

Intensity of Turbine Light shown in Candelas (cd)

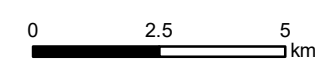
Vertical Angle	Turbine Lighting Intensity	
	2000cd light	200cd light
0° to 3°	2200/2500cd	220/250cd
0° to -1°	2200 to 980cd	220 to 98cd
-1° to -2°	980 to 420cd	98 to 42cd
-2° to -3°	420 to 220cd	42 to 22cd
-3° to -4°	220 to 170cd	22 to 17cd
Below -4°	Below 170cd	Below 17cd

- Notes**
1. Reduced intensity turbine lighting (200cd) based on 'Air Navigation Order 2016 (CAP393) Article 223 (8)' which allows the 2000cd turbine light to be 'reduced to not less than 10% of the minimum peak intensity specified' i.e. 200cd 'if visibility in all directions from every wind turbine generator in a group is more than 5km'.
 2. The lighting intensity for each of the vertical angles shown is based on information provided by an aviation warning light bulb manufacturer.
 3. Perception of theoretical candela intensity does not take account of distance.
 4. ZTV calculations do not take into account surface features such as forestry or buildings.
 5. ZTV calculations for turbine lighting intensity are based on visible aviation lighting mounted on the turbine hub.
 6. The ZTV calculates the degree of vertical angle from the study area shown to each of the Proposed Development turbines.
 7. ZTV calculations represent a worst case situation where predicted lighting intensity may be as a result of only one turbine in the layout.
 8. No landform within the study area is above 3 degrees from the height of the turbine lighting.

- LVIA Night-time Viewpoint**
- 2 - Minor Road near Craig
 - 12 - Maybole
 - 20 - Cornish Hill
- Dark Skies Viewing Location**
- 4 - Bruce's stone
 - 5 - Caldons woodlands
 - 7 - Loch Braden
 - 8 - Loch Doon south end

- KEY**
- Site Boundary
 - Proposed Turbine
 - 5 km Radii
 - 20 km Area
 - Dark Skies Viewing Location
 - LVIA Night-time Viewpoint
 - Wild Land Area
 - Dark Skies Park Core Area
 - Dark Skies Park Buffer

Nacelle Height:	102.5 / 122.5m	Observer height:	2m
DTM:	OS T5/T50 DTM	Surface features:	Excluded
DTM resolution:	10m	Earth curvature:	Included



Scale 1:150,000@ A3



Knockcronal Wind Farm
Technical Appendix

Figure 6.4.5

Hub Lighting Intensity ZTV (20km)

Date:	08/11/2021	Drawn by:	JM	Checked by:	SG	Version:	v1
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