

Key Project Outputs: Data Halls Infrastructure, Enterprise & Employment

161,226 sq.m of DC facilities across 6 DC
Buildings within a 39ha DC campus

440 direct jobs in data centre operation
320 FTE Construction jobs annualised
over 10 years

**1,094 indirect & induced employment in
regional supply chain**

**€79m additional annual wage
circulation in economy > Annual GVA
€118m**



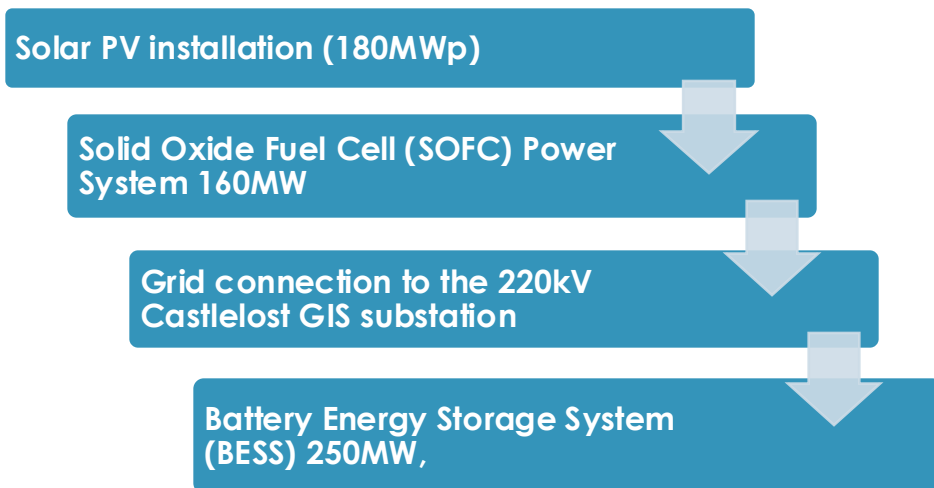
The Red Admiral project represents a significant regional Campus based DC facility supported by collocated energy generation and storage assets (DER). This DC facility is regarded as a hyperscale facility but is differentiated sustainable and innovate design and conformance with international best practice and Irish policy for the sector.

The facility will be a critical investment in the region stimulating new and transition employment opportunities; local supply chain expansion to service the enterprise and investment in the digital infrastructure of the Midland's region. The development of new skills and innovation knowledge will lead to new enterprise creation both in the Tech sector and the service economy. Potentially the site can become a host for Start-up & Innovation Supports targeted at Data Services; AI and GreenTech Economy enterprises and convergent sectors.

Key Project Outputs: DER Facilities

Infrastructure, Power Capacity

Alongside the Data Centre facilities there is Decentralised Energy Resource (DER), which will be constructed across circa 200ha adjoining land. The DER incorporates several power assets which will generate, store and manage electricity close to the DC facility. The DER will optimise the use of these assets to support operations at the DC facility and provide clean, dedicated power that tracks the DC facility's load requirements. The project has been designed to conform with the Irish Government's *Principles for Sustainable Data-Centre Development* which details a set of national principles that should inform and guide decisions on future data centre development.



Key Analysis Criteria for SWOT

We have used a criteria based approach to appraise the likely project outputs and their relative value or disbenefit. The key criteria used to underpin this analysis are the current principles on which the government policy for data centre development rests. These six principles are clear in their intention and influence towards the future accommodation for the data centre sector. Our analysis model is a simple Strengths / Weaknesses / Opportunities & Threats (SWOT) to evaluate the specific proposals, outputs and expected outcomes from the project from its construction to its operation.



1. ECONOMIC IMPACT

The Government has a preference for data centre developments associated with strong economic activity and employment.



2. GRID CAPACITY AND EFFICIENCY

The Government has a preference for data centre developments that make efficient use of our electricity grid, using available capacity and alleviating



3. RENEWABLES ADDITIONALITY

The Government has a preference for data centre developments that can demonstrate the additionality of their renewable energy use in Ireland.



4. CO-LOCATION OR PROXIMITY WITH FUTURE-PROOF ENERGY SUPPLY

The Government has a preference for data centre developments in locations where there is the potential to co-locate a renewable generation facility or advanced storage with the data centre, supported by a Corporate Power Purchase Agreements, private wire or other arrangement.



5. DECARBONISED DATA CENTRES BY DESIGN

The Government has a preference for data centres developments that can demonstrate a clear pathway to decarbonise and ultimately provide net zero data services.



6. SME ACCESS AND COMMUNITY BENEFITS

The Government has a preference for data centre developments that provide opportunities for community engagement and assist SMEs, both at the construction phase and throughout the data centre lifecycle.

RECEIVED 09/10/2025

Strengths associated with the Red Admiral Project



- The selected site and supporting infrastructure is second to none. Existing power terminal on-site and plan to host large renewables generation through solar energy park and Fuel Cell Battery facility. This co-located decentralised energy resource is a fundamental policy requirement for future data centre development and all large energy users as we face the challenge of rapidly scaling our renewable energy and electricity grid capacity.
- Regional location in Midlands/East Midlands is benefiting from proximity to established data centre clusters in Dublin region but not contributing to development pressure in that region.
- Access to critical infrastructure including motorway, grid connectivity for electricity and gas and primary fibre connections are all present on-site.
- Driving new economic activity in a Just Transition Region targeted for restructured economy and employment.
- Accelerating investment towards decarbonisation and energy security by virtue of collocated renewables.

Weaknesses associated with the Red Admiral Project

S

W

O

T

RECEIVED: 08/07/2025



- Lack of policy clarity at national level on data centres at present is leading to hold up and delay in the planning process and potential for lost investment to other countries with clearer policy framework for such developments.
- Grid demand and energy security vulnerability and fears will lead to strategic opposition to the project irrespective of its credentials and KPI's in relative terms.
- Very high energy demand from the sector.
- Relatively low employment density compared with other forms of enterprise and investment despite its contribution to economic restructuring.
- Local labour for construction phase and operation potentially is short supply leading to additional costs and delays.

Opportunities associated with the Red Admiral Project



- New economic activity leading to employment growth, skills development, regeneration and new enterprise creation in a Just Transition Region targeted for enterprise support.
- Strong potential for future clustering in related activity (digitalisation and decarbonisation) arising from the Red Admiral investment in key enterprise infrastructure and the regional skills base.
- Planning conditions will seek development contributions which will be reinvested in local infrastructure and amenity.
- The enterprise will become a significant commercial rate payer in the Local Authority bringing additional annual revenue for local services.
- Potential to partner with local community and statutory bodies to deliver local community benefit projects e.g. sports & recreation; education; tidy towns; biodiversity; local heritage etc.
- Development could act as a catalyst and host for innovation and research support around best practice in digital technology and renewable energy models.
- Sustaining communities through employment growth and active participation in local enterprise networks.

Threats associated with the Red Admiral Project



- Macro economic conditions could decline and create uncertainty in the investor market leading to re-evaluation of the returns.
- Competition from other locations and countries for same investment.
- Unsupportive legal and planning environment / regime due to the conflict between the competing priorities for digitalisation and carbon neutral targets.
- Delays associated with planning policy and process leading to inertia and opportunity cost.

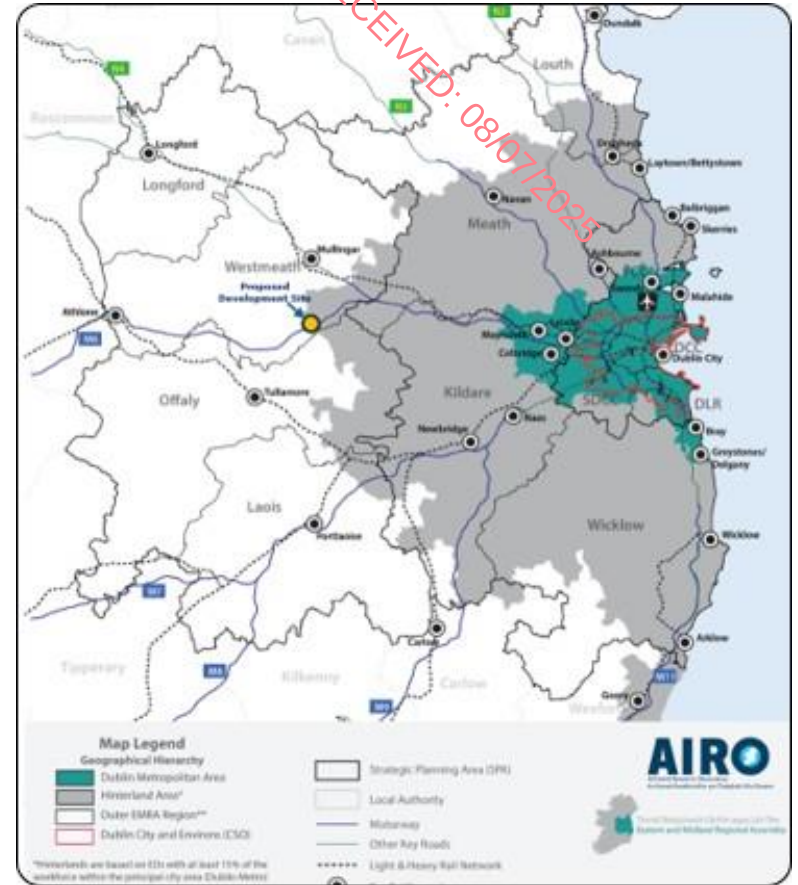
Conclusions from the SWOT Analysis

The Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (July 2022) defines how the State will reconcile the “twin transitions” of deep digitalisation and rapid decarbonisation. The document recognises data centres as core digital infrastructure while acknowledging the finite headroom on the national electricity grid and the binding carbon-budget ceilings set under the Climate Action and Low-Carbon Development (Amendment) Act 2021. Within that strategic tension the Statement articulates six guiding principles, each of which were carefully examined and used to guide and development the proposed project.

The proposed DC facility and DER will generate high-value employment, skills and export earnings rather than speculative capacity. It is located at an existing unconstrained node on the electricity system with available network headroom. The project includes a DER which can alleviate constraints through behind-the-meter flexibility (e.g. battery storage).

Because of its location and design, the DC facility be able to enter into long-term corporate power-purchase agreements (CPPAs) (importing low carbon and renewable generation from the national grid) in addition to it being supported by DER assets (on-site generation and storage). The DC facility adjoins the DER assets which includes to large-scale renewable and storage assets. It is also located adjacent to the existing Castlelost Flexgen project in anticipation of CRU large energy user (LEU) policy decision. The graphic to the right illustrates the key infrastructure components of the project aligning with policy.

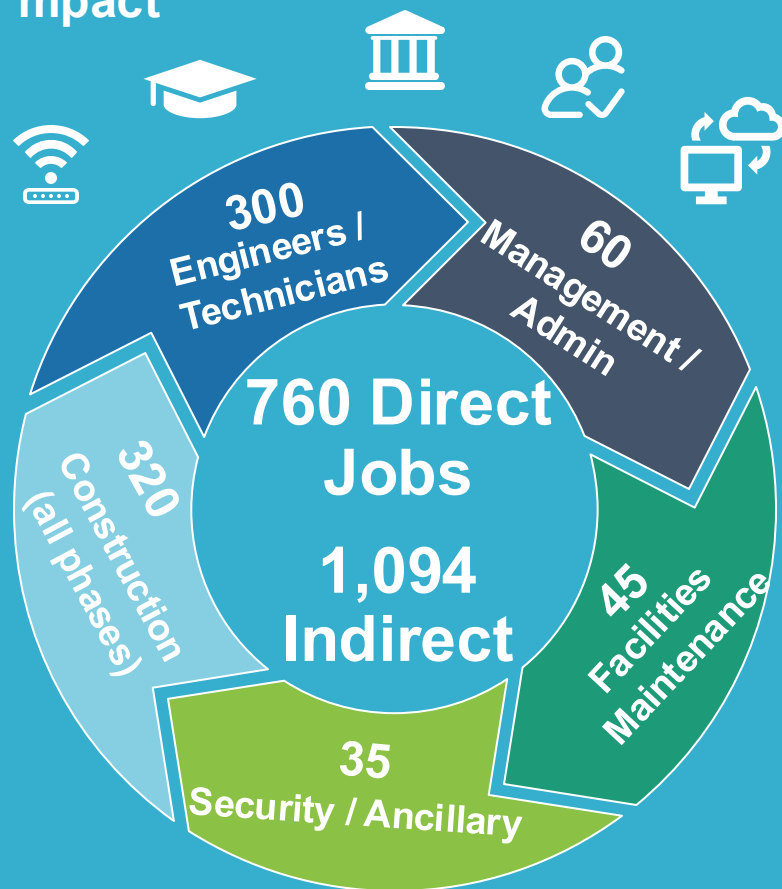
It is clear that the project will provide tangible benefits to the local and regional communities along with indigenous small-and medium-sized enterprises (SMEs) in the region. The socio-economic benefits will include new employment creation (direct and indirect), upskilling of workers, local procurement and SME enablement, development contributions, donations to charitable organisations, local authority rates, community benefit funds and social investment as outlined in this report.



RECEIVED: 08/07/2025

4. Economic Impact & Community Benefit

Employment related economic i mpact



Key Annual Impacts by year 5	Key Assumptions & metrics used
440 direct operational jobs at Data Centre across a variety of professional, technical, management and skilled occupations	- Data Centre jobs per sq.m (1 FTE : 400sq.m) - Incremental employment growth years 1 to 5. - Annual impact measured at year 5 employment level.
320 annualised FTE construction jobs over all development phases	320 full time equivalent (FTE) Construction jobs annualised over 10 years. It is estimated that up to 3,200 temporary construction related jobs will accrue over the lifetime of the development many of which will be short term and limited to a specific process in the development.
1,094 indirect jobs through additional demand and consumption in the local / regional economy	Indirect and induced employment in local / regional supply chain economy at a ratio's of 1 : 0.75 to 1 : 2 depending on the role and salary levels of direct jobs. Largely in service economy.
€79m additional annual wage circulation in the economy (direct & indirect jobs)	Additional wage circulation from both direct and indirect jobs. Assumed rates ranging from €40k for security and ancillary roles to €70k for management and senior engineering / IT roles.
Annual GVA Impact in local / regional economy €117.8m	- Adjustments for leakage, displacement and deadweight factors resulting from investment between 10% and 20%. - Economic impact multiplier of 1.7 applied to Data Centre employment value.

Estimated employment impacts from development and operation of Data Centre

Source of NEW employment	Total Direct Employment (all years)	Total Indirect & Induced Employment (all years)	Annual Job Creation (FTE)					Annual Wage Circulation (direct jobs)	Annual Wage Circulation (indirect jobs)	Adjusted for leakage & Displacement	GVA Multiplier
			Year 1	Year 2	Year 3	Year 4	Year 5				
Data Centre technicians & engineers	300.0	750.0	30	50	60	80	80	€20,400,000	€36,000,000	€45,120,000	€76,704,000.0
Management & Administration	60.0	90.0	20	10	15	5	10	€4,200,000	€4,320,000	€5,964,000	€10,138,800.0
Facilities maintenance	45.0	67.5	20	10	5	10	0	€2,160,000	€3,240,000	€4,860,000	€6,804,000.0
Security and ancillary	35.0	26.3	15	10	5	5	0	€1,400,000	€1,050,000	€2,450,000	€3,430,000.0
Construction related jobs from DC development (FTE)	320	160.0	N/A	N/A	N/A	N/A	N/A	€15,360,000	€7,680,000	€20,736,000	€20,736,000.0
TOTAL JOBS HOSTED / SUPPORTED	760	1093.8	85	80	85	100	90	€43,520,000	€52,290,000	€79,130,000	€ 117,812,800

The economic assessment is an outline model based on data and estimates of net direct employment at the site at full capacity. It does not take account of additional jobs safeguarded by the project or any future employment at the site in other operations not contained in the initial project proposal.

Indirect and induced jobs are assumed to accumulate at a range of between 0.75 to 2 jobs for each direct job accumulated by the project depending on which direct roles and their impact in terms of salary levels, propensity for innovation and security of role.

It is assumed that the employment impacts are largely local, meaning little of the wage circulation and supply chain value is lost to the region through leakage or displacement of current economic activity. However, this variable will be relative to the nature of the activity or the business sector in question.

An economic multiplier of 1.7 has been used to reflect the likely impact the investment and ongoing operation's tendency and propensity for further innovation, growth and export of goods and services within that sector and resulting 'ripple effects' in the regional economy.

Regional & Ecosystem Benefits

The project will have a number of direct, indirect and spin off benefits to the regional economy and community. Principally among these will be the significant new employment created through the initial investment and ongoing operation of the facility.

Indirectly the project will create a general stimulus to the local supply chain and service economy from the additional contracts, procurement and expenditure from the new enterprise. This will lead to an increased rate of homegrown Tech enterprises that will support the facility and its equipment and services through supply contracts. At the broader end there will be greater demand in the local / regional economy for hospitality, food, transport services, maintenance and materials, and a range of other goods and services.

Critically the facility will activate the enterprise and innovation supports of the ecosystem and capture the emerging opportunities for clustering associated with the digital and Greentech sectors. This aspect of economic impact is a result of the economic restructuring away from mature and declining industries towards emerging sectors such as digital, advanced manufacturing and engineering and other related knowledge services. As the area is covered by the Just Transition Programme to support workers transition to new roles in technology, renewable energy, high-tech construction and other future economy roles with tight labour markets, the Admiral DC and DER type of investment is crucial to ensuring this restructuring.

The project will also help reimagine the region as a dynamic and digital location. The investment in digital and other critical infrastructure will elevate its position to play in same the league as successful Digital and GreenTech clusters elsewhere in Ireland. The ecosystem intelligence will harness and foster new technology and key skills that will be critical to future success and expansion.



Supporting Local Policies & Strategies

Like any large-scale enterprise or industrial facility there is an opportunity and obligation to support core local priorities and objectives as set out in the local policy domain including the Local Economic and Community Plan (LECP), the draft County Development Plan, the Regional Spatial & Economic Strategy, various Sector Strategies, Westmeath Economic Development Strategy, Local Climate Action Plan, Just Transition Plan for region, Westmeath County Council Corporate Plan.

It will also reflect and embrace what is happening with Digital at a national and international level including the roll-out of e-Government Strategy and other strategic ICT initiatives.

Ultimately the development must ensure that local communities and economies are making the most of their competitiveness, cohesion and sustainability through the application of digital technologies and ensuring citizens have access to the tools and skills to fully participate in the digital society.

An exploration of the opportunities to support the Regional Spatial & Economic Strategy (RSES) for the Midlands & East Region and its priorities and initiatives and the Local Economic & Community Plan (LECP) and its action plan priorities is being pursued with the relevant authorities including EMRA and Westmeath County Council and LEO.

These consultations will help bring clarity to the community benefit aspects that the project can deliver by aligning the investment and enterprise opportunities with local / regional development agendas.

Additionally, opportunities for directly supporting local community projects or groups will be assessed through the relevant local fora including the Local Action Group (LAG) and other community interest groups.



5. Policy towards Data Centres and Digital Infrastructure

RECEIVED: 08/07/2025

Digital Policy Overview

Key Policy Relating to Digital and Data Centre's

- Digital Agenda for Europe & Digital Single Market
- Digital Decade to 2030 & Digital Compass
- Green Deal for Europe & Climate Action Plans
- National Digital Strategy to 2030 – Harnessing Digital
- Government Statement on the role of Data Centre's in Ireland's Enterprise Strategy 2022
- Adapt Intelligently: A Strategy for Sustainable Growth & Innovation 2025 to 2029 IDA Ireland
- Connecting Government 2030 – ICT Strategy for Public Service
- National Broadband Plan 2019 to 2027
- National Planning Framework – Project Ireland 2040
- National Economic Recovery Plan 2021
- Future Jobs Ireland / Enterprise 2025
- National Industry 4.0 & Smart Specialisation Policy
- Digitalisation of SME's in Ireland DETE 2019
- Our Rural Future 2021 to 2025
- Regional Spatial & Economic Strategy (EMRA)
- Midlands Regional Enterprise Plan 2021 to 2024
- Midlands ICT Sector Development Plan
- Midlands Just Transition Fund 2021 to 2027
- Westmeath LECP
- Westmeath County Development Plan 2021 to 2027



National Digital Policy

The digital agenda has become a central policy priority at all levels of Government in recent years. Since the publication of the first National Digital Strategy in 2012 there has been a continuous elevation of digital and innovation measures in policy.

The second National Digital Strategy launched in January 2022 (Harnessing Digital) sets the agenda for digital transition across Ireland's economy and society up to 2030. Harnessing Digital contains four high level priorities for Digital Transition including **Digital Transformation in Business**; **Digital Infrastructure** roll-out; **Digital Skills** investment; and **Digitalisation of Public Services**. Alongside this national framework for digital is the recent Connecting Government 2030 strategy for digital development of public services across all levels of Government.

There is also strong emphasis on digital solutions, infrastructure, skills and practices in the **Our Rural Future** strategy in which local digital strategies are recognized as a core part of the realisation of the goals. The key objectives are:

- Invest significantly in **remote working infrastructure** to ensure people can continue to live in rural communities while following their career ambitions.
- Invest in **rural towns and villages** as hubs of economic and social activity.
- Transform the opportunity for the diversification of rural economies, including through the delivery of **high-speed broadband** to every part of the country.

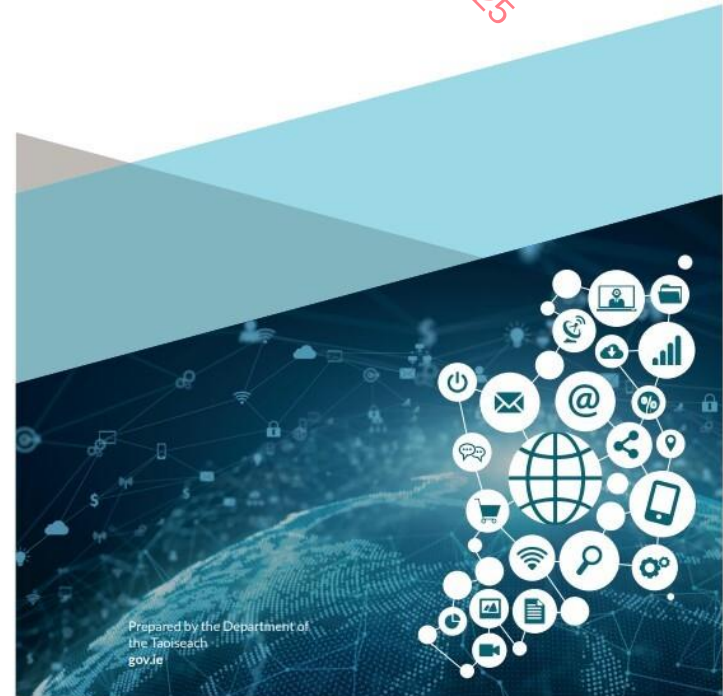
The policy will help rural economies and rural communities to restructure and to maximise the opportunities afforded by improved digital connectivity, town centre regeneration, the resilience and leadership of local communities, and the transition to a climate neutral society.



Rialtas na hÉireann
Government of Ireland

Harnessing Digital The Digital Ireland Framework

RECEIVED 08/07/2025



National Data Centre Policy

Government policy seeks to enable the 'twin transitions' of digitalisation and decarbonisation of our economy and society. These transitions can - and must be - complementary. For this to happen, digital and climate change policies need to move in tandem and this Statement sets out how this will be achieved in respect of data centres.

Data centres are core digital infrastructure and play an indispensable role in our economy and society. Data centres provide the foundation for all almost all online aspects of our social and work lives, including video calling, messaging and apps, retail, banking, travel, media, and public service delivery such as healthcare and welfare.

However, in the short term, there is only limited capacity for further data centre development, as the key state bodies, regulators and the electricity sector work to upgrade our infrastructure, connect more renewable energy and ensure security of supply. The capacity that will be available will be in regional locations and must assist in national ambitions to deliver an efficient, low-carbon energy system. By addressing these capacity constraints now, we can build the longer-term foundations for a net-zero-ready economy and society that will be a competitive and attractive hub for decarbonised digital services, enabling the industries and services of the future.

This Statement signals the Government's clear preference for data centre developments that are associated with strong economic activity and employment; make efficient use of our electricity grid, deliver renewable energy in Ireland. These principles will be reflected in energy, enterprise and planning policy, regulatory and other decisions across Government Departments, local authorities, enterprise development agencies and other public bodies.



Rialtas na hÉireann
Government of Ireland

Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy

RECEIVED: 09/07/2025

Principles for Sustainable Data Centre Development

ECONOMIC IMPACT

The Government has a preference for data centre developments associated with strong economic activity and employment.

GRID CAPACITY AND EFFICIENCY

The Government has a preference for data centre developments that make efficient use of our electricity grid, using available capacity and alleviating constraints.

RENEWABLES ADDITIONALITY

The Government has a preference for data centre developments that can demonstrate the additionality of their renewable energy use in Ireland.

CO-LOCATION OR PROXIMITY WITH FUTURE-PROOF ENERGY SUPPLY

The Government has a preference for data centre developments in locations where there is the potential to co-locate a renewable generation facility or advanced storage with the data centre, supported by a Corporate Power Purchase Agreements, private wire or other arrangement.

DECARBONISED DATA CENTRES BY DESIGN

The Government has a preference for data centres developments that can demonstrate a clear pathway to decarbonise and ultimately provide net zero data services.

SME ACCESS AND COMMUNITY BENEFITS

The Government has a preference for data centre developments that provide opportunities for community engagement and assist SMEs, both at the construction phase and throughout the data centre lifecycle.



Rialtas na hÉireann
Government of Ireland

Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy

RECEIVED: 09/07/2025

Conclusions

This report seeks to provide an estimate of the value and nature of local and regional impact from the Red Admiral development proposal for Hyper-scale DC Facilities together with expansive and co-located Decentralised Energy Resource.

The project in scale and investment value terms will be among the largest ever in the region and will ensure enhanced infrastructure to catalyse future investment and enterprise expansion in the midlands especially among future economy sectors including digital and renewable technologies. The location of the proposed development with its enabling infrastructure already in place (primary grid connectivity for electricity and gas; gigabit fibre broadband; direct motorway access and close proximity to 3 rail stations) offers outstanding competitive advantage over other locations such as the Greater Dublin region which is over burdened with development pressure and labour shortages or other regional locations without the key infrastructure in place.

Government industrial and development policy is firmly set on the dual objectives of Digitalisation and Decarbonisation. Policy towards Data centres has recognised the value and importance of this digital infrastructure and their role in supporting our enterprise base. The six key principles as set out in the page above are interwoven into the design and operational model of the Red Admiral DC & DER development and critically delivering benefit to the host region.

As the area is covered by the Just Transition Programme to support workers, enterprises and communities transition to new roles in technology, renewable energy, high-tech construction and other future economy roles with tight labour markets, the Admiral DC and DER type of investment is crucial to ensuring this restructuring.

Key Economic Outputs and Impacts

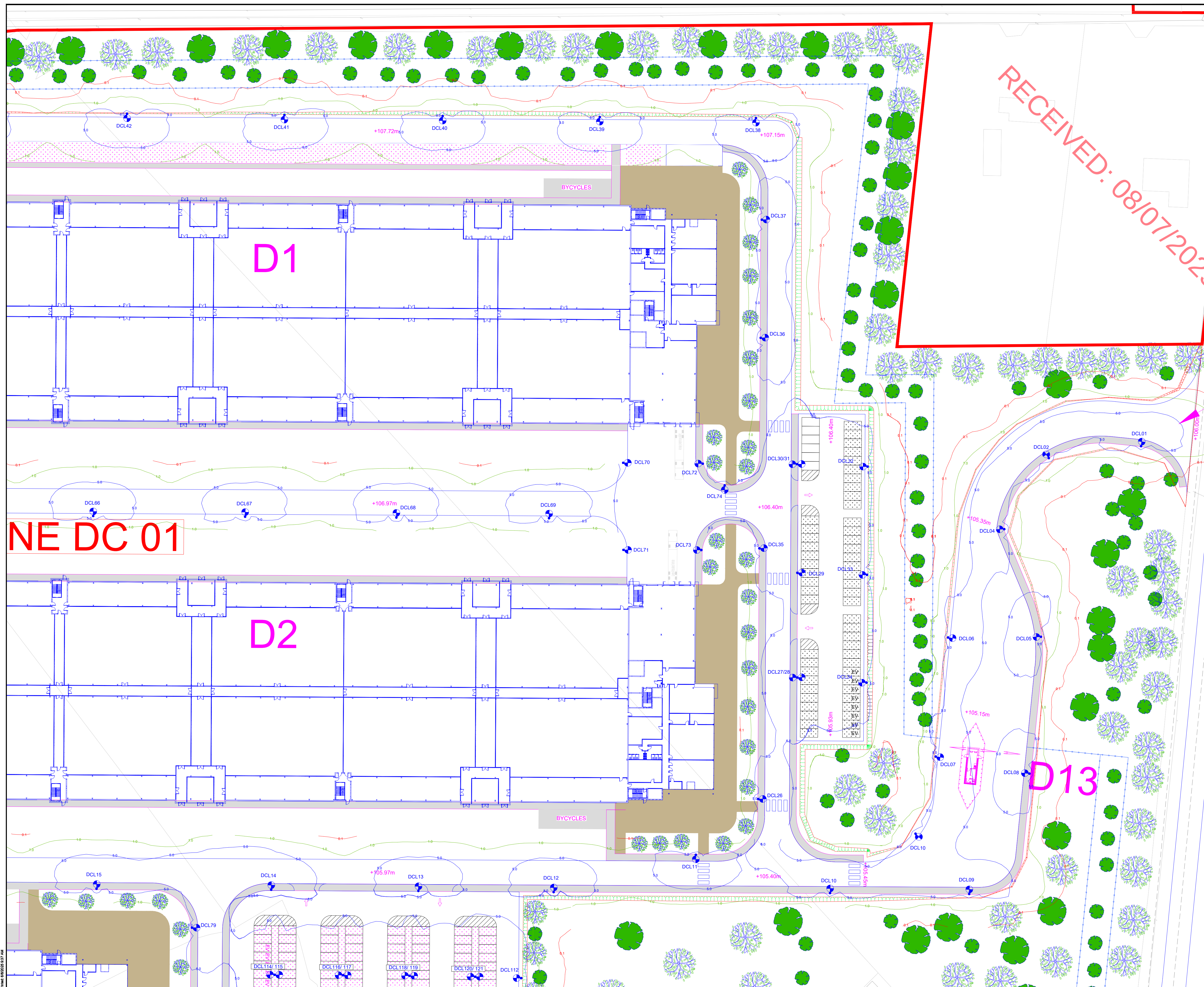
It is forecast that the Red Admiral project will deliver the following economic contributions to the local and Midlands regional economy.

- Construction Investment in excess of €1bn over the five year development project;
- Construction related employment of 320 FTEs (full time equivalents) annualised for ten years;
- 440 direct operational jobs across a range of occupations ;
- 1,094 indirect and induced jobs in the local / regional service economy and the supply chain;
- Generating almost €80m in additional annual wage circulation;
- Annual GVA (Gross Value Added) of €118m to the economy.

Other key economic outputs will include (a) strategic digital and low carbon / renewable energy infrastructure to catalyse future investment and enterprise creation in the digital and greentech sectors; (b) a variety of local community benefit initiatives to support local sports clubs, schools and charitable groups. The graphic on the following page outlines these outputs and impacts resulting from the proposed Red Admiral DC and DER.

RECEIVED 08/07/2025

APPENDIX 5.2

CDM RESIDUAL DESIGN RISKS
AND RESIDUAL ENVIRONMENTAL RISKS

In accordance with the Construction Design Management Regulations 2015, Daramack Lighting Consultancy has undertaken a design risk assessment for the elements of work shown on this drawing. The above are some but not all the residual risks identified in the risk assessment. For a comprehensive list refer to the design risk assessment.

1. Do not scale from this drawing.
2. Site verify all dimensions prior to construction
3. Report all discrepancies to the Drawing Originator immediately
4. This drawing is to be read in conjunction with all relevant documents and drawings

Notes

- 190  As Philips LumiStreet Gen2 Micro BGP291,
6.0km 40LED 17W DW50 BL1 3000K Warm White CLO
post top mounted luminaire complete with factory-fitted
integral rear shields at 0° tilt on 6m standard galvanized
steel planted lighting columns.
- 8  2 x Luminaire as Philips LumiStreet Gen2 Micro BGP292,
6.0km 40LED 17W DW50 BL1 3000K Warm White CLO
two outreach bracket mounted luminaire complete with
factory-fitted integral rear shields at 0° tilt on 6m standard
galvanized steel planted lighting columns.

- 5.0 5.0Lux Contour Line - Target average illuminance
- 1.0 1.0Lux Contour Line - Target minimum illuminance
- 0.1 0.1Lux Contour Line - equivalent moon light

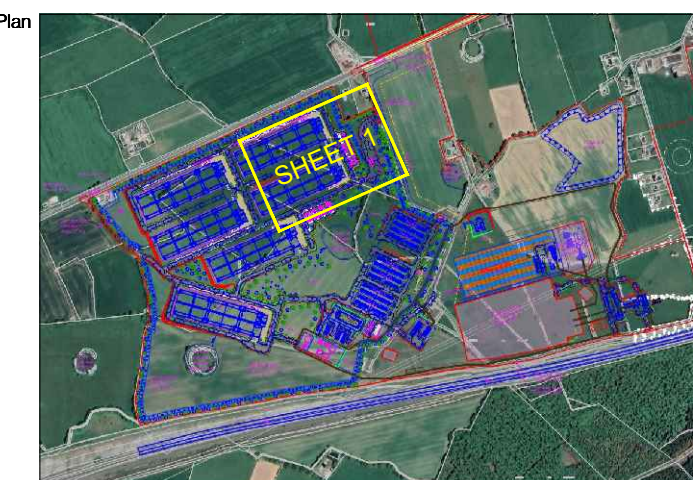
QUANTITIES ABOVE ARE THE TOTAL NUMBER OF PROPOSED UNITS ACROSS THE SITE.

LUX RATING CHART

	Condition	Light Level (LUX)	Foot Candles
Day Time	Sunlight	107,527	10,000
	Daylight	10,752.70	1,000
	Overcast Day	1,075.30	100
	Very Dark Day	107.53	10
	Twilight	10.75	1
Night Time	Deep Twilight	1.08	0.1
	Full Moon	0.108	0.01
	Quarter Moon	0.0108	0.001
	Starlight	0.0011	0.0001
	Overcast Night	0.0001	0.00001

R0	01/06/25	FIRST ISSUE	WDK	WD
Rev	Date	Description	Dm	Ch
Revisions				

Site Key Plan



Reproduced from the Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.

Drawing Originator:



THIS DRAWING IS THE PROPERTY OF DARAMACK LIGHTING CONSULTANCY
AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION

Drawing Status

PRELIMINARY

Project Name

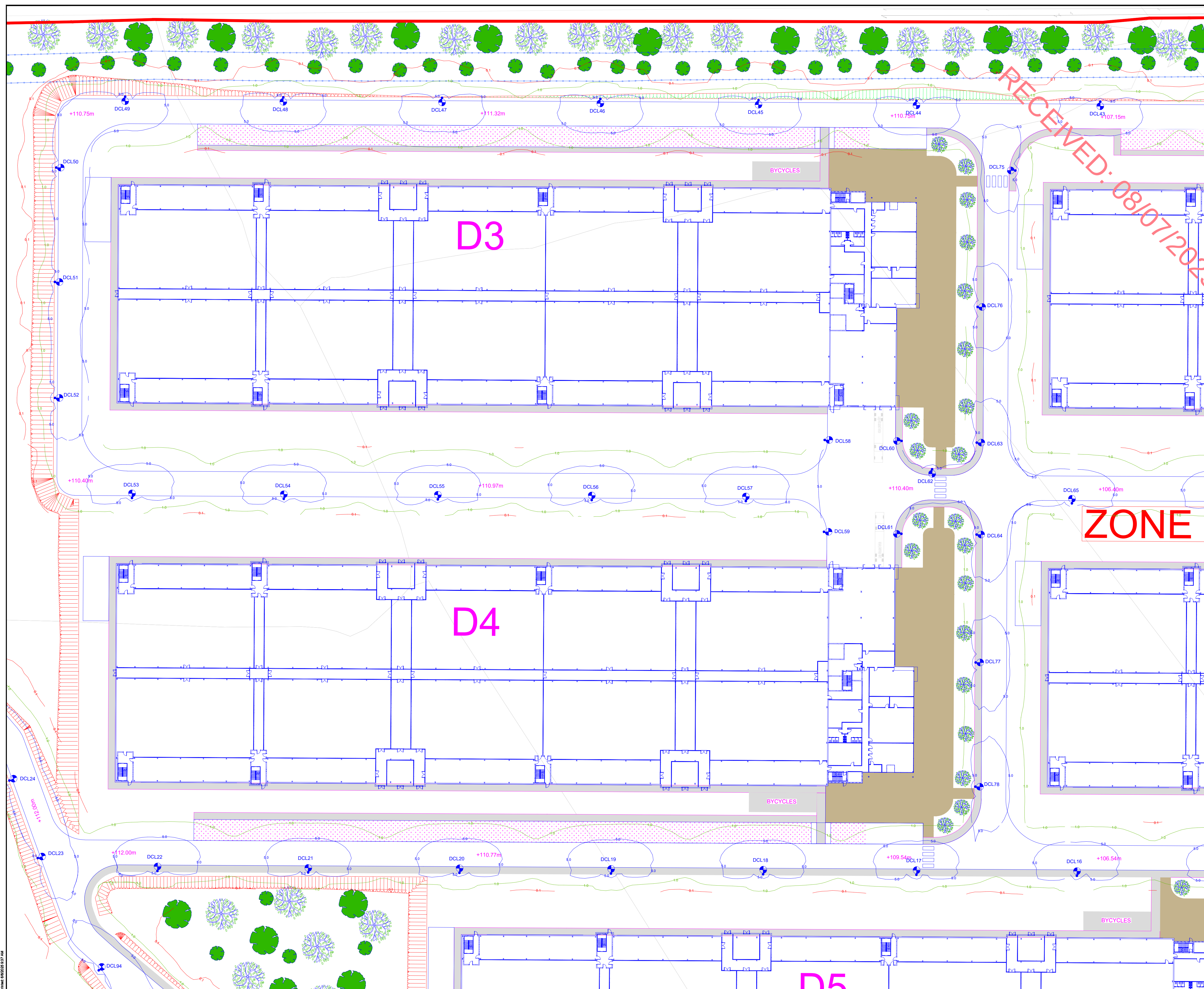
RED ADMIRAL DC LTD, DATA CENTRE

Drawn by WDK	Drawn Date 01/06/2025	Checked by WDK	Checked Date 01/06/25
Approved by	Approved Date	Scale NTS	

Title _____ Original drawing sheet is A _____

EXTERNAL LIGHTING LAYOUT
WITH LUX LEVEL CONTOURS
SHEET 1 OF 7

Drawing Number	Revised
DAR25411/001	RC



In accordance with the Construction Design Management Regulations 2015, Daramack Lighting Consultancy has undertaken a design risk assessment for the elements of work shown on this drawing. The above are some but not all the residual risks identified in the risk assessment. For a comprehensive list refer to the design risk assessment.

1. Do not scale from this drawing.
2. Site verify all dimensions prior to construction
3. Report all discrepancies to the Drawing Originator immediately
4. This drawing is to be read in conjunction with all relevant documents and drawings

Notes:

- 190  2 X Luminaire as Philips LuminaStreet Gen2 Micro BGP291, 6.0kIm 40LED 17W DW50 BL 1 3000K Warm White CLO post top mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.
- 8  2 X Luminaire as Philips LuminaStreet Gen2 Micro BGP292, 6.0kIm 40LED 17W DW50 BL 1 3000K Warm White CLO twin outdoor bracket mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.

5.0Lux Contour Line - Target average illuminance

1.0Lux Contour Line - Target minimum illuminance

0.1Lux Contour Line - equivalent moon light

QUANTITIES ABOVE ARE THE TOTAL NUMBER OF PROPOSED
UNITS ACROSS THE SITE.

LUX RATING CHART

	Condition	Light Level (LUX)	Foot Candles (FC)
Day Time	Sunlight	107,527	10,000
	Daylight	10,752.70	1,000
	Overcast Day	1,075.30	100
	Very Dark Day	107.53	10
	Twilight	10.75	1
Night Time	Deep Twilight	1.08	0.1
	Full Moon	0.108	0.01
	Quarter Moon	0.0108	0.001
	Starlight	0.0011	0.0001
	Overcast Night	0.0001	0.00001

R0	01/06/25	FIRST ISSUE		WDK	WD
Rev	Date	Description		Dm	Ch
Revisions					

Reproduced from the Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.

Drawing Originator



THIS DRAWING IS THE PROPERTY OF DARAMACK LIGHTING CONSULTANCY
AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION - LISBURN - TEL: 07500 286 007

Drawing Status

PRELIMINARY

Project Name

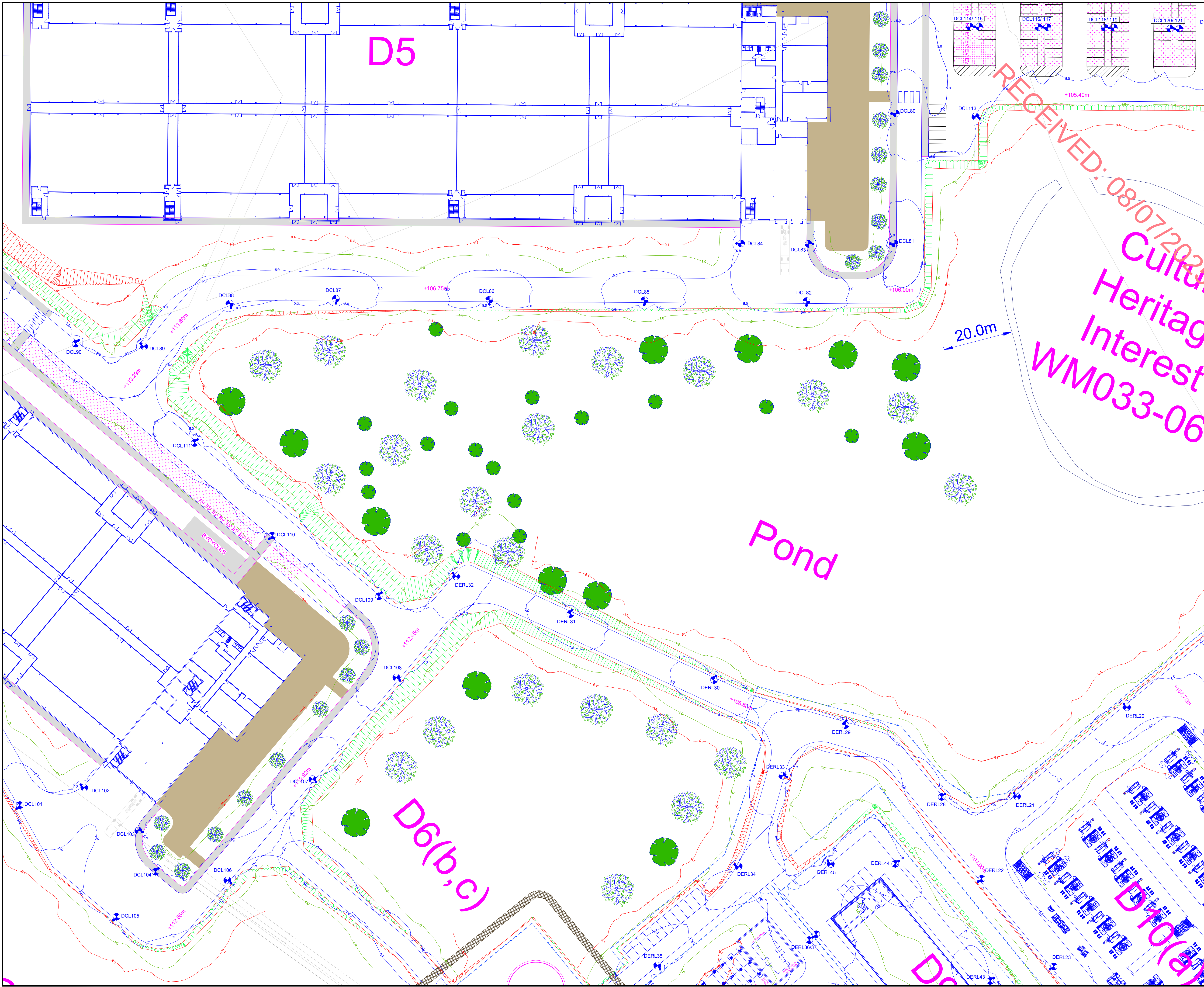
RED ADMIRAL DC LTD, DATA CENTRE

Drawn by WDK	Drawn Date 01/06/2025	Checked by WDK	Checked Date 01/06/25
Approved by	Approved Date	Scale NTS	

Title _____ Original drawing sheet is A _____

EXTERNAL LIGHTING LAYOUT
WITH LUX LEVEL CONTOURS
SHEET 2 OF 7

Drawing Number	Revised
DAR25411/002	RC



COM RESIDUAL DESIGN RISKS AND RESIDUAL ENVIRONMENTAL RISKS	
In accordance with the Construction Design Management Regulations 2015, Daramack Lighting Consultancy has undertaken a design risk assessment for the elements of work shown on this drawing. The above are some but not all the residual risks identified in the risk assessment. For a comprehensive list refer to the design risk assessment.	

- Notes:
1. Do not scale from this drawing.
 2. Site verify all dimensions prior to construction
 3. Report all discrepancies to the Drawing Originator immediately
 4. This drawing is to be read in conjunction with all relevant documents and drawings

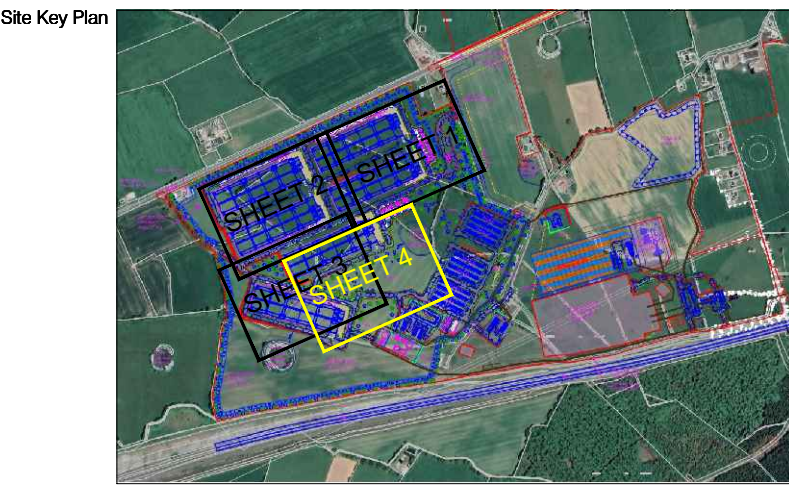
- 190
- 8
- Luminaire as Philips LumiStreet Gen2 Micro BGP291, 6.0km 40LED 17W DW50 BL1 3000K Warm White CLO post top mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.
- 2 x Luminaire as Philips LumiStreet Gen2 Micro BGP292, 6.0km 40LED 17W DW50 BL1 3000K Warm White CLO twin outreach bracket mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.

- 5.0
- 1.0
- 0.1
- 5.0Lux Contour Line - Target average illuminance
- 1.0Lux Contour Line - Target minimum illuminance
- 0.1Lux Contour Line - equivalent moon light

QUANTITIES ABOVE ARE THE TOTAL NUMBER OF PROPOSED UNITS ACROSS THE SITE.

LUX RATING CHART		
Condition	Light Level (LUX)	Foot Candles (FC)
Sunlight	107,527	10,000
Daylight	10,752.70	1,000
Overcast Day	1,075.30	100
Very Dark Day	107.53	10
Twilight	10.75	1
Deep Twilight	1.08	0.1
Full Moon	0.108	0.01
Quarter Moon	0.0108	0.001
Starlight	0.0011	0.0001
Overcast Night	0.0001	0.00001

Rev	Date	Description	Dm	Chkd
R0	01/06/25	FIRST ISSUE	WDK	WDK
Revisions				



Reproduced from the Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.



THIS DRAWING IS THE PROPERTY OF DARAMACK LIGHTING CONSULTANCY AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. L08JLRN - TEL 01700 586 007

Drawing Status

PRELIMINARY

Project Name

RED ADMIRAL DC LTD, DATA CENTRE

Drawn by WDK Drawn Date 01/06/2025 Checked by WDK Checked Date 01/06/25

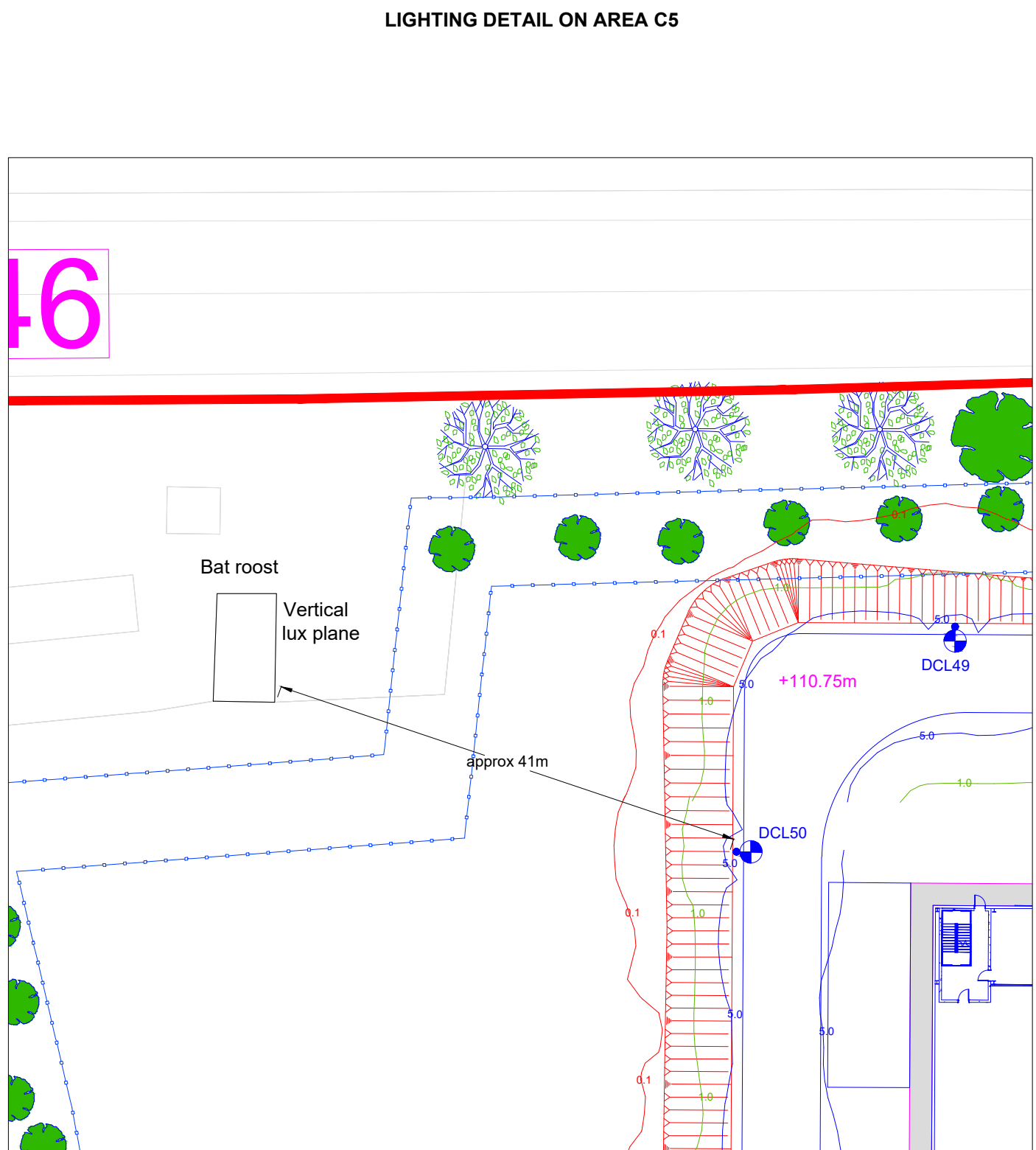
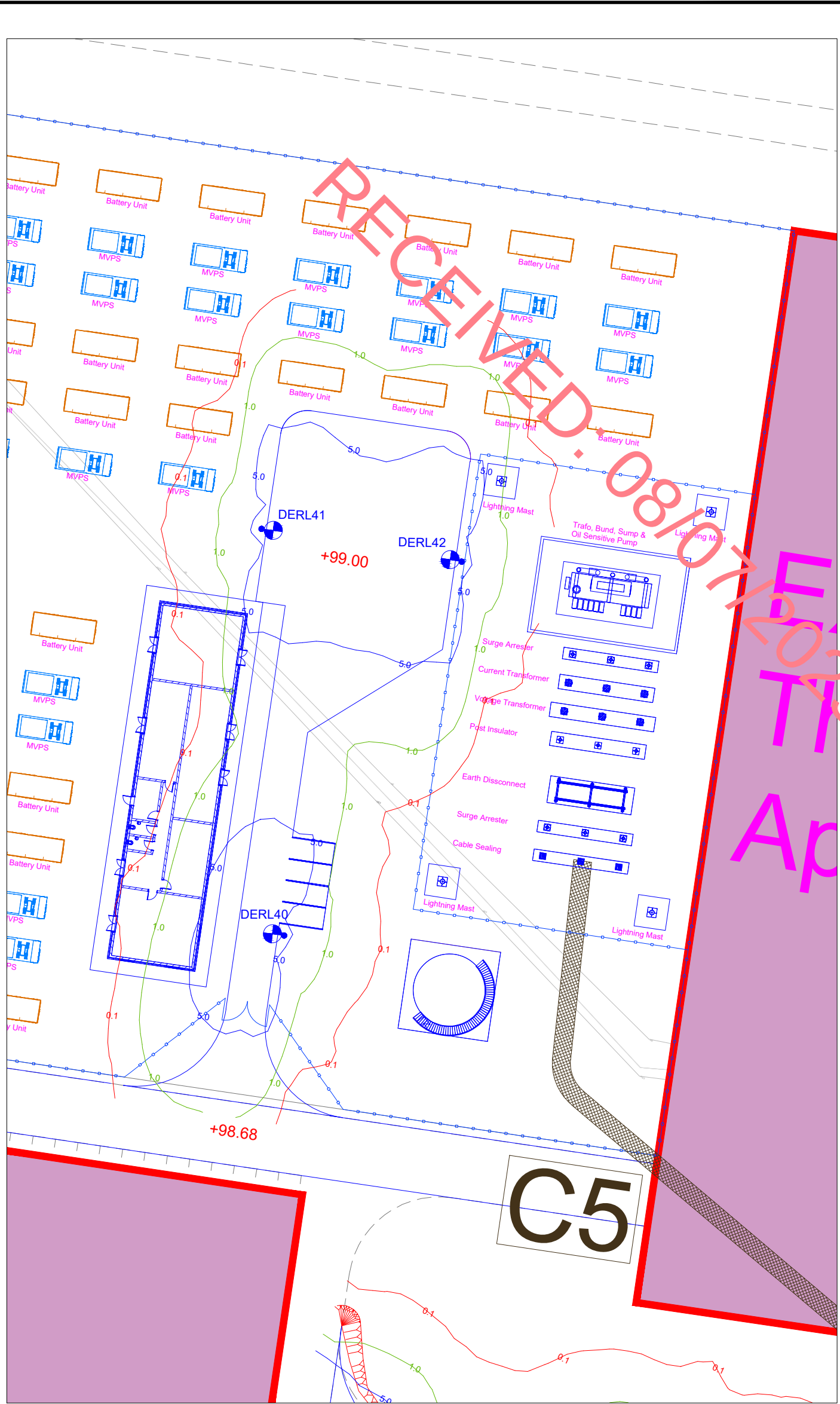
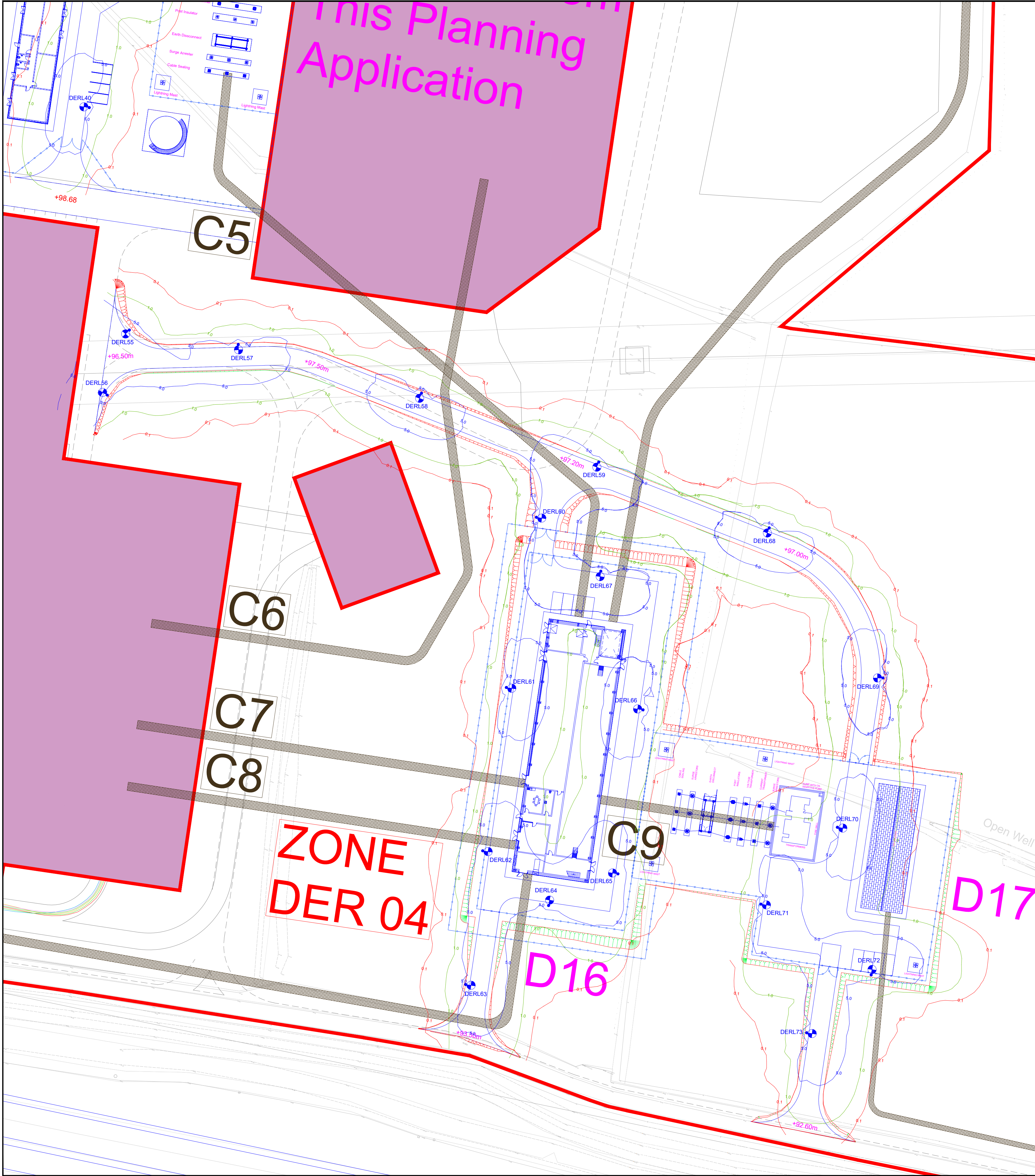
Approved by Approved Date Scale NTS

Title Original drawing sheet is A1

EXTERNAL LIGHTING LAYOUT
WITH LUX LEVEL CONTOURS
SHEET 4 OF 7

Drawing Number	Revision
DAR25411/004	R0

DAR25411 RED ADMIRAL DC LTD DATA CENTRE AND SOLAR FARMS WESTWEATH



COM RESIDUAL DESIGN RISKS AND RESIDUAL ENVIRONMENTAL RISKS	
In accordance with the Construction Design Management Regulations 2015, Damack Lighting Consultancy has undertaken a design risk assessment for the elements of work shown on this drawing. The above are some but not all the residual risks identified in the risk assessment. For a comprehensive list refer to the design risk assessment.	

1. Do not scale from this drawing.
2. Site verify all dimensions prior to construction
3. Report all discrepancies to the Drawing Originator immediately
4. This drawing is to be read in conjunction with all relevant documents and drawings

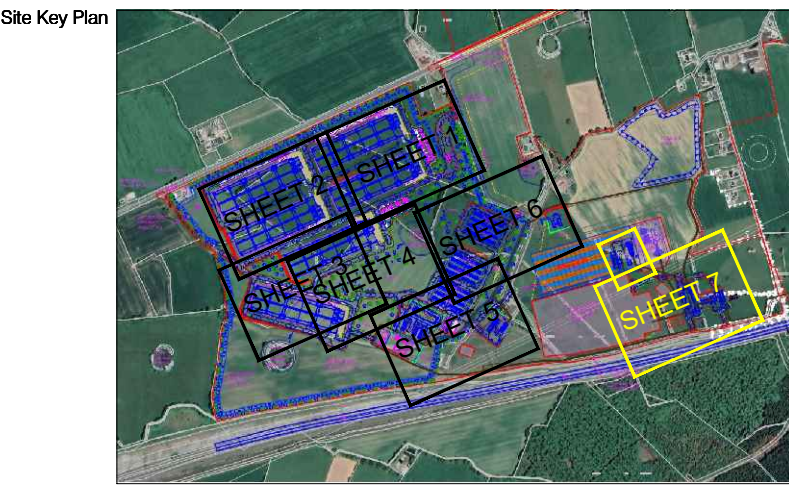
- Notes:
- 190 Luminaire as Philips LumiStreet Gen2 Micro BGP291, 6.0km 40LED 17W DW50 BL1 3000K Warm White CLO post top mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.
- 8 2 x Luminaire as Philips LumiStreet Gen2 Micro BGP292, 6.0km 40LED 17W DW50 BL1 3000K Warm White CLO twin outreach bracket mounted luminaire complete with factory-fitted integral rear shields at 0° tilt on 6m standard galvanized steel planted lighting columns.
- 5.0 5.0Lux Contour Line - Target average illuminance
- 1.0 1.0Lux Contour Line - Target minimum illuminance
- 0.1 0.1Lux Contour Line - equivalent moon light

QUANTITIES ABOVE ARE THE TOTAL NUMBER OF PROPOSED UNITS ACROSS THE SITE.

LUX RATING CHART		
Condition	Light Level (LUX)	Foot Candles (FC)
Sunlight	107,527	10,000
Daylight	10,752.70	1,000
Overcast Day	1,075.30	100
Very Dark Day	107.53	10
Twilight	10.75	1
Deep Twilight	1.08	0.1
Full Moon	0.108	0.01
Quarter Moon	0.0108	0.001
Starlight	0.0011	0.0001
Overcast Night	0.0001	0.00001

Rev	Date	Description	Dm	Chkd
R0	01/06/25	FIRST ISSUE	WDK	WDK

Revisions



Reproduced from the Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationary Office Crown Copyright. Unauthorized reproduction infringes Crown Copyright and may lead to prosecution or civil proceedings.



THIS DRAWING IS THE PROPERTY OF DARAMACK LIGHTING CONSULTANCY AND SHALL NOT BE REPRODUCED WITHOUT PRIOR WRITTEN PERMISSION. L0801001 - TEL: 01753 586 007

Drawing Status

PRELIMINARY

Project Name

RED ADMIRAL DC LTD, DATA CENTRE

Drawn by WDK

Checked by WDK

Approved by

Title

Original drawing sheet is A1

EXTERNAL LIGHTING LAYOUT WITH LUX LEVEL CONTOURS SHEET 7 OF 7

Drawing Number	Revision
DAR25411/007	R0

DAR25411 RED ADMIRAL DC LTD DATA CENTRE AND SOLAR FARMS, WESTWEATH

RECEIVED 08/07/2025

APPENDIX 6.1



Environmental Consultants

RECEIVED: 08/07/2025

Bat Survey Report

Project Admiral



RECEIVED: 08/07/2025

DOCUMENT DETAILS

Client: Red Admiral DC Ltd

Project Title: Construction of solar farm, data centers and ancillary works.

Document Title: Bat Survey Report

Prepared By: John Curtin; Eire Ecology

Date: 20/05/2025

EXECUTIVE SUMMARY

This document reports on the findings of bat surveys conducted in 2024 and 2025 within the proposed development in the townlands of Oldtown, Crockaun, Rahincuill and Farthingstown, Co. Westmeath located along R446 just west of Rochfortbridge. Surveys included pre-construction bat surveys focusing on the subject site, surrounding habitats, potential roost features and connectivity with the wider landscape.

Surveys included roost assessment of trees and structures, walked surveys using bat detectors, and longer duration static monitoring focusing on representative habitats found within the site. The aim was to examine current bat usage within the site and identify the impact of the development on the species present.

Eight static detectors were placed within the site for twelve nights in August to early September and again in April, with four statics placed in open habitat and four placed by edge habitat, along linear connective features in each section of the site. During static surveys, a total of seven species of bats were recorded: Common Pipistrelle, Soprano Pipistrelle, Nathusius Pipistrelle, Leisler's bat, Natterer's bat, Daubenton's bat and Brown long-eared bat. In addition, several unidentified Myotis species were recorded; though without social calls or characteristic call features present these are only classified to a genus level. The most frequently recorded species was Common Pipistrelle, followed by Soprano Pipistrelle and Leisler's bat, with lower levels of the Myotis species and Brown long-eared bat detected. Solar panels are proposed within open pasture with the majority of tree lines and hedges within solar lands being retained. The western development will result in the loss of some tree lines utilised by bats.

Results show that without mitigation there will be a significant impact on feeding bats by the western section of the site particularly Common Pipistrelle given the proximity to a roost.

All bats recorded during surveys are classified as 'Least Concern' on the Irish Red List No. 12 and protected under the EU Habitats Directive Annex IV and Wildlife Acts. The site is outside the typical geographical range for the EU Habitats Directive Annex II listed species lesser horseshoe bat.

Robust mitigation is proposed in order to negate potential impacts on bats including the creation of a woodland, creating veteran features in existing trees, limiting outdoor lighting, upgrades to bat roost and a post construction monitoring program designed to examine the effectiveness of these mitigation measures.

TABLE OF CONTENTS

1	INTRODUCTION	5
1.1	SITE DESCRIPTION	5
1.2	PURPOSE OF THIS REPORT	5
1.3	RELEVANT LEGISLATION	6
2	DESKTOP STUDY.....	9
2.1	SCOPE.....	9
2.2	DESKTOP REVIEW	9
2.3	BAT SPECIES RECORDED IN THE SURROUNDING AREA	13
3	SURVEY METHODOLOGY	15
3.1	SURVEY METHODOLOGIES	15
4	SURVEY FINDINGS.....	22
4.1	PEA RESULTS.....	22
5	DISCUSSION	34
6	IMPACT ASSESSMENT PRIOR TO MITIGATION.....	37
6.1	LOSS OF ROOSTING HABITAT	37
6.2	LOSS OF FORAGING AND COMMUTING HABITAT	38
6.3	DISTURBANCE.	41
6.4	BAT INTERACTIONS WITH SOLAR PANELS	43
7	MONITORING	45
8	CONCLUSION.....	45
9	RESIDUAL IMPACTS	46
	APPENDIX A – TABLES, FIGURES & PHOTOS.....	47
	POTENTIAL ROOST FEATURE (PRF) RESULTS	50
	PHOTOS69	

Figure 1-1: Site Layout.....	8
Figure 2-1: Location of proposed development to designated sites	11
Figure 3-1: Aerial view displaying four site areas.....	15
Figure 3-2: Buildings where emergence surveys were deemed necessary	16
Figure 3-3: Static detector locations.....	21
Figure 4-1: PRF Tree locations.....	23
Figure 4-2: Emergence Surveys conducted on buildings either side of R446.	26
Figure 4-3: Beech trees being surveyed for bats	28
Figure 4-4: Emergence Surveys Conducted on buildings 4, 5, 7 (Shed) and Tree.....	29
Figure 4-5: Combined Bat Activity. Size of circle represents activity level (Bp/Hr)	33
Figure 6-1: Trees Proposed as Monolith Features, section 1 proposed woodland and ponds.....	39
Figure 6-2: Proposed Compensatory Woodland (total : 5.34Ha)	40
Figure 6-3: Section 1 lighting zones.....	43

1 INTRODUCTION

This report details the findings of bat surveys carried out as part of the Admiral Solar Development which will develop farmland either side of the M6. The development will consist of a Solar Farm and data centres with ancillary buildings outside Rochfordbridge.

1.1 SITE DESCRIPTION

The subject site lies adjacent to the village of Rochfordbridge (53.3989, -7.326), within the townlands of Oldtown, Crockaun, Rahincuill and Farthingstown, Co. Westmeath. While close to the village, the site is located in a rural area. The settlement pattern in the area is linear, made up of one-off rural housing and farmyards generally located along the local road network. The majority of the proposed development is located within pasture and tillage with associated treelines and hedgerows. Small streams can be found to the north (Castlejordan Stream) and west (Kiltotan stream) of the site.

1.2 PURPOSE OF THIS REPORT

This report aims to;

- Examine the area of works for the presence of bats or their roosts.
- Identify species of bats using the sites and identify regions of higher bat activity to focus conservation efforts on.
- Potential impacts of bats by the proposed development.

In order to assess the presence and activity of bats within the proposed development grounds the following surveys were undertaken within and adjacent to the proposed planning boundary:

- Preliminary roost assessment.
- Bat activity (emergence surveys);
- At height tree roost inspections (PRF surveys) and
- Static detector (activity surveys).

The surveys undertaken follow elements of the Bat Conservation Trust 'Good Practice Guidelines, 4th edition, (Collins, 2023) and the Irish Wildlife Manual No. 134' (Marnell F. K., 2022).

1.2.1 Surveyor Information

The surveys were designed and carried out by John Curtin B.Sc. (Env.). John has over fifteen years' experience of carrying out bat surveys and has completed numerous surveys during this time. John has also completed the Bat Conservation Ireland, Bat Detector Workshop and Bat Handling Workshop which are the standard training for the carrying out of bat surveys in Ireland. He follows the Bat

Conservation Ireland 'Good Practice Guidelines'(Aughney et al., 2008)'. In addition, John is a longtime active member of Bat Conservation Ireland, which monitor bat populations in Ireland, and facilitate the education of bat communities to the public.

John holds the following licenses.

Description	Licence No
Licence to capture protected wild animals for educational, scientific or other purposes (bats)	C014/2025
Roost disturbance (bats)	Der/Bat 2025-177
Licence to photograph / film wild animals (bats)	032/2025

Surveys were assisted by; Karolina Illien M.Sc Ecologist, Fionn O Neill and Rowan Curtin (assistants). At height tree surveys were conducted by arborist Rik Pannett and overseen by John Curtin

1.3 RELEVANT LEGISLATION

There are two main pieces of legislation which cover wildlife protection in Ireland – the Wildlife Act and the Habitats Regulations. These are outlined below, with particular reference to the protection afforded to bat species in Ireland.

The Wildlife Acts 1976 and 2000

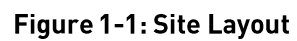
The primary domestic legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976, as amended. The aims of the wildlife act according to the National Parks and Wildlife Service are "... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims." All bat species are protected under the act. The Wildlife (Amendment) Act of 2000 amended the original Act to improve the effectiveness of the Act to achieve its aims.

It is an offence to:

- Intentionally kill, injure or take a bat
- Possess or control any live or dead specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose

1.3.1.1 *European Communities (Birds and Natural Habitats) Regulations 2011 to 2021*

The EC (Birds and Natural Habitats) Regulations 2011-2021 provide strict protection for all of the Irish species listed on Annex IV of the EU's Habitats Directive. It does so by prohibiting certain activities which could impact on the conservation status of those species. Those activities may only be permitted by way of a derogation license. All bat species found in Ireland are listed under Annex IV of the Directive, while the lesser horseshoe bat is afforded further protection under Annex II.



2 DESKTOP STUDY

2.1 SCOPE

As mentioned above, surveys undertaken follow elements of the Bat Conservation Trust 'Good Practice Guidelines, 4th edition, (Collins, 2023) and the Irish Wildlife Manual No. 134' (Marnell F. K., 2022). Emergence surveys were conducted in April and May 2025. While outside the peak maternity period, data from static surveys conducted in August and September provides insight into this period. A ground level tree assessments were conducted in March 2025. At height tree surveys were conducted in April 2025 with emergence surveys conducted in April and May. A final static detector surveys was carried out in April 2025. The survey types were determined appropriate to establish a baseline species assemblage, along with spatial and temporal distribution of species activity within the proposed planning boundary.

2.2 DESKTOP REVIEW

A desktop assessment is required in order to assign a risk level to the site and design future survey work. The appropriate level of survey effort for a site depends on the quality of habitat and the scale and likely impact of the development. Consideration should be given to the presence of suitable commuting and foraging habitat and the likely presence of bat roosts near proposed turbines. An assessment was conducted for Admiral by examining the BCI database, NBDC records, BCI landscape model for bat suitability, Ordnance survey, aerial photos and google street view.

A data search was conducted in August 2024 and again in March 2025 to revise existing information from the surrounds of the proposed planning boundary. The following sources of information were examined:

- Known bat records within a 6 km radius of the proposed sites from the Bat Conservation Ireland database
- Adhoc and observational bat records from the National Bat Database held by the National Biodiversity Data Centre (www.biodiversityireland.ie)
- Review of Ordnance Survey mapping and aerial photography of the proposed wind farm boundaries and their environs (i.e. 200 m plus rotor radius of the boundary of the development)
- Records of designated sites within a 6 km radius of the proposed sites where bats form part or all of the reason for designation (<https://www.npws.ie/protected-sites>)
- Collation of data on known caves within a 4 km radius of the proposed sites from the Cave Database for the Republic of Ireland, compiled by Trinity College (http://www.ubss.org.uk/search_irishcaves.php)
- Review of bat survey data from Ecological Impact Assessments from proposed and permitted developments within the wider environs of the site.

2.2.1 Designated Sites

In order to determine the state of the preexisting bat landscape in the area, a desktop search was made for designated sites within 15km of the proposed planning boundary. These included sites designated at the European level (in the context for bats, this refers to Special Areas for Conservation or SACs) and the Irish level (Natural Heritage Areas or NHAs and proposed Natural Heritage Areas or pNHAs). The Habitats Directive (Article 6) forms a basis for the designation of SACs. Further information on the context of SACs for bats is given in section 2.2.1.

NHAs are areas considered important for the habitats present or which holds species of plants and animals whose habitat needs protection. Under the Wildlife Amendment Act (2000), NHAs are legally protected from damage from the date they are formally proposed for designation.

All pNHAs were published on a non-statutory basis in 1995 but have not since been statutorily proposed or designated. However, for the purposes of this assessment all pNHAs have been considered as fully designated sites.

Both NHAs and pNHAs may be designated due to the presence of bats, so considerations are made for both.

The site lies, approximately 5.19km from Raheenmore Bog SAC [Site Code: 000582], approximately 5.61km from Lough Ennell SAC [Site Code: 000685], 6.30km from the Lough Ennell SPA [Site Code: 004044], 6.4km from Split Hills and Long Hill Esker SAC [Site Code: 001831], 13.36km from Wooddown Bog SAC [Site Code: 002205]. None of the EU designated sites are designated for the presence of bat species. (see **Figure 2-1** below).

The closest recorded cave lies 9.6km to the south of the site (Mount Brisco). No records of bats have been noted from the cave and it lies outside the zone of influence for the development.

RECEIVED 08/07/2025

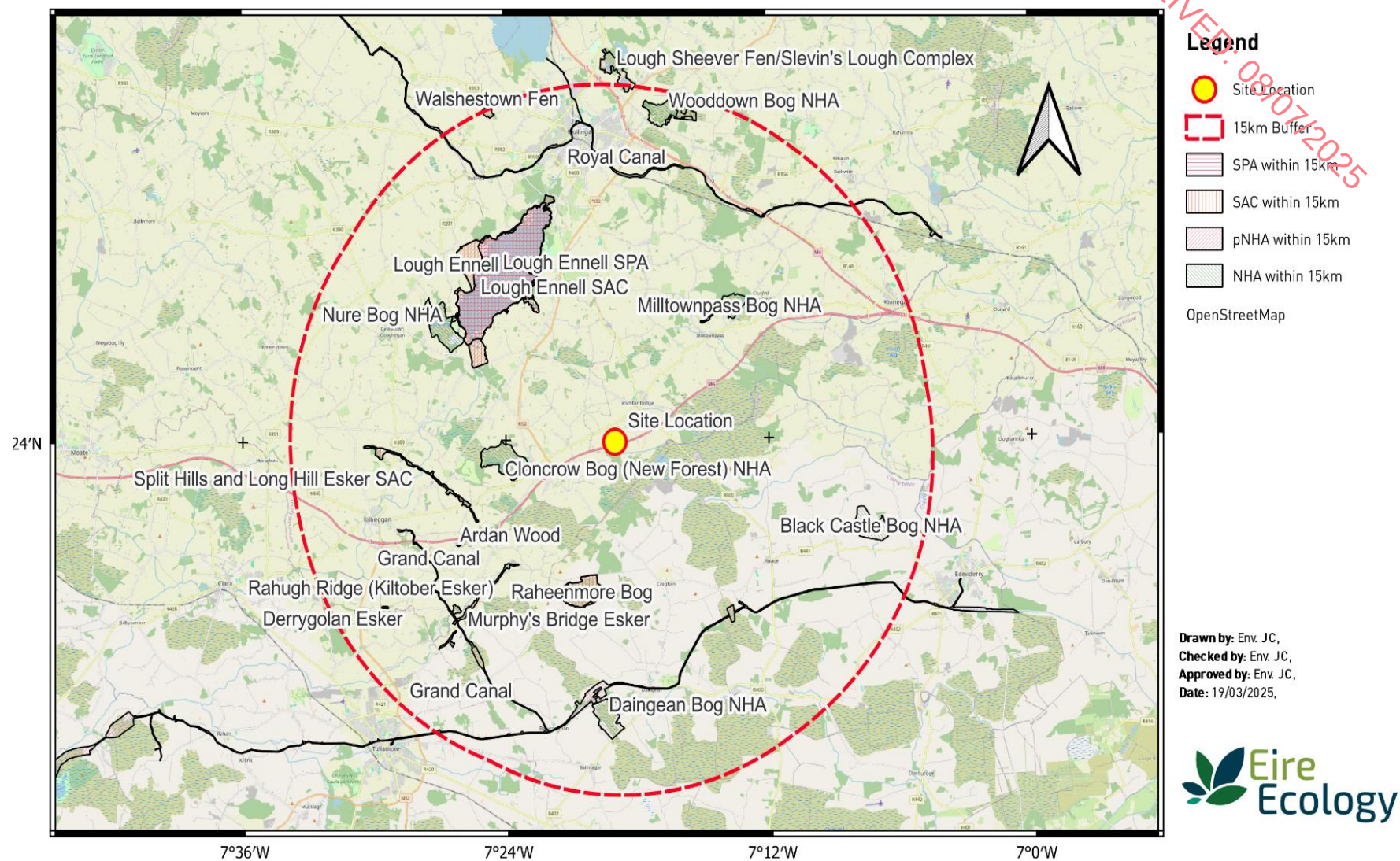


Figure 2-1: Location of proposed development to designated sites

Table 2-1: Designated sites surrounding site

Site Code	Site Name	Distance (Km)	Details with respect to Bats	Potential relevant connectivity
EU Designated Sites				
000582	Raheenmore Bog SAC	5.19km	The CO and Site synopsis documents for this SAC do not refer to bats	No.
000685	Lough Ennell SAC	5.61km	The CO and Site synopsis documents for this SAC do not refer to bats	No.
004044	Lough Ennell SPA	6.30km	The CO and Site synopsis documents for this SPA do not refer to bats	No.
001831	Split Hills and Long Hill Esker SAC	6.46km	A Soprano Pipistrelle roost is located within SAC.	Unlikely given distance
002205	Wooddown Bog SAC	13.36km	The CO and Site synopsis documents for this SPA do not refer to bats	No.
Nationally Designated Sites				
000677	Cloncrow Bog (New Forest) NHA	3.15km	The site synopsis documents for this NHA does not refer to bats.	No. Tyrellspass village forms a barrier between sites.
02323	Milltownpass Bog NHA	5.63km	The site synopsis documents for this NHA do not refer to bats. While there is potential connectivity through hedgerow between the sites this lacks relevance given bats are not a key feature of the NHA	No.
000918	Rahugh Ridge (Kiltober Esker) pNHA	6.30km	The site synopsis documents for this pNHA does not refer to bats.	No.
001725	Nure Bog NHA	7.59km	The site synopsis documents for this NHA do not refer to bats	Unlikely given distance
001711	Ardan Wood pNHA	7.66km	Common and Soprano Pipistrelle previously found next to pNHA	Unlikely given distance
001775	Murphy's Bridge Esker pNHA	8.89km	The site synopsis documents for this pNHA does not refer to bats.	Unlikely given distance
002104	Grand Canal	9.4km	While the site synopsis document for this pNHA does not refer to bats, the Grand canal acts as an important linear feature, especially for Daubenton's bats	Unlikely given distance
002033	Daingean Bog NHA	10.61km	The site synopsis documents for this NHA do not refer to bats	Unlikely given distance
002103	Royal Canal pNHA	10.81km	The site synopsis documents for this pNHA does not refer to bats although Daubenton's bats are known to utilize the canal.	Unlikely given distance
000570	Black Castle Bog NHA	11.40km	The site synopsis documents for this NHA do not refer to bats	Unlikely given distance
000896	Derrygolan Esker pNHA	12.40km	The site synopsis documents for this pNHA does not refer to bats.	Unlikely given distance
000694	Wooddown Bog NHA	13.22km	The site synopsis documents for this NHA do not refer to bats	Unlikely given distance
001731	Walshestown Fen pNHA	14.58km	The site synopsis documents for this pNHA does not refer to bats.	Unlikely given distance
000690	Lough Sheever Fen/Slevin's Lough Complex pNHA	14.69km	The site synopsis documents for this pNHA does not refer to bats.	Unlikely given distance

2.3 BAT SPECIES RECORDED IN THE SURROUNDING AREA

The BCI database was consulted for details on bat records held for the site and the surroundings. The database was consulted on 26/03/2025 for details on historical records from the site for the surrounding area. Results are outlined in Appendix A Table 1.

Five species were recorded roosting within a 6km radius of the site, including Common Pipistrelle, Soprano Pipistrelle, Daubenton's Myotis, Brown Long-eared bats and Natterer's bat.

The database lists four roosts within 6km. Of most relevance are roosts found 1.1km and 1.5km to the north of the site where Natterer's Myotis, Brown Long-eared and Common Pipistrelle (1 of each) were observed hibernating and a summer roost of Daubenton's bats (1 bat) and Brown Long-eared bat (max of 1 observed) was found. These roosts have connectivity to the subject site via hedgerows, however roost observations show low numbers of bats.

Additionally, bat box schemes set 4.4 and 5.5km from the site have records of Soprano Pipistrelle, unidentified Pipistrelle and unidentified bats.

The closest adhoc records are from 2km to the site where Soprano Pipistrelle and Daubenton's bats were noted.

2.3.1 Derrygreenagh CCGT located 2.78km south east of the subject site.

Bat emergence surveys conducted at six buildings and one structure within the vicinity of the existing Bord na Móna power plant in 2023 revealed the presence of eight bat roosts. Of these, two soprano pipistrelle and a single Natterer's bat maternity roost were confirmed. All other roosts were considered to be transitional /occasional roosts or night roosts/ feeding perches. According to (BCT, 2020) Natterers bats have a CSZ of 4km while Soprano Pipistrelle are 3km.

A core sustenance zone (CSZ), as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost.

The CSZ for these roosts cover sections of the solar site to the southeast however in these areas, treelines and hedgerows will not be impacted to a large extent.

2.3.2 Bat Landscapes

(Lundy, 2011) produced a landscape model by analyzing data contained in the Irish National Bat Database, maintained by Bat Conservation Ireland and the National Lesser Horseshoe Bat database maintained by National Parks and Wildlife Service. The maps are a visualisation of the results of the

analyses based on a 'habitat suitability' index. The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. The landscape model has been conducted for all of Ireland's nine resident species.

The site lies within a moderately suitable landscape for bats with highest suitability for Common Pipistrelle (see Table 2-2).

Table 2-2 Risk assessment (green is low suitability for bats, red is high)

Castlelost Solar development		Suitability index
Overall Suitability; BCI		21.78
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	35
<i>Plecotus auritus</i>	Brown Long-eared bats	26
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	38
<i>Rhinolophus hipposideros</i>	Lesser Horseshoe	0
<i>Nyctalus leisleri</i>	Leisler's Bat	35
<i>Myotis mystacinus</i>	Whiskered Bat	13
<i>Myotis daubentonii</i>	Daubenton's Bat	19
<i>Pipistrellus nathusii</i>	Nathusius's Pipistrelle	5
<i>Myotis nattereri</i>	Natterer's Bat	25

2.3.2.1 Preliminary Habitat Ranking

Much of the site consists of large tillage and pasture fields with associated tree lines and hedges. Bats use landscape features such as tree lines for commuting and feeding purposes. Large open fields are of less favorability than smaller ones. Of the four sections outlined in the scoping document, the western area appears to have more frequent and mature tree lines. The central site, close to a farmstead, also appears to have large tree lines thus are of somewhat higher value. The southern section contains a stream, partially dissecting the site. This could also be useful as a hunting and commuting route for bats.

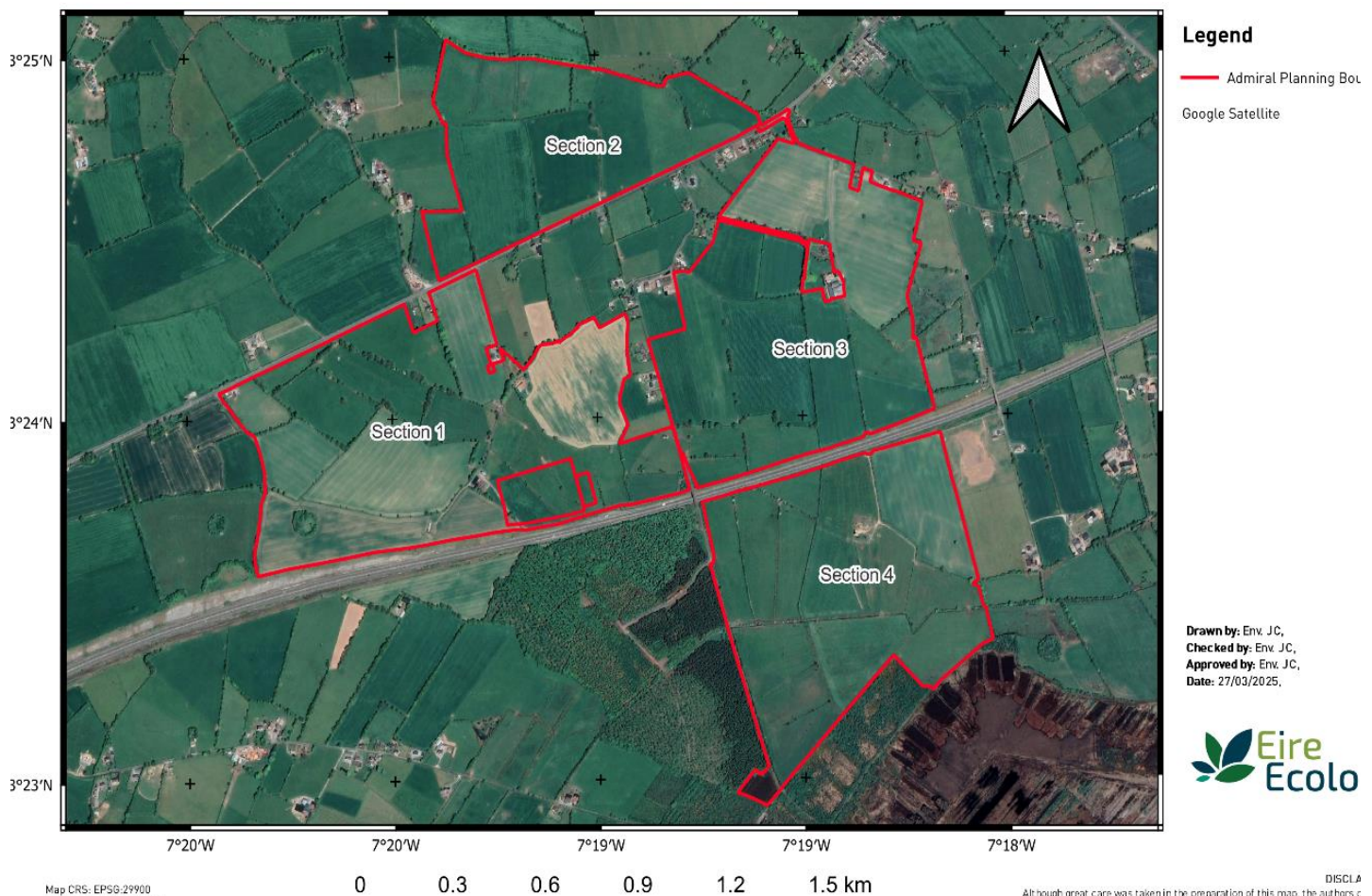
The site appears to have limited buildings within the red line boundary, with more found towards the periphery. Overall, the site is provisionally assigned a Moderate risk site.

3 SURVEY METHODOLOGY

3.1 SURVEY METHODOLOGIES

3.1.1 Habitats on site

The site as referred to in this report consists of four areas, three north of the M6 and one south, which are referred to as Section 1 through 4. Section 2, 3 and 4 will consist of arrays of Solar panels, with associated access routes and Section 1 will contain buildings, roads, ancillary structures alongside areas dedicated to wildlife. The subject site mostly comprised of Improved agricultural grassland and tillage, with small portions of peat to the south and some conifer plantation just outside the site boundary. The site is bisected by the M6 motorway, providing a barrier for connectivity between north and south portions of the site. The site does contain multiple large trees with multiple potential roost features across the site, some of which will be felled during the construction phase of the project. A PRF survey as well as at height tree survey was conducted in order to accurately assess the impact of the loss of these potential roost locations for bats.



3.1.2 Preliminary Ecological Appraisal (PEA)

The proposed development is not altering buildings onsite though will require the removal of a number of linear features including treelines and hedgerows to allow for the construction of access roads and buildings in Section 1.

An inspection of trees and structures was undertaken to assess for potential to host a bat roost on the 21st and the 26th of March 2025. Trees are a highly important feature of landscapes in that they provide roost sites throughout the year as well as being essential sources of insect prey. Therefore, the removal of such trees reduces the availability of shelter and feeding sites for bats (NRA 2005).

3.1.2.1 Structures.

Structures thought to be of high potential for bat roosts were identified onsite during desktop on preliminary roost assessment of the structures by surveyors. Four buildings were identified as having the highest potential and as such were flagged for nighttime emergence surveys.



Figure 3-2: Buildings where emergence surveys were deemed necessary

3.1.2.2 Trees - GLTA

The use of trees as roost sites is well established. Discovery of such roosts may be established by a variety of means including the use of a bat detector survey or alternatively by examination of all suitable crevices and cavities; commonly referred as Potential Roost Features (PRF's). Trees most likely to serve as bat roosts should be identified by a bat specialist from a walk-through of the route, from aerial photography or from a tree survey report.

High potential roost features (PRF's) used by bats include;

Knot-Holes – dead branch

Flush-Cuts – chainsaw cut of branch

Tear-Outs – wind or snow, often well below canopy

Double-Leaders - 2 stems of equal diameter emerge from same spot, cavity is located below split. Increased chance of roost where entrance hole is small

Wounds & Cankers - Rough edge, indistinct shape of entrance

Butt-Rot - decay at the base of a tree

Hazard-Beams - longitudinal splits in lateral limbs and (less frequently) upright stems allowing light to be seen through the gap typically found on Quercus, Salix and horse chestnut

Subsidence, Shearing & Helical-Splits - typically on the convex side of a bend

Lightning-Strikes – from crown to base.

Impact-Shatters – branch hit by falling tree etc.

Desiccation-Fissures – dead wood

Transverse-Snaps – branch / stem snapped however still attached

Lifting-bark

Unions – 2 independent branches (or double leader) fuses. Frequently Beech and Scots Pine

Ivy - typically where the root forms a mat against the tree – rare for bat usage.

Trees were categorized following (Collins, 2023).

Table 3-1: Categorise each tree according to Table 4.2 of (Collins, 2023).

Tree Category	Description
PRF	A tree with at least one potential roost feature (PRF)
FAR	Further assessment required to establish if PRF's are present in the tree.
None	Trees have no potential.

In total 420 trees were surveyed from ground level for their potential to host individual bats or a maternity roost. Two veteran ash trees in Section 1 and two Beech trees in Section 3 were flagged as having the potential to host a maternity roost (PRF-M). Both pairs of trees were subjected to nighttime emergence surveys as a second survey after an at-height inspection. Results are summarized below.

3.1.3 At-height surveys of trees

At-height surveys were carried out by John Curtin and Rik Pannett where Rik climbed trees and used a rigid 350 ca. This was connected to the ecologists phone via wi-fi thus the ecologist inspected all cavities. Surveys were conducted on the 02nd and the 08th of April 2025. A number of Veteran trees onsite were noted to be of key importance in maintaining the continuity of connectivity through the site during and post construction. It is advised these trees be kept as Monolith features to assist in the establishing of the Compensatory woodland that will be planted on the West of the site. Details are Outlined in Section 6 of this Report.

3.1.4 Bat activity and emergence surveys

Bat detectors used during emergence surveys were Wildlife Acoustics Inc. (Echometer Pro 2's) which are triggered to record when a bat call is emitted louder than 18dB for 1sec. These detectors use full spectrum sampling; detecting all frequencies simultaneously, meaning that multiple bat calls can be recorded at the same time.

In addition to audio recording, multiple NVA's were used to assist the onsite surveyors. These include:

- Track IR Pro 19mm thermal imaging scope
- Track IR Guide Pro TK thermal imaging scope
- Canon XA10 night vision camcorder supplemented with two Nightfox IR torches

Video footage was analysed using Motion Meerkat alongside manual verification. Each contact with a bat was recorded. Where possible, a positive identification to species level was made by comparing onsite observations, audio recordings and night vision footage. Information on flight behaviour was also recorded where available.

A contact describes a bat observed by the surveyor. This contact can range from a commuter passing quickly to a foraging bat circling a feature lasting for several minutes. Some observations contain multiple bats. When several bats of the same species are encountered together, they are recorded under the one contact. A separate contact is recorded for each species. A contact finishes when the recorder assumes the bat is no longer present. It is likely that the same bat is recorded in several contacts throughout the night. This survey type cannot estimate abundance of bats, rather activity; *the amount of use bats make of an area / feature.*

Bat activity is governed by the activity of their insect prey and insect abundance is in turn governed by weather conditions and climate. Insects, and therefore bats, are unlikely to be present at temperatures below 7°C or during periods of strong winds or heavy rainfall so surveying in such conditions is not

possible. All field surveys were undertaken within the active bat season and during good weather conditions (dry conditions and temperature at 8°C and greater).

Bats were identified by their ultrasonic calls coupled with behavioral and flight observations and by sound analysis of recorded echolocation and social calls with dedicated software (Wildlife Acoustic's Kaleidoscope Pro; version 5.6.8)¹.

3.1.5 Static bat detector surveys

Song Meter Mini and SM4BAT Full spectrum bat recorders were deployed within the study area for twelve nights in early autumn and spring periods. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some species such as the pipistrelles will continuously fly around a habitat and therefore it is likely that a series of bat passes within a similar time frame is one individual bat. On the other hand, Leisler's bats tend to travel through an area quickly and therefore an individual sequence or bat pass is more likely to be indicative of individual bats.

Detectors were programmed to commence half an hour before sunset and finish half an hour after sunrise to ensure that bat species that emerge early in the evening and return to roosts late are recorded. In total eight detectors were deployed, 4 within open habitats (the habitat type most impacted by the solar panels) and 4 adjacent to tree lines or hedges (higher potential features).

The data was analysed with Wildlife Acoustic's Kaleidoscope Pro; version 5.6.8). This software identifies many of the calls made by Irish bats. All calls were manually verified. Results presented below show some Myotis calls that the surveyor is confident are Natterer's bat and a single Daubenton's Bat. Distinguishing between Myotis species recordings is difficult (unless distinctive social calls are recorded thus several calls are recorded to genus level only. These could be either Whiskered, Daubenton's or Natterer's bat. Similarly, several Pipistrelle calls were recorded with a peak frequency of around 40kHz. These calls are lower than expected for Common Pipistrelle but higher than typical for Nathusius'. Following the precautionary approach these calls have been included in the ECOBAT section below as Nathusius Pipistrelle although it is likely many, if not all were Common Pipistrelle.

3.1.6 Static Survey and Analysis Limitations

- It is not always possible to identify a bat call to species level due to the recorded call not being clear. Recorded files from automated detectors may contain only fragments of a call, or the bat may be calling from a distance (from the detector) in which case it may not be clear enough to assign the call to a specific species. In these cases the call has been assigned to genus level;

¹ The surveyor manually verified all calls rather than depending on auto identification. It is the surveyor's opinion that auto-id features frequently misidentify bat species

- Some caution must be taken when comparing activity levels between species, as bias can be shown towards those species with 'louder' or 'lower frequency' echolocation calls. For example, *Nyctalus* species have louder and low frequency echolocation calls which carry further than the quieter and more broad-band brown long-eared bat echolocation calls;
- A bat contact (for static surveys) is defined as a single detector file which contains at least one bat call. Multiple contacts at any given detector location do not necessarily indicate the presence of more than one bat and should therefore be interpreted as a level of activity rather than the number of bats recorded;
- Typically, ECOBAT analysis (provides tools for the standardised, rigorous interpretation of bat activity data) is used to assign activity levels based on bat passes per night compared with environmental data such as location, weather etc. It works by contrasting the users data with previously uploaded data from other users. This tool had been offline (since November 2022) and while recently available, the author is not confident it currently works correctly thus the author has had to evaluate this dataset by using ECOBAT percentiles from previously used analysis on different sites that share similar attributes (open and edge habitat).
- Following the conservative approach 40kHz activity was included with *Nathusius* *Pipistrelle*.

RECEIVED: 08/07/2025

Admiral - Static Locations

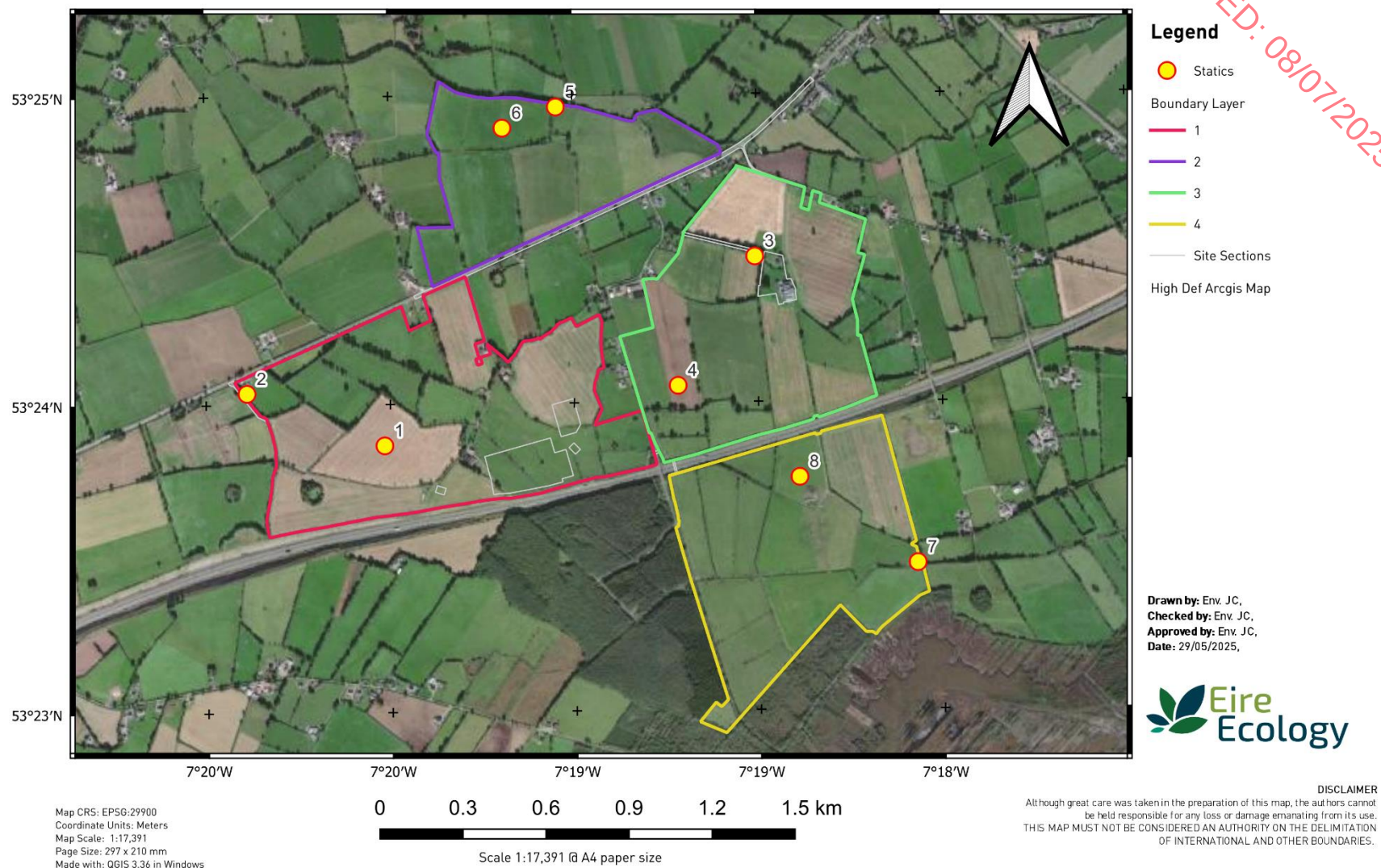


Figure 3-3: Static detector locations.

4 SURVEY FINDINGS

4.1 PEA RESULTS

4.1.1 Structures

A search was conducted of sheds and dwellings of highest potential that were within or close to the site. In situations where access was not possible the surveyor conducted nighttime surveys from the road examining bats and attempting to locate commuting routes and roosts. Table 4-1 and Figure 4-1 provide details from a preliminary search for bat roosts within buildings.

Table 4-1 Potential roost structures examined during daylight preliminary searches.

No.	Latitude	Longitude	Potential	Description
1	53.4006883	-7.3379244	Moderate	Occupied dwelling with newly renovated roof, some gaps in fascia and potential for bats in the tile roof.
2	53.4007471	-7.3376315	Moderate-Low	Shed on property of Structure 1, concrete walls with deep crevices provide potential for single bats.
3	53.4005975	-7.3400088	High	Derelict house, now used as a storage shed for large hay bales, all windows are open, and crevices are present in the walls of the building
4	53.4044935	-7.3089102	Moderate-Low	Occupied modern dwelling with recently renovated tile roof. Low potential for bats from the fascia.
5	53.4036950	-7.3089259	Moderate	Derelict dwelling and sheds next to farmyard. They are semi-detached with multiple sections of collapsed roof so there are areas where the interior is bright during the day, and so less suitable for bats.
6	53.400414	-7.324851	Moderate-Low	Derelict dwelling found to south of site by western section. Lots of light exposure due to no windows and large holes in roof and missing ceiling.
7	53.398711	-7.326159	Low	Shed and wall found to west of structure 6. Shed has no cavities and has metal roof. Shed lacks potential to host a roost. Wall has low potential.
8	53.397058	-7.328246	Low	Ruin of building with no roof. Exposed and low potential

During the daylight search no evidence of bats was noted from any of the structures listed in Table 3-4. Night-time surveys did reveal the presence of bat roost within five of these structures

4.1.2 Trees

In total, 420 trees were identified on site and were surveyed for bat Potential. Of these, 33 trees were concluded to contain potential roost features. Two ash trees in Section 1 were flagged as hosting good

potential for a large roost and 2 Beech trees in Section 3 were similarly flagged for good potential. These trees were investigated from the ground and then assessed again during at height tree surveys.

No bats were found to be roosting in trees onsite, though bats were observed utilising treelines for feeding purposes during nighttime surveys.

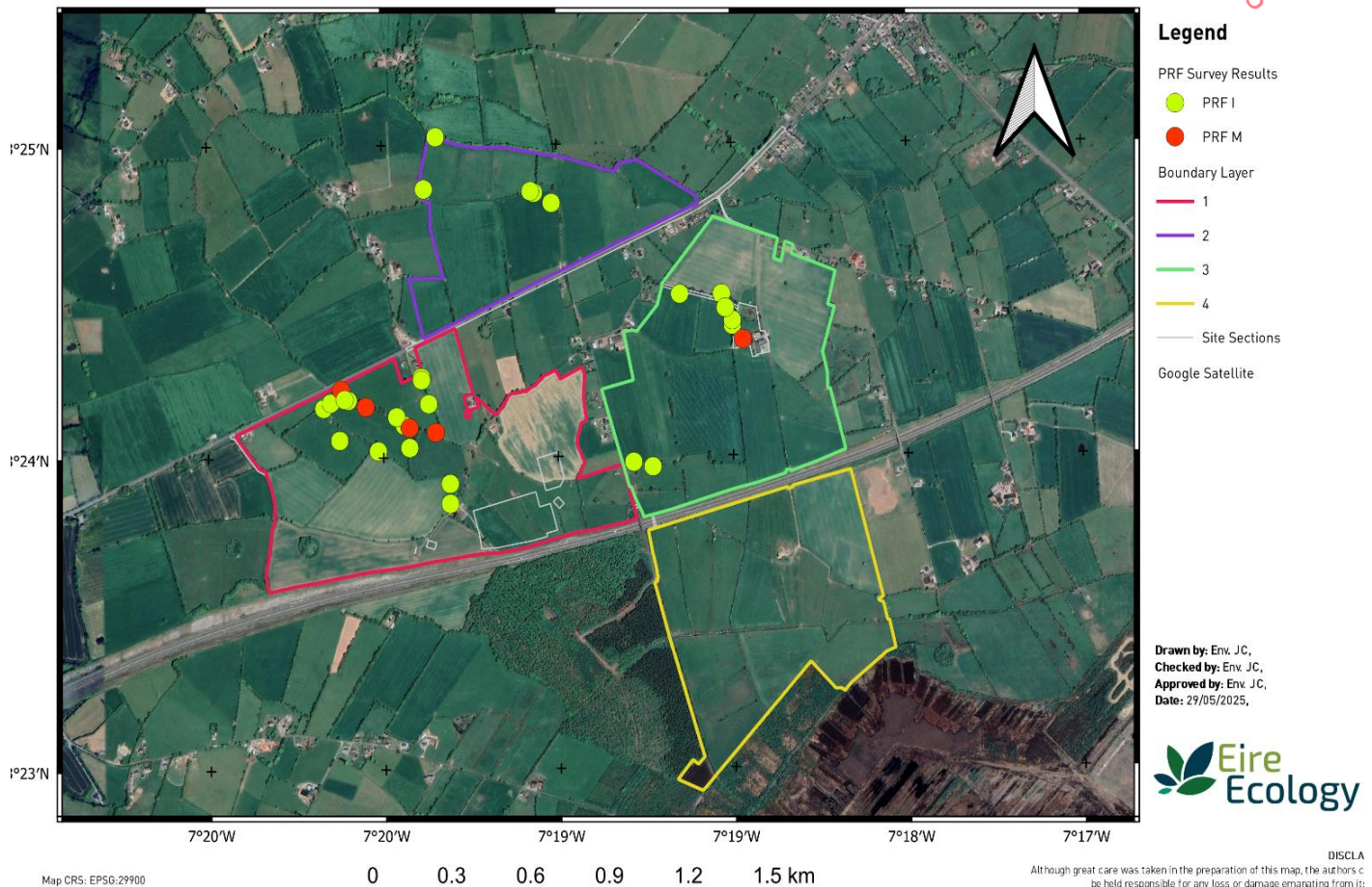


Figure 4-1: PRF Tree locations

4.1.3 Night-time Surveys

Nighttime surveys were conducted on the 23rd April, 01st of May and 9th May 2025. These surveys consisted of multiple surveyors recording activity levels at various points throughout the site at various structures identified during desktop surveys. The purpose of surveys was to examine for roosting bats that could be impacted by the development, observe bat interactions such as commuting routes, feeding areas, and examine if there are current impediments to bats within and surrounding the site.

- Trees located in section 1
- Occupied Dwelling to the West of Section 1, adjacent to D-2 and the shed Adjacent to house.
- Derelict Dwelling used as a hay storage shed.
- Occupied Dwelling in Section 3 of the site adjacent to D-3, shed included in survey.
- Derelict Sheds with slate roof semi-detached from derelict dwelling.

- Tree located in Section 3.

4.1.3.1 Key findings from nighttime surveys

4.1.3.1.1 Emergence surveys on 23/04/2025

Surveys were conducted on two veteran ash trees which showed potential for a maternity roost.

Trees were recorded with Thermal NVA's from multiple angles and multiple microphones were used to ensure good coverage.

Table 4-2: Summary results from emergence surveys 23rd April 2025

Contact number	Time	Species	Details	NVA
1	21:21	Common Pipistrelle	Common Pipistrelle recorded and seen flying length of treeline, not emerging from tree	Thermal Tk
2	21:24	Leisler's Bat	Recorded but not seen, infrequent Leisler's Recordings throughout night	Thermal Tk
3	21:29	Soprano Pipistrelle	Heard but not Seen	Thermal Tk
4	21:50	Common Pipistrelle	One bat seen flying South along treeline, Recordings show both Common and Leisler's Calls at this time	Thermal Tk
5	21:44	Leisler's Bat	Heard but not Seen	Thermal Tk
6	22:23	Leisler's Bat	Heard but not Seen	Thermal Tk
No Bats emerging from Trees				
1	21:40	Leisler's Bat	Recording of Leisler's calls present, none seen	Canon
No bats seen emerging or commuting along treeline				



Plate 4-1: Thermal Footage of Ash Tree Emergence Survey

4.1.3.1.2 Emergence surveys on 01/05/2025

Two emergence surveys were conducted on the 1st May 2025 of structures 1, 2 and 3 by multiple surveyors working with NVA's and Ultrasonic detectors. Six Pipistrelle bats were observed emerging from Structure 3 (most likely 5 Common Pipistrelle and 1 Soprano Pipistrelle), from various exit points in the walls and gable end of the building. Only a single bat was observed leaving Structure 2.

Admiral - Emergence Survey 01/05/2025

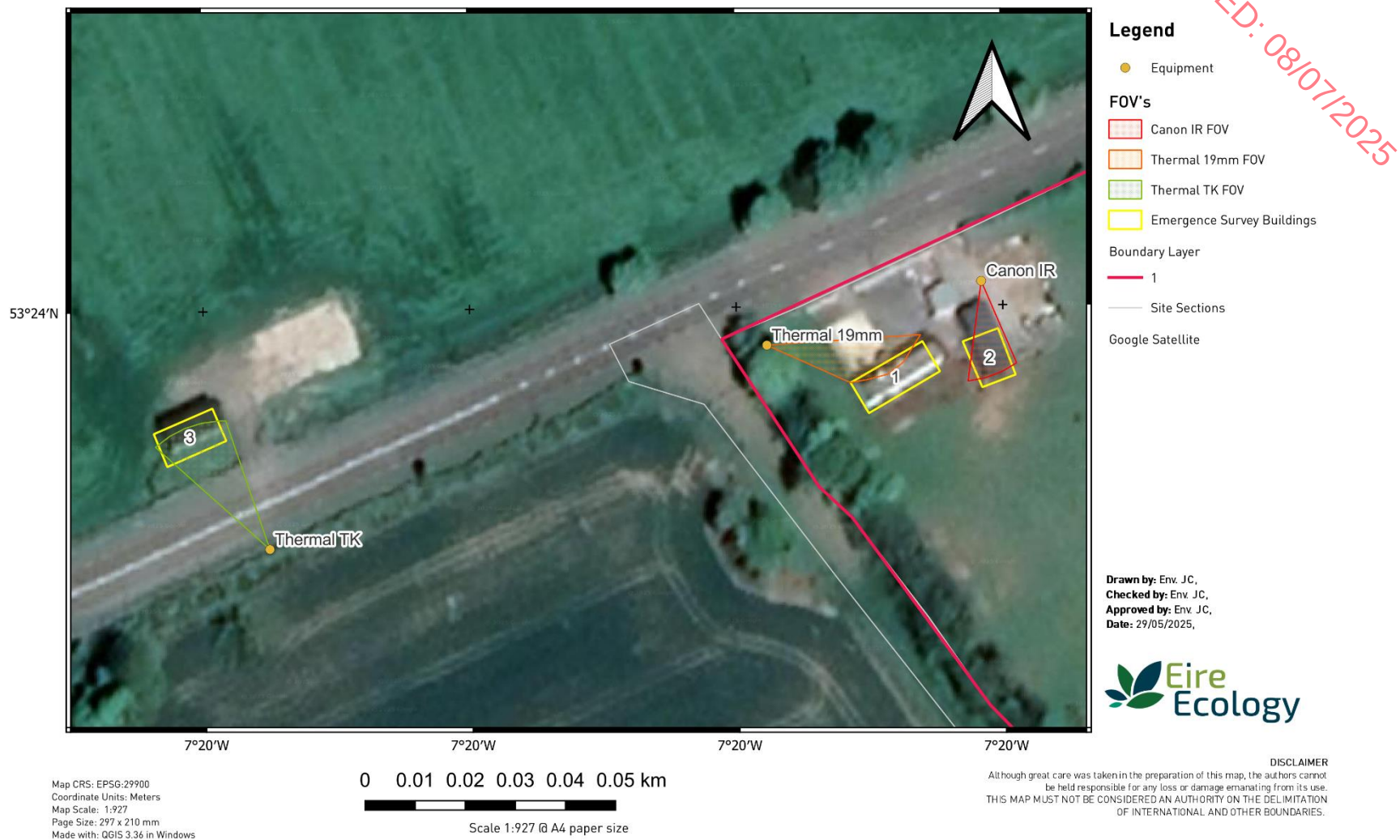


Figure 4-2: Emergence Surveys conducted on buildings either side of R446.

Table 4-3: Emergence Surveys 01/05/2025

Contact number	Time	Species	Details	NVA
1	20:40	Unknown	Bat swooping behind house	Thermal TK
2	21:16	Unknown	Bat on Thermal, swooping from behind house	Thermal TK
3	21:22	Unknown	Bat passing Thermal TK in front of house	Thermal TK
4	21:50	Common Pipistrelle	Bat swooping to the right of camera	Thermal TK
No bats seen emerging from occupied dwelling				
1	20:51	Unknown	Bat enters Shed	Thermal 19mm
2	21:13	Likely Pipistrelle	Bat emerges from crevice in wall on the south face of the shed. Thermal imaging suggests hay and plaster retain heat and make the shed a more promising roost site.	Thermal 19mm
3	21:44	Soprano Pipistrelle	Bat emerges from lower right-hand window on the south side.	Thermal 19mm
4	21:57	Likely Common Pipistrelle	Emerging from corrugated roof, above right-hand 1st floor window	Thermal 19mm
5	22:20	Common Pipistrelle	B circling dwelling, emergence not seen, foraging behaviour for a number of minutes	Thermal 19mm
6	22:20	Common Pipistrelle	Emerges from central 1st floor window	Thermal 19mm
7	22:22	Common Pipistrelle	Emerges from Top left window	Thermal 19mm
8	22:23	Common Pipistrelle	Emerges from gable opening	Thermal 19mm
Six Bats seen emerging from hay shed across road to west of site				
1	21:46	Common Pipistrelle	Bat emerges from shed interior	Canon IR
Single Bat emerges from Shed				

4.1.3.1.3 Tree Emergence survey on 9th May 2025

A tree emergence survey was also conducted on the night of the 9th May 2025. This survey was conducted on two Beech trees located West of an occupied dwelling and farmyard, which is being surveyed at the same time.

Table 4-4: Tree Emergence Survey 09/05/2025

Contact number	Time	Species	Details	NVA
1	21:44:05	Barn Owl	Pair of Barn Owls were seen during this survey	Thermal 19mm
2	22:17 -> End	Common Pipistrelle	Bats hunting low in front of trees	
No bats observed emerging from either Beech Tree				



Figure 4-3: Beech trees being surveyed for bats

4.1.3.1.4 Emergence survey on 09/05/2025

Multiple emergence surveys were conducted on the 9th of May on Structure 4, an occupied house with tile roof and Structure 5, a semi-detached derelict shed and dwelling. No bats were found to be emerging from either building. Structure 4 is an occupied dwelling and shed, with a modern slate roof. The shed is small but showed better potential for a small number of roosting bats than the dwelling. Additionally, a derelict dwelling with semi-detached sheds, both with slate roofs in disrepair, were also surveyed. Facia was in disrepair on these structures, but many areas had collapsed roofs, making the interior brighter and thus less suitable for bats.

RECEIVED: 08/07/2025



Figure 4-4: Emergence Surveys Conducted on buildings 4, 5, 7 (Shed) and Tree

Despite showing potential, no roosting bats were found in any structure on this property, though bats were observed frequently during the night using open areas in front of the dwelling. During late August surveys in 2024, this area showed high levels of bat activity, though reduced in Spring 2025, when this survey was completed.

Table 4-5: Emergence Survey 09/05/2025

Contact number	Time	Species	Details	NVA
1	21:45	Common Pipistrelle	Bat flies over house	Thermal TK
2	22:15	Common and Soprano Pipistrelle	Bats utilise the front of House and Lawn for hunting	Thermal TK
No bats observed emerging from House or Shed				
1	21:50	Soprano Pipistrelle	Bat circles shed in yard and behind building	Canon Starts at 21:14
2	22:00	Soprano Pipistrelle	Fly from other side of Shed	Video 2 starts at 21:51
3	22:28	Soprano Pipistrelle	Flew over surveyor and over slatted shed.	Finishes 22:59
No Bats observed Emerging from derelict sheds				

4.1.4 Static bat detector surveys

Eight Song Meter Mini full spectrum bat recorders were deployed within areas suitable for bats for 12 nights from August to early September during the bat active season, and again in May 2025. Detector 3, located in Section 3 showed the highest levels of Soprano Pipistrelle, Natterer's Bat and Leisler's Bat on site and had the highest activity level overall.

Several Pipistrelle calls were recorded with a peak frequency of around 40kHz. These calls are lower than expected for Common Pipistrelle but higher than the typical for Nathusius. In these cases, the calls are classified to genus level (Unidentified Pipistrelle 40kHz).

Table 3-1 below provides a summary of data with full data tables provided in Appendix A. Results show number of registrations and Bat passes per hour (Bp/Hr) and divides results per species and detector. An overall average of 46.9 Bp/Hr was recorded from the August-September period. Figure 3-3 below shows the location of statics detectors with size of location point based on number of registrations recorded.

Activity across the site was substantially higher on edge habitat compared to open across all sections, with the highest areas of bat activity being at Detector 3 and Detector 2 which show Bp/Hr of 241.1 and 131.6 during the August surveys. In August, the most common species recorded was Common Pipistrelle with 27,060 registrations (48%) followed by Soprano Pipistrelle with 14,829 recordings (27%). Leisler's bat represents 2.3% of total calls with other species recorded at low levels comparatively.

Activity in Spring showed reduced activity when compared to the first survey period. Detector 3 showed the largest drop-in activity of any location, activity dropped from 241.1 Bp/Hr (15,803 recordings), to just 18.5 Bp/Hr, with all species dropping in the same proportions. The majority of the calls on this site are still recorded at Detector 2, where Common Pipistrelle is the most abundant call recorded (89%)

It should be noted that a single bat continuously circling a small stand of trees will produce numerous recordings, thus the number of registrations cannot quantify abundance, rather activity.

RECEIVED: 03/07/2025

Table 4-6: Summary of all results from static detector surveys

Detector	Habitat	Leisler's Bat	Common Pipistrelle	Soprano Pipistrelle	Nathusius Pipistrelle	Pipistrelle 40 kHz	Brown Long-eared	Natterer's Bat	Daubenton's Bat	Unidentified Myotis	Total	Bp/Hr
1	Open	69	88	102	0	0	18	1	3	7	288	1.1
2	Edge	188	21,309	2,976	4	7	35	6	0	100	24,625	94.7
3	Edge	543	8,169	9,521	3	2	17	19	0	86	18,360	90.2
4	Open	124	64	92	0	1	23	2	0	7	313	1.2
5	Edge	261	8,159	5,284	0	0	36	9	2	436	14,187	51.3
6	Open	43	59	55	0	0	11	1	0	20	189	0.7
7	Edge	192	2,287	1,802	4	5	34	1	0	47	4,372	18.0
8	Open	190	142	177	0	0	18	2	0	17	546	2.0
Total		1,610	40,277	20,009	11	15	192	41	5	720	62,880	
Bat passes per hour (Bp/Hr)		0.8	19.7	9.8	0.0	0.0	0.1	0.0	0.0	0.4	30.8	



Figure 4-5: Combined Bat Activity. Size of circle represents activity level (Bp/Hr)

4.1.4.1 Activity Analysis

Static results were interpreted through ECOBAT type analysis. Ecobat was an online tool which makes assessments of bat activity levels by comparing data entered by the user with bat survey information from similar areas. Specifically, a median bat activity level is calculated which corresponds to a bat activity category (Table 4-7). This software had not been operational between November 2022 and January 2025 and while a new version has recently been release, the author is not yet satisfied it is providing accurate interpretations.

Table 4-7: Median percentile range and corresponding bat activity

Percentile	Bat Activity
81-100	High
61-80	Moderate to High
41-60	Moderate
21-40	Low to Moderate
0-20	Low

To prepare a risk assessment for the site, previous ECOBAT data the author has analysed was used to derive both an activity level and a median percentile. Data from numerous sites with similar habitat types were examined and compared with data from the subject site. Activity level from these donor sites were examined, activity percentiles were averaged to create a model from which activity can be derived. Admiral detectors were condensed into two groups; open grassland without a landscape feature within 25m of the detector and locations close to edge habitat (be that hedgerow or treeline). The percentile rating for each night's total passes per species from the comparison sites were ranked and averaged to derive a percentile score for the Garrane detectors. Following (P. Lintott., 2017) a minimum range of 200 nights with at least one night of bat passes was compiled.

An assessment was conducted only for those species identified for Leisler's bat, Common, Soprano and Nathusius Pipistrelle (following the precautionary approach all 40kHz Pipistrelle recordings were added to Nathusius Pipistrelle data). Table 4-8 provides an assessment of the entire site while table 4-10 compares the difference between open and edge habitats. For open habitats the site had moderate common and soprano pipistrelle activity and low Leisler's activity while edge had high activity for common and soprano, moderate Leisler's activity. Nathusius activity was low everywhere.

Table 4-8: Garrane detectors grouped by habitat

Group	1	2
Habitats	Open grassland without a landscape feature within 25m	Close to edge habitat (treeline, hedgerow or woodland)
Detectors	1, 4, 6, 8	2, 3, 5, 7

Table 4-9: Assigned activity levels – entire site

Latin Name	Common Name	Nights of High Activity	Nights of Moderate/ High Activity	Nights of Moderate Activity	Nights of Low/ Moderate Activity	Nights of Low Activity	Median Percentile	Bat Activity Category
<i>Nyctalus leisleri</i>	Leisler's bat	14	41	36	14	71	35	Low to Moderate
<i>Pipistrellus nathusii</i>	Nathusius Pipistrelle	0	5	7	5	159	0	Low
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	71	23	34	17	31	67	Moderate to High
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	66	32	22	8	48	61	Moderate to High

Table 4-10: Assigned activity levels – open compared to edge habitat

Latin Name	Common Name	Edge Habitat		Open Habitat	
		Median Percentile	Activity Category	Median Percentile	Activity Category
<i>Nyctalus leisleri</i>	Leisler's bat	53	Moderate	11	Low
<i>Pipistrellus nathusii</i>	Nathusius Pipistrelle	0	Low	0	Low
<i>Pipistrellus pipistrellus</i>	Common Pipistrelle	97	High	42	Moderate
<i>Pipistrellus pygmaeus</i>	Soprano Pipistrelle	93	High	46	Moderate