codling wind park

EIAR Addendum

Appendix 13-B LUX Assessment Report

Lux Assessment Report

Codling Wind Park

Codling Wind Park Limited

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Revision	Date	Prepared By	Checked By	Authorised By
01	13 May 2026	ND	TC	ND
02	27 May 2026	RD	TC	ND

Basis of Report

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Executive Summary

Codling Wind Park Limited (the 'Client') has instructed SLR Consulting Ltd to provide to provide relevant technical input in support of a full planning application (Ref: ABP320768-24) to An Coimisiún Pleanála. The application is for the construction, operation and decommissioning of the Codling Wind Park Project, an offshore wind farm (OWF) consisting of a generating station with wind turbine generators (WTGs) in the Irish Sea (the 'Proposed Development').

The site is located 13-22km offshore from the County Wicklow coast (the 'Site'), the extent of which is shown below in the Site Location figure below.

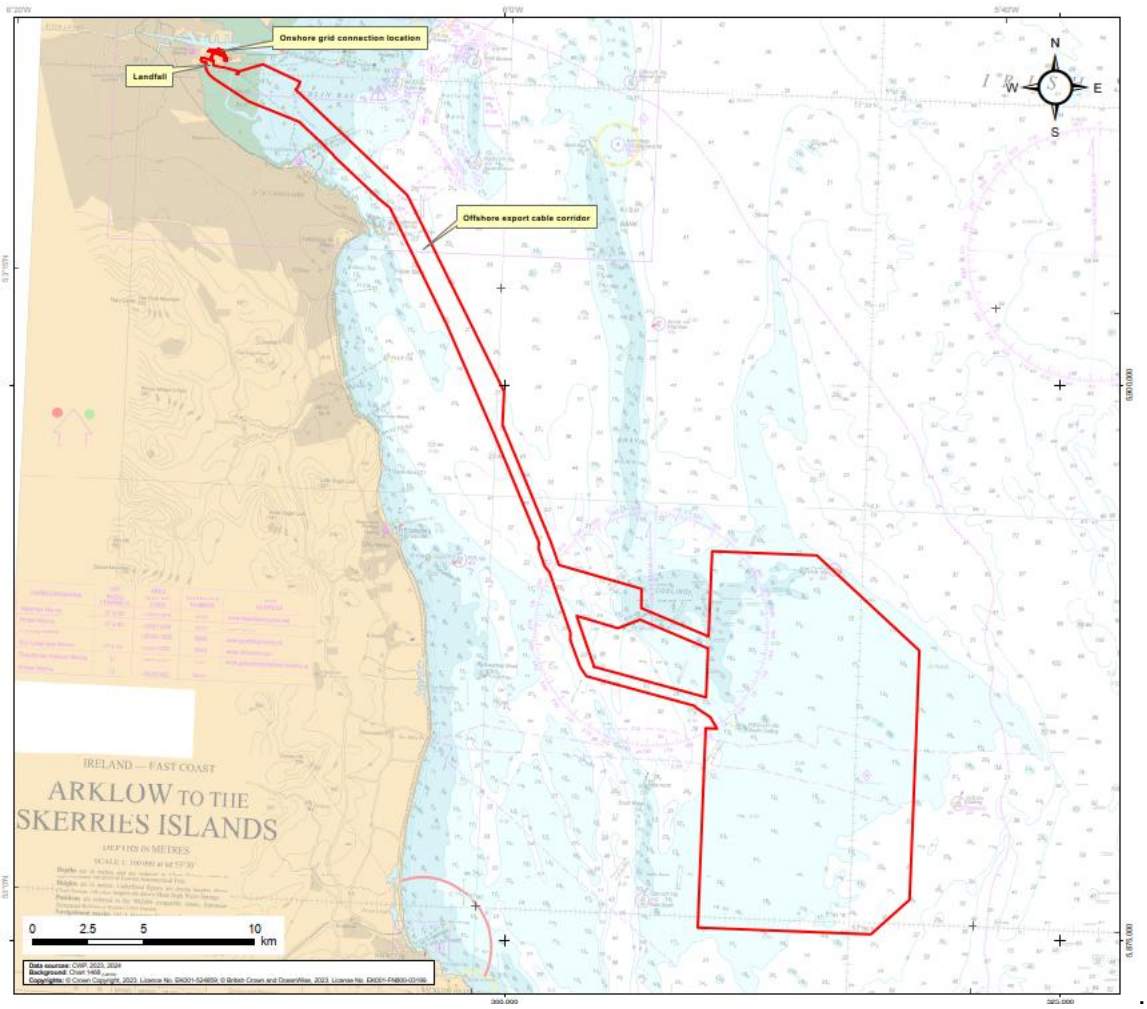
The objective of the lighting design, 3D photometric light modelling and lux assessment of one indicative wind turbine generator (WTG) is to provide data on the extent and intensity of light on and around the WTGs. This data is intended to allow the project ecologist to make an assessment of any potential impacts of this lighting, which is necessarily required for operational safety, on the behaviour of off-shore bats.

The data clearly demonstrates that the light is well constrained to the immediate area around the WTG and does not result in any materially significant light spill or glare, preserving the array area in contextual darkness for the benefit of off-shore bat and marine species.

Site Location:

Google Plus Code: 9C5P37FJ+WH

what3words: ///framing.instructors.wholehearted


Onshore grid connection location
Landfall
Offshore export cable corridor
N
W
E
S
IRELAND — EAST COAST
ARKLOW TO THE
SKERRIES ISLANDS
0
2.5
5
10
km

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Acronyms and Abbreviations

CIBSE	Chartered Institute of Building Services Engineers
ILP	Institute of Lighting Professionals
ALAN	Artificial Lighting at Night
PNL	Part Night Lighting
WTG	Wind Turbine Generator
LAT	Lowest Astronomical Tide
BCT	Bat Conservation Trust
CIBSE	Chartered Institute of Building Services Engineers
CMS	Central Management System
FFL	Finished Floor Level
IDA	International Dark-Sky Association
ILP	Institute of Lighting Professionals
LNR	Local Nature Reserve
MF	Maintenance Factor
PIR	Passive Infrared
PNL	Part Night Lighting
SAC	Special Area of Conservation
SLR	SLR Consulting Ltd
SSSI	Site of Special Scientific Interest

1.0 Introduction

1.1 Purpose of Report

1.1.1 A '***Further Information Request***' was produced by An Coimisiún Pleanála, which included the need for further assessment of the potential impact of lighting from the Proposed Development on existing offshore bats, as follows:

'Bats (14 - b) With regard to artificial lighting at night, the applicant is requested to provide a more comprehensive assessment of the potential effects on bats due to artificial lighting at night within the array area. The applicant is requested to provide an assessment (with reference to appropriate lux contours) to determine the extent to which proposed lighting may disturb or displace bats.'

1.1.2 To address this request, it was determined that a 'Lux Assessment' of the proposed array was required. This will involve the 3D photometric modelling of one indicative wind turbine generator (WTG) including a suitable and compliant design for lighting necessary for safe operation, including the production of both vertical and horizontal lux contours.

1.1.3 The results and findings of this exercise can be used to quantify potential lighting impacts across the whole proposed array and can be used by the project ecologist to inform their assessment on the impacts of lighting on offshore bats from the proposed development.

1.1.4 The lighting design will consider the requirements of all current industry regulations and recommendations alongside the requirement to protect light sensitive ecology including affects to biodiversity.

1.1.5 A best practice approach has been taken to ensure the scheme has minimal impact on the surrounding environment whilst providing appropriate lighting where necessary for the safety of maintenance personnel.

1.1.6 The result of the detailed lighting design based on the advice contained within this document will provide a suitable and compliant scheme with minimal impact on ecology or other receptors.

1.1.7 To satisfy the ***Further Information Request 14-b***, a suitable lighting design for one WTG is required. The potential impact of the wider array can then be extrapolated from the results.

1.1.8 Operational compliance will be demonstrated through a set of lighting calculations that show illuminance levels set out in relevant standards and guidance are met in key external areas.

1.1.9 The following items will be required to provide satisfactory detail:

- Review of the proposed development plans, marking plan and layouts;
- Review of the Site location with respect to identification of sensitive receptors;
- Identify appropriate design criteria for areas that require illumination including risk assessments for operational lighting where necessary; and
- Produce a suitable and compliant lighting design including equipment specifications, general best practice approach and reference to relevant standards and guidance.

1.1.10 Every effort has been made to reduce, omit or minimise artificial lighting within the design for the benefit of light sensitive ecology, the naturally dark character of the area and the preservation of the quality of the night sky.

1.1.11 With minimal and sensitively designed amenity lighting, the proposed design should demonstrate that it does not make any materially significant contribution to sky glow or pose a materially significant risk to the landscape through light pollution.

1.2 Site and Context

1.2.1 Codling Wind Park Limited is proposing to develop the Codling Wind Park (CWP) Project, a proposed offshore wind farm (OWF) located in the Irish Sea approximately 13–22km off the east coast of Ireland, at County Wicklow. See **Figure A**.

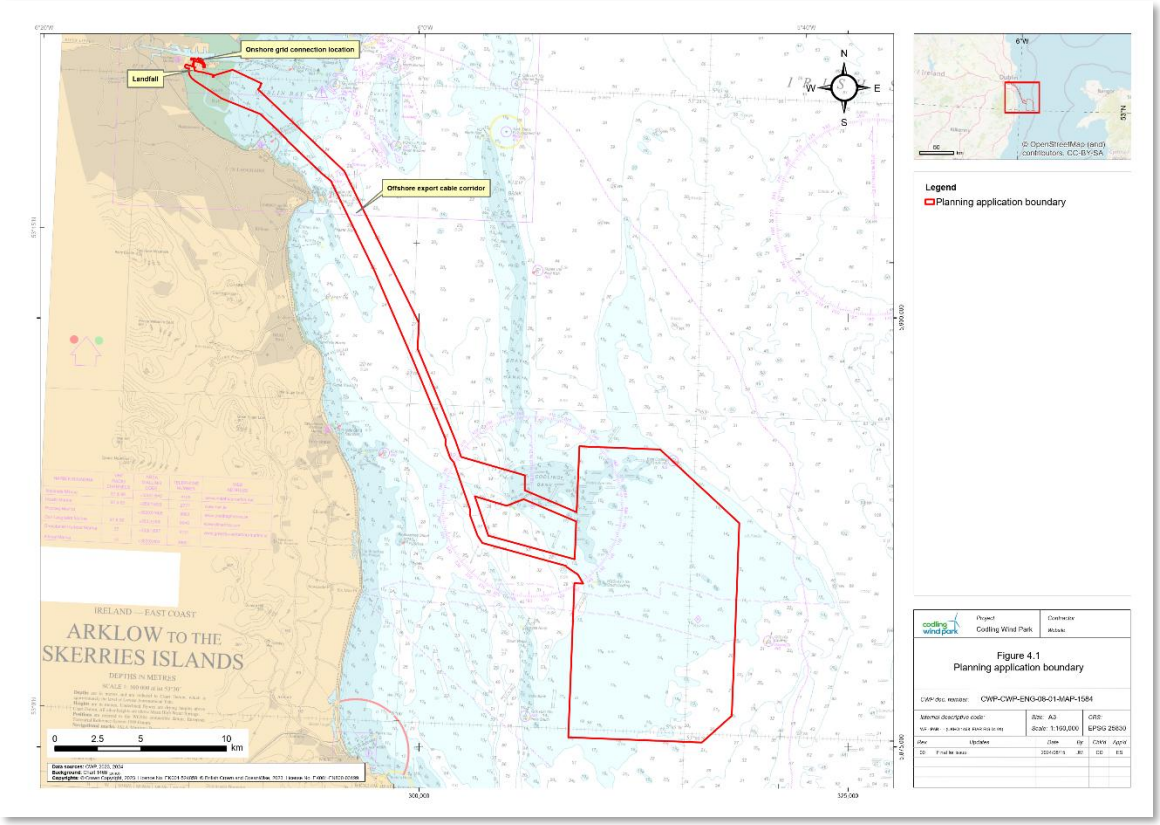
1.2.2 The CWP Project has an expected generating capacity of 1300 MW from layout Option A comprising 75 WTGs with a rotor diameter of 250m.

1.2.3 A 10-year planning permission is sought, with an operational lifetime of 25 years.

1.2.4 The CWP Project consists of a single array site, within which the wind turbine generators (WTGs), inter-array cables (IACs) and the Offshore Substation Structures (OSSs) are proposed.

Figure A: Location and Boundary

CWP-CWP-ENG-08-01-MAP-1584 - Planning Application Boundary (by CWP)



2.0 Methodology, Policy and Guidance

2.1.1 The lighting strategy uses the information provided in **Section 2.1.2** below along with policy and guidance as per **Section 2.1.3**, to determine the best practise for lighting impacts to human and ecological receptors.

2.1.2 The following information has been considered:

- CWP-CWP-ENG-08-01-MAP-1584 - Planning Application Boundary (by CWP);
- 0058 Layout Option A - Wind Turbine Generator (WTG) Details (by TOBIN);
- EIA Report Chapter 13 Offshore Bats (by CWP);
- EIA Report Chapter 15 Seascape, Landscape and Visual Impact Assessment (by CWP);
- Lighting and Marking Plan (by Anatec);
- Available maps and satellite imagery; and.
- Information from project ecologists.

2.1.3 The following documents have been referred to in the preparation of this document. It is expected that, at the time of construction, the latest issue of the documents below will be referred to so as to ensure current regulations and best practice are met:

Government

- Marine Strategy Framework Directive (MSFD) (2008/56/EC);
- Marine Planning Policy Statement (November 2019);
- The Convention on Migratory Species of Wild Animals Treaty (Bonn Convention 1979 enacted 1983);
- The Agreement on the Conservation of Populations of European Bats (Eurobats 1991);
- The European Union (EU) Habitats Directive 192 as amended (EEC Council Directive 92/43/EEC) is transposed into law by the European Communities Regulations 2011 (as amended) and includes all Irish and British bats within Annex four; and

European Standards

- IS EN 12464-2:2024 - Light and lighting - Lighting of work places - Part 2: Outdoor work places.

ILP - Institution of Lighting Professionals

- GN01:2021. Guidance Notes for the Reduction of Obtrusive Light.
- PLG04:2013. Guidance on Undertaking Environmental Lighting Impact Assessments.
    - Bat Conservations Trust ILP Guidance Note GN08:2023 - Bats and Artificial Lighting at Night

CIE - International Commission on Illumination

- CIE Publication 150-2017. Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2nd Edition.
- CIE Publication 126-1997. Guidelines for minimising sky glow.

Other

- Title: Environmental Impact Assessment Volume 3, Chapter 13: Offshore Bats. Document No: CWP-CWP-CON-08-03-03-REP-0008 Revision No: 00 In the Republic of Ireland (ROI) the European legislation builds upon the Wildlife Act 1976 (as amended) and forms part of the European Communities (Birds and Natural Habitats) Regulations 2011.
- DarkSky (Formerly International Dark-Sky Association).
- Bat Conservations Trust.
- Eurobats Publication Series No.8 - Guidelines for Consideration of bats in lighting projects.

2.1.4 Potential receptors are identified as:

- **Bats** - especially light sensitive species that may be utilising the area of the array as part of migration and foraging routes.
- **The quality of the night sky** - the existing condition can be considered as Class 3 on the Bortle Scale, based on information gathered from *www.lightpollutionmap.info* consistent with a 'rural sky'. Despite being over 10km from the coast, the location is within an area of influence from sky glow emanating from the wider conurbation of Dublin to the northwest. The area of the array can be considered as in contextual darkness and should be protected from any contribution to localised sky-glow.
- **Residential properties** – Human receptors are not considered at risk from any adverse effects of light spill or glare conditions due to considerable distance.

2.1.5 To determine the environmental zone for the site, information provided in the Institute of Lighting Professionals (ILP) Guidance Note 1 ***'ILPGN01:2021 - The Reduction of Obtrusive Light'*** Table 2 is replicated below in **Table A**. Environmental Zone E1 is selected as the appropriate zone for the site.

Table A: ILP Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village, or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

2.1.6 **Table B** below shows illuminance limitations (lux levels) and maximum luminous intensity (cd, candelas) for each Environmental Zone. These are the maximum levels of light that would be permitted at the receptor and the emission of the light source within the luminaire when viewed from the receptor position.

2.1.7 For Environmental Zone E1 this would be maximum of 2 lux pre-curfew and <0.1 lux post-curfew. The maximum luminous intensity allowed would be 2,500 cd pre-curfew and 0 cd post-curfew. Post-curfew hours would be considered from 23:00 hours (a reasonable expected time) until 05:00. As the lighting is expected to be used solely for occasional or ad-hoc critical safety related maintenance and operational purposes, the curfew does not apply in this scenario.

Table B: Illuminance Limitations & Maximum Luminous Intensity (Ap)

Zone	Pre-Curfew (lx)	Post-Curfew (lx)	Pre-Curfew (cd)	Post-Curfew (cd)
E0	N/A	N/A	0	0
E1	2	<0.1*	2,500	0
E2	5	1	7,500	500
E3	10	2	10,000	1,000
E4	25	5	25,000	2,500
	* If the installation is for public (road) lighting then this can increase to 1 lx			

2.1.8 The Institute of Lighting Professionals (ILP) Guidance Note 8 ***'ILPGN08:2023 - Bats and Artificial Lighting'*** provides further detail with particular attention to sections *'Appropriate Luminaire Specifications 4.29'* and '*Lighting Contour Plans 4.51-4.54'*.

2.2 Ecology

2.2.1 A detailed assessment of any potential impact of typical lighting for WTGs on bat species is set out in the ***'EIA Report - Chapter 13 Offshore Bats'*** (by CWP)

2.2.2 A further assessment based on the provided indicative lighting design and lux assessment provided by SLR will be undertaken by the project appointed ecologist.

2.3 Bats and Lighting

2.3.1 Relevant extracts from the '***Bat Conservations Trust ILP Guidance Note 08/2023 - Bats and Artificial Lighting at Night***' include:

(1.12) - 'In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats. Many night-flying species of insect that bats hunt are attracted to light, especially those light sources that emit an ultraviolet component (Light Emitting Diodes (LEDs) have removed this) or have a high blue spectral content.'

2.3.2 **Applied Strategy:** No lighting equipment to be specified that includes any UV emission and the colour temperature must be 3000k or lower.

(1.21) - 'Continuous lighting in the landscape, such as along roads or waterways, creates barriers which many bat species cannot cross, especially slower-flying species, even at very low light levels. Lesser Horseshoe bats have been shown to move their flight paths which link their roosts and foraging grounds to avoid artificial light installed on their usual commuting routes. Significant effects have been recorded from as low as 3.6 lux.'

2.3.3 **Applied Strategy:** Careful consideration must be made to avoid creating any continuous linear lighting features at night to prevent the bisection of habitat or commuting routes through continuous lighting. Mitigations such as lighting being based on occupation of the WTGs and application of either dimming or switch-off to be included in the control strategy. Due to the natural spacing between WTGs, there are large breaks in between the lighting, preserving a network of interlinked dark habitats and commuting routes throughout the array.

(4.15) - 'An adverse impact from illumination onto a Key Habitat feature is likely to have a significant effect on the bats using it. Therefore, an absence of artificial illumination and glare acting upon both the feature and an appropriately sized buffer zone is most often the only acceptable solution. An ecologist will be best placed to set the size of such a buffer zone according to the species present and the level of usage, and these can be tens of metres if unattenuated light spill or glare from local sources is predicted. The input of a lighting professional should be sought when determining the distances of light spill from new sources and likelihood of glare.'

2.3.4 **Applied Strategy:** As there is significant spacing between WTGs there is a natural network of 'dark corridors' enabling light sensitive ecology to pass through the array area without experiencing adverse lighting conditions, these spaces between WTGs must be protected from light pollution by constraining any active lighting to the immediate area around the WTGs and avoiding any sources of glare in the wider area.

(4.16) - '...There is no legal duty requiring any place to be lit. British (European) Standards and other policy documents allow for deviation from their own guidance where there are significant ecological/environmental reasons for doing so. It is acknowledged that in certain situations lighting is critical in maintaining safety. Nevertheless, these are not exempt from the statutory protection afforded to bats, their roosts and commuting routes directly associated with roosts, and good design principles such as the Institution of Lighting Professionals' GN01: The Reduction of Obtrusive Light remain best practice. However, in the public realm, while lighting can increase the perception of safety and security, measurable, objective benefits on safety and security are less well established. Consequently, lighting design should be holistic, taking into consideration the relevant British (European) Standards or local policies concerning lighting but, through a risk assessment-style process, be able to fully take into account the presence of protected species and the likely adoption of mitigation approaches through proper engagement with local communities.'

2.3.5 **Applied Strategy:** Subject to risk assessments, consideration should be made to areas of conflict between maintaining dark corridors and lighting for safety, security and operational amenity.

(4.35) - 'Depending on the pattern of bat activity across the Supporting Habitat identified by the ecologist, it may be appropriate for an element of on-site lighting to be controlled by dimming or switching either diurnally, seasonally, or according to human activity (light on demand). This is known as Part-Night Lighting (PNL). It is important to state that PNL is not likely to be appropriate where Key Habitats are at risk, especially as PNL often results in lighting when bats are most active.'

2.3.6 **Applied Strategy:** Given lighting required for active maintenance is only activated by the presence of personnel on the WTG, the lighting will remain 'off' when not in active use, which is likely to be the majority of the time through the hours of darkness and throughout the year, reducing any potential adverse effects to negligible levels.

3.0 Lighting Strategy

3.1 Wind Turbine Generator Lighting

3.1.1 There is no legal duty requiring any place to be lit or requiring that new developments should necessarily require lighting. It is determined to be beneficial to minimise the extent of lighting and leave some areas unlit for the benefit of light sensitive ecology and ecological habitat.

3.1.2 Safety is a primary concern, and lighting is an essential component in the safe operation and maintenance of the WTGs within the array.

3.1.3 There are two general categories of lighting required for the safe operation of the array:

- The marine and aviation warning lights mounted on the WTGs to prevent collision with aircraft and marine vessels with the array infrastructure.
- The lighting required for personnel to safely access the WTGs for operational and maintenance purposes.

3.2 Warning Lights - Design Parameters

3.2.1 A detailed assessment of aviation and marine warning lights is set out in the ***'Codling Wind Park Lighting and Marking Plan'*** (by Anatec)

3.2.2 This includes the following categories of warning lights:

- Significant peripheral structure (SPS) lighting to IALA G1162 (IALA, 2022)
- Aviation warning lighting to ASAM No 18 (IAA, 2015)
- SAR Lights to MGN 654 (MCA, 2021)
- Blade markings to MGN 654 (MCA, 2021)

3.2.3 Marine lights marking selected periphery WTGs are in yellow and not continuous, flashing every 5 seconds. They are also only present on a number of the peripheral columns.

3.2.4 Aviation warning lights are mounted on the highest point of the structures and light fittings are baffled so that practically no light will be emitted below the horizontal, with a flash rate of 40–60 flashes per minute.

3.2.5 As the proposed warning lights are designed to provide visibility as a point source at distance, they are not included in the Lux Assessment photometric modelling as they do not result in any materially significant localised illumination.

3.2.6 The project ecologist provides an assessment of the potential effects of the marine and aviation warning lights within the ***'EIA Report - Chapter 13 Offshore Bats'*** (by CWP) - 193 *'Any impacts from lighting offshore would be indistinguishable from the current baseline and any annual variation. The magnitude relative to the current baseline is negligible.'*

3.3 Operational Areas - Design Parameters

3.3.1 The determination of whether an area is to be illuminated, and if so, to which standard or illumination level, will be based upon a risk assessment for the operational area. The risk assessment will consider the following:

- The scenario and context;
- The requirement for the presence of personnel;
- The task requirements for the activity; and
- The closest identified standards providing guidance as to the safe level of illumination.

3.3.2 Guidance on the appropriate level of lighting in an area is contained in ***'IS EN 12464-2:2024 Light and Lighting. Lighting of Work Places - Outdoor Work Places'*** set out in ***Table 19 – Off-shore Gas and Oil Structures*** (see **Table C**)

Table C: Identification of Operational Lighting Requirements

IS EN 12464-2:2024 Table 19: Type of area, task or activity	Em lx	Uo –	RGL –	Ra –
19.2: Ladders, Stairs and Walkways	100	0.25	45	40
19.3: Boat Landing Areas	100	0.25	50	40

3.3.3 The operational areas are identified as:

- The Boat Landing Area (sea level at the base of the access ladder)
- The Access Ladder (providing access from sea level to the Working Deck)
- The Access Platforms (platforms between sea level and the Working Deck)
- The Working Deck (walkways and working area platform)
- The Access Door (ladder and access doorway)

3.3.4 A 3D photometric model of an indicative example WTG (Option A), showing a suitable and compliant lighting design to meet the illuminance criteria set out above, is shown in **Appendix A - Operational Requirements** and **Appendix B - Lighting Layout & Lux Contour Plan**.

3.3.5 All lighting mounted to the WTGs will have a maximum colour temperature of 3000 kelvin to meet requirements of reducing impact on light sensitive ecology and reduce insect attraction.

3.3.6 LED luminaires should meet the specification or equivalent to 'dark skies' standards with zero direct upward light emission, full shielding, warm colour temperature, appropriate lumen output (minimum required) and good optical design to constrain the light to the area intended for illumination only.

3.4 Control Strategy

3.4.1 The lighting control system on each WTG shall be fitted with photocell sensors to ensure lighting is not activated during hours of daylight when there is sufficient natural illumination, to save energy and extend the life of the lighting fixtures.

3.4.2 The access ladders and platforms from sea level to the Working Deck shall be activated by presence detection (PIR, CCTV or similar detectors). This lighting is necessary to allow for safe access from the sea. The lighting shall be activated on the detection of personnel in the vicinity of the landing area and on each ladder section or platform to maintain lighting for safe access during occupation of the WTG. A reasonable time should be allowed between detection and when the lighting is switched off, to ensure lighting remains active long enough for personnel to complete their ascent to the Working Deck.

3.4.3 A ramped dimming profile should be used to gradually increase light levels over 2 seconds on presence detection to reduce the impact of sudden changes in light level to any migrating or foraging bat species. A gradual ramp-down time of 10-20 minutes after last detection should be implemented to avoid any possibility of personnel being left in darkness during their descent to egress.

3.4.4 Presence detection is used to activate the access area lighting only during occupation which ensures the lighting is not active at any other time. This reduces the overall duration and frequency of illumination to only that which is necessary, resulting in low risk of this lighting affecting light sensitive ecology nearby.

3.4.5 Lighting from the access ladder to the access door is activated by presence detection to ensure safe lighting from the sea to the interior of the WTG.

3.4.6 Inside the interior of the WTG, a local lighting ‘Control Plate’ will be provided to manually activate the lighting to the Working Deck and access routes, this is to ensure a safe lit working environment throughout the occupation of the WTG by personnel.

3.4.7 The integrated lighting control system which controls all exterior lighting equipment (using DALI) should be able to be accessed remotely to activate exterior lighting in an emergency or for the purposes of maintaining security in the event of intrusion.

3.5 Exterior Amenity Lighting

3.5.1 Exterior amenity lighting equipment should be provided for the primary access and Working Deck area.

3.5.2 Lighting should be oriented inwards and light from exterior amenity lighting should not project outwards or upwards to reduce effects of source intensity or glare in the wider landscape and reduce any contribution to sky glow.

3.5.3 Exterior lighting specified must have no directly visible light source or a diffused lit surface. All lighting equipment should have downward only optics and feature cowls to minimise direct visibility of the light source.

3.5.4 Luminaires should be specified with a maximum of 3000 kelvin colour temperature, contain no upward light distribution, and the downward distribution should not leave the immediate area intended for illumination. Under no circumstances should any installed lighting fixture emit any direct light above horizontal.

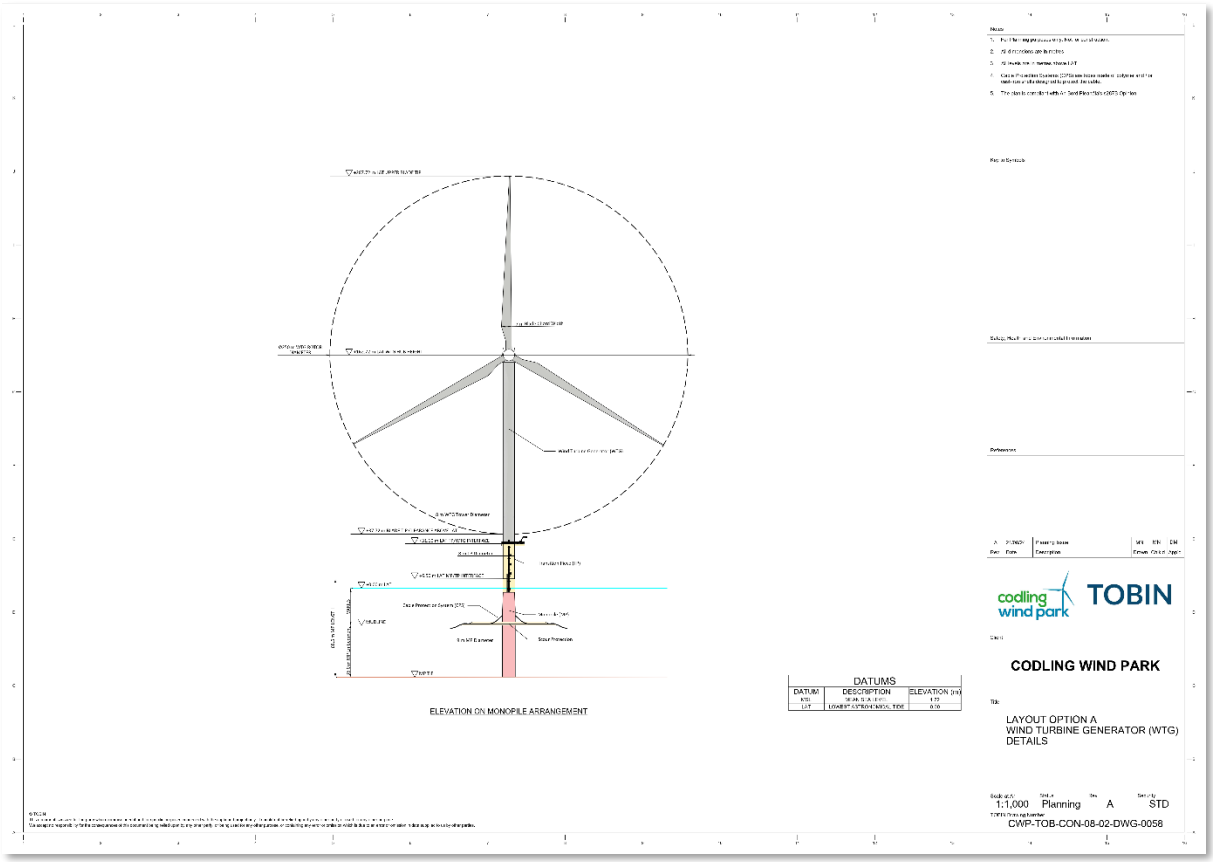
3.5.5 Lighting equipment must be suitable for the harsh marine environment and adhere to appropriate IP ratings to ensure premature failure is avoided.

PRODUCT SPECIFICATION	REFERENCE IMAGE
X1 Manufacturer: Luminell Model: RLX C G2 Floodlight Ref: RLX C FL 80W100-277VAC Mounted Under Platform Directed Towards Boat Loading Area & Access Ladder Optic: 60° Wide Beam Delivered Lumens: 8988 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	
X2 Manufacturer: Luminell Model: RLX B G2 Floodlight Ref: RLX B FL 40W MB30 850 Mounted Under Platform Directed Towards Access Ladder and intermediate platforms Optic: 30° Narrow Beam Delivered Lumens: 4379 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	

X3 Manufacturer: Luminell Model: RLX B G2 Floodlight Ref: RLX B FL 20W MB50 BU Mounted to Turbine Directed Towards Access Ladder & Working Deck Optic: 50° Beam Delivered Lumens: 395 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	
X4 Manufacturer: Luminell Model: RLX B G2 Floodlight Ref: RLX B FL 40W MB50 850 Mounted on Turbine Directed Towards Working Deck Optic: 50° Wide Beam Delivered Lumens: 3966 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	
X5 Manufacturer: Glamox Model: MIR G2 Marine - DARK SKY Ref: MIRS67-1200 (M) G2 5000 DARK SKY DALI OP 830 TW BN20 FR/PC RAL9005 Item Number: MIR107765 Mounted to Railing Directed Towards ID Marker Optic: Asymmetric Downwards Optic Delivered Lumens: 4759 lm CCT: Warm White Light (3000 K) CRI: >80 Control: DALI Control with Remote Access	
X6 Manufacturer: Glamox Model: MIR G2 Marine - DARK SKY Ref: MIRS67-600 (M) G2 2500 DARK SKY DALI OP 830 TW BN20 FR/PC RAL9005 Item Number: PM240516101 Mounted to Railing Directed Towards Working Deck Optic: Wide Beam Delivered Lumens: 2367 lm CCT: Warm White Light (3000 K) CRI: >80 Control: DALI Control with Remote Access + PIR Presence Detection	

3.6 Photometric Modelling

3.6.1 The modelling of one indicative WTG was undertaken in DiaLux Evo software to a reasonable degree of accuracy based on the provided drawings '***0059 Layout Option A - Wind Turbine Generator (WTG) Details***' by TOBIN:



3.6.2 It should be noted that the specific details of the WTGs are not yet confirmed, and as such, some details have been extrapolated to conclude the modelling exercise. The lighting design provided is fully compliant and is presented as a reasonable basis for assessment at this stage. A detailed lighting design, specification and impact assessment must be undertaken for the finalised WTG design at the appropriate stage of the process.

3.6.3 A series of measurement planes were set out in the 3D model to provide evidence that the indicative design presented is compliant and suitable for safe operation. These measurements are shown at a Maintenance Factor of MF=0.8 to ensure the scheme is still compliant, even under 'worst case scenario' conditions. See **Appendix A**.

3.6.4 A set of horizontal ISOLux contours are provided at LAT level for the assessment of light spill to the surface of the sea. A set of vertical measurement planes are provided to demonstrate the vertical spread of light around the WTG and the extent to which light is present in 3D space. See **Appendix B**.

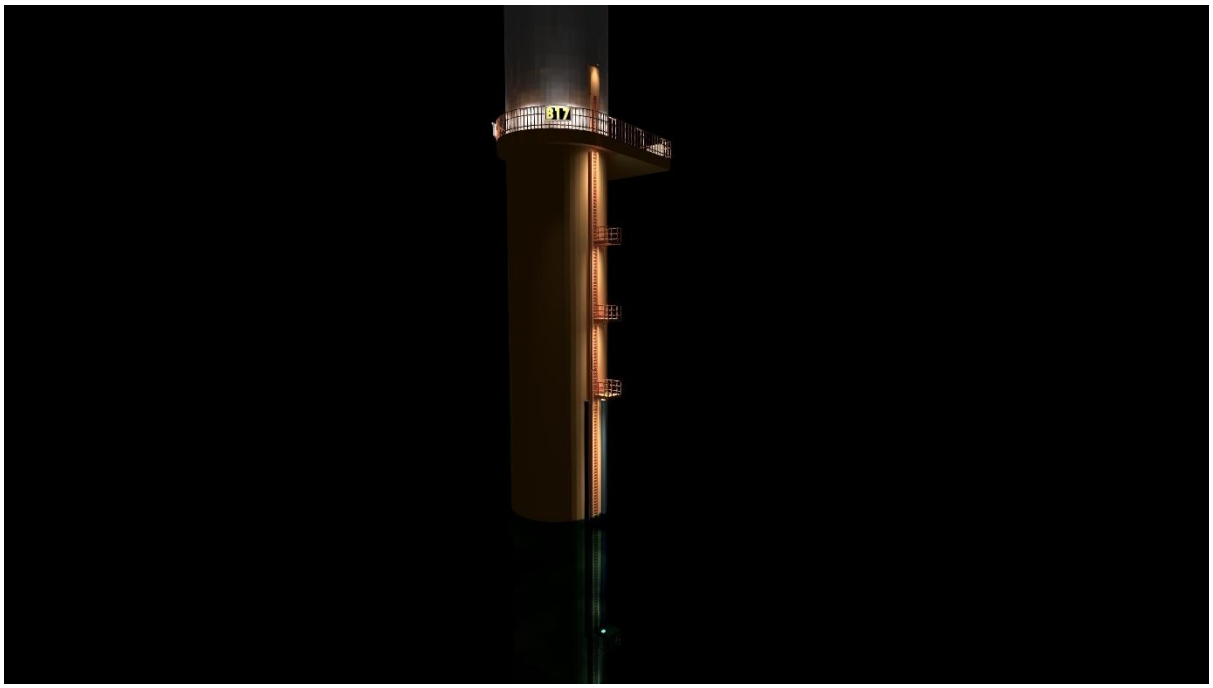
3.6.5 All vertical and horizontal measurements for the purpose of assessing impact on ecology are shown at a Maintenance Factor of MF=1.

4.0 Photometric Renders

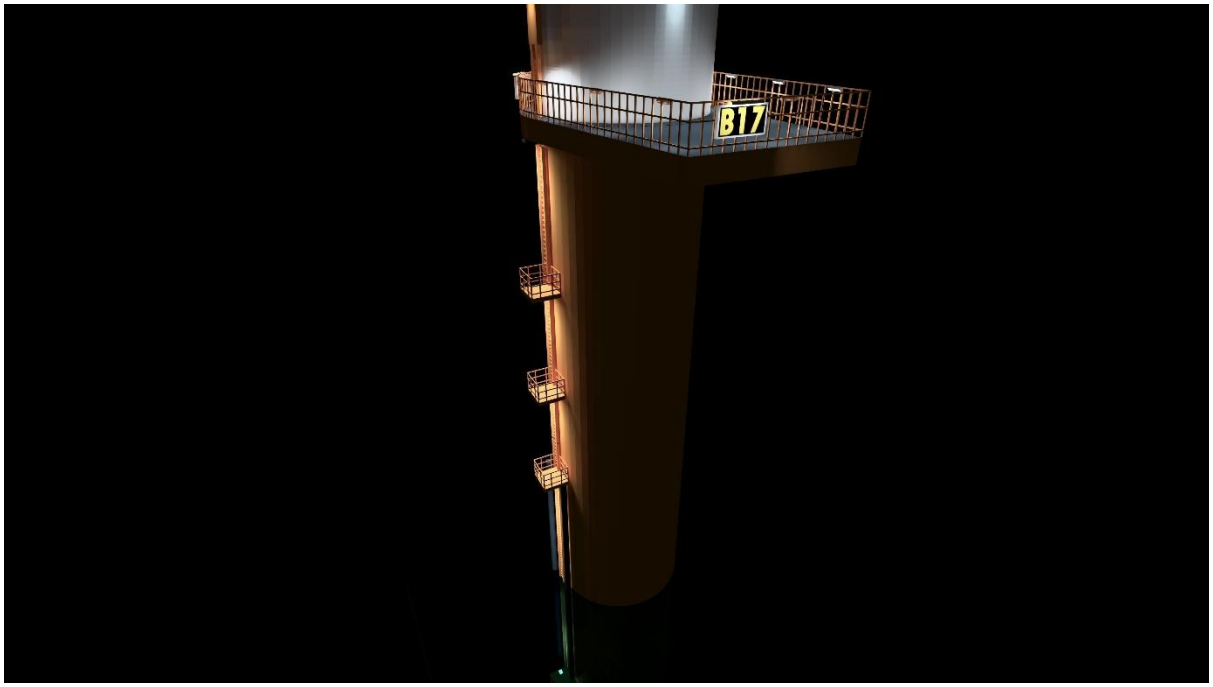
4.1.1 A series of renderings are presented which are derived from the 3D photometric model:

Render 1: WTG with All Lighting 'ON'

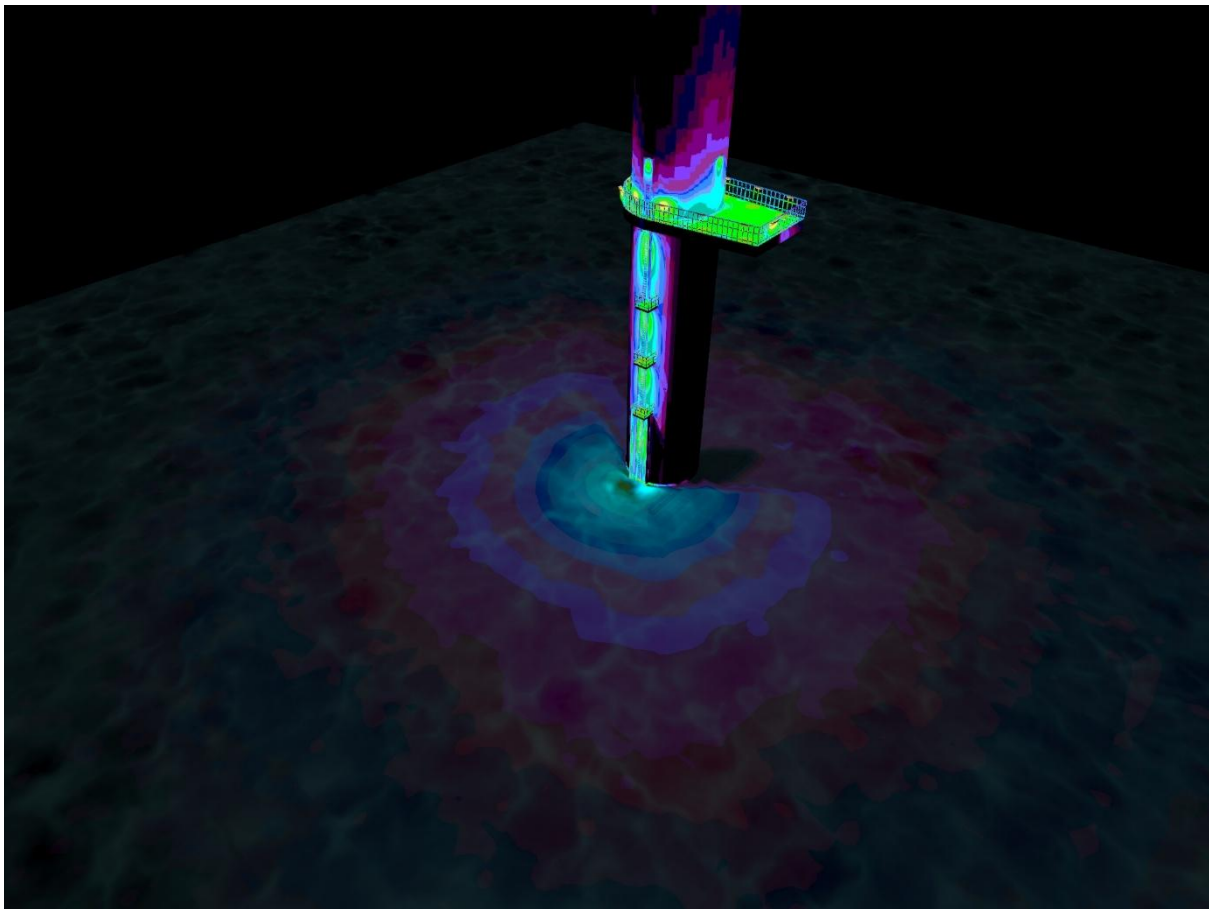
Render 2: Access Ladder and Platforms with All Lighting 'ON'



Render 3: Working Deck with All Lighting 'ON'



Render 4: False Colour* Diagram with All Lighting 'ON'



**False Colours – Brighter colours represent higher levels of illumination.*

5.0 Summary & Conclusion

5.1.1 The objective of the lux assessment is to provide evidence that a fully compliant lighting scheme, designed to ensure safe operation at night, can be provided without detriment to migrating or foraging off-shore bats.

5.1.2 A sensitive and well considered lighting design and lighting control strategy ensures that the levels of illumination for safe access are able to be met whilst restricting any resulting light spill to the immediate vicinity of the WTGs and at the lowest levels possible.

5.1.3 The implementation of the Control Strategy ensures that only the minimum lighting to the ID Marker Boards is ‘on’ continuously throughout the hours of darkness. The lighting provided to the ID Marker Boards is of a sufficiently low intensity and optically constrained to the immediate area of marker boards as to present no materially significant light spill to the surrounding environment during normal operation (unoccupied state). All other exterior lighting remains ‘off’ unless human presence is required for maintenance or operation.

5.1.4 The results of the 3D photometric modelling demonstrate that the light emitted by the installation is well constrained to the immediate vicinity of the column. Even under ‘worst case scenario’ conditions, with all lights ‘on’ at full output and a Maintenance Factor of MF=1 (representing day one output, without deterioration) the extent of the light spill to the sea surface at LAT is below 1lux beyond 40 metres of the centre of the column.

5.1.5 The definition provided for approximation of ‘complete darkness’ as defined by the Bat Conservation Trust and Institute of Lighting Professionals is 0.2 lux on the horizontal plane and 0.4 lux on the vertical plane. The evidence provided in **Appendix A - Operational Requirements** and **Appendix B - Lighting Layout & Lux Contour Plan** show that there is no materially significant light level above ‘complete darkness’ beyond approximately 65 metres from the centre of the column, even under ‘worst case scenario’ conditions.

5.1.6 It should be noted that the frequency of occupation for maintenance that requires lighting to be active is likely to be low, limiting the number of hours the lighting would be ‘on’ and therefore reducing further any potential impact on off-shore bats to negligible levels. Bats are also relatively dormant for the majority of the winter months when the lighting installations are likely to be used more frequently due to reduced day length.

5.1.7 The extensive spacing between WTGs and the relatively minimal extent of any light spill from the WTGs means that the areas between the WTGs will remain entirely in ‘contextual darkness’, maintaining permeability for migrating and foraging bats through the array site even if all WTGs were occupied and lit simultaneously.

5.1.8 The use of ‘dark sky’ compliant lighting equipment and a ‘warm white’ colour temperature with no UV emission reduces other issues such as attraction of insects, source intensity, glare and sky glow to negligible levels. Every possible measure has been taken to reduce or mitigate for any adverse effects of lighting on the WTGs for the benefit of off-shore bats.

5.1.9 A detailed lighting design that follows these proposed measures and specifications would be subject to further detailed impact assessment at the appropriate stage of the development.

Appendix A Operational Requirements

Lux Assessment Report

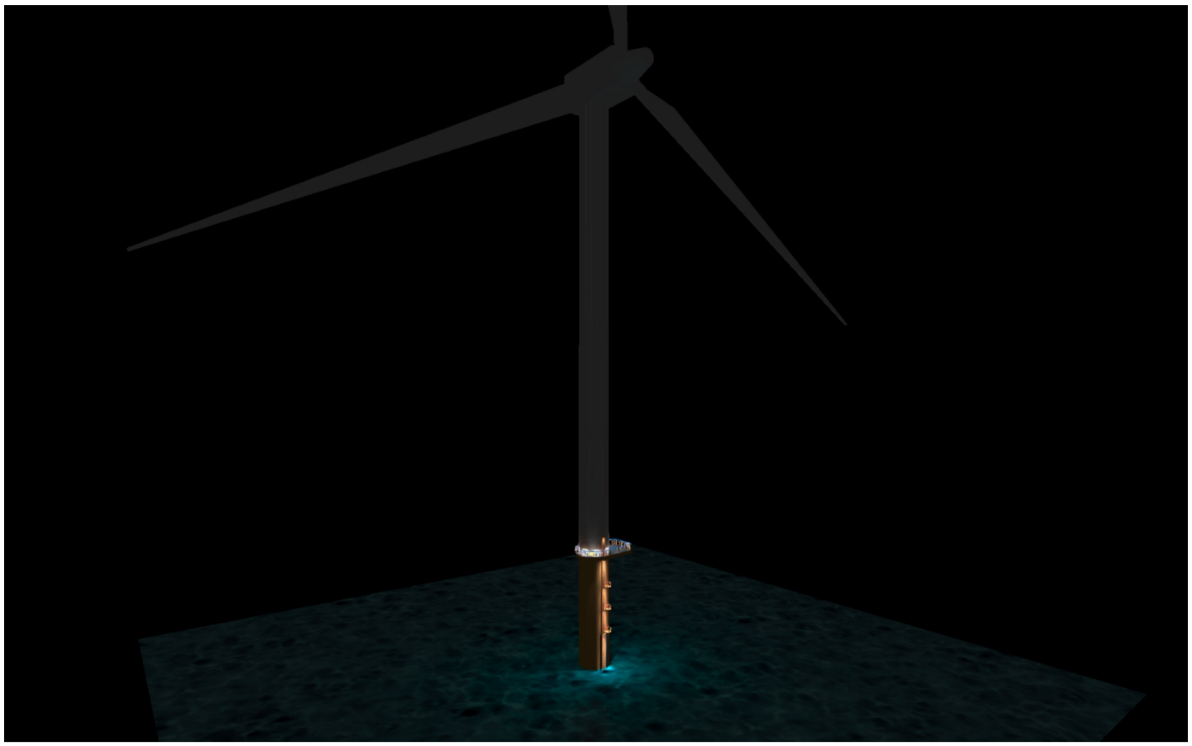
Codling Wind Park

Codling Wind Park Limited

SLR Project No.: 415.065438.00001

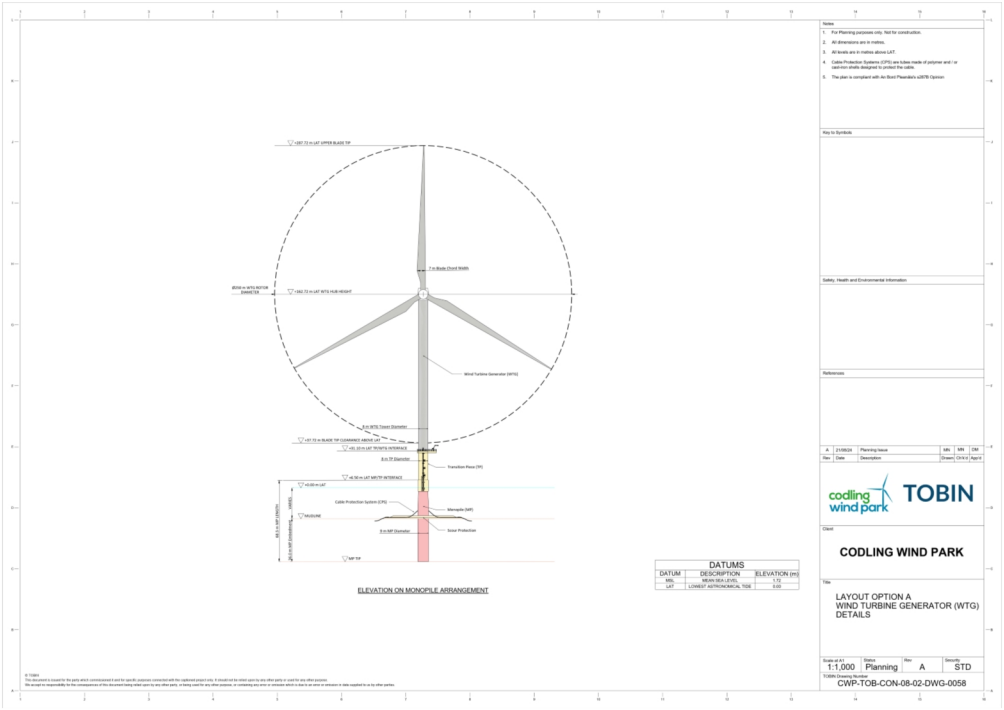
27 May 2026

Date 13/05/2026



Codling Wind Park

Appendix A - Operational Requirements

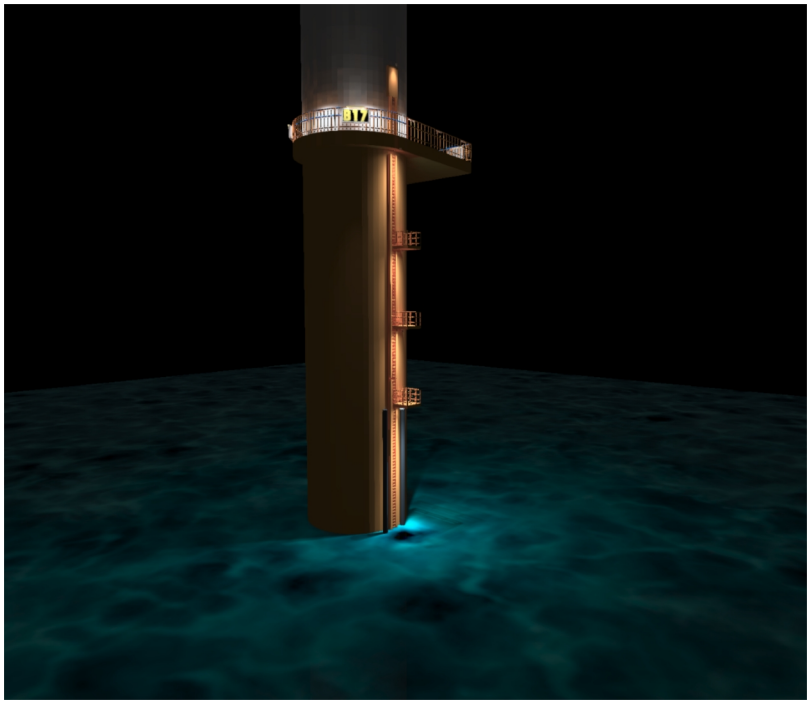


Description

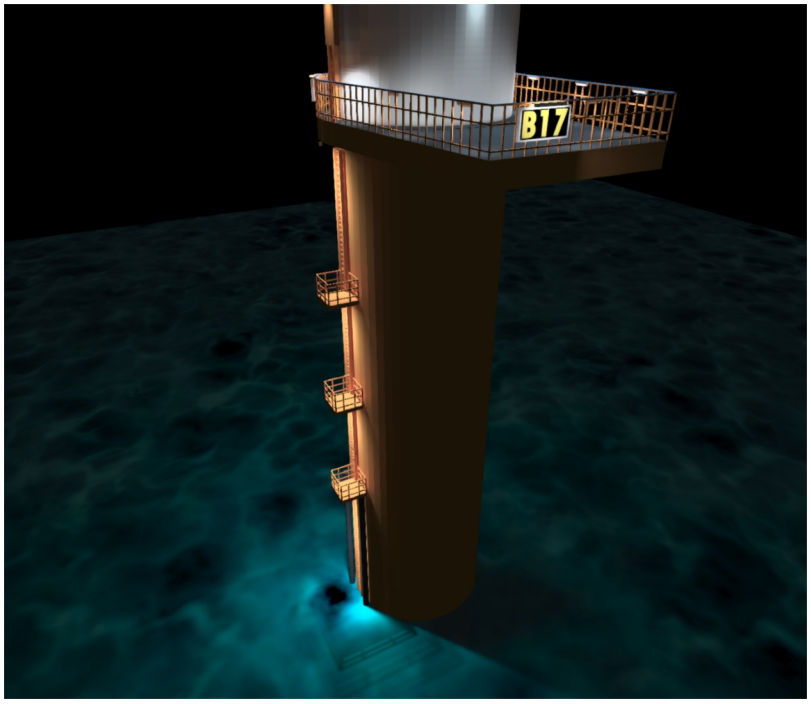
Based on:
'0058 Layout Option A - Wind Turbine Generator (WTG) Details' (by Codling Wind Park)

Images

Base Render



Platform Render



Luminaire list

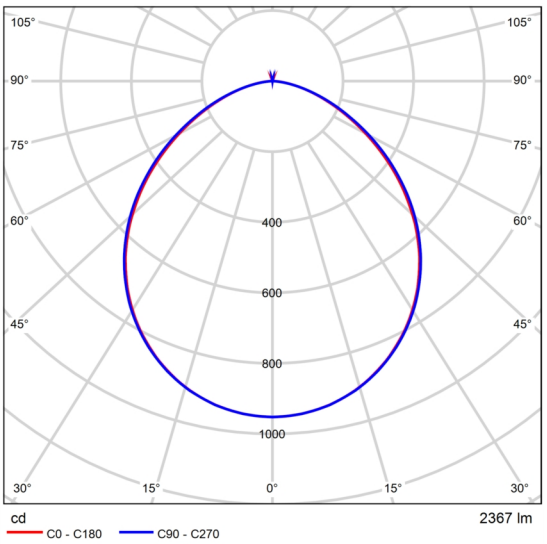
Φ_{total}	P_{total}	Luminous efficacy
66864 lm	775.0 W	86.3 lm/W

pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy	Index
11	Glamox	PIM421482	MIR 600 G2 2500 DARK SKY OP 830 FR-PC	30.0 W	2367 lm	78.9 lm/W	X6
3	Glamox	PIM445237	MIR 1200 G2 5000 DARK SKY OP 830 FR-PC	62.0 W	4759 lm	76.8 lm/W	X5
1	Glamox	100015	RLX C Floodlight 80WAC1 SB20 5K 1x6-13 2ABAABK	80.0 W	8988 lm	112.3 lm/W	X1
1	Glamox	PIM398275	RLX B FL 20W MB50 BU 2--A--	19.0 W	395 lm	20.8 lm/W	X3
3	Glamox	PIM398277	RLX B FL 40W MB30 850 2--A--	40.0 W	4379 lm	109.5 lm/W	X2
1	Glamox	PIM398278	RLX B FL 40W MB50 850 2--A--	40.0 W	3966 lm	99.2 lm/W	X4

Product data sheet

Glamox - MIR 600 G2 2500 DARK SKY OP 830 FR-PC

Article No.	PIM421482
P	30.0 W
Φ_{Lamp}	–
$\Phi_{Luminaire}$	2367 lm
η	–
Luminous efficacy	78.9 lm/W
CCT	3000 K
CRI	100
Index	X6



Polar LDC

Glare evaluation according to UGR

ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	18.9	20.2	19.2	20.4	20.7	19.5	20.7	19.8	21.0	21.2
	3H	19.8	21.0	20.1	21.2	21.5	20.5	21.7	20.8	21.9	22.2
	4H	20.1	21.2	20.4	21.5	21.8	20.9	21.9	21.2	22.2	22.5
	6H	20.2	21.2	20.6	21.5	21.9	21.0	22.1	21.4	22.4	22.7
	8H	20.2	21.2	20.6	21.5	21.9	21.1	22.1	21.4	22.4	22.7
	12H	20.2	21.2	20.6	21.5	21.8	21.1	22.0	21.4	22.3	22.7
4H	2H	19.4	20.5	19.8	20.8	21.1	19.9	21.0	20.2	21.2	21.5
	3H	20.5	21.4	20.9	21.7	22.1	21.1	22.0	21.4	22.3	22.7
	4H	20.8	21.7	21.2	22.0	22.4	21.5	22.3	21.9	22.7	23.1
	6H	21.0	21.8	21.5	22.2	22.6	21.8	22.5	22.2	22.9	23.3
	8H	21.1	21.8	21.5	22.2	22.6	21.8	22.5	22.3	22.9	23.3
	12H	21.1	21.7	21.5	22.1	22.6	21.8	22.5	22.3	22.9	23.3
8H	4H	21.0	21.6	21.4	22.0	22.5	21.6	22.3	22.0	22.7	23.1
	6H	21.3	21.8	21.7	22.2	22.7	21.9	22.5	22.4	22.9	23.4
	8H	21.3	21.8	21.8	22.3	22.8	22.0	22.5	22.5	23.0	23.5
	12H	21.4	21.8	21.9	22.3	22.8	22.1	22.5	22.6	23.0	23.5
12H	4H	21.0	21.6	21.4	22.0	22.4	21.6	22.2	22.0	22.6	23.1
	6H	21.3	21.8	21.7	22.2	22.7	21.9	22.4	22.4	22.9	23.4
	8H	21.4	21.8	21.9	22.2	22.8	22.0	22.5	22.5	22.9	23.4

Variation of the observer position for the luminaire distances S

S = 1.0H	+0.2 / -0.3	+0.2 / -0.2
S = 1.5H	+0.4 / -0.8	+0.4 / -0.6
S = 2.0H	+0.9 / -1.5	+0.9 / -1.2
Standard table	BK03	BK04
Correction summand	3.5	4.7

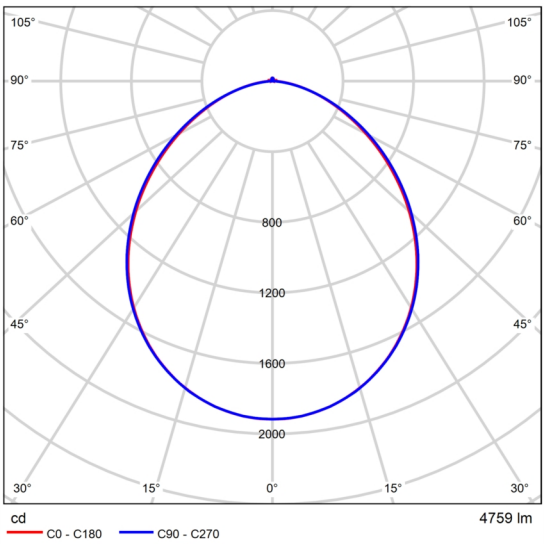
Corrected glare indices referring to 2367lm Total luminous flux

UGR diagram (SHR: 0.25)

Product data sheet

Glamox - MIR 1200 G2 5000 DARK SKY OP 830 FR-PC

Article No.	PIM445237
P	62.0 W
Φ_{Lamp}	–
$\Phi_{Luminaire}$	4759 lm
η	–
Luminous efficacy	76.8 lm/W
CCT	3000 K
CRI	100
Index	X5



Polar LDC

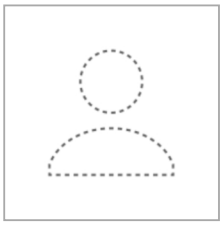
Glare evaluation according to UGR

ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	22.3	23.6	22.6	23.8	24.1	22.4	23.7	22.7	24.0	24.2
	3H	23.5	24.6	23.8	24.9	25.2	23.6	24.8	24.0	25.1	25.3
	4H	23.9	25.0	24.3	25.3	25.6	24.1	25.1	24.4	25.4	25.7
	6H	24.2	25.2	24.6	25.5	25.9	24.3	25.3	24.7	25.7	26.0
	8H	24.3	25.3	24.7	25.6	26.0	24.4	25.4	24.8	25.7	26.0
	12H	24.4	25.3	24.7	25.6	26.0	24.4	25.3	24.8	25.7	26.0
4H	2H	22.9	23.9	23.2	24.2	24.6	23.0	24.0	23.3	24.3	24.7
	3H	24.2	25.1	24.6	25.5	25.8	24.3	25.3	24.7	25.6	26.0
	4H	24.8	25.6	25.2	26.0	26.4	24.9	25.7	25.3	26.1	26.5
	6H	25.2	25.9	25.6	26.3	26.7	25.2	26.0	25.7	26.4	26.8
	8H	25.3	26.0	25.8	26.4	26.8	25.3	26.0	25.8	26.4	26.9
	12H	25.4	26.0	25.9	26.5	26.9	25.4	26.0	25.8	26.4	26.9
8H	4H	25.0	25.7	25.4	26.1	26.5	25.1	25.7	25.5	26.2	26.6
	6H	25.5	26.1	26.0	26.5	27.0	25.6	26.1	26.0	26.5	27.0
	8H	25.7	26.2	26.2	26.7	27.2	25.7	26.2	26.2	26.7	27.2
	12H	25.9	26.3	26.4	26.8	27.3	25.8	26.2	26.3	26.7	27.2
12H	4H	25.0	25.6	25.4	26.0	26.5	25.1	25.7	25.5	26.1	26.6
	6H	25.5	26.0	26.0	26.5	27.0	25.6	26.1	26.1	26.5	27.0
	8H	25.8	26.2	26.3	26.7	27.2	25.8	26.2	26.3	26.7	27.2
Variation of the observer position for the luminaire distances S											
S = 1.0H S = 1.5H S = 2.0H		+0.2 / -0.2 +0.3 / -0.5 +0.6 / -1.0					+0.1 / -0.2 +0.3 / -0.5 +0.6 / -1.0				
Standard table		BK05					BK04				
Correction summand		8.5					8.0				
Corrected glare indices referring to 4759lm Total luminous flux											

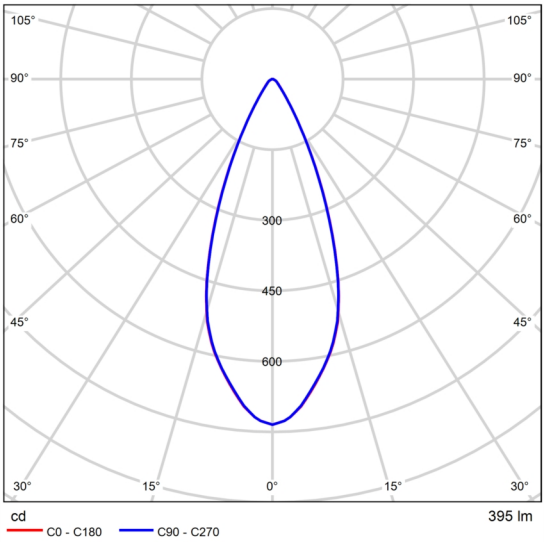
UGR diagram (SHR: 0.25)

Product data sheet

Glamox - RLX B FL 20W MB50 BU 2--A--



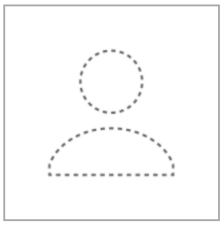
Article No.	PIM398275
P	19.0 W
Φ_{Lamp}	–
$\Phi_{Luminaire}$	395 lm
η	–
Luminous efficacy	20.8 lm/W
CCT	3000 K
CRI	100
Index	X3



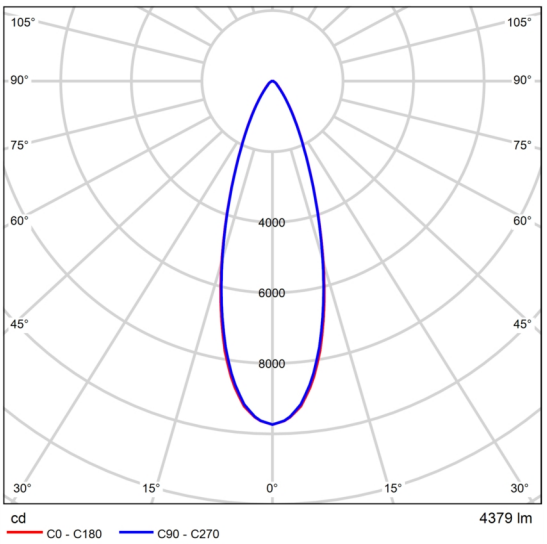
Polar LDC

Product data sheet

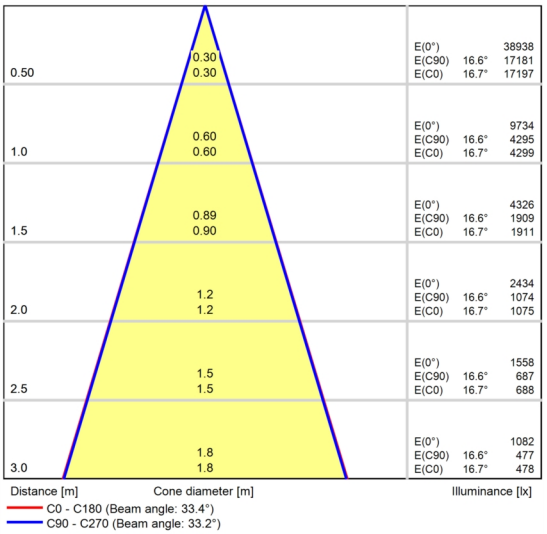
Glamox - RLX B FL 40W MB30 850 2--A--



Article No.	PIM398277
P	40.0 W
Φ_{Lamp}	–
$\Phi_{Luminaire}$	4379 lm
η	–
Luminous efficacy	109.5 lm/W
CCT	3259 K
CRI	84
Index	X2



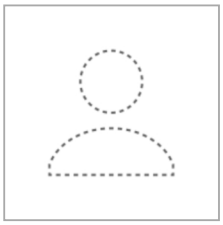
Polar LDC



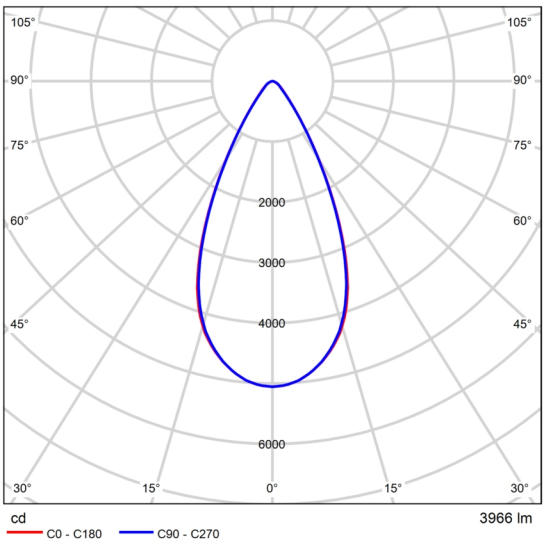
Cone diagram

Product data sheet

Glamox - RLX B FL 40W MB50 850 2--A--



Article No.	PIM398278
P	40.0 W
Φ_{Lamp}	–
$\Phi_{Luminaire}$	3966 lm
η	–
Luminous efficacy	99.2 lm/W
CCT	3259 K
CRI	84
Index	X4



Polar LDC

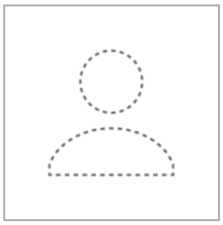
Glare evaluation according to UGR

ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	21.0	21.8	21.2	22.0	22.2	20.9	21.8	21.2	22.0	22.2
	3H	21.1	21.9	21.4	22.2	22.4	21.3	22.1	21.6	22.4	22.6
	4H	21.1	21.8	21.4	22.1	22.4	21.4	22.1	21.7	22.4	22.7
	6H	21.0	21.7	21.4	22.0	22.3	21.4	22.1	21.7	22.3	22.6
	8H	21.0	21.7	21.3	22.0	22.3	21.3	22.0	21.7	22.3	22.6
	12H	21.0	21.6	21.3	21.9	22.2	21.3	21.9	21.7	22.2	22.6
4H	2H	21.1	21.8	21.4	22.1	22.4	21.1	21.8	21.4	22.1	22.4
	3H	21.3	22.0	21.7	22.3	22.6	21.6	22.3	22.0	22.6	22.9
	4H	21.3	21.9	21.7	22.2	22.6	21.7	22.3	22.1	22.6	23.0
	6H	21.3	21.7	21.7	22.1	22.5	21.7	22.2	22.1	22.6	23.0
	8H	21.2	21.7	21.6	22.1	22.5	21.7	22.1	22.1	22.5	22.9
	12H	21.2	21.6	21.6	22.0	22.4	21.7	22.1	22.1	22.5	22.9
8H	4H	21.3	21.7	21.7	22.1	22.5	21.7	22.1	22.1	22.5	22.9
	6H	21.2	21.6	21.7	22.0	22.5	21.7	22.0	22.1	22.5	22.9
	8H	21.2	21.5	21.7	21.9	22.4	21.7	22.0	22.1	22.4	22.9
	12H	21.2	21.4	21.6	21.9	22.4	21.6	21.9	22.1	22.3	22.8
12H	4H	21.2	21.7	21.7	22.1	22.5	21.6	22.0	22.1	22.5	22.9
	6H	21.2	21.5	21.7	21.9	22.4	21.6	22.0	22.1	22.4	22.9
	8H	21.1	21.4	21.6	21.9	22.4	21.6	21.9	22.1	22.3	22.8
Variation of the observer position for the luminaire distances S											
S = 1.0H		+2.5 / -2.1					+2.3 / -1.8				
S = 1.5H		+4.6 / -3.3					+4.3 / -2.3				
S = 2.0H		+6.4 / -5.0					+6.0 / -3.4				
Standard table		BK01					BK01				
Correction summand		3.2					3.4				
Corrected glare indices referring to 3966lm Total luminous flux											

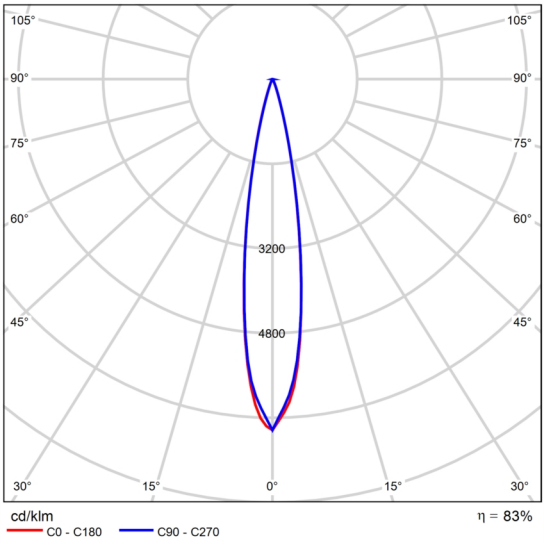
UGR diagram (SHR: 0.25)

Product data sheet

Glamox - RLX C Floodlight 80WAC1 SB20 5K 1x6-13 2ABAABK



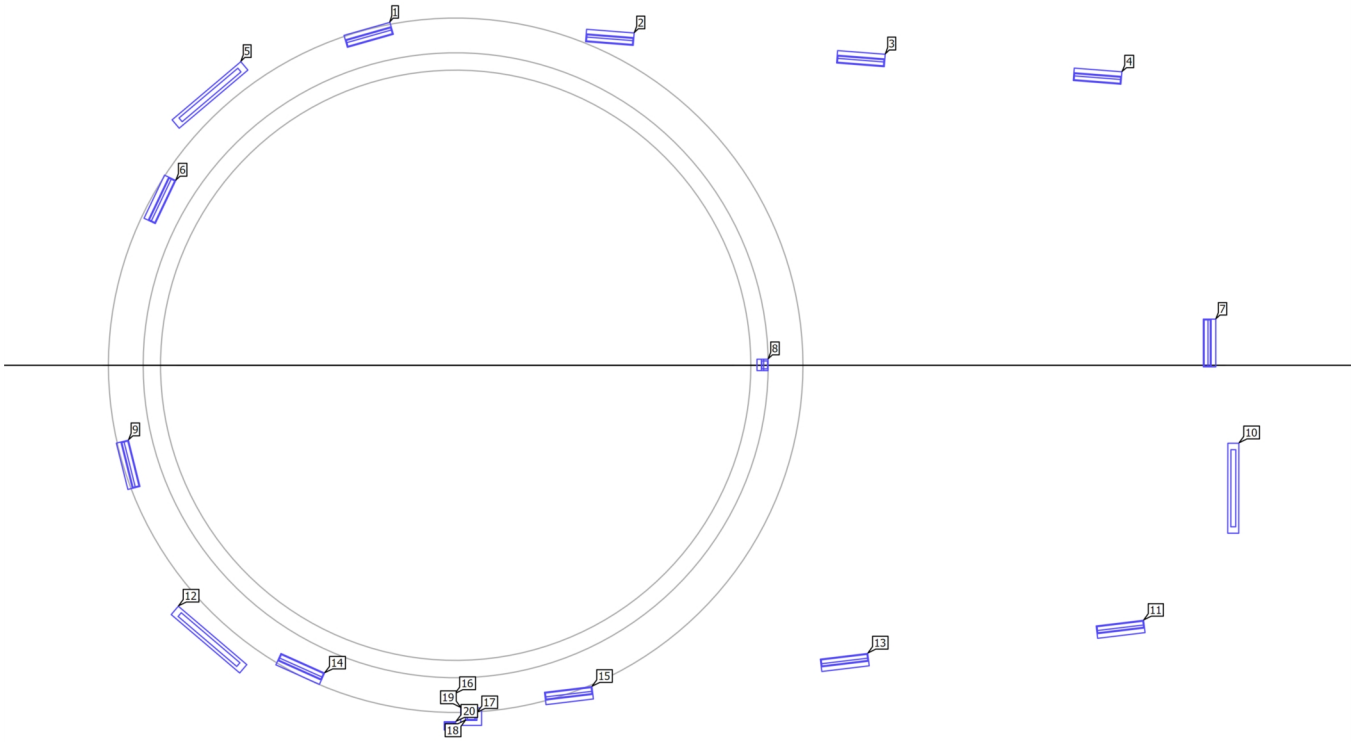
Article No.	100015
P	80.0 W
Φ_{Lamp}	10776 lm
$\Phi_{Luminaire}$	8988 lm
η	83.41 %
Luminous efficacy	112.3 lm/W
CCT	3259 K
CRI	84
Index	X1



Polar LDC

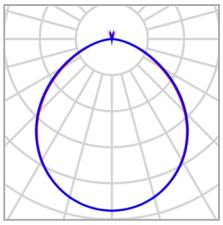
Codling Wind Park

Luminaire layout plan



Codling Wind Park

Luminaire layout plan



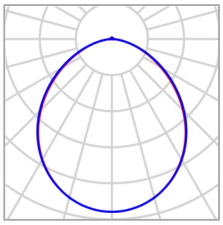
Manufacturer	Glamox	P	30.0 W
Article No.	PIM421482	$\Phi_{Luminaire}$	2367 lm
Article name	MIR 600 G2 2500 DARK SKY OP 830 FR-PC		
Fitting	1x PIM421482		
Index	X6		

Individual luminaires

X	Y	Mounting height	Luminaire
-220.279 m	4.790 m	94.372 m	1
-216.794 m	4.755 m	94.372 m	2
-213.179 m	4.448 m	94.372 m	3
-209.772 m	4.196 m	94.372 m	4
-223.306 m	2.403 m	94.372 m	6
-208.129 m	0.320 m	94.372 m	7
-223.765 m	-1.442 m	94.372 m	9
-209.439 m	-3.837 m	94.372 m	11
-213.410 m	-4.314 m	94.372 m	13
-221.269 m	-4.405 m	94.372 m	14
-217.382 m	-4.792 m	94.372 m	15

Codling Wind Park

Luminaire layout plan



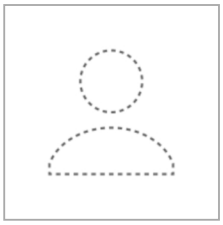
Manufacturer	Glamox	P	62.0 W
Article No.	PIM445237	$\Phi_{Luminaire}$	4759 lm
Article name	MIR 1200 G2 5000 DARK SKY OP 830 FR-PC		
Fitting	1x PIM445237		
Index	X5		

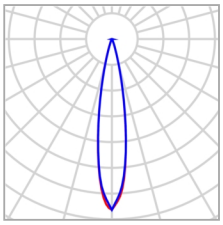
Individual luminaires

X	Y	Mounting height	Luminaire
-222.554 m	3.892 m	94.409 m	5
-207.820 m	-1.772 m	94.409 m	10
-222.568 m	-3.951 m	94.409 m	12

Codling Wind Park

Luminaire layout plan





Manufacturer	Glamox
Article No.	100015
Article name	RLX C Floodlight 80WAC1 SB20 5K 1x6-13 2ABAABK
Fitting	1x RLX C Floodlight 80WAC1 SB20 5K 1x6-13 2ABAABK
Index	X1

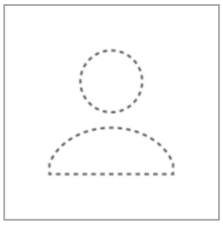
P	80.0 W
$\Phi_{Luminaire}$	8988 lm

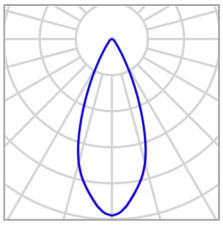
Individual luminaires

X	Y	Mounting height	Luminaire
-218.794 m	-5.062 m	71.823 m	19

Codling Wind Park

Luminaire layout plan





Manufacturer	Glamox
Article No.	PIM398275
Article name	RLX B FL 20W MB50 BU 2--A--
Fitting	1x PIM398275
Index	X3

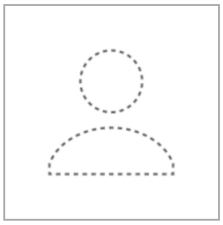
P	19.0 W
$\Phi_{Luminaire}$	395 lm

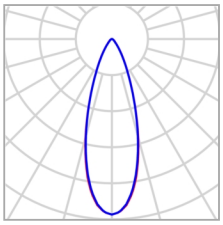
Individual luminaires

X	Y	Mounting height	Luminaire
-219.112 m	-4.800 m	98.129 m	16

Codling Wind Park

Luminaire layout plan





Manufacturer	Glamox
Article No.	PIM398277
Article name	RLX B FL 40W MB30 850 2--A--
Fitting	1x PIM398277
Index	X2

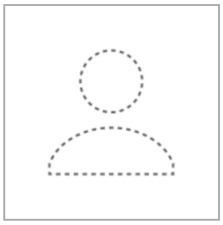
P	40.0 W
$\Phi_{Luminaire}$	4379 lm

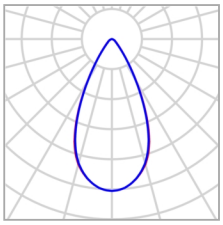
Individual luminaires

X	Y	Mounting height	Luminaire
-218.794 m	-5.056 m	84.258 m	17
-218.794 m	-5.062 m	78.027 m	18
-219.100 m	-5.200 m	91.852 m	20

Codling Wind Park

Luminaire layout plan





Manufacturer	Glamox
Article No.	PIM398278
Article name	RLX B FL 40W MB50 850 2--A--
Fitting	1x PIM398278
Index	X4

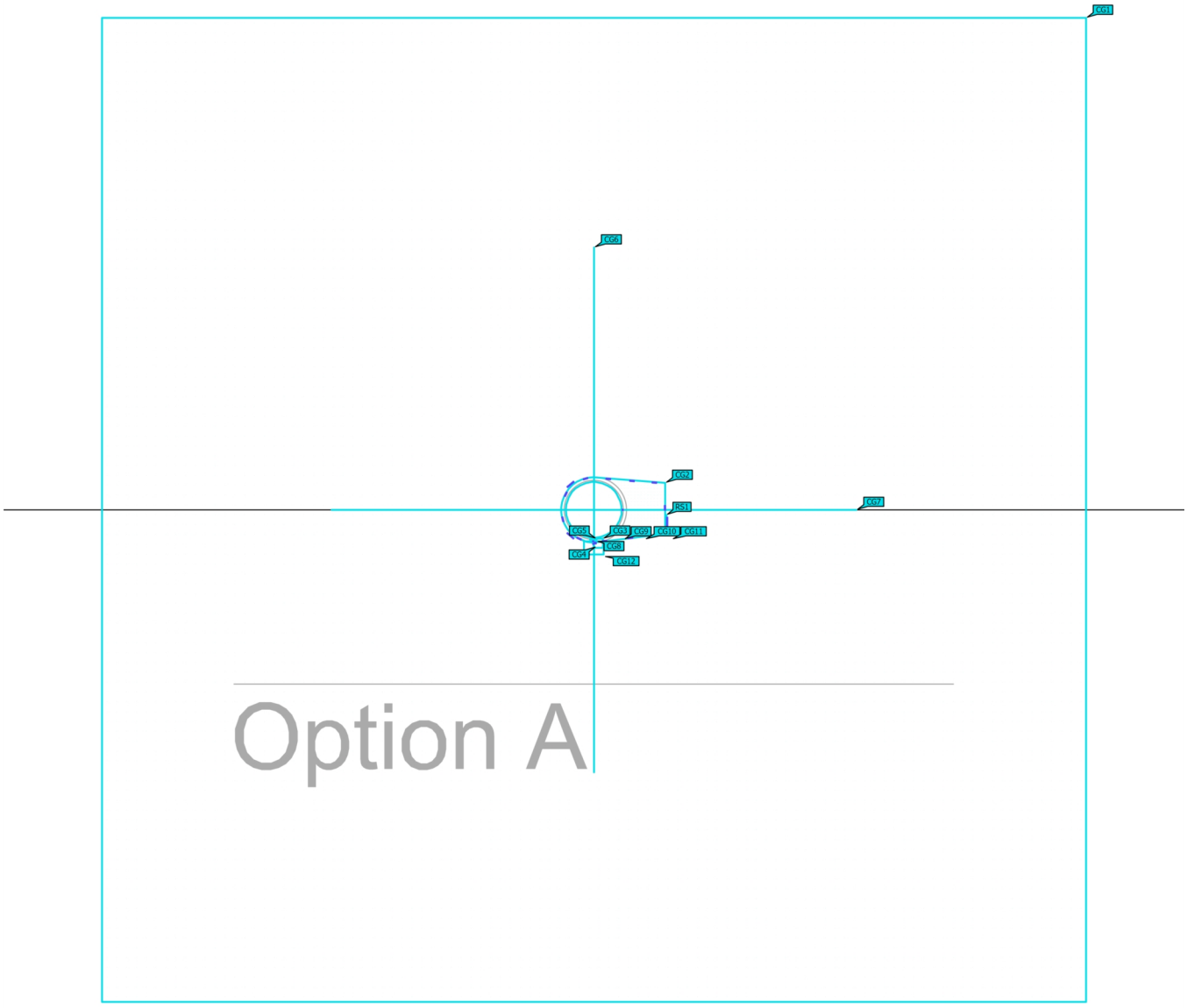
P	40.0 W
$\Phi_{Luminaire}$	3966 lm

Individual luminaires

X	Y	Mounting height	Luminaire
-214.630 m	0.004 m	98.129 m	8

Codling Wind Park (Active Use)

Calculation objects



Codling Wind Park (Active Use)

Calculation objects

Surface result objects

Properties	Ø	min	max	U_o (g_1)	g_2	Index
ID1 - ID Marker Board Perpendicular illuminance (adaptive) Height: 93.196 m	80.2 lx	20.2 lx	310 lx	0.25	0.065	RS1
ID1 - ID Marker Board Luminance Height: 93.196 m	12.2 cd/m²	3.08 cd/m²	47.4 cd/m²	0.25	0.065	RS1

Calculation surfaces

Properties	$\bar{E}$	E_{min}	E_{max}	U_o (g_1)	g_2	Index
BL1 - Boat Landing Area Perpendicular illuminance Height: 62.453 m	429 lx	214 lx	664 lx	0.50	0.32	CG12
L1 - Ladder Perpendicular illuminance Height: 67.654 m	169 lx	56.0 lx	474 lx	0.33	0.12	CG11
L2 - Ladder Perpendicular illuminance Height: 75.232 m	144 lx	41.0 lx	344 lx	0.28	0.12	CG10
L3 - Ladder Perpendicular illuminance Height: 81.416 m	146 lx	42.8 lx	337 lx	0.29	0.13	CG9
L4 - Ladder Perpendicular illuminance Height: 88.895 m	183 lx	46.7 lx	352 lx	0.26	0.13	CG8
LAT Perpendicular illuminance Height: 62.100 m	0.84 lx	0.001 lx	550 lx	0.001	0.000	CG1
P1 - Platform Perpendicular illuminance Height: 72.192 m	222 lx	184 lx	255 lx	0.83	0.72	CG5
P2 - Platform Perpendicular illuminance Height: 78.402 m	220 lx	182 lx	252 lx	0.83	0.72	CG4

Codling Wind Park (Active Use)

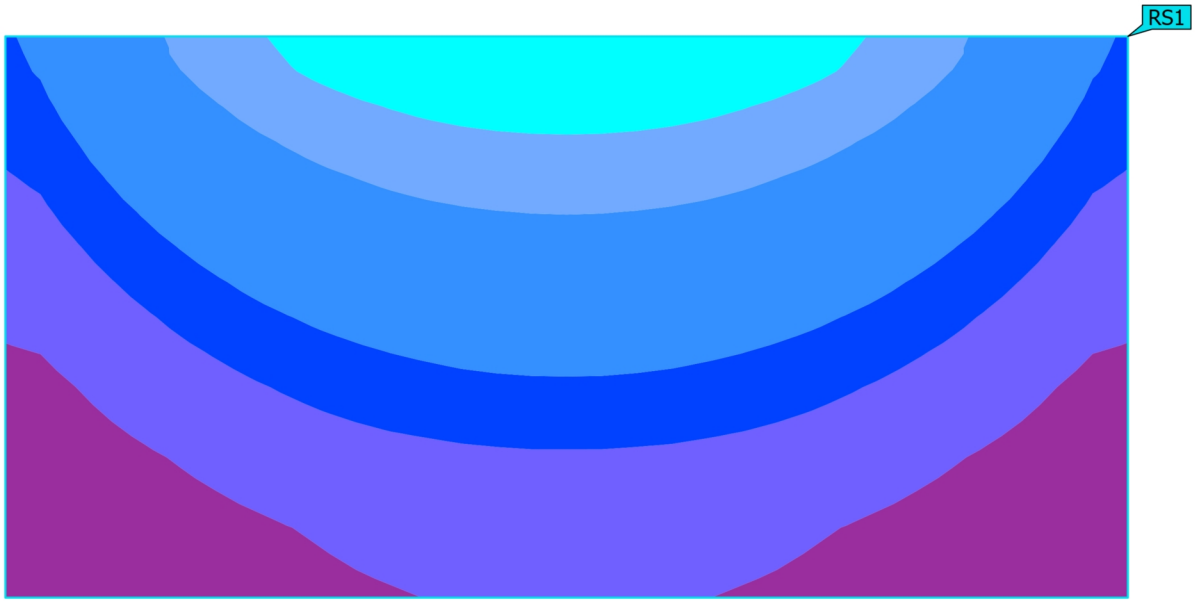
Calculation objects

P3. Platform Perpendicular illuminance Height: 84.579 m	134 lx	105 lx	159 lx	0.78	0.66	CG3
VMP1 - Section B-B Perpendicular illuminance (adaptive) Height: 101.966 m	1.34 lx	0.000 lx	5156 lx	0.00	0.00	CG6
VMP1 - Section B-B Perpendicular illuminance Height: 101.966 m	0.77 lx	0.00 lx	170 lx	0.00	0.00	CG6
VMP1 - Section B-B Vertical illuminance Rotation: 0.0°, Height: 101.966 m	0.77 lx	0.00 lx	170 lx	0.00	0.00	CG6
VMP2 - Section A-A Perpendicular illuminance (adaptive) Height: 102.127 m	0.63 lx	0.000 lx	160 lx	0.00	0.00	CG7
VMP2 - Section A-A Perpendicular illuminance Height: 102.127 m	0.70 lx	0.00 lx	137 lx	0.00	0.00	CG7
VMP2 - Section A-A Vertical illuminance Rotation: 269.2°, Height: 102.127 m	0.71 lx	0.00 lx	133 lx	0.00	0.00	CG7
WD1 - Working Deck Perpendicular illuminance Height: 92.889 m	181 lx	70.8 lx	451 lx	0.39	0.16	CG2

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Codling Wind Park (Active Use)

ID1 - ID Marker Board

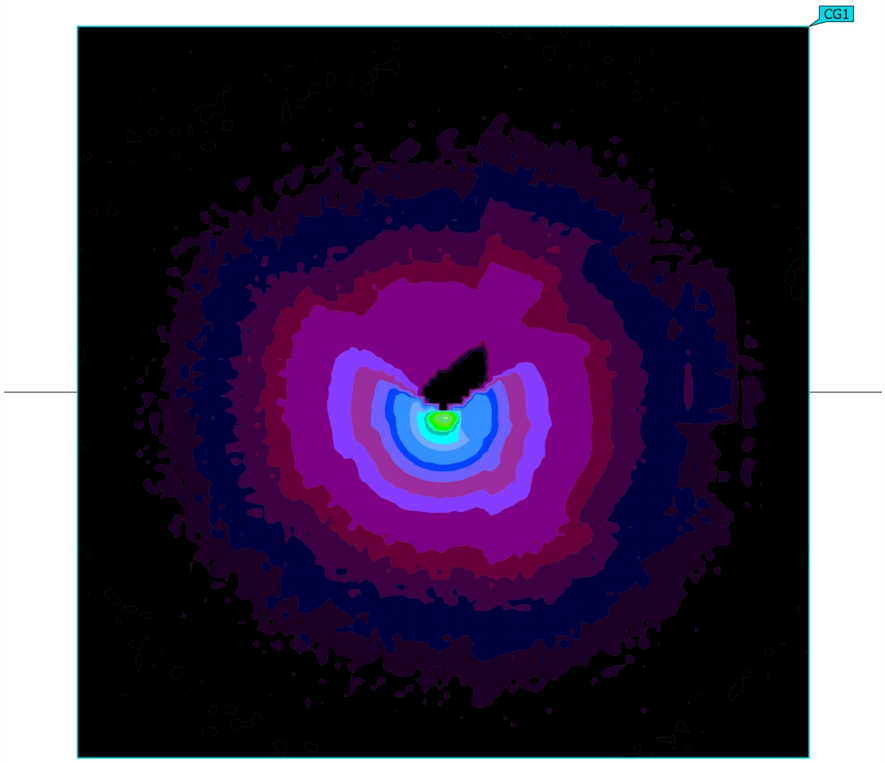


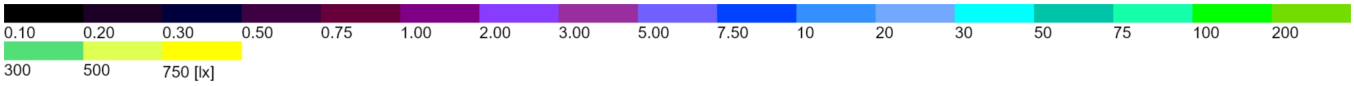
Properties	Ø	min	max	U_o (g_1)	g_2	Index
ID1 - ID Marker Board Luminance Height: 93.196 m	12.2 cd/m²	3.08 cd/m²	47.4 cd/m²	0.25	0.065	RS1

Notes on planning:
Mean (Average) Luminance – 5 cd/m2, Uniformity =0.25

Codling Wind Park (Active Use)

LAT

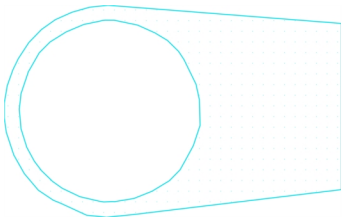


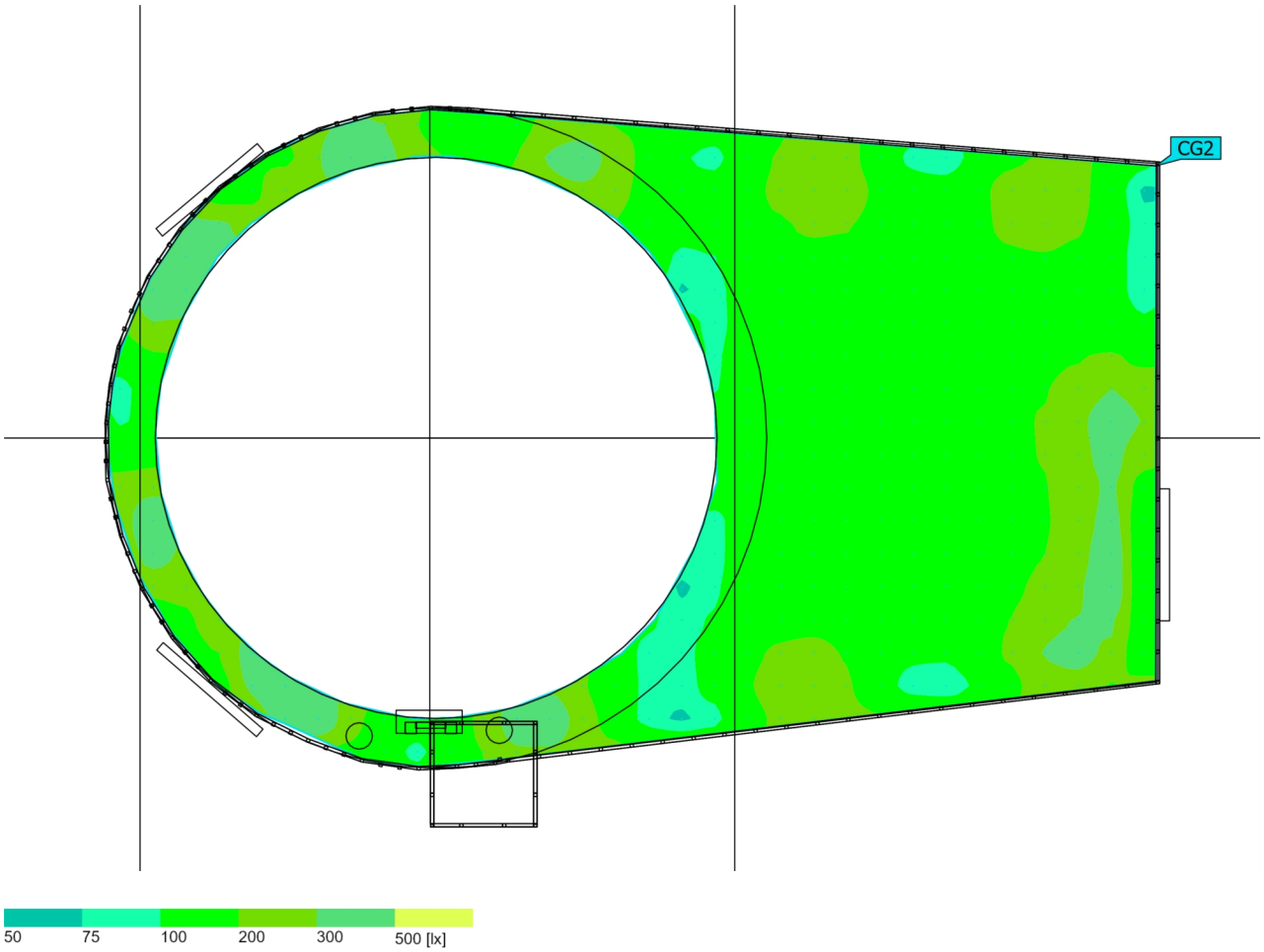


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
LAT Perpendicular illuminance Height: 62.100 m	0.84 lx	0.001 lx	550 lx	0.001	0.000	CG1

Codling Wind Park (Active Use)

WD1 - Working Deck



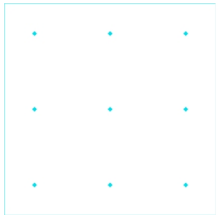


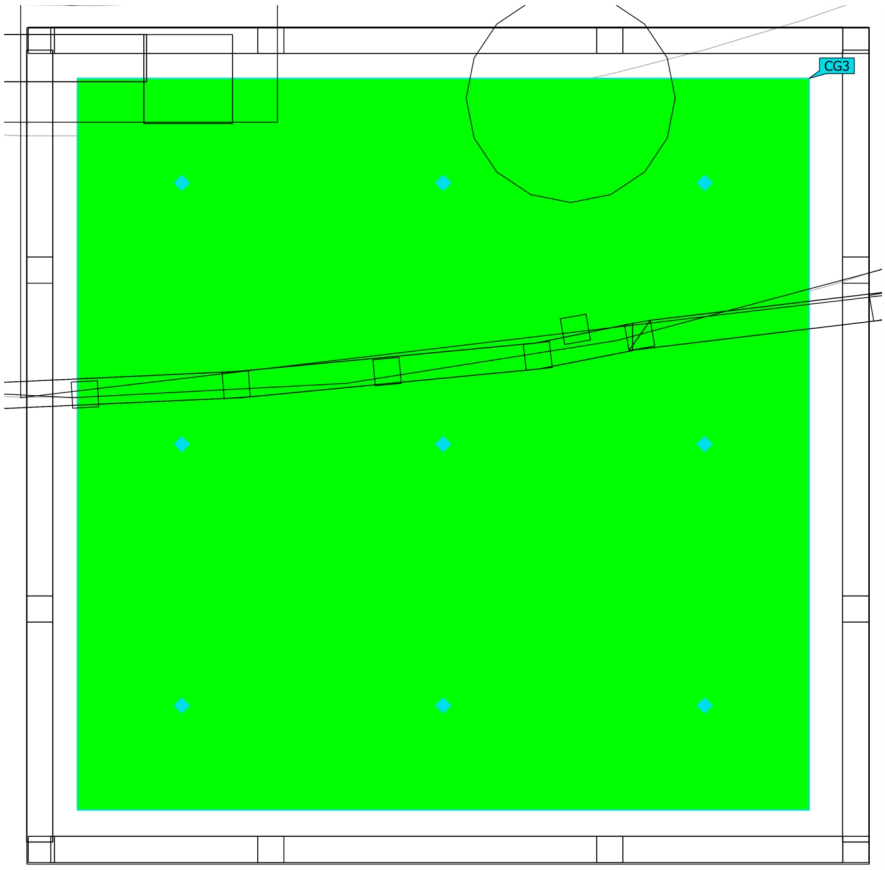
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
WD1 - Working Deck Perpendicular illuminance Height: 92.889 m	181 lx	70.8 lx	451 lx	0.39	0.16	CG2

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

P3. Platform



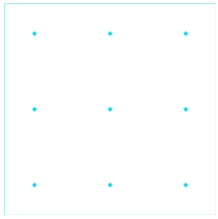


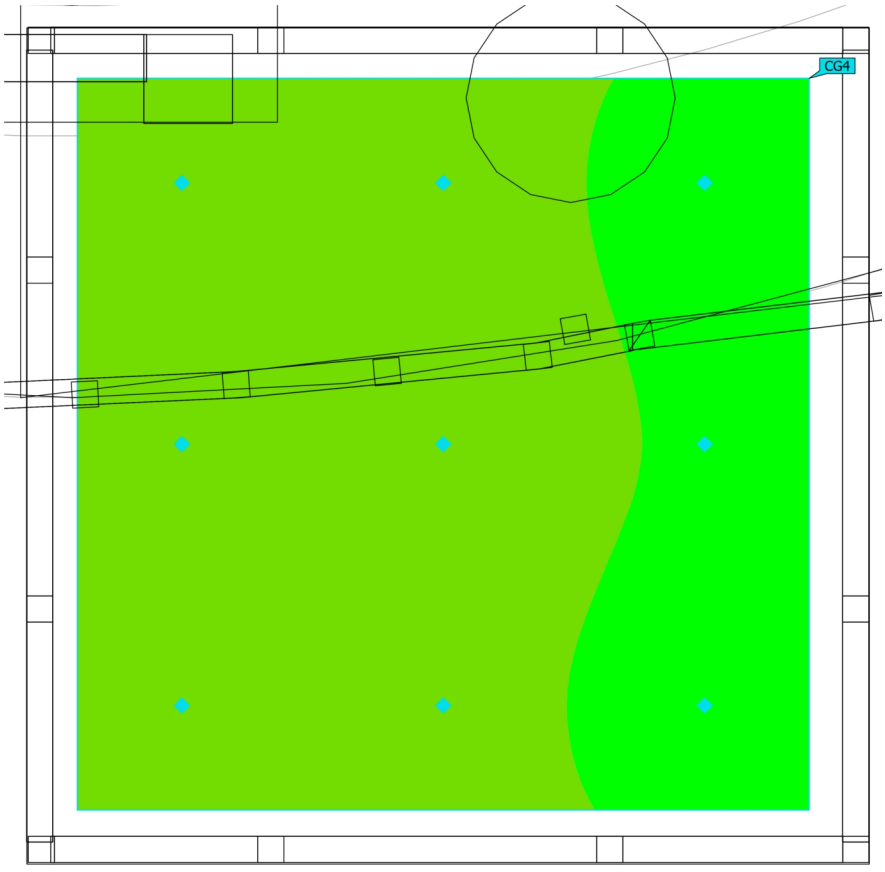
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
P3. Platform Perpendicular illuminance Height: 84.579 m	134 lx	105 lx	159 lx	0.78	0.66	CG3

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

P2 - Platform



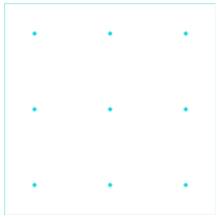


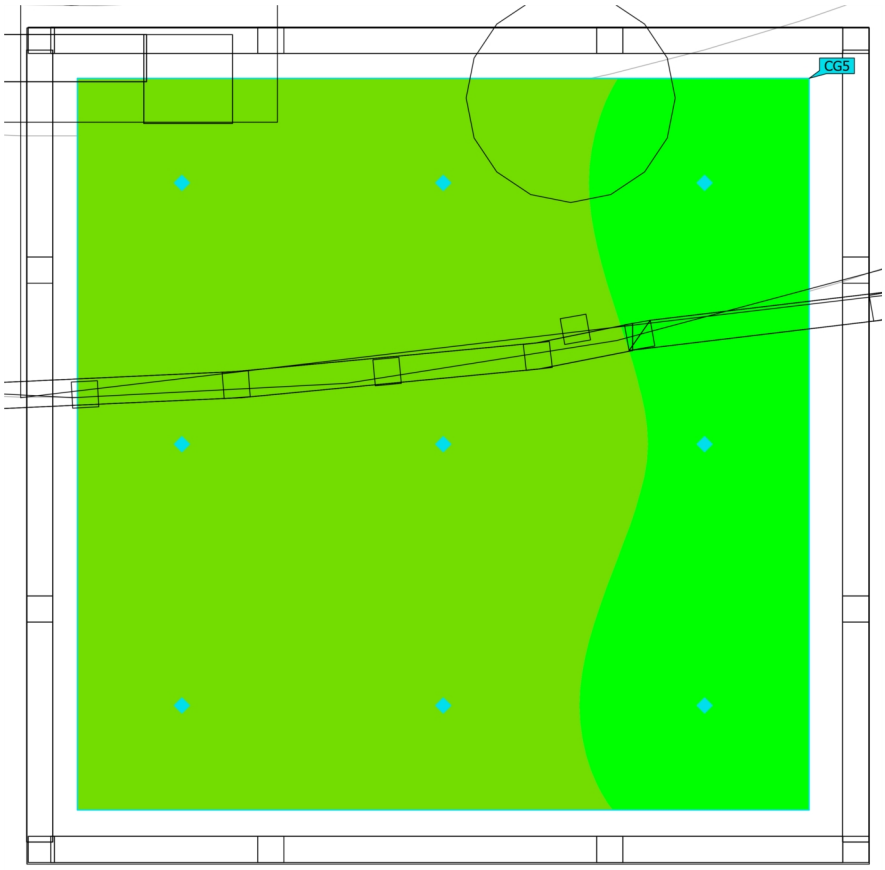
Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
P2 - Platform Perpendicular illuminance Height: 78.402 m	220 lx	182 lx	252 lx	0.83	0.72	CG4

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

P1 - Platform



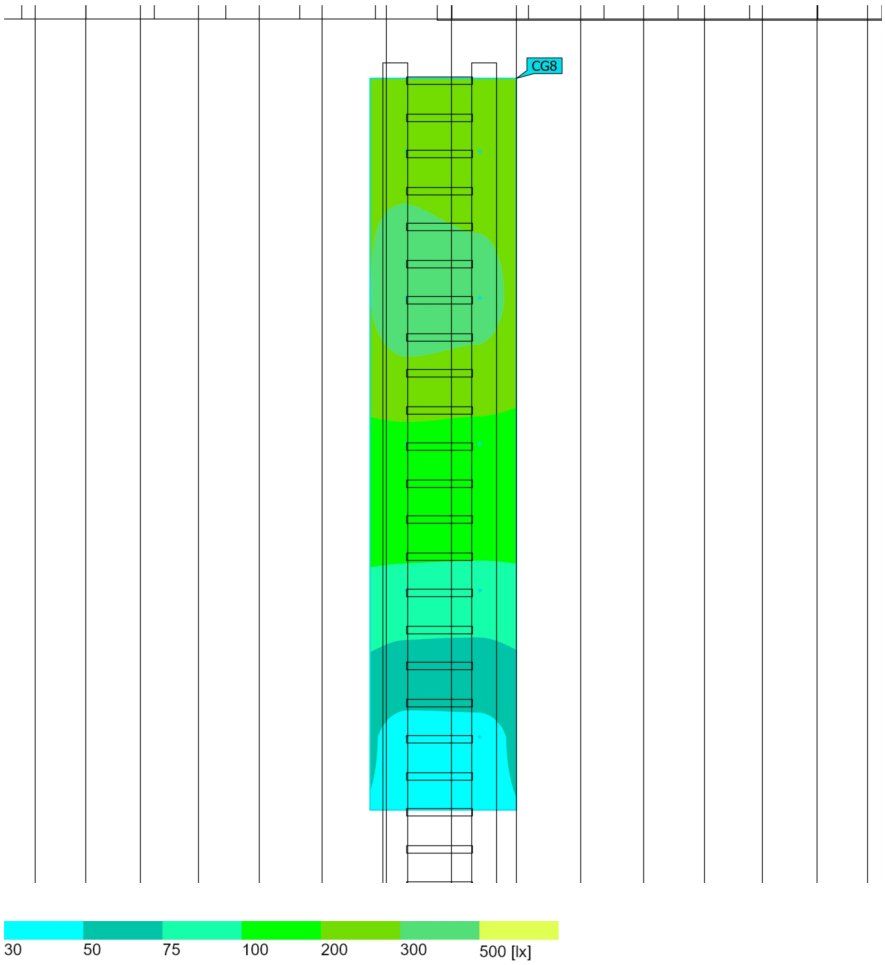


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
P1 - Platform Perpendicular illuminance Height: 72.192 m	222 lx	184 lx	255 lx	0.83	0.72	CG5

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

L4 - Ladder

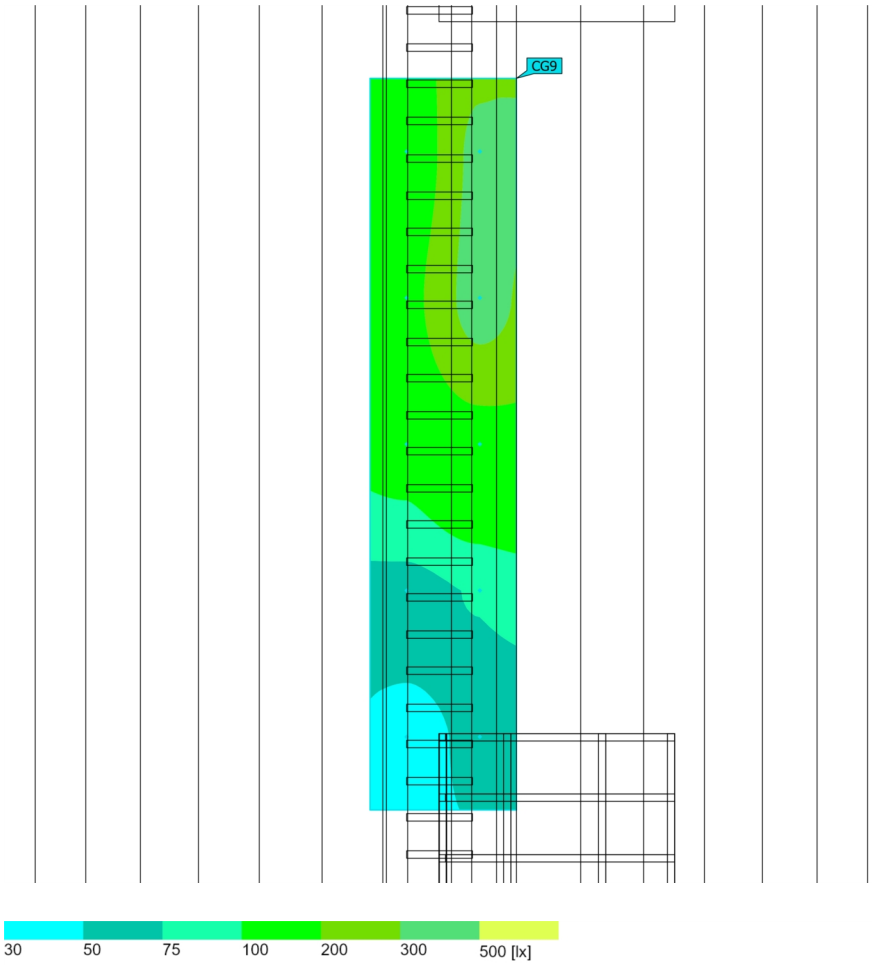


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
L4 - Ladder Perpendicular illuminance Height: 88.895 m	183 lx	46.7 lx	352 lx	0.26	0.13	CG8

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

L3 - Ladder

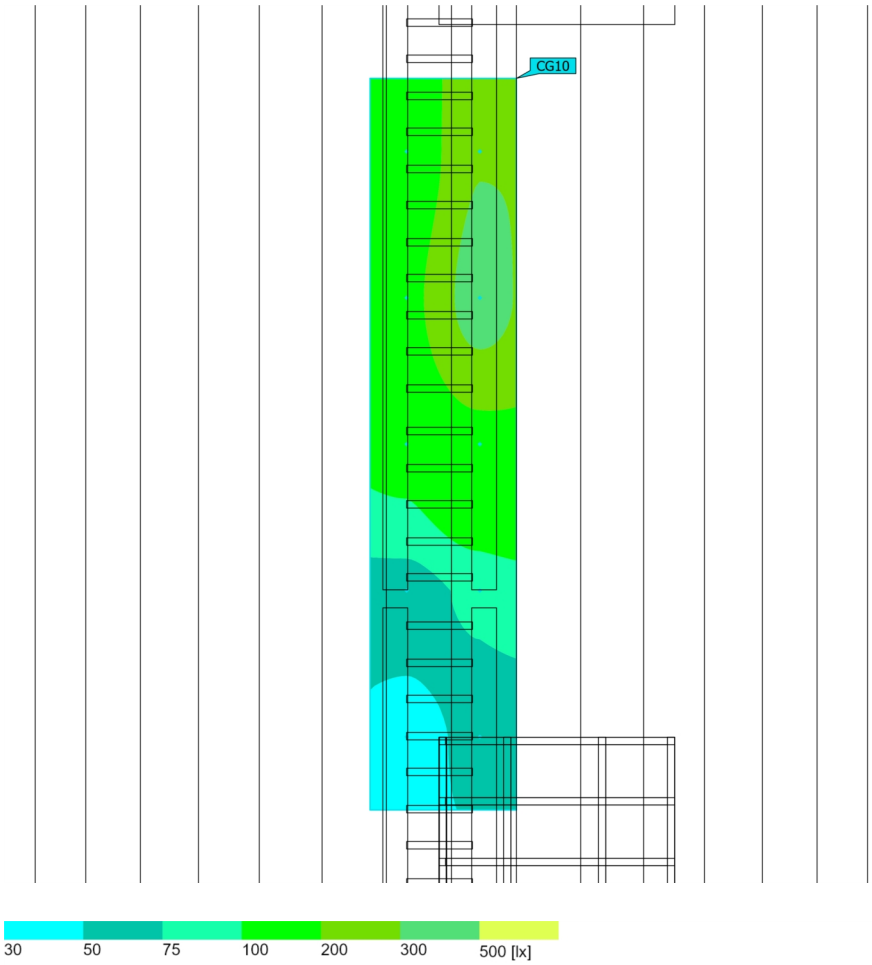


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
L3 - Ladder Perpendicular illuminance Height: 81.416 m	146 lx	42.8 lx	337 lx	0.29	0.13	CG9

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

L2 - Ladder

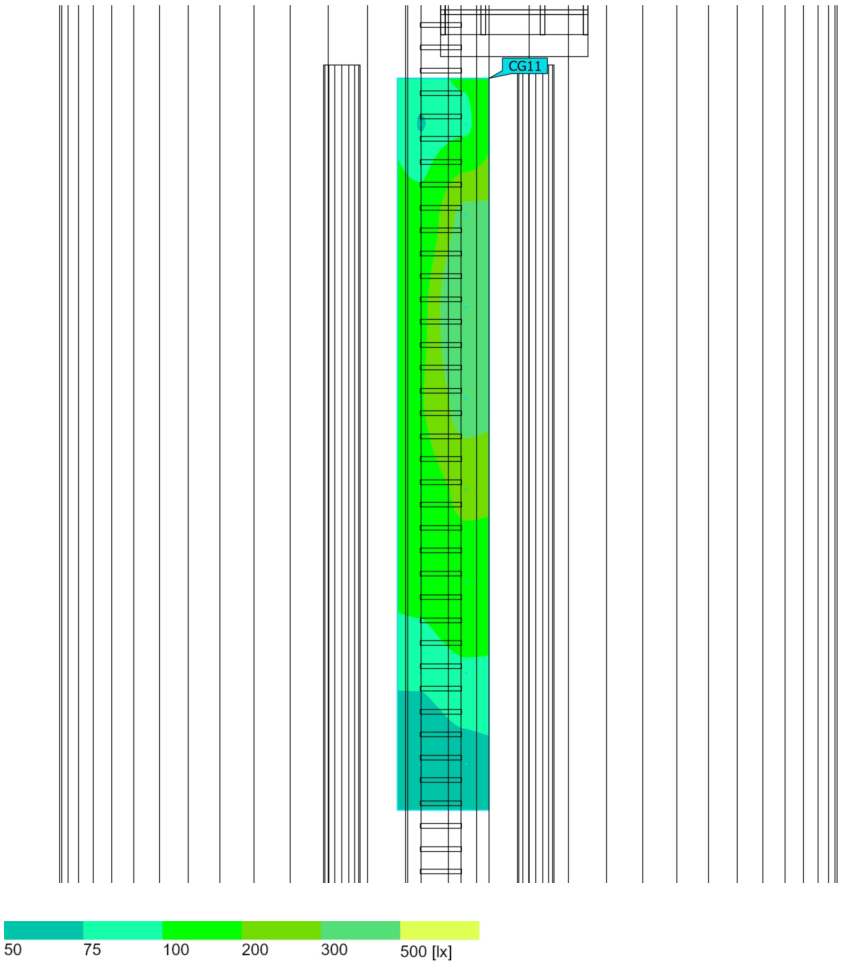


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
L2 - Ladder Perpendicular illuminance Height: 75.232 m	144 lx	41.0 lx	344 lx	0.28	0.12	CG10

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

L1 - Ladder

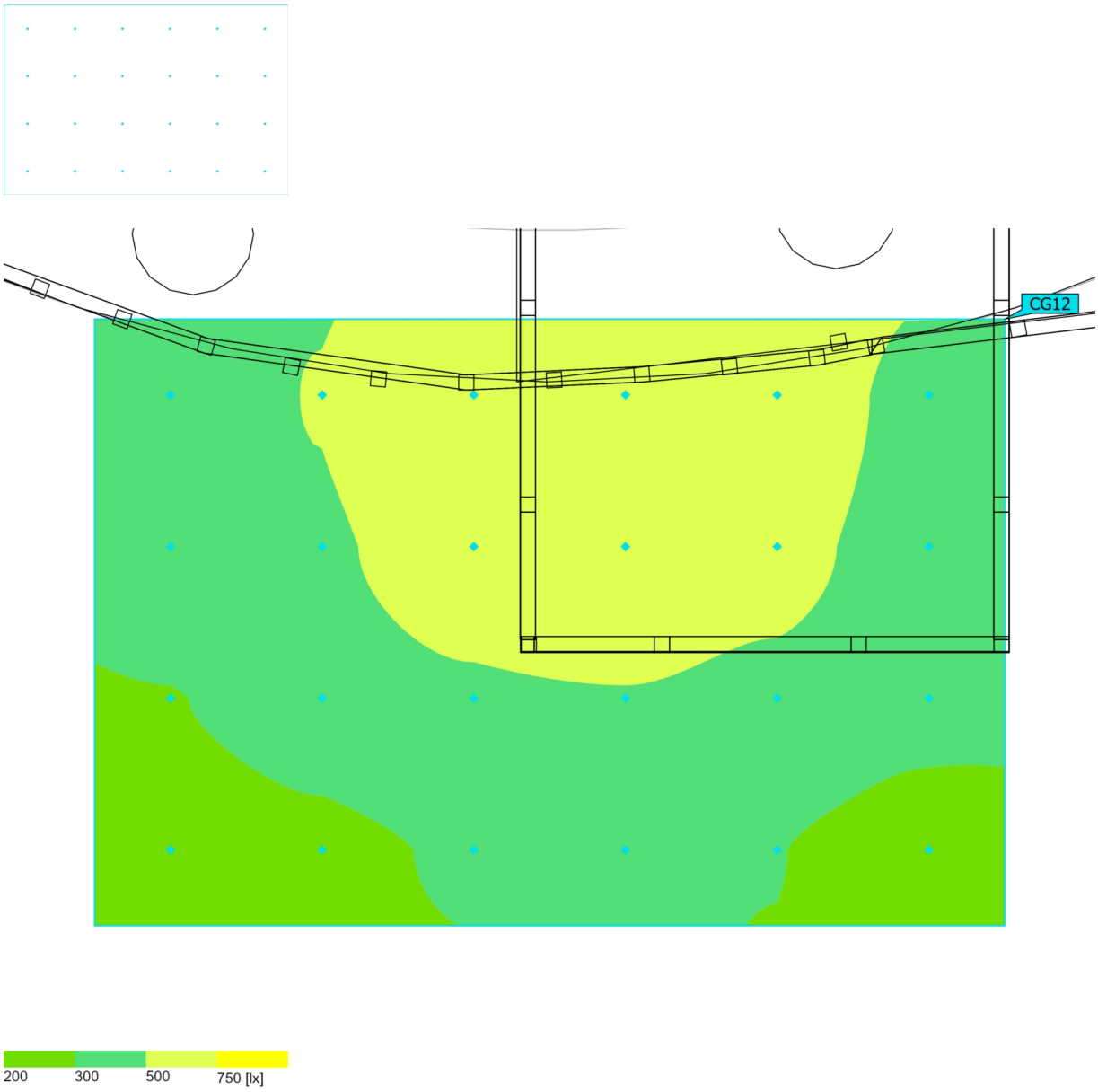


Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
L1 - Ladder Perpendicular illuminance Height: 67.654 m	169 lx	56.0 lx	474 lx	0.33	0.12	CG11

Notes on planning:
BS EN 12464 19.2 Off-shore Structures: Ladders, stairs and walkways.
Average: 100 lux, Uniformity: 0.25

Codling Wind Park (Active Use)

BL1 - Boat Landing Area



Properties	Ē	E_{min}	E_{max}	U_o (g_1)	g_2	Index
BL1 - Boat Landing Area Perpendicular illuminance Height: 62.453 m	429 lx	214 lx	664 lx	0.50	0.32	CG12

Notes on planning:
BS EN 12464 19.3 Off-shore Structures: Boat Landing Area.
Average: 100 lux, Uniformity: 0.25

Appendix B Lighting Layout & Lux Contour Plan

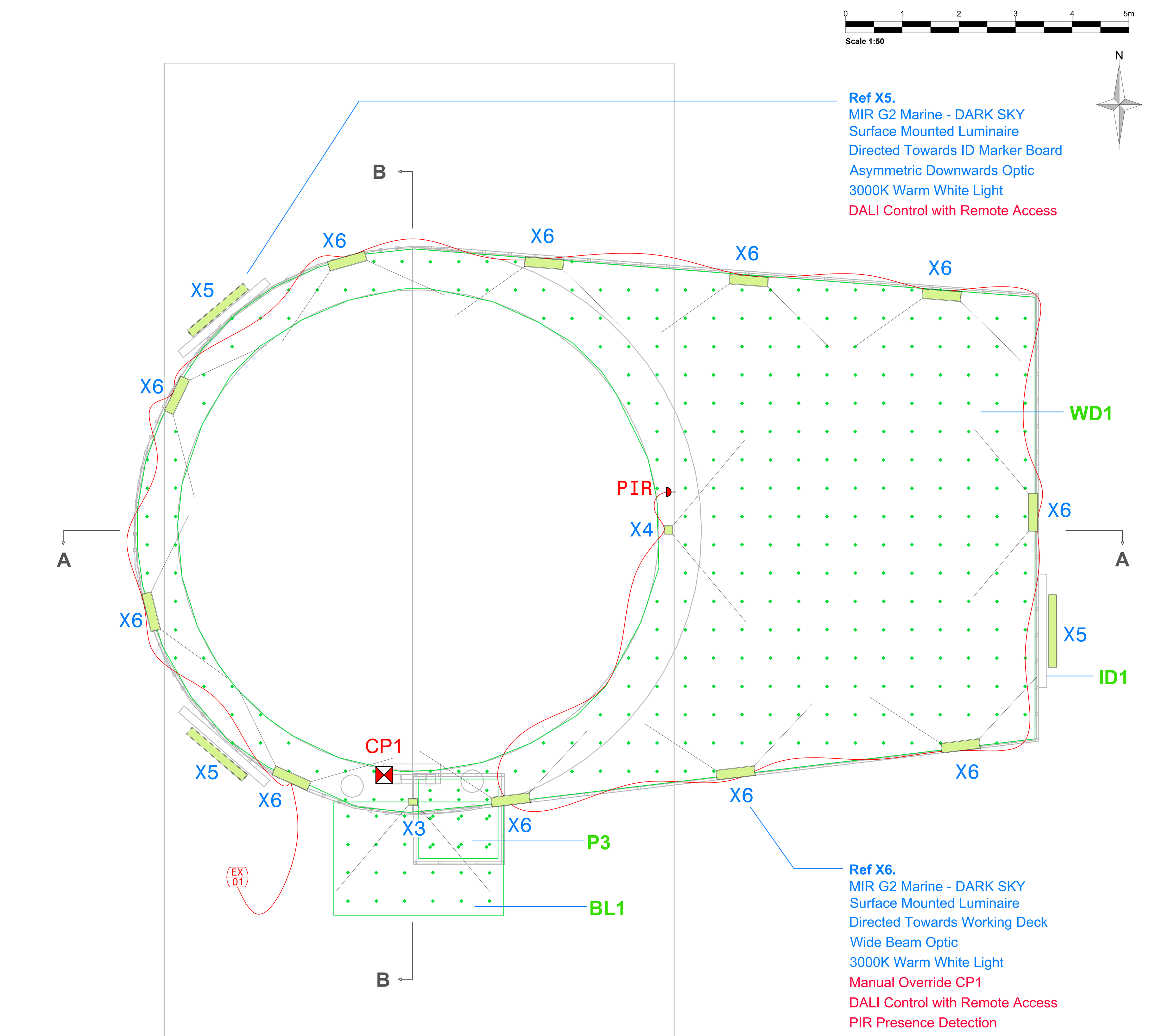
Lux Assessment Report

Codling Wind Park

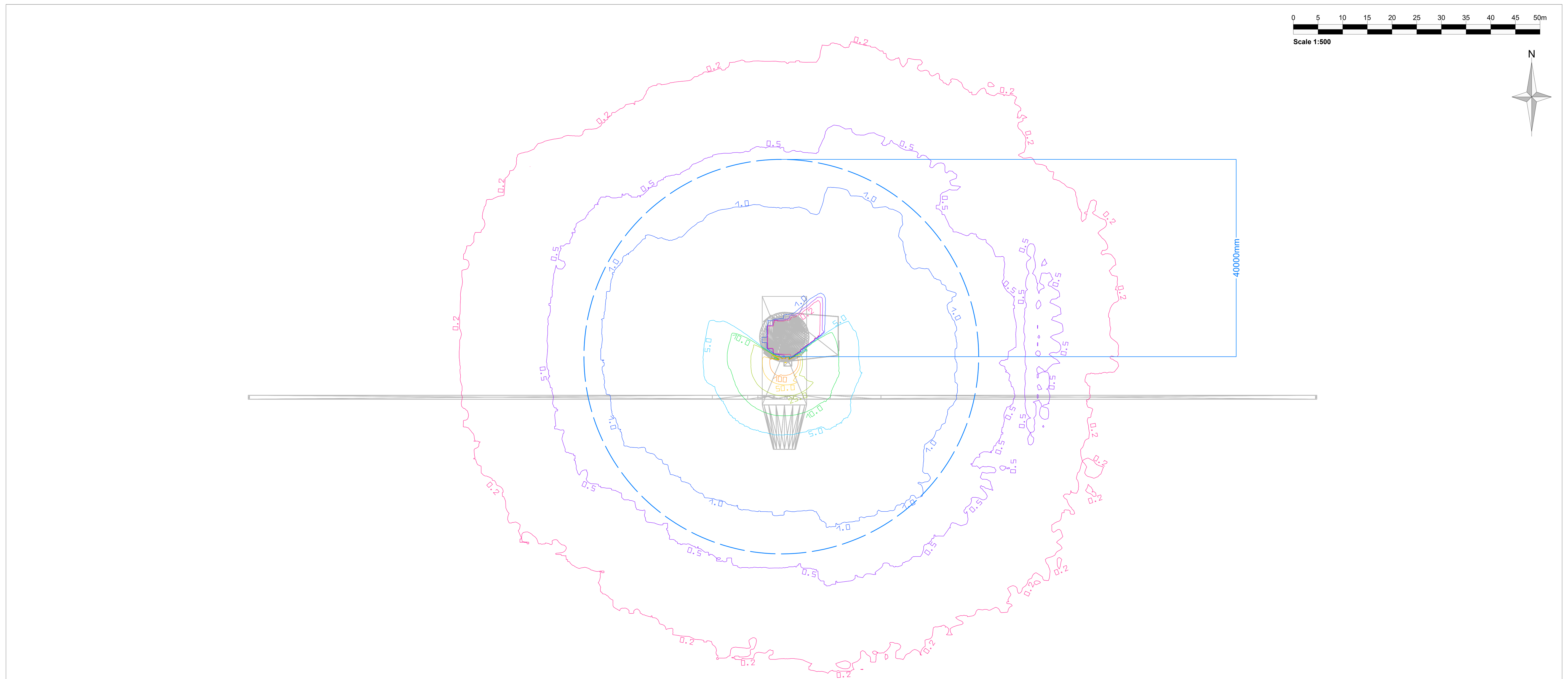
Codling Wind Park Limited

SLR Project No.: 415.065438.00001

27 May 2026

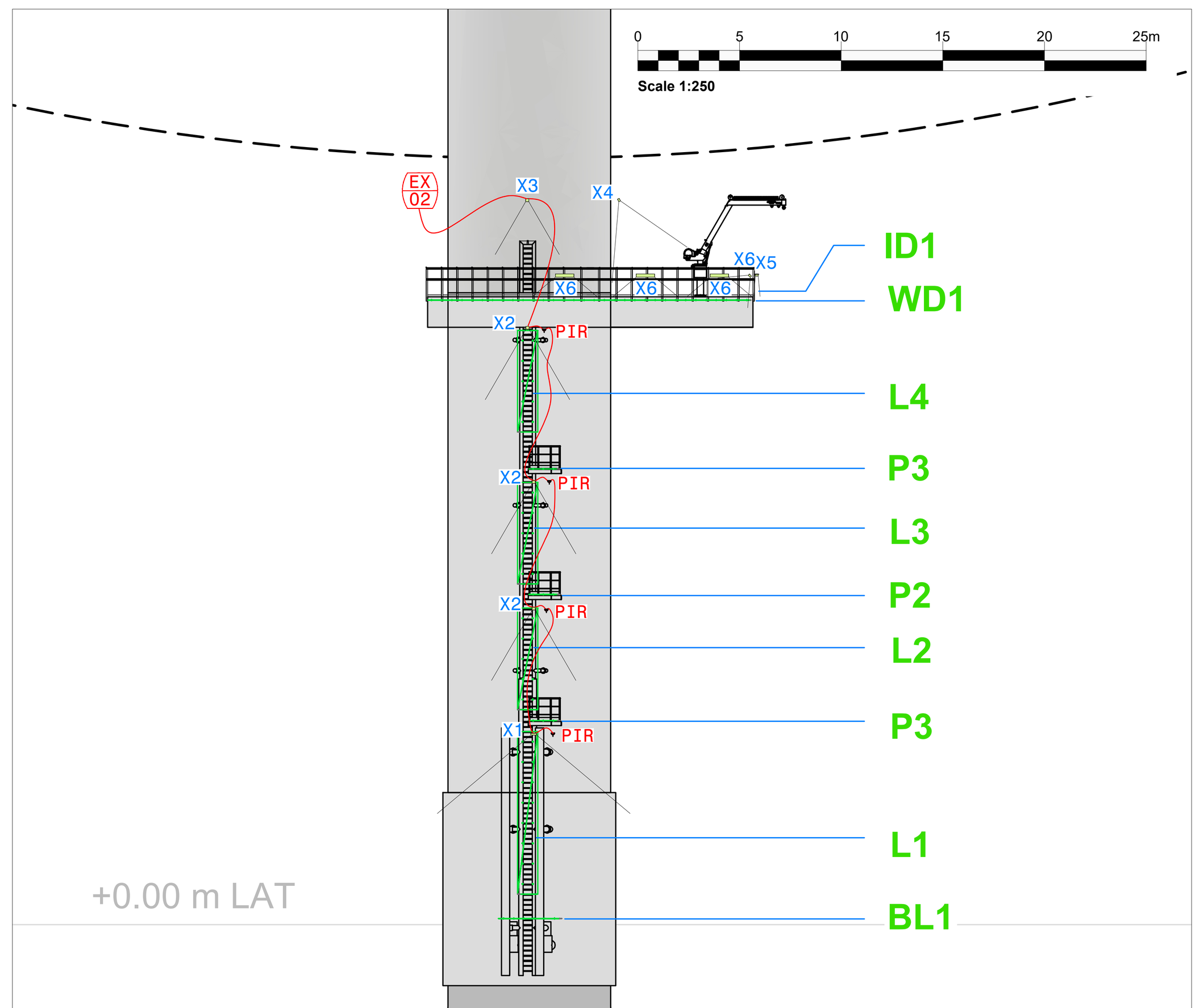


LIGHTING LAYOUT PLAN (WD1 - WORKING DECK) - MAINTENANCE FACTOR 0.80



LUX CONTOUR PLAN AT +0.00 m LAT - MAINTENANCE FACTOR 1.00 / ALL ON 100%

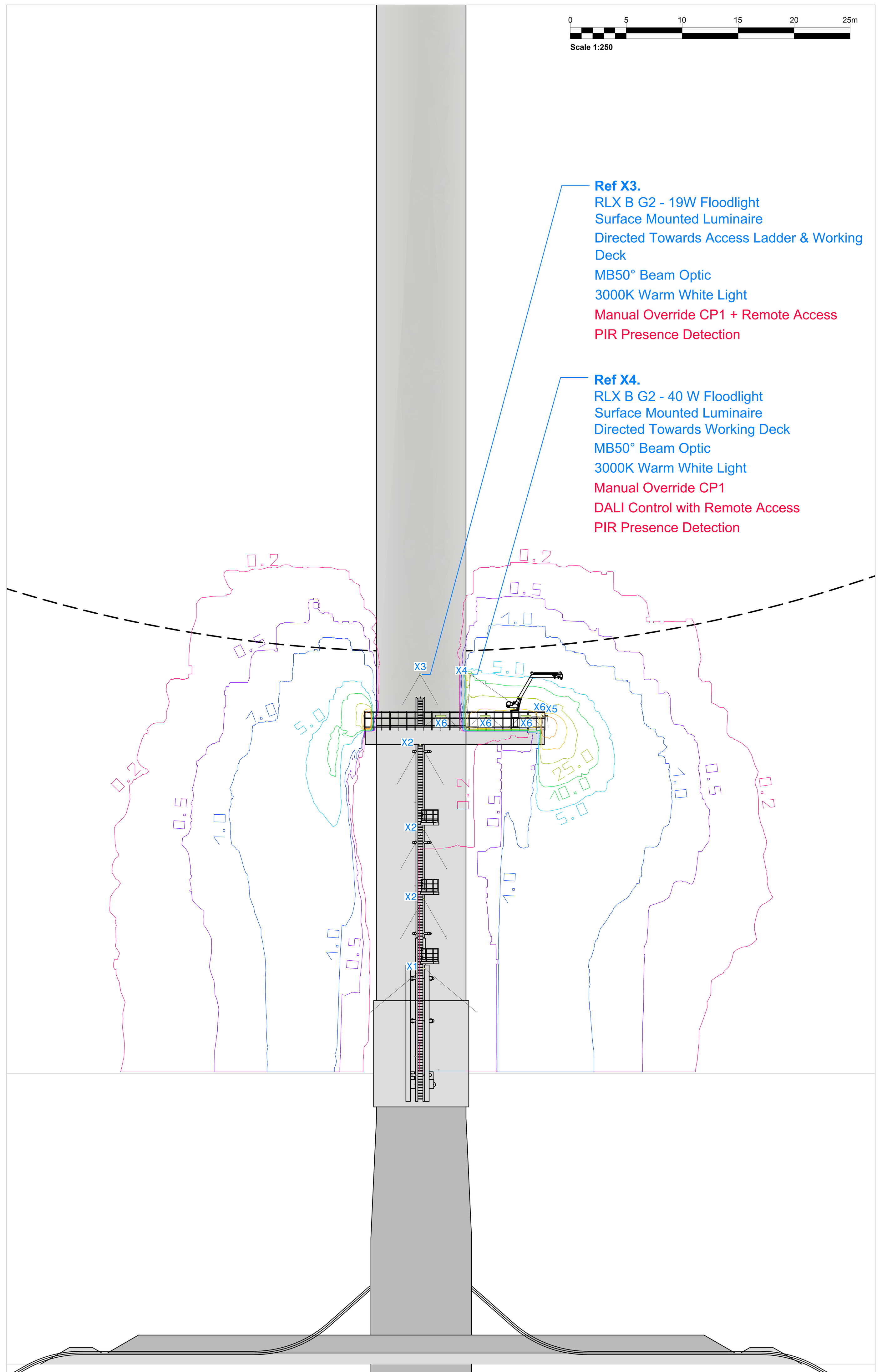
LUMINAIRE REF	QTY	LOAD (W)	TOTAL LOAD (W)
X1 Manufacturer: Glamox Model: Luminell RLX C G2 Floodlight Ref: RLX C FL 80W100-277VAC Surface Mounted Under Platform Directed Towards Boat Loading Area & Access Ladder Optic: Wide Beam Delivered Lumens: 8988 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	1	80 W	80 W @ 100%
X2 Manufacturer: Glamox Model: Luminell RLX B G2 Floodlight Ref: RLX B FL 40W MB30 850 Surface Mounted Under Platform Directed Towards Access Ladder Optic: MB30° Narrow Beam Delivered Lumens: 4379 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	3	40 W	120 W @ 100%
X3 Manufacturer: Glamox Model: Luminell RLX B G2 Floodlight Ref: RLX B FL 20W MB50 BU Surface Mounted to Turbine Directed Towards Access Ladder & Working Deck Optic: MB50° Beam Delivered Lumens: 395 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	1	19 W	19 W @ 100%
X4 Manufacturer: Glamox Model: Luminell RLX B G2 Floodlight Ref: RLX B FL 40W MB50 850 Surface Mounted to Turbine Directed Towards Working Deck Optic: MB50° Beam Delivered Lumens: 3966 lm CCT: Warm White Light (3000 K) CRI: >70 Control: PIR Presence Detection + Control System with Remote Access	1	40 W	40 W @ 100%
X5 Manufacturer: Glamox Model: MIR G2 Marine - DARK SKY Ref: MIRS67-1200 (M) G2 5000 DARK SKY DALI OP 830 TW BN20 FR/PC RAL9005 Item Number: MIR107765 Surface Mounted to Railing Directed Towards ID Marker Board Optic: Asymmetric Downwards Optic Delivered Lumens: 4759 lm CCT: Warm White Light (3000 K) CRI: >80 Control: DALI Control with Remote Access	3	62 W	40 W @ 100%
X6 Manufacturer: Glamox Model: MIR G2 Marine - DARK SKY Ref: MIRS67-600 (M) G2 2500 DARK SKY DALI OP 830 TW BN20 FR/PC RAL9005 Item Number: PM240516101 Surface Mounted to Railing Directed Towards Working Deck Optic: Wide Beam Delivered Lumens: 2367 lm CCT: Warm White Light (3000 K) CRI: >80 Control: DALI Control with Remote Access + PIR Presence Detection	11	30 W	330 W @ 100%



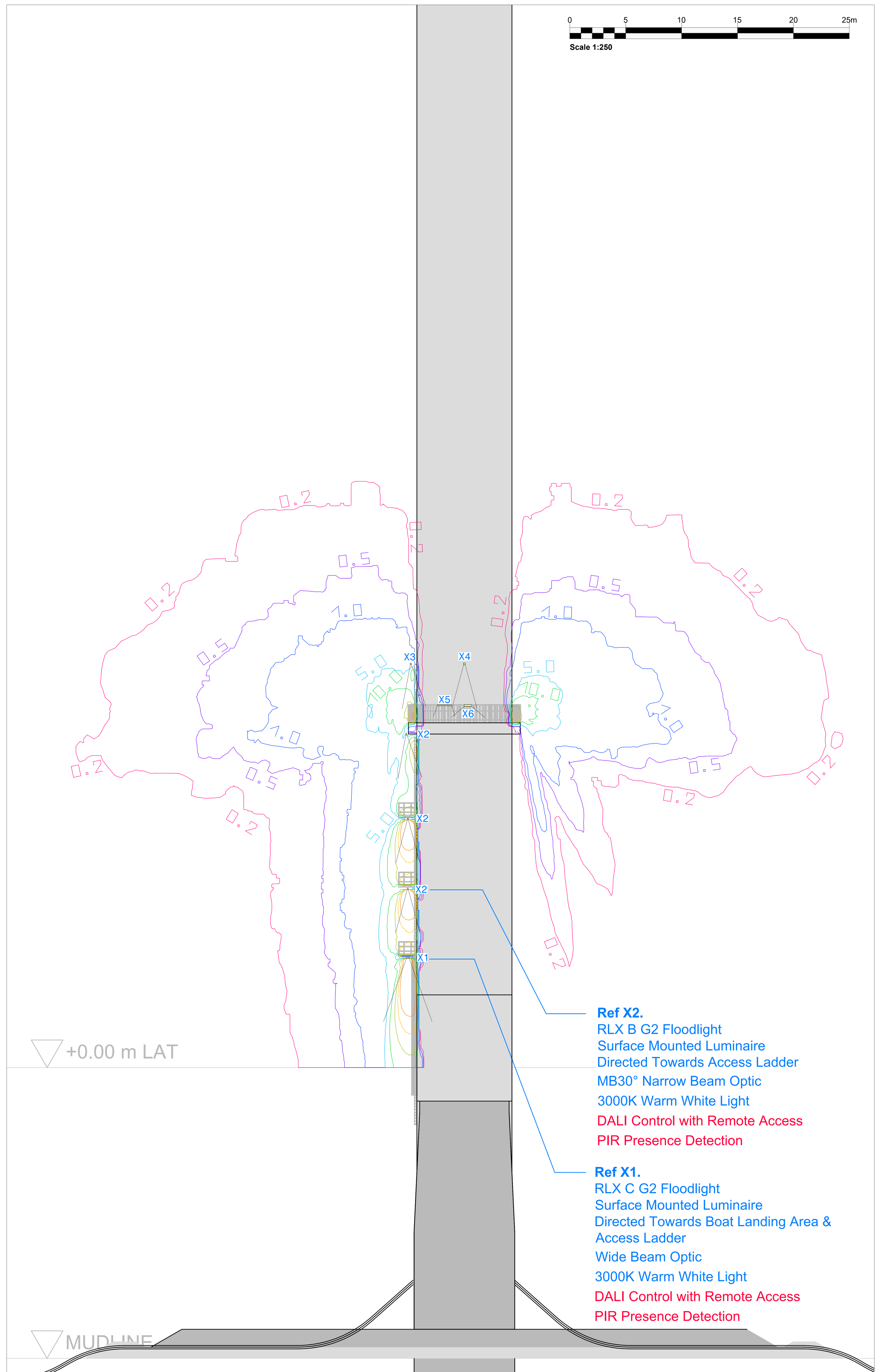
SECTION A-A: LIGHTING LAYOUT SECTION - MAINTENANCE FACTOR 0.80

BS EN 12464-2: 2024 GUIDANCE FOR LIGHTING OF OUTDOOR WORKPLACES

ILLUMINANCE Normal Operation MF = 0.80	AVERAGE ILLUMINANCE [LUX]		UNIFORMITY		TARGET
AREA / USAGE	**REQUIREMENT**	**RESULT**	**REQUIREMENT**	**RESULT**	**PASS/FAIL**
BL1 - Boat Landing Area *BS EN 12464 Table 19 - Off-shore Structures 19.3 Boat Landing Area*	100	430	0.25	0.50	PASS
L1 - Ladder *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	169	0.25	0.33	PASS
L2 - Ladder *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	144	0.25	0.28	PASS
L3 - Ladder *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	146	0.25	0.29	PASS
L4 - Ladder *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	183	0.25	0.26	PASS
P1 - Platform *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	222	0.25	0.83	PASS
P2 - Platform *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	221	0.25	0.83	PASS
P3 - Platform *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	134	0.25	0.78	PASS
WD1 - Working Deck *BS EN 12464 Table 19 - Off-shore Structures 19.2 Ladders, stairs and walkways*	100	168	0.25	0.42	PASS
	AVERAGE ILLUMINANCE [cd/m^2]		UNIFORMITY		TARGET
ID1 - ID Marker Board *ID System and panel*	5	12	0.25	0.25	PASS



SECTION A-A: LUX CONTOUR SECTION - MAINTENANCE FACTOR 1.00 / ALL ON 100%



SECTION B-B: LUX CONTOUR SECTION - MAINTENANCE FACTOR 1.00 / ALL ON 100%

DESIGN NOTES:

Contractor shall verify all dimensions, levels and existing utilities on site before installation; any discrepancies must be reported to the Engineer.

Columns, brackets and luminaires shall be installed to manufacturer's instructions; mounting heights and orientations shall match the drawing.

LED luminaires shall be supplied with the specified wattage, optical distribution and control settings.

Existing equipment to be removed shall be disconnected, made safe and disposed of in accordance with WEEE regulations.

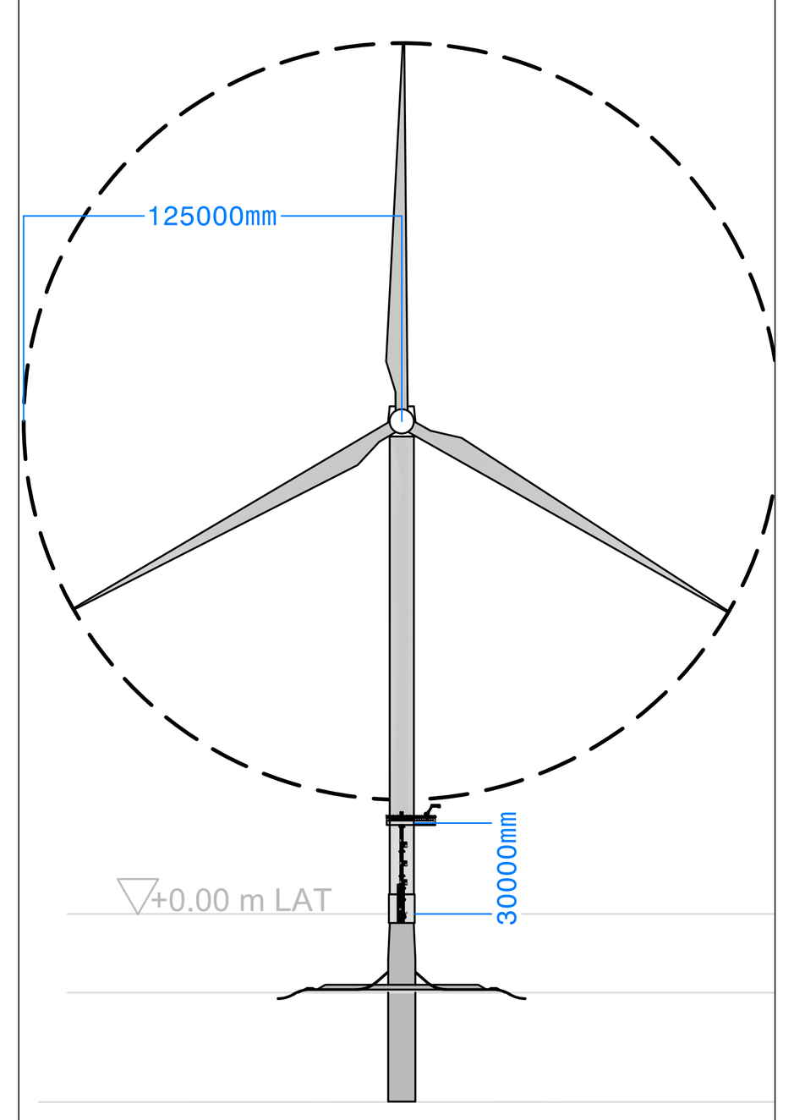
All installations shall be tested and certified to BS 7671; as built information shall be provided prior to handover.

Lighting design undertaken in accordance with ILP Guidance Note 01/21 - The Reduction of Obtrusive Light and relevant environmental zone criteria.

Scheme designed to minimise light spill, sky glow, and glare, with optical control selected to avoid illumination of adjacent properties, habitats, or sensitive receptors.

This drawing should be read in conjunction with the Lux Assessment Report.

Drawing based on:
'0058 Layout Option A - Wind Turbine Generator (WTG) Details'
(by Codling Wind Park)



ISOLINES

- 0.2 lx
- 0.4 lx
- 1.0 lx
- 5.0 lx
- 10.0 lx
- 25.0 lx
- 50.0 lx
- 100.0 lx

LIGHTING CONTROL

EX XX — 'External' — Denotes External Control Group

CP1 — Control Plate (inside door) Manual override to control exterior lighting during operational occupation

Control Group	Product	QTY	Method
1	[X4] RLX B G2 Floodlight MB50° Optic - 40W [X6] Glamox MIR G2 Marine MIRS67-1200 (M) Wide Beam - 30 W	12	DALI Control with Remote Access + PIR Presence Detection
2	[X1] RLX C G2 Floodlight Wide Beam - 80W & [X2] RLX B G2 Floodlight Narrow Beam - 40W & [X3] RLX B G2 Floodlight MB50° Optic - 19W	5	DALI Control with Remote Access + PIR Presence Detection

Rev	Amendments	Date	By	Chk	Auth
01	FIRST ISSUE	13.05.26	RD	ND	ND

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Drawing Purpose	INDICATIVE LAYOUT
Suitability Code	S1
Client	CODLING WIND PARK LIMITED
Project	CODLING WIND PARK
Drawing Title	INDICATIVE LIGHTING LAYOUT & LUX CONTOURS
Scale	VARIES @ A0
SLR Project No.	415.065438.00001
Designed	ND
Drawn	RD
Checked	ND
Authorised	ND
Date	13.05.26
Drawing Number	415.065438.00001-LLP+LCP
Rev.	01

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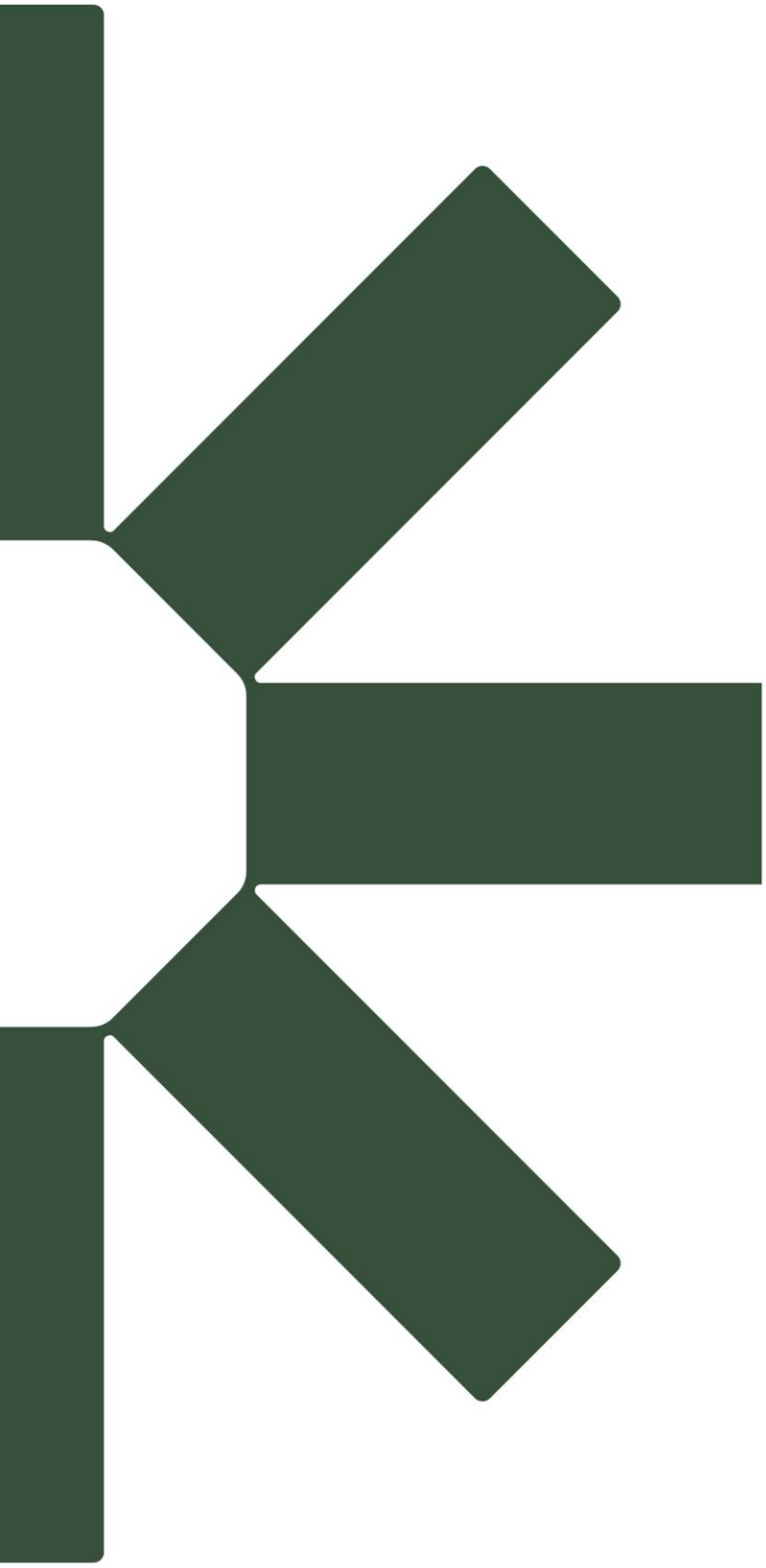

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