

APPLICATION FOR FORESHORE LEASING TO CONSTRUCT AN OFFSHORE ELECTRICITY GENERATING STATION

(Please read the guidance notes before completing this application form)

1	Name	Codling Wind Park II Limited
2	Address (postal)	Connaught House, 1 Burlington Rd, Dublin 4
3	Phone No (contact)	+353 1 618 9300
4	E-mail address	info@codlingwindpark.ie
5	Fax No.	+353 1 618 8389
6	VAT No.	As the above company is not yet trading (this will be subject to award of the Lease), the company cannot be registered for VAT at this time.
7	Tax District	See note above.

APPLICANT DETAILS

8	Name	To Be Advised as Appropriate
9	Address (postal)	
10	Phone No (contact)	
11	E-mail address	
12	Fax No.	

APPLICANT LEGAL ADVISOR DETAILS

13	Longitude and Latitude of proposed generating station site boundaries	The array of 200 turbines would be located within a 66 km ² area bounded by the following co-ordinates: <table border="1"> <tr> <td>Latitude (N)</td> <td>5° 50' 35"</td> </tr> <tr> <td>Longitude (W)</td> <td>53° 4' 18"</td> </tr> <tr> <td>Latitude (N)</td> <td>5° 43' 00"</td> </tr> <tr> <td>Longitude (W)</td> <td>53° 4' 18"</td> </tr> <tr> <td>Latitude (N)</td> <td>5° 50' 35"</td> </tr> <tr> <td>Longitude (W)</td> <td>53° 0' 00"</td> </tr> <tr> <td>Latitude (N)</td> <td>5° 44' 15"</td> </tr> <tr> <td>Longitude (W)</td> <td>53° 0' 00"</td> </tr> <tr> <td>Latitude (N)</td> <td>5° 43' 01"</td> </tr> <tr> <td>Longitude (W)</td> <td>53° 0' 43"</td> </tr> </table>	Latitude (N)	5° 50' 35"	Longitude (W)	53° 4' 18"	Latitude (N)	5° 43' 00"	Longitude (W)	53° 4' 18"	Latitude (N)	5° 50' 35"	Longitude (W)	53° 0' 00"	Latitude (N)	5° 44' 15"	Longitude (W)	53° 0' 00"	Latitude (N)	5° 43' 01"	Longitude (W)	53° 0' 43"
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	Longitude and Latitude of proposed generating station site boundaries	The cable route locations have previously been consented as part of the initial Codling Lease.																				
14	Where the area can be identified on the Ordnance Survey map, specify also the Ordnance survey co-ordinates	Not Applicable																				
15	Longitude and Latitude of the central Point of the proposed wind farm	53°2'6" N 5°46'47" W																				

SITE LOCATION

22	Nature of proposed generating station (i.e. wind powered, wave powered, etc.)	Wind Powered
23	Details of Authorisation to construct and Licence to generate and supply issued by the Commission for Electricity Regulation	CER confirmation of receipt of application attached.
24	Number & location of turbines/generating device within the area (indicate on charts)	200 turbines (Site Layout Map and grid locations of all turbines attached) Location of Sub-stations : B1 53°46' N 5°50'8" W B2 53°1'34" N 5°44'44.5"
25	Maximum height of turbines above chart datum (including, in the case of windfarms, blades when vertical)	161.69 Metres
26	Rotor diameter of turbines (in the case of windfarms)	120 Metres
27	Physical dimensions of each complete structure including anchorage or foundation	
		Rotor diameters will range up to 120m for the largest machines considered for the site. The rotor hub would have a maximum height of 90 m over the top of the foundation, which itself would lie approximately 10 m above Mean Sea Level (MSL). The turbines would have a maximum blade length of 60 m, giving a maximum height from MSL to blade tip in the highest position of 160 m. The spring tidal range in this part of the Irish Sea is 3.1 m giving a normal minimum blade tip height above the sea surface (for the lowest blade tip position) of 36.9 m at spring high tides, decreasing to 31.5 m for the extreme conditions of the highest astronomical tide combined with a 1 in 50 year surge and a 1 in 50 year wave.

PROPOSAL DETAILS

16	Area to be covered by the proposed generating station	6600 Hectares (NB. This is the area within the boundary of the site and not the sum of the footprints)
17	Dimension of the generating station area at its longest and widest points	Longest 8.4 Km Widest 7.9 Km
18	Nearest distance from other generating stations or other constructions on the sea-bed (including constructions anchored permanently or semi-permanently to the sea-bed)	The commissioned Arklow Bank wind turbines are located 23km to the south of the Codling Extension Project. The east Codling LANBY is located 2.7 km to the east of the Codling Extension project.
19	Distance from shore at nearest point	13.3 Km
20	Distance from nearest habitation	13.3 Km
21	Distance from nearest Aquaculture operation if less than 3 km	Not Applicable Km

The nacelle and rotor are bolted to a steel cylindrical tower, which in turn is secured to the sub-sea foundation.

A monopile foundation for a modern multi-mega watt turbine would comprise a steel pile of up to 5.5 m diameter, with a wall thickness of 60 to 80 mm. The depth of penetration into the seabed will vary depending on loading and ground conditions, however, a typical depth would be in the order of 30-35 m. This is illustrated in the diagram below.

The monopile foundation is considered suitable for turbines up to 3.6MW.

The multi-pile foundation may take many forms but would likely comprise a circular central column, with steel leg structures. The central column would be in the range 4.5 – 5.5m in diameter with the material thickness in the range 60m to 80mm. The leg elements would likely be fabricated from steel tubes in the order of 1.2m to 2.0m in diameter with wall thickness in the range 20mm to 40mm. The plan area of the base would likely be in the order of 20 m to 25 m in diameter. The depth of penetration into the seabed will vary depending on loading and ground conditions, however, a typical depth would be in the order of 30-35 m. This is illustrated in the diagram below.

The multi-pile foundation is considered suitable for any size of turbine type and is particularly suitable for turbines over 3.6MW.

Gravity Foundation bases may take many different shapes but would generally comprise a base with a large plan area and a central tower. The plan area of the base would likely be in the order of 20 m to 25 m in diameter. A gravity foundation for the site in question would likely have a weight in the order of 2300 tonnes. After installation on the seabed approximately an additional 2000 tonnes of ballast material would be added to achieve the required in-situ weight.

The gravity foundation is considered suitable for any size of turbine type and is particularly suitable for turbines over 3.6MW.

Offshore Sub-station Platforms

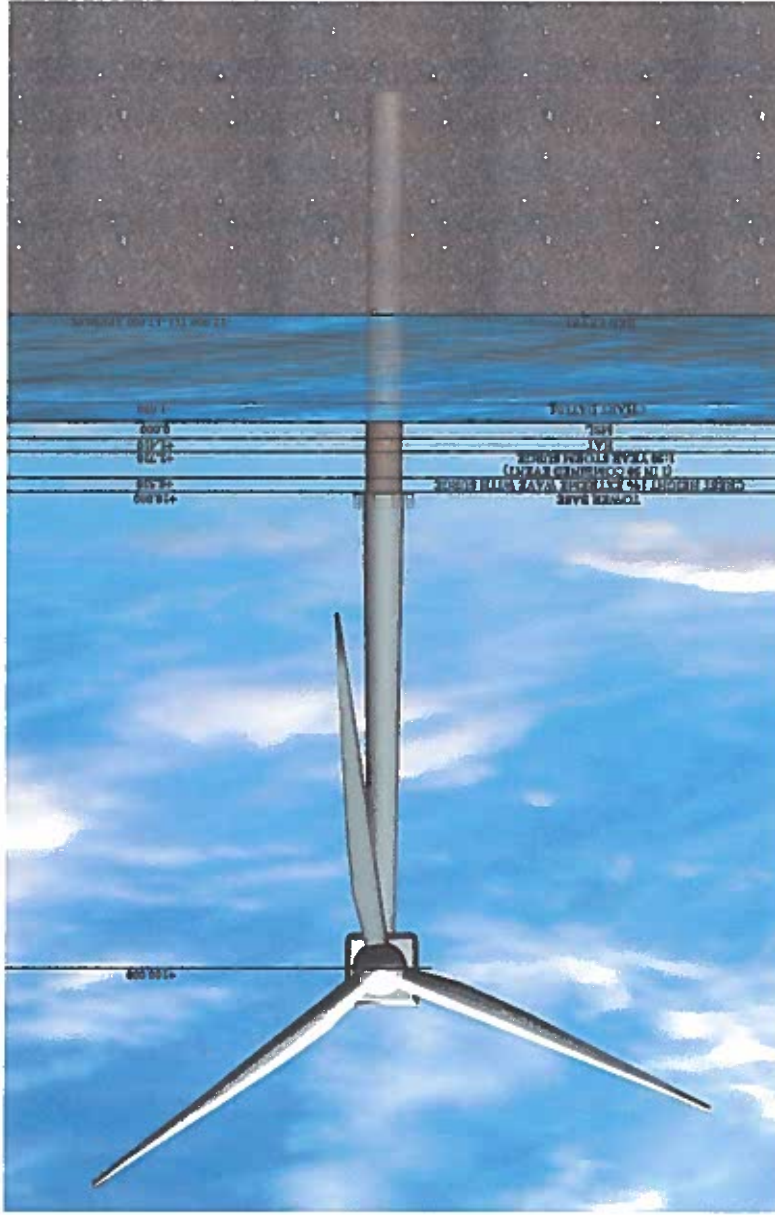
The offshore transformers would be supported on steel platform structures at a height of approximately 10 m above mean sea level. The area required to accommodate the required equipment would be in the order of 900 m² per sub-station. Boat access points would be required and in addition a helicopter landing platform may be provided. The final design of the substation platforms has not been completed, but it is likely to be similar to that shown in the figure below.

The weight of the electrical installations and other ancillary equipment supported on the platform would be in the order of 300-400 tonnes and the tallest components would be approximately 8m in height.

It is most likely that the equipment and helicopter deck would be supported on a steel superstructure on 4 to 6 steel tubular legs which would be supported on steel tubular piles. The form of construction would be similar to that of a traditional offshore oil installation, with the superstructure being fabricated from standard structural steel box and I sections, probably with open mesh decking. Similar construction techniques are likely to be employed. The figure below illustrates the likely form of construction. The helicopter deck would also be of steel construction and would likely be positioned above the main elements of plant and electrical equipment.

The potential foundation types and substation platform foundation are detailed further in Section 4 of the Codling Extension EIS.

The turbine tower is bolted on to a flange on top of the foundation at a level above which the water/wave level is expected to reach. An access/work platform is usually provided at



The nacelle and rotor are bolted to a steel cylindrical tower, which in turn is secured to the sub-sea foundation as shown below.

29	Nature of construction above sea-level
	<p>It is not possible at this stage to specify the particular type of foundation which would eventually be used, this being dependent on a number of factors including but not restricted to contractors specific choice, available construction equipment, site conditions and cost. Three types of foundation are considered as potentially suitable for the proposed site including monopile, multi pile or gravity foundations. These are indicated in the figures above. Site investigation studies to determine the suitability of the above foundation types are detailed in Section 6 of the Codling Extension EIS.</p>
28	Nature of construction below sea-level

<p>the level. The location of access platforms is indicated on the attached foundation figures.</p> <p>Offshore Sub-station Platforms</p> <p>The offshore transformer would be supported on two steel platform structures at a height of approximately 10 m above mean sea level. Boat access points would be required and in addition a helicopter landing platform may be provided.</p> <p>The main items of electrical equipment provided would be:</p> <ul style="list-style-type: none"> • 33/220 KV transformers • 33 KV Switchboard • 132 KV Switch gear • Diesel generator and tank <p>In addition other ancillary items may/would include lifesaving/safety equipment, care and welfare facilities.</p>	<p>30</p>
<p>Manner in which structures will be anchored (i.e. cable, set in concrete foundations, etc.)</p> <p>Initial site investigations studies have determined that three types of foundation are considered as potentially suitable for use for the proposed Codling Extension. It is not possible at this stage to specify the particular type of foundation which would eventually be used, this being dependent on a number of factors including but not restricted to available construction equipment, site conditions and cost.</p> <p>The potentially suitable foundations include the following:</p> <p>A monopile foundation for a modern multi-mega watt turbine would comprise a steel pile of up to 5.5 m diameter, with a wall thickness of 60 to 80 mm. The mass of a pile is typically in the range of 350 to 500 tonnes, depending on the water depth and depth of embedment.</p> <p>The multi-pile foundation may take many forms but would likely comprise a circular central column, with steel leg structures. The foundation is supported by piles with diameters in the order of 1.2 m to 1.8 m, which are driven or vibrated up to 35 m into the sea bed, depending on soil conditions. The height and width of the structure would also depend on site conditions.</p> <p>Such bases may take many different shapes but would generally comprise a base with a large plan area and a central tower. This type of base relies on its mass to resist overturning forces. The foundation would generally comprise a hollow concrete or steel structure which is filled with a high density material once the base has been placed in position.</p> <p>A gravity foundation for the site in question would likely have a weight in the order of 2300 tonnes. The plan area of the base would likely be in the order of 20 m to 25 m in diameter. After installation on the seabed approximately an additional 2000 tonnes of ballast material would be added to achieve the required in-situ weight.</p> <p>Additional information is provided in Section 4.7 of the Codling Wind Park EIS.</p>	

Questions 25, 26, and 27 require scale drawings to be provided

Environmental Considerations

31	Distance from nearest Special Protection Area (SPA) or Special Area of Conservation (SAC) if less than 5 Km	Not applicable Km
32	Indicate any other economic or leisure activities known to take place within or adjacent to the area proposed for the generating station	
<p>Whelk Fishing (Commercial)</p> <p>The most significant commercial fishery in the Codling area is for whelk <i>Buccinum undatum</i>. The south-east coast is also an important area for mussel seed <i>Mytilus edulis</i> which is dredged for transplantation to more productive areas for the bottom mussel culture industry.</p> <p>It is estimated that 30-40 boats may be currently involved in whelk fishing throughout the SW Irish Sea area with perhaps 20-25 vessels operating in the Arklow sector which includes Codling Bank and the proposed development area (adjacent to the existing licensed site). However not all of these boats would be active on the actual site of proposed development. The smaller vessels normally operate with a skipper and one helper while the larger vessels are crewed by a skipper and two or more helpers. Assuming a 50/50 split between large and small boats would suggest that perhaps 65-80 individuals are employed in fishing for whelks in this area.</p> <p>Fahy et al (2005)¹ estimated that the whelk fishery in the SW Irish Sea had a turnover of €18 million in 2003 and employed 250 persons, directly and indirectly, in catching and processing. Based on first sale price, the total value of the fishery in the years 2001-2003 exceeded €5 million in each year. However in the last 3 years (2005 to 2007) the first sale value has fallen to €2.05 - €2.31 million per year. It is difficult to assess what proportion of this value is attributable to fishing in the Codling area - an indication may be that over the last 7 years the Arklow sector, which includes Codling, has averaged 76% of the landings to the entire fishery.</p> <p>The fishery also supports a processing industry in Kilmore Quay, Dunmore East and Donegal. There appears to be four main processors involved producing an added value likely to be in excess of 100% based on a meat yield ranging from 18% to 25%.</p> <p>Mussel Seed (Commercial)</p> <p>The other significant feature in relation to commercial fisheries in the wider area is the occurrence of mussel seed beds which are a valuable source of seed for the expanding bottom mussel culture industry. Mussel seed <i>Mytilus edulis</i> is dredged for transplantation to more productive areas for the bottom mussel culture industry.</p> <p>Surveys undertaken by BIM have shown that the most consistent seed beds within the vicinity of the Codling Extension development are located off Wicklow Head, and that two areas to the west of the India Bank have produced 75% of the seed dredged from the Irish Sea over the last 8 years.² Dredging of mussel seed for transfer to another area</p>		

¹ Fahy E, Carroll J, O'Toole M, Barry C & Hoher Parkes L (2005). Fishery-associated changes in the whelk stock in the southwest Irish Sea, 1995-2003. Irish Fisheries Investigations No 15: 26 pp

² DAF/DARD (2008). The Rising Tide. A Review of the Bottom Crown (BG) Mussel Sector on the Island of Ireland. Department of Agriculture, Fisheries & Food (RD). Department of Agriculture & Rural Development (NI) 230pp

	<p>33 Maximum noise levels expected at the site</p>	<p>109.5 dB</p>
<p>34 Normal noise levels expected at the site</p>	<p>107.5 at source dB</p>	<p>Noise data for this assessment has been based on the use of the REpower 5 MW turbine. This turbine has a maximum measured sound power level of 107.5dBA which is reached at a wind speed of 10m/s. Allowing for the manufacturers standard uncertainty of +/- 2dB suggests that it would be realistic to assume that the turbines proposed for this site would have a sound power level not exceeding 109.5 dB(A) at a 10m height wind speed of 10 m/s.</p>
	<p>requires the issue of a Molluscan Movement Order from the DAFF. In the past it is reported that significant quantities of seed were transferred illegally but this process is now well regulated and there are now no unlicensed transfers of seed. However it has been noted that under the current management and stock-tracking regime there are still great difficulties in achieving accurate records of the amount of seed harvested in a given year</p> <p>The tonnage of mussel seed dredged each year is broadly reflected in the subsequent annual harvest, as the ratio of seed to saleable weight tends to be 1:1 or slightly less. The industry continues to grow with significant recent developments both north and south.</p> <p>Recreational Fishing</p> <p>Angling is very popular in the general area although there is limited activity directly on the bank due to the dangerous tidal currents. Most of the angling activity takes place in the inshore area to the west of the bank from small 16-18 foot craft operating out of Greystones, Arklow and Wicklow.</p> <p>There are also up to 50 sea angling clubs in the Dublin area, most of which fish out of Greystones on a regular basis, bringing their own boats to launch from the beach. Increasing numbers of visitors from the UK are fishing in the area, mostly shore fishing but many are now transporting their own boats to fish the inshore area. Some of the larger boats venture out to the bank and beyond where the main drift, is between the east and the south Codling buoys. Most of the fishing effort focuses on codling and whiting but anglers may also catch spurdog, tope, blond ray and thornback ray, all to specimen size. The Greystones Harbour Development currently under construction will provide a new harbour and marina with additional boat launching and car parking facilities.</p> <p>There has been a decline in the number of angling charter vessels operating in this area with just a single vessel currently registered on the CFB Charter Boat Directory for Co Wicklow – this vessel is believed to operate mainly in an area to the south of the proposed development site.</p> <p>Recreational Sailing</p> <p>There are 21 sailing clubs on the east coast affiliated to the Irish Sailing Association. Consultation with the Irish Sailing Association indicates that the nearest sailing club, Greystones SC, which is situated due west of the Codling Bank, is predominantly a dinghy sailing club whose normal area for racing would lie within 3-4km of the shore, well away from the bank.</p> <p>The other clubs in the area include Bray Sailing Club to the north west, and Wicklow Sailing Club to the South west have cruiser fleets (as well as dinghy fleets) requiring a larger expanse of water for racing, however the Irish Sailing Association have informed us that the Codling Bank would not be within their normal racing area. However, consultation with Wicklow Sailing Club has indicated that they hold a race out to the Codling Bank area once a year.</p>	

43	Have necessary on-shore wayleaves been	Yes		NO	X
		<p>The cable route to shore has been consented under the original Codling Lease, awarded in September 2005. Whilst an application has been submitted for a grid connection, no indication has been provided from ESB as to where the point of connection would be or whether this would be onshore or offshore in respect of connection in to the east-west interconnector.</p>			
42	Has planning permission been received for shore based works? (if yes copy should be attached) If planning permission has not been received a copy of the planning application(s) should accompany the application)	Yes	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>
41	Have nearby harbour authorities been consulted	Yes	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
40	Has consultation taken place with National Parks and Wildlife - the National Heritage Service	Yes	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>
	A full visual impact assessment is provided in the Codling Wind Park EIS Section 9.10				
39	Describe visual impact of the proposal at site of nearest habitation or human activity on-shore (indicate type of site (i.e. houses, beach, boat club, etc.)				
	<p>These values provided above correspond to worst case down wind propagation from easterly wind directions. For westerly wind directions, received sound levels are likely to be around 10 dB lower</p>				
38	Indicate conditions which might be expected (a) to increase noise levels above normal and (b) to maximum levels				
37	Maximum noise levels expected at nearest SPA or SAC (if closer than 5 Km.)	Not Applicable dB			
36	Maximum Noise levels expected at site of nearest habitation	29 dB			
	<p>Calculations have been carried out assuming all 420 turbines at Codling and Codling Extension are subject to a wind speed of 10 m/s at 10m height. The predicted noise at the nearest housing on the shore, located at Five Mile Point from all 420 turbines operating simultaneously under these conditions is 28.6 dB LA90. The maximum predicted noise level at the nearest point in Six Mile Point is predicted to be 29 dB LA90. Wind farm noise is generally considered acceptable if predicted noise is shown to be below 35 dB LA90 for a wind speed of 10 m/s at 10m height and there is no need for a full background noise assessment.</p> <p>These values correspond to worst case down wind propagation from easterly wind directions. For westerly wind directions, received sound levels are likely to be around 10 dB lower.</p>				
35	Normal noise levels expected at site of nearest habitation	28.6 dB			

obtained	Again this would fall under the remit of ESB and would be subject to the location of the grid connection point.
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Navigation Safety Considerations

44	Distance from shipping lanes at nearest point <i>Illustrate on the appropriate marine charts accompanying the application</i>	3 Km (see Site Location Map and Marine Safety Statement)
45	Is an exclusion zone for passage of shipping (including fishing and leisure boats) sought (If "yes" please supply details and give reasons)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
46	Is an exclusion zone (or ban) sought on the use of any type of fishing gear or leisure activity within the area occupied by the turbines and/or associated cables? (exclusion zone should be indicated on the appropriate marine charts which should accompany the application)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
	No trawling could be permitted in the area due to the possibility of snagging cables, however, due to the nature of the sea bed trawling is not possible in this area in any event.	

A separate marine safety statement is required for all Offshore electricity generating stations. – see attached statement.

Commercial Details

47	Designed maximum annual output of the proposed generating station	1000 MW
48	Anticipated maximum annual output of the proposed generating station	1000 MW
49	Capital Cost of Proposed Venture	The investment value of the Codling Extension through design, construction and commissioning would be between €1.8 billion and €4 billion (subject to the final turbine output).

50	Source of capital	Sources of Capital. Prior to construction all cost will be funded from the internal resources of the partners. Thereafter the intention is to procure 3rd party bank finance on commercial terms.
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DECLARATION and CONSENT

The details given on this Application are correct to the best of my knowledge.
 I understand that no works will be commenced, by me or my agents on the proposed site, without the prior written consent of the Minister.
 I understand that the possession of a Foreshoreshore licence does not give me preferential rights for the development of the area to which I am now making an application to Lease.

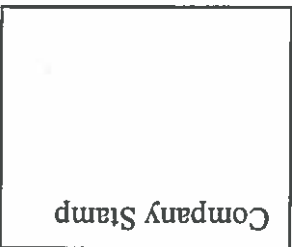
Signed for and on behalf of the applicant



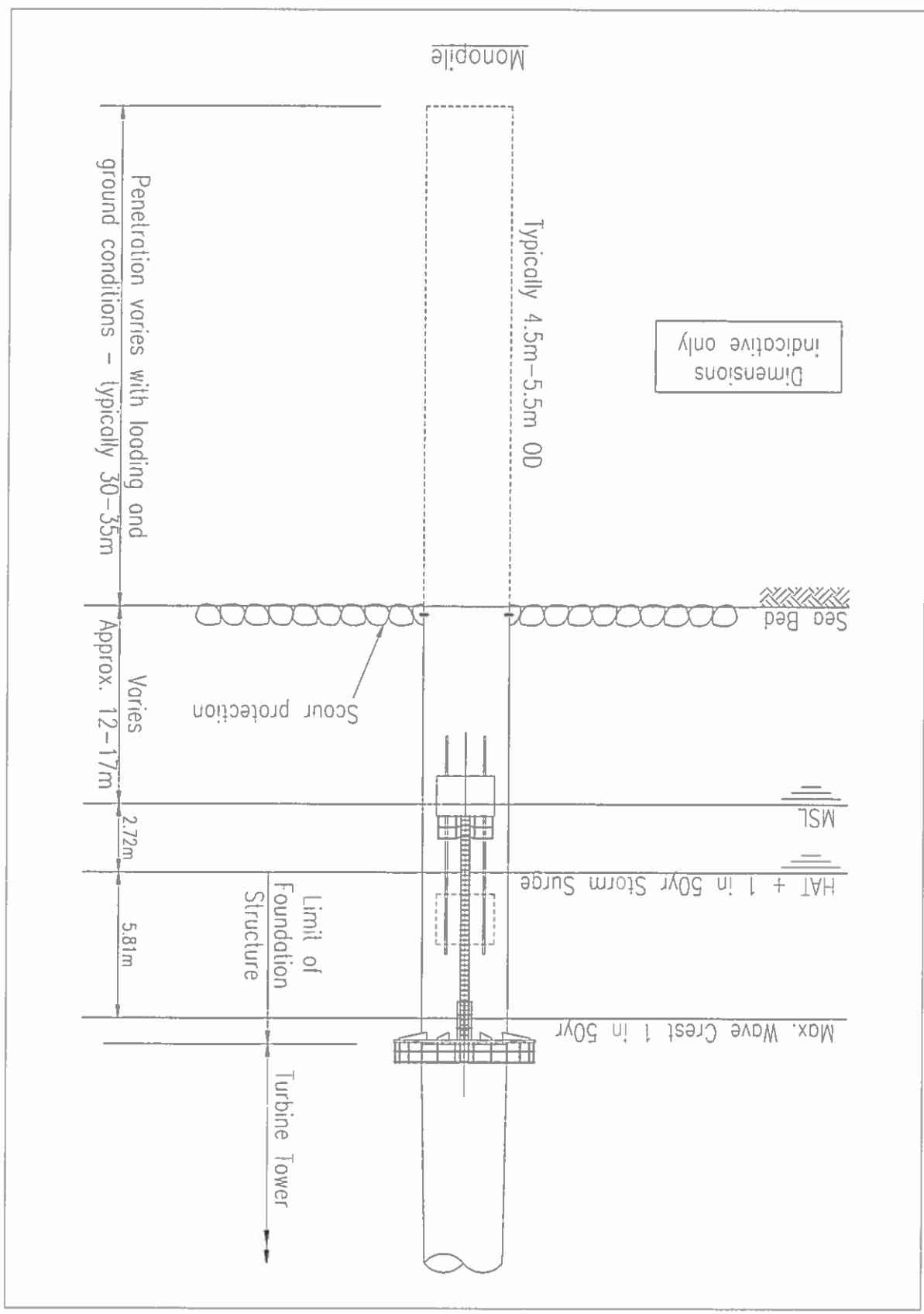
Name of Signatory (block letters) NICHOLAS EMERY

Position Held Director

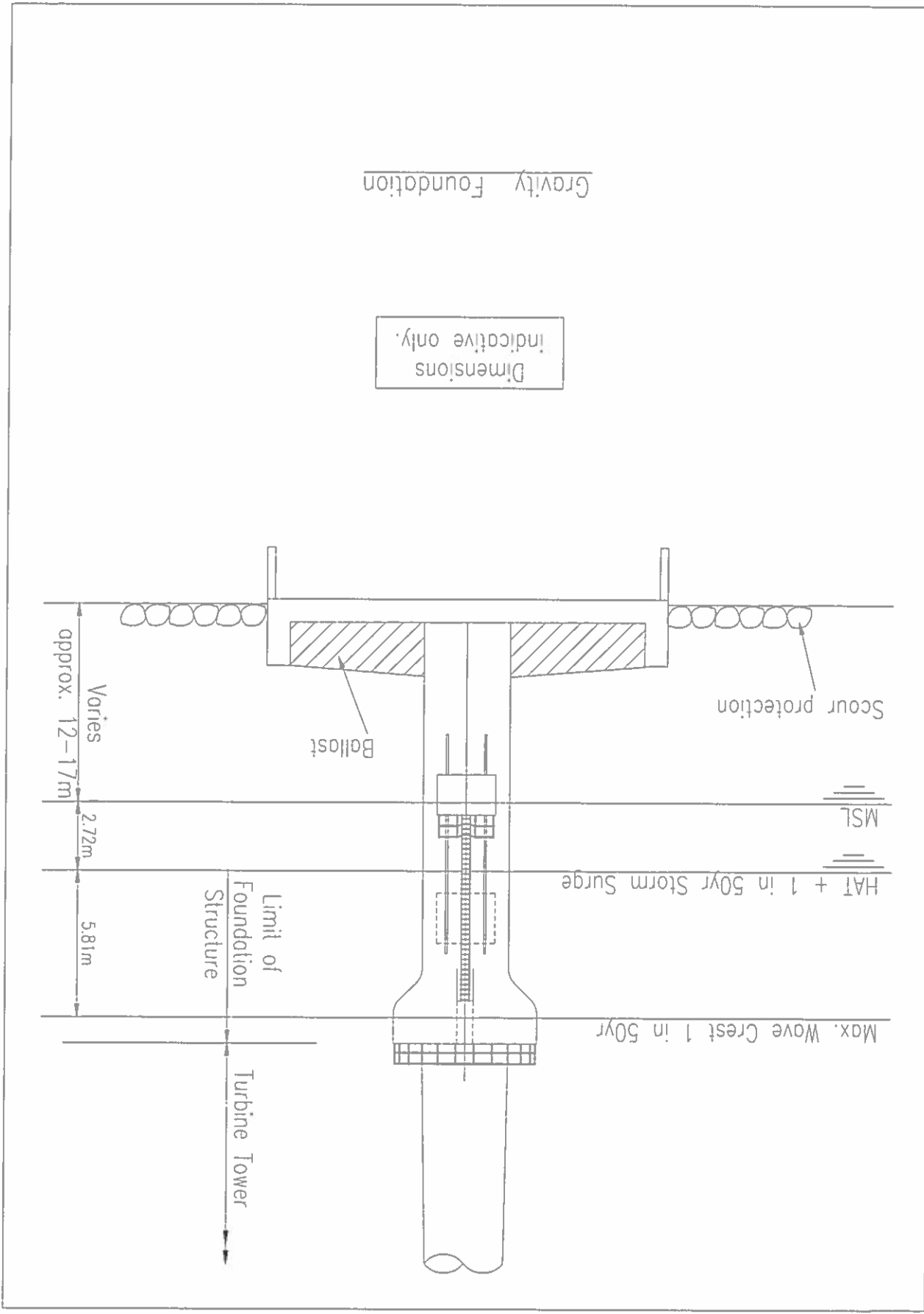
Date 24/03/2009



Monopile Foundation

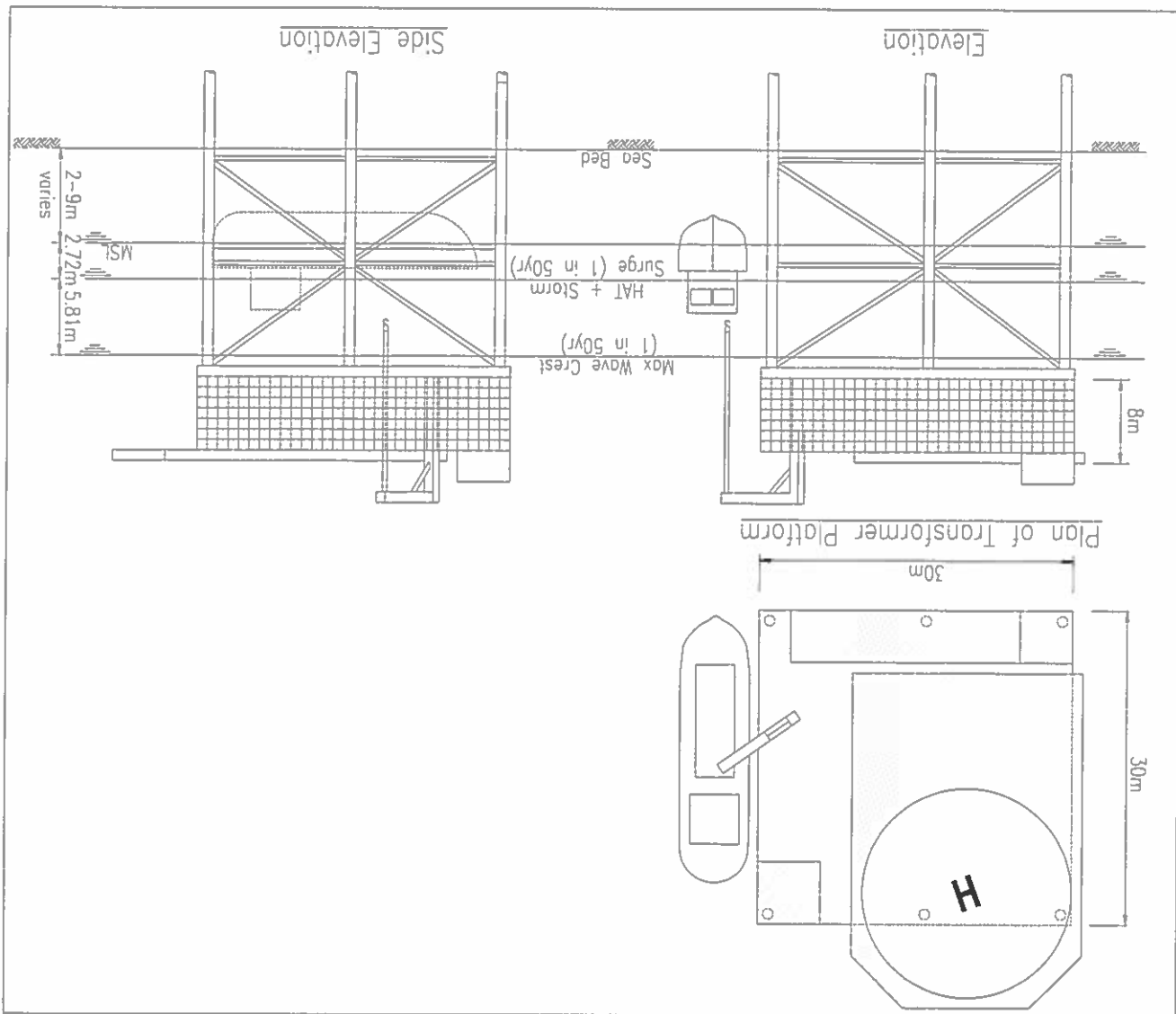


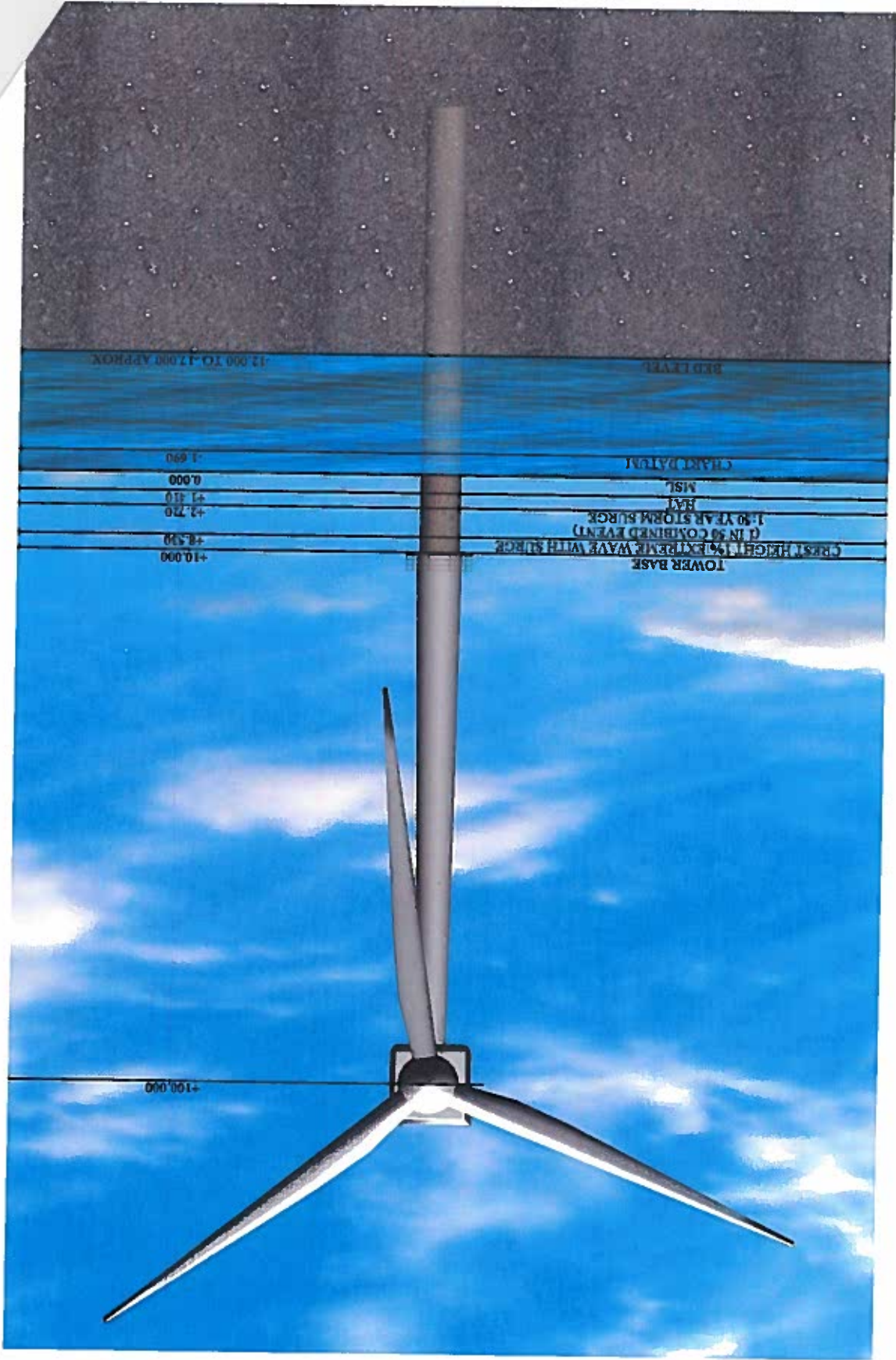
Gravity Foundation



Gravity Foundation

Typical Form of Construction for Sub-Station Platform





Offshore Turbine