

Hornsea Project Three
Offshore Wind Farm



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Hornsea 3
Offshore Wind Farm

Orsted

Environmental Impact Assessment

Environmental Statement

Volume 6

Annex 4.6 – Residential Visual Amenity

Liability

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5 Howick Place,

London, SW1P 1WG

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Prepared by: LDA Design

Checked by: ANGUY/SARCR

Accepted by: STLIV

Approved by: STLIV

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Acronyms

Acronym	Description
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current

Units

Unit	Description
m	Metre
km	Kilometre

1. Introduction

1.1.1.1 This annex considers effects on residential visual amenity due to Hornsea Three. Effects on residential amenity due to construction of the onshore cable route are scoped out due to the temporary and short term nature of the works. Effects due to the operation of the onshore cable route are scoped out because the cables would be buried and not cause any effects on residential amenity.

1.1.1.2 The maximum design scenario for construction of the onshore High Voltage Alternating Current (HVAC) booster station and onshore High Voltage Direct Current (HVDC) converter/HVAC substation is that this may last a total of 36 months, in two phases with a gap between the phases. This would potentially lead to temporary effects. Effects during operation would be of longer term which, for the purposes of this assessment, are deemed to be permanent. Effects on residential visual amenity are therefore assessed for the operation phase because they would have potential to affect the long term viability of the residential properties as unattractive places in which to live. Commentary on potential effects during the construction phase are also given where main construction compounds for the onshore HVAC booster station and onshore HVDC converter/HVAC substation lie closer than the permanent onshore HVAC booster station and onshore HVDC converter/HVAC substation.

1.2 Methodology

1.2.1.1 The detailed method for assessing effects on residential amenity due to changes in views is given in volume 6, annex 4.1: Landscape and Visual Impact Assessment Methodology, appendix B and accords with the Guidelines for Landscape and Visual Impact Assessment (GLVIA3). However, a summary of the study area used in the residential visual amenity assessment is provided below for clarity.

1.2.1.2 Residential amenity study areas of 400 m from the onshore HVAC booster station and onshore HVDC converter/HVAC substation were considered. This residential amenity study area is judged suitable to identify any residential properties that could be affected to the extent that Hornsea Three is sufficiently “oppressive” or “overbearing” that the residential property would be rendered an unattractive place in which to live¹, taking into account the maximum design scenario for the onshore HVDC converter/HVAC substation which is greater in terms of footprint and height than the onshore HVAC booster station. The maximum design scenarios in terms of height are summarised in Table 1.1.

¹ This test is explained in volume 6, annex 4.1: Landscape and Visual Impact Assessment Methodology, appendix B. This explains the approach based on inspector’s reports for public inquiry decisions that, in considering effects on private residential amenity, effects which fall below the threshold of being “so unpleasant, overwhelming and oppressive that this would become an unattractive place to live” (known as the Lavender Test) “would not feature in the planning balance, irrespective of how many dwellings were so affected” (Spring Farm Ridge wind farm (APP/Z2830/A/11/2165035 – December 2014).

Table 1.1: Maximum design scenarios used for the residential visual amenity assessment.

	Buildings height above maximum potential ground level	Lightning protection height above maximum potential ground level
Onshore HVAC booster station	12.5m	17.5m
Onshore HVDC converter/HVAC substation	25m	30m

1.2.1.3 400 m is judged to be a suitable study area based on experience of undertaking residential visual amenity assessments for other developments. For example, a maximum of a 2 km study area is common practice in assessing potential effects on residential visual amenity for onshore wind turbines of up to 150 m tall. The maximum design scenario for the tallest elements of the onshore HVDC converter/HVAC substation is 30 m (one fifth of a 150 m turbine) comprising finer elements of the onshore HVDC converter/HVAC substation, with buildings (the more bulky elements) up to 25 high; thus a study area of 400 m (one fifth of a maximum 2 km study area) is considered more than sufficient to identify any effects arising from Hornsea Three that could potentially be considered “oppressive” or “overbearing”.

1.2.1.4 There are no residential properties within 400 m of the permanent onshore HVAC booster station, the closest being Keepers Cottage located within woodland approximately 490 m to the south-east (see Figure 4.1, Sheet 2 of 8 in volume 3, chapter 4: Landscape and Visual Resources), and the maximum design scenario for the onshore HVAC booster station is less than the onshore HVDC converter/HVAC substation so the potential for effects on residential visual amenity are less. Keepers Cottage lies approximately 300 m from the temporary construction area for the onshore HVAC booster station and the construction and operational access road would pass along the existing track immediately west of the cottage. The permanent operational and temporary construction aspects of the onshore HVAC booster station would not result in visual effects on Keepers Cottage which would be “oppressive” or “overbearing”. Therefore this annex focuses on residential properties within 400 m of the onshore HVDC converter/HVAC substation which are illustrated on Figure 1.6.

1.2.1.5 Site visits were undertaken in November 2017 (baseline) and January 2018 (assessment). All properties were viewed from publicly accessible locations with the exception of Brooks Green traveller’s site which was not visible. Brooks Green traveller’s site was therefore assessed using aerial photographs, and site visits to the local area.

1.3 Assessments

- 1.3.1.1 The results of the residential visual amenity assessment is summarised in Table 1.2. In this table, distance and direction are given from the nearest part of the permanent onshore HVDC converter/HVAC substation envelope to the nearest wall of the house (or nearest house of a group) and are accurate to within approximately 10 m.
- 1.3.1.2 Within the assessment, the following terms are utilised:
- Partial for windows indicates views seen between obstructions such that the view is partially screened;
 - Partial within gardens indicates where Hornsea Three would be visible from some parts of the property's garden areas, but not others;
 - For windows – Direct views are those which would be seen looking directly out of the window, oblique indicates views seen to one side, but still likely to be visible. Very oblique views where it would be necessary to open the window and look out, or stand unnaturally close to the window are not recorded as visible; and
 - The arc of view is given (to the nearest degree) as the theoretical maximum arc of view which might be occupied by the development if not obscured by local screening such as vegetation or outbuildings.
- 1.3.1.3 The assessment allows for the seasonal changes of vegetation and is based the 'worst case' when deciduous trees are not in leaf.
- 1.3.1.4 Mangreen Hall lies just outside the 400 m study area for the permanent onshore HVDC converter/HVAC substation but has been included in the assessment because it also lies within approximately 270 m of the temporary construction area.

Table 1.2: Residential Visual Amenity Assessment.

Residential Property/Group of residential properties	Distance from onshore HVDC converter/HVAC substation – permanent*	Number of storeys	Visibility	Arc of View	Assessment
House on the Hill, B1113 (Figure 1.2)	270 m, SW	2	Gardens – partial Windows – partial / none	48°	The main facades of this house face away from the permanent onshore HVDC converter/HVAC substation and the temporary construction works, with the front facing northwest and the back southeast (see Figure 1.6). The house and garden are surrounded by mature trees and a well-maintained hedge. As a result, views from windows would be limited to those from the upstairs gable end window which faces the onshore HVDC converter/HVAC substation. There may also be some visibility from the rear garden, looking out over the hedge. The permanent onshore HVDC converter/HVAC substation would not be overbearing and, although it would occupy a theoretically wide arc of view, views would be limited by the orientation of the property and surrounding vegetation. The temporary construction area would lie beyond the residential property than the onshore HVDC converter/HVAC substation. Hornsea Three would occupy the outlook in a way which would not be oppressive.
Pond Cottage, Holly View Cottage, Park View Cottage, Mangreen Cottage, Mangreen (Figure 1.2)	200 m, SE (70 m, S from temporary construction area)	2	Gardens – partial Windows - partial	75°	Each of these properties has a rear garden with backs facing the onshore HVDC converter/HVAC substation and the temporary construction area. To the rear of each of the houses, there are a number of outbuildings, and trees within the gardens which would break up views from ground floor windows and parts of the gardens. Each of these houses also has a substantial hedgerow forming the garden boundary on the side of the onshore HVDC converter/HVAC substation and temporary construction area, although this has a gap in the case of Park View Cottage (see Figure 1.3). Hornsea Three would not be overbearing during construction or operation. Hornsea Three would occupy a theoretically wide arc of view and an existing electricity power line on timber poles, which is already visible from these properties, would be diverted closer to them. Views would primarily consist of direct and oblique views from upstairs windows filtered by mature trees. Hornsea Three would not occupy the outlook in a way which would be oppressive.
Wattle Cottage, Mangreen (Figure 1.2)	210 m, SE (150 m, S from temporary construction area)	1.5	Gardens – partial / none Windows – partial / none	70°	The gardens are mostly to the south of this cottage which faces across a lane to a tall hedgerow (see Figure 1.4). There is only likely to be any visibility of the onshore HVDC converter/HVAC substation and the temporary construction area during winter, when it could be seen through the branches of the hedgerow from the driveway entrance and from north facing windows. The windows on the north side of the house are small, and views towards the permanent onshore HVDC converter/HVAC substation and temporary construction works would be direct. Hornsea Three would not be overbearing and would not occupy the outlook in a way which would be oppressive.
Mangreen Hall (Figure 1.2)	440 m, SE (270 m, SE from temporary construction area)	2	Gardens – partial / none Windows – partial / none	48°	The grounds of Mangreen Hall include a number of buildings and are surrounded by mature trees. A group of houses lie between Mangreen Hall and the permanent onshore HVDC converter/HVAC substation and the temporary construction area, along with clumps and groups of mature trees and hedgerows. There is likely to be little or no visibility of the onshore HVDC converter/HVAC substation and the temporary construction area, except for the potential for some views from upstairs windows in winter, filtered through tree branches (see Figure 1.5). Hornsea Three would not be overbearing and would not occupy the outlook in a way which would be oppressive.

Residential Property/Group of residential properties	Distance from onshore HVDC converter/HVAC substation – permanent*	Number of storeys	Visibility	Arc of View	Assessment
Brooks Green traveller's site (8 properties) (Figure 1.2)	270 m, NE (160 m, N from temporary construction area)	1	Gardens – partial / none Windows – partial / none	38°	<p>This traveller's site lies to the north of the A47, beyond the embankments and vegetation which line the A47. As noted at paragraph 1.2.1.5 these properties were not visible during the site visit. In undertaking the assessment it has been assumed that the permanent onshore HVDC converter/HVAC substation and the temporary construction area could potentially be visible, thus adopting a conservative approach in assuming 'worst potential case'.</p> <p>The taller parts of the HVDC converter/HVAC substation may potentially be seen above the hedge from some parts of the traveller's site, where views are not interrupted by vegetation, vehicles and buildings. Dense vegetation along the A47 would provide partial or complete screening. There is potential for some tall elements within the temporary construction area to be visible, although this is unlikely.</p> <p>Hornsea Three would not be overbearing, and would not occupy the outlook in a way which would be oppressive.</p>

* The distance from the temporary construction area is also given in brackets where it is closer to the residential property than the permanent onshore HVDC converter/HVAC substation.

1.4 Mitigation

- 1.4.1.1 The assessment above makes no allowance for potential mitigation that would be provided by proposed planting. Proposed planting around the permanent onshore HVAC booster station and onshore HVDC converter/HVAC substation is illustrated in the Outline Landscape Management Plan (document reference number A8.7).
- 1.4.1.2 In respect of the nearer residential properties to the southwest and southeast of the onshore HVDC converter/HVAC substation, areas within the order limits close to these houses have been identified with the potential for tree planting to provide additional screening as illustrated on Figure 1.2. This will be offered as optional mitigation, to be taken forward should residents wish this, and it is not essential to mitigate the effects. Some residents may prefer to retain the openness of views (including some visibility of the onshore HVDC converter/HVAC substation) rather than having a tree belt close to their house.



Figure 1.1: Residential Properties.

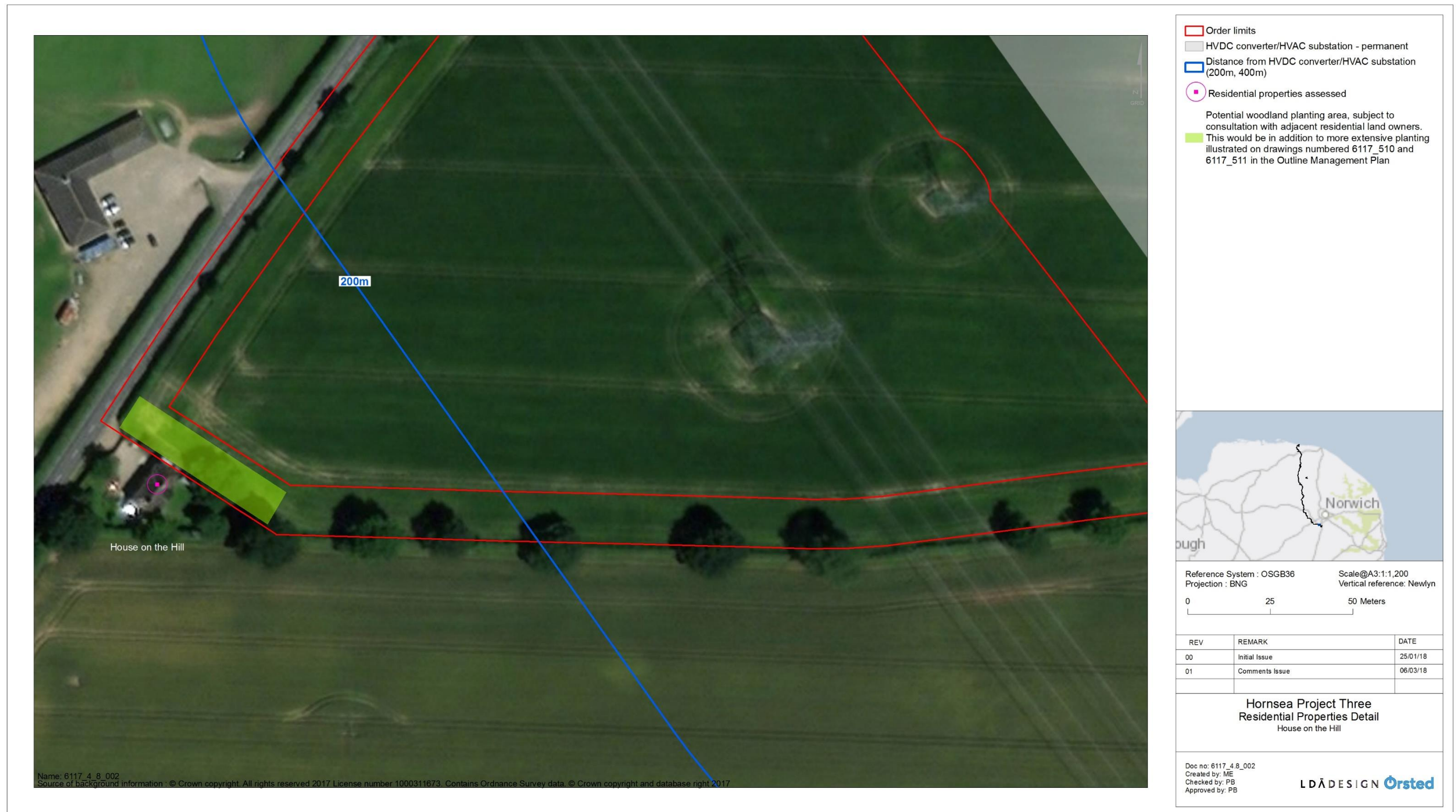


Figure 1.2: Residential Properties Detail Sheet 1 of 3.



Figure 1.2: Residential Properties Detail Sheet 2 of 3.



Figure 1.2: Residential Properties Detail Sheet 3 of 3.



Figure 1.3: Rear elevation of Pond Cottage, Holly View Cottage, Park View Cottage and Mangreen Cottage.



Figure 1.4: Front/side elevation of Wattle Cottage.



Figure 1.5: Rear elevation of Mangreen Hall.



Figure 1.6: Rear elevation of House on the Hill.

2. Summary and Conclusion

- 2.1.1.1 This annex provides the results of a residential visual amenity assessment undertaken in relation to Hornsea Three. The assessment gave consideration to residential properties located within a study area of 400 m from the permanent HVDC converter/HVAC substation and the HVAC booster station (although the latter had no residential properties within this study area).
- 2.1.1.2 Based on the findings of the assessment, it is concluded that none of the residential properties would be affected to the extent that Hornsea Three would be sufficiently “oppressive” or “overbearing” that the property would be rendered an unattractive place in which to live. This conclusion does not allow for or require mitigation discussed in section 1.4.