



Netherlands Enterprise Agency

Helicopter accessibility new designated wind farm zones – Final –

Preliminary study

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Preliminary study

Helicopter accessibility new designated wind farm zones

- Final -

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Preliminary study

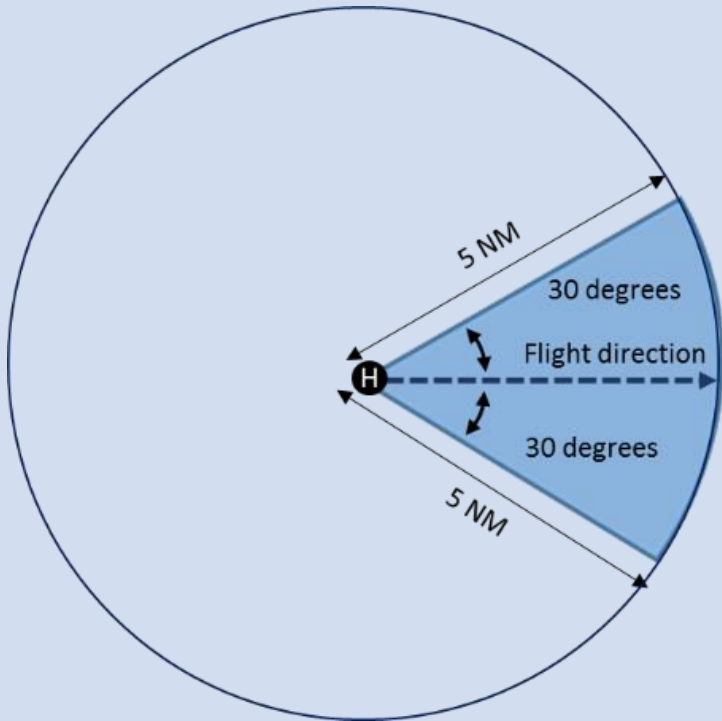
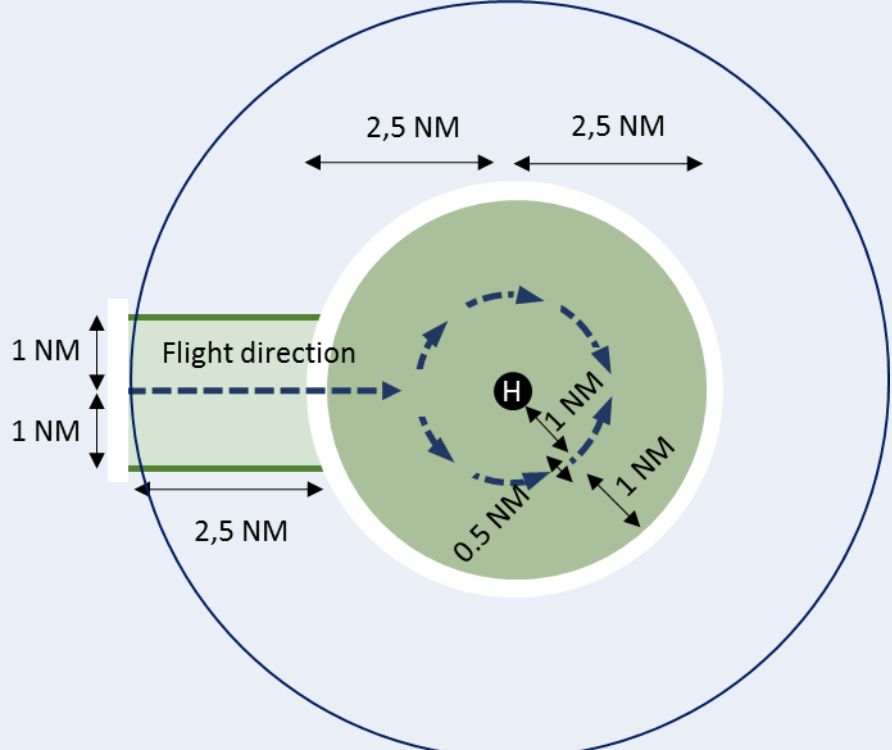
- This preliminary study analyses the helicopter accessibility of platforms located in new designated wind farm zones
- The method used is the same as in the previous study on helicopter accessibility of oil & gas platforms near the offshore wind farm zones Hollandse Kust (zuid) and (noord) (april 2017)
- The impact by shipping (both in transit in or outside shipping lanes, and moored in anchorage areas) is out of scope of this study

Assumptions

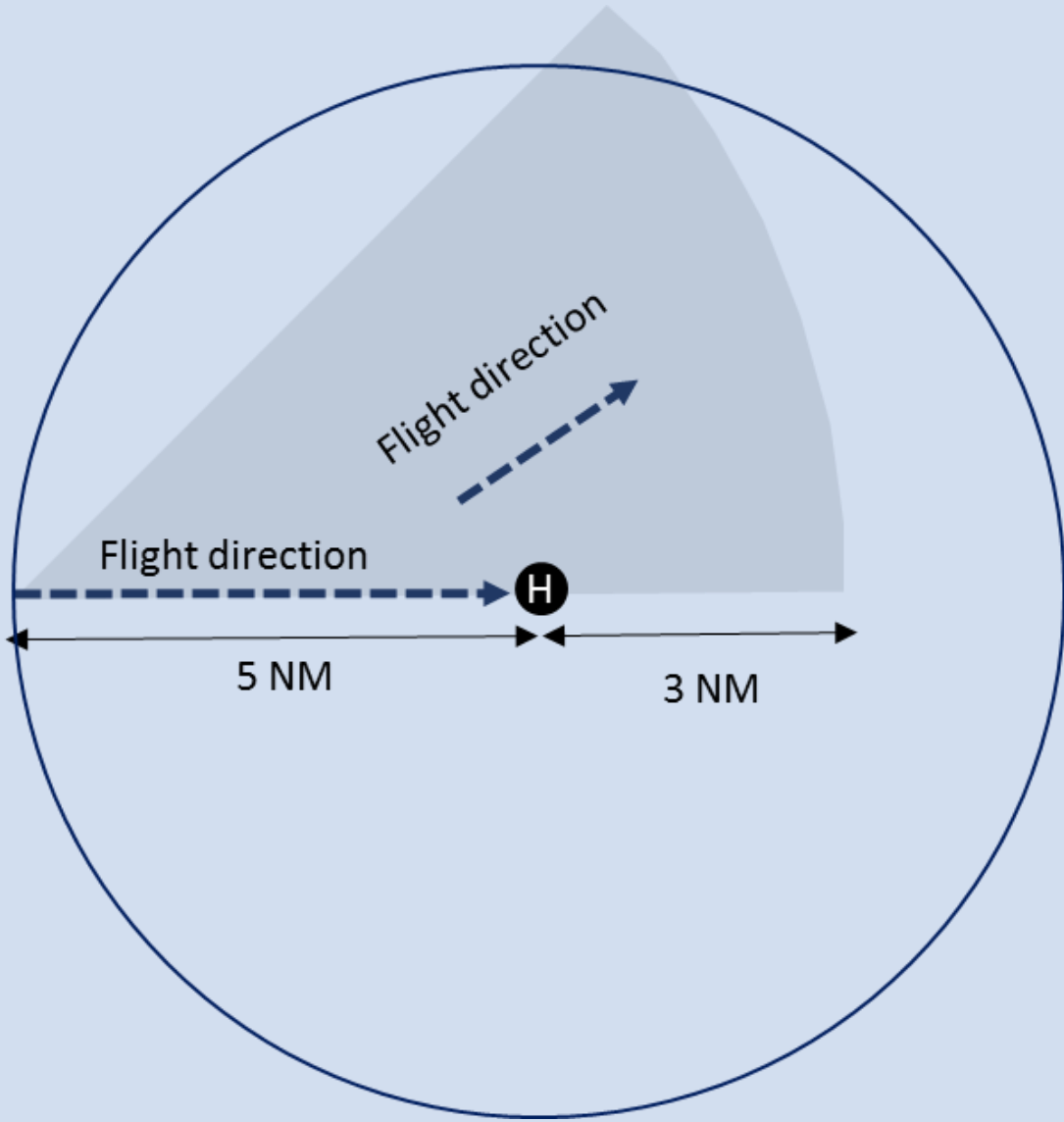
Departure, approach and missed approach should:

- not overlap other platforms within the 5 NM zone
- not overlap the defined buffer area for wind park generated turbulence
- not overlap the limited obstacle sector if the sector contains critical objects preventing enhanced class 2 procedures in this direction
- assumed path of missed approach should not be aimed at the wind farm

Aligning the shapes (1 of 2)

Shape type	Schematic representation
<p>Departure sector</p> <p>Modelled shape:</p> <ul style="list-style-type: none"> • ARA based departure sector • Length: 5 NM • 60 degrees (2x 30) sector 	
<p>Approach sector</p> <p>Modelled area:</p> <ul style="list-style-type: none"> • ARA based final approach corridor • Length: 2,5 NM • Visual “maneuvering” circle • $R = 2,5 \text{ NM}$ 	

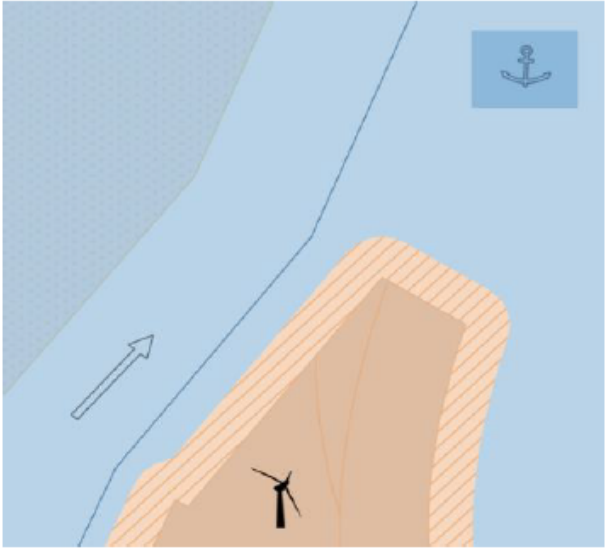






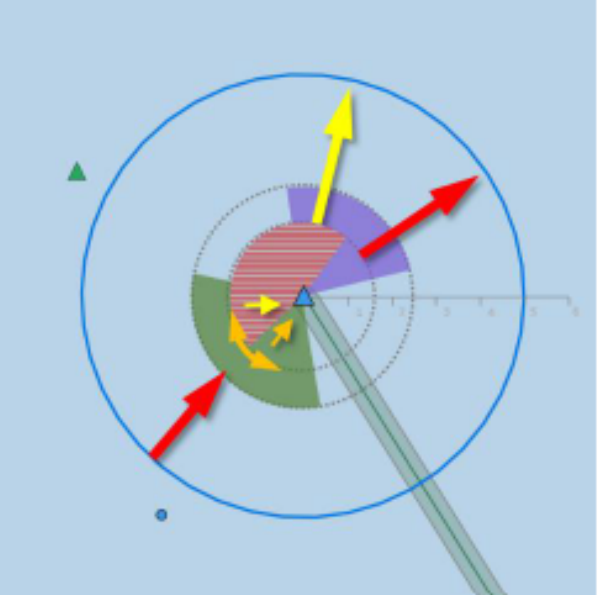


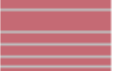







Aligning the shapes (2 of 2)

Shape type	Schematic representation
<p>Missed approach sector</p> <p>Modeled area:</p> <ul style="list-style-type: none">45° sector, orientated left or right of the final approach track, originating from a point 5 NM short of the destination, and terminating on an arc 3 NM beyond the destination	

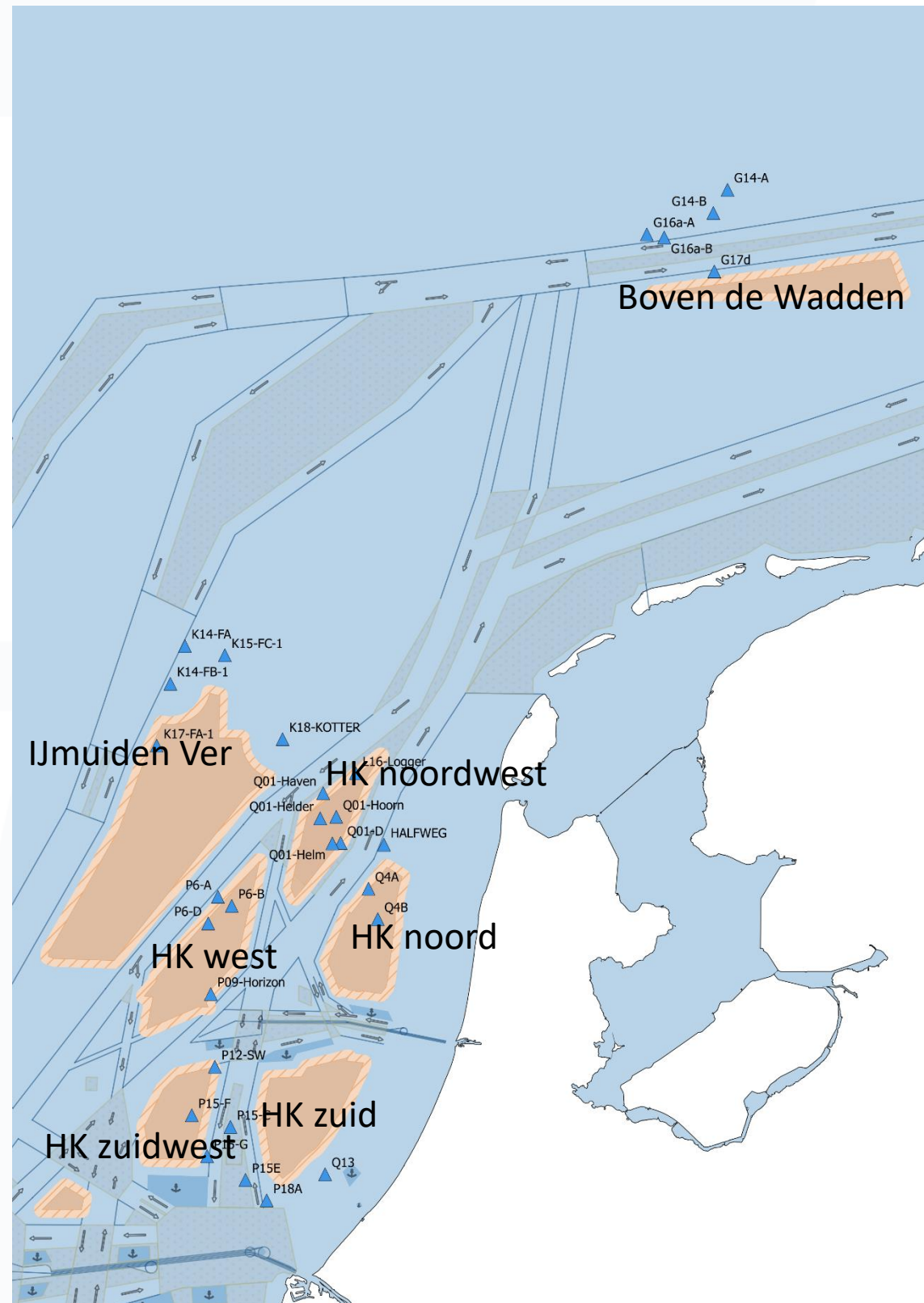
Accessibility

Accessibility	$\geq 3x D + (A)$	$0x D (+A)$				
<div>“almost always” (90 - 95%)</div>						
<div>“9 out of 10” (85-95%)</div>						
<div>“8 out of 10” (70-90%)</div>						
<div>“7 out of 10” (60 – 80%)</div>						
<div>“Less than 7 out of 10” (35 – 65%)</div>						
<div>NOT</div>						

Explanation of symbols and colors

		Water
		Shipping routes
		Shipping separation zone
		Anchorage area
		Wind park
		1 NM buffer-zone (for wind park generated turbulence)
 <p><u>Scales:</u></p> <ul style="list-style-type: none"> - Inner dotted circle: R = 1,5 NM (used to visualize the rig limited sector) - Outer dotted circle: R = 2,5 NM (used to visualize the maneuvering area) - Blue circle: R = 5 NM (the HTZ circle) 		Platform HTZ outside wind farm zone
		Platform HTZ inside wind farm zone
		Rig Limited obstacle sector (drawn up to 1,5NM)
		Sub-sea completion position (P15-C only)
		Cable or pipeline and maintenance area
		5 NM zone / HTZ boundary
		ARA based approach or departure directions
		Approach or departure directions based on enhanced class 2 procedure
		Visual circling direction possible
		Possible visual approach directions

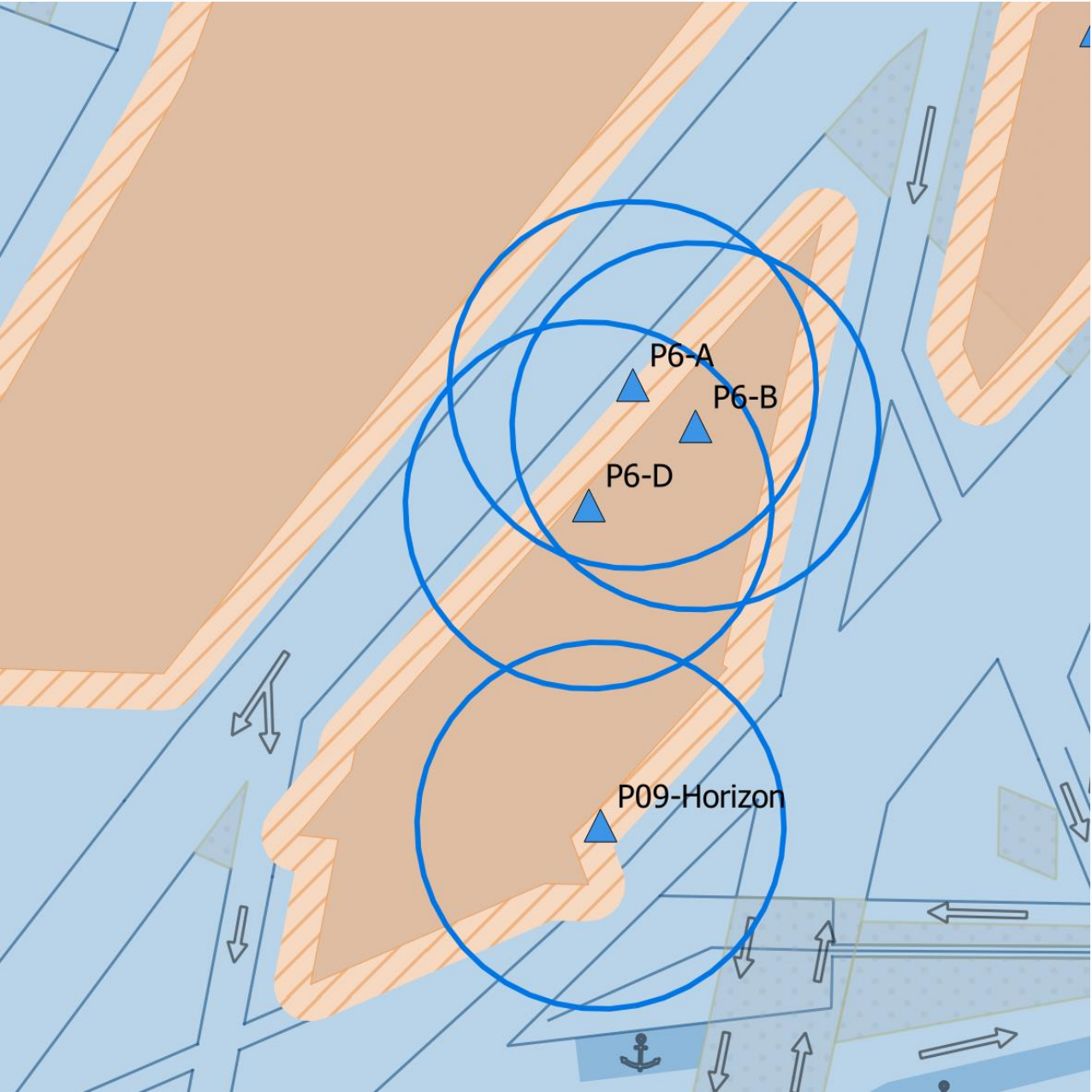
Overview wind farm zones & platforms



Hollandse Kust (west)

Hollandse Kust (west)

Platform / Rig Id	Company	Manned?	Location
P6-A	WINTERSHALL	Yes	Located inside the turbulence buffer
P6-B	WINTERSHALL	No	Located inside the designated wind farm zone
P6-D	WINTERSHALL	No	Located inside the designated wind farm zone
P09-Horizon	Petrogas	Yes	Located inside the turbulence buffer



Hollandse Kust (west)

P6-A	P6-B	P6-D	P09-Horizon
Critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector
P9-A	P9-B		
<p>Subsea? Geen gegevens beschikbaar</p>	<p>Subsea? Geen gegevens beschikbaar</p>		

P6-A

Departures

Approaches

Baseline

Possible departure directions:

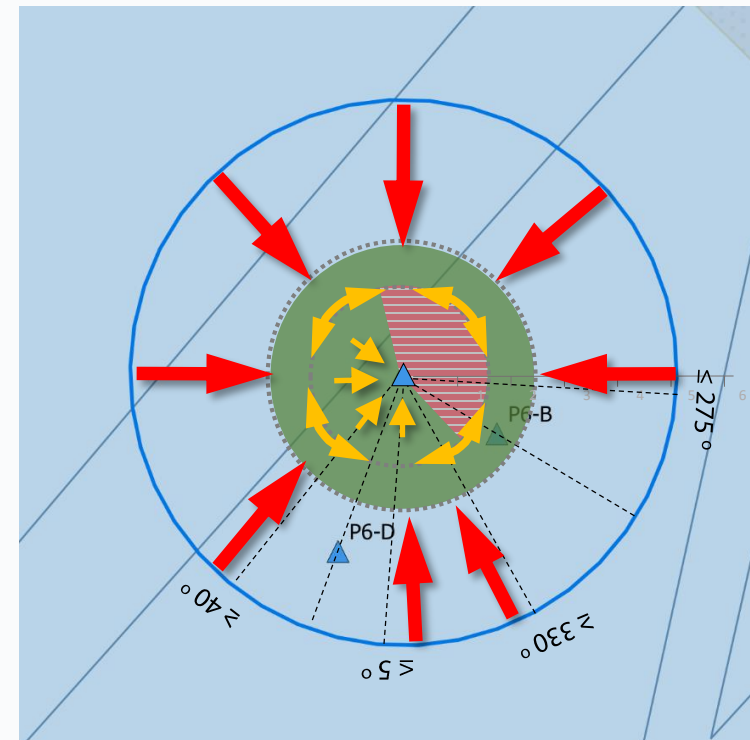
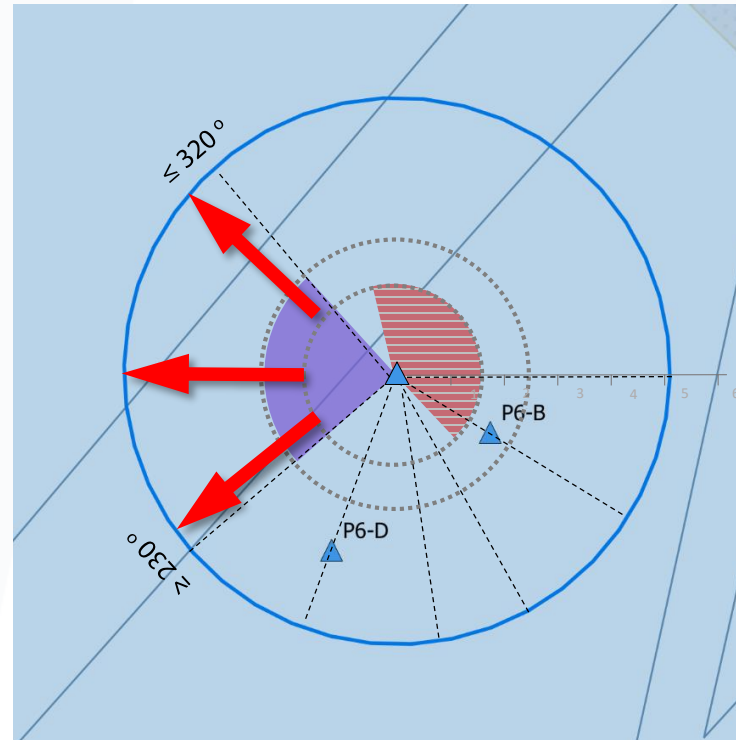
- Between 230° - 320° (90° sector)

Possible approach directions:

- Between 275° - 40° (220° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

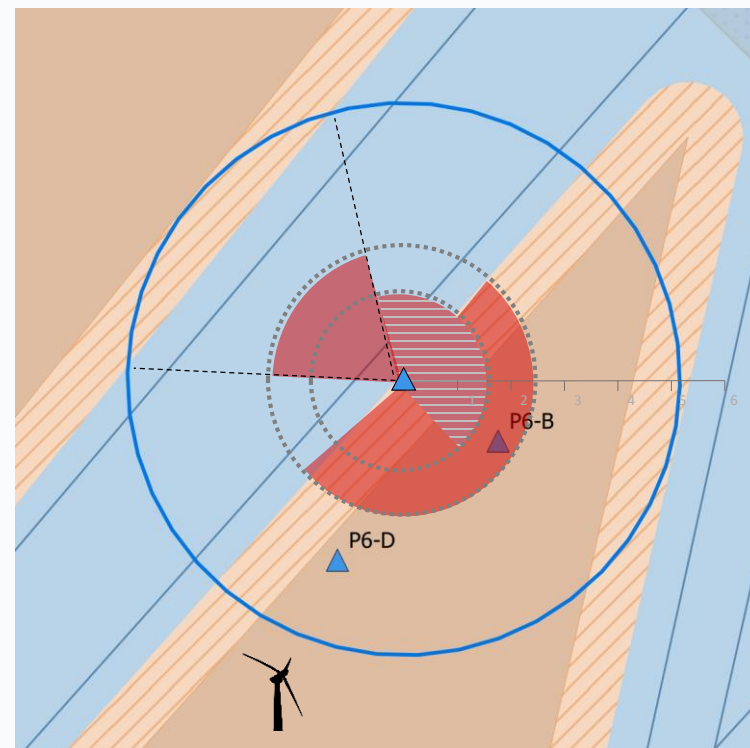
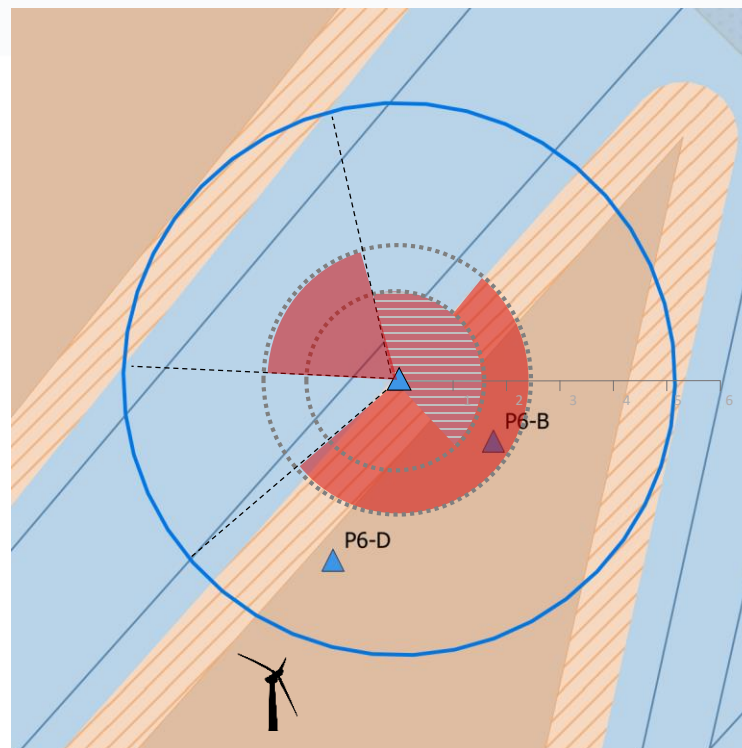
- Not possible (wind park to close)

Possible approach directions:

- Approach is not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



P6-B

Departures

Approaches

Baseline

Possible departure directions:

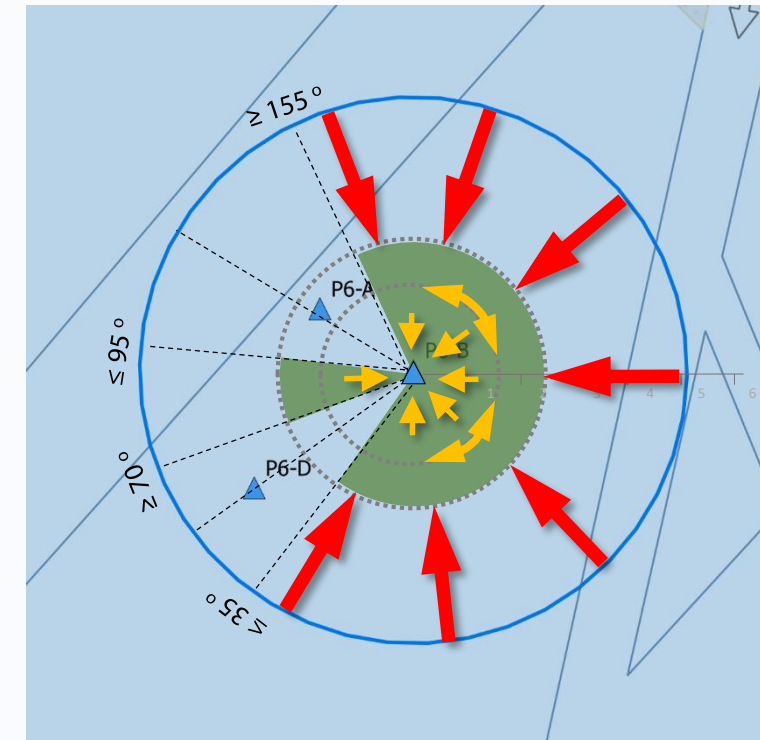
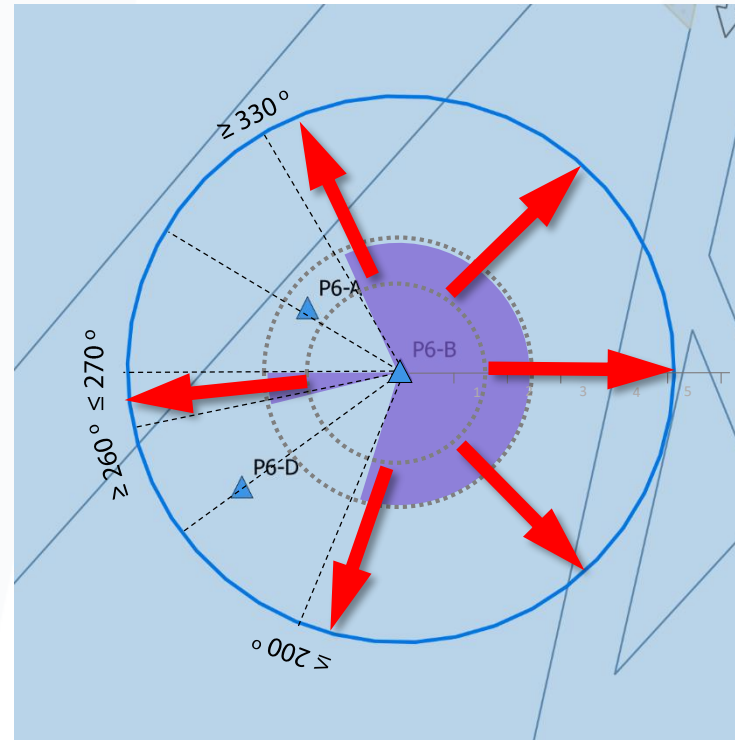
- Between 330° - 200° (230° sector)
- Between 260° - 270° (10° sector)

Possible approach directions:

- Between 155° - 35° (240° sector)
- Between 70° - 95° (25° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

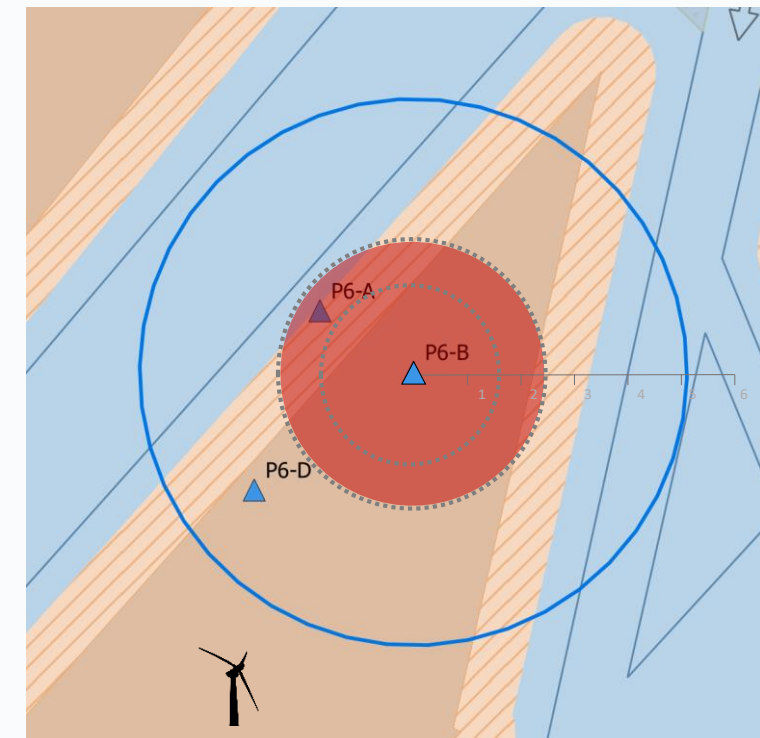
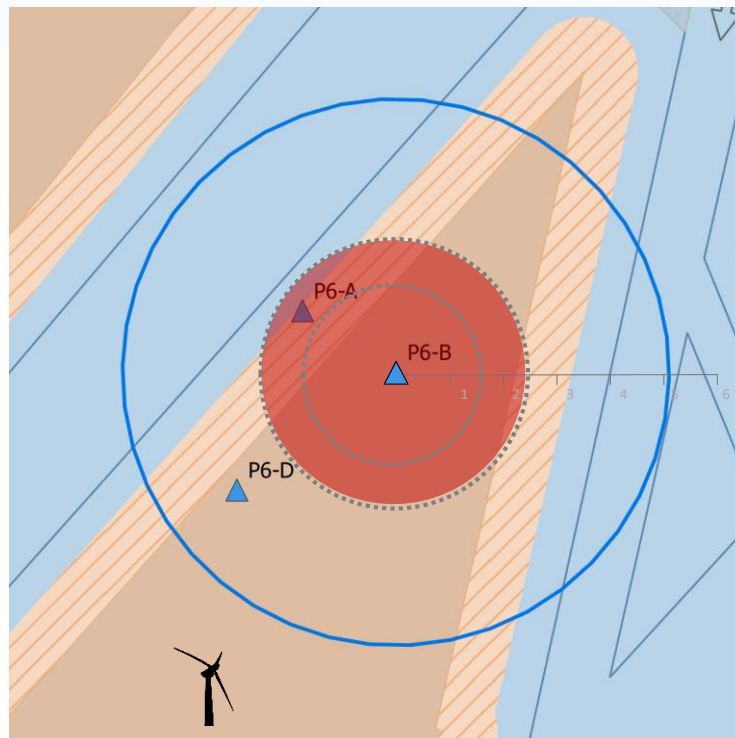
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM

P6-D

Departures

Approaches

Baseline

Possible departure directions:

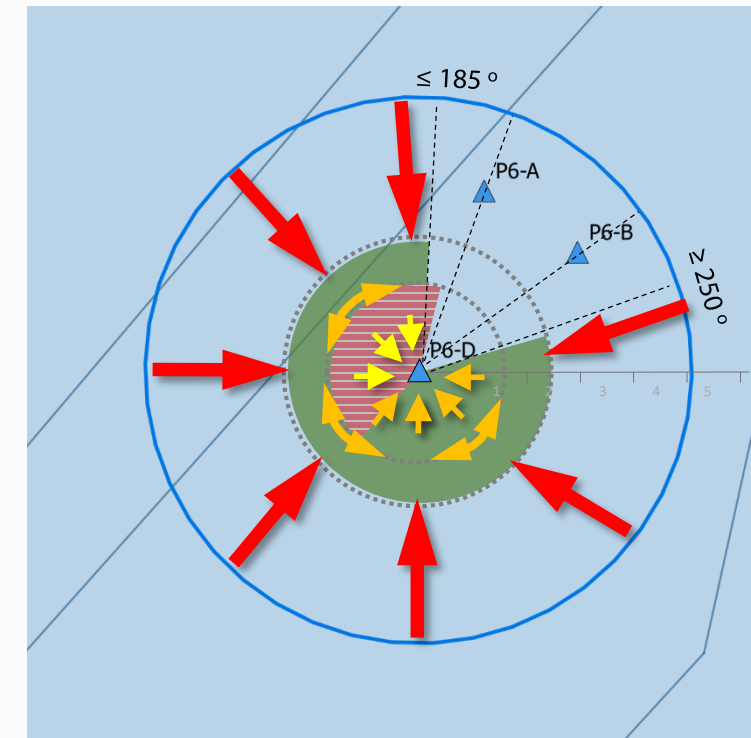
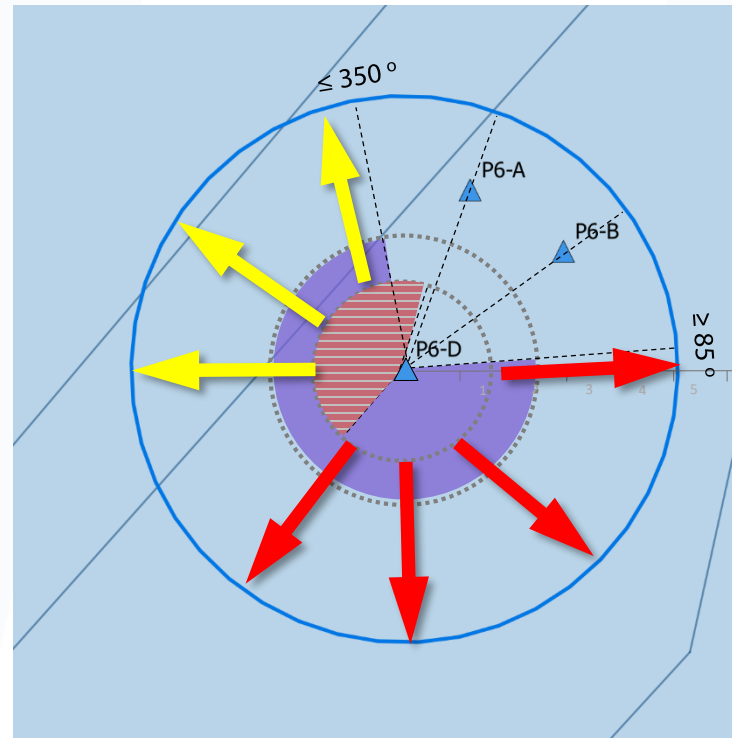
- Between 85° - 350° (265° sector)

Possible approach directions:

- Between 250° - 185° (295° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

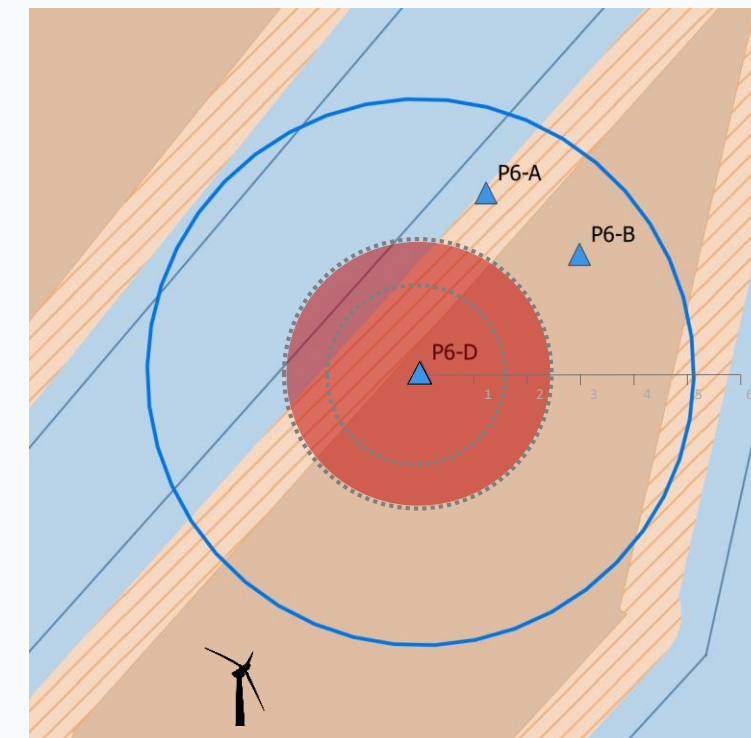
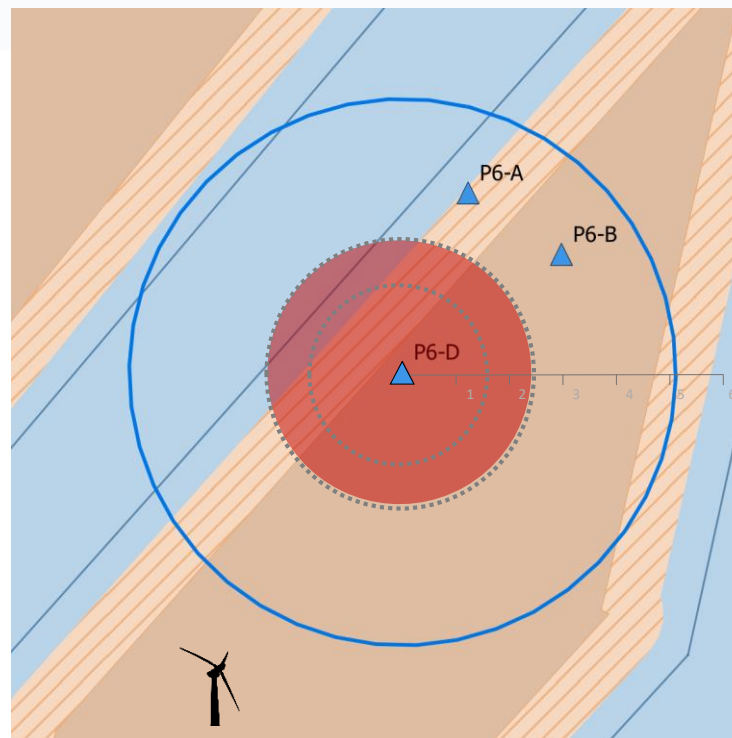
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM

P09-Horizon

Departures

Approaches

Baseline

Possible departure directions:

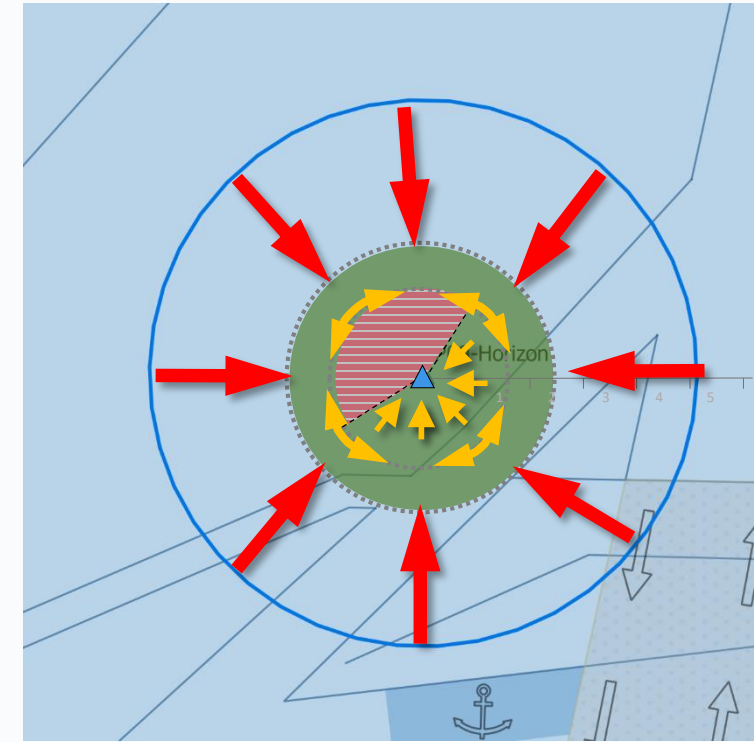
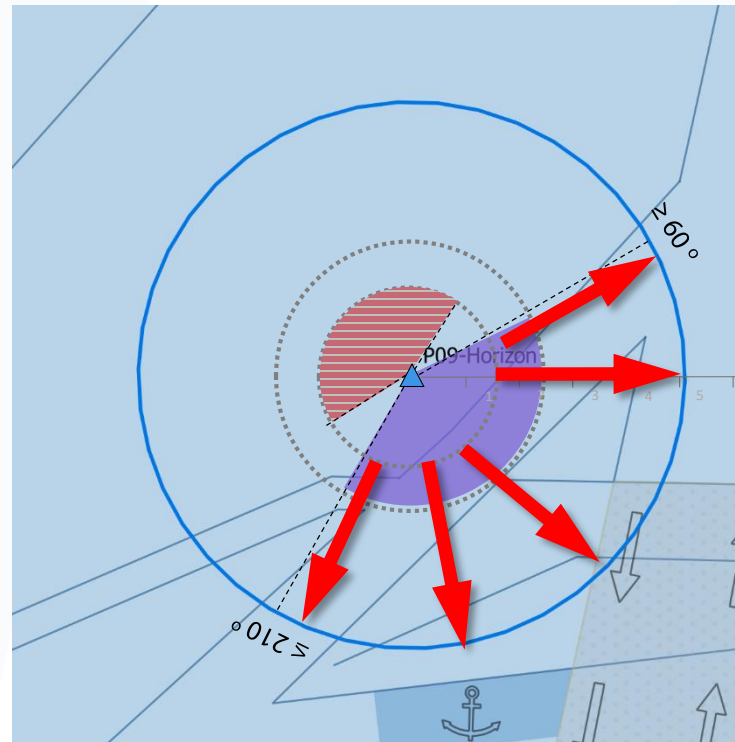
- Between 60° - 210° (150° sector)

Possible approach directions:

- All (360° sector)

Accessibility:

- 70 – 90%



Windpark

Possible departure directions:

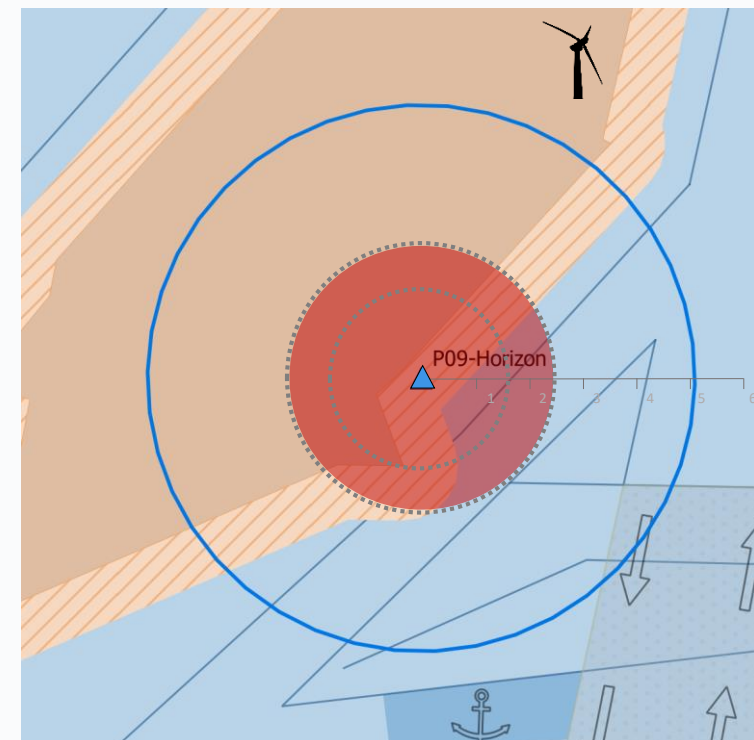
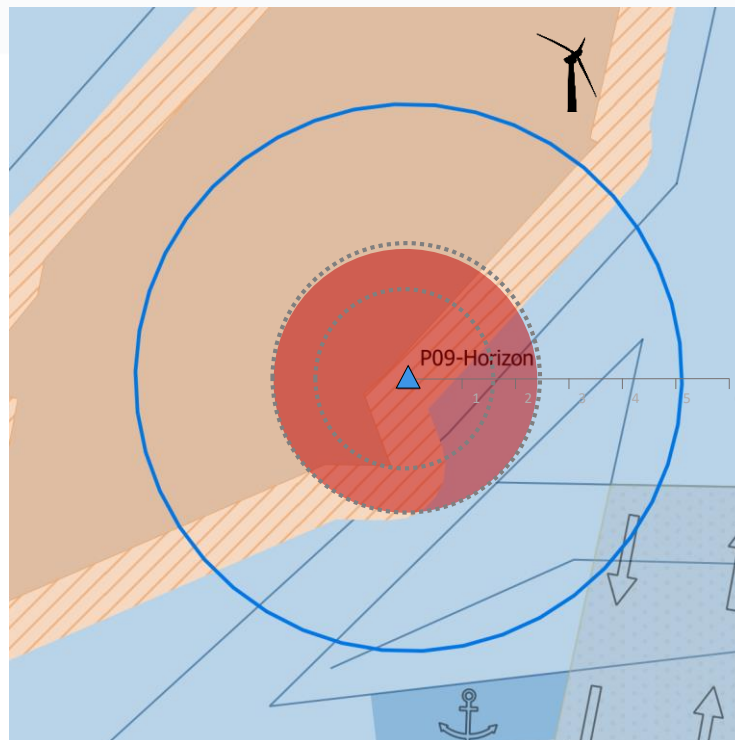
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible

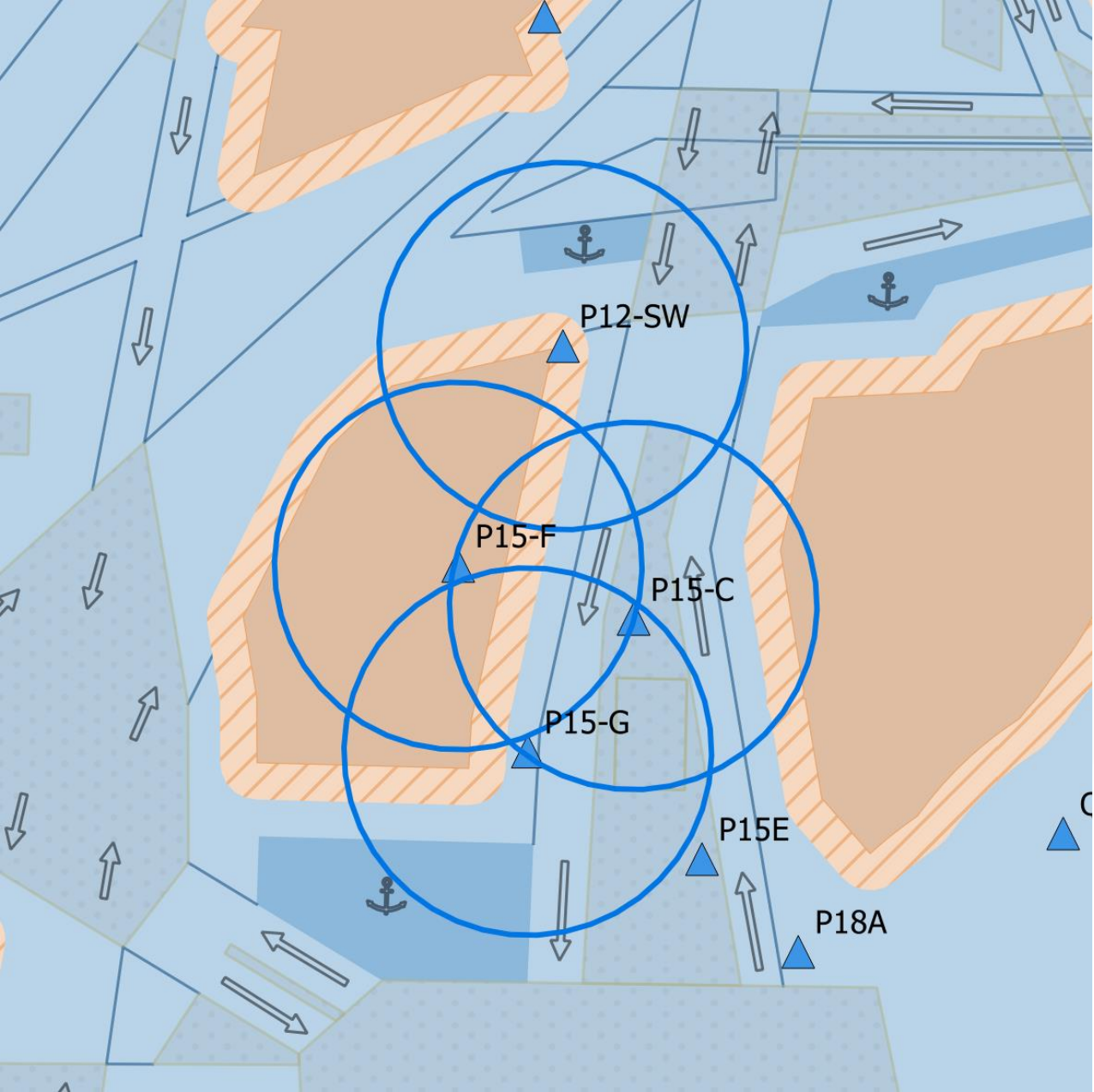


0 1 2 3 4 5 NM

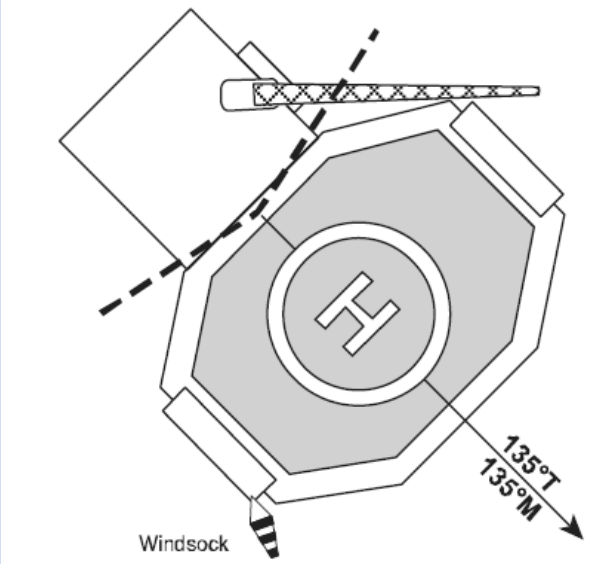
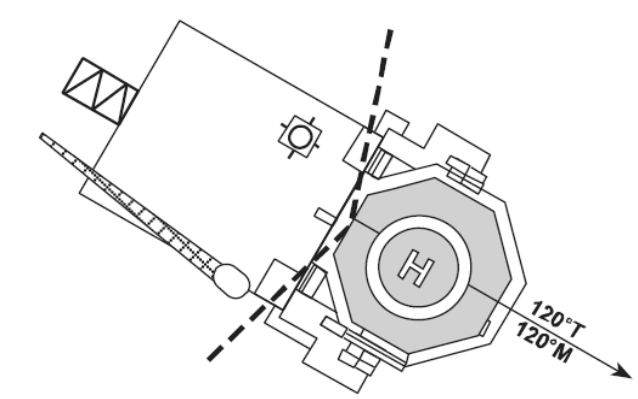
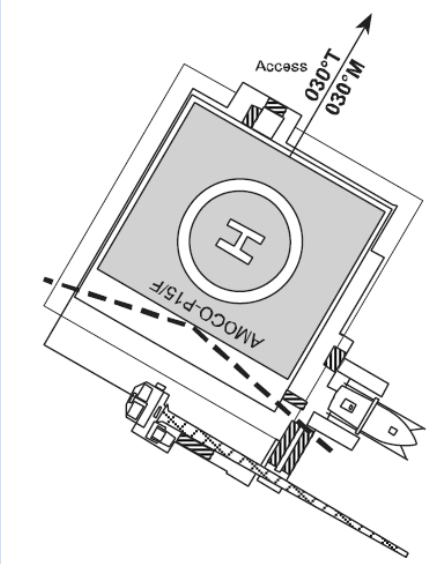
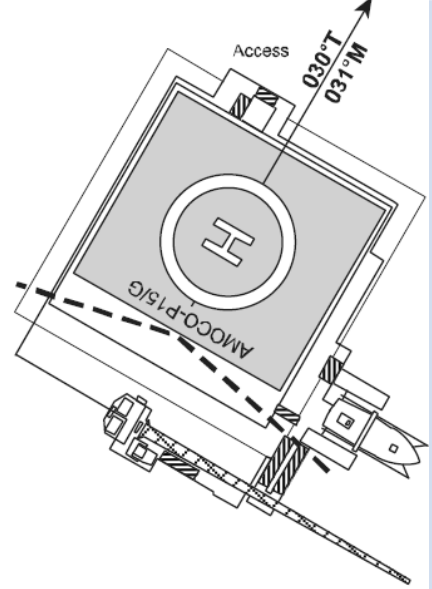
Hollandse Kust (zuidwest)

Hollandse Kust (zuidwest)

Platform / Rig Id	Company	Manned?	Location
P12-SW	WINTERSHALL	No	Located inside the turbulence buffer
P15-C	TAQA	Yes	Located outside the designated wind farm zone
P15-F	TAQA	No	Located inside the designated wind farm zone
P15-G	TAQA	No	Located outside the designated wind farm zone and the visual maneuvering circle of 2,5 NM is not available



Hollandse Kust (zuidwest)

P12-SW	P15-C	P15-F	P15-G
			
No critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector
P15-12S	P15-14S		
Subsea? Geen gegevens beschikbaar	Subsea? Geen gegevens beschikbaar		

P12-SW

Departures

Approaches

Baseline

Possible departure directions:

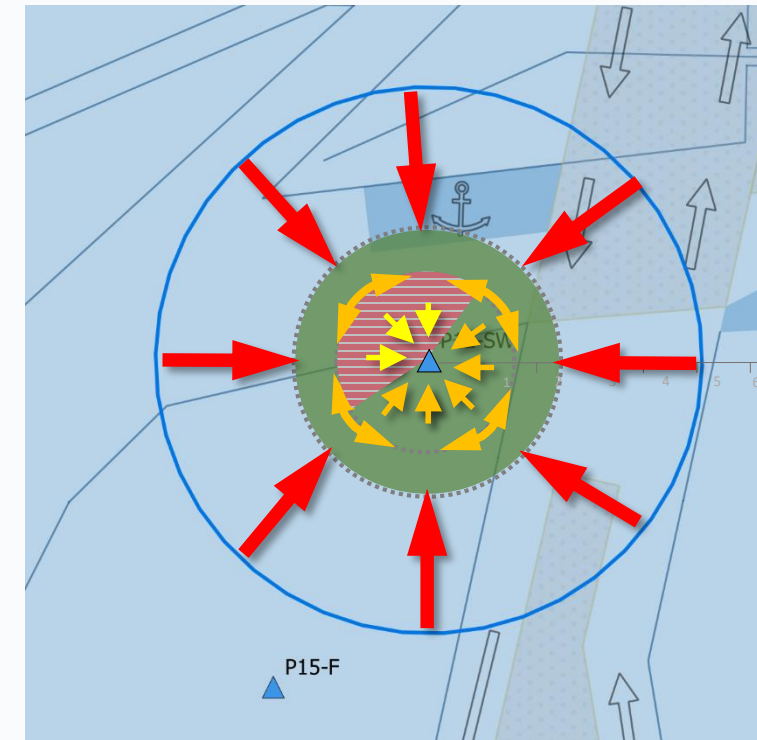
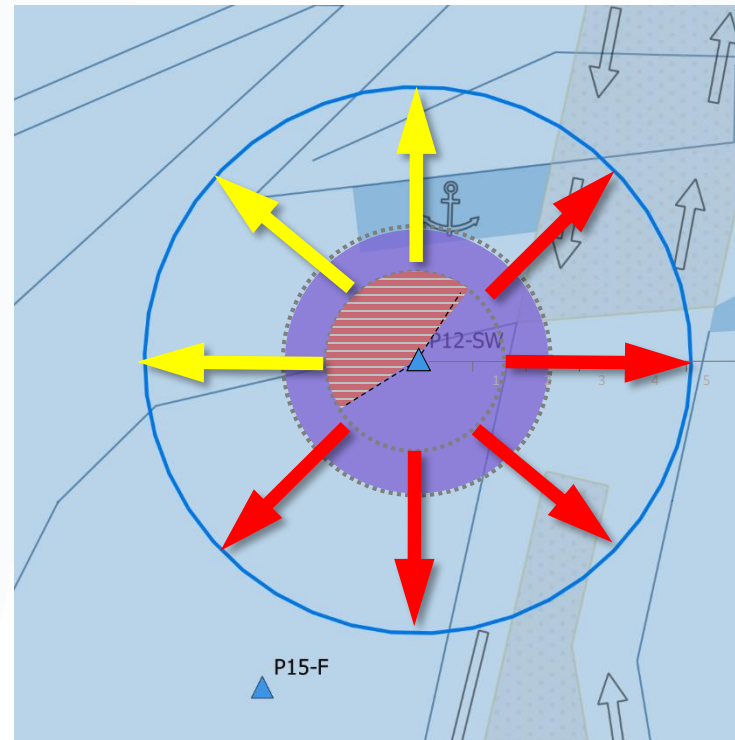
- All (360° sector)

Possible approach directions:

- All (360° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

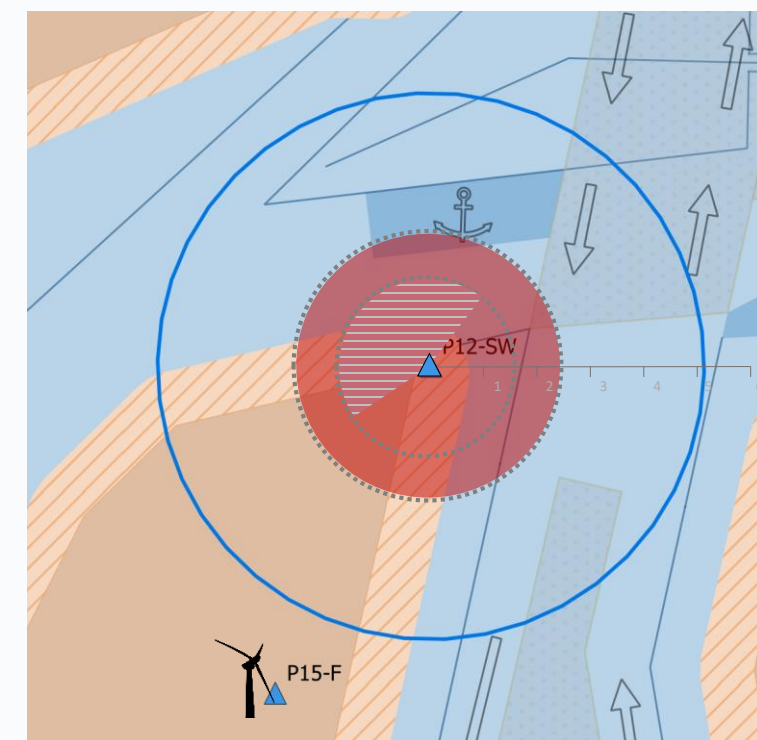
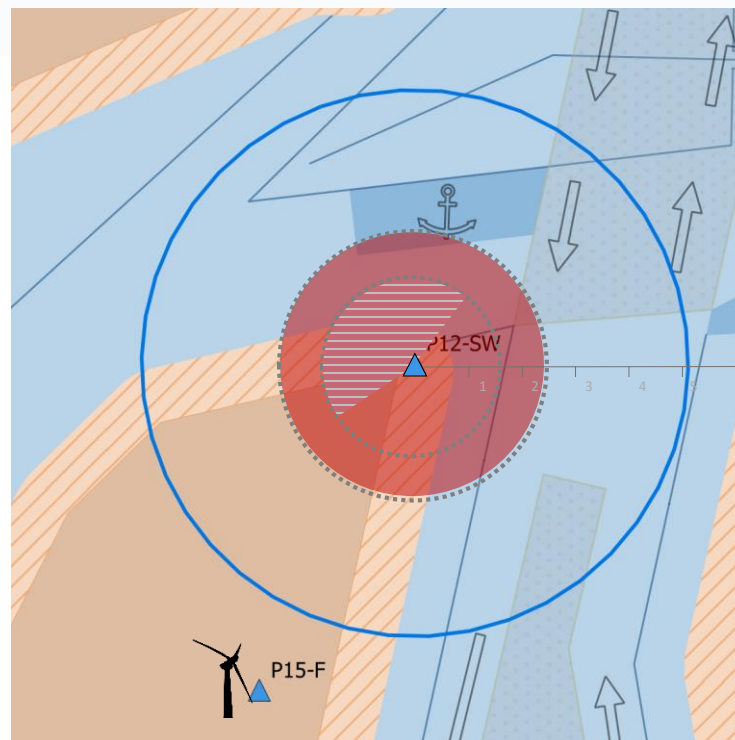
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM

P15-C

Departures

Approaches

Baseline

Possible departure directions:

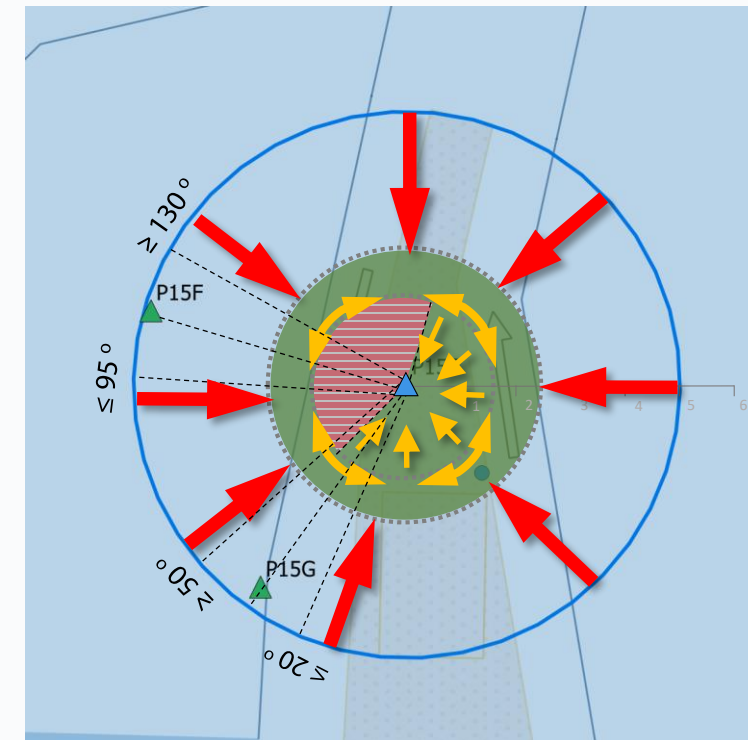
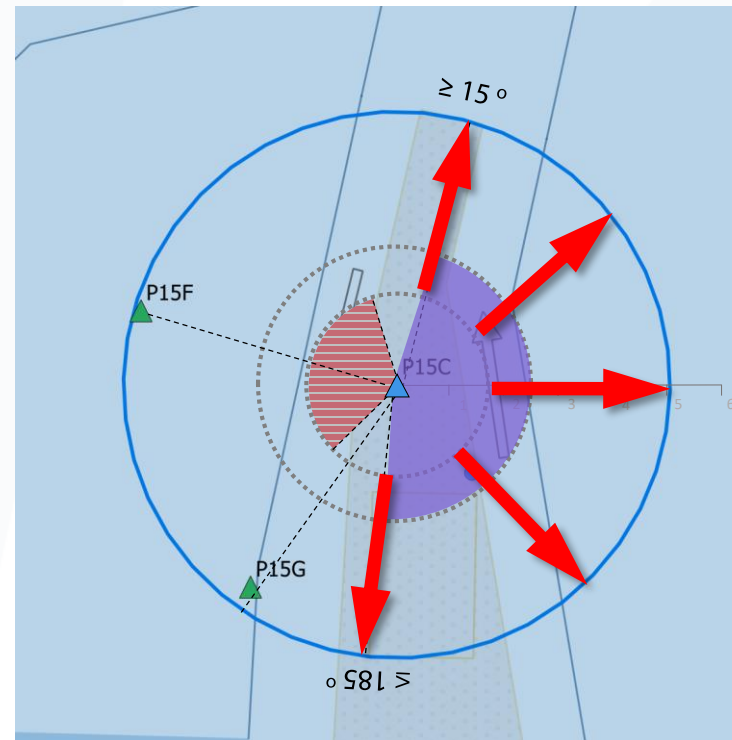
- Between 15° - 185° (170° sector)

Possible approach directions:

- Between 50° - 95° (45° sector)
- Between 130° - 20° (250° sector)

Accessibility:

- 70 – 90%



Windpark

Possible departure directions:

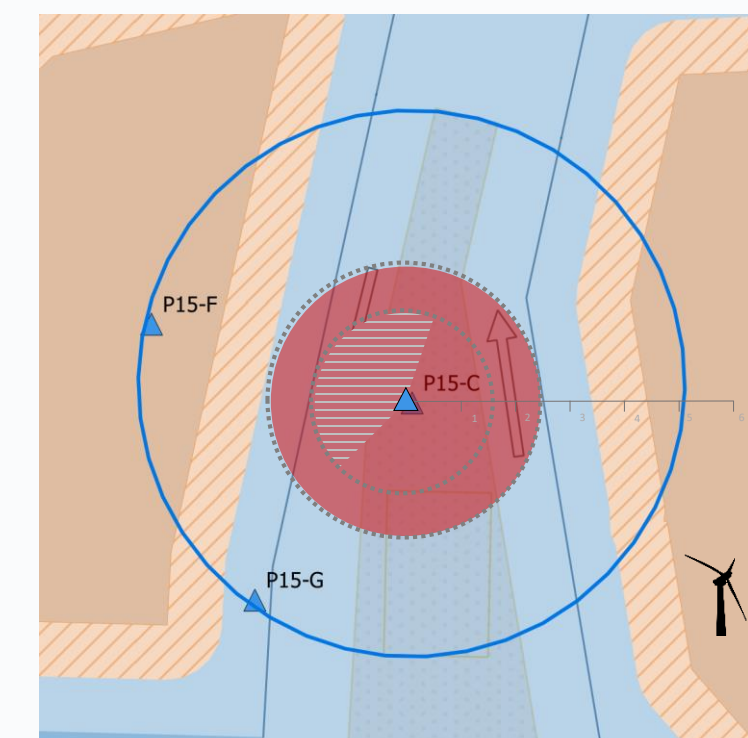
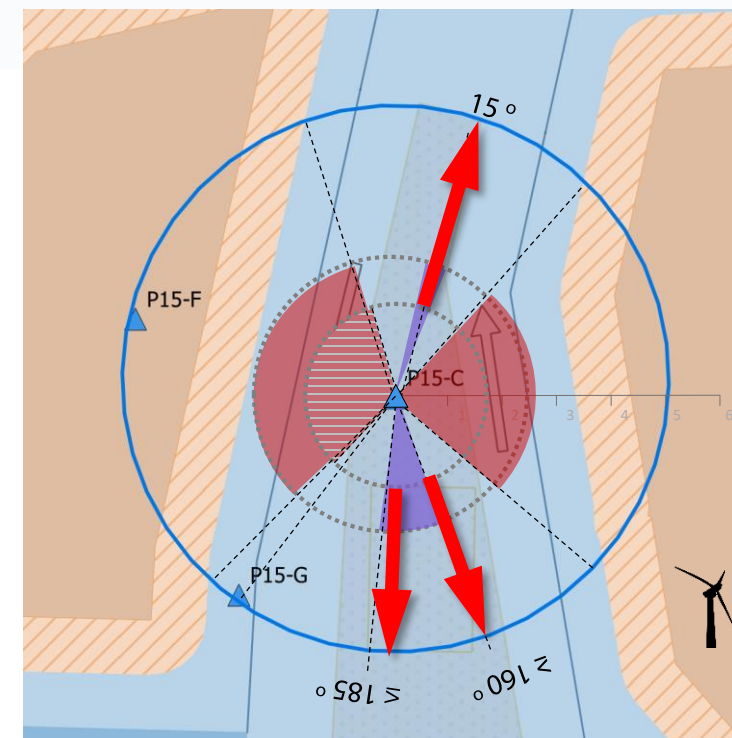
- 15°
- Between 50° - 95° (45° sector)

Possible approach directions:

- No directions
- Missed approach is not possible (both wind parks too close)

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



P15-F

Departures

Approaches

Baseline

Possible departure directions:

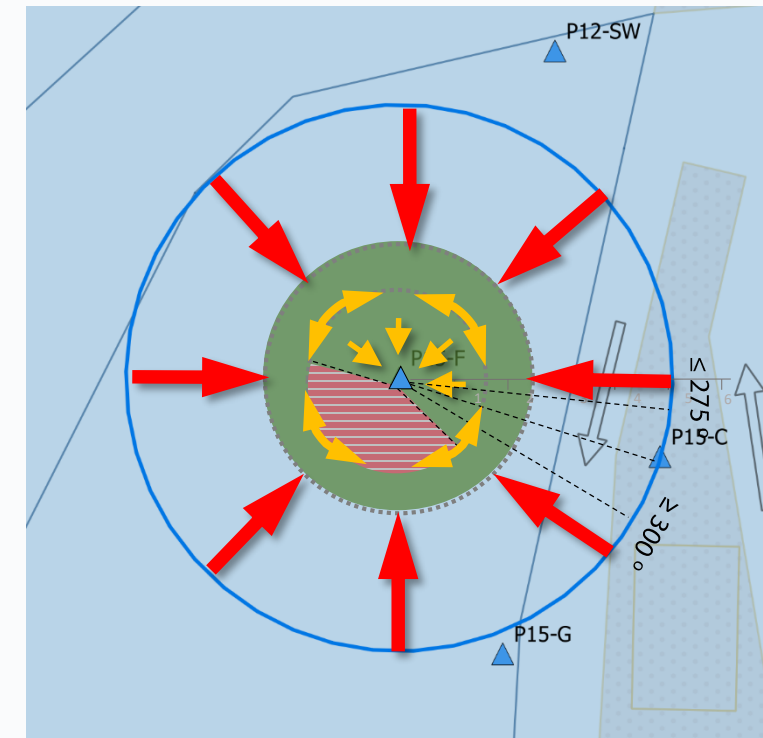
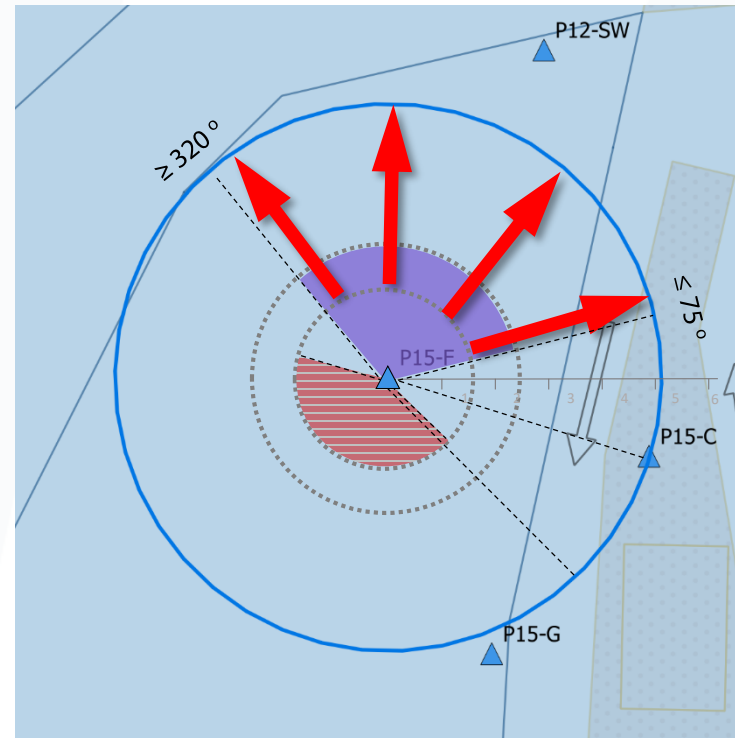
- Between 320° - 75° (115° sector)

Possible approach directions:

- Between 275° - 300° (335° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

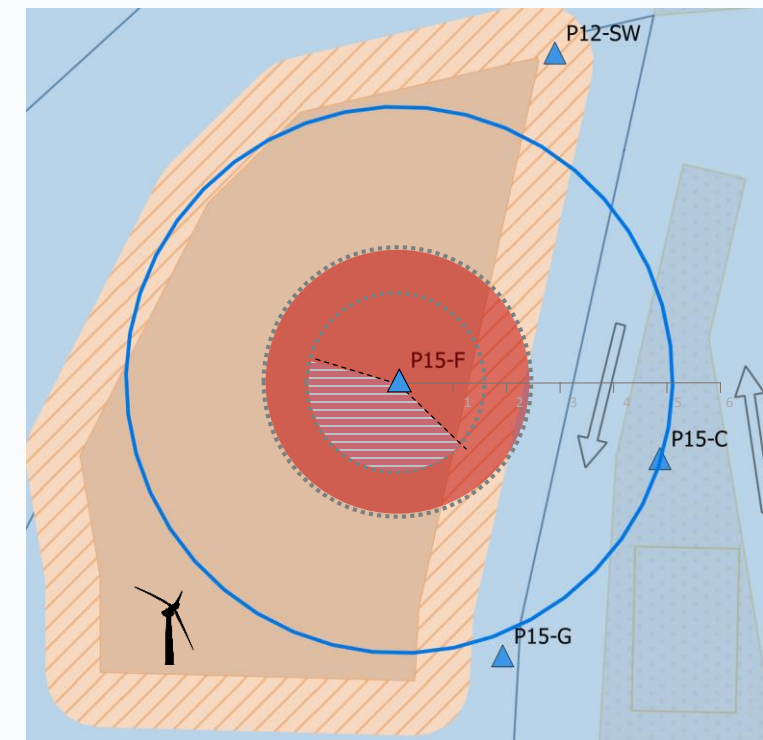
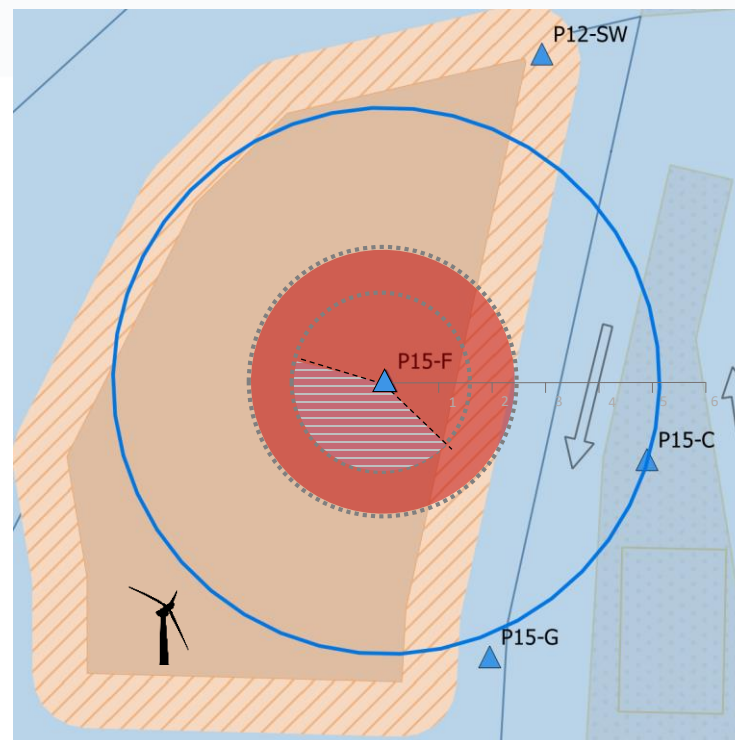
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



P15-G

Departures

Approaches

Baseline

Possible departure directions:

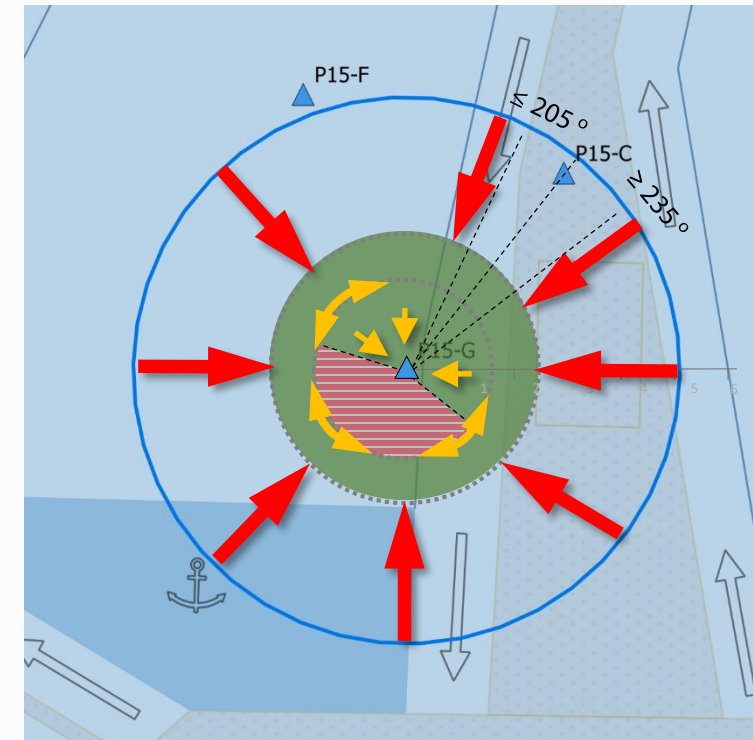
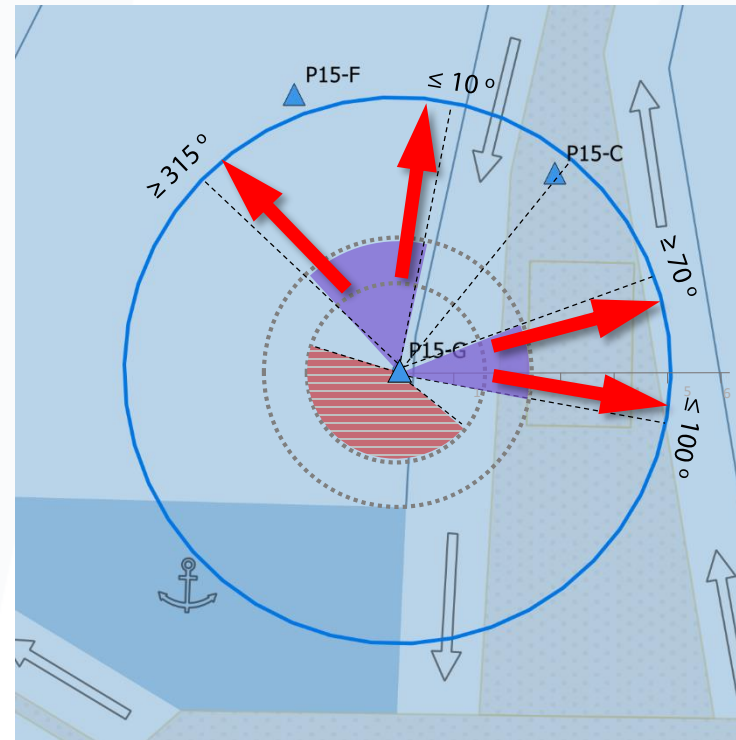
- Between 315° - 10° (55° sector)
- Between 70° - 100° (30° sector)

Possible approach directions:

- Between 235° - 205° (330° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

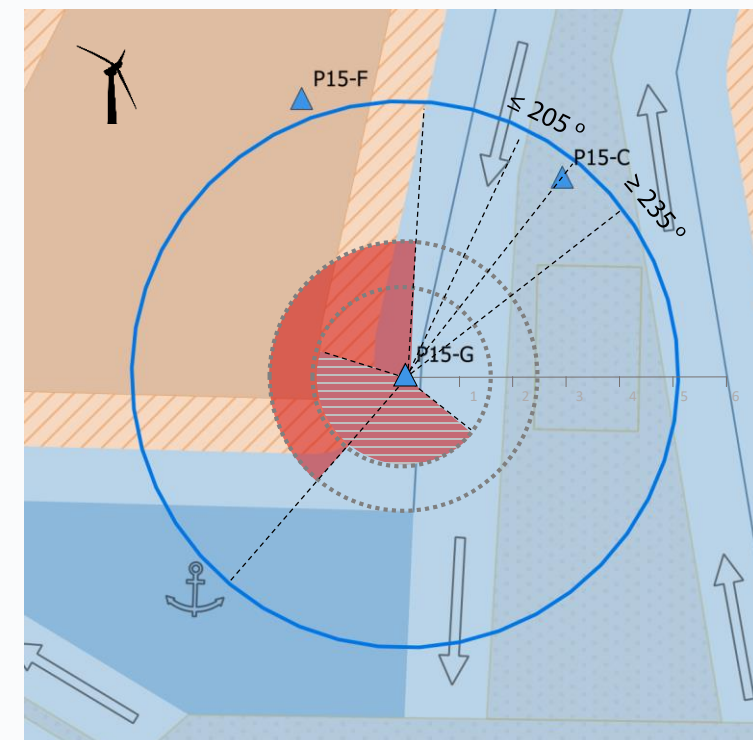
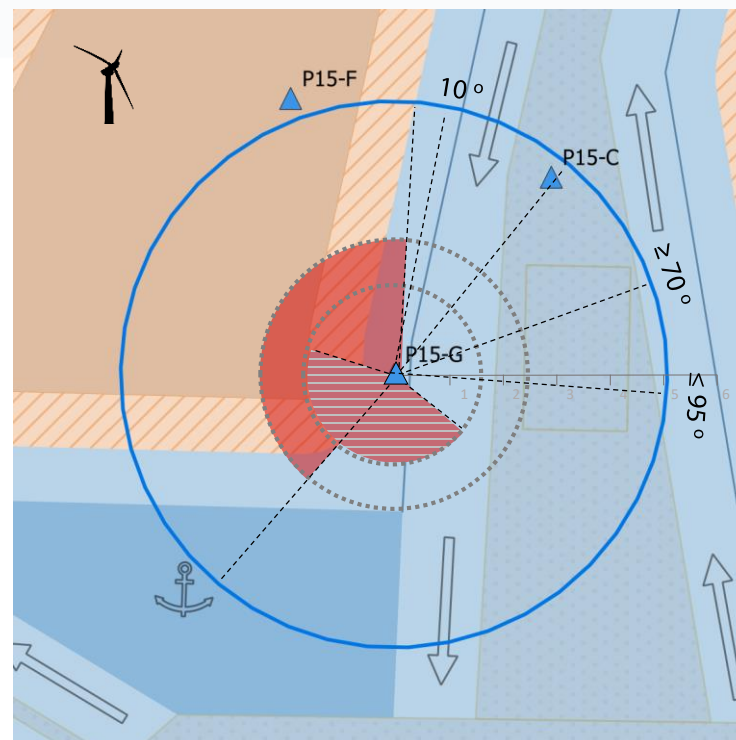
- Not possible, wind park Hollandse Kust (zuid) to close

Possible approach directions:

- Not possible
- Missed approach not possible, wind park Hollandse Kust (zuid) to close

Accessibility:

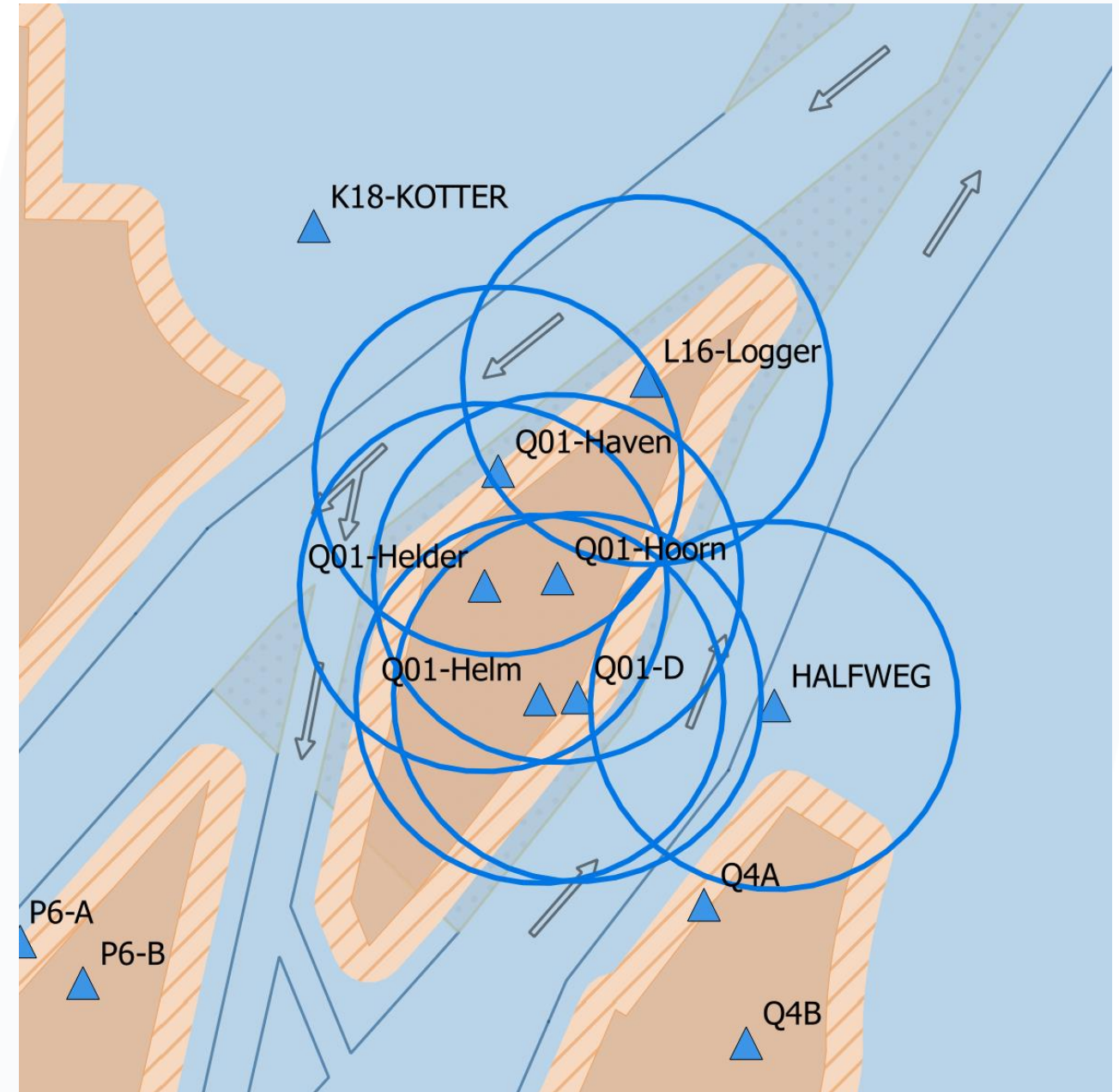
- Not accessible



0 1 2 3 4 5 NM

Hollandse Kust (noordwest)

Hollandse Kust (noordwest)			
Platform / Rig Id	Company	Manned?	Impact on accessibility
HALFWEG	Petrogas	No	Located outside the designated wind farm zone and the visual maneuvering circle of 2,5 NM is not available
L16-Logger	WINTERSHALL	No	Located inside the designated wind farm zone
Q1-D	WINTERSHALL	No	Located inside the turbulence buffer
Q1-Haven	Petrogas	No	Located inside the turbulence buffer
Q1-Helder	Petrogas	Yes	Located inside the designated wind farm zone
Q1- Hoorn	Petrogas	Yes	Located inside the designated wind farm zone
Q1-Helm	Petrogas	Yes	Located inside the designated wind farm zone



Hollandse Kust (noordwest)

HALFWEG	L16-Logger	Q1-D	Q1-Haven
No critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector
Q1-Helder	Q1-Helm	Q1-Hoorn	
Critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector	Critical objects in the limited obstacle sector	

HALFWEG

Departures

Approaches

Baseline

Possible departure directions:

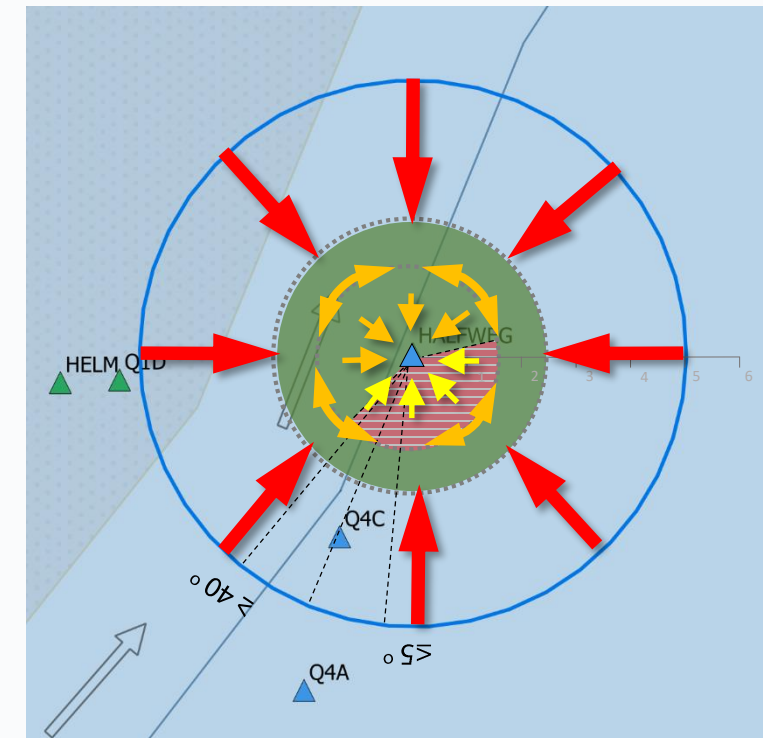
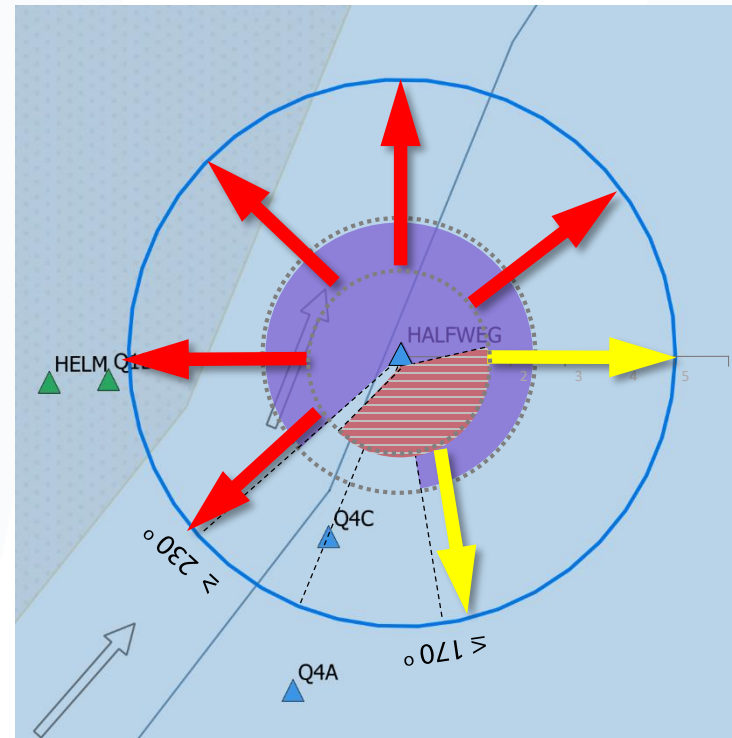
- Between 230° - 170° (300° sector)

Possible approach directions:

- Between 40° - 5° (325° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

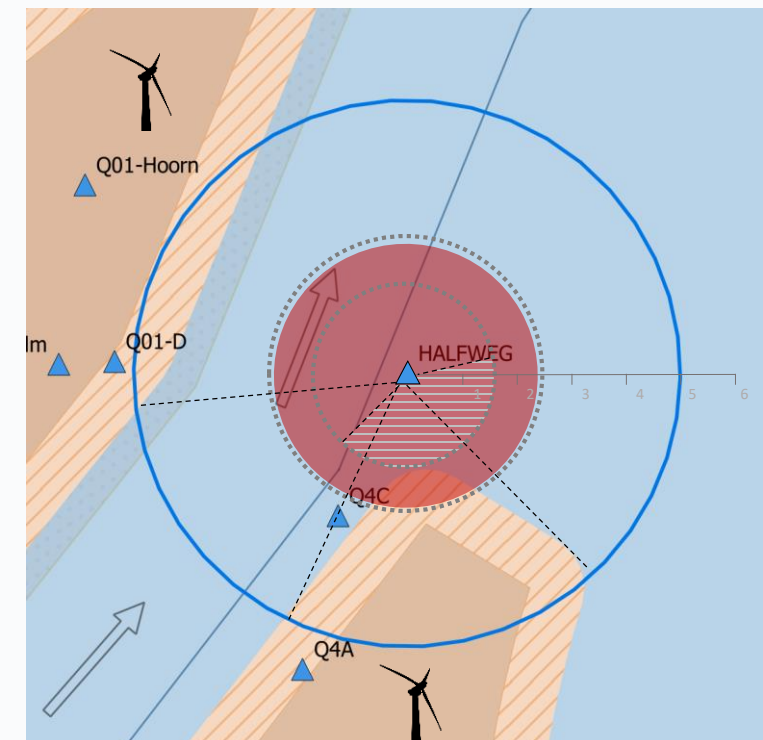
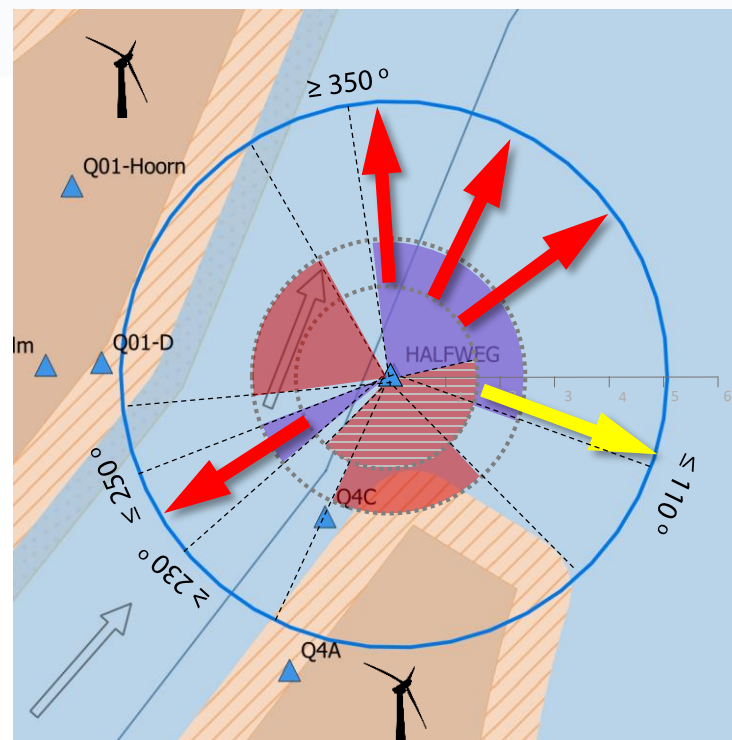
- Between 350° - 110° (120° sector)
- Between 230° - 250° (20° sector)

Possible approach directions:

- Due to missed approach no other approach directions are possible

Accessibility:

- Not accessible



L16-Logger

Departures

Approaches

Baseline

Possible departure directions:

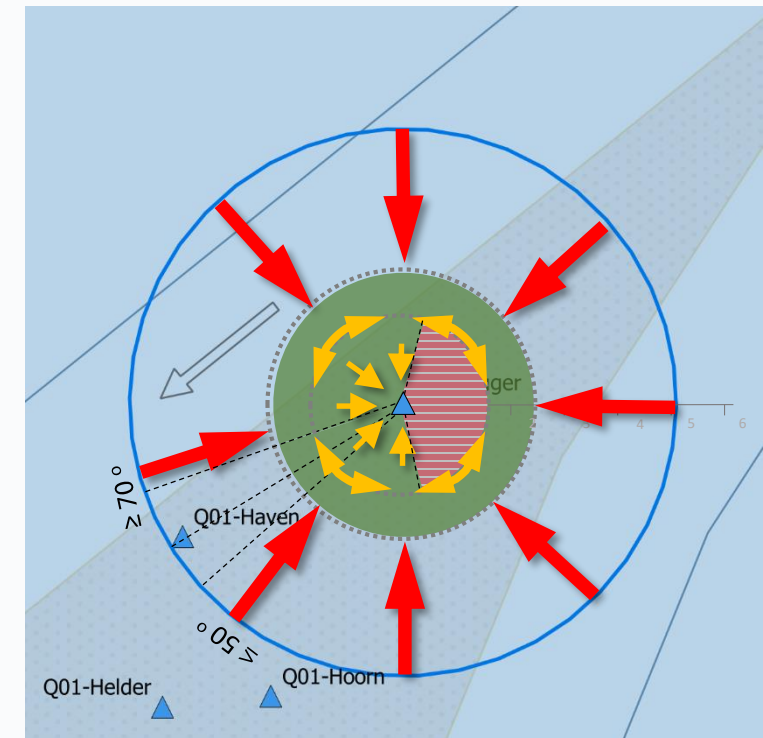
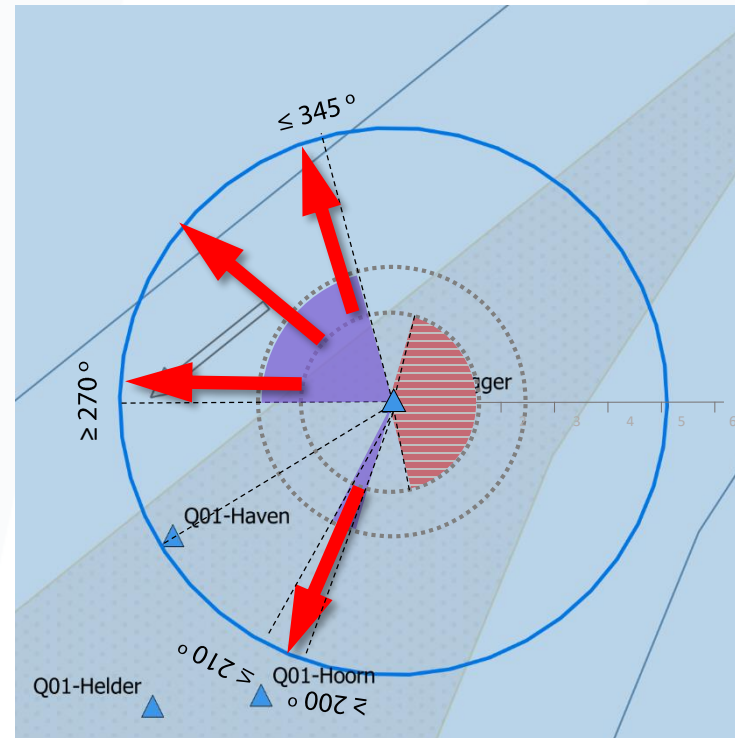
- Between 270° - 345° (75° sector)
- Between 200° - 210° (10° sector)

Possible approach directions:

- Between 70° - 50° (340° sector)

Accessibility:

- 70 – 90%



Windpark

Possible departure directions:

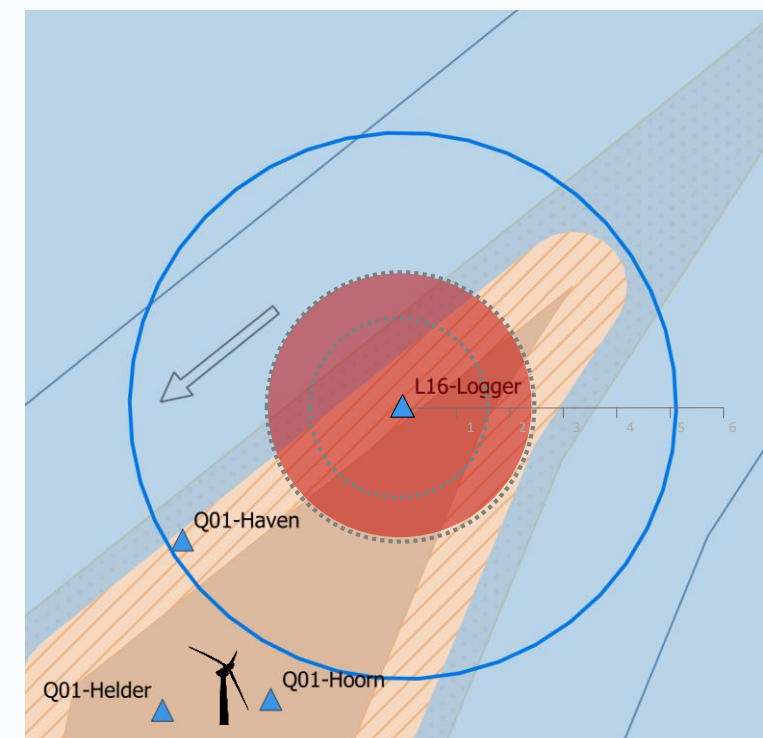
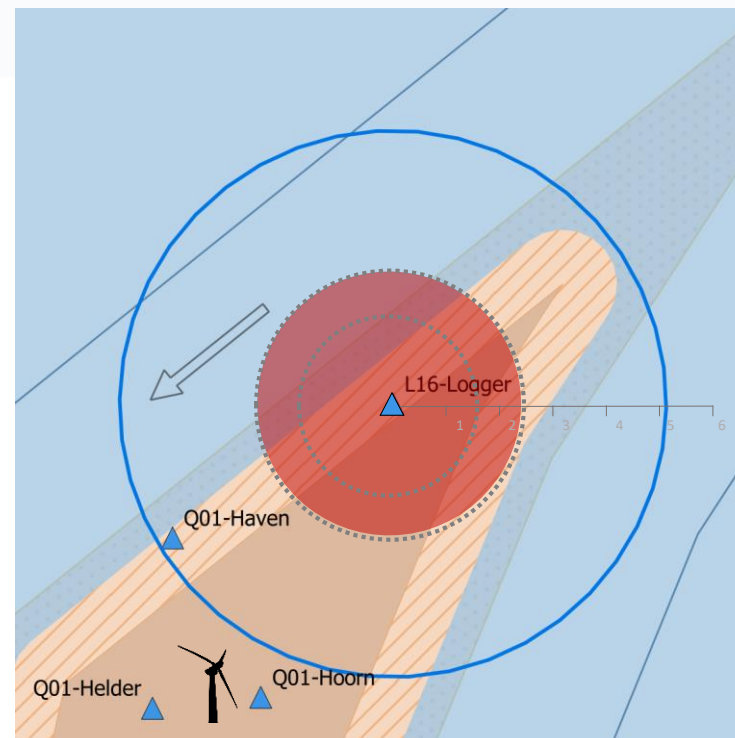
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



Q1-D

Departures

Approaches

Baseline

Possible departure directions:

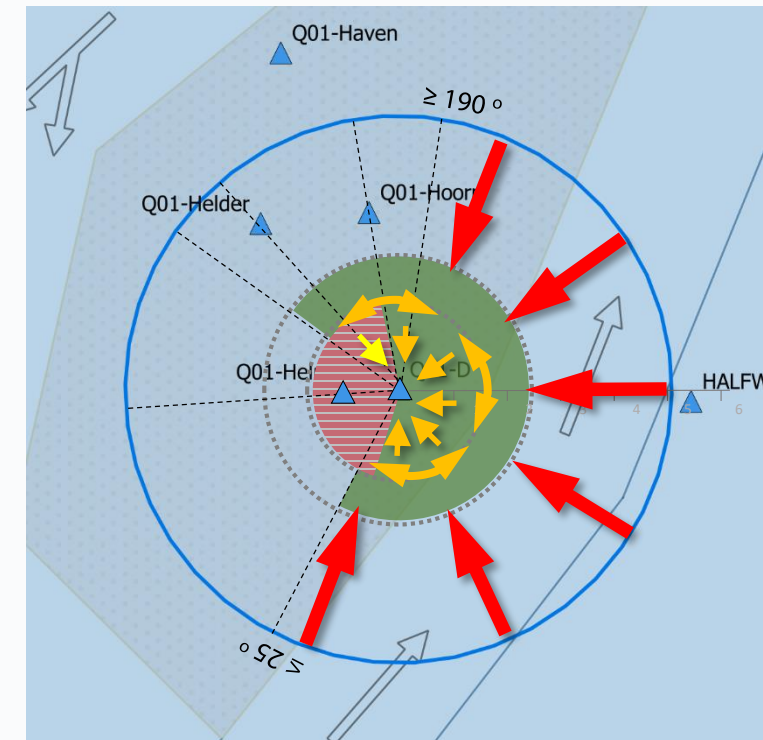
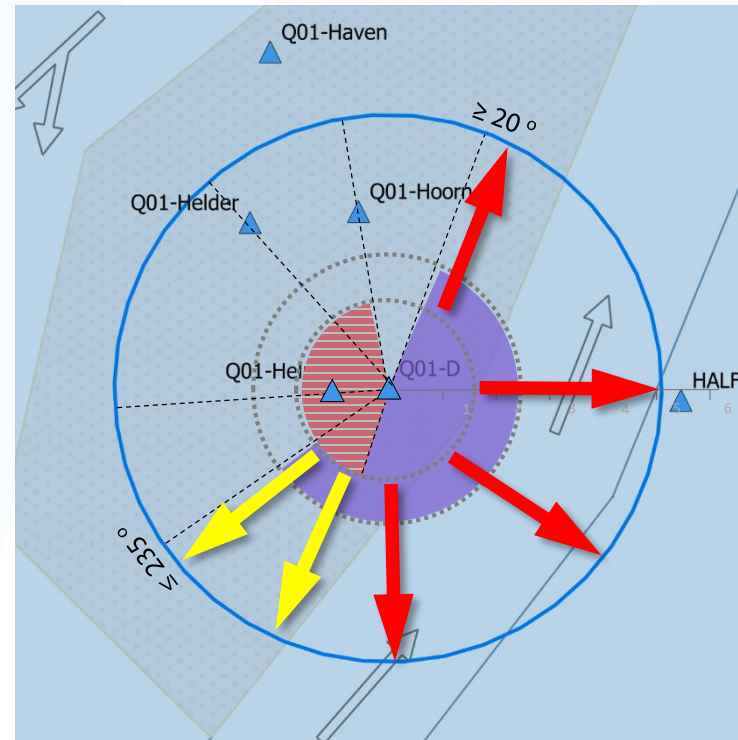
- Between 20° - 235° (215° sector)

Possible approach directions:

- Between 190° - 25° (195° sector)

Accessibility:

- 85 – 95%



Windpark

Possible departure directions:

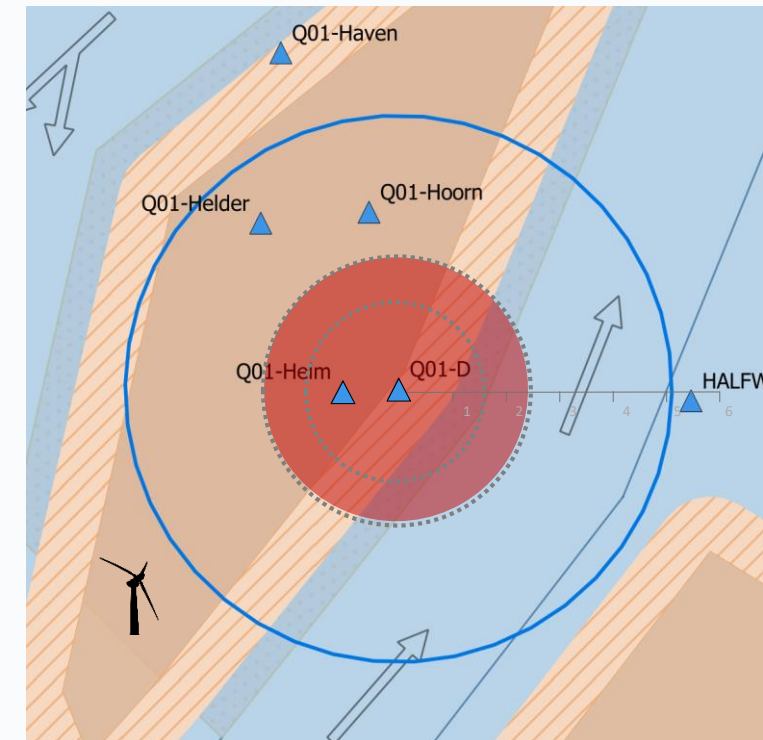
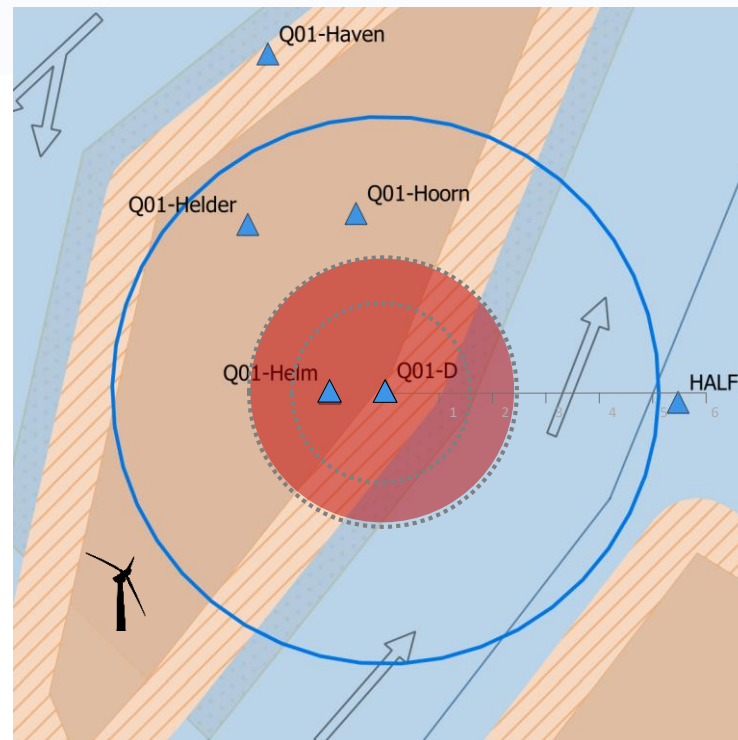
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



Q1-Haven

Departures

Approaches

Baseline

Possible departure directions:

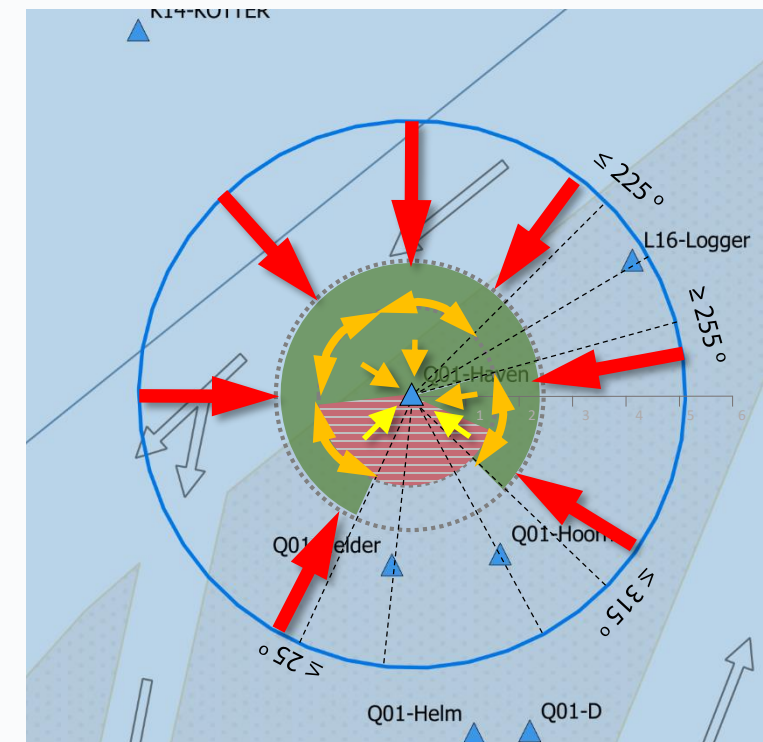
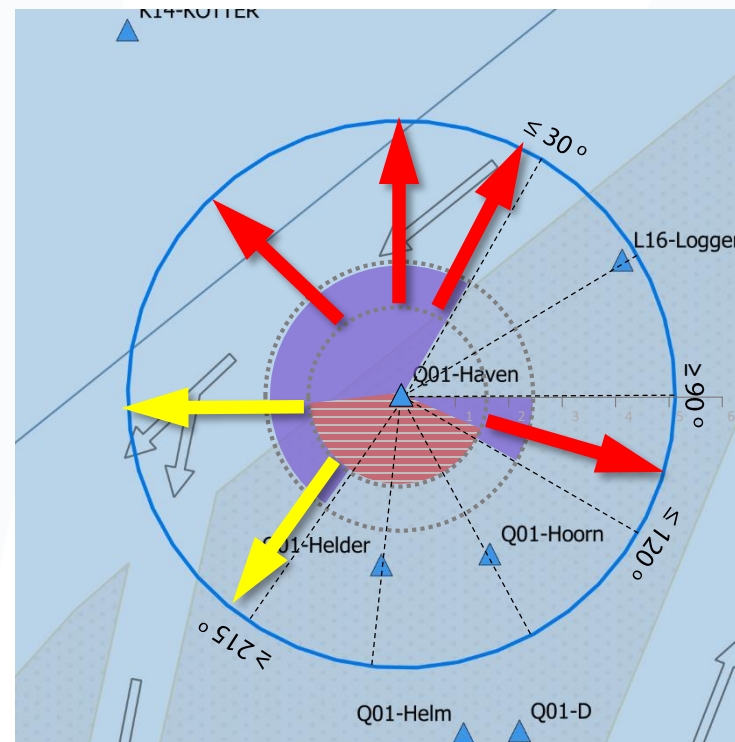
- Between 215° - 30° (175° sector)
- Between 90° - 120° (30° sector)

Possible approach directions:

- Between 25° - 225° (200° sector)
- Between 225° - 315° (90° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

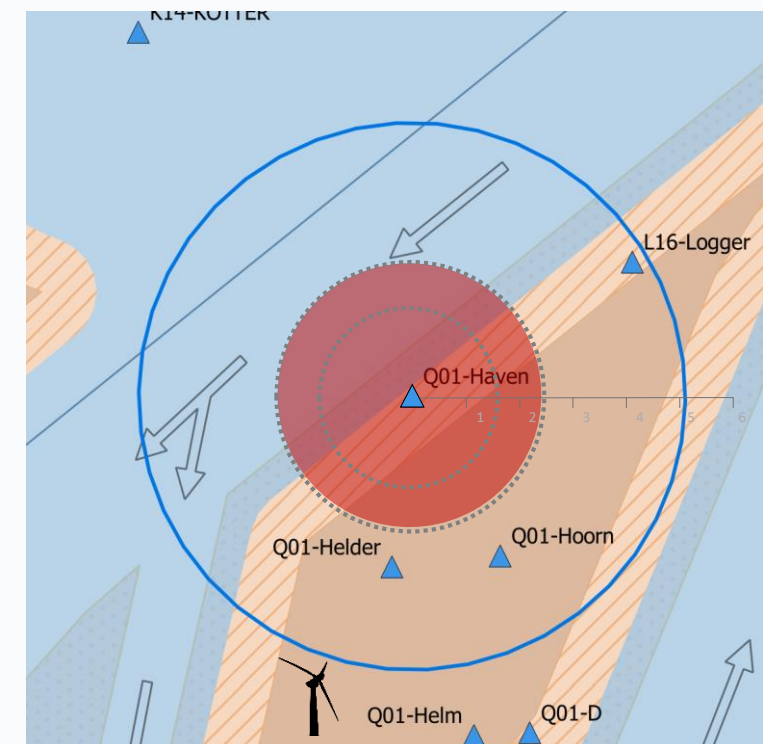
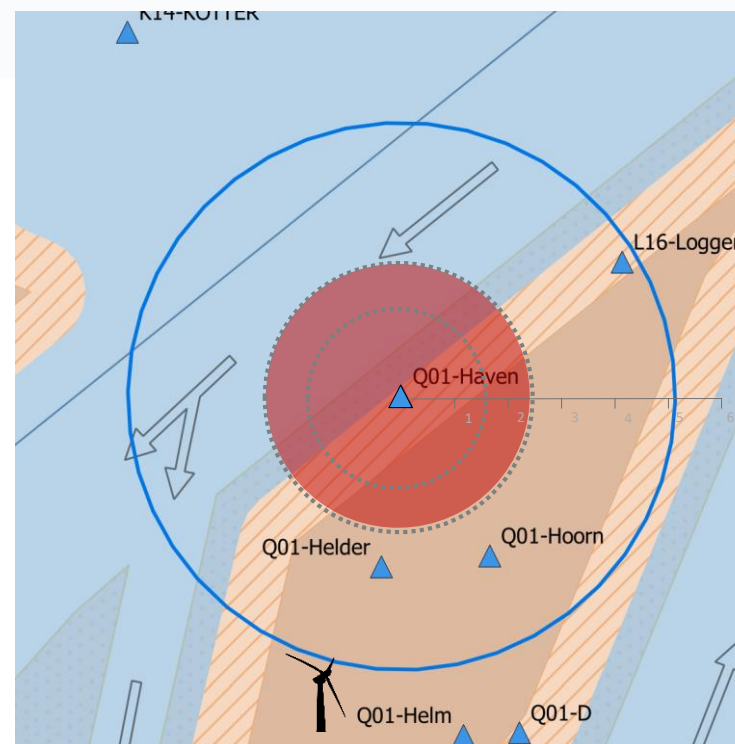
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



Q1-Helder

Departures

Approaches

Baseline

Possible departure directions:

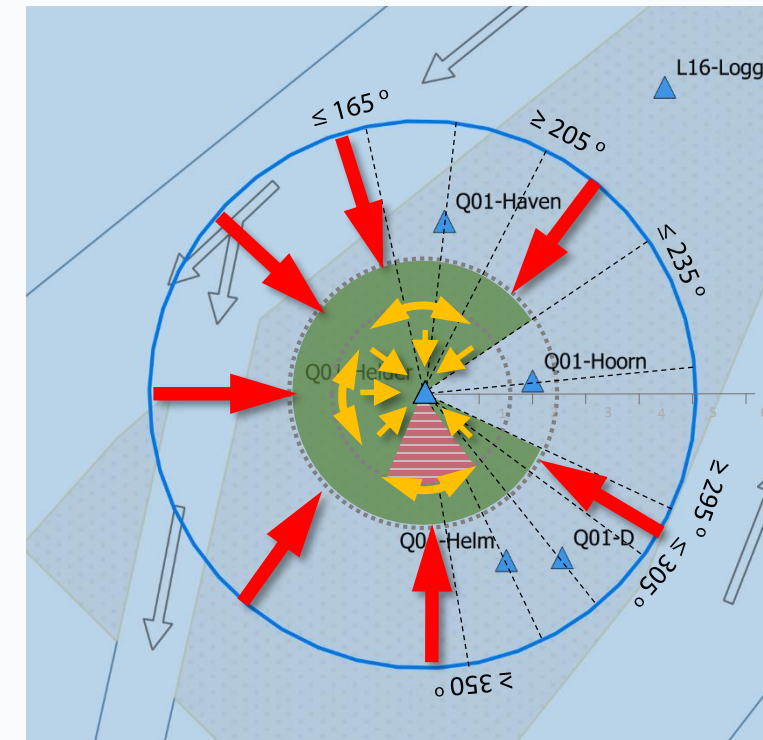
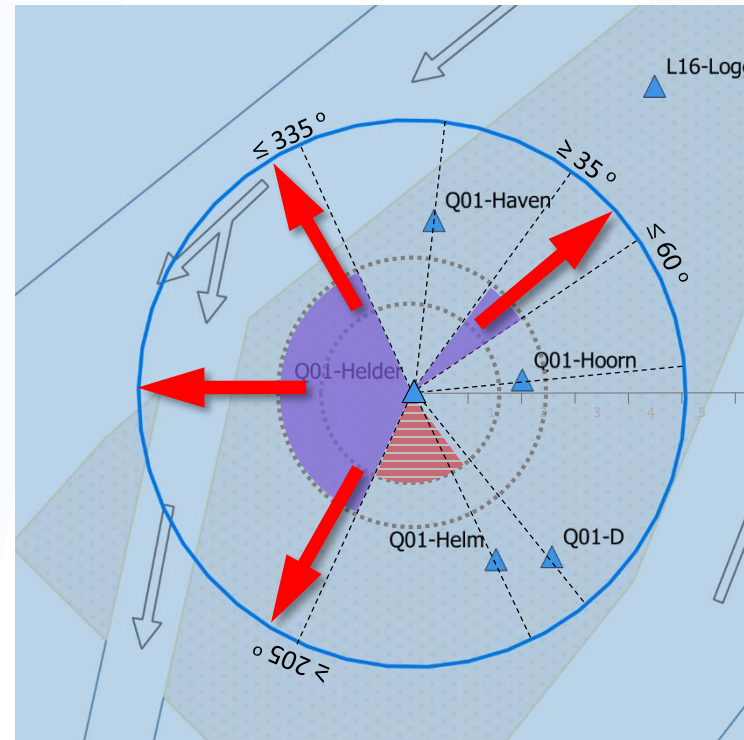
- Between 35° - 60° (25° sector)
- Between 205° - 335° (130° sector)

Possible approach directions:

- Between 205° - 235° (30° sector)
- Between 295° - 305° (10° sector)
- Between 350° - 165° (175° sector)

Accessibility:

- 85 – 95%



Windpark

Possible departure directions:

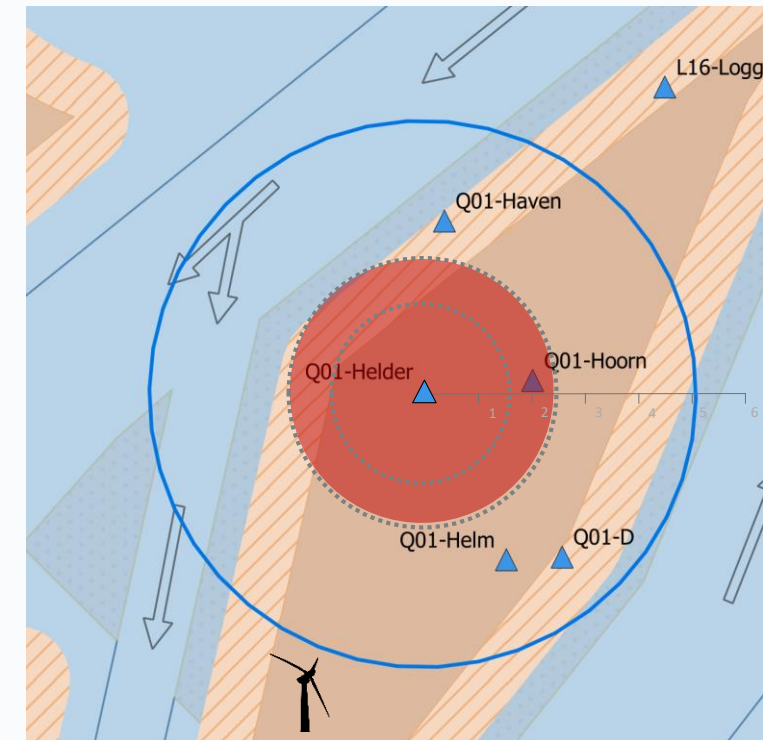
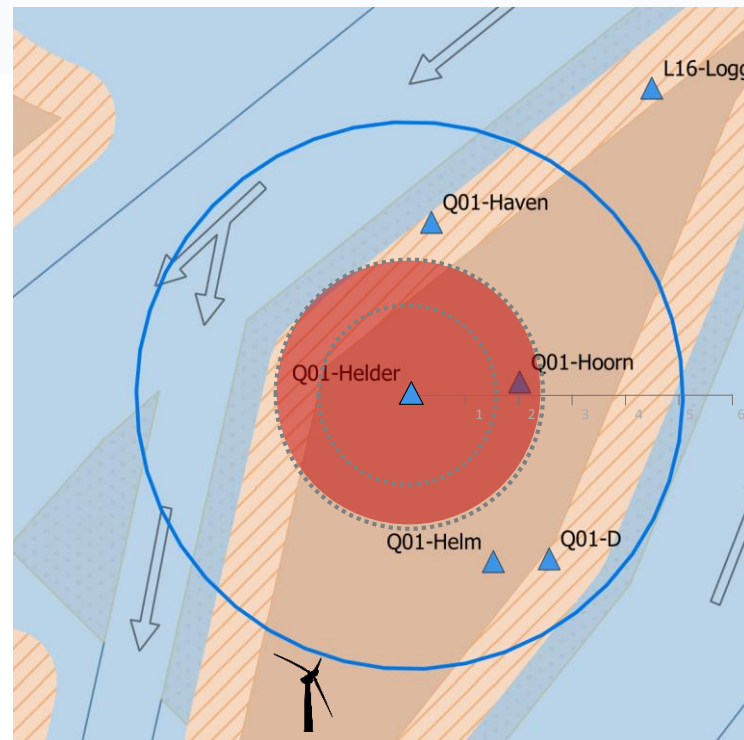
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



Q1-Helm

Departures

Approaches

Baseline

Possible departure directions:

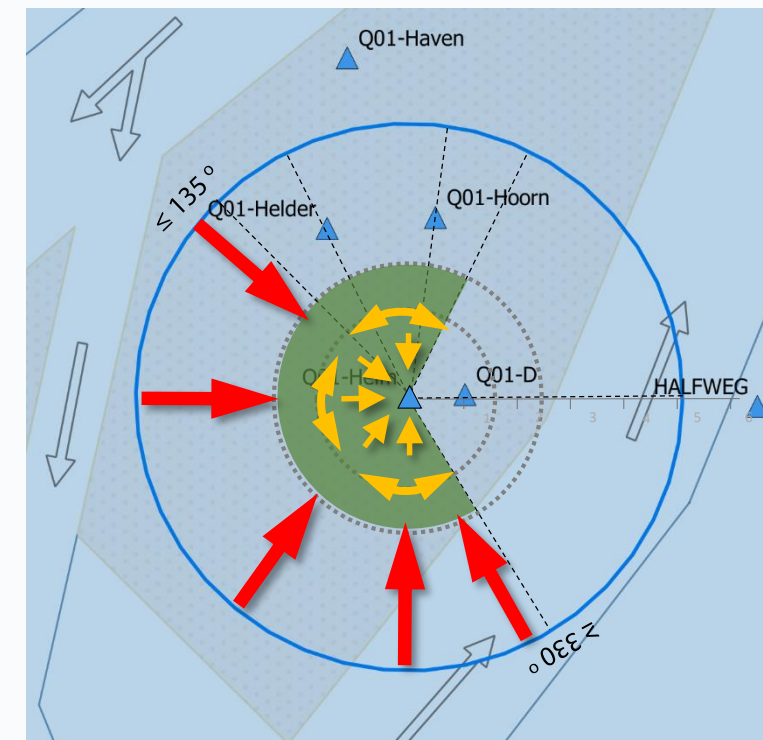
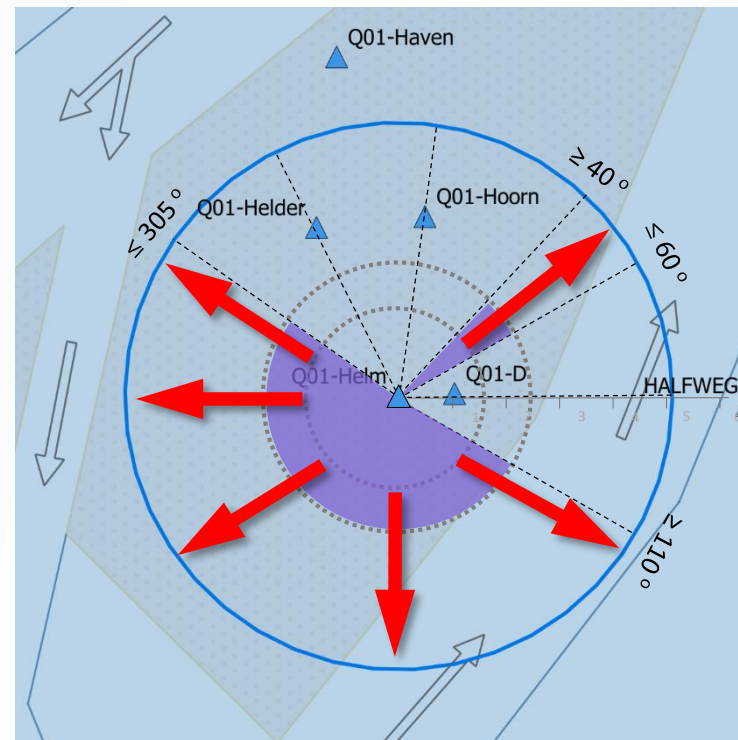
- Between 40° - 60° (20° sector)
- Between 110° - 305° (195° sector)

Possible approach directions:

- Between 330° - 135° (195° sector)

Accessibility:

- 85 – 95%



Windpark

Possible departure directions:

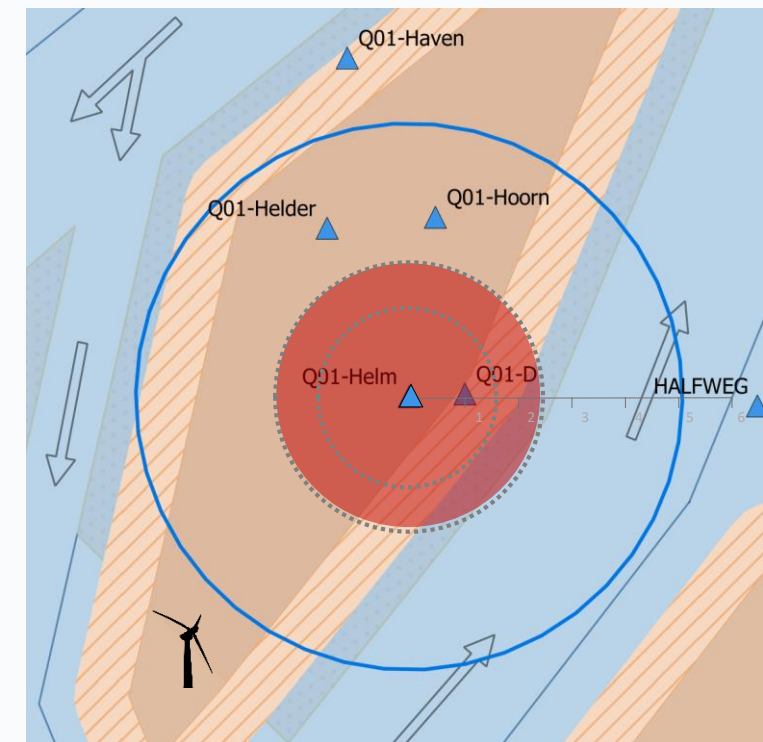
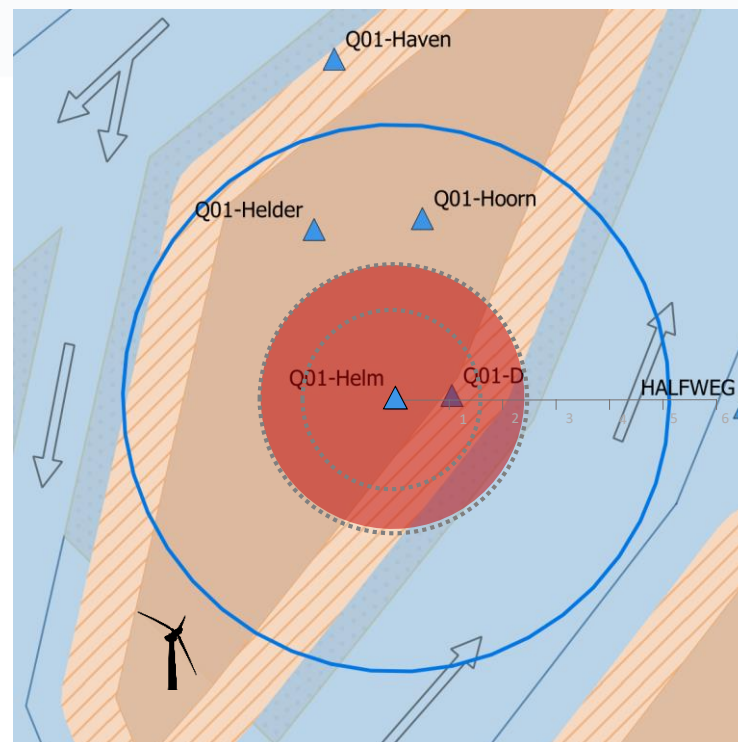
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



Q1-Hoorn

Departures

Approaches

Baseline

Possible departure directions:

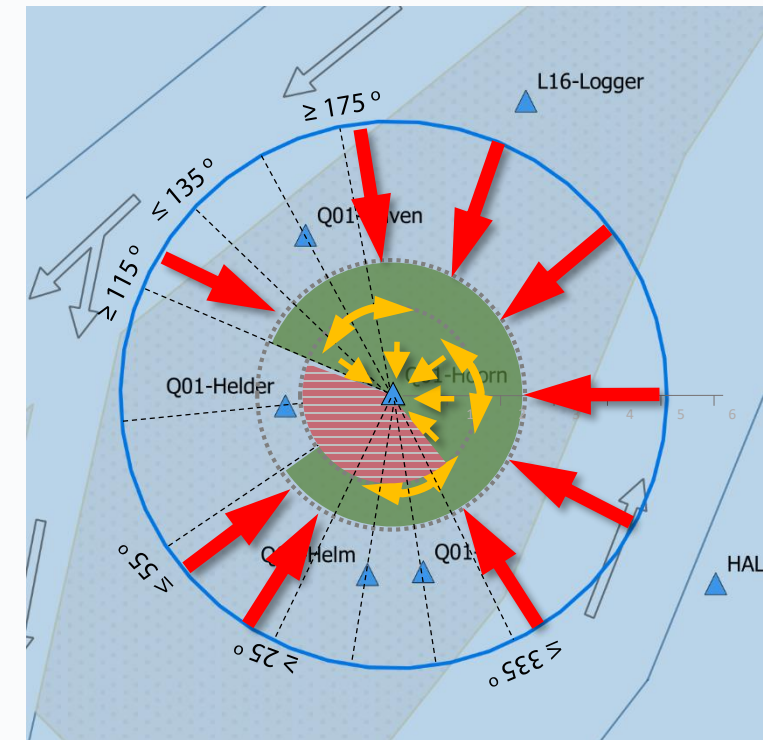
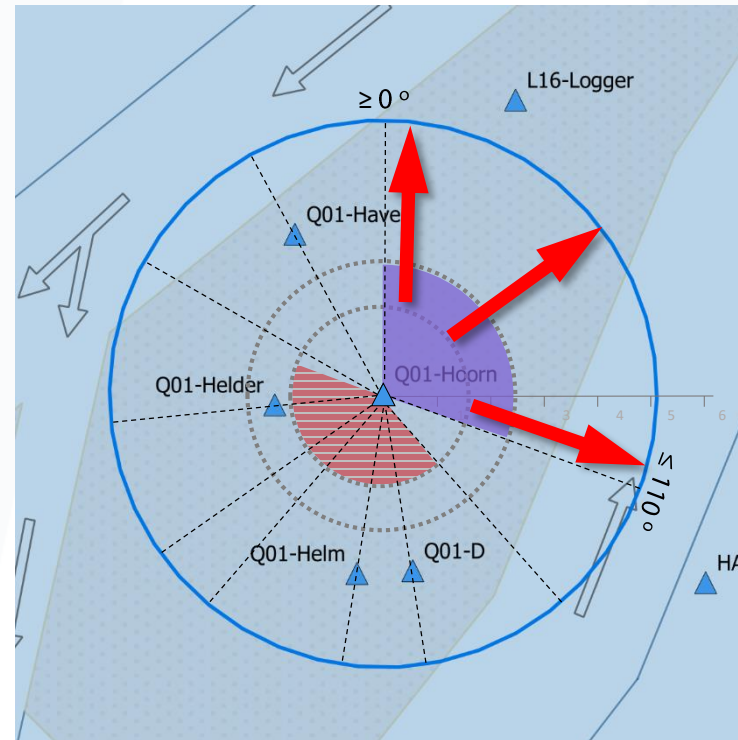
- Between 0° - 110° (110° sector)

Possible approach directions:

- Between 25° - 55° (30° sector)
- Between 115° - 135° (20° sector)
- Between 175° - 355° (180° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

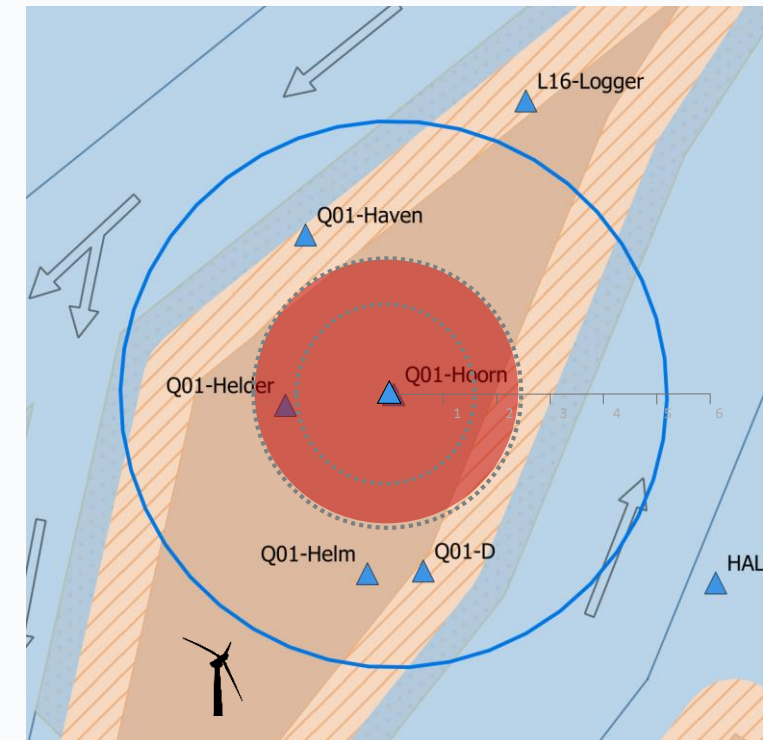
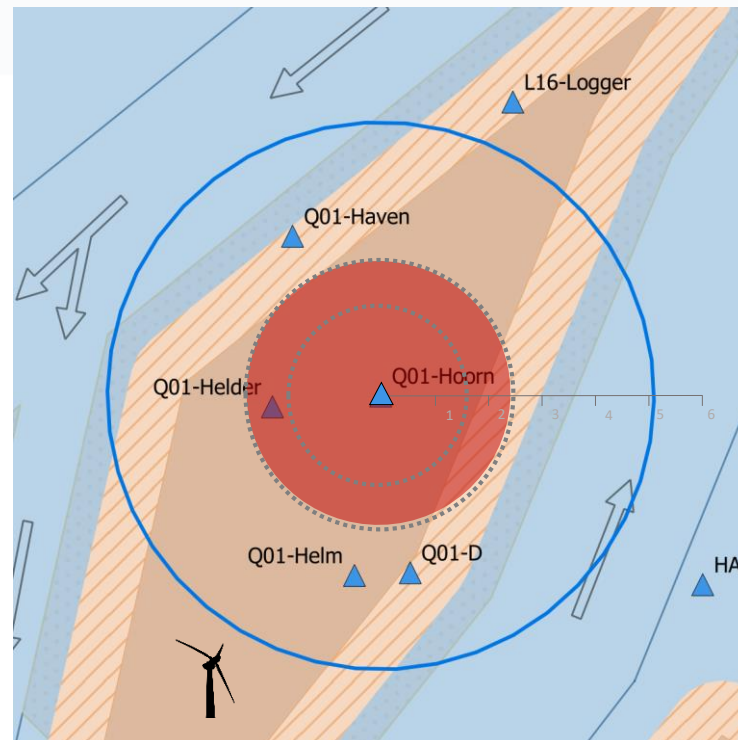
- Not possible

Possible approach directions:

- Not possible

Accessibility:

- Not accessible

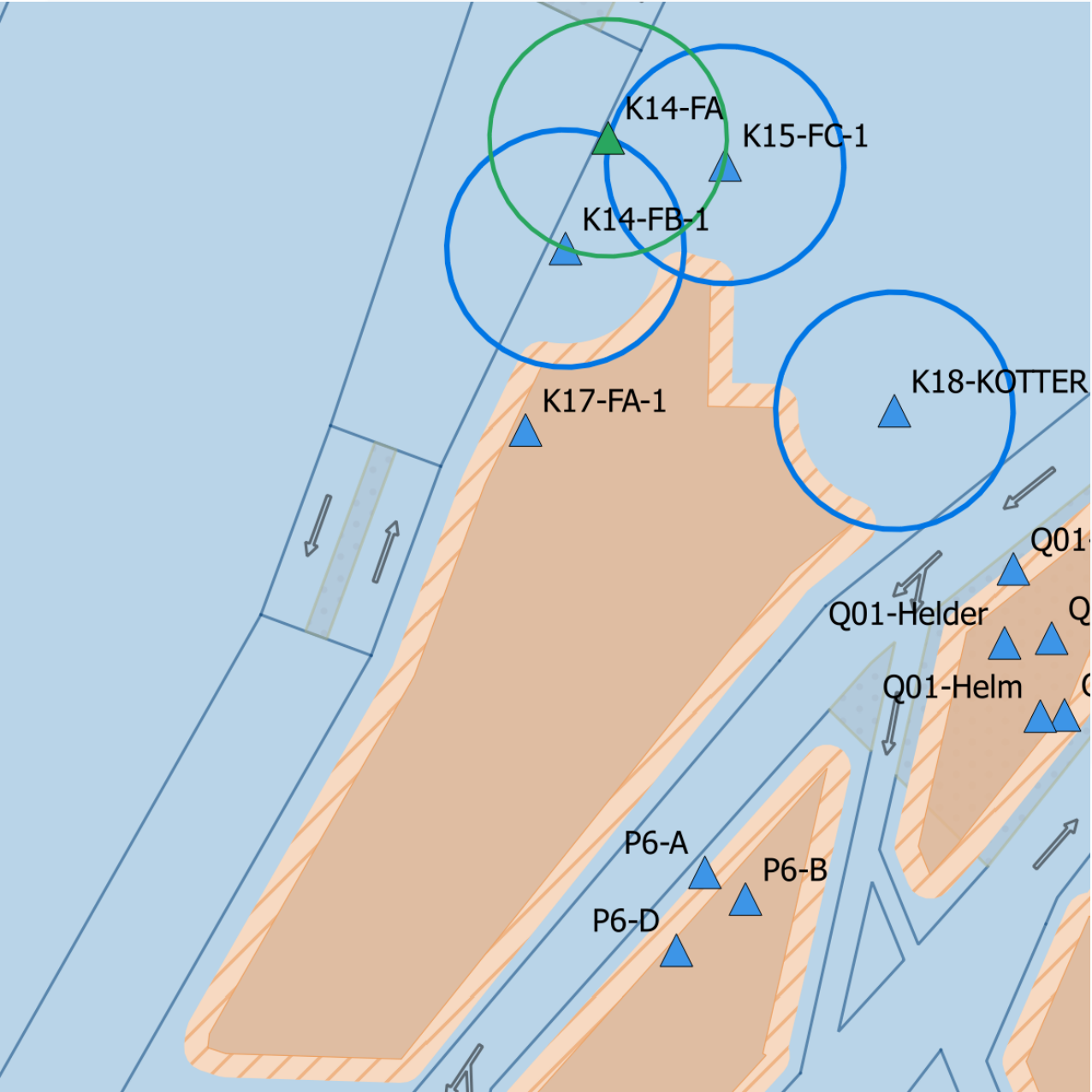


0 1 2 3 4 5 NM

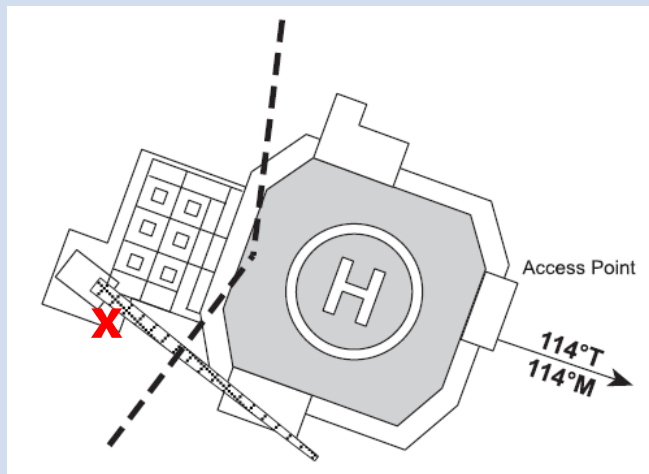


IJmuiden Ver

Platform / Rig Id	Company	Manned?	Impact on accessibility
K14-FB-1	NAM	No	Located outside the designated wind farm zone
K18-KOTTER	WINTERSHALL	Yes	Located outside the designated wind farm zone
K15-FC-1	TAQA	No	Located outside the designated wind farm zone
K14-FA	NAM	Yes	Located outside the designated wind farm zone

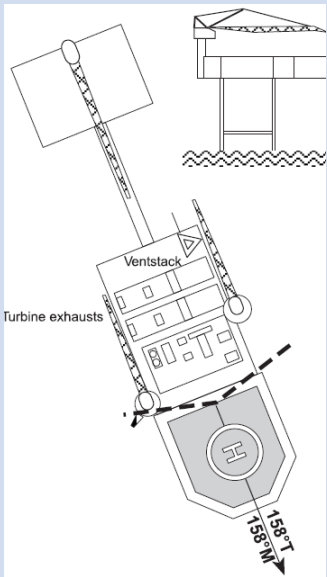


K14-FB-1



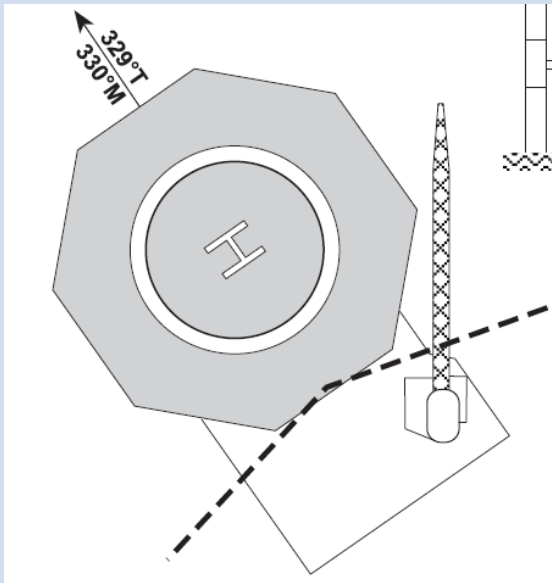
Critical objects in the limited obstacle sector

K18-KOTTER



Critical objects in the limited obstacle sector

K15-FC-1

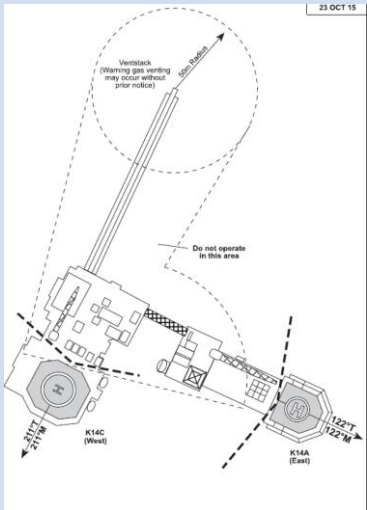


Critical objects in the limited obstacle sector

K17-FA-1

No helideck

K14-FA



Critical objects in the limited obstacle sector

K18-G2

Subsea?
Geen gegevens beschikbaar

K18-G4

Subsea?
Geen gegevens beschikbaar

K14-FB1

Departures

Approaches

Baseline

Possible departure directions:

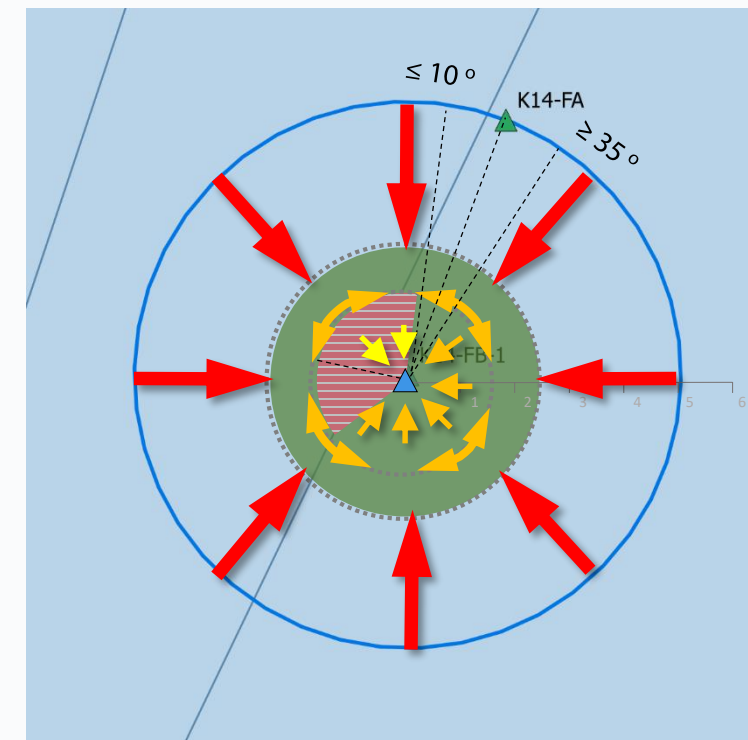
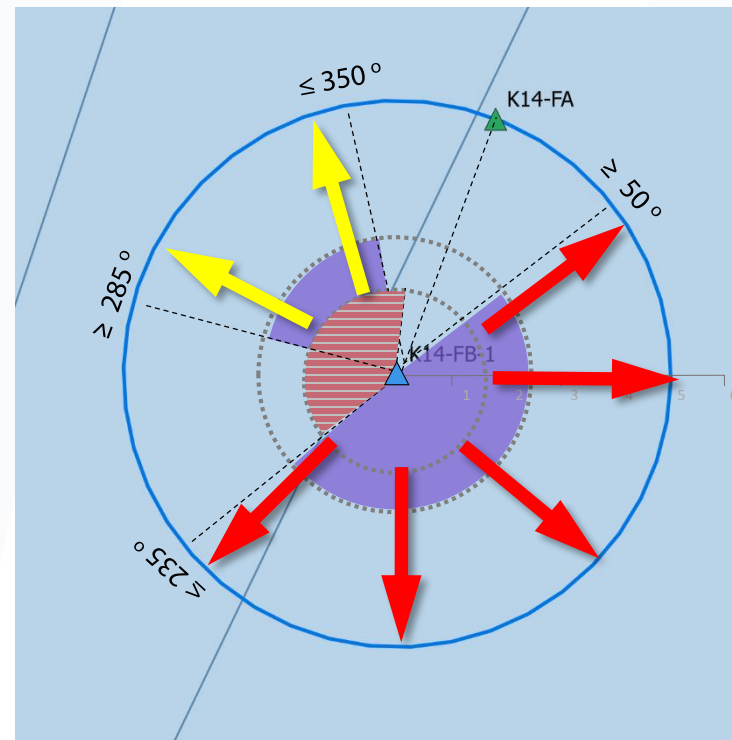
- Between 50° - 235° (185° sector)
- Between 285° - 350° (65° sector)

Possible approach directions:

- Between 35° - 10° (335° sector)

Accessibility:

- 85 – 95%



Windpark

Possible departure directions:

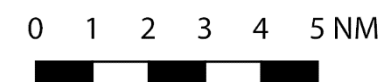
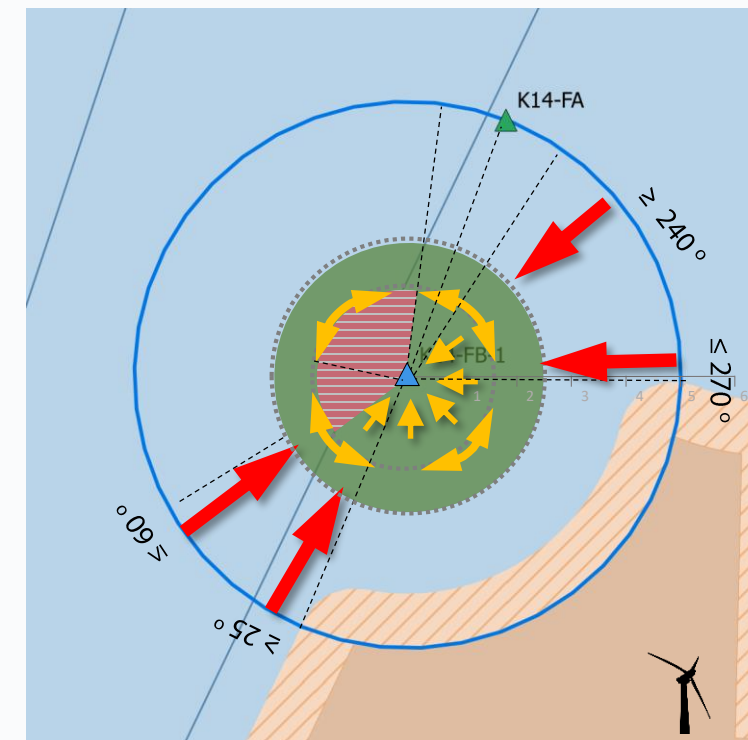
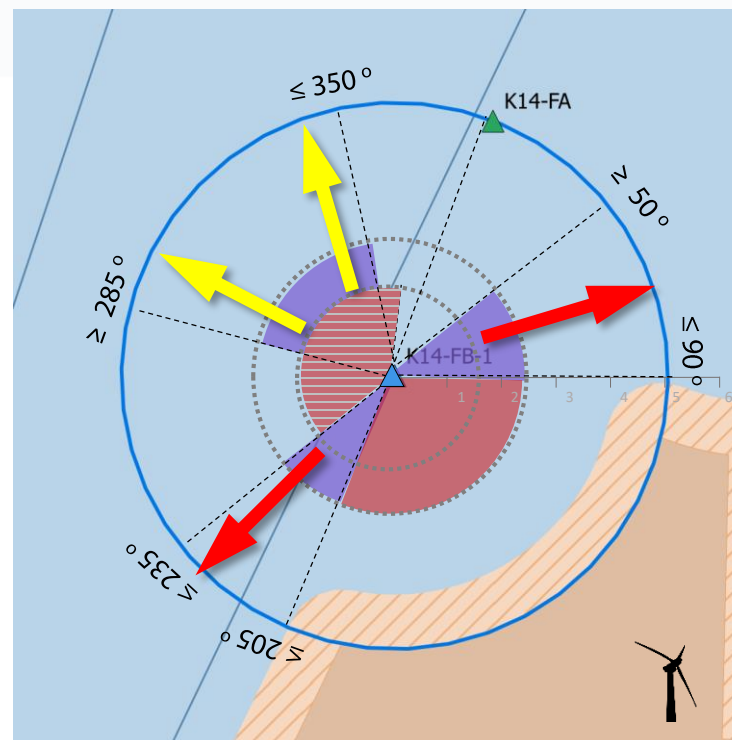
- Between 50° - 90° (40° sector)
- Between 205° - 235° (30° sector)
- Between 285° - 350° (65° sector)

Possible approach directions:

- Between 25° - 60° (35° sector)
- Between 240° - 270° (30° sector)
- Due to missed approach no other approach directions are possible

Accessibility:

- 70 – 90%



K18-Kotter

Departures

Approaches

Baseline

Possible departure directions:

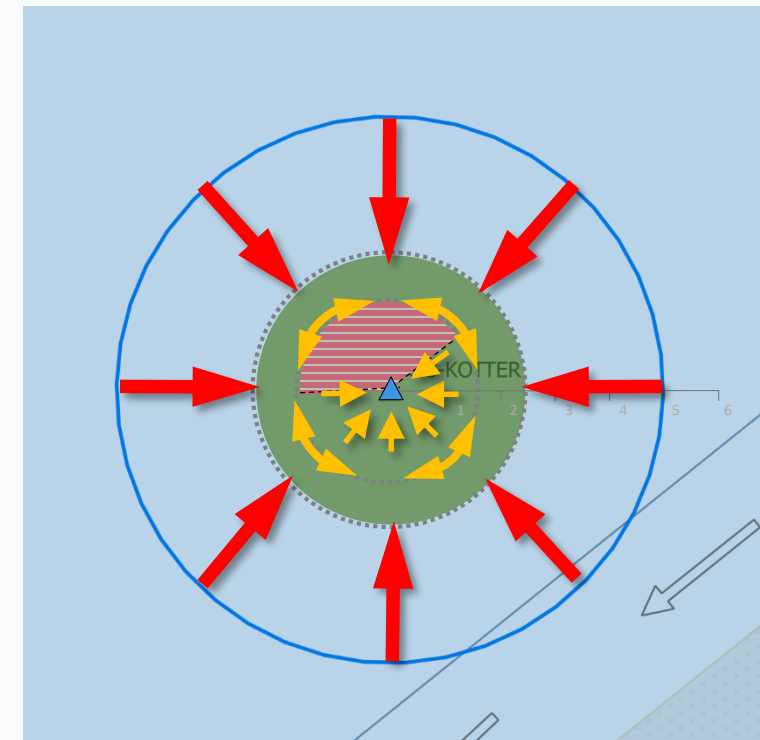
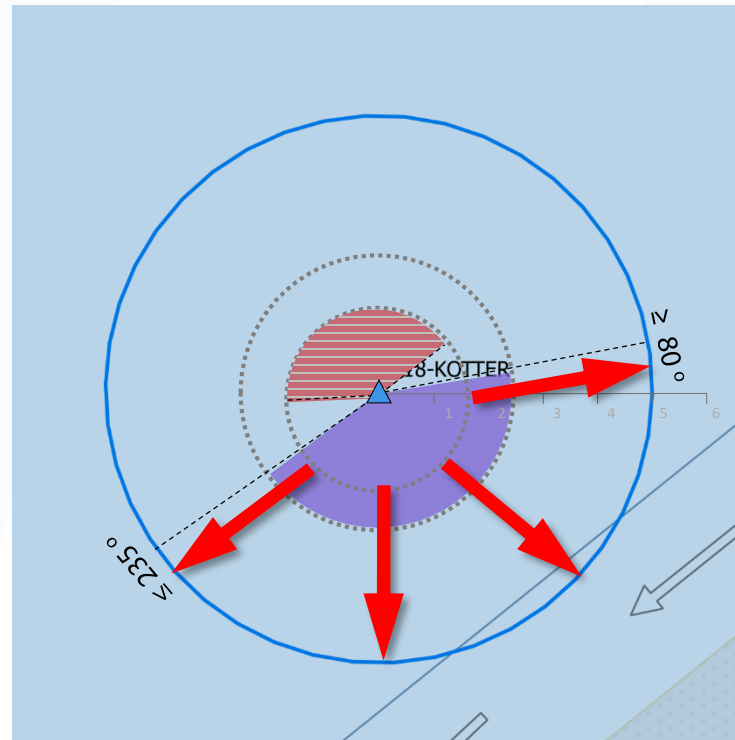
- Between 80° - 235° (155° sector)

Possible approach directions:

- All (360° sector)

Accessibility:

- 70 – 90%



Windpark

Possible departure directions:

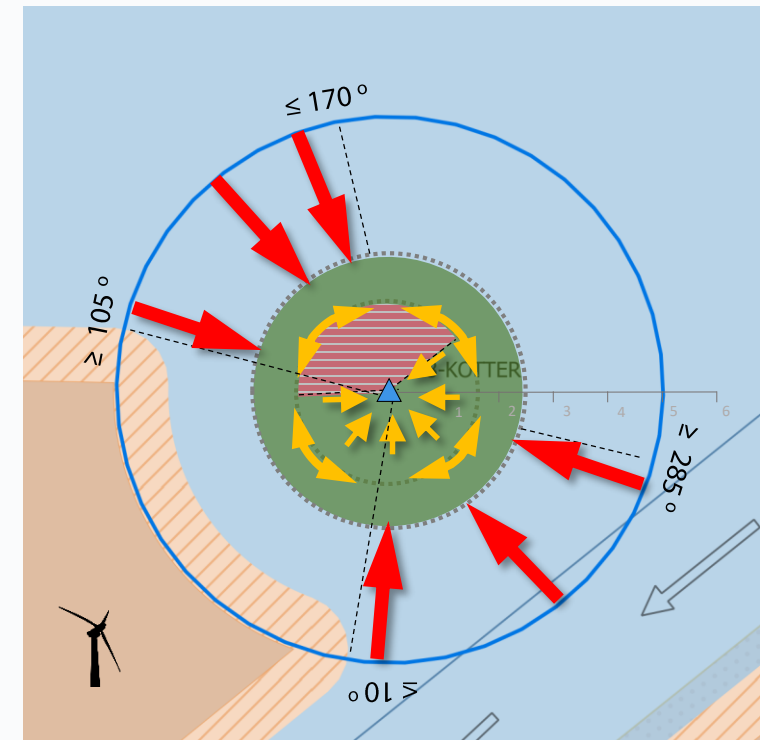
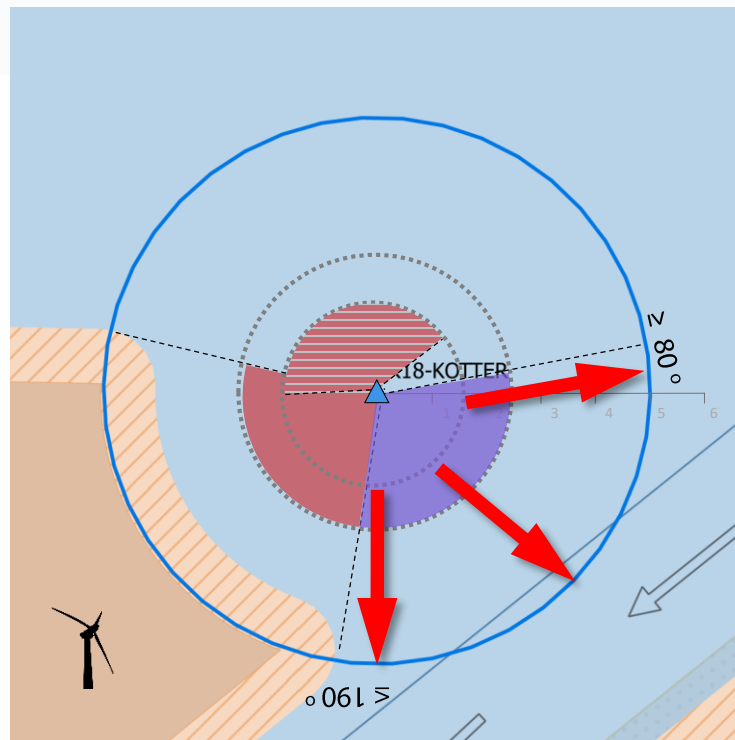
- Between 80° - 190° (90° sector)

Possible approach directions:

- Between 105° - 170° (65° sector)
- Between 285° - 10° (85° sector)
- Due to missed approach no other approach directions are possible

Accessibility:

- 35 – 65%



0 1 2 3 4 5 NM



K15-FC1

Departures

Approaches

Baseline

Possible departure directions:

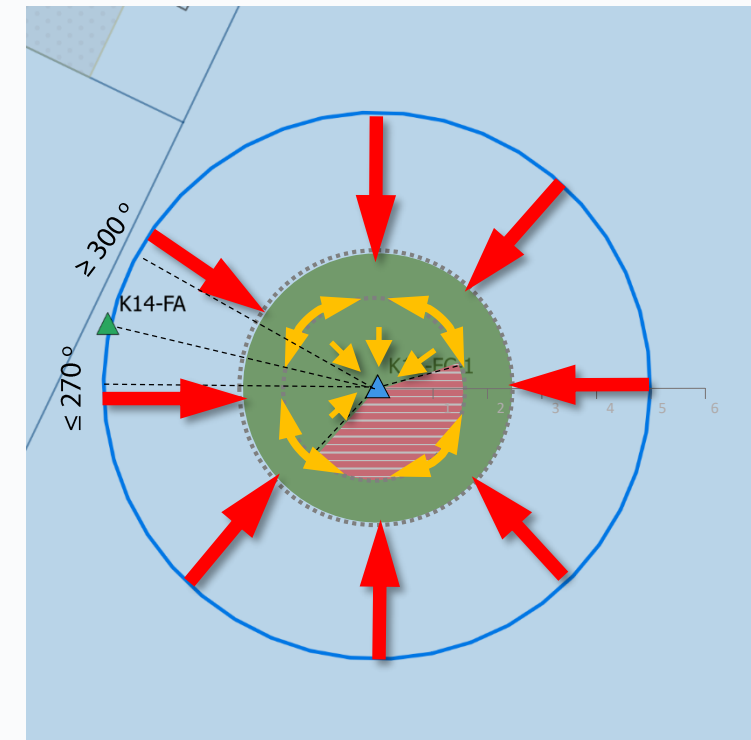
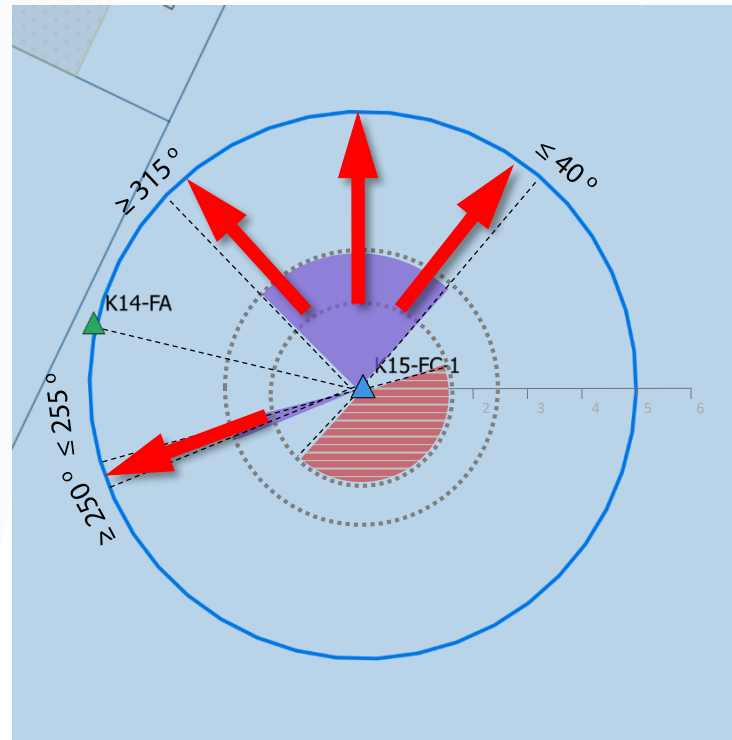
- Between 250° - 255° (5° sector)
- Between 315° - 40° (85° sector)

Possible approach directions:

- Between 300° - 270° (330° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

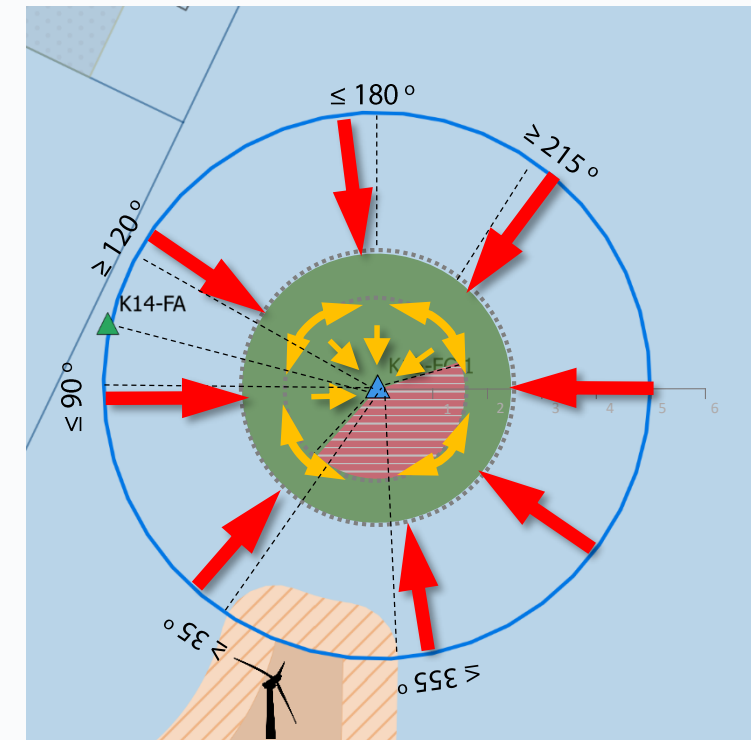
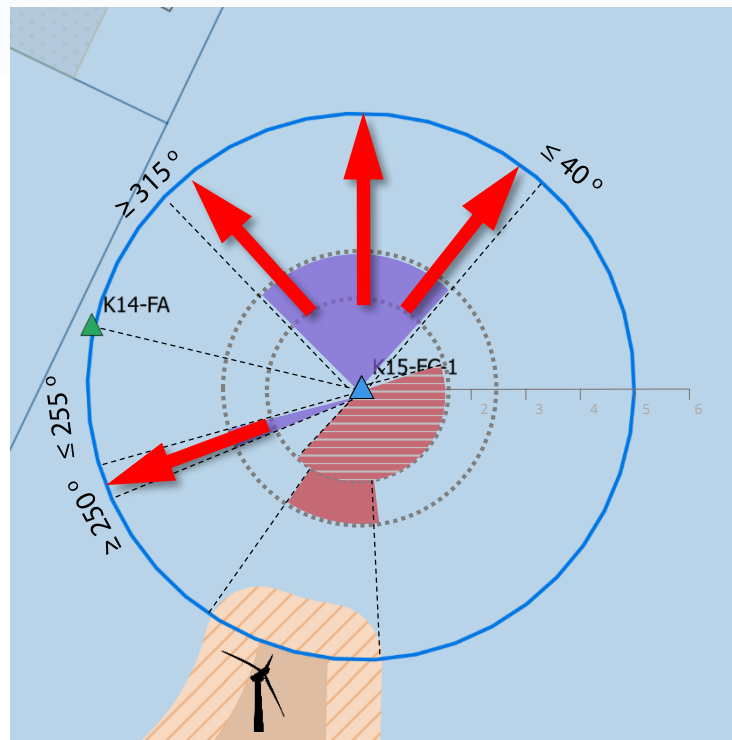
- Between 250° - 255° (5° sector)
- Between 315° - 40° (85° sector)

Possible approach directions:

- Between 35° - 90° (55° sector)
- Between 120° - 180° (60° sector)
- Between 215° - 355° (140° sector)
- Due to missed approach no other approach directions are possible

Accessibility:

- 60 – 80%



0 1 2 3 4 5 NM



K14-C

Departures

Approaches

Baseline

Possible departure directions:

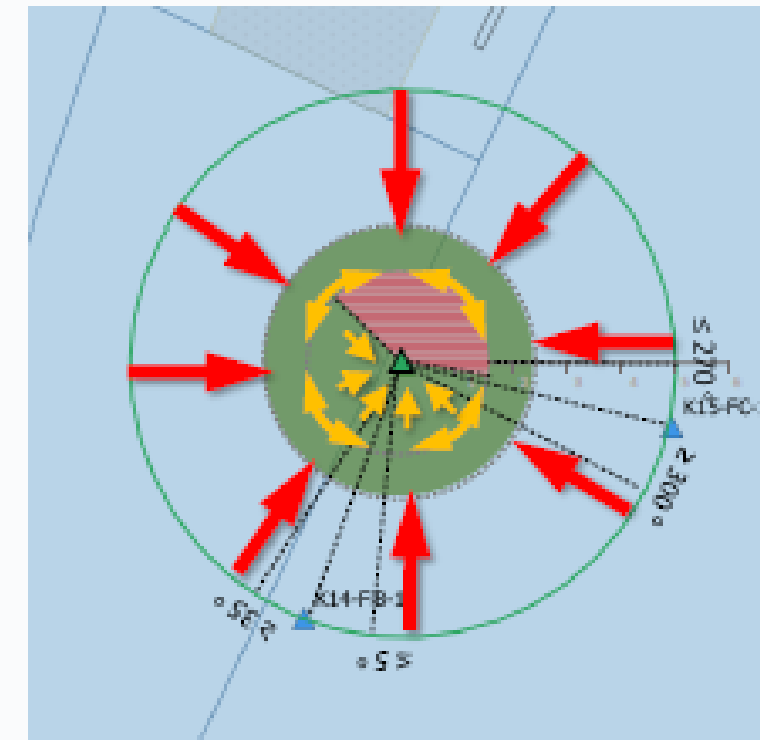
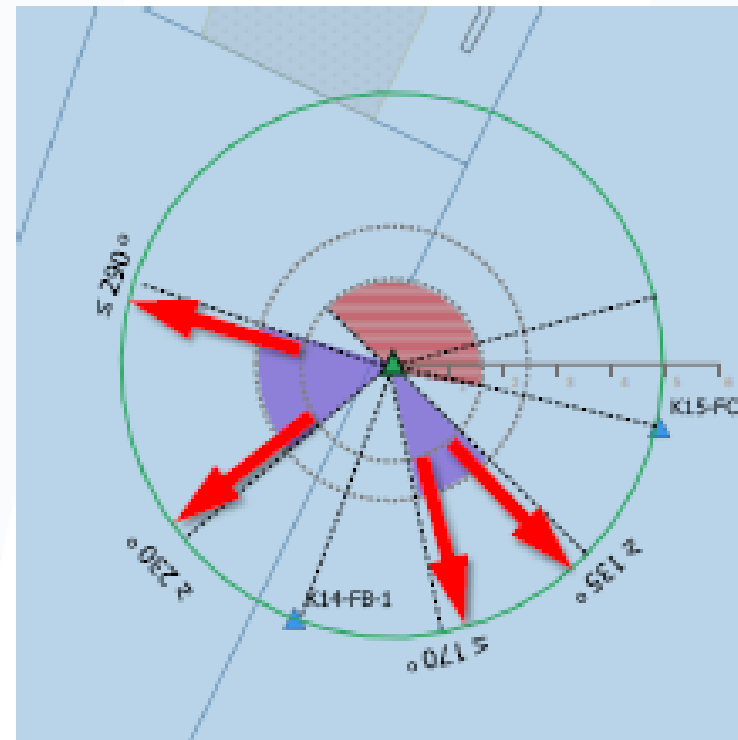
- Between 135° - 170° (35° sector)
- Between 230° - 290° (60° sector)

Possible approach directions:

- Between 35° - 270° (235° sector)
- Between 300° - 5° (65° sector)

Accessibility:

- 70 – 90%



Windpark

Possible departure directions:

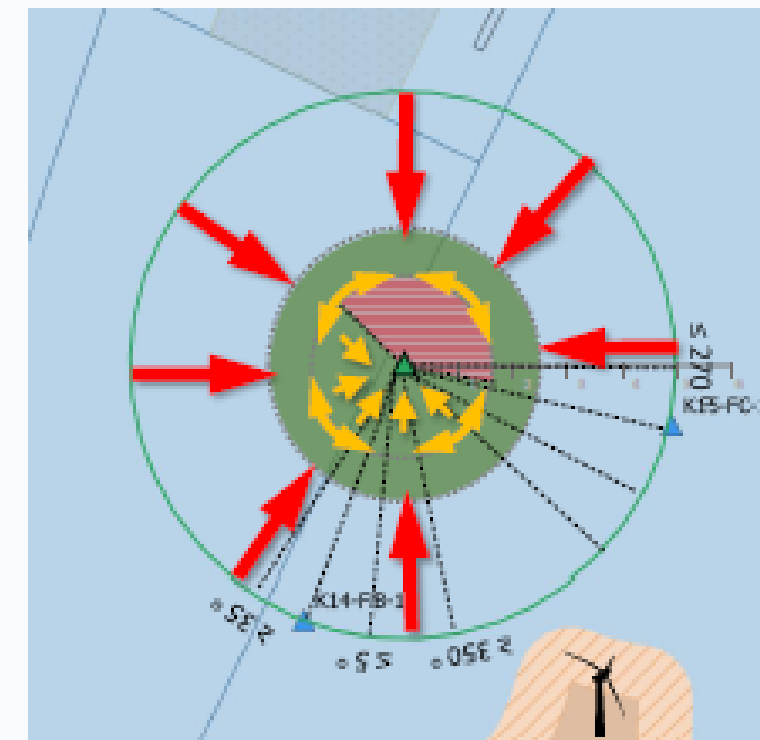
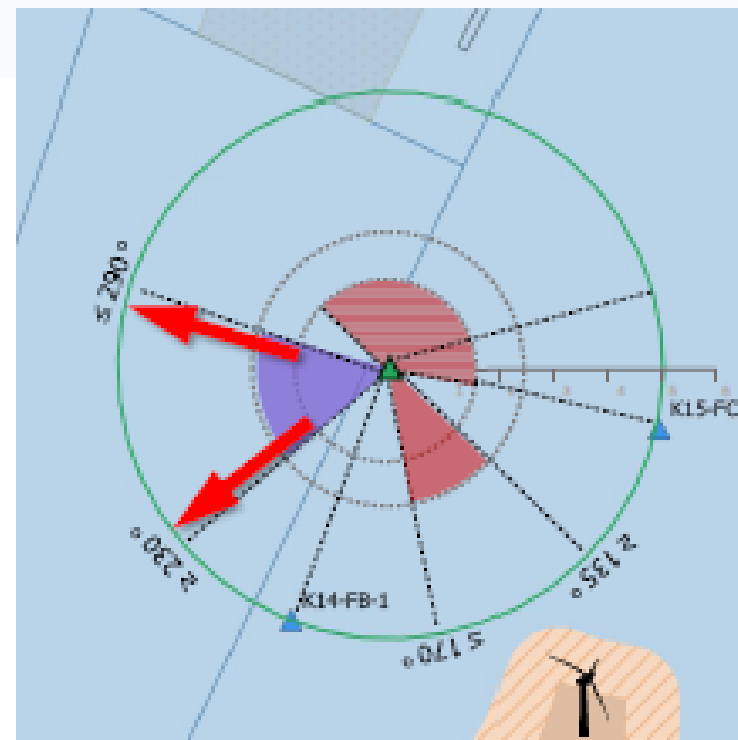
- Between 230° - 290° (60° sector)

Possible approach directions:

- Between 35° - 270° (235° sector)
- Between 350° - 5° (15° sector)

Accessibility:

- 35 – 65%



0 1 2 3 4 5 NM



K14-A

Departures

Approaches

Baseline

Possible departure directions:

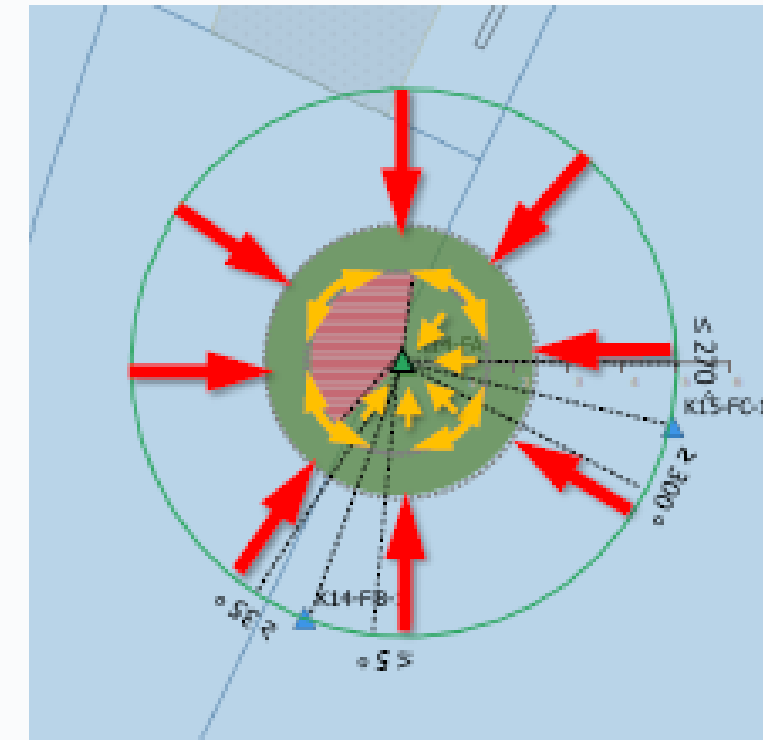
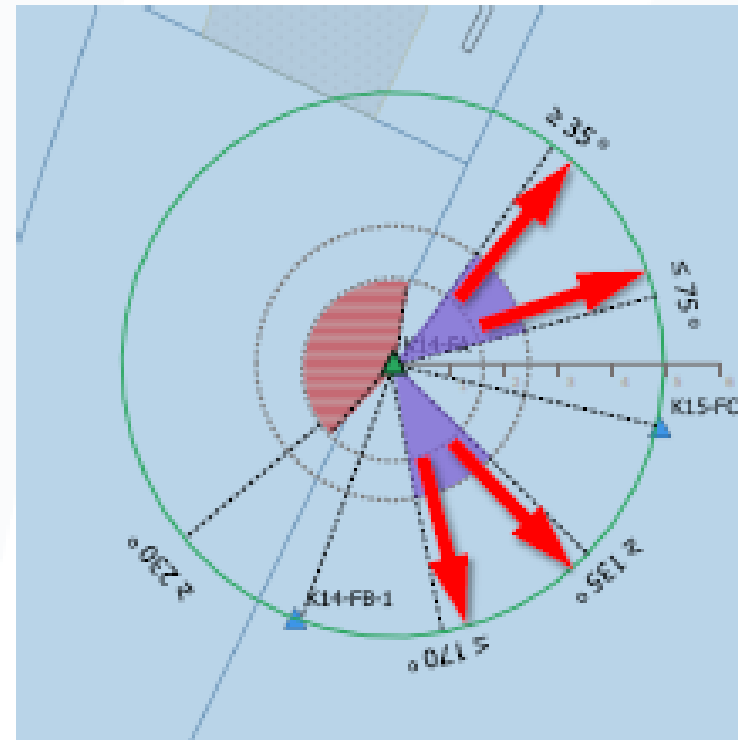
- Between 35° - 75° (40° sector)
- Between 135° - 170° (35° sector)

Possible approach directions:

- Between 35° - 270° (235° sector)
- Between 300° - 5° (65° sector)

Accessibility:

- 60 – 80%



Windpark

Possible departure directions:

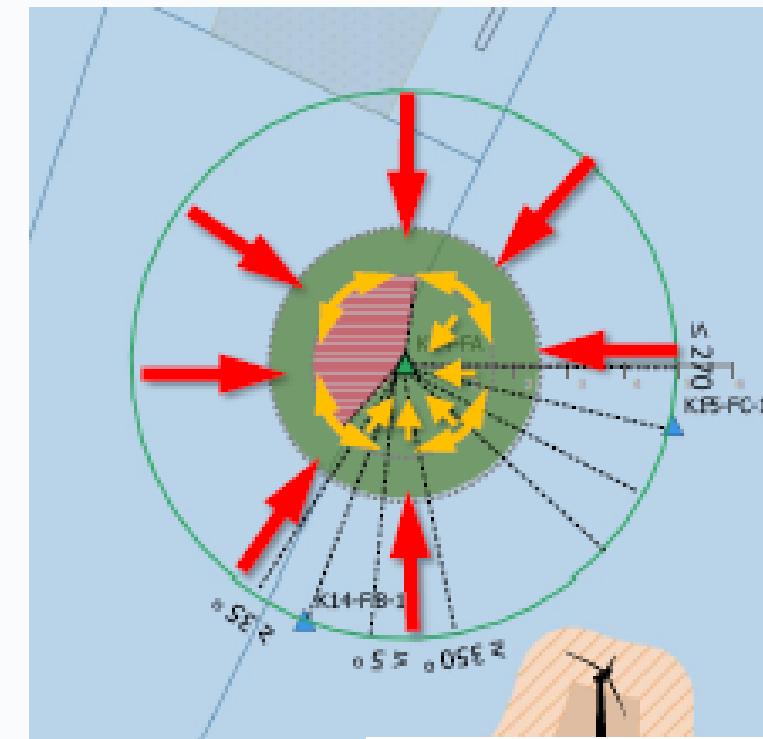
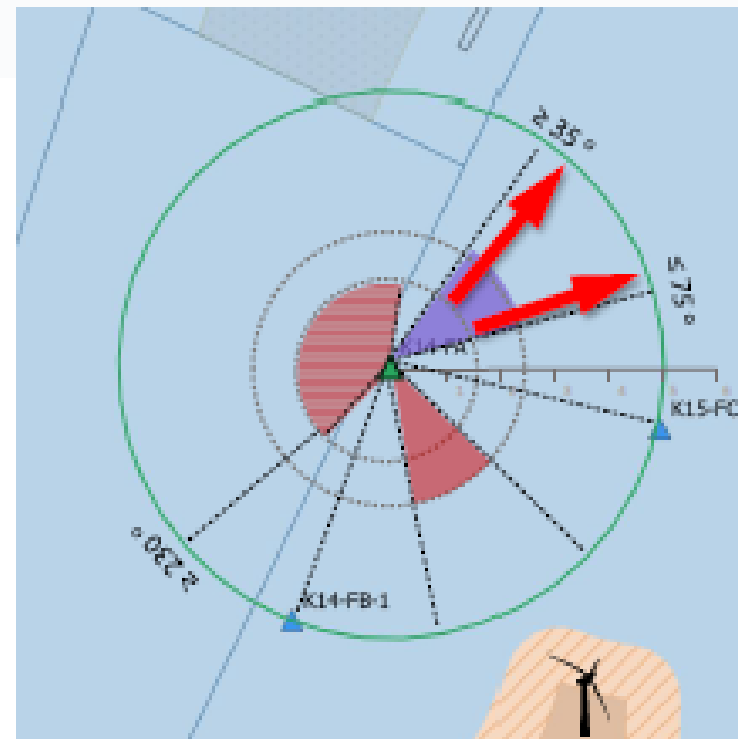
- Between 35° - 75° (40° sector)

Possible approach directions:

- Between 35° - 270° (235° sector)
- Between 350° - 5° (15° sector)

Accessibility:

- 35 – 65%

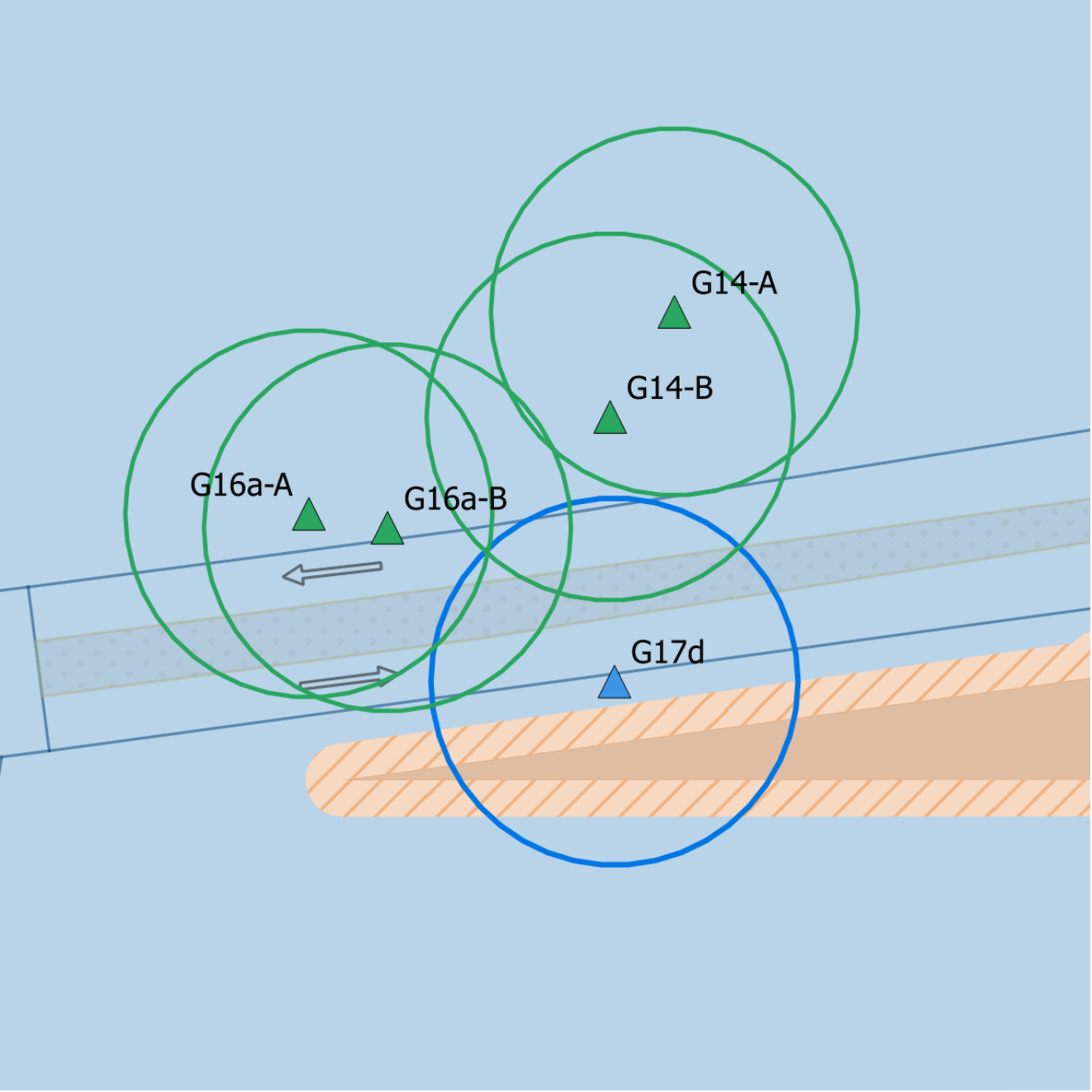


0 1 2 3 4 5 NM

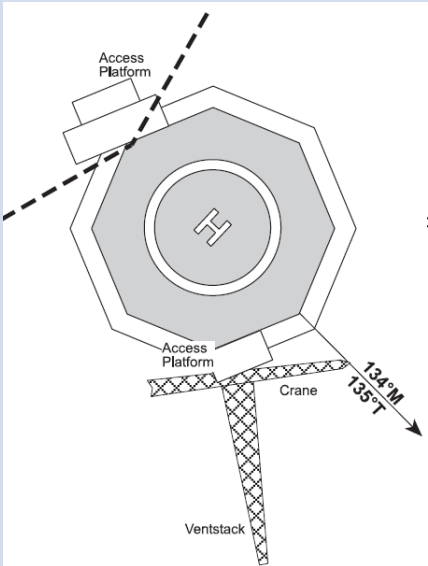
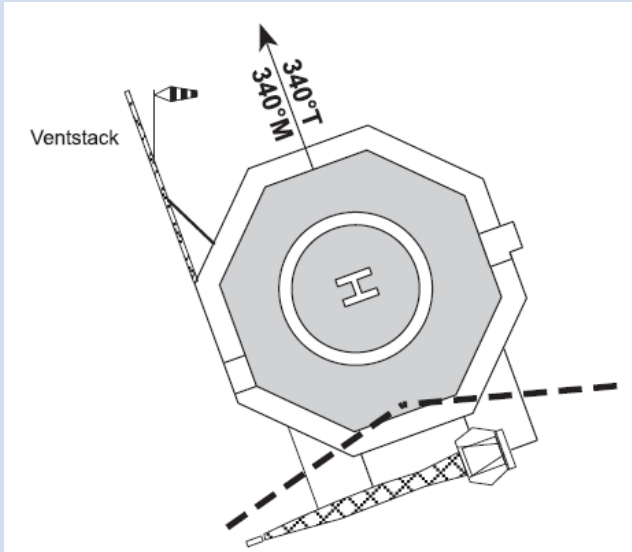
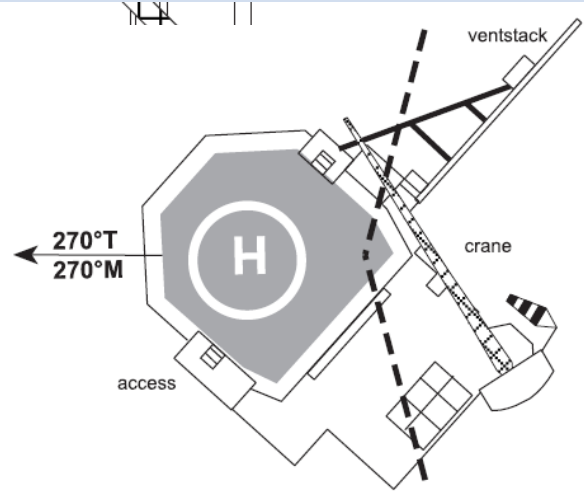
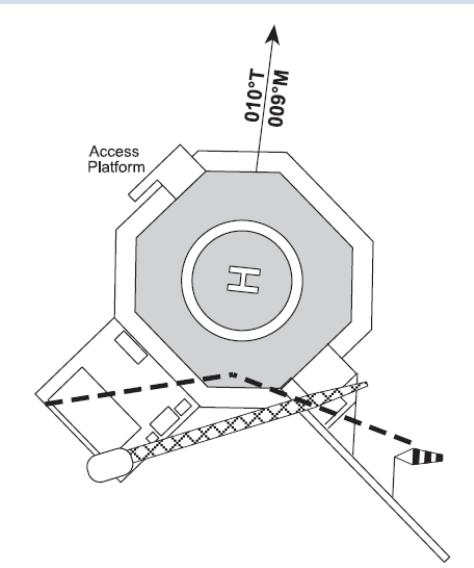


Boven de Wadden

Platform / Rig Id	Company	Manned?	Impact on accessibility
G17d	ENGIE	Yes	Located outside the designated wind farm zone and the visual maneuvering circle of 2,5 NM is not available
G16a-A	ENGIE	No	Located outside the designated wind farm zone
G16a-B	ENGIE	No	Located outside the designated wind farm zone
G14-A	ENGIE	No	Located outside the designated wind farm zone
G14-B	ENGIE	No	Located outside the designated wind farm zone



Boven de Wadden

G17d	G17a-S1	G16a-A	G16a-B
	<p>Subsea? Geen gegevens beschikbaar</p>		
No critical objects in the limited obstacle sector		No critical objects in the limited obstacle sector	No critical objects in the limited obstacle sector
G14-A	G14-B		
	<p>Geen plate beschikbaar</p>		
No critical objects in the limited obstacle sector			

G17-D

Departures

Approaches

Baseline

Possible departure directions:

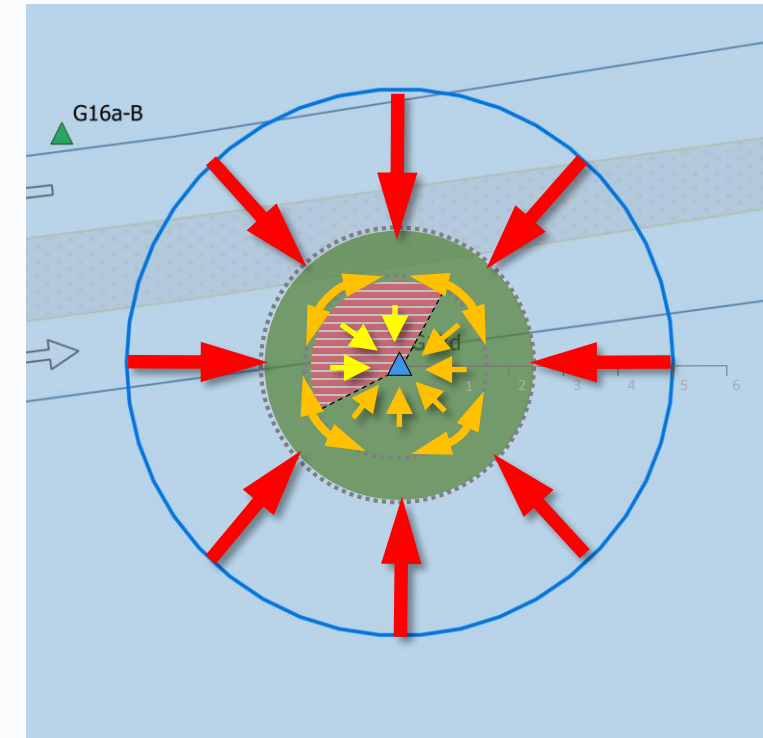
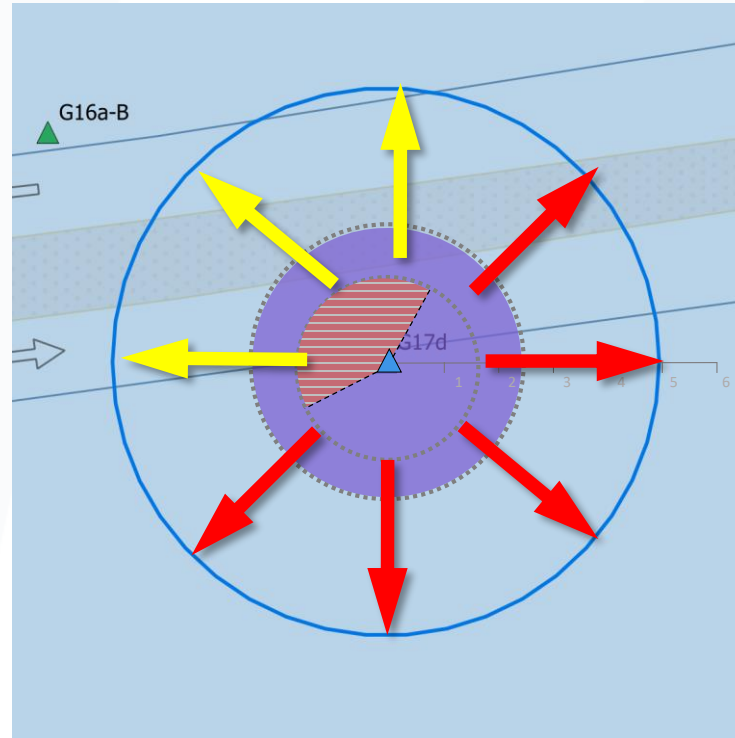
- All (360° sector)

Possible approach directions:

- All (360° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

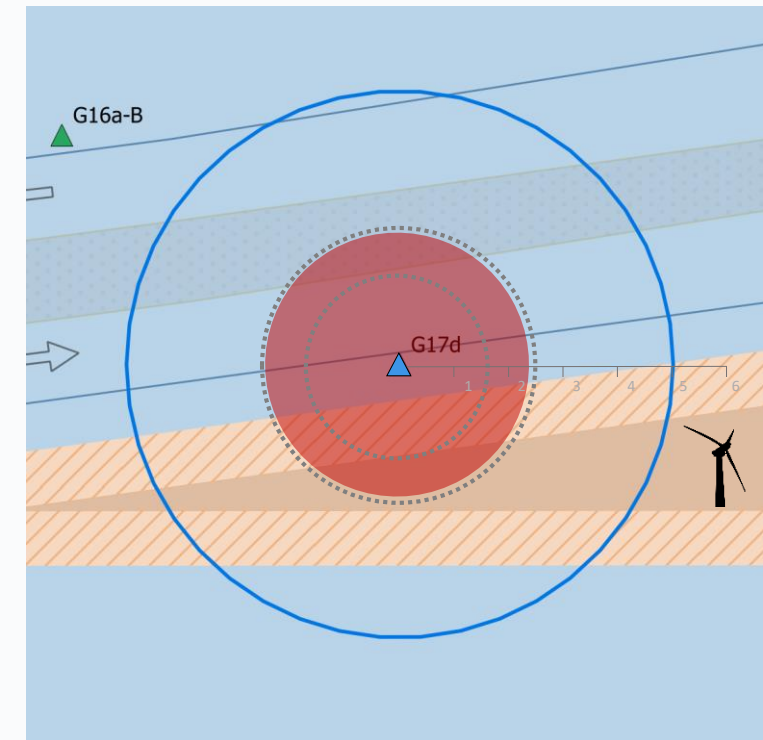
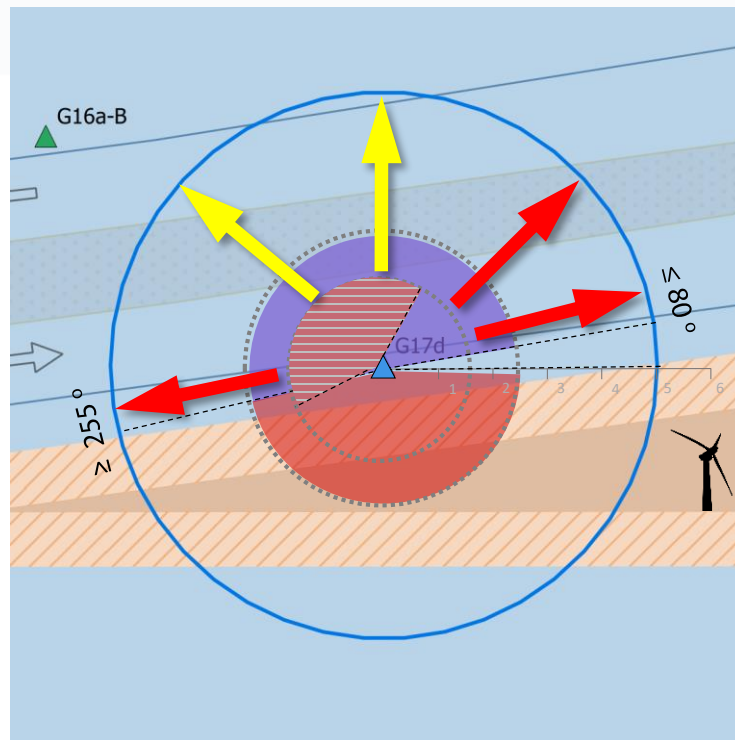
- Between 255° - 80° (225° sector)

Possible approach directions:

- No missed approach is possible

Accessibility:

- Not accessible



0 1 2 3 4 5 NM



G16a-A

Departures

Approaches

Baseline

Possible departure directions:

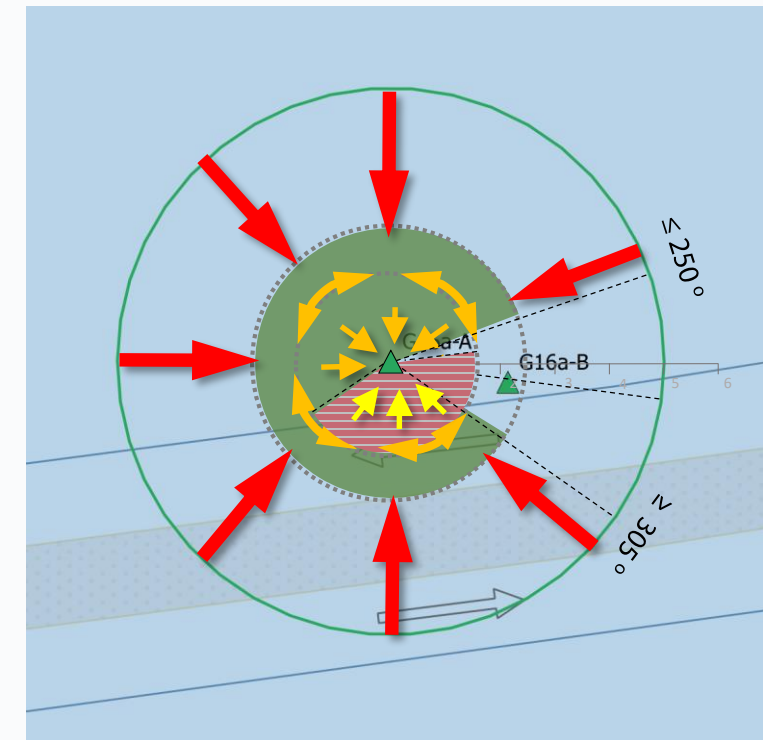
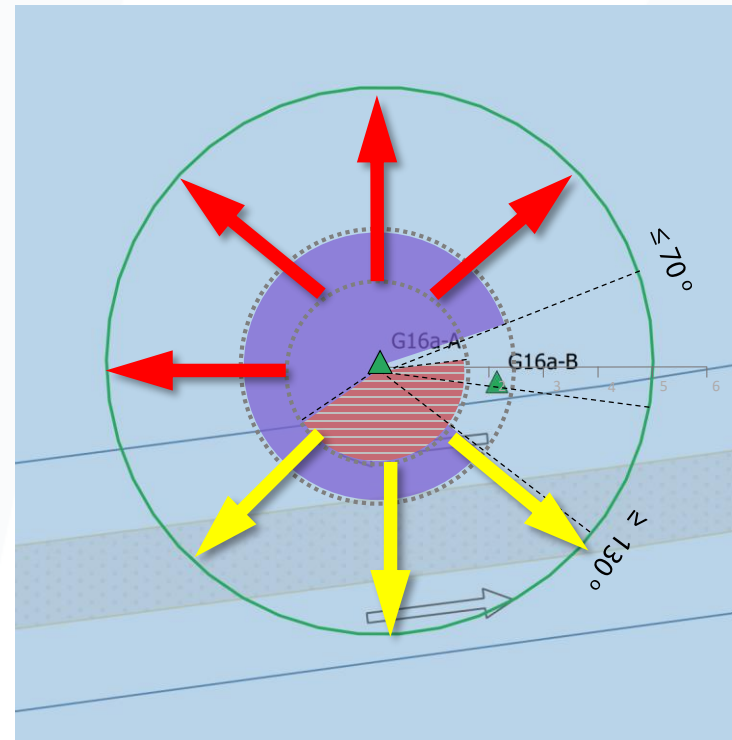
- Between 130° - 70° (310° sector)

Possible approach directions:

- Between 305° - 250° (305° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

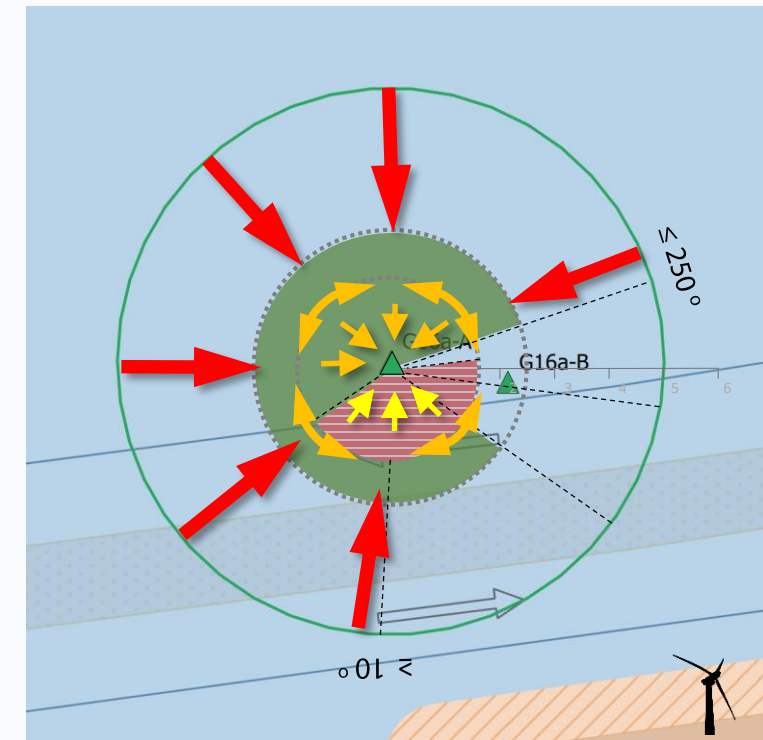
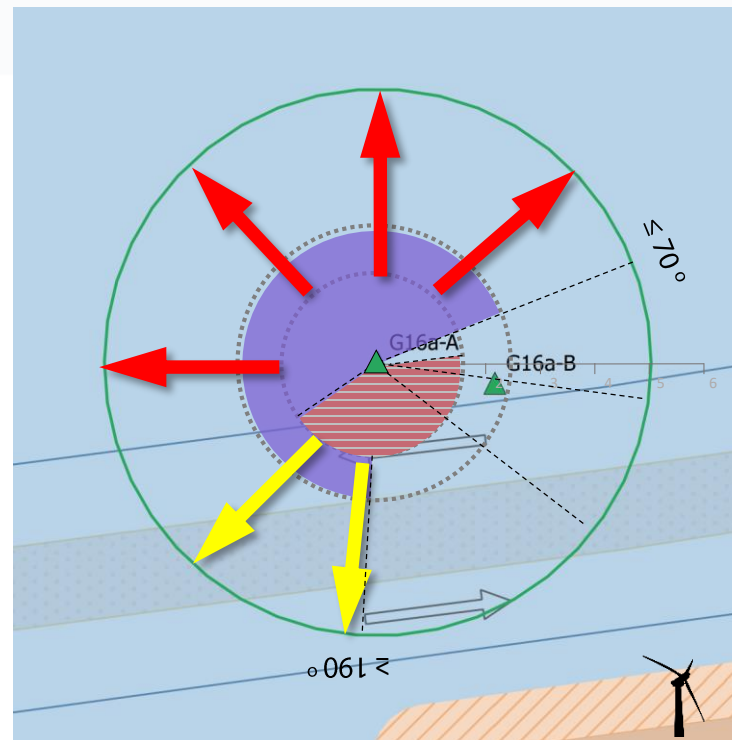
- Between 190° - 70° (250° sector)

Possible approach directions:

- Between 10° - 250° (240° sector)

Accessibility:

- 85 – 95%



G16a-B

Departures

Approaches

Baseline

Possible departure directions:

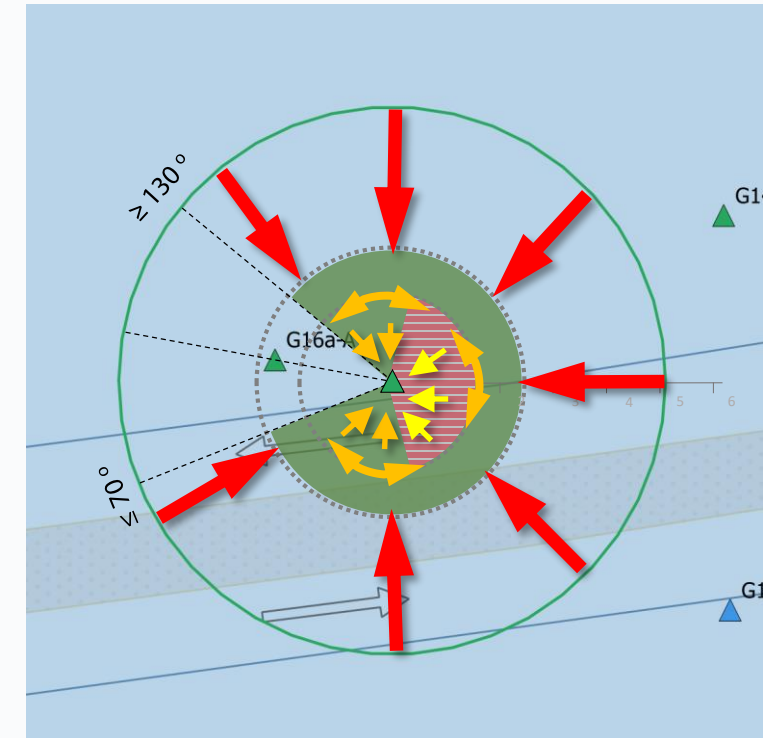
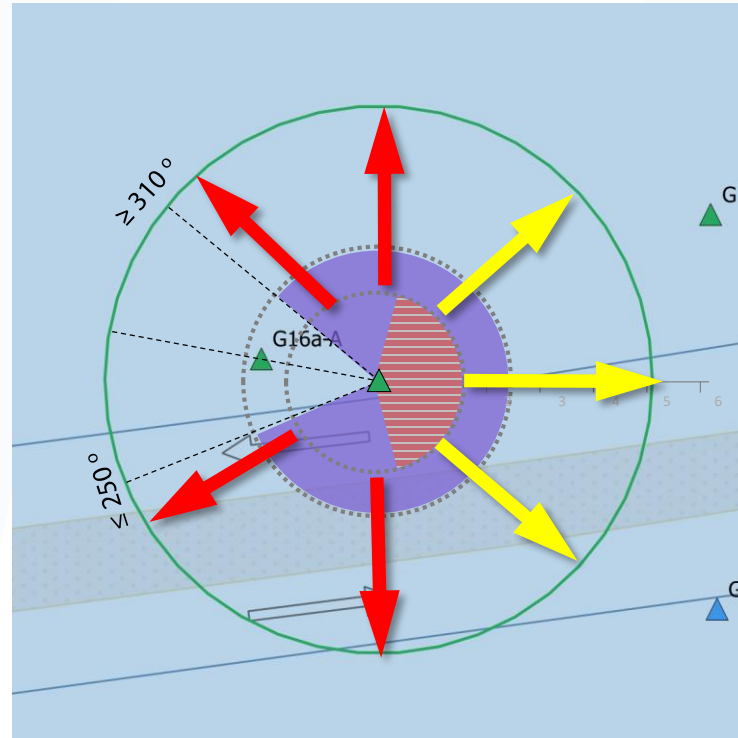
- Between 310° - 250° (300° sector)

Possible approach directions:

- Between 130° - 70° (300° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

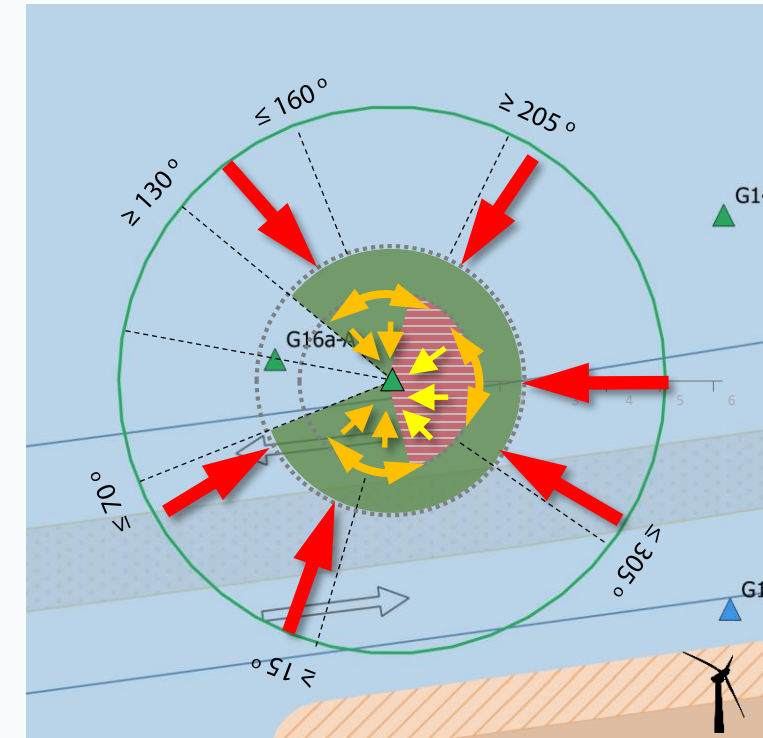
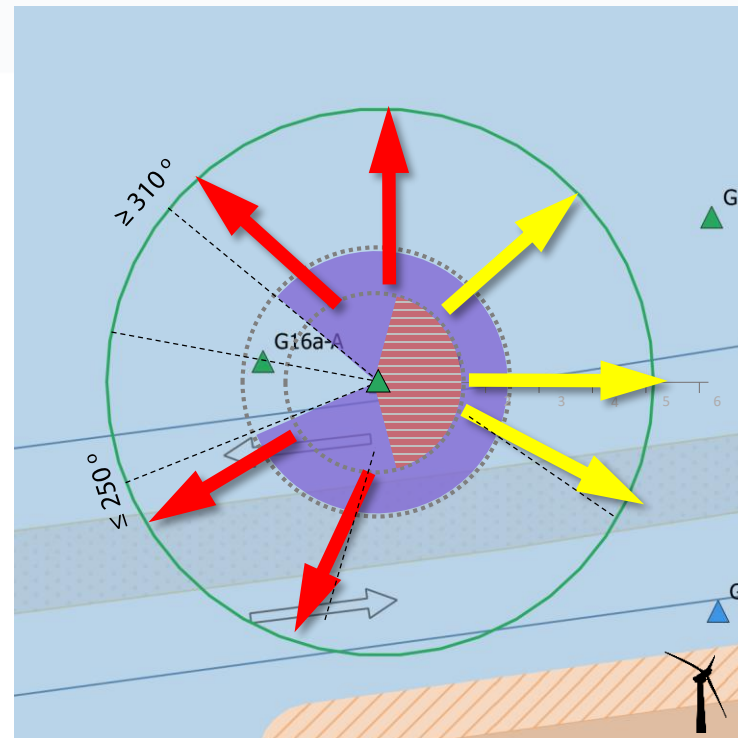
- Between 310° - 250° (300° sector)

Possible approach directions:

- Between 15° - 70° (55° sector)
- Between 130° - 160° (30° sector)
- Between 205° - 305° (105° sector)

Accessibility:

- 90 – 95%



0 1 2 3 4 5 NM



G14-A

Departures

Approaches

Baseline

Possible departure directions:

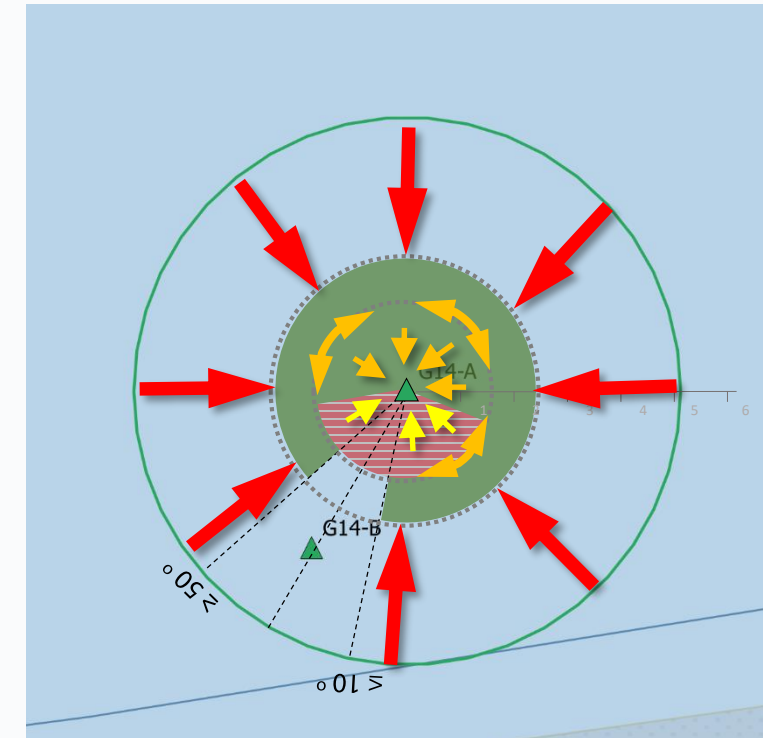
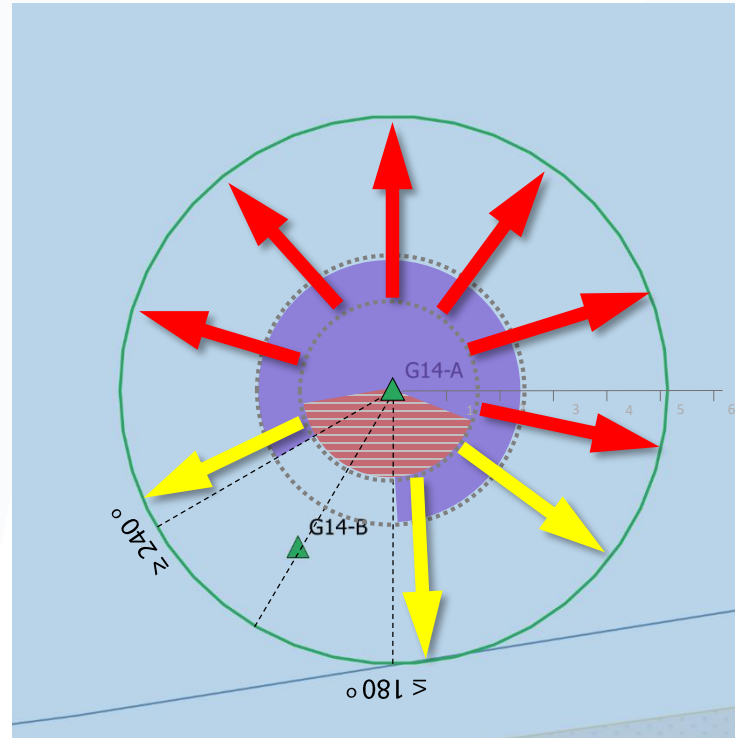
- Between 240° - 180° (150° sector)

Possible approach directions:

- Between 10° - 50° (320° sector)

Accessibility:

- 90 – 95%



Windpark

Possible departure directions:

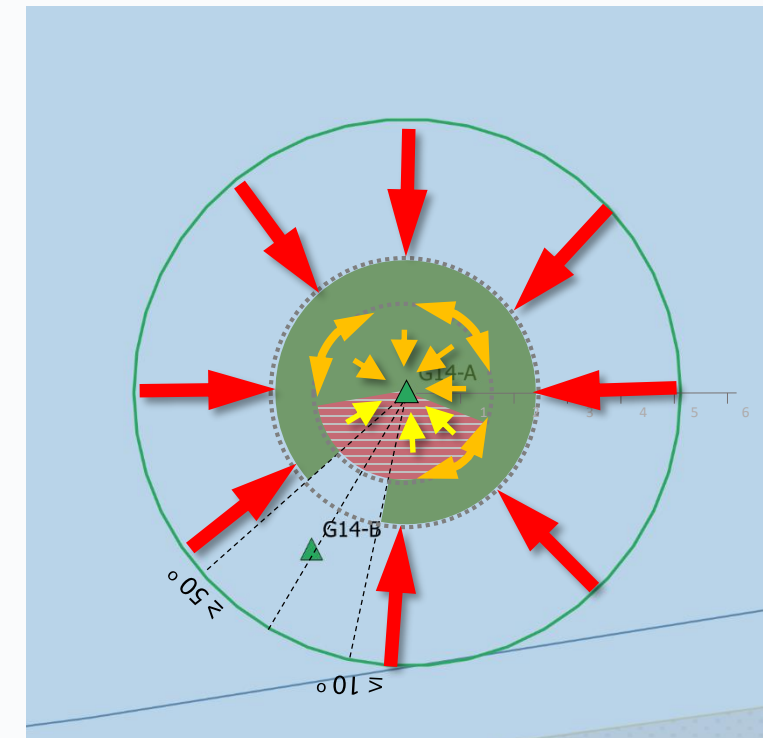
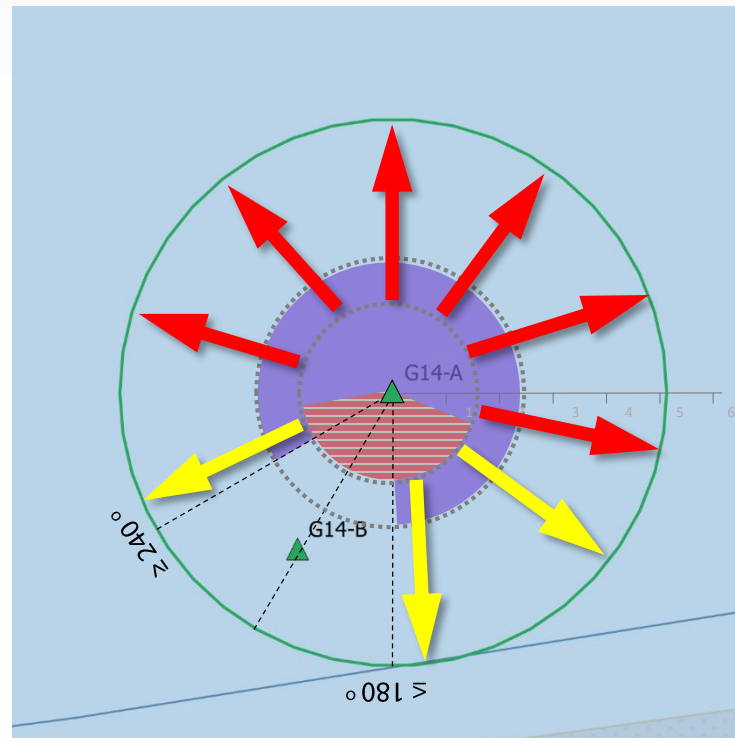
- Between 240° - 180° (150° sector)

Possible approach directions:

- Between 10° - 50° (320° sector)

Accessibility:

- 90 – 95%



0 1 2 3 4 5 NM





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This investigation was carried out by To7o, commissioned by RVO.nl, an agency of the Ministry of Economic Affairs and Climate Policy.

The information in this document is valid at the time of publishing (see month/year). Updates will be published on the website <https://offshorewind.rvo.nl/> at the relevant sitemap (Hollandse Kust (zuid)/Hollandse Kust (noord), General Information, submap Revision Log and Q & A. In the Revision Log is indicated which versions are the latest and what the changes are in relation to previous versions. The documents can be found at the relevant sites, indicated in the Revision Log.

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www.rvo.nl / <http://english.rvo.nl>

Netherlands Enterprise Agency (RVO.nl) | May 2018