

The person, company or organisation making the application that will be named as the licensee on any licence issued.

3. Agent

Any person, company or organisation acting under contract (or other agreement) on behalf of any party listed in the answer to question 2, and having responsibility for the control, management or physical deposit of materials anywhere below the tidal limit of the mean high water springs (MHWS) (e.g. a consultancy company submitting the application or a contractor who will be carrying out the works.)

4. Duration of Project

Provide details of the proposed commencement and completion dates of the project. The start date will not normally be backdated, except in exceptional circumstances, since to commence a project for which a licence has not been obtained may constitute an offence resulting in appropriate legal action. A licence is normally valid for 1 calendar year or the duration of the project (whichever is longer). After this period, it may be necessary for licence holders to re-apply for a further licence to continue any ongoing work (i.e. the project will be reviewed to establish whether original details are being adhered to). Although Marine Scotland Licensing Operations Team (MS-LOT) will aim to write to licence holders one month before the expiry date of a licence, it is the licensee's responsibility to apply for any further licences or an extension prior to the expiry of the initial licence.

5. Description and Cost of the Proposed Project

- (a) This estimate should only cover work taking place below the tidal level of MHWS and should take into consideration the cost of materials, labour fees etc.
- (b) Where the project is expected to take longer than 12 consecutive months, this description must detail which elements are to be undertaken in the first 12 months, with an outline of the schedule for each further 12 month period (the method of work should be described in the answer to question 7). In the event that MS-LOT must undertake a wider consultation on your application this description may be used as a basis for informing other bodies as to the nature of the proposed work.
- (c) Best describe the type of work proposed. Where the project involves a number of elements, please complete all appropriate boxes.

6. Location of Project

Include a list of the National Grid References (NGR) or latitude and longitude co-ordinates of the boundary points of the proposed project. In some cases, (e.g. the laying of cables) it may only be practicable to supply NGR or latitude and longitude co-ordinates for the start and end points.

NGR: Should consist of two letters followed by 10 digits (e.g. TL6320031700) where the first 5 digits are the eastings (read from the south west corner of an Ordnance Survey map) and the last 5 digits are northings.

Latitude & longitude: For positions read from charts of 1:25,000 scale or smaller, the format should be, e.g. 55°55.55'N 2°22.22'W. The decimal point specifies that decimals of minutes are used and the datum is stated explicitly. If seconds are used then the datum should be explicitly marked, e.g. 55°55'44"N 2°22'11"W. For positions read from larger scale charts, e.g. 1:10,000, three decimal places of minutes should be used, e.g. 55°55.444'N 2°22.222'W.

It is important that the correct positions are included with this application, as any errors may result in the application being refused or delayed.

To supplement the information given in section 6, the following must be provided with the completed application form:

- a suitably scaled extract of an Ordnance Survey Map (1:2,500 scale but not more than 1:10,000) or Admiralty Chart which should be marked to indicate:
 - the full extent of the project in relation to the surrounding area;
 - either NGR or latitude and longitude co-ordinates defining the area of operation.
 - the level of MHWS;
 - any adjacent Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), Ramsar or similar conservation area boundary.

These drawings/plans may be copied to others as part of the MS-LOT consultation process. If they are subject to copyright, **it is the responsibility of the applicant to obtain necessary approvals to reproduce the documents and to submit suitably annotated copies with the application.**

7. Method Statement

Please provide a full method statement, including details of any temporary structures/deposits that may be required below MHWS during the project, the ultimate fate of the structure and material used in its construction. Details of temporary structures will be included in any licence issued.

Proposed measures to ensure the marine environment is adequately safeguarded during the project should also be described, as should those taken to minimise any interference with other uses of the sea or foreshore.

8. Permanent (and Temporary) Deposits

- (a) Complete the appropriate box(es) to indicate all materials to be deposited below MHWS. If you propose using types of materials for which a specific box is not provided, please describe the nature of such material in the box marked "Other".
- (b) If any materials to be placed below MHWS are to be brought to the site by sea, give details of the material (e.g. clean rock, average particle size) the vessels to be used,

A chart should also be provided showing the proposed vessel route to the project site and details of any trans-shipment areas (i.e. where material may be off-loaded to smaller vessels/barges for transport inshore).

If temporary deposits are required, please provide details as with the permanent deposits above. The temporary deposit location details (NGR or Lat/Long) should be added to section 6 of the form, and the period of time the site will be used must be provided. If issuing a licence, MS-LOT will include on the document details of any area that has been approved as a temporary deposit site

9. Producer/Contractor

The person, company or organisation whose activities produce the material intended for deposit in the sea (e.g. the dredging or excavation contractor).

10. Holder

The person, company or organisation that will be in possession of the waste prior to its deposit in the sea. This will include those providing temporary storage facilities or transporting the material to the vessel for conveyance to the sea disposal site etc.

11. Agent

Any person, company or organisation acting under contract (or other agreement) on behalf of any party listed in the answer to sections 1, 9 or 10 and having responsibility for the control, management or deposit anywhere below the tidal limit of MHWS (e.g. a consultancy company submitting the application or a contractor who will be carrying out the operations).

12. Duration of Dredging/Drilling Operation

Provide details of the proposed commencement and completion dates of the operations. The start date will not normally be backdated, except in exceptional circumstances, since to commence a project for which a licence has not been obtained may constitute an offence resulting in appropriate legal action. A licence may be issued for up to 3 calendar years, although MS-LOT will aim to write to licence holders two months before the expiry date of a licence, it is the licensee's responsibility to apply for any further licences or an extension prior to the expiry of the initial licence.

13. Details of Dredging/Drilling and Disposal Vessel(s)

The name, operator and type of vessel, including the type of dredging/drilling plant (e.g. cutter-suction) should be entered. If vessel details are not available at the time of application, please indicate this on the form as these details will be required prior to licence issue.

14. Method Statement of Dredging/Drilling Operation

Provide a full method statement of the dredging/drilling operation. This should include details such as the rate of dredging/drilling, timing of the operation, order of the areas to be dredged/drilled and the precautions taken to protect both navigation and the environment.

15. Use of Explosives

Indicate whether explosives are to be used as part of the dredging operations. If yes, please indicate if a method statement has been provided with your application. If a method statement has been produced but is not available, please provide an explanation in the space provided.

16. Details of Areas to be Dredged/Drilled

This section requires data to be provided about the source area to be dredged and the type of material to be deposited.

Name of Area - An annotated chart/location plan (either at A3 or A4 format) of suitable scale (1:2,500 but no more than 1:10,000) should be provided, with each proposed dredge area marked and named. The chart/location plan should show the full extent of the project in relation to the surrounding area. These drawings/plans may be copied to others as part of MS-LOT consultation procedures. If they are subject to copyright, it is the responsibility of the applicant to obtain necessary approvals to reproduce the documents and to submit suitably annotated copies with the application.

Co-ordinates - Include a list of the National Grid References (NGR) or latitude and longitude co-ordinates of the boundary points for the proposed dredge areas.

- **NGR:** Should consist of two letters followed by 10 digits (e.g. TL6320031700) where the first 5 digits are the eastings (read from the south west corner of an Ordnance Survey map) and the last 5 digits are northings.
- **Latitude & longitude:** For positions read from charts of 1:25,000 scale or smaller, the format should be, e.g. 55°55.55'N 2°22.22'W. The decimal point specifies that decimals of minutes are used and the datum is stated explicitly. If seconds are used then the datum should be explicitly marked, e.g. 55°55'44"N 2°22'11"W. For positions read from larger scale charts, e.g. 1:10,000, three decimal

places of minutes should be used, e.g. 55°55.444'N 2°22.222'W.

Nature of Dredge/Drill Area - provide a description of the type of area to be dredged/drilled (e.g. river bed, sea, harbour, approach channel, estuary)

17. Details of Material to be Dredged/Drilled

Information is required for each of the areas listed in the answer to section 16. The applicant should indicate the following:

A pre-dredge survey and sediment chemical analysis report will be required by MS-LOT prior to the issue of a sea disposal licence. Please contact MS-LOT for details in relation to specific projects. In addition to those samples analysed by the applicant, sediment sub-samples must be submitted to MS-LOT as check monitoring may be required.

Physical Composition of Material - indicate the approximate proportions (by volume) of the different types of dredged materials which are expected to be removed from each area.

For the purposes of this application the following descriptions should be used:

Average particle size (Based on the Wentworth Table)		
Description	Lower range	Upper range
Boulders	256 mm +	
Cobbles	64 mm	256 mm
Pebbles	4mm	64 mm
Granules	2 mm	4mm
Sand	62 microns	2mm
Silt and clay		62 microns

Depth of Material to be Removed - indicate the maximum depth (in metres) below the current seabed level, to which it is expected dredging is to be carried out.

Estimated Specific Gravity - indicate the specific gravity of the material to be disposed.

Quantity to be Dredged/Drilled per Year - the amount of material to be dredged (per year) from each area. Indicate unit of measure, either in-situ cubic metres or metric tonnes.

18. Dredged/Drilled Material: Additional Information

Contamination - information should be given regarding contamination in any of the areas to be dredged/drilled e.g. waste discharges, man-made rubbish or industrial activity in close proximity.

Type of dredger - indicate the type of dredging plant to be used within each area.

Beneficial uses – include any intended beneficial use of material (details to be provided in the BPEO).

19. Details of Dredged/Drilled Material Quality

The applicant is required to have representative sediment samples analysed at a laboratory of choice. This is liable to extend the time required to consider your application **as no licence will be issued without provision of this chemistry data**. As part of the application consideration process, an assessment will be made of the

chemical and physical characteristics of the material to be deposited at sea and its potential effects upon the marine environment.

As part of the licence conditions, you may be required to take representative samples of the dredged/drilled material during the dredging/sea disposal operations for analysis by MS-LOT. In such cases, samples should be taken at specified locations and depths and placed in containers which will be provided. The samples should then be returned to MS-LOT at the Marine Laboratory Aberdeen. This process enables the UK to fulfil its obligations under international conventions.

20. Best Practicable Environmental Option (BPEO) Assessment

Under Part 4, Section 27(2) of the Marine (Scotland) Act 2010 (there is no equivalent provision under the Marine and Coastal Access Act 2009), the Licensing Authority has an obligation to consider the availability of practical alternatives when considering applications involving disposal of material at sea. In order for Marine Scotland to thoroughly assess the available alternative options and reach a properly considered decision, all sea disposal licence applications must be supported by a detailed assessment of the alternative options - a Best Practicable Environmental Option (BPEO) assessment. This should include a statement setting out the reasons which have led to the conclusion that deposit of the materials at sea is the BPEO. **Sea disposal applications will not be considered unless they are accompanied by a BPEO assessment.** All options in the BPEO should be explored fully (as per the guidance documents) otherwise your form and BPEO are liable to be returned to you thereby delaying processing of the application.

21. Sea Disposal Site Details

Provide details of the proposed sea disposal site for the dredged material and, if necessary, any alternative sea disposal site(s) considered. In determining whether to issue a licence, MS-LOT will take into account any site nominated by the applicant. However, should this site be unsuitable, the nearest suitable disposal site for the dredged material will be identified. Should you wish to establish a new site, please provide details in a covering letter with your application and MS-LOT will contact you to discuss your proposal before your application is determined. The cost of any site investigations to identify any new sea disposal site will normally be the responsibility of the applicant.

22. Other Consents

Detail all consents required for the proposed project and indicate those that you have applied for or received. In all cases the applicant must provide the name and address of the nearest Local Planning Authority for the location of the project.

23. Statutory Consenting Powers

Please describe in the answer to this question what (if any) statutory responsibilities you (or your client) have to consent any aspect of the project.

24. Advertising and Consultation

- (a) Confirm whether the proposed project has been advertised, and if so how and where?
- (b) Have the public been invited to comment on the proposed project? If so to whom and what was the closing date?
- (c) Have any consultation meetings been held with the public? If so where and when?

25. Consultation with Conservation Bodies

Consenting Authorities have a duty to ensure marine projects will not have a significant adverse environmental impact, particularly upon designated conservation areas (e.g. SSSI, SAC, SPA, Ramsar sites etc). All details of

consultations with conservation bodies (e.g. SNH, JNCC) should be given, particularly where the applicant has statutory powers for consenting aspects of the project

In addition, guidance can be obtained from www.foodstandards.gov.uk/ with regards to the Shellfish Waters Directive (2006/113/EC) which has parameters set to protect the water quality in which edible shellfish are grown.

26. Designated Conservation Areas

Indicate whether the proposed project is located within or close to the boundaries of a conservation area such as a SAC, SPA, SSSI or Ramsar site (further information can be found on the SNH SiteLink webpage <http://gateway.snh.gov.uk>).

27. Environmental Assessment

Under the Marine Works (EIA) Regulations 2007, there may be a requirement for certain projects to undergo an Environmental Impact Assessment (EIA) and produce an Environmental Statement (ES). If an EIA/ES is deemed necessary, MS-LOT cannot issue a marine Licence until the outcome of the EIA/ES has been determined. Please indicate whether any EIA has been carried out in respect of the proposed project, either under your own powers or as required by another authority. If such an assessment has been undertaken, please indicate if a copy has been provided with your application. If the statement/assessment has been completed but is not available, please provide an explanation in the space provided.

Additionally, please also give details regarding if and where a copy has been/is being made available for public inspection.

Other Considerations

Applicants should also be aware of the need to pay due regard to coastal and marine archaeological matters and attention is drawn to Historic Scotland's Operational Policy Paper HP6, "Conserving the Underwater Heritage". Please ensure that you have:

- completed all applicable sections of the application form;
- signed and dated the declaration;
- provided the correct relevant documents, charts, and continuation sheets (where necessary); and
- enclosed the correct payment (together with the remittance slip) or paid by means of BACS (if appropriate).

Otherwise your application may be delayed or returned to you.

Application for Marine Renewable Energy Projects in the Territorial Sea and UK Controlled Waters Adjacent to Scotland

(ML-003)

Marine (Scotland) Act 2010

It is the responsibility of the applicant to obtain any other consents or authorisations that may be required.

Under Part 4, Section 54 of the Marine (Scotland) Act 2010 and Section 101 of the Marine and Coastal Access Act 2009 all information contained within or provided in support of this application will be placed on the Public Register. There is no national security grounds for application information not going on the Register under the 2010 Act. Under the 2009 Act, application information goes on the Register unless the Secretary of State determines that it's disclosure in the Register would be contrary to the interests of national security.

Public Register

Is there any information contained within or provided in support of this application that you consider should not be included on the Public Register on the grounds that its disclosure

- (a) would be contrary to the interests of national security; or YES ☐ NO ☒
- (b) would adversely affect the confidentiality of commercial or industrial information where such confidentiality is provided by law to protect a legitimate commercial interest? YES ☐ NO ☒

If **YES**, to either (a) or (b), please provide full justification as to why all or part of the information you have provided should be withheld.

1. Project Title and Payment Details

Please give a brief identifiable description, including the location, of the project.

Methil Offshore Demonstration Wind Turbine, adjacent to Fife Energy Park, Wellesley Road, Buckhaven,

Payment: Enclosed payment ☐ BACS ☒ **OR** Invoice ☐

2. Applicant Details

Title Mr Initials S Surname Harper

Trading Title (if appropriate) 2-B Energy Ltd.

Address Ground Floor Suite 2,
The Hydrogen Office
Methil Dock Business Park

Name of contact
(if different)

Position within Company Manager, UK
(if appropriate)

Telephone No. 07710 487567
(inc. dialing code)

Fax No.
(inc. dialing code)

Company Registration No. 7194189

Email scott.harper@2-BEnergy.com

3. Agent Details (if any)

Title Initials Surname

Trading Title (if appropriate)

Address

Name of contact
(if different)

Position within Company
(if appropriate)

Telephone No.
(inc. dialing code)

Fax No.
(inc. dialing code)

Company Registration No.

Email

4. Duration of Project

Start date 01/04/2012

Expected completion date 31/07/12

5. Description and Cost of the Proposed Project

(a) Estimated gross cost of the works proposed seawards of the tidal limit of MHWS

£1,500,000

(b) Give a detailed description of the proposed schedule of work.

INTRODUCTION

Overview

2-B-Energy Ltd. is proposing to develop an offshore wind turbine prototype on the northern shore of Firth of Forth, Scotland. The project, Methil Offshore Windfarm Demonstration Wind Turbine, is located 50m offshore from Fife Energy Park, Methil.

The Development will comprise of:

- A single, two-bladed demonstration wind turbine with a hub height between 98m and 114m AOD and

(c) Types of Work Proposed

General Marine Project (e.g. wave, tidal device, monopile turbine)

Foundation for jacket structure to support demonstration turbine, construction of loading pad to facilitate it

Scientific/Marine Survey (e.g. geotechnical, geophysical, waverider):

Moorings (e.g. private, commercial):

Dredging/Drilling Operations

Small volume of overburden/silt excavation and small diameter drill rod insertions to secure foundation to

6. Location of Project (including any temporary deposit locations)

This should include either National Grid References (NGR) or Latitude and Longitude co-ordinates defining the extent of the project.

The project is adjacent to the Fife Energy Park in Methil, Fife.

Turbine corner Grid references are shown below in both formats

National Grid References	Latitude & Longitude
Corner A NT 36820, 98381	56° 10' 25.936" N 3° 1' 9.024" W
Corner B NT 36837, 98390	56° 10' 26.235" N 3° 1' 8.046" W
Corner C NT 36847, 98373	56° 10' 25.690" N 3° 1' 7.452" W
Corner D NT 36829, 98363	56° 10' 25.358" N 3° 1' 8.486" W

7. Method Statement

<p>Construction Method Statement</p> <p>Construction Pad</p> <p>1 Carefully uplift and lay aside existing rock armour protection for re-use</p> <p>2 Deposit stone fill material in layers to provide level working platform between high and low water lines</p> <p>3 Drive steel sheet pile to form outer edge of construction pad</p>
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8. Permanent (and Temporary) Deposits

(a) Quantity of permanent (and temporary, where applicable) materials to be deposited below MHWS:

Type of Deposit	Nature of Deposit (P = Permanent, T = Temporary)	Deposit Quantity
Steel/Iron	P	210 Tonnes No. (if applicable)
Timber		m ³ /tonnes
Plastic/Synthetic		m ²
Concrete	P	850 m ³
Silt		m ³
Sand		m ³
Stone/Rock/Gravel	P	Size range (mm) 0-40mm type 1: 3500m ³ Total m ³
Concrete bags/mattresses		No. Dimensions Total m ³
Cable	P	Length (m)

Other (please describe below):
Stone/Rock/ Gravel for re-instatement of the coastal defence in the following sizes - 0.3 to 0.7 tonnes sec

(b) Method of delivery of material.
(see Guidance Notes)

All materials will be delivered to the site by road and access will be provided from the adjacent Fife Energy Park

If necessary, please continue on a separate sheet and tick this box

☐

IF THE PROJECT INVOLVES DREDGING/DRILLING (AND DISPOSAL OF DREDGED MATERIALS AT SEA) THEN PLEASE COMPLETE THE FOLLOWING SECTIONS, OTHERWISE PROCEED TO SECTION 22

9. Dredging/Drilling Contractor/Producer Details

Title Initials Surname

Trading Title (if appropriate)

Address

Name of contact
(if different)

Position within Company Manager, UK
(if appropriate)

Telephone No. Fax No.
(inc. dialing code) (inc. dialing code)

Company Registration No. Email

10. Holder

If the Holder is also the Applicant (shown at 2) tick the box and go to section 11

☐

If the Holder is also the Producer (shown at 9) of the material tick the box and go to section 11

☐

Title Initials Surname

Trading Title (if appropriate)

Address

Name of contact
(if different)

Position within Company
(if appropriate)

Telephone No. Fax No.
(inc. dialing code) (inc. dialing code)

Company Registration No. Email

11. Agent

Title Initials Surname

Trading Title (if appropriate)

Address

Name of contact
(if different)

Position within Company Manager, UK
(if appropriate)

Telephone No.
(inc. dialing code)

Fax No.
(inc. dialing code)

Company Registration No.

Email

If more than one 'Agent' please continue on a separate sheet and tick the box ☐

12. Duration of Dredging/Drilling Operation

When is it proposed to begin the dredging/drilling operation?

When are dredging/drilling and disposal operations expected to be completed?

13. Details of Dredging/Drilling and Disposal Vessel(s)

	Name of Vessel and Operator	Type of Vessel
(a)		
(b)		
(c)		
(d)		

14. Method Statement for Dredging/Drilling Operation

15. Use of Explosives

Will any part of the dredging operation involve the use of explosives?

YES ☐ NO ☒

If YES,

Has a method statement regarding the use of explosives been submitted with this application?

YES ☐ NO ☐

If a method statement is not being submitted, please provide an explanation as to why.

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16. Details of Areas to be Dredged/Drilled

Dredge/Drill Areas	Name of Area to be Dredged/Drilled	Co-ordinates	Nature of Dredged/Drilled Area
A			
B			
C			
D			
E			

If necessary please continue on a separate sheet and tick this box ☐

17. Details of Material to be Dredged/Drilled

For each of the areas at rows A –E above (plus any listed separately), provide the following information:

Dredge/Drill Areas	Estimated Specific Gravity	Physical Composition of Material	Depth of Material to be Removed (metres)	Quantity to be Dredged/Drilled per Year (either in-situ m ³ or metric tonnes)
A				
B				
C				
D				
E				

If necessary please continue on a separate sheet and tick this box ☐

18. Dredged/Drilled Material: Additional Information

For each of the areas at rows A – E above (plus any listed separately), provide the following information:

Dredge/Drill Areas	Type of Contamination	Type of Dredger	Beneficial Uses
A			
B			
C			
D			
E			

If necessary please continue on a separate sheet and tick this box ☐

19. Details of Dredged Material Quality

Has the dredged/drilled material been chemically analysed in the last 3 years?

YES ☐ NO ☒

Can the samples be made available if required?

YES ☐ NO ☐

If NO, when will they be available?

20. Best Practicable Environmental Option (BPEO) Assessment

Has an up to date BPEO assessment been included with your application?

YES ☐ NO ☐

21. Sea Disposal Site Details

Name of Disposal Site (or Oslo Code)	Co-ordinates of Disposal Site

explanation below.

The EIA was submitted to Marine Scotland as part of the Section36 application in April 2010

Is the EIA/ES available for public inspection?
If **YES**, at what locations:

YES ☒ NO ☐

Buckhaven Local Services Centre, Buckhaven Local Office, 1 College Street, Buckhaven, Leven, KY8 1AB;
Methil Local Services Centre, Methil Library, Wellesley Road, Methil, Leven, KY8 3PA;
Fife Council, Planning Department, Town House, 2 Wemyssfield, Kirkcaldy, KY11 XW.

Declaration

I declare to the best of my knowledge and belief that the information given in this form and related papers is true.

WARNING

It is an offence under the Act under which this application is made to fail to disclose information or to provide false or misleading information.

Signature

Scott Harper

Digitally signed by Scott Harper
DN: cn=Scott Harper, o=2-B Energy Ltd., ou, email=scott.harpe@2-benergy.com, c=GB
Date: 2011.06.22 14:57:17 +01'00'

Date

22/6/11

Name in BLOCK LETTERS

SCOTT HARPER

Position within company
(if appropriate)

MANAGER, UK

Please check carefully the information you have given and that all the enclosures (including copies) have been included.

Application Check List

1. Electronic Application


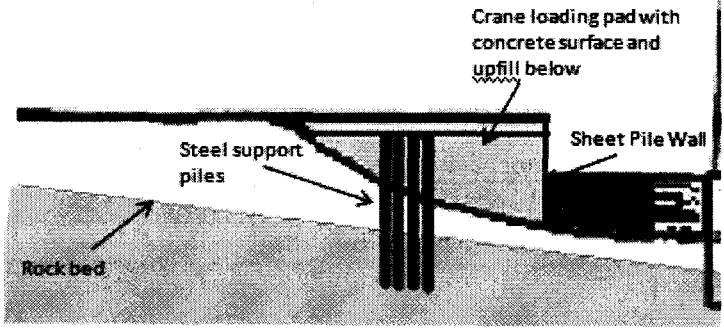
- Completed application form x 1
- Project drawings x 1
- Method Statement x 1
- Maps/Charts x 1
- Additional environmental information, eg. Photographs, Environmental Impact Assessment etc (if required) x 1
- Payment (signed cheque or BACS details)

✓
✓
✓
✓
✓

2. Non-electronic Application

- Completed, signed application form x 7
- Project drawings x 7
- Method Statement x 7
- Maps/Charts x 7
- Additional information, eg. photographs, Environmental Impact Assessment etc (if required) x 7 (**dependent on size and relevance to consultees**)
- Payment (signed cheque or BACS details)

2-B ENERGY METHIL DEMONSTRATION TURBINE FOUNDATION INSTALLATION METHOD STATEMENT

	Construction Method Statement	Notes / Detail Description
	Construction Pad	
1	Carefully uplift and lay aside existing rock armour protection for re-use	<p>The picture below shows the nature of the existing revetment, a mixture of slipped rock armour and concrete deposits</p> 
2	Deposit stone fill material in layers to provide level working platform	<p>Material will be sourced from the Energy Park site – this is a mixture of colliery mine-stone and imported crushed rock material. Any material utilised will be tested to ensure its suitability. Should existing site won material not be suitable in terms of either the bearing capacity or chemical content, imported stone Type 1 material will be utilised.</p> <p>Total quantity of fill material 3500 m3.</p>
3	Drive steel sheet pile to form outer edge of construction pad	<p>The sheet pile outer support will be designed only to retain the fill material and concrete pad – It will not support the crane or turbine loads which will be dealt with by means of independent steel pile supports.</p> 
4	Upfill with stone, compacted in layers, to 600mmm from top of sheet piling	
5	Drive small diameter (350mm) steel piles below crane and material lay-down areas	<p>Sheet pile will be 100kg /m2 total weight of 90 tonnes</p> <p>Drive piles are 350mm diameter , 100kg/m total weight 35 tonnes</p>

2-B ENERGY METHIL DEMONSTRATION TURBINE FOUNDATION INSTALLATION METHOD STATEMENT

6	Install steel re-enforcement for pad		
7	Pour in-situ concrete surface to pad	Total volume 390m3	
	Re-instatement of Rock Armour Revetment		
1	Excavate/fill slope to sea defence on east and west of the construction pad.		
2	Install geotextile membrane		
3	Install secondary rock armour protection to slope		
4	Uplift primary Rock armour, previously laid aside and place on newly formed revetment. Supplement with new rock armour as required.		
	Turbine Foundations		
1	Deliver Jack-up barge to site and position		
2	Excavate silt/overburden material to form socket for caisson, excavated material deposited on Fife Energy Park for use in construction or disposal to licenced tip	<p>Artificially made ground is present across the majority of the Fife Energy Park. Borehole records in proximity of the quay indicate between 0.9 m and 3.85 m of superficial deposits, mainly comprising colliery spoil material, likely to have been transported into the sea in surface water runoff from the adjacent spoil heap. There is some evidence of colliery spoil amongst the silty sand in the 2 m of superficial marine deposits.</p> <p>Excavation will be carried out with appropriate plant from the jack-up barge. Excavation of approximately 25m3 will take place at each leg of the structure. This is to form a clean surface and connection to the rock bed below. The excavation will allow the caisson to be inserted.</p>	
3	Rotate caisson into seabed	The caisson will be mechanically rotated/pushed into the top surface of the rock bed below the superficial deposits. Each caisson will be 4m in diameter and up to 12 m long. The caisson will project above the high water level and extend to the rock bed. Caisson Weight 25 tonnes each	
4	Pump out water and silt from interior of caisson	Prior to filling with concrete and silt deposits any sea water remaining within the caisson will be pumped out.	
5	Drill through pre-formed sleeves to rock-bed to prepare for anchor rods	The caisson will be fitted with up to 16 nr drill sleeves of 75mm diameter. Each individual anchor rod will be pre-drilled utilising the drill sleeves pre- installed in the caisson. All drill arisings will be deposited on the energy park site or taken to tip	
6	Insert anchor rods into caisson sleeves to be secured mechanically or chemically		
7	Pour in-situ concrete fill to caisson	Concrete volume – 150m3 per caisson	
8	Remove jack-up barge from site		

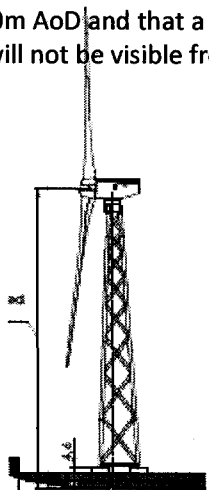
EIA Section	Detail Clarification for Alternative Foundation Design
3. Project Description	
The Demonstration Wind Turbine	
The turbine is approximately 120m to the hub with a rotor diameter of 130m, giving a maximum tip height of 185m. (179m AOD) The turbine is fixed to a steel tubular lattice structure which provides the foundation and tower as a continuous structure without transition pieces.	<p>As a result of the alternative foundation design and finalisation of the dimensions of the steel lattice structure, we are able at this time to confirm the anticipated height of the hub and blade tip as being within the maximum range previously proposed.</p> <p>It may be that the structure sits on the sea-bed directly or as a result of the proposed concrete and steel caisson bases, it may sit fully above the high water level. The table below shows the potential range of heights and confirms that the previously stated maximum will not be exceeded. It is also of note that the site level adjacent to the turbine sits at around 10m AoD and that a large section of the structure base will not be visible from the landward side of the site.</p> 

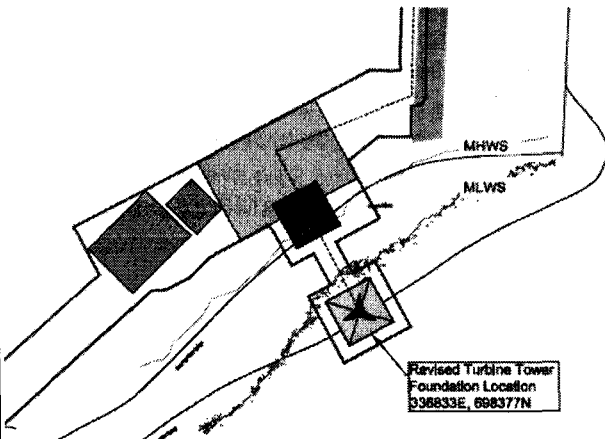
Table 3.1 Turbine Specifications

Turbine Specification	Dimension/Number	Turbine Specification	Dimension/Number
Turbine Rated Capacity	6MW	Turbine Rated Capacity	6MW
Number of Blades	2	Number of Blades	2
Tower Style	Lattice	Tower Style	Lattice
Max hub height AOD	114m	Hub height AOD	98m - 114m
Max blade diameter	130m	Max blade diameter	130m
Max height to blade tip AOD	179m	Height to blade tip AOD	163m - 179m
Revolutions per minute	5 – 13.25	Revolutions per minute	5 – 13.25
Direction of Rotation	Clockwise	Direction of Rotation	Clockwise

Wind Turbine Foundation	
<p>In order to construct the foundations, it is likely that at high tide a jack up barge will be floated to the turbine position, where the barge will jack up out of the water in order to provide a stable platform for construction. Alternatives to drill from the construction pad are also being investigated. Boreholes will be drilled to a depth of up to 20m and steel piles inserted and grouted. The piles are likely to be a maximum of 20m long and approximately 2m in diameter.</p>	<p>The 2-B Energy foundation study, currently in process, has identified that depending upon the specific loading requirements, it may be possible to utilise a modular jack-up structure, which could be delivered by road and installed in sections. Our principle assumption however, is that the traditional jack-up barge will still be required.</p> <p>The foundation will take one of the following two forms</p> <ol style="list-style-type: none"> 1. Large steel caisson foundations, which would be manufactured off site, delivered to the construction pad location and craned into position. <p>Each caisson will be up to 4 m in diameter, 10-12 m in length, depending upon the depth of overburden of silt/colliery spoil. They will be lowered/rotated into an excavated socket, then filled with in-situ concrete once placed on site. The caissons will extend above the water level to provide a clean above surface fixing for the turbine structure.</p> <p>They will be pre-fitted with steel sleeves to allow fixing with multiple anchor rods (mechanical or chemical fixing) through to the sandstone bed below the foundation. Small diameter rods will be drilled through the sleeves into the rock below.</p> <ol style="list-style-type: none"> 2. The pile foundation solution with a hammered or rotated steel pile sleeve, is still considered to be a potential option for foundations at this site. Following installation of the pile sleeve, large diameter steel piles would be placed, either by drilling the rock bed or by driving the piles. As before, these piles would be up to 20m long and up to 2m in diameter.
<p>Any spoil arising from the drilling of the foundation piles will either be utilised within the Fife Energy Park site works or removed from site and disposed of at a licenced waste facility.</p>	<p>Any spoil arising from either foundation option will either be utilised within the Fife Energy Park site works or removed from site and disposed of at a licenced waste facility.</p>

Crane Pad

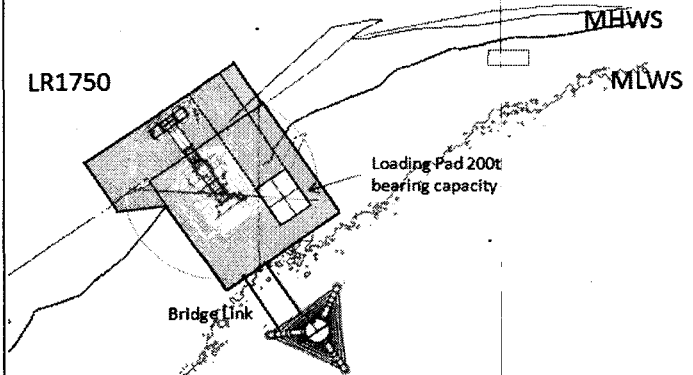
Onshore, close to the turbine position, a hardstanding will be constructed with the stable base, on which to laydown the turbine components ready for assembly and erection. The cranes required to lift the tower and nacelle and rotor will also be sited within this area. The total approximate area of crane hardstanding will be 400m² (20m x 20m) with an approximate thickness of 600mm as shown below.



It may also be necessary to undertake work to protect the existing coastal defences in the immediate vicinity of the crane pad.

The size of the crane hardstanding and loading platform will be up to 30m x 30m giving a total area of 900m².

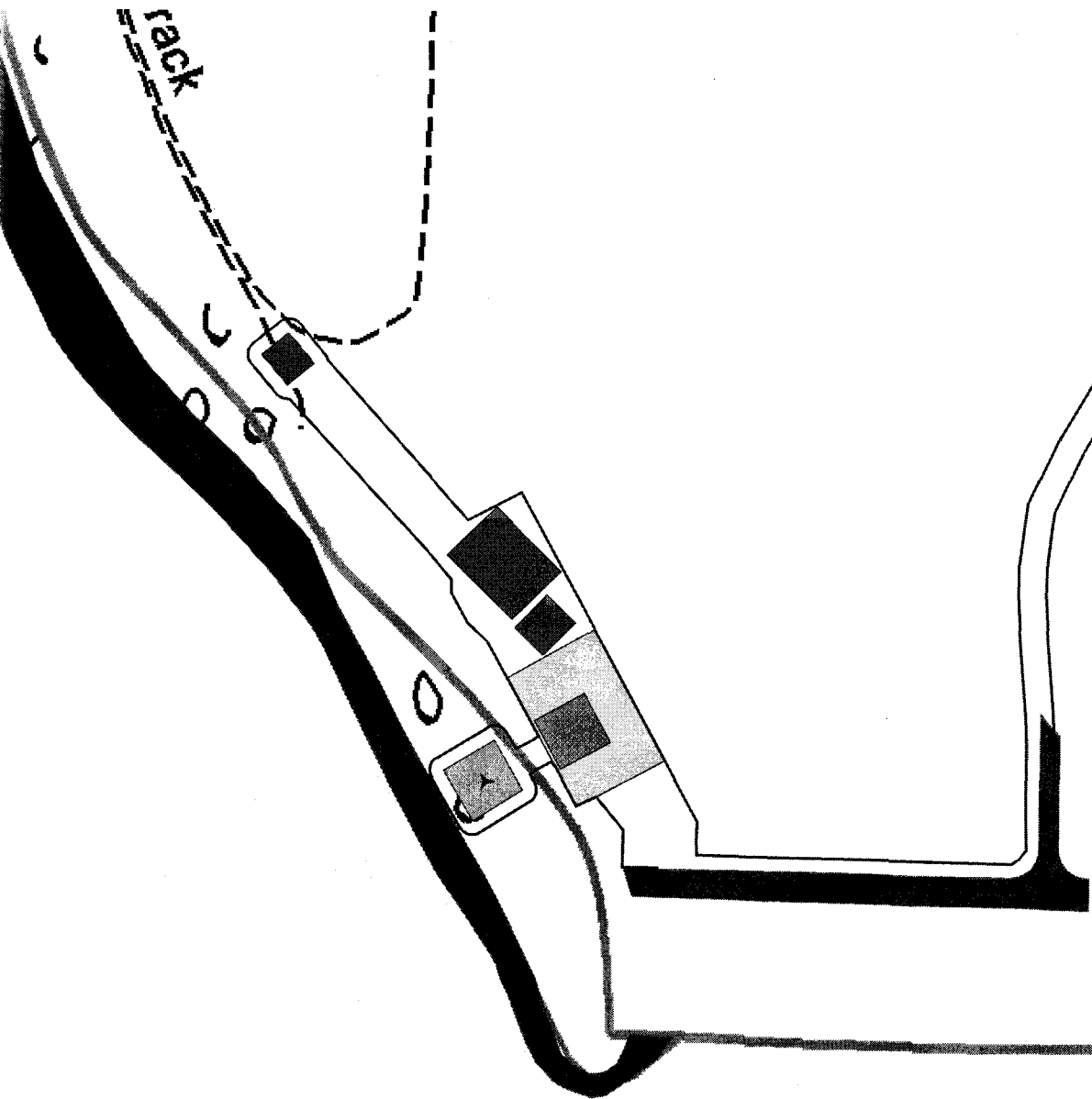
Figure below provides an indicative layout

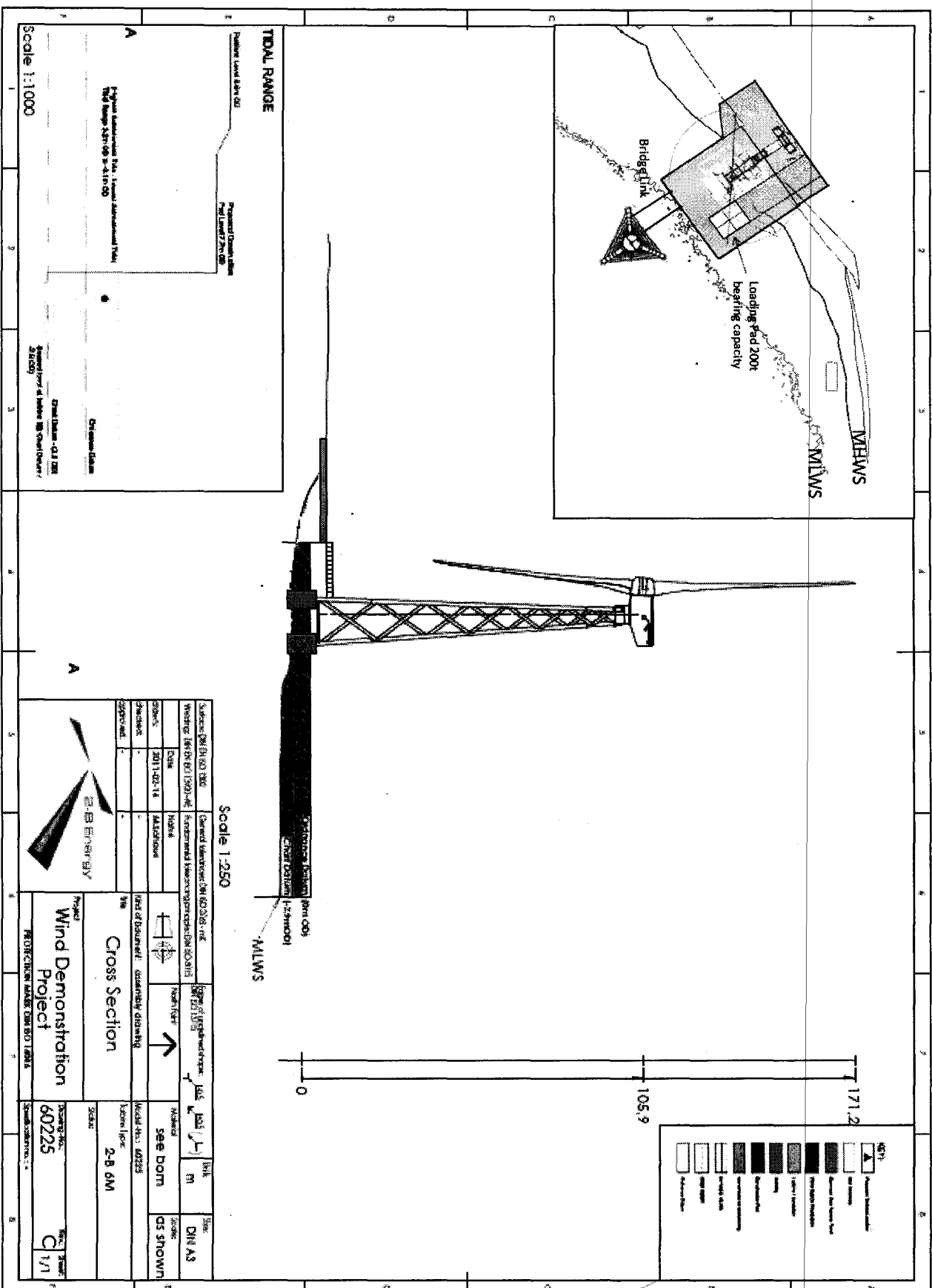


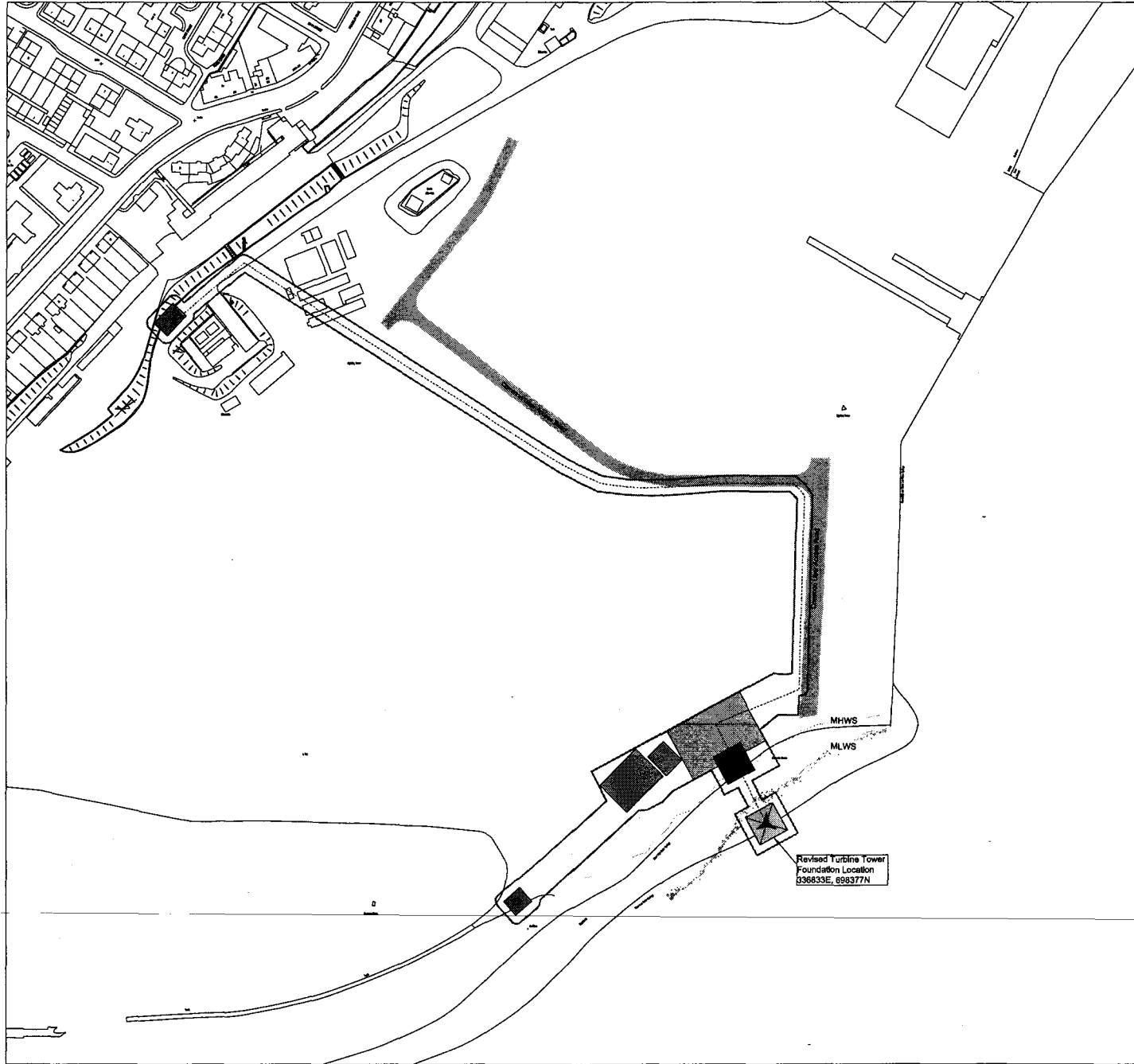
The existing coastal defence has slipped in many areas. The slopes of the coastal defence will be rebuilt around the sides of the sheet pile wall of the crane loading platform

CHAPTER 9 WATER RESOURCES AND COASTAL HYDROLOGY	
<i>Topography and Land Use</i>	
<p>The turbine is to be located in an area of seabed to the south west of Quay 2, as shown in Figure 3.4 of this EA. The centre of the turbine is approximately 20 m from the crest of the existing slope into the sea in an area that is shown to be within the Scottish Enterprise ownership boundary. The sea revetment in this area has not been repaired or re-instated but it is understood that proposals by Scottish Enterprise to re-construct formal coastal defences to protect the site will be implemented in due course. The elevation of the site is approximately 8 m Above Ordnance Datum (AOD) and it is assumed that ground level at the turbine location will be 3m – 5m below Ordnance Datum.</p>	<p>Following the relocation of the turbine to be on the seaward side of the mlws line as per the previous post application amendment, the centre of the turbine is now 50m from the crest of the existing slope and now sits in an area of seabed wholly owned by Crown Estate</p>
<i>Alteration of Current Flow Pathways</i>	
<p>The turbine is to be located in an intertidal area, meaning the area is not submerged under water during low tide. During low tide there will be no effect on coastal currents. Considering the relatively small volume of the installed turbine foundations (approximately 20 m³) and the wide spacing of each metal support beam, it is considered that the Development will have a negligible effect on the natural coastal currents during high tide and will not lead to sediment scouring to the southwest of the turbine foundations. Given the moderate sensitivity and negligible magnitude of effect, the significance of effects associated with the alteration of current flow pathways is considered to be negligible, in accordance with Table 9.2.</p>	<p>The turbine is to be located in an intertidal area, meaning the area is not submerged under water during low tide. During low tide there will be no effect on coastal currents. The proposed caisson foundation would occupy approximately 12m² per leg (x 3) This is still a relatively small area of seabed and with the spacing of each leg at 20m centres, it is considered that the Development will still have a negligible effect on the natural coastal currents during high tide and will not lead to sediment scouring to the southwest of the turbine foundations.</p>












Fife Energy Park







KEY:-

-  Proposed Turbine Location
-  Wind Monitoring Mast
-  Site Boundary
-  Cable Route
-  Transformer
-  Common User Access Road
-  Wind Mast Foundation
-  Turbine Foundation
-  Building
-  Construction Pad
-  Construction Hardstanding



Project:
Wind Demonstration Project

Client:
2-B Energy Holding B.V.

The
Site Layout Figure 1.2

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BELLSHILL MANCHESTER

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