Foreshore Licence Application – Clogher Head, Co. Louth.

Outline Contractor's Method Statement

Document No.: QS-000247-02-R460-R001

Date: 18/12/2017

ESB International, One Dublin Airport Central, Dublin Airport, Cloghran, Co. Dublin, K67 XF72, Ireland.

Phone +353 (0)1 703 8000

www.esbinternational.ie

File Reference:	QS-000247-02	
Client / Recipient:	Hibernian Wind Power	
Project Title:	Offshore Wind Project – Clogher Head, Co. Louth	
Report Title:	Outline Contractor's Method Statement	
Report No.:	QS-000247-02-R460-001	
Revision No.:	0	
Prepared by:	Eoin Mac Crosain	Date: 13/12/2017
Title:	Graduate Civil Engineer	
Verified by:	Annmarie Downey	Date: 18/12/2017
Title:	Project Manager	
Approved by:	Mark Fielding	Date: 19/12/2017
Title:	Pre Development Group Manager Civil & Environmental Engineering	

Template Used: T-020-007-ESBI Report Template

Change History of Report

Date	New Revision	Author	Summary of Change

Table of Contents

1 Description of proposed works methodologies

The proposed works involve completing a geophysical survey, geotechnical investigation and site characterisation of the offshore environs near Clogher Head, Co. Louth.

The total proposed survey area is approximately 187 km^2 and the geophysical survey will be completed in a grid of yet to be determined resolution. The geotechnical investigation sampling will be completed as per the required sampling intervals shown in Drawing numbers QS-000247-02-D460-002 and QS-000247-02-D460-003.

It is envisaged that the survey and investigation works will be carried out during the Summer of 2018 to take advantage of favourable weather conditions.

The site characterisation will require the deployment of a monitoring buoy during the summer of 2018 for a period of 12 to 36 months to yield sufficient data.

The vessels used in offshore surveys and investigations are typically 55-85m in length. Such vessels have high sea-endurance and may/may not mobilise from an Irish port for the works. It is common in shallower coastal waters to use smaller vessels, typically 8-35m. These vessels may mobilise from a local port/pier, e.g Clogherhead, Annagassan, Carlingford etc. The contractor's choice, configuration and scheduling of vessel(s) may vary with resource availability, timing or other relevant factors.

There are four main methods used to deploy survey and investigation equipment from vessls to undertake the works as described. They are as follows:

- Towed in a vessel's wake,
- Launched by a crane,
- Deployed through a vessel's moonpool,
- Attached to a vessel's hull.

The choice of deployment method typically reflects equipment needs, contractor resources or contractor methodologies.

1.1 Geophysical Survey

The Geophysical survey will include MBES, SSS, Magnetometer, Sub-bottom Profiler. These survey equipment are all non intrusive survey techniques.

Multibeam Echo Sounder (MBES)

The Multibeam Echo Sounder (MBES) is a type of sonar (acoustic surveying) used in seabed mapping wherein acoustic waves are used to indicate depth-to-seabed. The device is typically affixed to a vessel's hull or towed in it's wake. The process is non intrusive and the device will not make contact with the seabed at any point. The Kongsberg EM710 may be taken as an indicative example of a MBES system to be used in the completion of these works and datasheet for the Kongsberg EM710 is included in Appendix A.

Magnetometer

A magnetometer detects ferrous objects and as such is used to survey and detect objects or unexploded ordnance which could cause interference to any subsea works. The magnetometer is typically towed behind a survey vessel or affixed to a vessel's hull. The

process is non intrusive and the device will not make any physical contact with the seabed at any point. The G-882 Marine Magnetometer may be taken as an indicative example and datasheet for this device in included in Appendix A.

Geophysical Acquisition System/Sub-bottom Profiler (Sparker/Boomer)

The sub-bottom profiler uses reflection seismology to give a 2D image of the sub-seabed geology. Commonly used variants of this technology are known as the Sparker and Boomer. The device is typically towed behind the vessel during survey works or affixed to the vessel's hull. The process is non intrusive and the device will not make any physical contact with the seabed at any point. The Innomar SES-2000 Quattro Parametric Sub-Bottom Profiler may be taken as an indicative example and the datasheet for this device is included in Appendix A.

Side Scan Sonar (SSS)

Side Scan Sonar is a type of sonar used to create an image of large areas of the sea floor. Whilst surveying, the device is typically affixed to the hull of a survey vessel or towed in it's wake. The process is non-intrusive and the device will not make physical contact with the seabed at any point. The EdgeTech 4200-MP may be taken as an indicative example of SSS and the datasheet for this device is included in Appendix A.

1.2 Geotechnical Investigation

Grab Sampling

Grab sampling is a mechanical method of obtaining a sediment sample from the seabed. The process of collecting seabed samples will most likely involve launching a grab from a crane on the vessel onto the seabed. The grab and sample will be retrieved to the vessel using the crane.

A Hamon Grab is an indicative example of a grab sample which could be used for these works.

Cone Penetration Test (CPT)

The cone penetration test (CPT) is used to acquire in situ data to the required testing depth which will be up to circa 5 m. The CPT device is typically launched into the water from a crane on the vessel or deployed through a moonpool on the vessel. The test method will involve pushing the instrumented cone downwards into the soil at a controlled and calibrated rate.

Samples will be completed at the required sampling interval as shown on Drawing numbers QS-000247-02-D460-002 and QS-000247-02-D460-003.

Vibrocore

Vibrocoring allows sediment samples to be taken without disturbing their in-situ stratigraphy. The testing method will involve using a crane to launch the corer into the water or deploying through a moonpool from the vessel. Cores will be taken in approximate 6m lengths and 110mm diameter but exact core dimensions will depend on the specification of the vibrocore used. Samples will be completed at the required sampling interval as shown on Drawing numbers QS-000247-02-D460-002 and QS-000247-02-D460-003.

The cores will be cut into ~ 1m lengths and logged; cores will then be capped and stored vertically onboard the vessel. Upon demobilisation the cores will be transported to a laboratory for testing.

1.3 Metocean Characterisation

Up to three lidar buoy's will be deployed at the locations shown on Drawing numbers QS-000247-02-D460-002 and QS-000247-02-D460-003. The purpose of the lidar buoy's is to collect metocean data including data on the wind and wave resource.

The devices will most likely be launched into the water from a crane on the vessel during the offshore geophysical survey and geotechnical investigation campaign. Another suitable method of deploying the buoy's would be to tow them from a smaller survey vessel.

The buoy's willl be deployed for a minimum of 12 month and maximum 36 month duration. A marker buoy will be deployed beside each of the lidar buoy's to indicate their existence and to ensure other mariner users are aware of their location. The Commissioner of Irish Lights requirements in terms of the marker bouy and lighting will be adhered to.

Acoustic Doppler Current Profilers (ADCP) may be deployed beside the Lidar buoy's. They will be used to provide a current velocity profile from the seabed to the surface. The ADCP's will most likely be mounted on the seabed in a trawl resistant frame and they will most likely be lauched from the vessel by crane.

The duration of such a deployment is typically 2 months and they will be recovered from the seabed using the same technique.

2 Vessels / Equipment

The vessels proposed to undertake the works shall be suitably classed by a recognised certifying authority for the area where the proposed operations are being carried out, and shall be capable of undertaking all the Services specified herein, using equipment detailed herein and the necessary personnel and ships crew required to complete the various Services. All certification shall be valid throughout the work period.

Typical vessels and equipment used for the survey work and operations are shown in the data sheets provided in Appendix A of the application.

The actual vessels / equipment will not be known until award of contract as each contractor has their own survey vessels or access to a spread of vessels and equipment however vessel sizes, specification, equipment and survey techniques used will be similar to those shown in the Appendix and as described above.

3 Environmental Protocols

Environmental factors will be taken into account in all decisions during the survey campaign. Environmental efforts should be preventative rather than remedial;

The Contractor will maintain a suitably certified environmental management system.

Contractor will take particular care when handling or storing hazardous materials, radiation sources and chemicals.

All storage and handling must be according to accepted guidelines and appropriate safety precautions must be taken and safety clothing worn as necessary.

Liquid or non-liquid pollutants or waste material will not be dumped, thrown or otherwise disposed of into the sea. All refuse and materials shall be kept onboard the vessel and safely disposed of onshore according to the MARPOL convention.

All substances required to be handled and/or used whilst undertaking the work will be handled, used, stored and documented in accordance with assessments and recommendations of the COSHH (Control of Substances Hazardous to Health) Regulations 1994.

Where Fuels, Oils and Lubes are required to be stowed on boats, suitable containers will be used and stowed to allow ventilation and safe dissipation of any accidental leaked gas and retention of any leaked liquid. No liquid will be discharged into the water at any stage of the work on site.

No smoking will be permitted in the vicinity of fuel in storage or when in use.

4 Access/egress arrangements

The offshore survey works will be undertaken from a large offshore survey vessel and a smaller survey vessel with a shallow draft to ensure full coverage of required survey areas. The large vessel will be capable of operating in water depths of approximately 12m – 80m and the smaller vessel will undertake survey works in water depths of between 0m – 15m.

Mobilisation port for the large offshore survey vessel will not be known until award of contract and potential timing of the survey. The survey vessel may mobilise directly to site from their base. Potential ports along the East Coast of Ireland which could be used for mobilistation and demobilistation are Belfast, Dublin, Greencore.

Once the vessel arrives at the offshore survey area it will remain offshore for the duration of the offshore works.

Typical smaller ports in close proximity to the site will likely be used for the nearshore work. These are Clogherhead, Annagassan, Carlingford for example. The vessel will return to shore each evening on completion of the works for the duration of the nearshore survey campaign.

5 Health and safety procedures

Health, safety and environmental protection shall be given foremost consideration in the execution of the work and shall be promoted in a proactive and highly visible manner throughout the workforce.

Established Safety procedures will be followed by both survey and ship's crew. Onboard the vessel personel live and work in close proximity to potentially dangerous materials, systems and machinery in an environment where fire and extreme weather are a constant threat. This is not a place for complacency, safe working procedures must be followed and safety drills practiced.

Care will be taken to maintain contact with fishing vessels operating within the area of operations. The contractor will ensure notifications of the intended work and time lines are posted in the relevant press well ahead of schedule and a fisheries liaison officer will be employed.

6 Programme schedule/timelines

The Marine Survey works (Geophysical and Geotechnical spread) are scheduled to be carried out in the Summer of 2018 (June - September). Approximate duration of the works are 6 weeks, weather permitting.

The Lidar buoy's and ADCP's will be deployed during this survey campaign. The duration of these deployments will be as indicated above.

Exact mobilistation dates will not be known until closer to the time of the survey. ESB is currently in the process of procuring a contractor to undertake the survey work.

The timing of the survey including mobilistation and demobilistation will depend on successful contractor schedule, resource availability and weather.