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Design Statement

KINCARDINE OFFSHORE WINDFARM PROJECT

Prepared	Checked	Reviewed	Approved
27/03/2018	27/03/2018	27/03/2018	27/03/2018
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*Purpose of Issue: for information, for review, for approval

[illegible]

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ACRONYMS, ABBREVIATIONS and DEFINITIONS

CaP	Cable Plan
CMS	Construction Method Statement
DS	Design Statement
DSLp	Design Specification Layout Plan
ECoW	Ecological Clerk of Works
EOWDC	European Offshore Wind Deployment Centre
EMP	Environmental Management Plan
ES	Environmental Statement
GIS	Geographic Information Systems
HAT	Highest Astronomical Tide
HES	Historic Environment Scotland
KOWL	Kincardine Offshore Wind Ltd
LAT	Lowest Astronomical Tide
LMP	Lighting and Marking Plan
MHWS	Mean High Water Springs
MS-LOT	Marine Scotland Licensing and Operations Team
MW	MegaWatt
NSP	Navigational Safety Plan
SNH	Scottish Natural Heritage
S36C	Section 36 C Variation Application to vary the Section 36 Consent granted to KOWL in March 2017
VMP	Vessel Management Plan
WTG	Wind Turbine Generator
ZTV	Zone of Theoretical Visibility

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1. INTRODUCTION

1.1. Purpose of the Document

This Design Statement (DS) has been prepared to address the specific requirements of the relevant conditions attached to the Section 36 Consent and Marine Licence issued to Kincardine Offshore Windfarm Ltd (KOWL) for the Kincardine Offshore Windfarm (the Project).

The overall aim of the DS is to set out the rationale for the design and layout of the Project as described in the Development Specification and Layout Plan (DSLPL), and to present the visualisation of the Project from agreed viewpoints. The DSLPL confirms the final layout and specification of the Project.

1.2. Scope of the Document

In line with the requirements of the Section 36 and Marine Licence conditions the following information is presented in this DS:

- A comparison of the Zone of Theoretical Visibility (ZTV) of the consented Project against the Varied Project as presented in the Section 36C (S36C) Variation Application (See Section 1.3 below for further information on the S36C Variation Application); and
- Visualisations of the final Project from the agreed viewpoints along the coastline.

1.3. Project Overview

The Project is considered a commercial demonstrator site, which will utilise floating foundation technology, and will be one of the world's first arrays of floating wind turbines. It has been included within the Survey, Deploy and Monitoring scheme for offshore renewable systems (similar to wave and tidal devices).

The Project is located south-east of Aberdeen approximately 8nm (15km) from the Scottish coastline and provides suitable water depth for a floating offshore wind demonstrator development (approximately 60-80m) (Figure 1-1).

The project is split into the following areas:

- The Development Area – the wind farm area including the Wind Turbine Generators (WTG) and inter-array cables.
- The Offshore Export Cable Corridor – the area within which the proposed export cables will be laid, from the perimeter of the Development Area to the onshore area at Mean High Water Spring (MHWS).
- The Onshore Area – the onshore area above Mean High Water Spring (MHWS) including the underground cables connecting to the onshore substation at Redmoss.

This DS focuses on the offshore elements only as per Section 36 Consent and Marine Licences granted. The onshore area is subject to a separate planning permission granted by Aberdeen City Council.

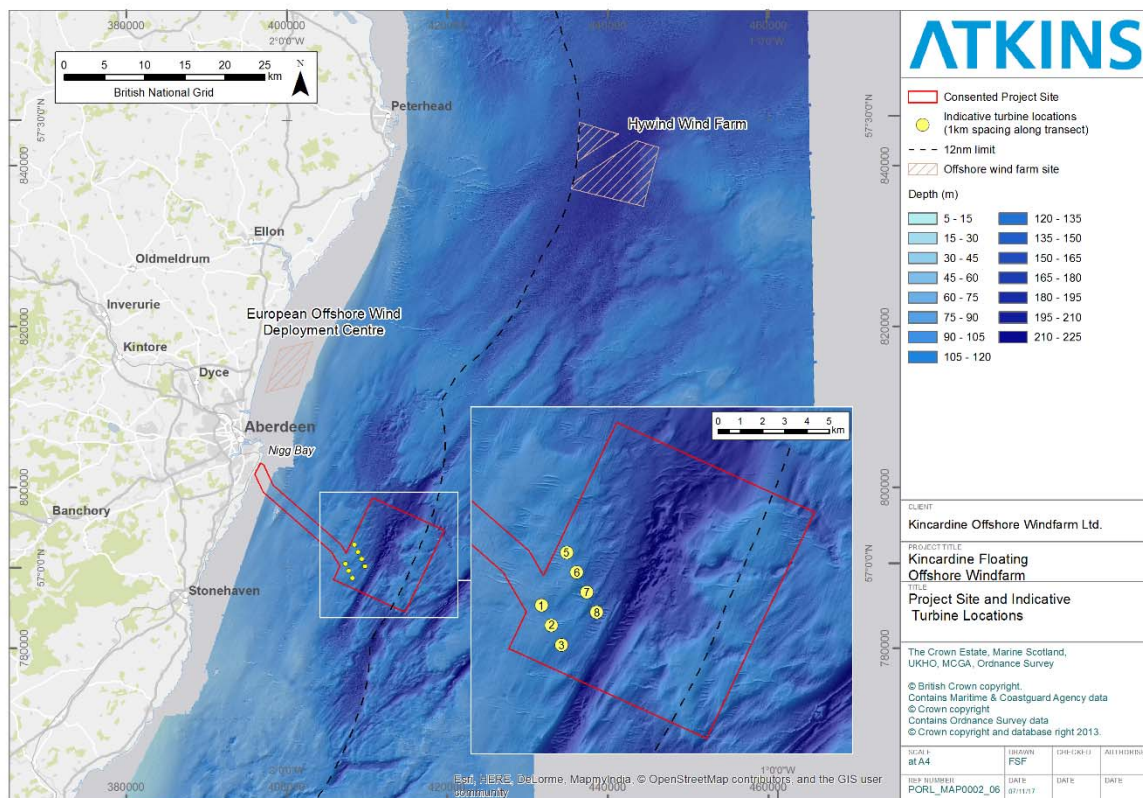


Figure 1-1 Project site and indicative turbine locations

In April 2016 KOWL submitted applications for consent to construct and operate the Project, which included the Original ES. In September 2016 an addendum (referred to as the ES Addendum), of additional environmental information to the Original ES, was also submitted. In March 2017 consent under Section 36 and Section 36A of the Electricity Act 1989 was granted.

Since consent was granted, there have been several necessary changes to the Project. Therefore, an application for a variation of the Section 36 consent granted by the Scottish Ministers under S36C of the Electricity Act 1989 was applied for in December 2017 (the 'Variation Application').

The table below outlines the application dates, relevant ES Documents and the components of the Project as were included in the Original Application and the Variation Application.

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Table 1-1 Summary of document timelines

Original Documents	Addendums	Variation
Date Submitted: March 2016	Date Submitted: September 2016	Date Submitted: November 2017
Original Application	Original Application	S36C Variation Application
Kincardine Offshore Windfarm ES (Original ES)	ES Additional Information Addendum (ES Addendum)	Section 36C Variation ES (Variation ES)
Maximum generation capacity: 50MW	Maximum generation capacity: 50MW	Maximum generation capacity: 50MW
WTGs: 8 x 6MW	WTGs: 8 x 6MW	WTGs: 1 x 2MW and 6 x 8.4MW
Substructures: semi-submersible	Substructures: semi-spar	Substructures: combination of semi-submersible and semi-spar
Cables: 33kv inter-array and export cables	Cables: 33kv inter-array and export cables	Cables: 33kv inter-array and export cables

As noted in the table above, the most significant changes to the Project outlined in the Variation Application are those associated with the turbines. KOWL now intend to install up to seven turbines, including a 2MW turbine that will be installed first, followed by six larger 8.4MW turbines over the remainder of the installation period up to the end of 2020. The current proposed turbines would have a rated capacity of up to 8.4MW; however, the maximum generating capacity of the windfarm will remain up to 50MW.

The first turbine comprised in the Varied Project to be deployed will be a wind turbine generator and associated substructure, anchors and mooring lines with a generating capacity not exceeding 2MW ("Turbine 1"). A condition in the existing marine licence requires Third Party Certification or Verification (or suitable alternative as agreed, in writing, with the Licensing Authority) for all WTGs, mooring systems and WTG platform structures prior to the commencement of the works. The initial period sought for such certification / verification / suitable agreed alternative of the WTG platform substructure for Turbine 1 will be limited (expected to be three years or less). This is due to the engineering life of the substructure (ten years from initial substructure construction in 2011). At the expiry of the WTG platform substructure certification, Turbine 1 will only be re-deployed if (i) the platform structure is re-certified following inspection (and only for so long as valid certification is in place) and (ii) if Marine Scotland Licencing Team (MS-LOT) (in consultation with Scottish Natural Heritage (SNH), Historic Environment Scotland (HES), Aberdeen City Council and Aberdeenshire Council) is satisfied that the re-deployment at the proposed location within the Site would not give rise to new or materially different likely significant effects to those identified in the seascape, landscape and visual assessment of the Variation ES. Any further re-certification would follow the same process. If Turbine 1 is not re-deployed within 6 months, it will be decommissioned (in line with condition 5 of the S36 consent on Redundant

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turbines). It is anticipated this position will be secured by a condition in the marine licence (and if considered necessary, also in the S36 consent).

In the Original ES, it was presented that the turbines would be between 6 to 8MW. The largest turbines (up to 8.4MW) that will now be used have some parameters that are out-with the Rochdale Envelope developed for the turbines that were previously assessed for the Original ES and ES Addendum. These new parameters were assessed where necessary in the Variation ES. These parameters are shown in the table below.

This document is based on the Project description included in the Variation ES.

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Table 1-2 Summary of turbine parametres are defined in the Rochdale Envelopes in the EIAs undertaken for the Original ES, ES Addendum and the Variation ES

Project Component	Parameter	Worst Case Value Original ES	Worst Case Value ES Addendum	Worst Case Value Variation	
Turbine	Number of turbines	8	No Change	7	
	Rated capacity	up to 8MW for each turbine and maximum 50MW for the total array	No Change	up to 8.4MW for each turbine and maximum 50MW for the total array	
	Design	Three-bladed horizontal-axis	No Change	Three-bladed horizontal-axis	
	Turbine Parameters	up to 8MW	No Change	Vestas V80 (2MW)	164m
	WTG Hub Height (to centreline of hub)	Lowest Astronomical tide (LAT) +100m	No Change	66m	104.9m
	WTG Blade Length (to centreline of hub)	76m	No Change	40m	82m
	Effective Tip Height	176m	No Change	106m	191m
	Rotor diameter	152m	No Change	80m	164m
	Max blade width	4.5m	No Change	3.5m	5.4m
	Rotation speed	6.4-10.1 rpm	No Change	Up to 17 rpm	4.8-12.1rpm
	Operational wind speed	3.5m/s - 30 m/s	No Change	4.0 ms ⁻¹ – 30ms ⁻¹	4ms ⁻¹ – 25 ms ⁻¹
	Derived mean rotation speed at site	9.3 rpm for 6mw	No Change	15rpm	10.5rpm
	Average pitch	15°	No Change	15°	6°
	Blade clearance	22m maintained at all tidal states (floating sub structure rather than fixed)	No Change	26m	22.9m
	Colour	Pale grey	No Change	No Change	

1.4. Approach to Amending and Updates to this Design Statement document

This DS was written between the Original Consent being granted in March 2017, and during the period between the S36C Variation Application submission in December 2017 and determination. This DS is based on visualisations and ZTVs of the proposed design and layout of the Varied Project as included in the S36C Variation Application, and as per the DSLP which was also based on the S36C Variation Application.

Where it may be necessary to update the design parameters in the DSLP in light of any significant new information related to the design and layout specification, and where those changes are judged to have a significant effect on the visualisation set out in the DS, KOWL will communicate such a change to the Scottish Ministers, re-draft this DS in line with the new DSLP and re-submit it to the Scottish Ministers for approval.

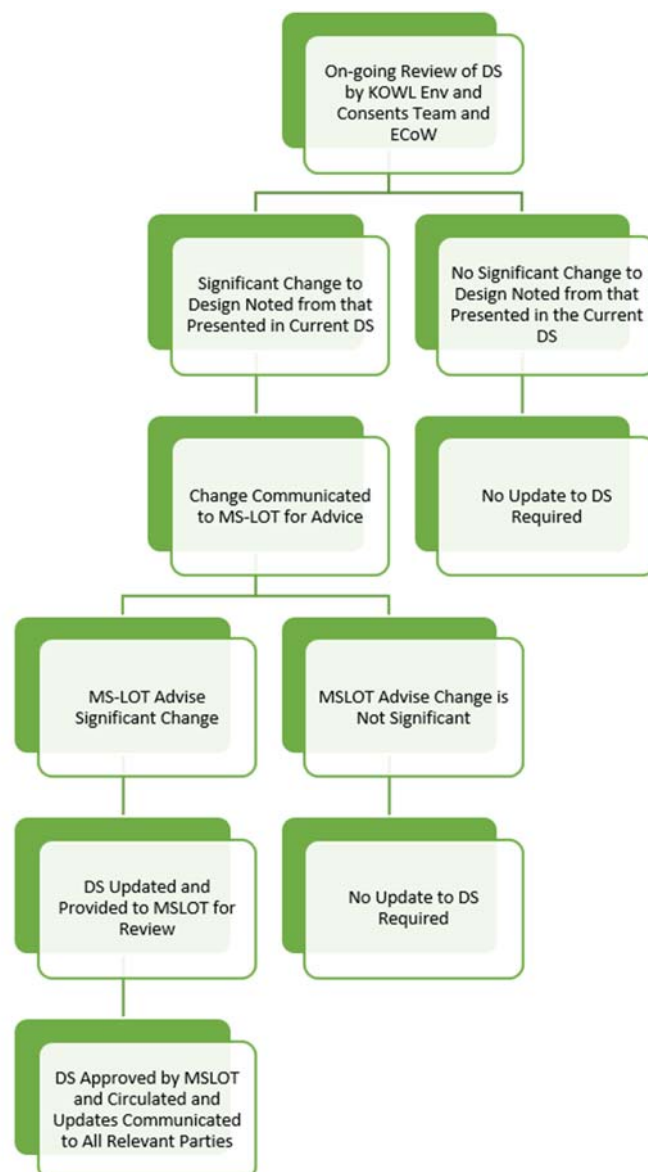


Figure 1-2 Change Management Procedure for this DS

1.5. Consent Conditions

The following consent conditions are taken from the S36 and Marine Licences which form the requirements for this DS.

Table 1-3 Licence conditions relevant to the DS

Licence	Condition Number	Name	Details
S36	12	Design Statement	The Company must, no later than 6 months prior to the Commencement of the Development, submit a Design Statement ("DS"), in writing, to the Scottish Ministers. The DS, which must be signed off by at least one qualified landscape architect as instructed by the Company prior to submission to the Scottish Ministers, must include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers, based upon the final DSLP as approved by the Scottish Ministers as updated or amended.

Linkages to Other Consent Plans

The following consent conditions are taken from the S36 and Marine Licences with which this DS has linkages to.

Table 1-4 Licence conditions relevant to the DS

Licence	Condition Number	Name	Details
S36	10	Construction Method Statement	<p>The Company must, no later than 6 months prior to the Commencement of the Development submit a Construction Method Statement ("CMS"), in writing, to the Scottish Ministers for their written approval.</p> <p>The CMS must include, but not be limited to:</p> <ul style="list-style-type: none"> a. the construction procedures and good working practices for installing the Development; b. details of the roles and responsibilities, chain of command and contact details of company personnel, any contractors or sub-contractors involved during the construction of the Development; c. details of how the construction related mitigation steps proposed in the ES and in the ES Addendum are to be delivered;

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Licence	Condition Number	Name	Details
			<p>d. a waste management plan for the construction phase of the Development; and</p> <p>e. demonstration of seasonal avoidance to minimize impacts on key sensitive bird interests (the main wintering (non-breeding period) during which construction should be avoided is between September and March).</p> <p>The CMS must adhere to the construction methods assessed in the Application, ES and ES Addendum. The CMS also must, so far as is reasonably practicable, be consistent with the Design Statement ("DS"), the Environmental Management Plan ("EMP"), the Vessel Management Plan ("VMP"), the Navigational Safety Plan ("NSP"), the Cable Plan ("CaP") and the Lighting and Marking Plan ("LMP").</p>
S36	11	Development Specification and Layout Plan	<p>The Company must, no later than 6 months prior to the Commencement of the Development, submit a Design Specification and Layout Plan ("DSLPP"), in writing, to the Scottish Ministers for their written approval.</p> <p>The DSLPP must include, but not be limited to:</p> <p>a. a plan showing the location of each individual WTG (subject to any required micro-siting), including information on WTG spacing, WTG identification/numbering, seabed conditions, bathymetry, confirmed foundation type for each WTG and any key constraints recorded on the Site;</p> <p>b. a list of latitude and longitude co-ordinates accurate to three decimal places of minutes of arc for each WTG. This should also be provided as a Geographic Information System ("GIS") shapefile using the World Geodetic System 1984 ("WGS84") format;</p> <p>c. a table or diagram of each WTG dimensions including – height to blade tip (measured above Lowest Astronomical Tide ("LAT")) to the highest point, height to hub (measured above LAT to the centreline of the generator shaft), rotor diameter and maximum rotation speed;</p>

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Licence	Condition Number	Name	Details
			<p>d. the generating capacity of each WTG used on the Site (Annex 1, Figure 1) and a confirmed generating capacity for the Site overall;</p> <p>e. the finishes for each WTG (see condition 18 on WTG lighting and marking); and</p> <p>f. the length and proposed arrangements on the seabed of all inter-array cables.</p>
ML	3.1.1	Compliance with the Application and approved plans	The Licensee must at all times construct and operate the Works in accordance with this Licence, the Application, the ES, the section 36 consent and the plans and programmes approved by the Scottish Ministers. The Licensee must, at all times maintain the Works in accordance with the approved O&M Plan.
ML	3.1.2	Licence conditions binding other parties	All conditions bind any person who for the time being owns, occupies or enjoys any use of the Works for which this licence has been granted.

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1.6. Compliance

The final design and construction of the Project will require compliance with the DSLP upon which this DS is based, or any future iterations of the DSLP as required. For Contractors and Subcontractors during construction this will be ensured through condition of contract and by appropriate auditing by the Environmental Clerk of Works (ECoW) appointed by KOWL, and during final design this will be ensured through the KOWL Environment and Consents Team.

Where updates or amendments are required to the DSLP, KOWL will notify the Scottish Ministers as soon as is reasonably practicable, and where necessary this DS will also be updated accordingly.

The construction, and operation of the Project will also require compliance with the relevant consent plans as noted in Section 1.5 above, and as approved with the Scottish Ministers.

Compliance with the parameters defined in the Section 36C Variation Application and Project description and are defined in the Variation ES in conjunction with the Original ES and ES Addendum is required where applicable to this DS. The Project description is also defined in Annex 1 of the S36 Consent, however, at the time of writing, the current Consent does not reflect the Project defined in the DSLP or Visualisations used for this DS. This section will be updated in line with the DSLP and DS at such a time that the S36 consent is varied. Further details on updates to this DS are provided in Section 1.4 above.

2. DESIGN STATEMENT

2.1. Preparation

In line with the requirement of the S36 condition as noted in Table 1-3 above, this DS has been prepared by the KOWL Environmental and Consents Team and signed off by Stephen Bacon (Atkins Ltd.), a Chartered Landscape Architect with 20 years' post-qualification experience.

2.2. Relevant Guidance Documentation

No guidance exists specifically on the production of a Design Statement for a consented windfarm, but the relevant elements of existing guidance documents of the visual effects of wind farms published by Scottish Natural Heritage (SNH) have been utilised as noted below.

Visual Representations of Windfarm Version 2.2 (SNH, 2017)

Offshore Renewables – Guidance on assessing the impact on coastal landscape and seascape (SNH, 2012)

2.3. Zone of Theoretical Visibility (ZTV)

ZTV maps were produced for the Original Project layout and were included in the Scoping Report and Original ES. These ZTVs were then used to determine the Viewpoints for which the Seascape and Landscape Visual Impact Assessment was undertaken in the Original ES and ES Addendum. The Viewpoints are shown in Figure 2-1, and the Original ZTV maps are shown in Figure 2-2, Figure 2-4 and Figure 2-6.

For the purposes of this DS the ZTV maps have been updated in line with the configuration of turbines in the DSLP; a tip height of 200m was retained for the six larger turbines and for Turbine Location 8 a tip height of 106m was used. It should be noted as per Section 1.3 that the smaller turbine will be only be re-deployed to this location following re-certification of the sub-structure and in agreement with all relevant consultees.

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The updated ZTV maps are shown in Figure 2-3, Figure 2-5 and Figure 2-7. As the Original ZTVs were conservatively based on a tip height of 200m and for eight turbines, there is no significant change in the extent of the ZTV for the configuration of the Project assessed (seven turbines) compared to the Original ZTV within the areas shown in the Figures below.

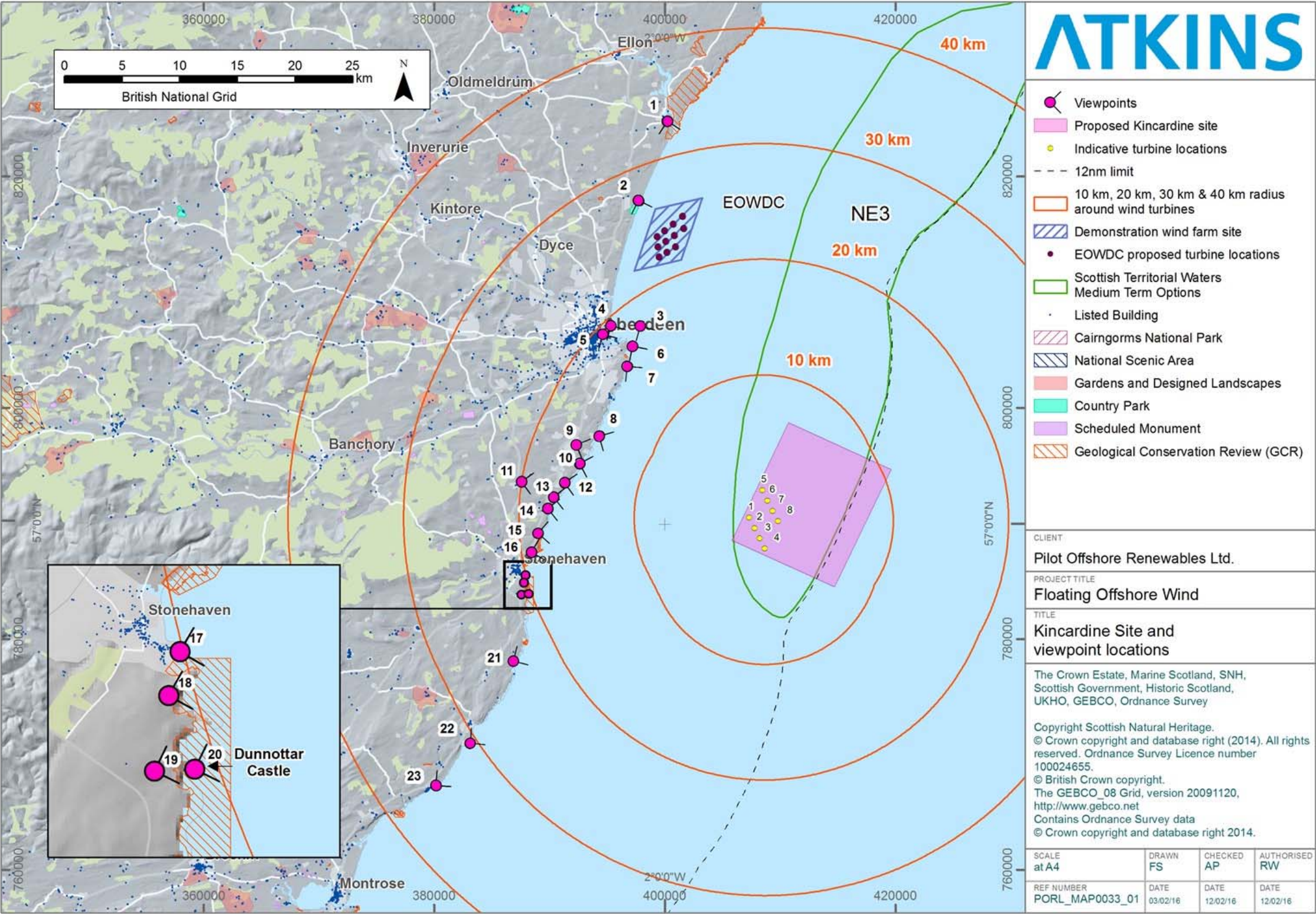


Figure 2-1 All viewpoint locations in relation to the 40km radius from the Project site showing viewing angle

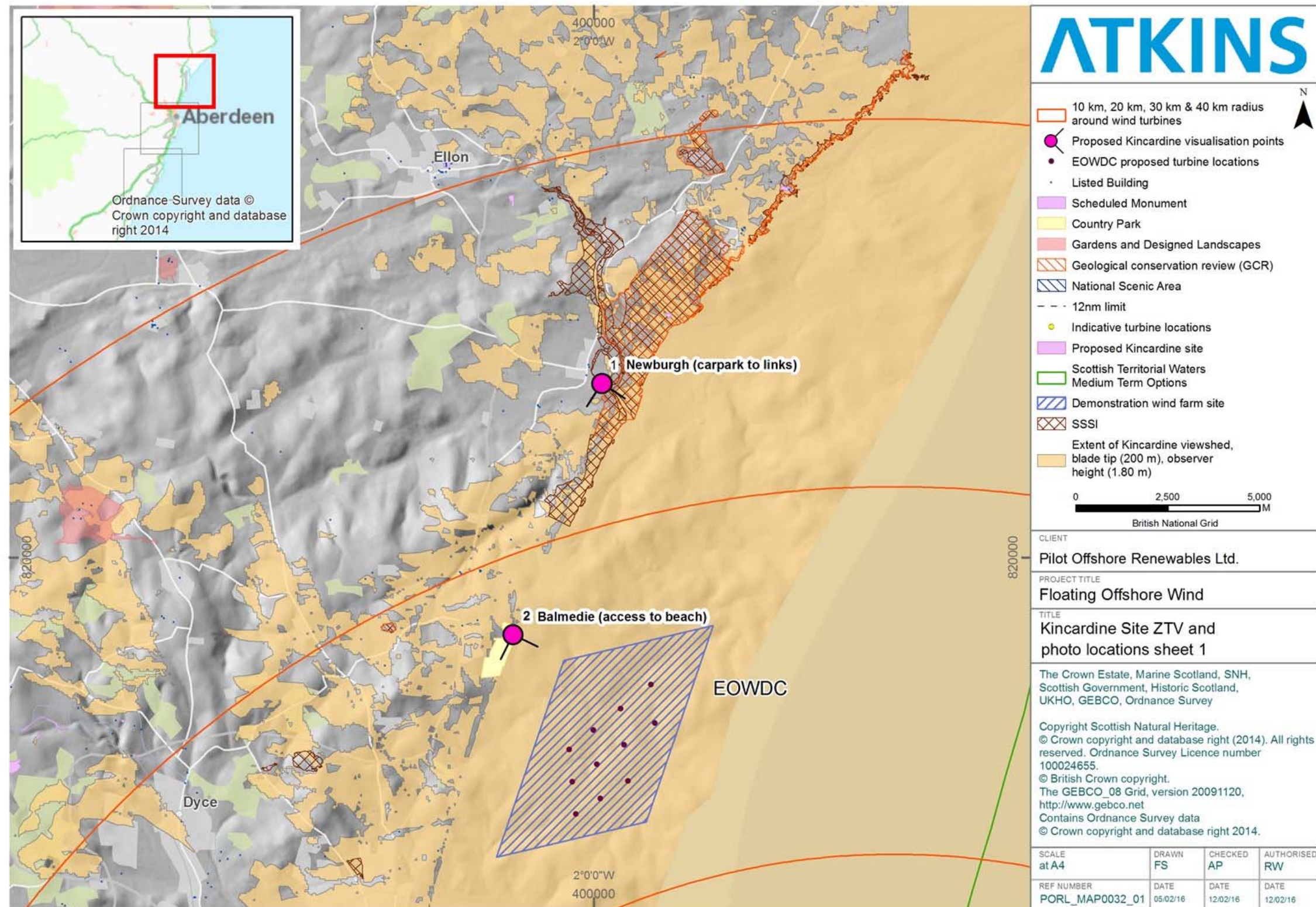


Figure 2-2 Smaller scale image of identified viewpoints 1 and 2 showing viewing angle to Project site – Original ZTV

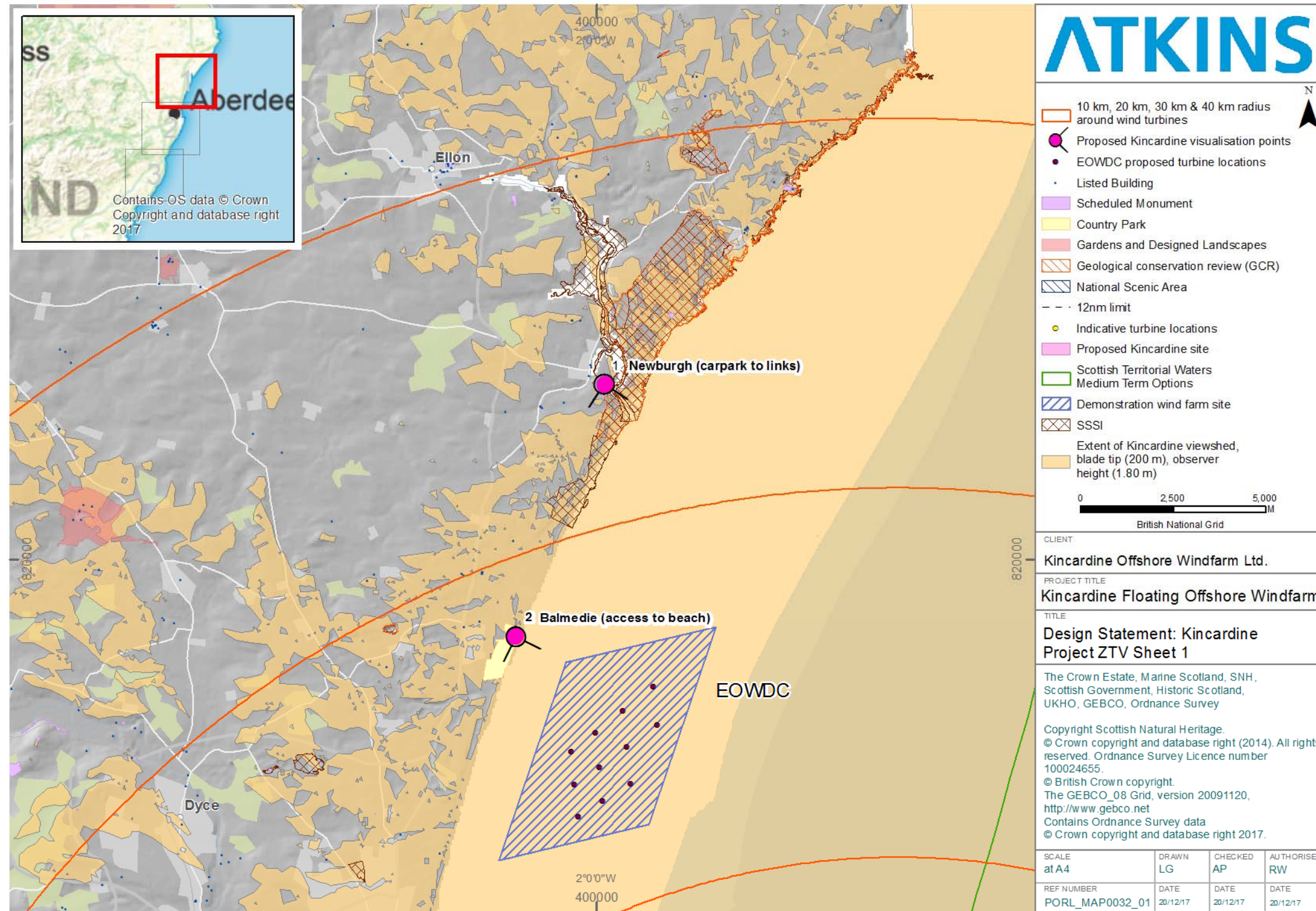


Figure 2-3 Smaller scale image of identified viewpoints 1 and 2 showing viewing angle to Project site – Updated ZTV

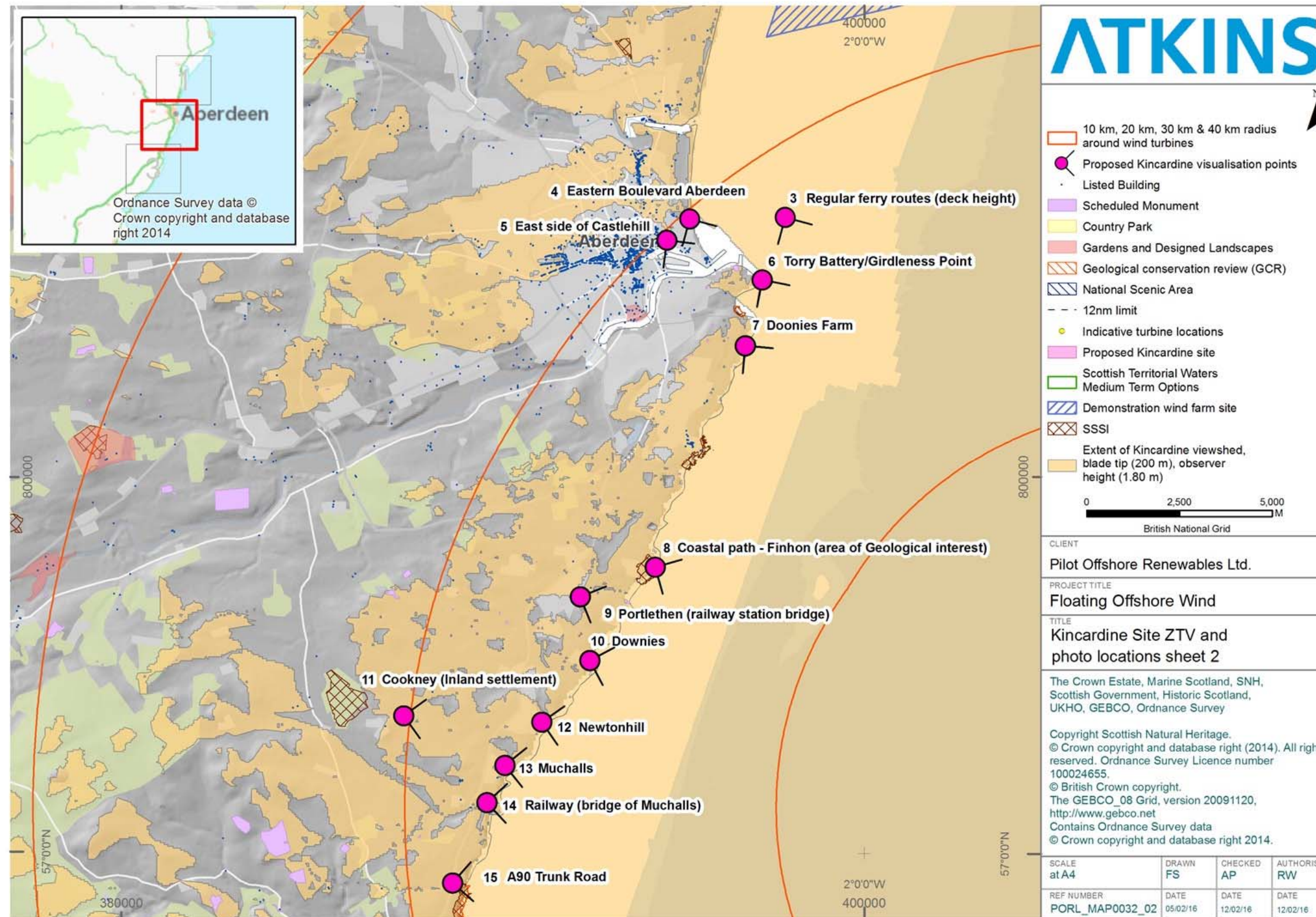


Figure 2-4 Smaller scale image of identified viewpoints 3-15 showing viewing angle to Project site – Original ZTV

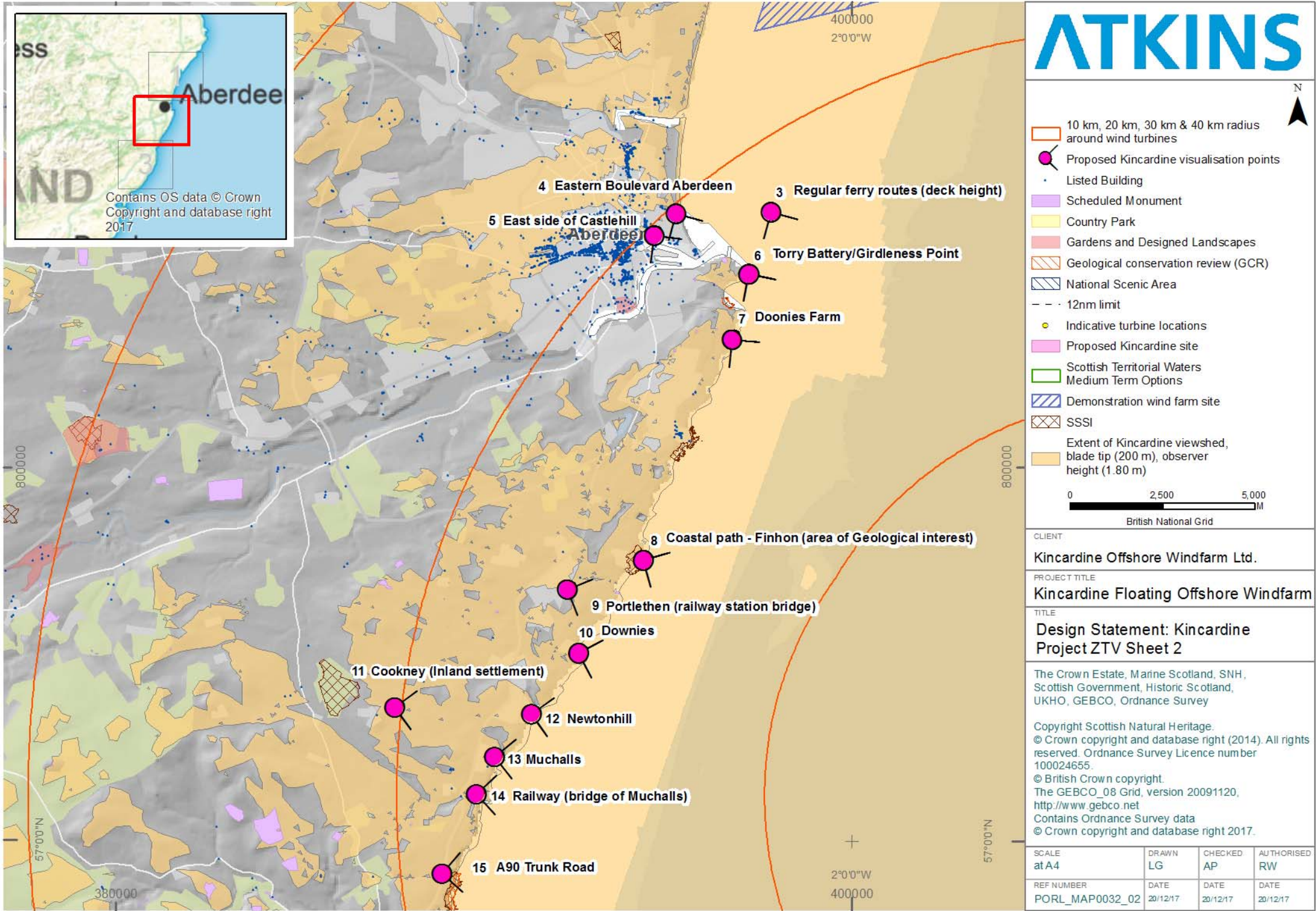


Figure 2-5 Smaller scale image of identified viewpoints 3 to 15 showing viewing angle to Project site – Updated ZTV

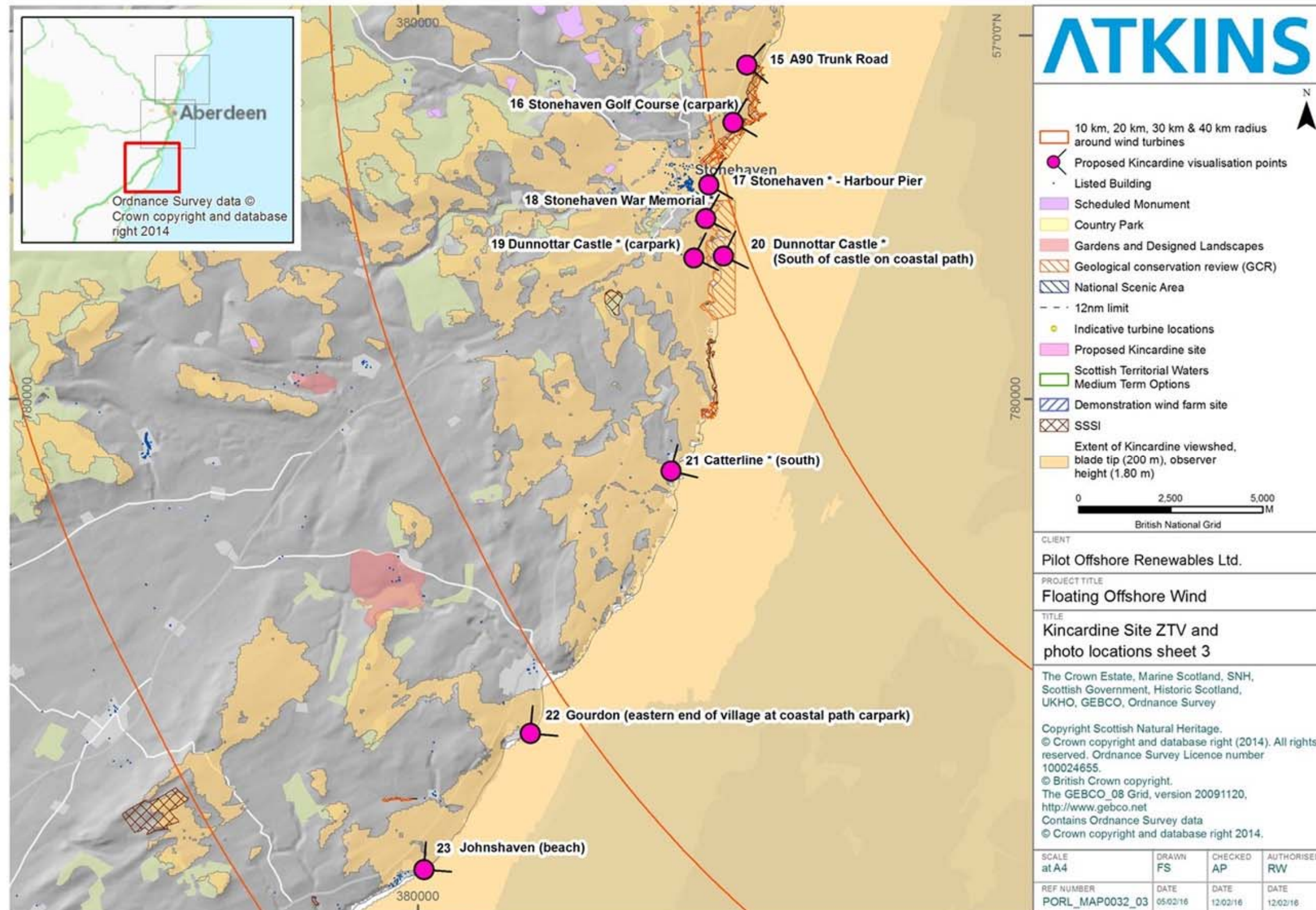


Figure 2-6 Smaller scale image of identified viewpoints 15 to 23 showing viewing angle to Project site – Original ZTV

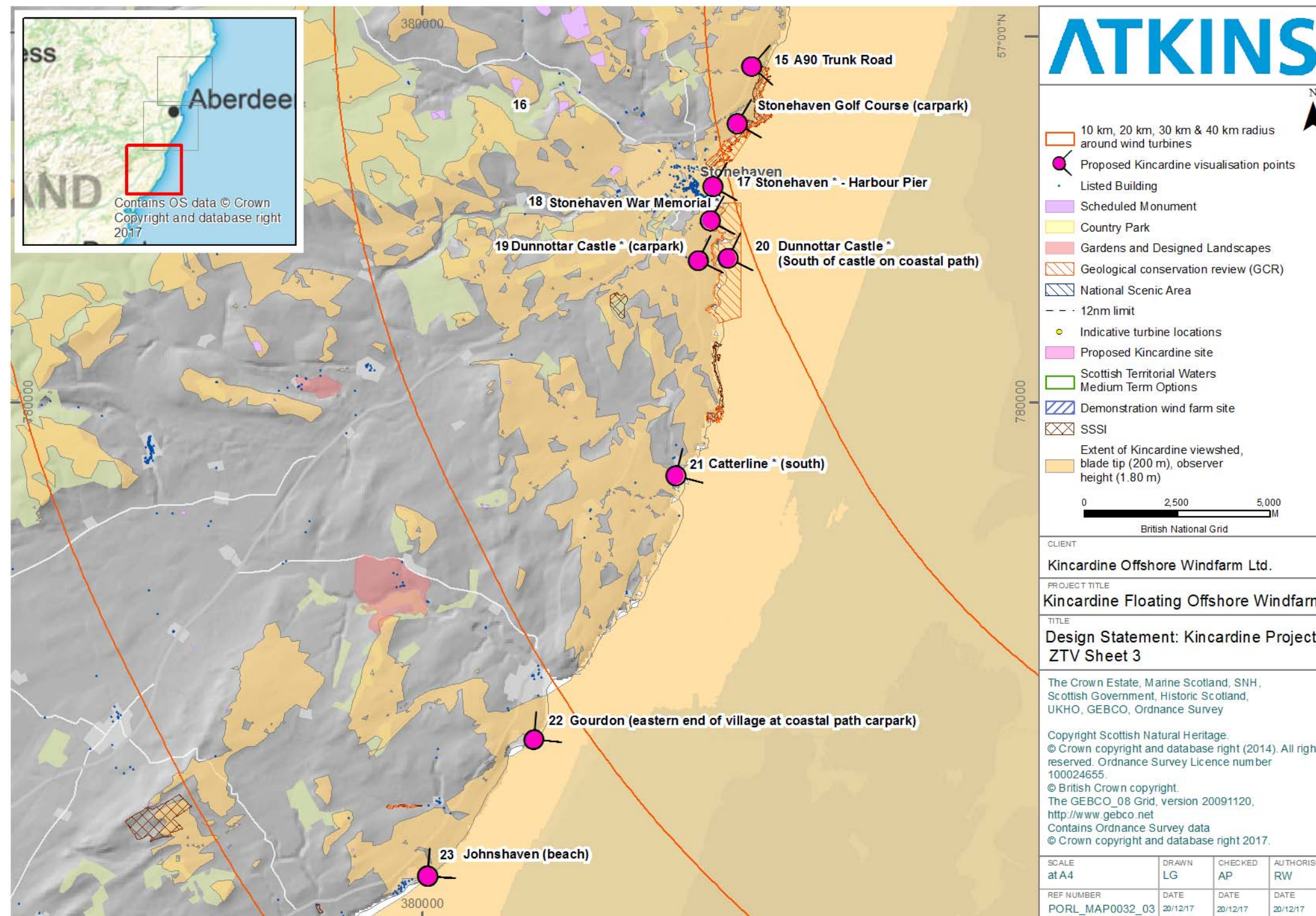


Figure 2-7 Smaller scale image of identified viewpoints 15 to 23 showing viewing angle to Project site – Updated ZTV

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2.4. Agreement on Viewpoints

As noted in the S36 condition (Table 1-3) there is a requirement that the DS *'must include representative wind farm visualisations from key viewpoints as agreed with the Scottish Ministers'*.

As visualisations were included in the Original ES, ES Addendum for six of the 23 viewpoints and seven of the 23 viewpoints in the Variation ES in agreement with relevant consultees (SNH, Aberdeen City Council and Aberdeenshire Council and HES), it was decided that all seven of these visualisations would be included in this DS. The seven viewpoints are made up of the six that were used in the Original ES for the Seascape and Landscape Visual Impact Assessment SLVIA for the Project only, and the addition of a seventh as requested by consultees in the ES Addendum for the consideration of the cumulative impact of both the Project and the European Offshore Wind Deployment Centre (EOWDC). For the Variation ES, visualisations were made for all seven viewpoints as presented in Appendix A.

The viewpoints for this DS are noted below and the numerical references are the same as those in the Original ES, ES Addendum and the Variation ES:

- Viewpoint 6 - Torry Battery/ Girdleness Point
- Viewpoint 7 - Doonies Farm
- Viewpoint 10 - Downies
- Viewpoint 16 - Stonehaven Golf Course (Garrow Point)
- Viewpoint 18 - Stonehaven War Memorial
- Viewpoint 20 - Dunnottar Castle (South of the Castle on coastal path)
- Viewpoint 2 – Balmedie Beach (cumulative assessment only)

2.5. Visualisations and Viewpoint Appraisal

This Section considers the design attributes of the Varied Project layout from the seven agreed viewpoints as noted in Section 2.4.

The visualisations that support this section of the DS are presented in Appendix A, and are the same as those that were submitted with the S36C Variation Application. The Visualisations have been prepared in accordance with the requirements of SNH guidance (SNH, 2017). The baseline photography used in the visualisations has not changed between the Original Application, Variation ES or the production of this DS.

The viewpoint appraisal below addresses the constituent aspects of a view as set in the guidance noted in Section 2.2 (SNH, 2012); in particular chapter 5, paragraphs 5.5 to 5.6.

Paragraph 5.5 states *'SNH's Siting and Designing windfarms in the landscape explores layout and design issues in relation to inshore windfarms. Basic design principles are relevant:*

- *Turbine form, design, size and colour,*
- *Turbine layout/array,*
- *Lighting,*
- *Turbine grouping, relationship to scale-indicators and focal points, especially when viewed in relation to land – be it an island, coastline or backdrop across a firth.'*

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Paragraph 5.6 states *‘For offshore windfarms additional consideration include:*

- *How they relate to the coast, their position within a channel, or firth;*
- *How the height of turbines relation to other coastal elements or features, for example power station chimneys, prominent focal hills or mountain;*
- *Whether they will be backclothed by sea or land;*
- *Their scale if positioned within a firth on a major searoute, or on a tourist/transport route;*
- *How the relate, as a new focal feature, to their surroundings – for example, by replacing the value of existing landmarks;*
- *How they will be viewed from settlements on the coast, as well as those that enjoy an ‘outer’ marine backcloth.’*

The design process has been informed, at all stages, by both technical drivers and by environmental constraints and opportunities which includes consideration of landscape, seascape and visual impacts. The principles of good design as set out in the noted guidance documents has been applied throughout the design process and this, coupled with consultation, has driven the final configuration as assessed in the Variation ES and described in this DS.

The current layout is considered optimal taking into account the provision of sufficient spacing between WTGs, maximising electrical output, ground conditions, search and rescue requirements, site restrictions, other marine users and visual impacts to landscapes and seascapes. Final micro-siting will be further refined following further detailed geotechnical investigations.

From a visual perspective, the embedded mitigation measures, as described in the Original ES, have been maintained as much as possible within the technical requirements of the Project. The embedded mitigation measures included in the Original ES are:

- WTGs will be placed in a regular grid subject to requirements during installation of anchors;
- WTGs will all be of equal dimensions;
- The WTGs will all be pale grey in colour. This reduces the distance over which the WTGs are visible, especially in dull or overcast conditions. Offshore WTGs are viewed against the sky, consequently grey is the most appropriate colour as it is closest to that of the lower part of the sky under most frequent UK weather conditions.

Whilst it is recognised that the introduction of the smaller turbine into the array is not the preferred option in terms of visual impacts, this was driven by the technical needs of the Project, and as noted in Section 1.3, the possibility of the smaller turbine being re-deployed as part of the full array is dependent on re-certification and further consultation with all consultees. However, if it is re-deployed into the full array, as presented in the visualisation, it will be in Location 8, reducing its visibility behind the turbines in Locations 1-3 from most of the viewpoints.

The final paint, signage and lighting design for the Project has now been defined in the Lighting and Marking Plan (LMP). The LMP has been created in order to be compliant with the relevant guidance on the lighting and marking of offshore wind farms, including for both marine and aviation users. The main considerations from a visual perspective have been included below for consideration.

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- Turbine Lighting
 - Yellow light with special mark characteristic (flash once every five seconds);
 - Light to have range of five nautical miles;
 - 360° visibility;
 - Classed as IALA Category 1 (availability of at least 99.8%); and
 - Mounted at least 6m above Highest Astronomical Tide (HAT), and below the lowest point of the blade arc (and not more than 30m above HAT)
- ID Markings
 - Each turbine will be assigned a unique ID which will be displayed on identification panels fitted to the turbines, with the alphanumeric characters visible from 150 metres (m) away (typically at least 1m in height), and shown in black over a yellow background. Multiple illuminated panels will be used per turbine to ensure the ID is clearly visible in all directions, and during both the daylight and night hours.
- Paint
 - The turbine structure (columns) will be painted yellow (RAL 1023) in lead free pigmentation from the water line (float line) to a minimum of 9.5m up to the hand rails on the turbine sub-structure. The portion of sub-structure painted yellow may greater than 9.5m depending on ballast conditions, engineering requirements and the design of future phases of turbines. Sections of structure that will remain below Lowest Astronomical Tide at all times are not required to be painted. The remainder of the WTG and tower above the yellow paint will be painted light grey (RAL 7035) in lead free pigmentation.

The visualisations for the viewpoints are appraised in the tables below in line with the guidance noted above. For Viewpoint 2 – Balmedie Beach, the cumulative impact with EOWDC is also considered.

Table 2-1 Viewpoint 6 - Torry Battery/ Girdleness Point – Appendix A Figures A-1 to A-3

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint the two lines of the array are distinct with the turbines in Location 5-7 being more prominent than the turbines in Locations 1-3. The smaller turbine in Location 8 is much less prominent than the larger turbines and almost not distinguishable.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements

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		is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators from this viewpoint with which to compare the windfarm. However, there is transient vessel traffic as shown in the visualisation, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
5	Contextual relationship with coast	The seascape from this viewpoint is very open apart from the transient vessel movements. Therefore, the turbines will not visually encroach on any features.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoint with which to compare the Project height to. The Project will become a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with transient vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon.

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Table 2-2 Viewpoint 7 – Doonies Farm – Appendix A Figures A-4 to A-6

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint the two lines of the array are distinct with the turbines in Location 5-7 being more prominent than the turbines in Locations 1-3. The smaller turbine in Location 8 is much less prominent than the larger turbines and almost not distinguishable.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators from this viewpoint with which to compare the windfarm. However, there is transient vessel traffic as shown in the visualisation, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
5	Contextual relationship with coast	The seascape from this viewpoint is very open apart from the transient vessel movements. Therefore, the turbines will not visually encroach on any features.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The Project will become

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		a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with constant vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon.

Table 2-3 Viewpoint 10 – Downies – Appendix A Figures A-7 to A-9

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint all the turbines appear to be in a straight line. However, the smaller turbine in Location 8 is much less prominent than the larger turbines and almost not distinguishable.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements

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		is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators from this viewpoint with which to compare the windfarm. However, there is transient vessel traffic as shown in the visualisation, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline
5	Contextual relationship with coast	The seascape from this viewpoint is very open apart from the transient vessel movements. Therefore, the turbines will not visually encroach on any features.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The Project will become a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with transient vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon.

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Table 2-4 Viewpoint 16 – Stonehaven Golf Course – Appendix A Figures A-10 to A-12

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint the two separate lines are indistinguishable and the array appears to be more of an informal a cluster. The smaller turbine in Location 8 is much less prominent than the larger turbines and almost not distinguishable.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators in the marine environment from this viewpoint with which to compare the windfarm. However, there is transient vessel traffic as shown in the visualisation, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
5	Contextual relationship with coast	From this viewpoint the coastal landforms are visible in the foreground, however, the Project is clearly located within the marine environment with a visible separation between the Project and the coastal landforms.

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6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The Project will become a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with transient vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon as it will sit comfortably in the seascape.

Table 2-5 Viewpoint 18 – Stonehaven War Memorial – Appendix A Figures A-13 to A-15

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint the two separate lines are indistinguishable and the array appears to be more of an informal a

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		cluster. From this Viewpoint the whole array appears almost indistinguishable on the horizon. The smaller turbine in Location 8 will only be visible on the clearest of days.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators in the marine environment from this viewpoint with which to compare the windfarm.
5	Contextual relationship with coast	From this viewpoint the Project is clearly located within the marine environment with a visible separation between the Project and the coastal landforms in the foreground.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The Project will become a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon

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		with transient vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon.

Table 2-6 Viewpoint 20 – Dunnottar Castle – Appendix A Figures A-16 to A-18

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.
2	Turbine layout/array	From this Viewpoint the two separate lines are indistinguishable and the array appears to be more of an informal a cluster. From this Viewpoint the whole array appears almost indistinguishable on the horizon. The smaller turbine in Location 8 will only be visible on the clearest of days.
3	Lighting	The lighting and markings for all the turbines are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour and vessel movements.
4	Turbine grouping, scale-indicators and focal points	As noted in the visualisations there are no permanent scale indicators in the marine environment from this viewpoint with which to compare the windfarm.
5	Contextual relationship with coast	From this Viewpoint the coastal landforms are visible in the foreground, however, the Project is clearly located within the marine environment with a visible separation

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		between the Project and the coastal landforms.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The Project will become a focal point out to sea when visibility allows.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to interrupt this coastline.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with transient vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon.

Table 2-7 Viewpoint 2– Balmedie Beach (Cumulative with EOWDC) – Appendix A Figures A-19 to A-21

	Design Attribute	Design Appraisal
1	Turbine form, design, size and colour	<p>A consistent size of substructure and turbine will be used for the six larger turbines. The 2MW turbine will be smaller, however, there will be consistency between the colour of the substructures and turbines used.</p> <p>The turbines will be similar to those used for the EOWDC project, however, the substructures will be different, but the lighting and marking requirements will be similar. Due to the distance offshore of the</p>

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		Project, it will not be possible to distinguish the differences between the substructures of the two developments.
2	Turbine layout/array	From this Viewpoint the turbines appear to be in two clusters, however, the layout of Project is considerable masked by the EOWDC array in the foreground.
3	Lighting	The lighting and markings for all the turbines for both the Project and the EOWDC are in line with all the statutory marine and aviation requirements for navigational and aviation safety. The visual impact of the lighting requirements is minimal from the viewpoint due to the distance offshore and other light impacts from Aberdeen Harbour, vessel movements and the EOWDC.
4	Turbine grouping, scale-indicators and focal points	Due to the distance offshore, the Project appears significantly smaller than the EOWDC in the foreground from this Viewpoint. The EOWDC will be the focal point from this viewpoint.
5	Contextual relationship with coast	From this Viewpoint the coastal landforms are visible in the foreground, however, the Project and the EOWDC are both clearly located within the marine environment with a visible separation from the coastal landforms.
6	Height relationship with coastal elements and features	There are no coastal elements visible from this viewpoints with which to compare the Project height to. The EOWDC will be the focal point from this Viewpoint.
7	Backclothing	The backcloth to the Project is an active marine environment.
8	Scale of turbine	As the turbines and substructures are floating all parameters e.g. blade clearance will remain constant regardless of the state of tide removing any change in visual appearance. Furthermore, due to the distance offshore, the turbines do not appear to be significantly out of proportion to the vessel traffic that will continue to

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		interrupt this coastline. However, the Project does look significantly smaller when visible compared to the EOWDC.
9	Relationship to surroundings	The scale of the Project is appropriate to the seascape at this viewpoint as it will remain a distant feature on the far horizon with the EOWDC in the foreground and constant vessel traffic and movement under all weather and light conditions.
10	Visual appearance from coastal settlements	When visibility permits the Project will be seen as a new distant element of the far seaward horizon as it will sit comfortably in the seascape behind the EOWDC.

3. COMPLIANCE WITH APPLICATIONS AND ASSOCIATED ENVIRONMENTAL STATEMENTS

The final design and construction of the Project will require compliance with the parameters defined in the Variation ES in conjunction with the Original ES and ES Addendum where applicable.

In addition to the conditions set out in Section 1.5, Condition 7 of the S36 Consent states:

“The Development must be undertaken in accordance with the Application, the Environmental Statement (as supplemented or amended by further environmental information submitted by the Company on 22nd September 2016) and any other documentation lodged in support of the Application”.

This Section sets out information from the ES/ES Addendum and Variation regarding compliance with the Project specification and layout.

3.1 Compliance with the ES, ES Addendum and Variation ES

The Original ES, ES Addendum and Variation ES set out the specifications and layout which are to be applied during the construction of the Project. This took the form of a ‘Rochdale Envelope’ which provided details on the specification and layout proposed for the Project. Following the award of the S36 consent and Marine Licence, the specifications and layout were refined to that described in the S36 Variation and to that described in this DS. To demonstrate compliance with the Variation ES as the latest configuration assessed design parameters considered in the Variation ES are compared with the design parameters set out in this DS in the table below. In addition, the final design and construction of the Project will comply with the ES and ES Mitigation measures relating to lighting and markings as defined in the Original ES, ES Addendum and Variation ES, and outlined in the LMP.

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Table 3-1: Compliance with Rochdale Envelope Parameters defined in the Variation ES

Parameter	Details of Commitment		Implementation	
Number of WTG structures	1 x 2MW	6 x 8.4 MW	1 x 2MW	6 x 8.4 MW
Rated Capacity	Maximum 50MW		Maximum 50MW	
WTG Tip Height	106m	191m	106m	191m
WTG Hub Height (to centreline of hub)	66m	104.9m	66m	104.9m
Rotor diameter	80m	164m	80m	164m
Max blade width	3.5m	5.4m	3.5m	5.4m
Number of Rotor Blades	3	3	3	3
Blade Clearance	26m	22.9m	26m	22.9m
Colour	Pale Grey	Pale Grey	Pale Grey	Pale Grey
Substructure type	Semi-submersible WindFloat™ prototype	Combination of the WindFloat™ (steel semi-sub) and Cobra (concrete semi-spar)	Semi-submersible WindFloat™ prototype	Combination of the WindFloat™ (steel semi-sub) and Cobra (concrete semi-spar)