

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Environmental Statement

Volume 7

Pre-Examination Procedural Deadline

Chapter 23 – Landscape and Visual Impact Assessment

Figure 23-1 to Figure 23-15 (Revision 2)

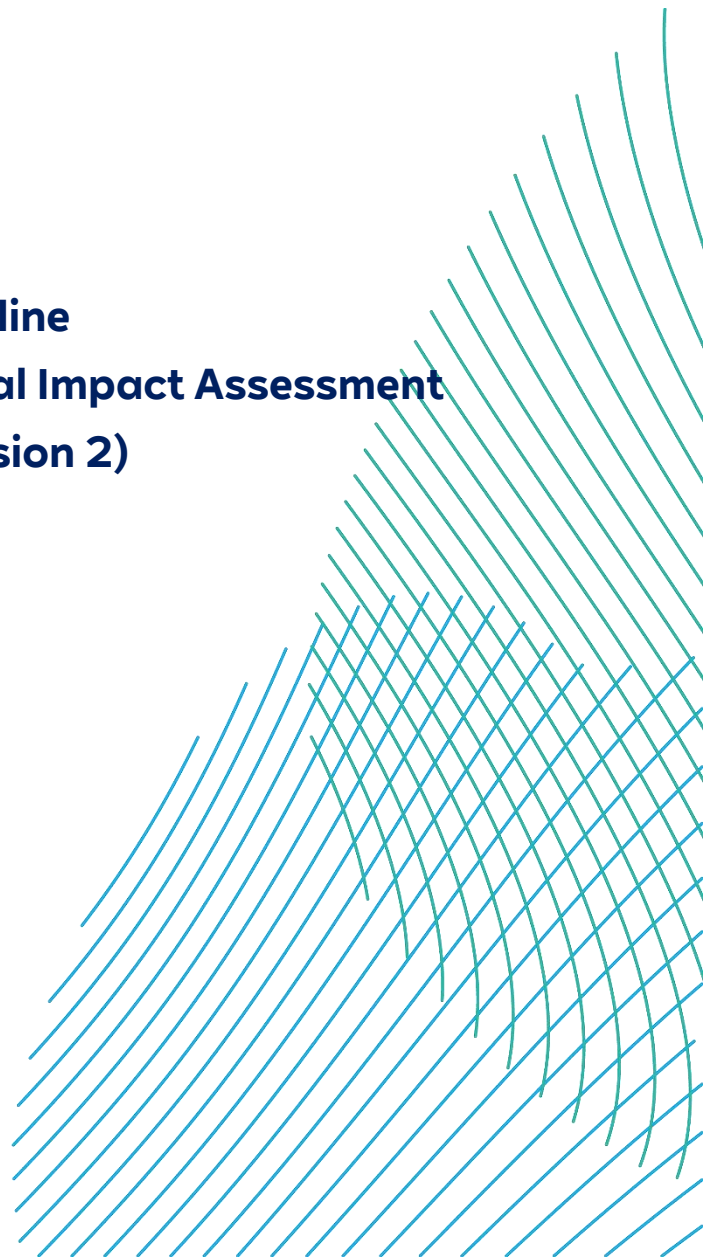
October 2024

Application Reference: 7.23.1

APFP Regulation: 5(2)(a)

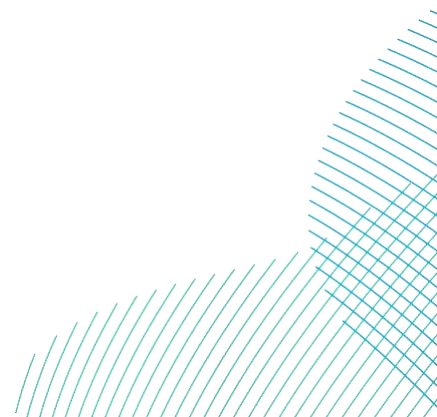
Revision: 02

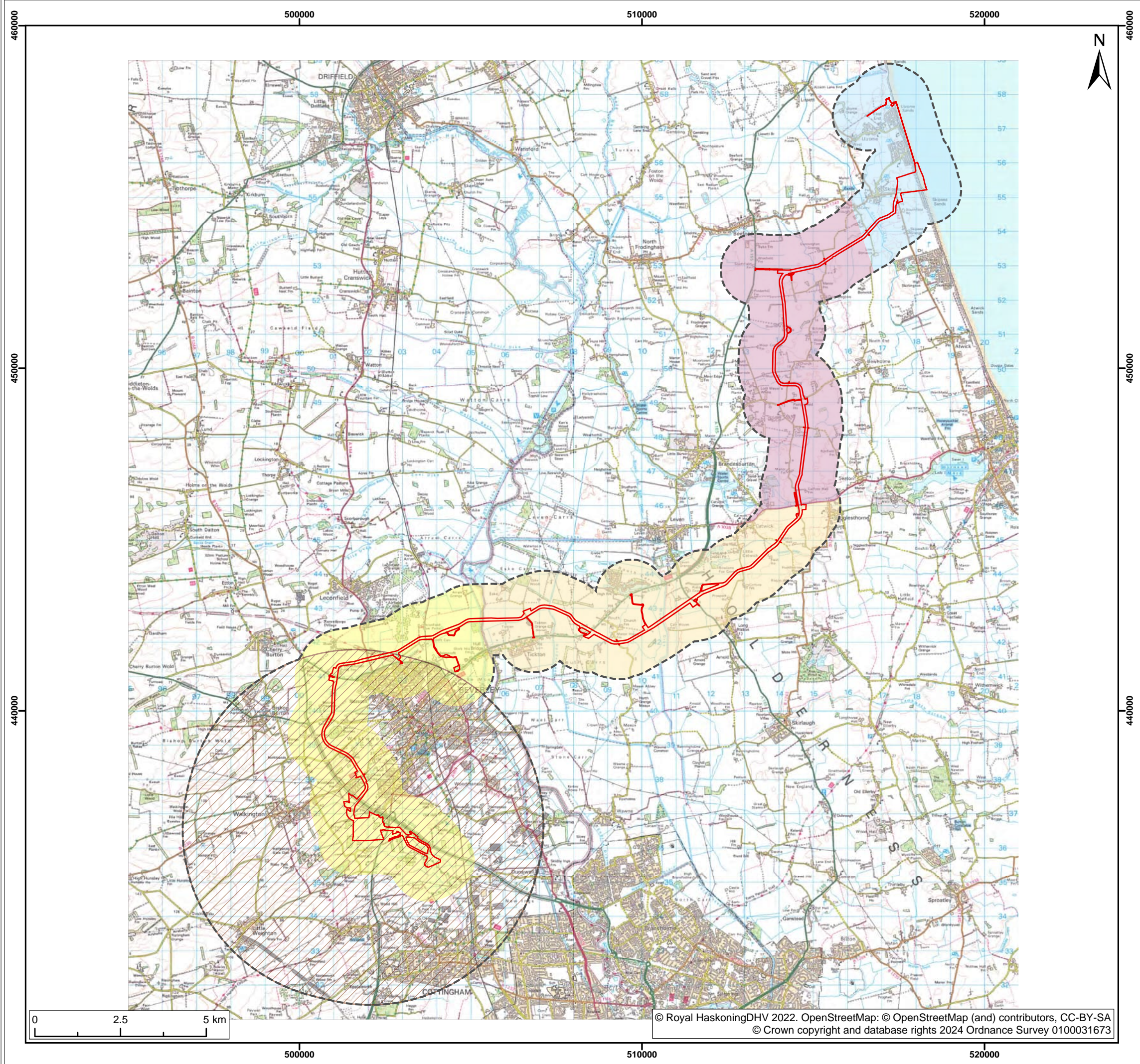
Unrestricted



Company:	RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited	Asset:	Development		
Project:	Dogger Bank South Offshore Wind Farms	Sub Project/Package:	Consents		
Document Title or Description:	Environmental Statement – Chapter 23 – Figure 23-1 to Figure 23-15 (Revision 2)				
Document Number:	004300167-02	Contractor Reference Number:	PC2340-RHD-ON-ZZ-RP-Z-0106		
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Rev No.	Date	Status/Reason for Issue	Author	Checked by	Approved by
01	June 2024	Final for DCO Application	LUC	RWE	RWE
02	October 2024	Submission at Pre-Examination Procedural Deadline	LUC	RWE	RWE

Revision Change Log			
Rev No.	Page	Section	Description
01	N/A	N/A	Submitted for DCO Application
02	6	Figure 23-2b	Figure 23-2b created to show the topography data in relation to the LVIA Study Area to address the Rule 6 Errata
02	10	Figure 23-6	Amended figure legend to clearly identify the area to be returned to agriculture as requested in the Rule 6 Errata





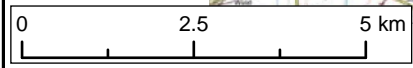
- Legend:
- Onshore Development Area
 - Landscape and visual study area
 - Subarea 1
 - Subarea 2
 - Subarea 3
 - Subarea 4
 - Subarea 5

S5	P07	27/02/2024	Suitable for Information	ZM	TH	PM
S4	P06	20/11/2023	Suitable for Information	TH	EH	PM
S3	P02	22/03/2023	Suitable for Information	HS	TH	PM
S2	P01	06/02/2023	Suitable for Information	GS	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Landscape and Visual Study Area

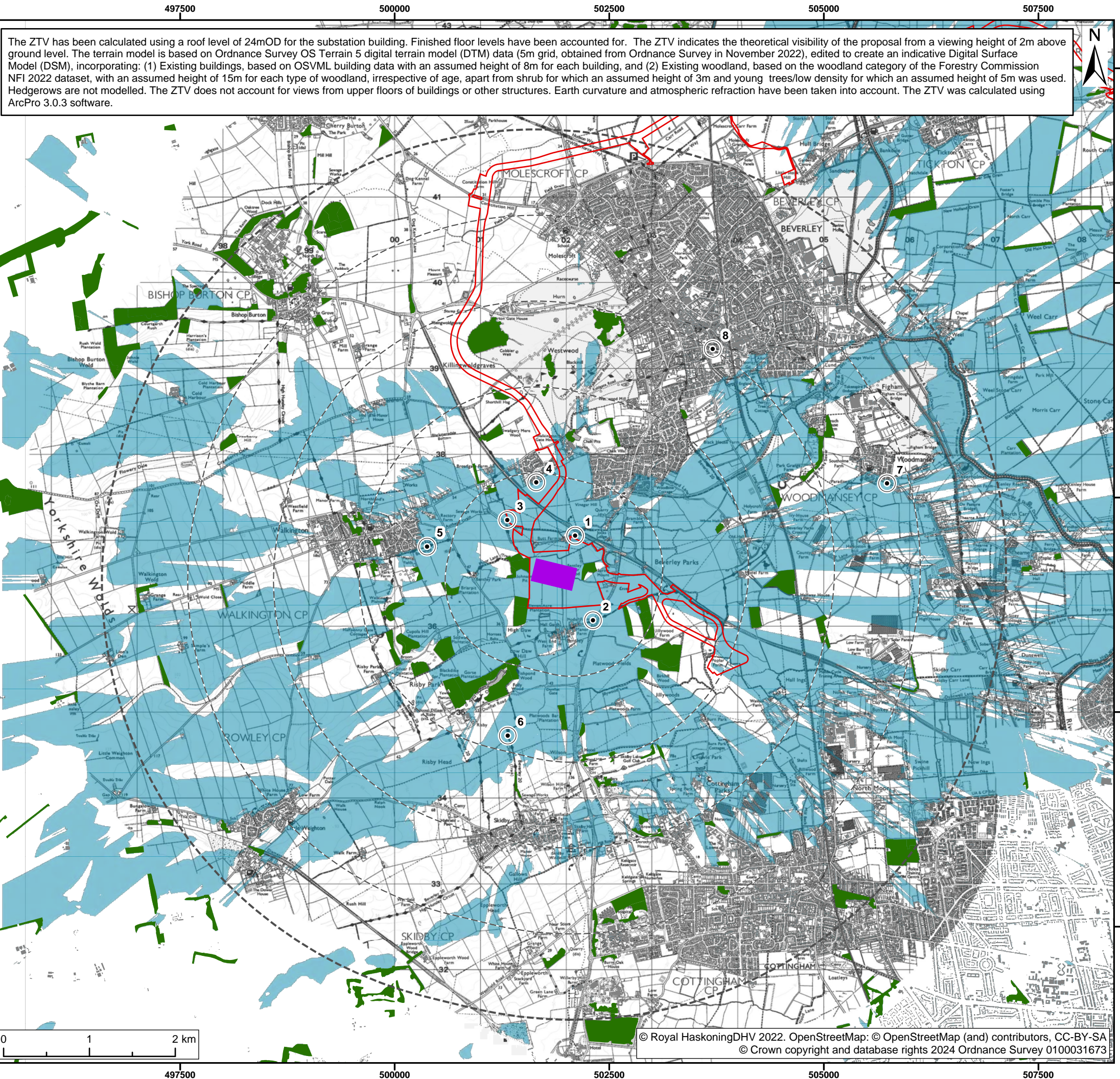
Figure: 23-1 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_1

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:110,000
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The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVLM building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



Legend:

- Onshore Development Area
- Indicative Onshore Converter Stations Footprint
- 1km intervals from Indicative Onshore Converter Stations Footprint
- 5km from Indicative Onshore Converter Stations Footprint
- Viewpoint location
- 1: Butt Farm
- 2: Copleflat Lane, Bentley
- 3: Beverley 20 near Broadgate
- 4: Oriel Close, off Broadgate
- 5: Walkington
- 6: Footpath, Risby
- 7: Woodmansey
- 8: Beverley Minster Tower
- Existing woodland screening
- Existing building screening
- Proposed Converter Station theoretically visible

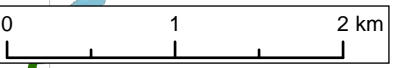
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S4	P06	20/11/2023	Suitable for Information	TH	EH	PM
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S2	P01	06/02/2023	Suitable for Information	GS	TH	PM

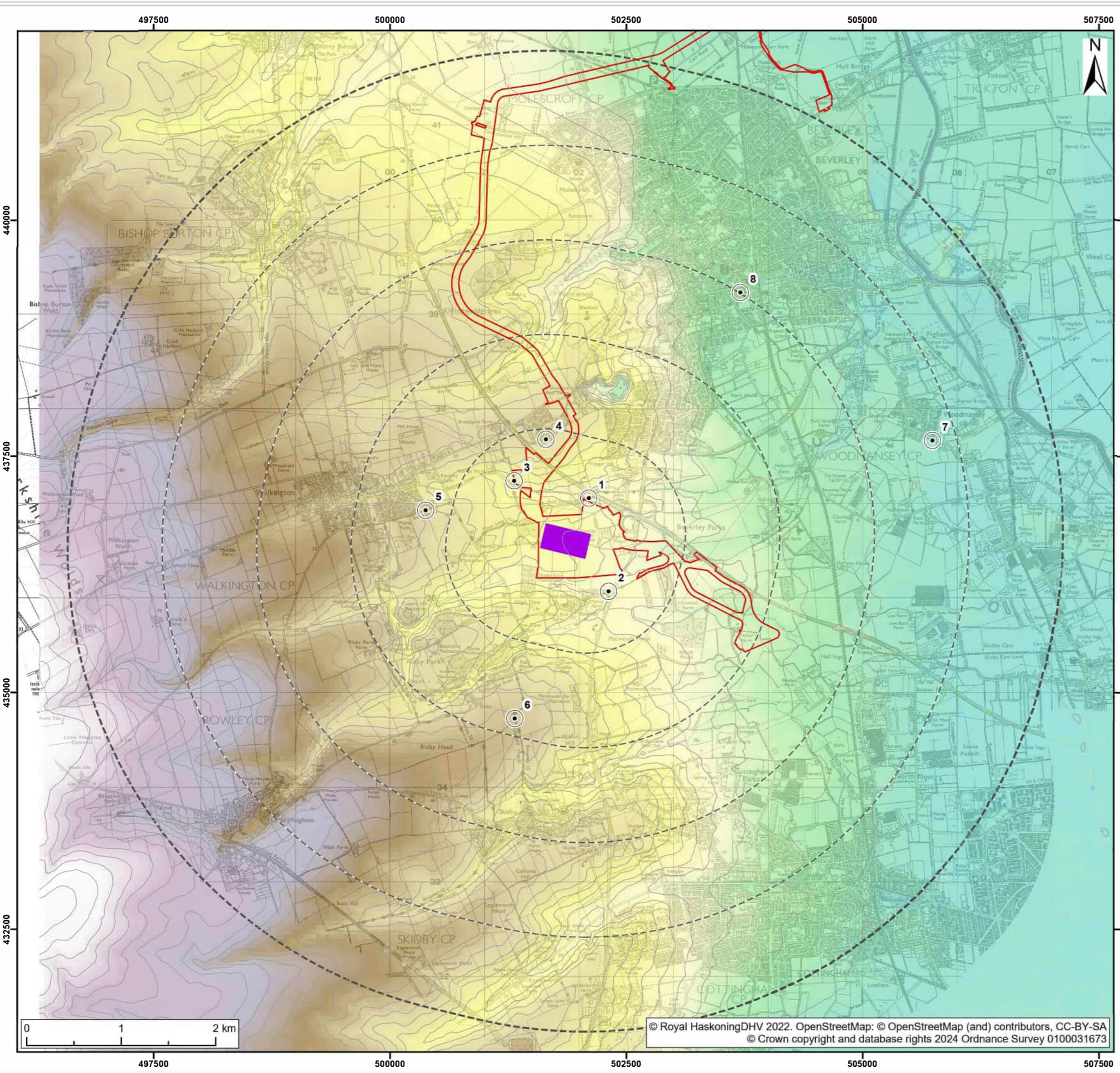
Title:
Onshore Substation Zone of Theoretical Visibility

Figure: 23-2a Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_2

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:45,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement





Legend:

- Onshore Development Area
- Indicative Onshore Converter Stations Footprint
- 1km intervals from Indicative Onshore Converter Stations Footprint
- Footprint
- 5km from Indicative Onshore Converter Stations Footprint
- Viewpoint location
- 1: Butt Farm
- 2: Copleflat Lane, Bentley
- 3: Beverley 20 near Broadgate
- 4: Oriel Close, off Broadgate
- 5: Walkington
- 6: Footpath, Risby
- 7: Woodmansey
- 8: Beverley Minster Tower
- 5m contour line

OS Terrain 5 DTM (m)

138.19

-2.44

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SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

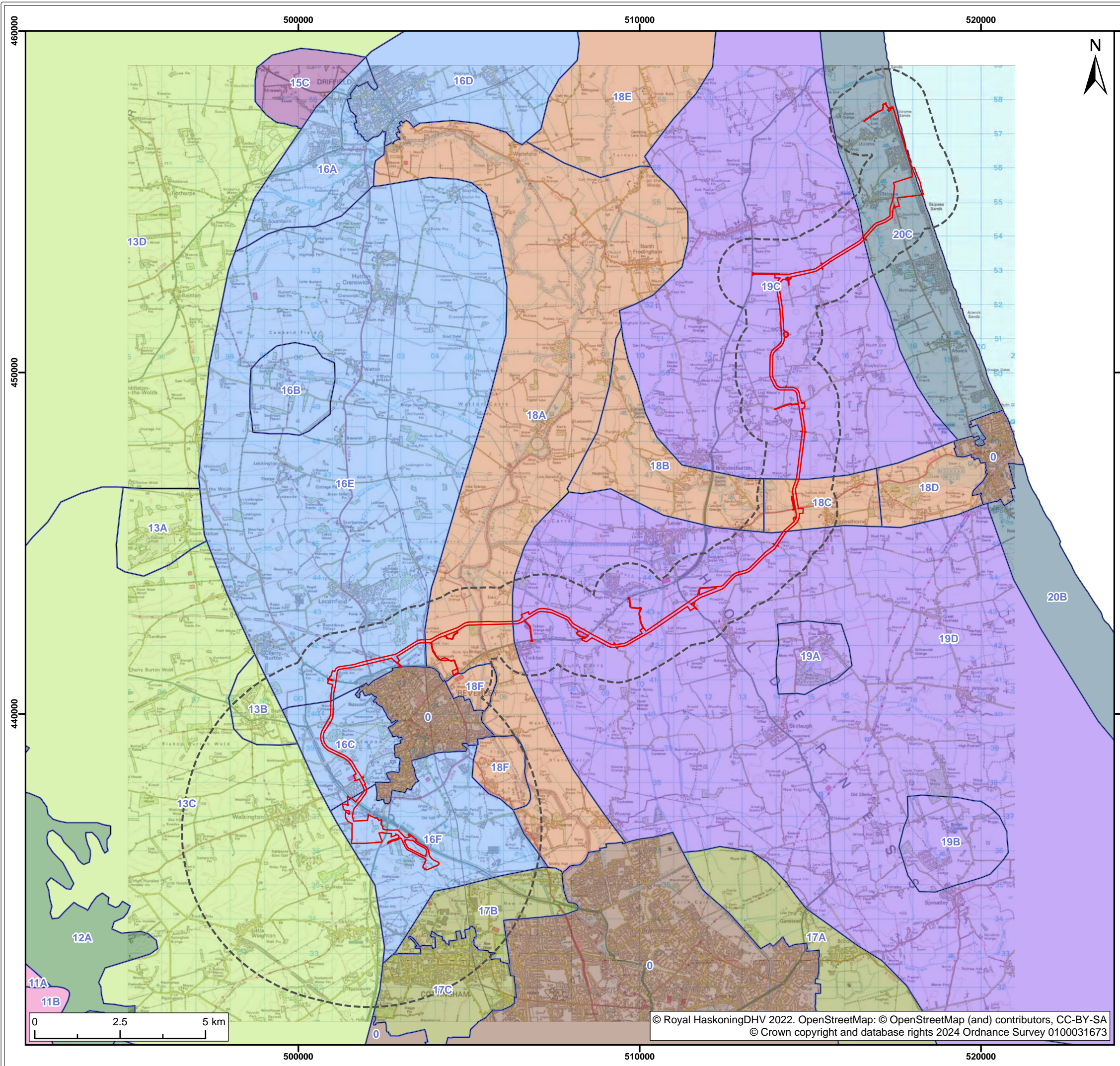
Title:
Topography of the Study Area

Figure: 23-2b Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_2_1

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:45,000
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Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement
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- Legend:**
- Onshore Development Area
 - Landscape and visual study area
- East Riding of Yorkshire Landscape Character Type**
- 0: Urban
 - 11: Jurassic Hills Farmland
 - 12: Sloping Wooded Farmland
 - 13: Open High Rolling Farmland
 - 14: Central Dissected Plateau
 - 15: Wolds Valley Farmland
 - 16: Sloping Farmland (Edge of Wolds)
 - 17: Farmed Urban Fringe
 - 18: Low Lying Drained Farmland
 - 19: Open Farmland
 - 20: Coastal Farmland

Refer to Chapter 23 for details of Landscape Character Areas (Landscape Character Areas source: East Riding of Yorkshire Council)

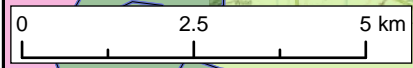
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S4	P06	20/11/2023	Suitable for Information	TH	EH	PM
S3	P02	22/03/2023	Suitable for Information	HS	TH	PM
S2	P01	06/02/2023	Suitable for Information	GS	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Landscape Character

Figure: 23-3 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_3

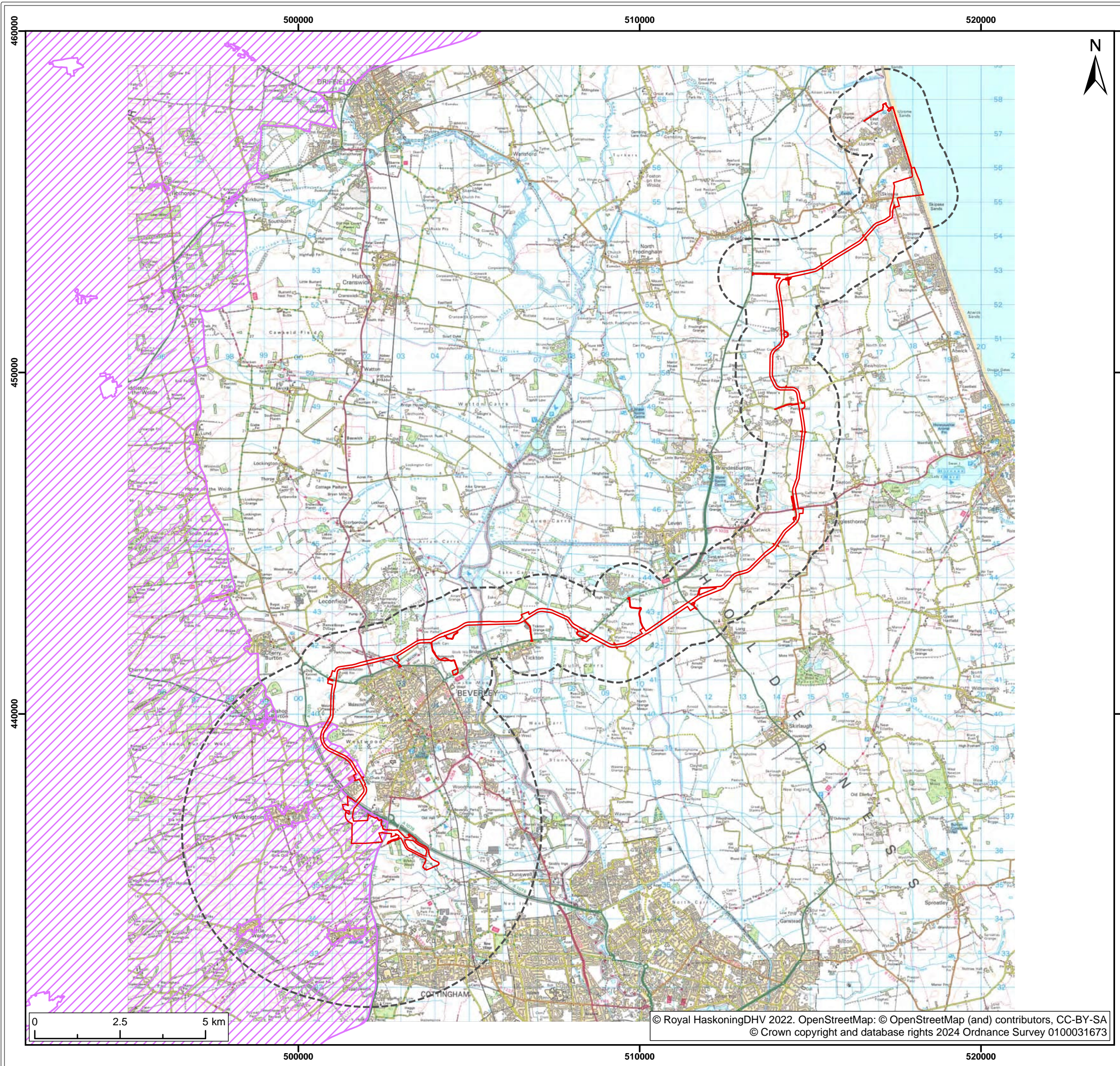
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Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement



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- Legend:
- Onshore Development Area
 - Landscape and visual study area
 - Important Landscape Area (Yorkshire Wolds)

Important Landscape Area source: East Riding of Yorkshire Council

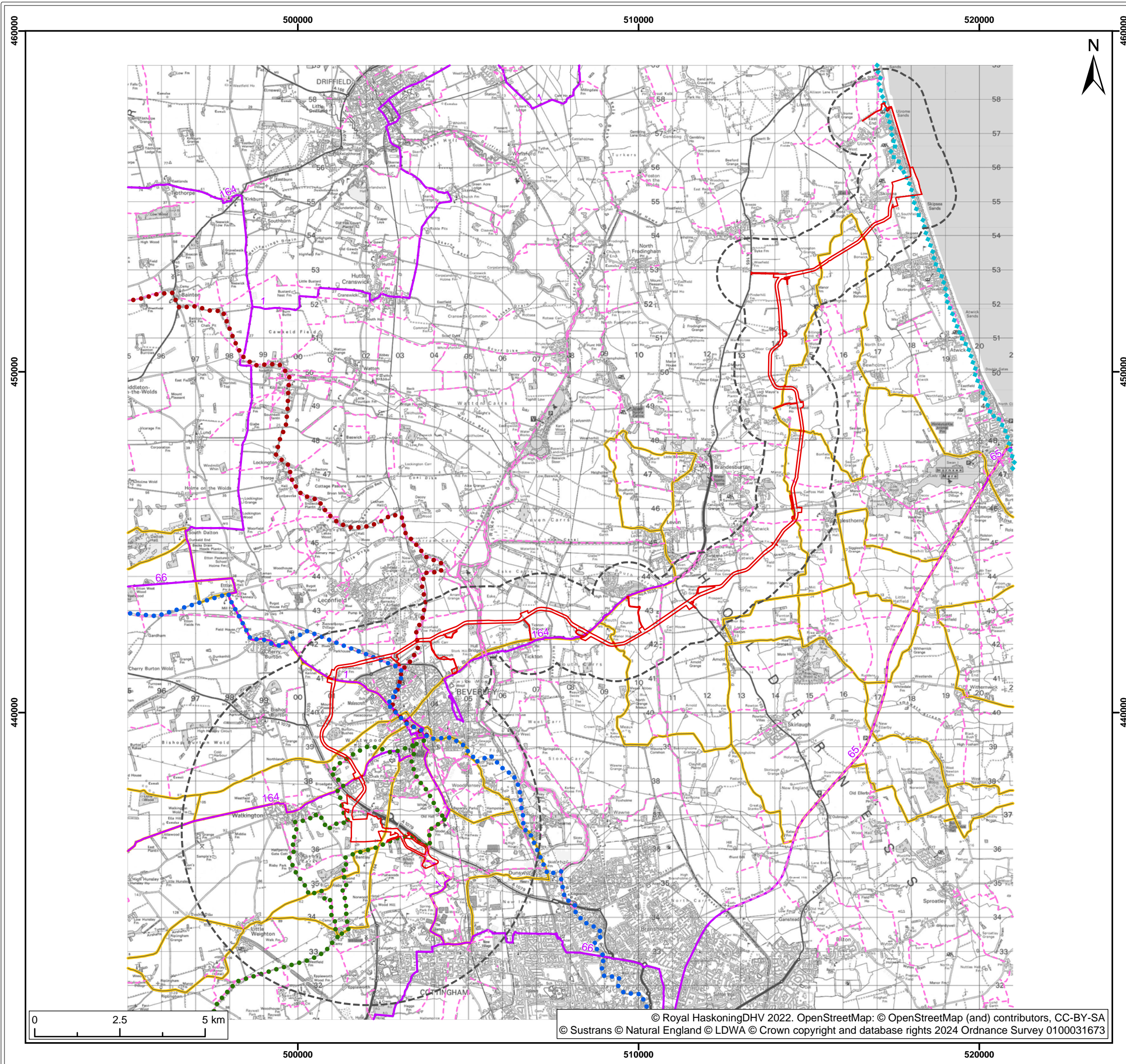
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S4	P06	20/11/2023	Suitable for Information	TH	EH	PM
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S2	P01	06/02/2023	Suitable for Information	GS	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Landscape Designations

Figure: 23-4 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_4

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:110,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	





- Legend:**
- Onshore Development Area
 - Landscape and visual study area
 - National Cycle Network (Sustrans)
 - Holderness and Beverley cycle routes
 - Public Right of Way (indicative)
 - King Charles III England Coast Path
- Long Distance Walking Routes (indicative)**
- Beverley 20
 - Minster Way
 - Wilberforce Way

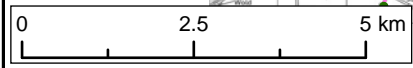
S5	P07	27/02/2024	Suitable for Information	ZM	TH	PM
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S3	P02	22/03/2023	Suitable for Information	HS	TH	PM
S2	P01	06/02/2023	Suitable for Information	GS	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Recreation

Figure: 23-5 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_5

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:110,000
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Legend:

- Onshore Substation Zone
- Existing utilities
- Area of underground cables
- Proposed meadow grassland
- Proposed woodland meadow
- Existing woodland to be retained
- Proposed native woodland
- Existing hedgerow to be retained
- Proposed native hedgerow
- Proposed native hedgerow with trees
- Proposed scrub
- Area for SUDs (indicative)
- Area to be returned to agriculture
- Access
- Area of earthworks to be re-seeded with grassland
- Public Right of Way
- Public Right of Way diversion

SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR
S6	P07	06/03/2024	Suitable for Information	SH	EH	PM
S5	P07	27/02/2024	Suitable for Information	SH	EH	PM
S4	P06	22/11/2023	Suitable for Information	SH	EH	PM
S3	P02	22/03/2023	Suitable for Information	HS	TH	PM
S2	P01	06/02/2023	Suitable for Information	GS	TH	PM

Title:
 Indicative Landscape Plan

Figure: 23-6	Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23_6	
Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:6,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	



50000 501250 502500 503750

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438750

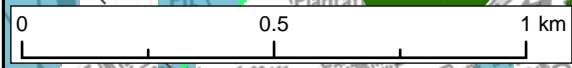
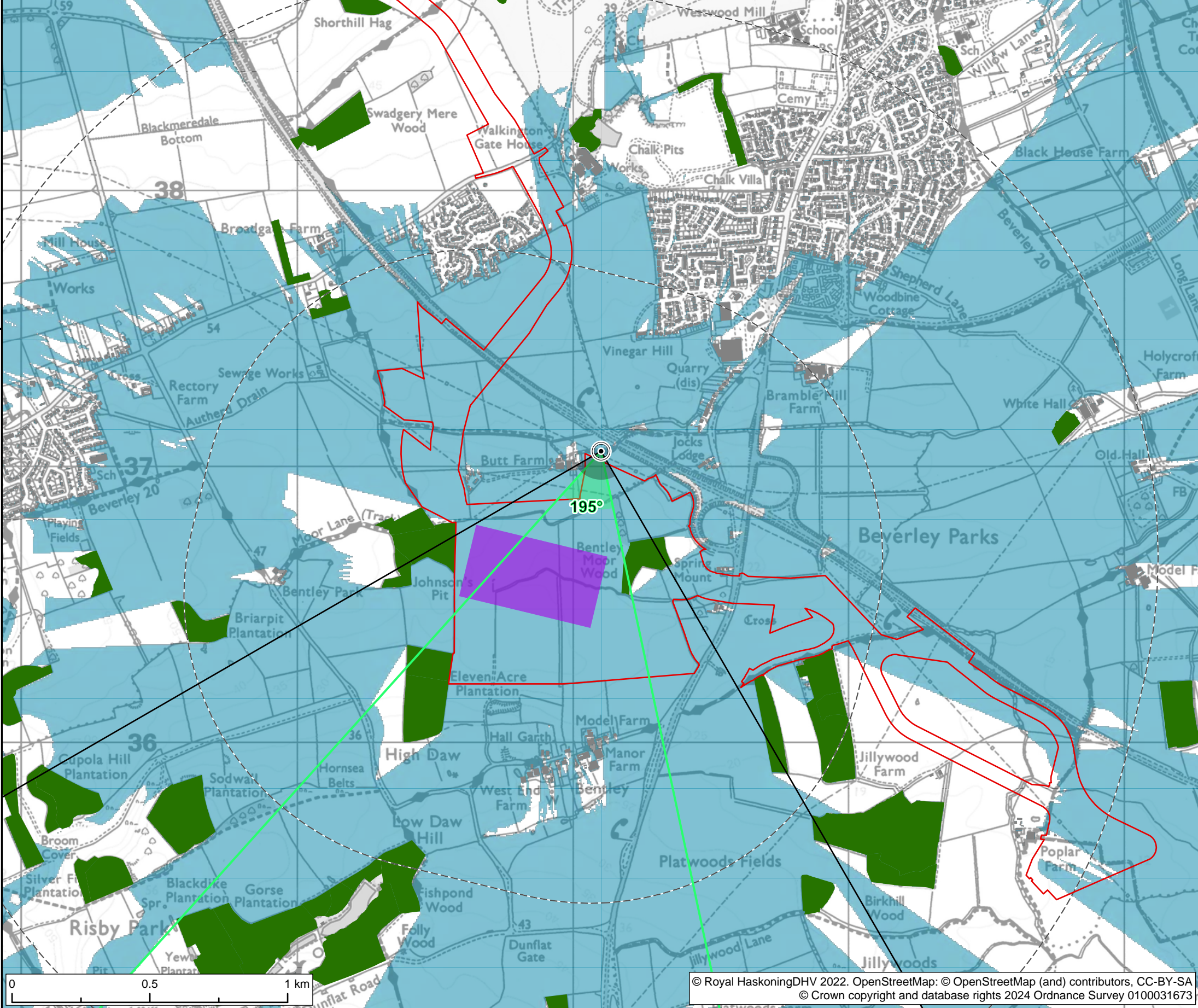
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437500

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Legend:

- Onshore Development Area
- Indicative Onshore Converter Stations
- 1km intervals from Indicative Onshore Converter Stations Footprint
- 5km from Indicative Onshore Converter Stations Footprint
- Viewpoint
- Existing woodland screening
- Existing building screening
- Proposed Onshore Converter Stations theoretically visible
- ∨ 53.5° field of view
- ∨ 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 1: Butt Farm

Figure: 23-7 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-7

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement





Baseline photograph

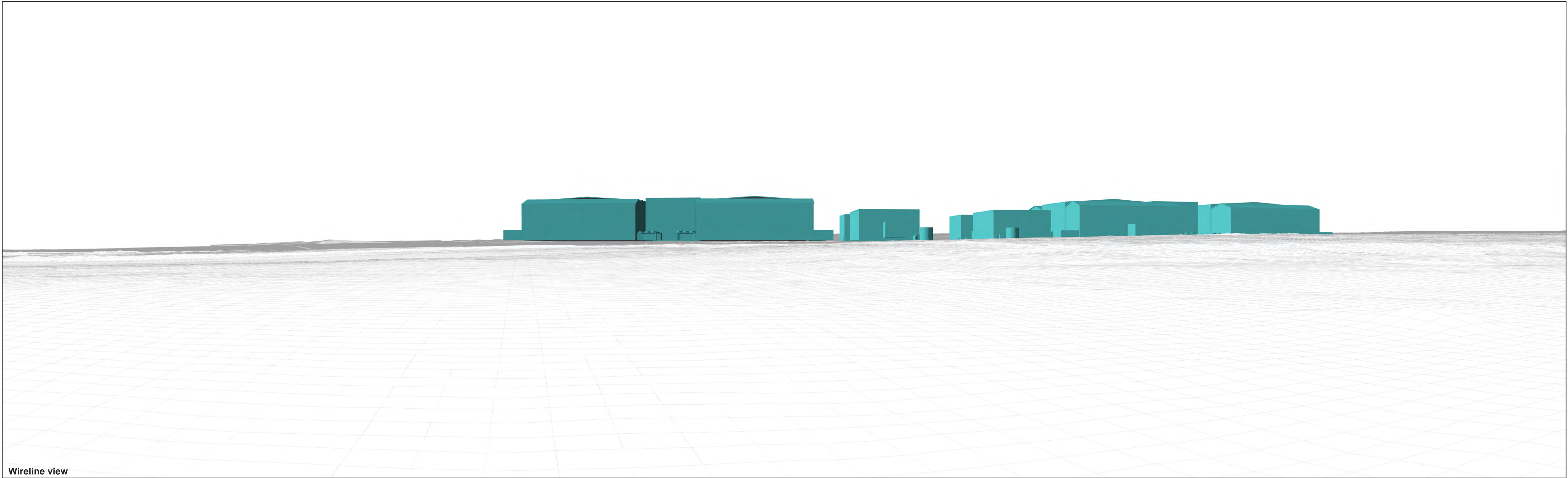


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Direction of view:	195°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	19/05/2022 08:15

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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Wireline view



OS reference: 502102 E 437056 N
AOD (Above Ordnance Datum): 28.93 m
Direction of view: 195°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023

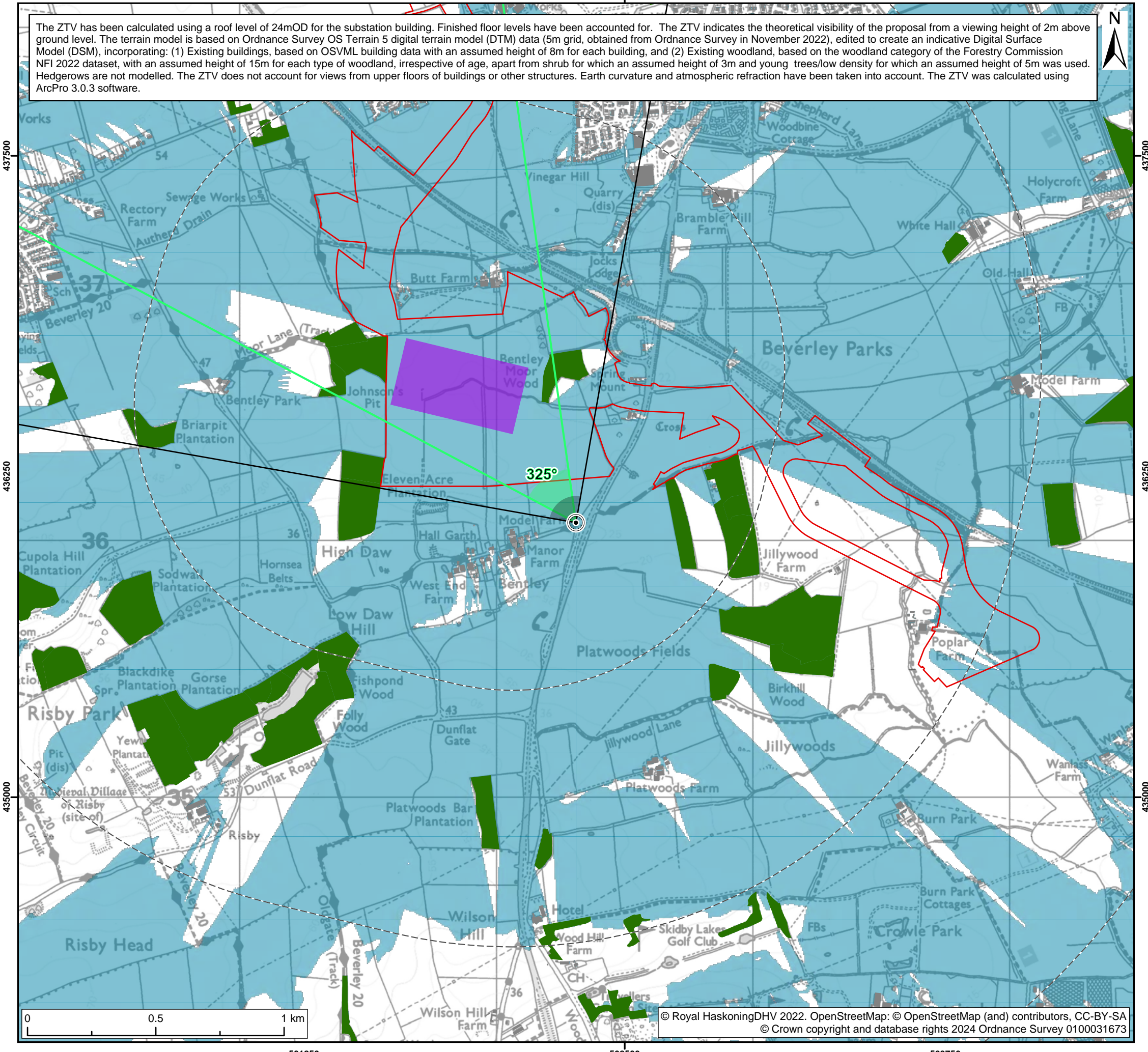


Visualisation showing Proposed Onshore Converter Stations



Visualisation showing Proposed Onshore Converter Stations - year 10 mitigation planting

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - ✓ 53.5° field of view
 - ✓ 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 2: Copleflat Lane, Bentley

Figure: 23-8	Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-8	
Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:15,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	





Baseline photograph

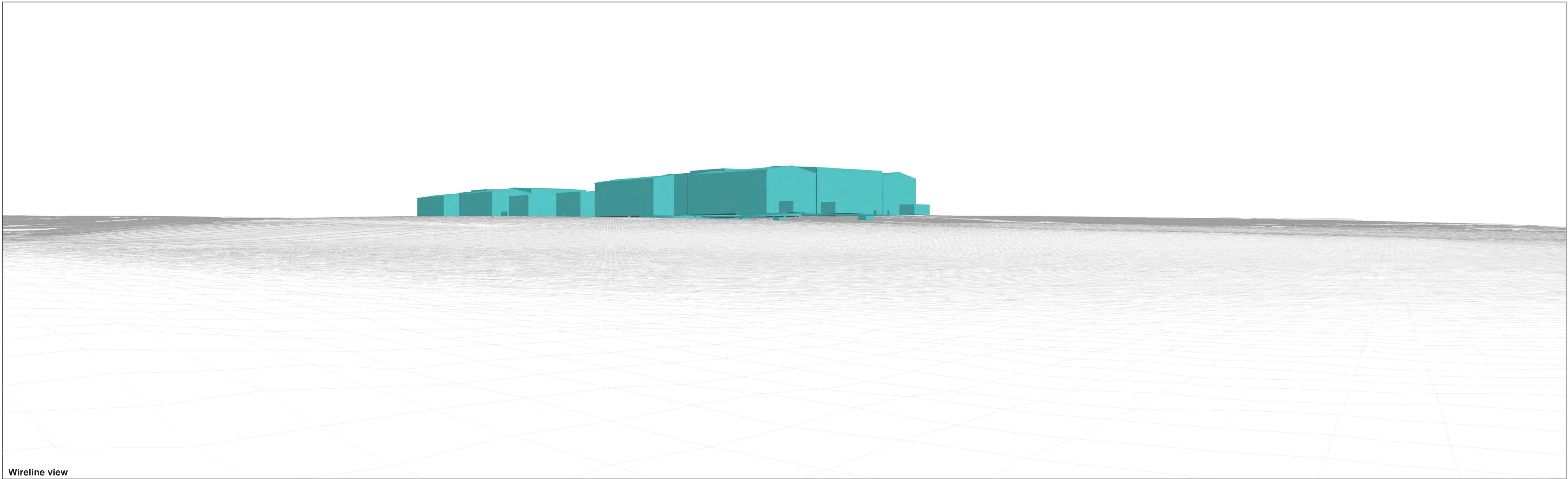


OS reference:	502310 E 436070 N
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Vertical field of view:	27°
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Correct printed image size:	820 x 250 mm

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Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	19/05/2022 09:40

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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Wireline view



OS reference: 502310 E 436070 N
AOD (Above Ordnance Datum): 23.8 m
Direction of view: 325°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023

HVDC Converter Hall (2)



Visualisation showing Proposed Onshore Converter Stations



OS reference:	502310 E 436070 N
AOD (Above Ordnance Datum):	23.8 m
Direction of view:	325°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	19/05/2022 09:40

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
	3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
	DHV on 11/10/2023.

HVDC Converter Hall (2)



Visualisation showing Proposed Onshore Converter Stations - year 10 mitigation planting



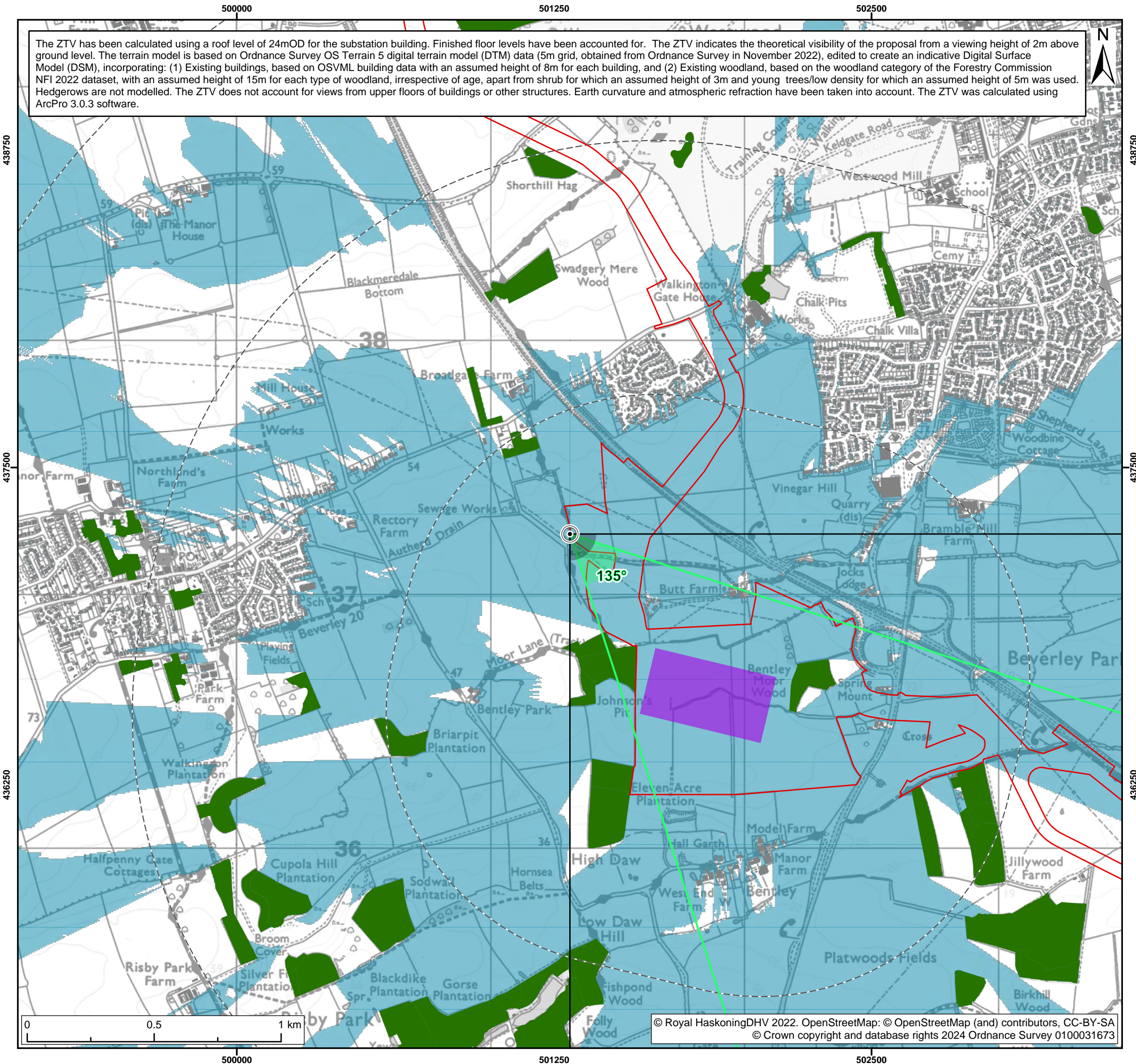
OS reference:	502310 E 436070 N
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Direction of view:	325°
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Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	19/05/2022 09:40

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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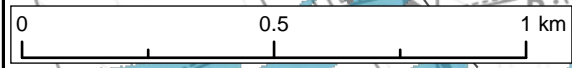


- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - V 53.5° field of view
 - V 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 3: Beverley 20 near Broadgate

Figure: 23-9	Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-9	
Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:15,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	



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Baseline photograph

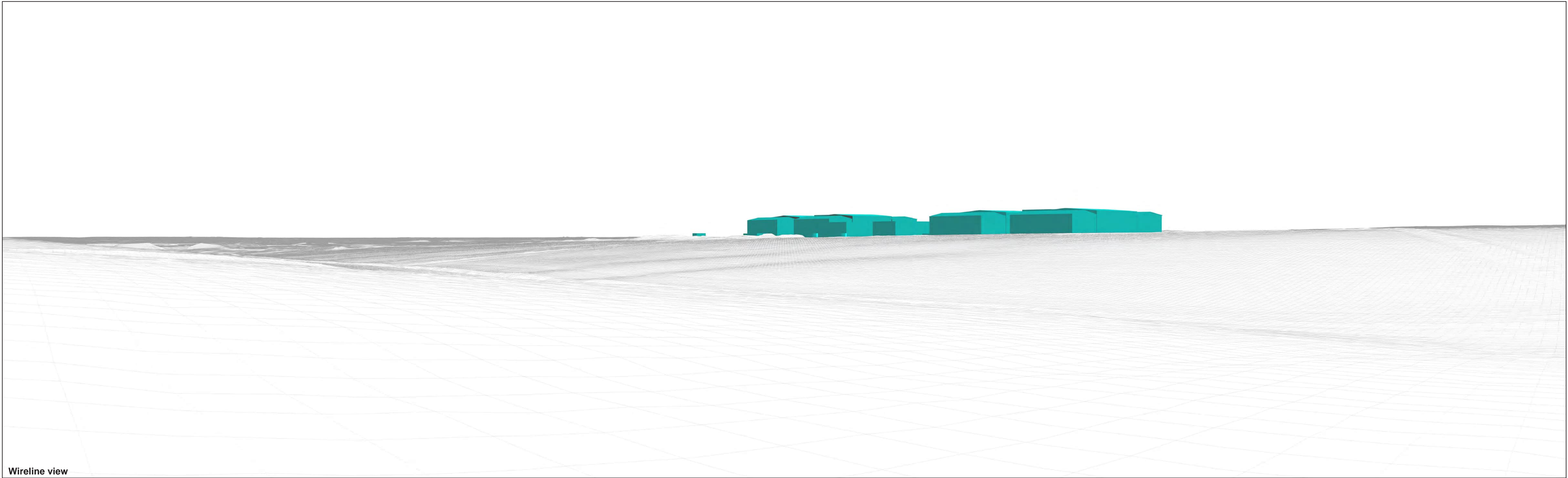


OS reference:	501312 E 437238 N
AOD (Above Ordnance Datum):	37.81 m
Direction of view:	135°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	17/01/2023 12:55

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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Wireline view



OS reference: 501312 E 437238 N
AOD (Above Ordnance Datum): 37.81 m
Direction of view: 135°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Visualisation showing Proposed Onshore Converter Stations



OS reference:	501312 E 437238 N
AOD (Above Ordnance Datum):	37.81 m
Direction of view:	135°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	17/01/2023 12:55

Data Sources:	
Topography to inform AOD heights:	1m National LiDAR programme DTM (2020), Environment Agency
3D model informed by Site option layouts and development height parameters provided by Royal Haskoning	
DHV on 11/10/2023.	



Visualisation showing Proposed Onshore Converter Stations - year 10 mitigation planting



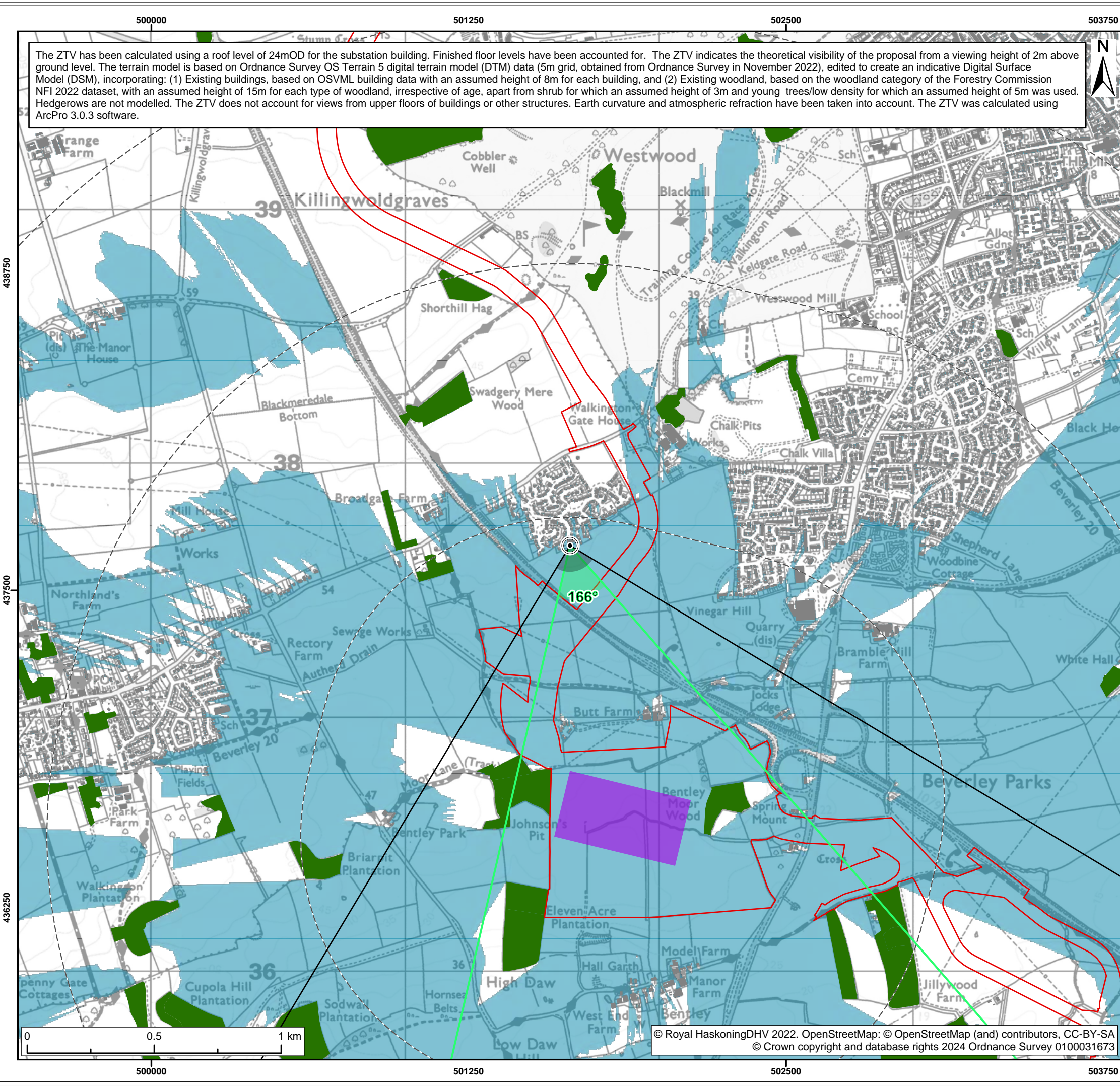
OS reference:	501312 E 437238 N
AOD (Above Ordnance Datum):	37.81 m
Direction of view:	135°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	17/01/2023 12:55

Data Sources:	
Topography to inform AOD heights:	1m National LiDAR programme DTM (2020), Environment Agency
3D model informed by:	Site option layouts and development height parameters provided by Royal Haskoning
	DHV on 11/10/2023.

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - V 53.5° field of view
 - V 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 4: Oriel Close, off Broadgate

Figure: 23-10	Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-10	
Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:15,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	





Baseline photograph

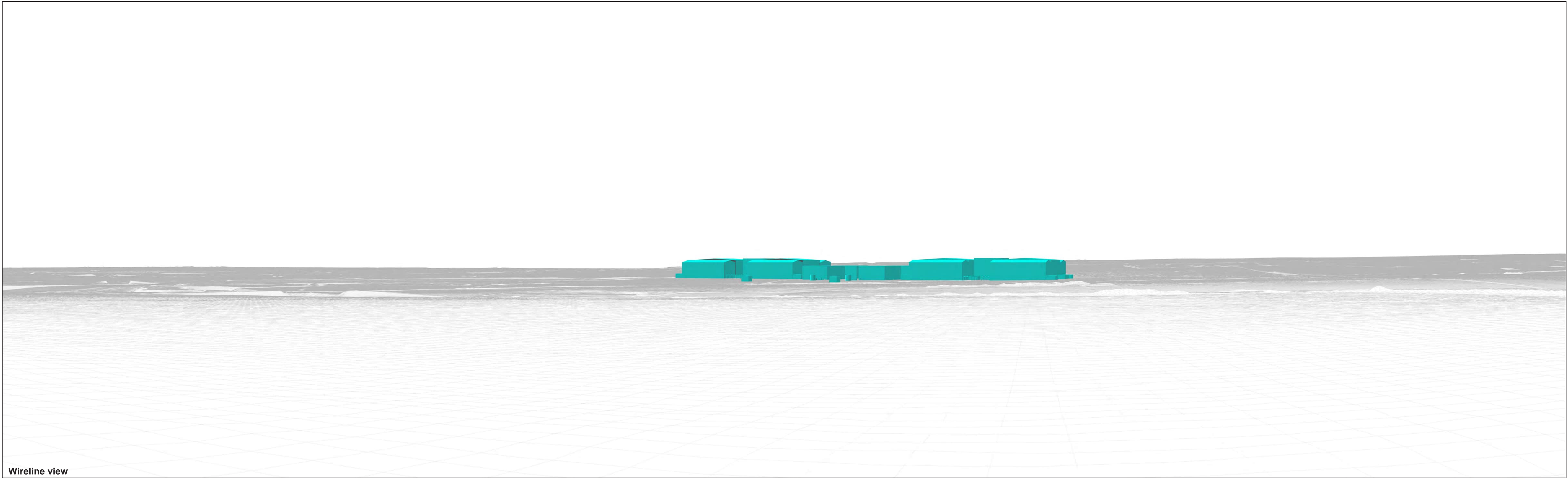


OS reference:	501649 E 437677 N
AOD (Above Ordnance Datum):	51.74 m
Direction of view:	166°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	29/09/2023 09:43

Data Sources:	
Topography to inform AOD heights:	1m National LiDAR programme DTM (2020), Environment Agency
3D model informed by Site option layouts and development height parameters provided by Royal Haskoning	
DHV on 11/10/2023.	



Wireline view

LUC

OS reference: 501649 E 437677 N
AOD (Above Ordnance Datum): 51.74 m
Direction of view: 166°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Proposed Onshore Converter Stations

Visualisation showing Proposed Onshore Converter Stations



OS reference: 501649 E 437677 N
 AOD (Above Ordnance Datum): 51.74 m
 Direction of view: 166°
 Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
 Image Enlargement Factor: 96%
 Paper size: 841 x 297 mm (half A1)
 Correct printed image size: 820 x 250 mm

Camera: NIKON D750
 Lens: Nikkor AF 50mm f/1.8D
 Camera height: 1.5 m (above AOD)
 Date and time: 29/09/2023 09:43

Data Sources:
 Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
 DHV on 11/10/2023.



Proposed Onshore Converter Stations

Visualisation showing Proposed Onshore Converter Stations - year 10 mitigation planting

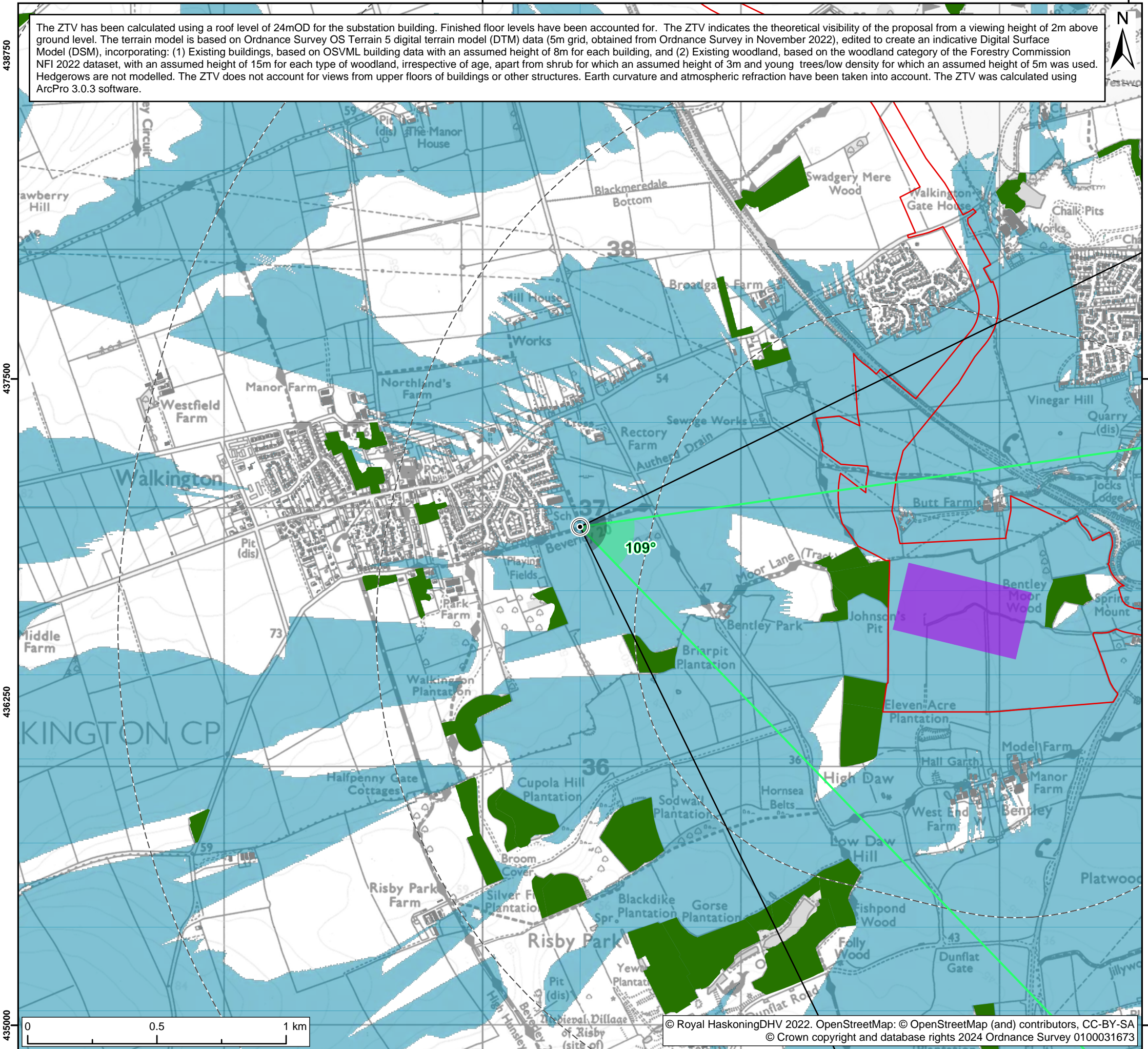
498750

500000

501250

502500

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - ∨ 53.5° field of view
 - ∨ 90° field of view

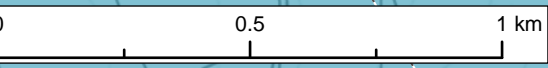
S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 5: Walkington

Figure: 23-11 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-11

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement



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Baseline photograph

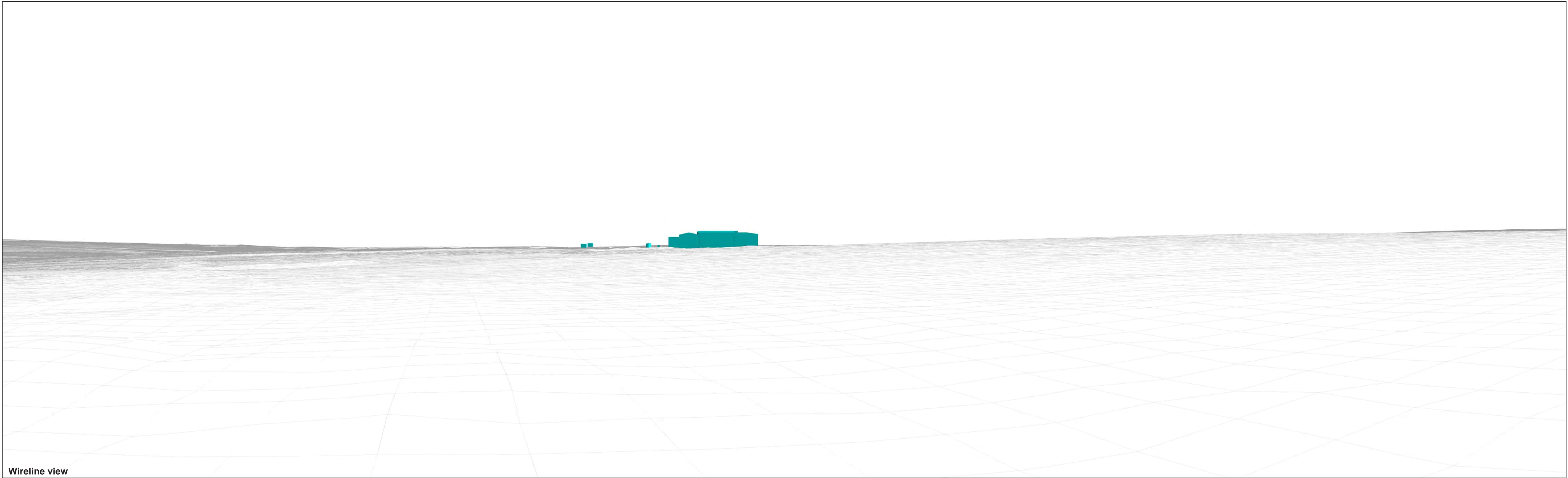


OS reference:	500377 E 436928 N
AOD (Above Ordnance Datum):	52.79 m
Direction of view:	109°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	17/01/2023 12:16

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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Wireline view



OS reference: 500377 E 436928 N
AOD (Above Ordnance Datum): 52.79 m
Direction of view: 109°
Horizontal field of view: 90° (cylindrical projection)

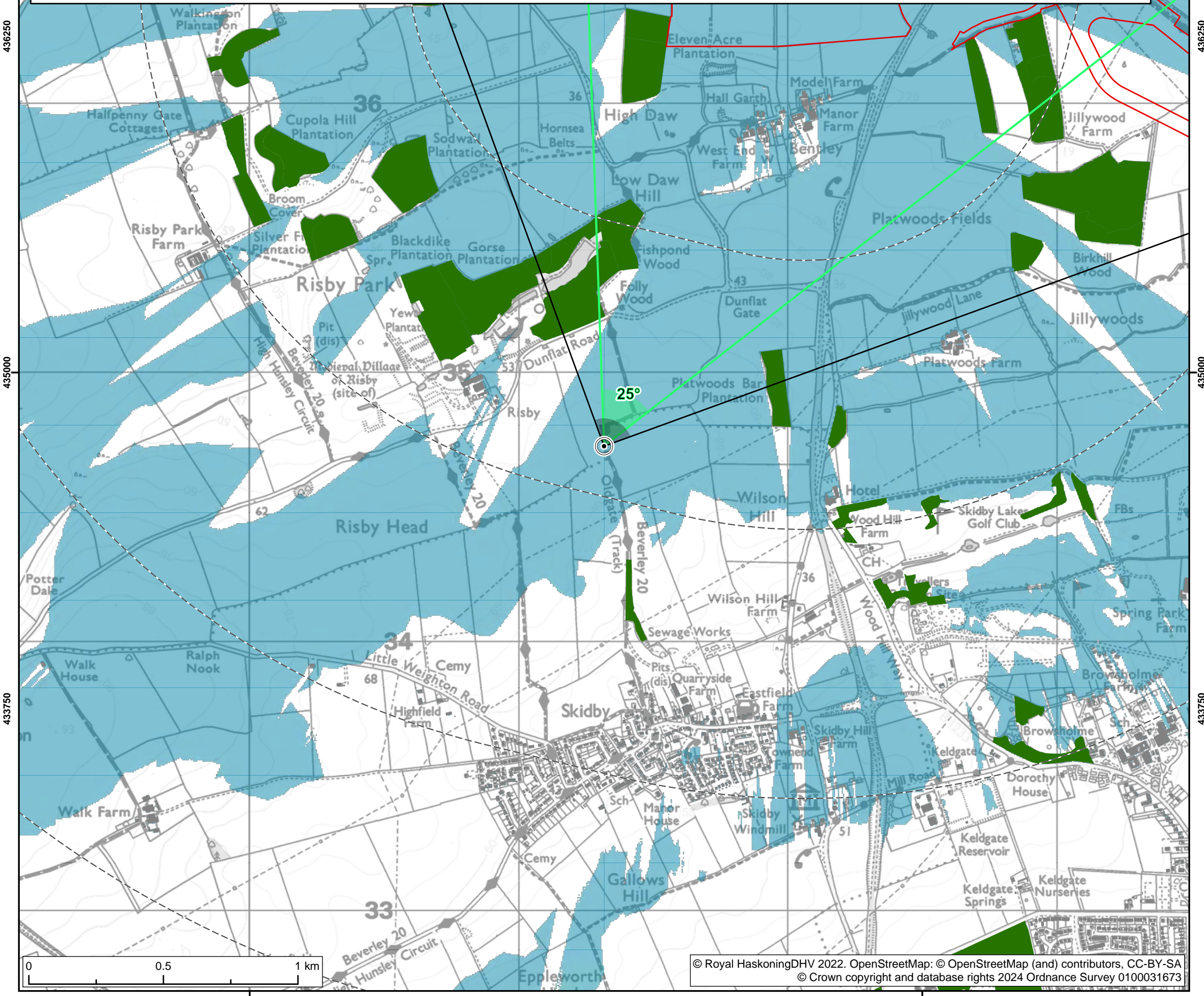
Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Visualisation showing Proposed Onshore Converter Stations

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - ∨ 53.5° field of view
 - ∨ 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 6: Footpath, Risby

Figure: 23-12 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-12

Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:15,000
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Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement
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Baseline photograph

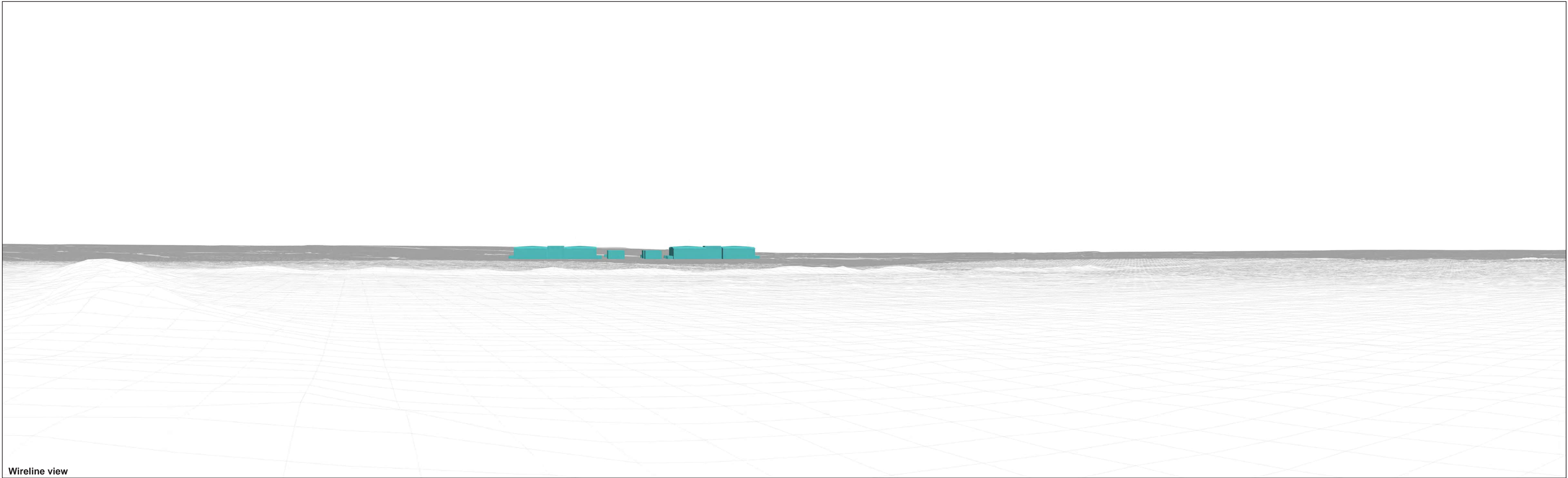


OS reference:	501317 E 434726 N
AOD (Above Ordnance Datum):	60.4 m
Direction of view:	25°
Horizontal field of view:	90° (cylindrical projection)

Vertical field of view:	27°
Image Enlargement Factor:	96%
Paper size:	841 x 297 mm (half A1)
Correct printed image size:	820 x 250 mm

Camera:	NIKON D750
Lens:	Nikkor AF 50mm f/1.8D
Camera height:	1.5 m (above AOD)
Date and time:	19/05/2022 11:05

Data Sources:	Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning DHV on 11/10/2023.
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Wireline view



OS reference: 501317 E 434726 N
AOD (Above Ordnance Datum): 60.4 m
Direction of view: 25°
Horizontal field of view: 90° (cylindrical projection)

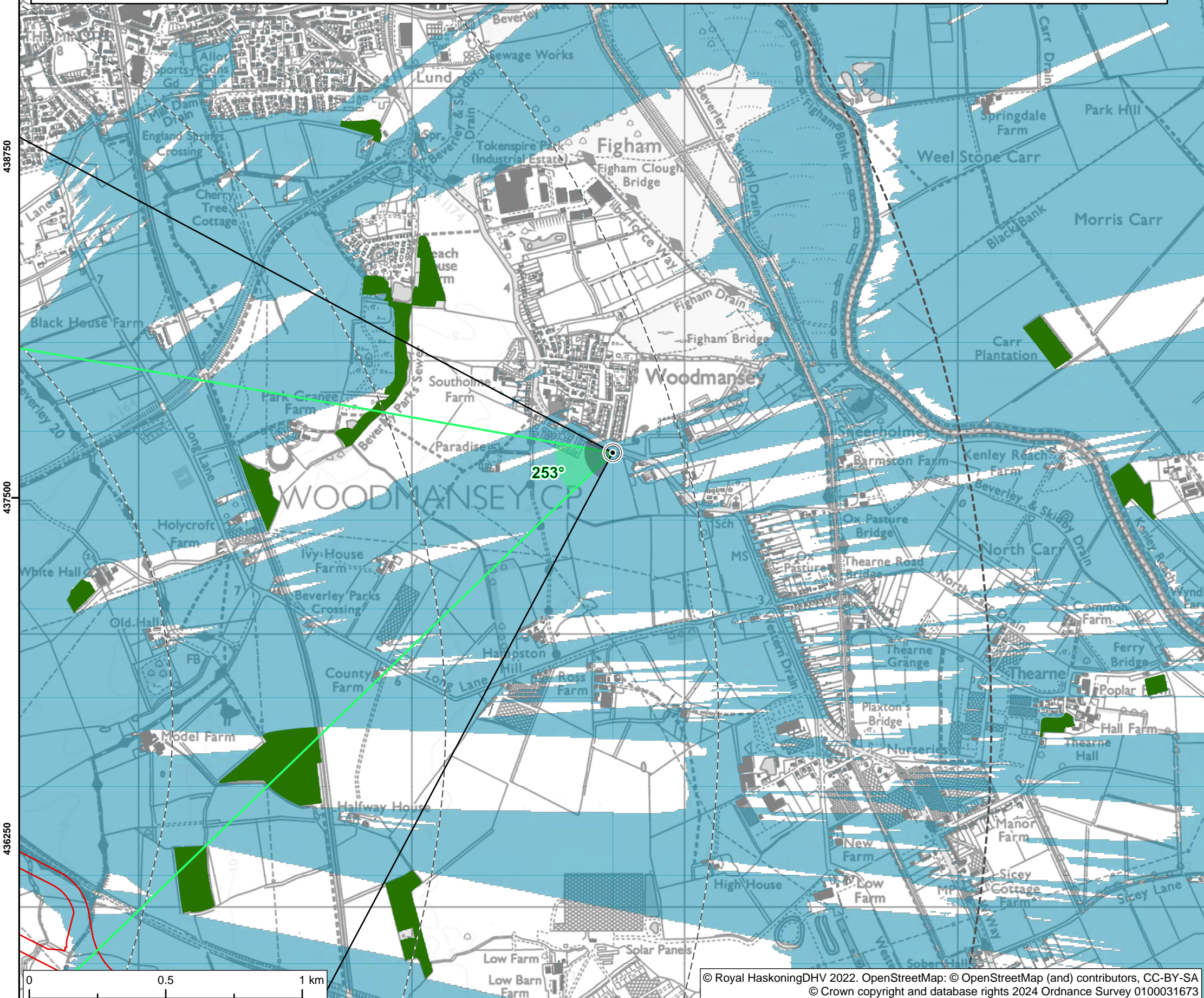
Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Visualisation showing Proposed Onshore Converter Stations

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



Legend:

- Onshore Development Area
- Indicative Onshore Converter Stations
- 1km intervals from Indicative Onshore Converter Stations Footprint
- 5km from Indicative Onshore Converter Stations Footprint
- Viewpoint
- Existing woodland screening
- Existing building screening
- Proposed Onshore Converter Stations theoretically visible
- ∨ 53.5° field of view
- ∨ 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 7: Woodmansey

Figure: 23-13	Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-13	
Co-ordinate system: British National Grid	Page Size: A3	Scale: 1:15,000
Project: Dogger Bank South Offshore Wind Farms	Report: Dogger Bank South: Environmental Statement	





Baseline photograph

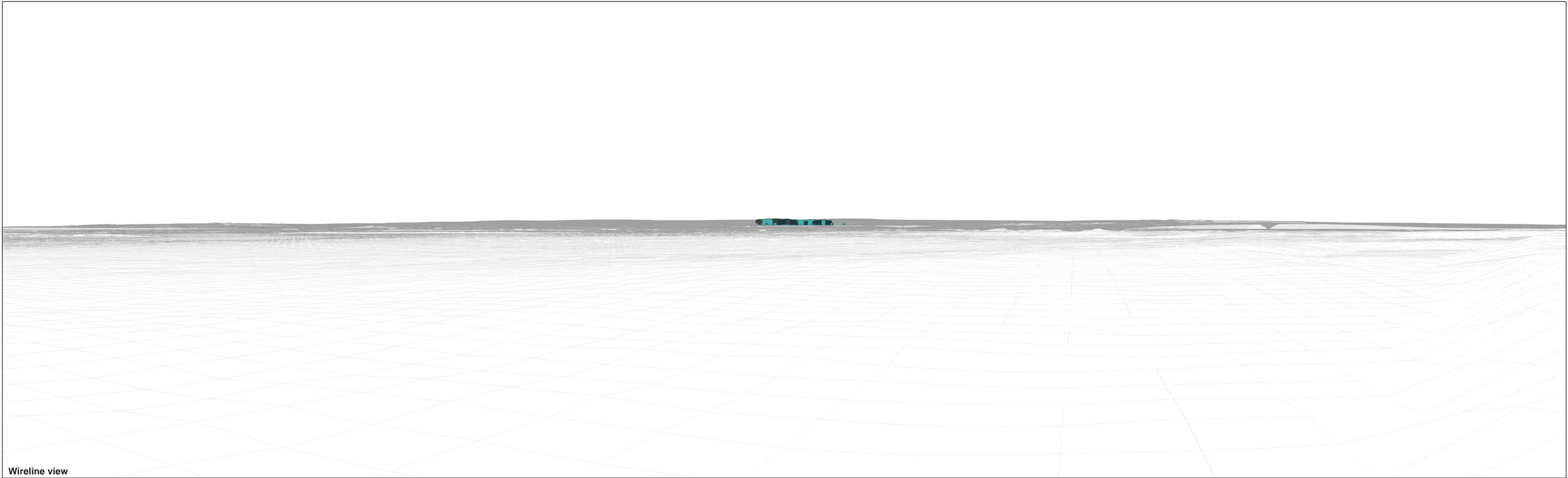


OS reference: 505736 E 437665 N
 AOD (Above Ordnance Datum): 3.22 m
 Direction of view: 253°
 Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
 Image Enlargement Factor: 96%
 Paper size: 841 x 297 mm (half A1)
 Correct printed image size: 820 x 250 mm

Camera: NIKON D750
 Lens: Nikkor AF 50mm f/1.8D
 Camera height: 1.5 m (above AOD)
 Date and time: 17/01/2022 10:52

Data Sources:
 Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
 DHV on 11/10/2023.



Wireline view



OS reference: 505736 E 437665 N
AOD (Above Ordnance Datum): 3.22 m
Direction of view: 253°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Proposed Onshore Converter Stations

Visualisation showing Proposed Onshore Converter Stations

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. The ZTV does not account for views from upper floors of buildings or other structures. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



- Legend:
- Onshore Development Area
 - Indicative Onshore Converter Stations
 - 1km intervals from Indicative Onshore Converter Stations Footprint
 - 5km from Indicative Onshore Converter Stations Footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
 - Proposed Onshore Converter Stations theoretically visible
 - ✓ 53.5° field of view
 - ∨ 90° field of view

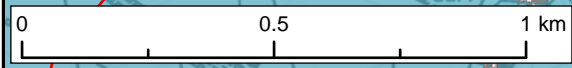
S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint 8: Beverley Minster Tower

Figure: 23-14 Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-14

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement



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Baseline photograph

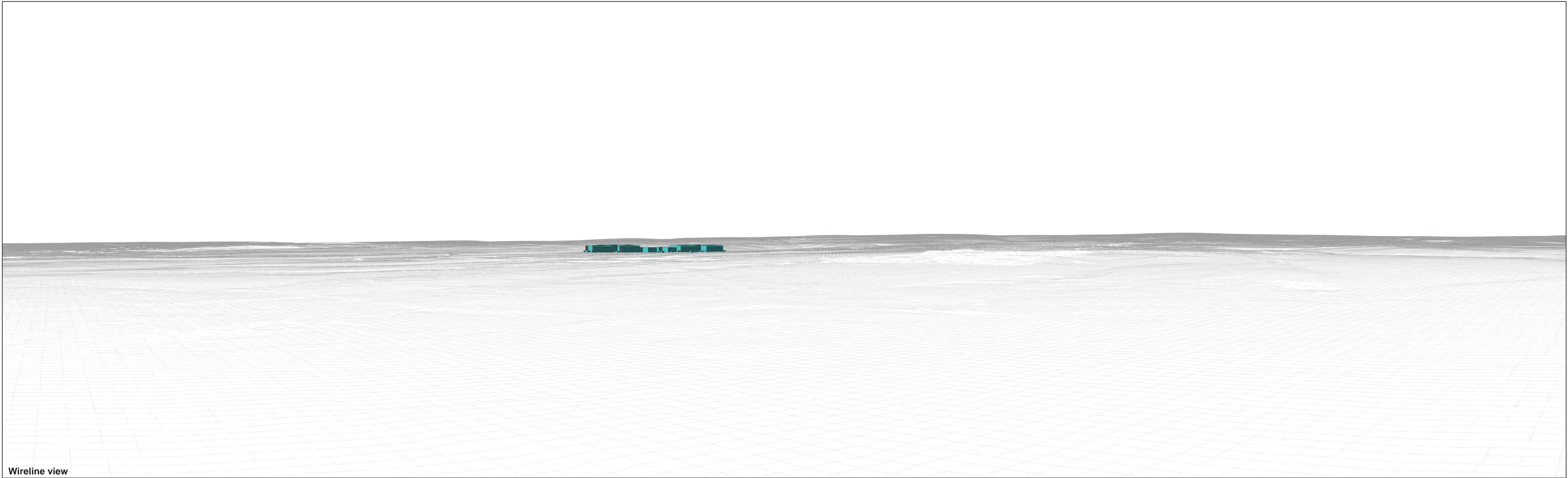


OS reference: 503705 E 439231 N
AOD (Above Ordnance Datum): 27.51 m
Direction of view: 222°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Camera: NIKON D750
Lens: Nikkor AF 50mm f/1.8D
Camera height: 1.5 m (above AOD)
Date and time: 29/09/2023 10:57

Data Sources:
Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
DHV on 11/10/2023.



Wireline view



OS reference: 503705 E 439231 N
AOD (Above Ordnance Datum): 27.51 m
Direction of view: 222°
Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
Image Enlargement Factor: 96%
Paper size: 841 x 297 mm (half A1)
Correct printed image size: 820 x 250 mm

Data Sources:
Topography Digital Terrain Model (DTM) uses 1m National LiDAR programme (2020) Environment Agency data and Ordnance Survey OST50 data.
Platform height of Western HVDC at 33.45m AOD and Eastern HVDC at 30.4m provided by Royal Haskoning on 12/10/2023



Proposed Onshore Converter Stations

Visualisation showing Proposed Onshore Converter Stations



Proposed Onshore Converter Stations

Visualisation showing Proposed Onshore Converter Stations - year 10 mitigation planting



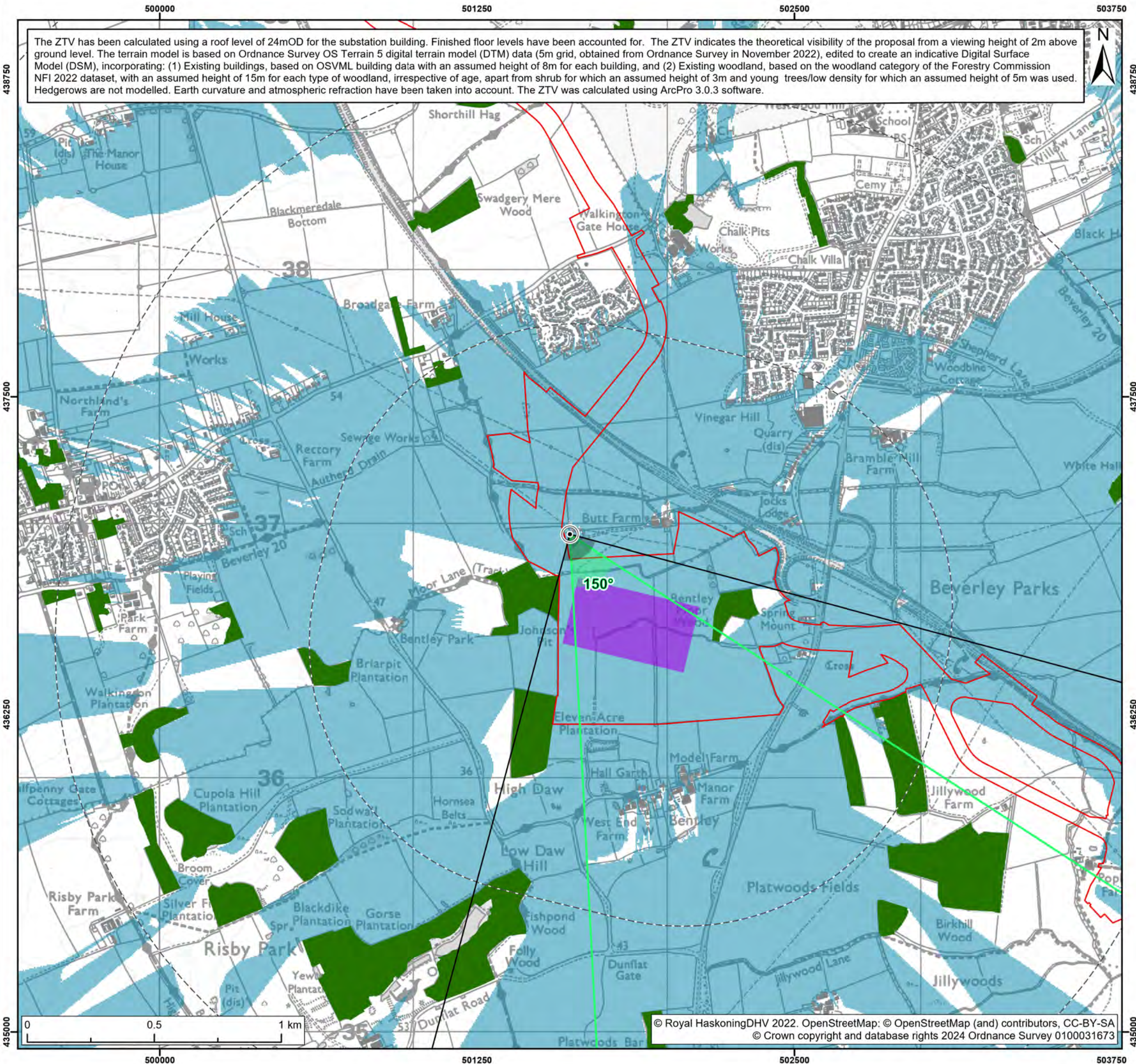
OS reference: 503705 E 439231 N
 AOD (Above Ordnance Datum): 27.51 m
 Direction of view: 222°
 Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
 Image Enlargement Factor: 96%
 Paper size: 841 x 297 mm (half A1)
 Correct printed image size: 820 x 250 mm

Camera: NIKON D750
 Lens: Nikkor AF 50mm f/1.8D
 Camera height: 1.5 m (above AOD)
 Date and time: 29/09/2023 10:57

Data Sources:
 Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
 DHV on 11/10/2023.

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- Legend:
- Onshore development area
 - Indicative converter station footprint
 - 1km intervals from indicative substation footprint
 - 5km from indicative substation footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
- Zone of theoretical visibility**
- Proposed substation theoretically visible
 - ∨ 53.5° field of view
 - ∨ 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint CH2: Anti Aircraft Battery at Butt Farm

Figure:23-15a Drawing No:PC2340_LUC_ON_ZZ_DR_Z_23-15a

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement





Baseline photograph



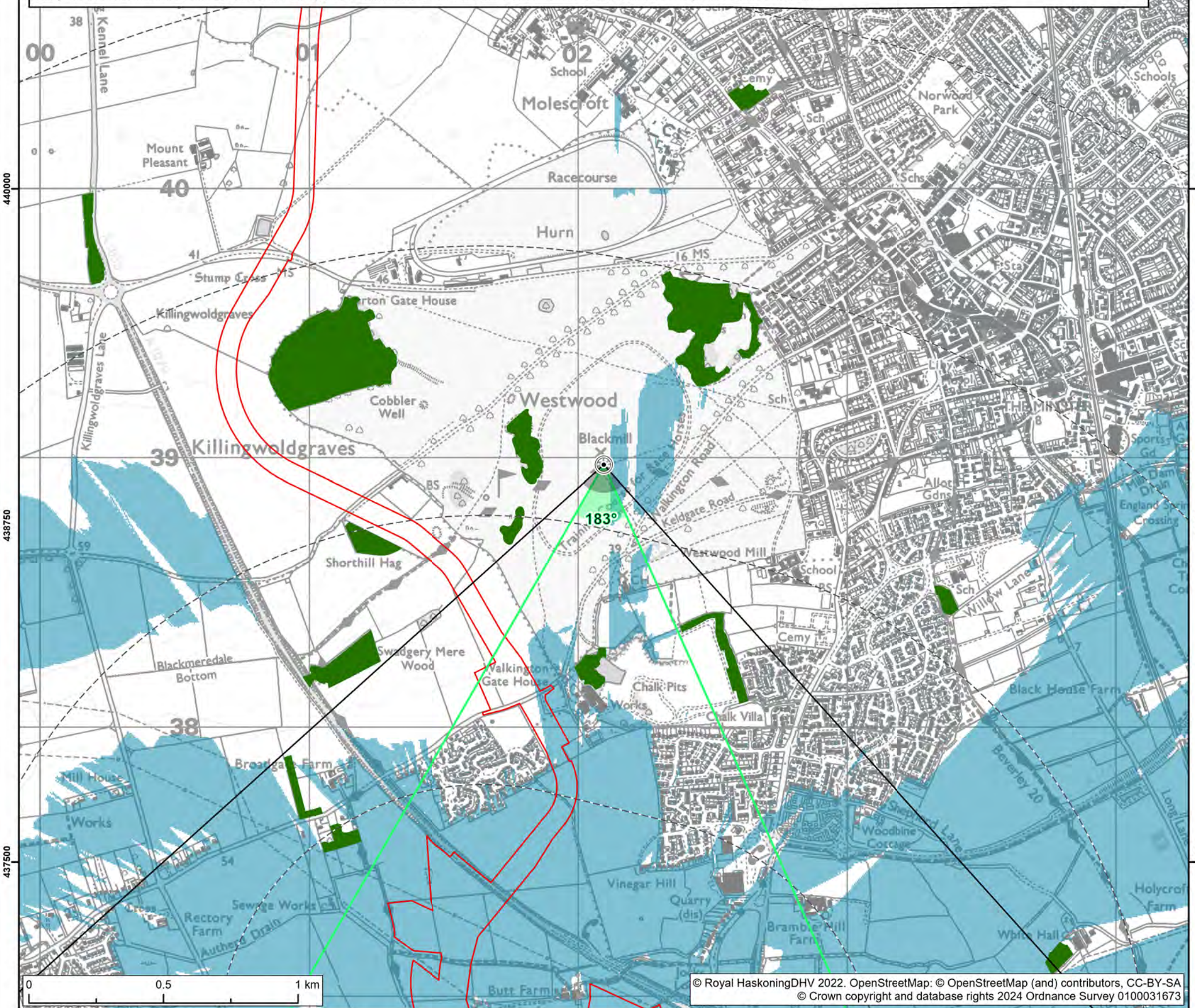
Visualisation showing proposed onshore substation



Visualisation showing proposed onshore substation - year 10 mitigation planting

50000 501250 502500 503750

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



50000 501250 502500 503750



- Legend:
- Onshore development area
 - Indicative converter station footprint
 - 1km intervals from indicative substation footprint
 - 5km from indicative substation footprint
 - Viewpoint
 - Existing woodland screening
 - Existing building screening
- Zone of theoretical visibility**
- Proposed substation theoretically visible
 - V 53.5° field of view
 - V 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint CH3: SM's and LB at Black Mill

Figure:23-15b Drawing No:PC2340_LUC_ON_ZZ_DR_Z_23-15b

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

Project: Dogger Bank South Offshore Wind Farms Report: Dogger Bank South: Environmental Statement





Proposed onshore substation location

Baseline photograph - annotated extent



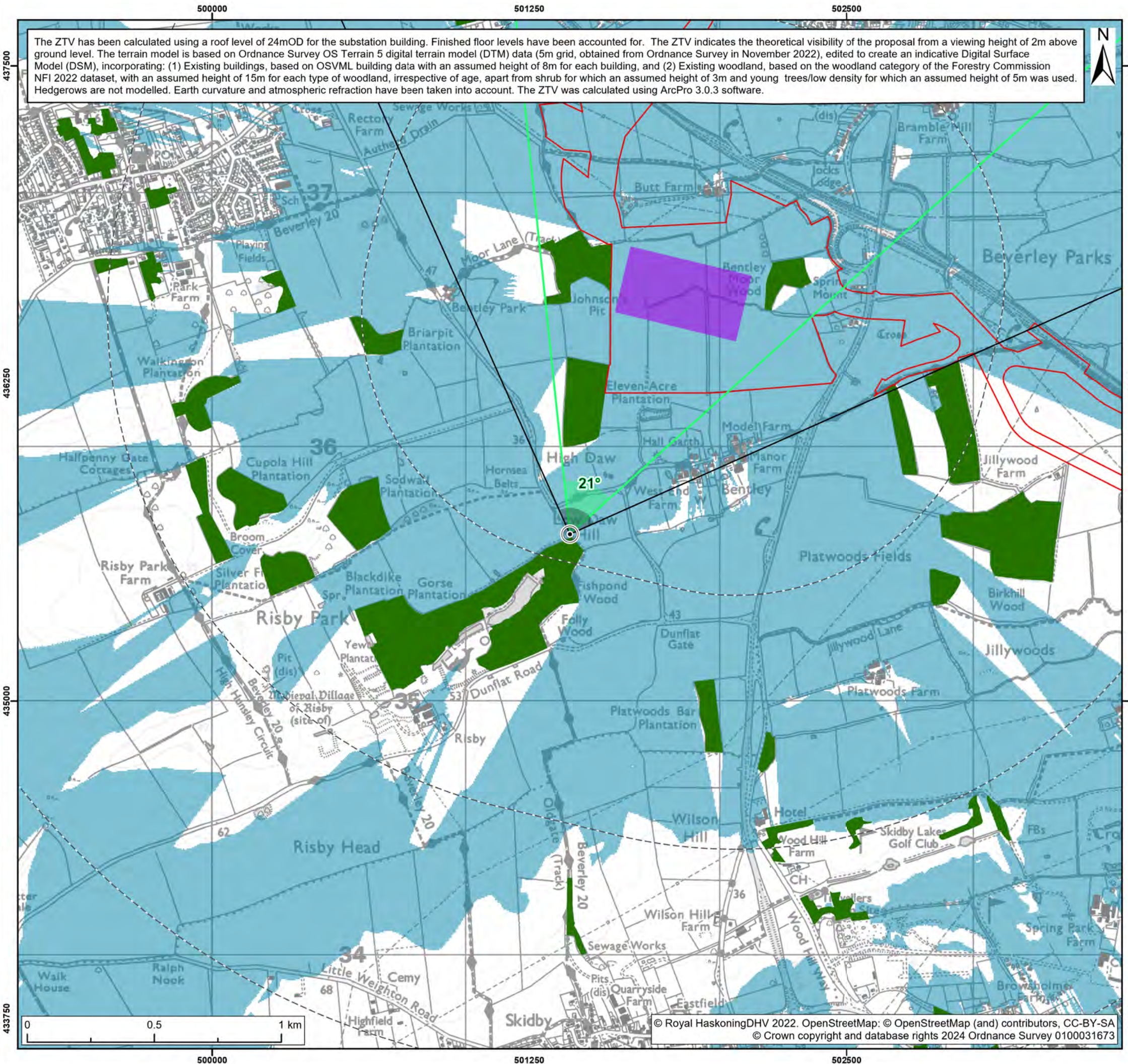
OS reference: 502095 E 438975 N
 AOD (Above Ordnance Datum): 39.57 m
 Direction of view: 183°
 Horizontal field of view: 90° (cylindrical projection)

Vertical field of view: 27°
 Image Enlargement Factor: 96%
 Paper size: 841 x 297 mm (half A1)
 Correct printed image size: 820 x 250 mm

Camera: NIKON D750
 Lens: Nikkor AF 50mm f/1.8D
 Camera height: 1.5 m (above AOD)
 Date and time: 17/01/2023 13:43

Data Sources:
 Topography to inform AOD heights: 1m National LiDAR programme DTM (2020), Environment Agency
 3D model informed by Site option layouts and development height parameters provided by Royal Haskoning
 DHV on 11/10/2023.

The ZTV has been calculated using a roof level of 24mOD for the substation building. Finished floor levels have been accounted for. The ZTV indicates the theoretical visibility of the proposal from a viewing height of 2m above ground level. The terrain model is based on Ordnance Survey OS Terrain 5 digital terrain model (DTM) data (5m grid, obtained from Ordnance Survey in November 2022), edited to create an indicative Digital Surface Model (DSM), incorporating: (1) Existing buildings, based on OSVML building data with an assumed height of 8m for each building, and (2) Existing woodland, based on the woodland category of the Forestry Commission NFI 2022 dataset, with an assumed height of 15m for each type of woodland, irrespective of age, apart from shrub for which an assumed height of 3m and young trees/low density for which an assumed height of 5m was used. Hedgerows are not modelled. Earth curvature and atmospheric refraction have been taken into account. The ZTV was calculated using ArcPro 3.0.3 software.



Legend:

- Onshore development area
- Indicative converter station footprint
- 1km intervals from indicative substation footprint
- 5km from indicative substation footprint
- Viewpoint
- Existing woodland screening
- Existing building screening

Zone of theoretical visibility

- Proposed substation theoretically visible
- V 53.5° field of view
- V 90° field of view

S1	P07	27/02/2024	Suitable for Information	ZM	TH	PM
SUI	REV	DATE	DESCRIPTION	DRW	CHK	APR

Title:
Viewpoint CH5: Risby Hall RPG

Figure: 23-15c Drawing No: PC2340_LUC_ON_ZZ_DR_Z_23-15c

Co-ordinate system: British National Grid Page Size: A3 Scale: 1:15,000

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Proposed onshore substation location

Baseline photograph - annotated extent