MARINE LICENCE CML2365

CONDITION 3.30: LIGHTING AND MARKING PLAN

Liverpool Bay CCS Project

Marine and Coastal Access Act 2009

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1. INTRODUCTION

1.1. PURPOSE

1.1.1. This document is the Lighting and Marking Plan (LMP) and provides the information to fulfil the requirements of Marine Licence CML2365: Condition 3.30 issued by Natural Resources Wales (NRW) for the installation of:

- A new offshore CCS platform and jacket structure; and
- Associated offshore electrical cables for power supply, and pipelines for CO_2 transport.

1.1.2. The location and key coordinates of the new infrastructure are shown in the chart at Appendix A.

1.1.3. This LMP is a 'live' document that will be revised as the project design, construction methodology, and agreed AtoN arrangements develop. Any material change to approved lighting and marking arrangements will be submitted for approval in accordance with Marine Licence CML2365: Condition 3.30.2.

1.1.4. The purpose of this LMP is to detail the measures that will be implemented to ensure that all offshore structures, temporary works, and construction vessels are appropriately marked and lit to ensure maritime and aviation safety, in accordance with the requirements of:

- The UK Hydrographic Office (UKHO)
- The Maritime and Coastguard Agency (MCA)
- Trinity House Lighthouse Service
- The Civil Aviation Authority (CAA) (if applicable)
- International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA)

1.1.5. The overarching purpose of this LMP is to ensure that all works are safely and effectively identified to mariners, in accordance with UK maritime legislation, IALA standards, and the conditions of the Marine Licence.

1.2. SCOPE

1.2.1. This LMP applies to all permanent and temporary marine structures, and vessels within the Marine Licence boundary, including:

- Offshore CCS platform and jacket installation area.
- Cable and pipeline routes (lay and burial corridor).
- Temporary works areas, guard vessels, and anchoring spreads.

1.3. OBJECTIVES

1.3.1. The overall aim is to establish and maintain a comprehensive, GLA-approved system of lights, marks, and notifications that ensures the continued safety of navigation for all mariners during the construction, installation, commissioning, and operation of

the Liverpool Bay CCS Project, while meeting all statutory obligations under UK maritime and marine environmental law.

1.3.2. The primary objectives of the LMP are set out in Table 1-1.

Table 1-1 – LMP Objectives

Regulatory obligation	Requirements
Ensure the Safety of Navigation	• Provide clear and conspicuous visual, audible, and electronic signals to alert mariners to the presence of offshore construction works, vessels, and structures. • Maintain appropriate Aids to Navigation (AtoN)-lights, fog signals, buoys, and AIS AtoN-during all phases of the project to mitigate navigational risks.
Comply with Statutory and Regulatory Requirements	• Fulfil the conditions of the Marine Licence, Energy Act 2008, and Merchant Shipping (Safety of Navigation) Regulations 2002, and meet MCA Marine Guidance Notes (MGNs 401, 543, 654). • Obtain approval from the General Lighthouse Authority (Trinity House) for all temporary and permanent AtoN.
Align with International and National Standards	• Apply IALA Recommendation G1162 - The Marking of Man-Made Offshore Structures, and associated IALA guidelines for temporary works. • Ensure that all lighting, marking, and fog signal specifications meet recognised standards for colour, intensity, flash character, and range.
Support Safe Construction, Operation and Maintenance	• Identify and mitigate navigational hazards during installation, hook-up, and commissioning of offshore platforms, pipeline spools, cables, concrete mattresses, and rock protection. • Provide appropriate temporary marking during construction and permanent AtoN post-commissioning, with defined transfer between the two.
Promote Effective Communication with Mariners	• Define the procedures for issuing Local and Admiralty Notices to Mariners (NtMs) and Kingfisher/KIS-ORCA bulletins to ensure timely dissemination of information. • Ensure that updates are provided to the UK Hydrographic Office (UKHO) for charting purposes within statutory timeframes.
Ensure AtoN Reliability and Availability	• Specify the maintenance, inspection, and autonomy requirements for all AtoN, including minimum 96-hour battery backup and photocell/visibility control. • Maintain availability targets in accordance with IALA Category 3 AtoN reliability (97 %).
Define Roles, Responsibilities, and Reporting	• Establish clear lines of responsibility between the Marine Coordinator, Installation Contractor, Trinity House, MCA, and NRW Compliance Officer. • Provide procedures for reporting AtoN failures, defects, and outages, and for reinstatement or rectification within 24 hours.
Prevent Environmental and Navigational Hazards	• Minimise the risk of vessel collision, gear entanglement, or unmarked obstruction through proactive planning, accurate positioning, and controlled removal of temporary marks. • Ensure that all AtoN are removed promptly when no longer required, to avoid creating navigational clutter or confusion.

1.4. INTERFACES AND ASSOCIATED DOCUMENTS

1.4.1. The considerations, mitigation and measures that are described in this LMP are informed by relevant assessments and descriptions contained within the Offshore Environmental Statement (ES) that supported the Marine Licence (CML2365) application. The relevant ES chapters are as follows:

- ES Volume 2, Chapter 4: The Proposed Development;
- ES Volume 2, Chapter 7: Other marine users; and
- ES Volume 2, Chapter 13: Shipping and navigation.

1.4.2. This LMP also interfaces with several other management plans, and method statements. It has been drafted to be consistent with the timings, approaches and controls set out in the preconstruction plans and documents submitted for approval under Marine Licence CML2365. Specifically, implementation of the LMP will require interface with the following Management Plans, which are all Activity-specific Conditions of Marine Licence CML2365:

- Vessel Management Plan (VMP), as required in Condition 3.27;
- Navigation and Safety Plan (NSP), as required in Condition 3.29;
- Cable crossing and working agreements, as required in Condition 3.31.

1.4.3. On completion of the activities LB CCS Limited will undertake the following;

- Compass Deviation Survey, as required in Condition 3.28;
- Installed Cable and Pipeline Report, as required in Condition 3.32; and
- Post Construction As-Built Report, as required in Condition 3.33.

2. REGULATORY AND GUIDANCE FRAMEWORK

2.1. REGULATORY REQUIREMENTS

2.1.1. The Standard Marking Schedule, issued by the UK Department of Energy & Climate Change (DECC, 04/11), sets out the mandatory lighting, marking, and signalling requirements for offshore installations and vessels engaged in offshore operations under the Energy Act 2008. It ensures that all structures are conspicuously marked and identifiable for navigational safety.

2.1.2.

2.1.3. Table 2-1 identifies the Maritime and Coastguard Agency (MCA) Marine Guidance Notes (MGNs) applicable to the lighting, marking, and navigational safety of offshore oil and gas, carbon capture and storage (CCS), and associated subsea infrastructure within UK waters.

2.1.4. These MGNs collectively ensure compliance with international standards including IALA Recommendation G1162, COLREGS 1972, and SOLAS Chapter V, the core requirements, incorporated into the project design, are summarised as follows:

- All offshore lighting and marking will be designed and operated in accordance with IALA G1162 and the relevant MCA MGNs above.
- White flashing lights (Morse "U"), red subsidiary lights, and fog signals with 96-hour autonomous backup remain the standard for fixed platforms.
- Temporary AtoN (e.g. yellow special or cardinal buoys) will be deployed during construction, major maintenance, or decommissioning, only after consultation with, and where required, approval by, Trinity House.
- Notices to Mariners will be issued prior to, during, and after works, with all as-built data provided to the UK Hydrographic Office (UKHO) for chart updates.
- All AtoN failures or outages will be reported immediately to the General Lighthouse Authority (Trinity House) and MCA, with corrective action within 24 hours.
- Operators remain responsible for ensuring AtoN availability, maintenance, and compliance at all times.

2.1.5. All vessels engaged in the installation of offshore electrical cables, jackets, and topside platforms will comply with international, national, and local regulatory requirements, as well as project-specific licence conditions. Compliance is mandatory and a condition of mobilisation for any vessel involved in project works.

2.1.6. The statutory, environmental, safety, and project-specific requirements and obligations that will be applied are summarised in

2.1.7. Table 2-1.

Table 2-1 – Summary of regulatory obligations

Regulatory obligation	Requirements
Marine Licence CML2365 Condition 3.30	• **Condition 3.30.1** The Licence Holder will submit a LMP to the Licensing Authority for written approval at least 4 months prior to commencement of the Licensed Activities. No Licensed Activities may be undertaken prior to written approval from the Licensing Authority.
IALA Recommendations E-200	• The IALA Recommendations E-200 (Recommendations - IALA) provide guidelines for marine signal lights, focusing on their luminous intensity, spectral properties, and colour measurement. Key aspects include: o Effective Intensity: Defined as the luminous intensity of a fixed light that matches the spectral distribution of a flashing light, ensuring clarity in colour and brightness perception. o Colour Characteristics: Recommendations include defined chromaticity regions for marine signal lights to reduce confusion among mariners. o Measurement Methods: Guidance on how to measure or estimate the angular, temporal, and colour characteristics of these lights. o For more detailed information, you can refer to the official IALA documents available on their website.
IALA Guideline G1162	• *The IALA Guideline G1162 – The Marking of Offshore Man-made Structures (Edition 1.1, December 2021)* provides international guidance on how to mark offshore installations to ensure maritime safety and environmental protection. It covers a wide range of structures, including oil and gas platforms, offshore wind farms, wave and tidal energy devices, aquaculture farms, cables, pipelines, and other floating infrastructure. • The document outlines general marking principles, such as the use of lights, radar beacons, AIS Aids to Navigation (AtoN), hazard warning signals, and colour schemes (notably yellow for visibility). It emphasizes coordination among competent authorities, proper charting and promulgation of information, and the development of contingency and emergency response plans. • Specific marking requirements are provided for different types of structures and operational phases—construction, operation, and decommissioning. The guideline also highlights future considerations, including the impact of emerging technologies and autonomous ships on AtoN practices.
Marine Guidance Note (MGN) 401 (M+F)	• Navigation: Offshore Installations and Safety Zones.. Relevant to Offshore oil & gas installations; CCS platforms. Defines lighting, marking and charting of 500 m safety zones; requires notification to UKHO, Trinity House and MCA; primary reference for oil & gas platform marking.
MGN 5431 (M+F)	• Offshore Renewable Energy Installations (OREIs): Requirements, Guidance and Operational Procedures for Lighting and Marking. Relevant to All fixed or temporary offshore structures. Main UK reference for Aids to Navigation (AtoN); adopts IALA G1162; sets technical standards for lights, fog signals, and buoyage; requires GLA approval of all AtoN schemes.
MGN 372 (M+F)	• Offshore Renewable Energy Installations: Guidance on Safety Zones and Navigational Safety. Relevant to Offshore construction and decommissioning activities. Provides framework for establishing safety/exclusion zones, issuing Notices to Mariners (NtMs), and coordinating with UKHO and GLA.
MGN 654 (M+F)	• Guidance on UK Navigational Practice, Safety and Emergency Response Issues. Relevant to All offshore projects and operations. Integrates navigation safety with emergency response; outlines Navigation Risk Assessment (NRA) and stakeholder consultation expectations.
MGN 275 (M+F)	• Marine Aids to Navigation Availability and Reliability. Relevant to All AtoN operated on offshore installations. Establishes AtoN availability categories (typically Category 3 – 97 % uptime); defines maintenance, inspection, and fault-reporting standards.
MGN 299 (M+F)	• Use of Automatic Identification System (AIS) as an Aid to Navigation. Relevant to Fixed offshore structures and subsea assets. Provides standards for transmitting AIS AtoN signals; enhances situational awareness for mariners where physical marks are impractical.
Trinity House	• Local Aid to Navigation applications.

Regulatory obligation	Requirements
DECC 04/11	• Standard Marking Schedule for Offshore Installations: The schedule provides a uniform national standard for the marking and lighting of offshore platforms, MODUs, and construction vessels, ensuring they are safely visible and identifiable to mariners under all conditions.
UKHO Hydrographic Notes	• Hydrographic Notes allow you to inform the UK Hydrographic Office of any navigationally significant information. This information could include new or suspected dangers, changes to navigational aids, amendments to details included in publications and suspicious charts or publications that could be counterfeit.
CAA CAP 437	• CAP 437: Standards for offshore helicopter landing areas: This publication provides the criteria applied by the CAA in assessing the standards of offshore helicopter landing areas for worldwide use by helicopters registered in the United Kingdom.
CAA CAP 1077	• Specification for sand Offshore Helideck Lighting System.
CAA Guidance	• Lighting and Marking of Obstacles. Guidance on the requirements and recommendations for the lighting/marking of obstacles in UK airspace.

3. ROLES AND RESPONSIBILITIES

3.1. OVERVIEW

3.1.1. This section defines accountability and operational roles across the following key entities:

- Liverpool Bay CCS Limited (Developer / Marine Licence Holder); and
- Vessel Owners/Operators (e.g. Boskalis, Heerema);

3.1.2. Each role is structured by "Activity" and "Description," establishing a clear governance chain from legal accountability (Developer) down to real-time operations and stakeholder engagement.

3.2. LIVERPOOL BAY CCS LIMITED

3.2.1. Liverpool Bay CCS Limited holds ultimate responsibility for navigational safety associated with the project. They will ensure that all lighting and marking measures are approved, implemented, maintained, and verified in accordance with the Marine Licence, UK maritime law, and GLA/MCA guidance, and that any failure or change is promptly reported and rectified.

3.2.2. Table 3-1 presents a structured overview of the roles and responsibilities of Liverpool Bay CCS Limited in lighting and marking management.

Table 3-1 – Roles and responsibilities of the Marine Licence holder (Developer) in lighting and marking management

Activity	Description
Overall compliance governance	• Act as the duty holder under the Marine Licence, responsible for compliance with all licence conditions relating to navigational safety, lighting, marking and notification. • Ensure the Lighting and Marking Plan (LMP) is prepared, approved, implemented, and maintained in accordance with the conditions of the Marine Licence and relevant UK legislation (Energy Act 2008, Merchant Shipping Act 1995, and IALA standards). • Maintain auditable evidence that all marking and lighting measures remain compliant throughout the project lifecycle.
Development and approval of the LMP	• Prepare and submit the Lighting and Marking Plan to Natural Resources Wales (NRW) and the Maritime and Coastguard Agency (MCA) for review, and obtain formal approval from Trinity House (GLA) for all Aids to Navigation (AtoN). • Ensure the plan references relevant standards and guidance (IALA G1162, MCA MGNs 401, 543, 654, and DECC "Standard Marking Schedule"). • Update the plan as required following design or programme changes, and circulate revisions to all stakeholders.
Implementation and operation	• Ensure all temporary and permanent AtoN (lights, buoys, fog signals, identification panels, AIS AtoN etc.) are installed, commissioned, and operated in accordance with the approved plan and the GLA's requirements. • Confirm that each AtoN has appropriate autonomy (≥ 96 hours), photocell / visibility control, and availability per IALA Category 3 standards (97 % availability). • Maintain clear operational control of all AtoN through the appointed Marine Coordinator (MC) or AtoN maintenance contractor. • Arrange for regular inspection, maintenance and testing of all navigation lights and marks, and keep verifiable records.

Activity	Description
Notifications and stakeholder communication	• Ensure timely issue of Local and Admiralty Notices to Mariners (NtMs) prior to, during, and following construction activities, as required under the Marine Licence. • Notify the UK Hydrographic Office (UKHO) within the specified period (usually within 10 days of completion) so that all new or removed structures are correctly charted. • Coordinate with the Kingfisher Information Service (KIS-ORCA) to inform fishing and maritime communities of vessel routes, safety zones and locations of works. • Maintain open communication with NRW, MCA, Trinity House, and local harbour authorities.
Incident, defect, and outage management	• Ensure that any failure, defect or outage of AtoN or lighting/fog signal is: o Reported immediately to Trinity House, MCA and NRW; o Rectified as soon as practicable (normally within 24 hours); and o Recorded in a maintenance and incident log for audit purposes. • Investigate any navigation incident, near miss, or complaint arising from the project, and implement corrective actions.
Removal and decommissioning	• Remove all temporary AtoN promptly when no longer required and only after written authorisation from Trinity House. • Provide confirmation to NRW and UKHO that all marks and lights have been removed or replaced by permanent AtoN as appropriate. • Ensure seabed and navigational hazards are cleared and verified safe post-construction.
Oversight and audit	• Conduct internal compliance audits of the LMP implementation during construction and prior to handover to operations. • Make all inspection, maintenance and reporting records available to NRW, MCA, and Trinity House on request. • Review and update the LMP as necessary during operation and decommissioning.

3.3. VESSEL OWNERS/OPERATORS

3.3.1. Vessel owners and operators are responsible for the execution of project requirements. Their duties include operating vessels safely, maintaining statutory and regulatory compliance, ensuring proper crewing and maintenance, and meeting both international law and project-specific standards.

3.3.2. They will ensure their vessels comply with lighting, marking, and operational requirements specified in the Lighting and Marking Plan, COLREGS, and the Marine Licence. This includes deploying, monitoring, and reporting all temporary AtoN, as required.

3.3.3. Owners and operators contribute to the project's navigational safety assurance framework under the direction of Liverpool Bay CCS Limited.

3.3.4. During marine construction, installation, and operation phases related to the Liverpool Bay CCS Project, owners and operators have specific responsibilities to support the implementation of the approved LMP.

3.3.5. These tasks are defined by UK maritime law and Marine Licence conditions, with the purpose of maintaining navigational safety, personnel welfare, and marine environmental protection.

3.3.6. Table 3-2 presents a structured overview of the roles and responsibilities of vessel owners/operators in lighting and marking management.

Table 3-2 – Roles and responsibilities of vessel owners/operators in lighting and marking management

Activity	Description
Compliance with statutory requirements	• Ensure compliance with the Merchant Shipping (Safety of Navigation) Regulations 2002, COLREGS 1972, and relevant MCA Marine Guidance Notes (MGNs), including MGNs 543, 654, and 372. • Operate in accordance with this approved Lighting and Marking Plan and any site-specific requirements agreed with the General Lighthouse Authority (GLA) and MCA Navigation Safety Branch. • Maintain an auditable record of all navigational aids, warning signals, and lights fitted and operated on board.
Lighting and marking of vessels during construction	• During the construction and installation phases (including platform installation, cable lay, pipeline lay, mattress and rock placement), all project vessels will: Display Required COLREGS Lights and Shapes o Display the correct lights, day shapes, and signals for "Vessels Restricted in Their Ability to Manoeuvre" (Rule 27), towing, underwater operations, or anchored status, as applicable. o Ensure obstruction-side and safe-side lights (red/red and green/green) are correctly exhibited where required. o Operate deck and work lights so that they do not obscure or reduce visibility of prescribed navigational lights. Support Temporary Aids to Navigation (AtoN) o Assist in the deployment, monitoring, and maintenance of temporary buoys, beacons, or lighted marks established under the LMP. o Notify the Marine Coordinator and Trinity House of any AtoN malfunction, damage, or displacement immediately. o Record all checks, outages, and rectifications in vessel logs and communicate these through the project reporting chain. Ensure Safe Operations and Marking During High-Risk Activities o Maintain an active AIS signal, VHF watch, and appropriate radar reflector visibility. o Display additional lighting or warning beacons as specified in the LMP when operating at night or in reduced visibility, provided these do not conflict with COLREGS lights. o Use guard vessels where required to maintain exclusion or advisory zones and to warn third-party traffic.
Lighting and marking during operation	• When operating in the field after construction (e.g., during maintenance, inspection, or decommissioning campaigns): o Continue to comply with COLREGS and project-specific AtoN requirements. o Display appropriate navigational lights and shapes when conducting diving, ROV, or inspection work. o Coordinate all temporary or revised marking with the Marine Coordinator and Trinity House before deployment. o Maintain readiness to reinstate or maintain any temporary AtoN if a new hazard (e.g., exposed pipeline or cable) emerges.
Communication and notification responsibilities	• Communicate daily with the Marine Coordinator to confirm vessel positions, lighting status, and operational plans. • Notify the Marine Coordinator immediately of any: o Failure of navigational lights, fog signals, or AtoN equipment; o Navigational hazard, debris, or dropped object; o Any change to vessel configuration that affects marking or safety zones. • Cooperate with the issue of Notices to Mariners (NtMs) and the Kingfisher Information Service (KIS-ORCA) by supplying accurate operational and positional information.
Maintenance and inspection	• Conduct daily inspection and functional checks of all vessel navigation lights, shapes, and fog signals. • Maintain spare bulbs, lenses, fuses, and backup power supplies to ensure redundancy and ≥96-hour autonomy where required.

Activity	Description
	• Support periodic audits of lighting and marking arrangements undertaken by the Marine Coordinator, NRW Compliance Officer, or GLA.
Reporting and record keeping	• Maintain vessel navigation logbooks detailing daily lighting and marking status, including checks and outages. • Record all dropped objects or debris recoveries in coordination with the Dropped Object Plan and report to the Marine Coordinator. • Provide reports on AtoN or light failures to the Developer/Licence Holder and relevant authorities within 24 hours of detection.
Decommissioning and demobilisation	• Remove or deactivate all temporary lights, marks, and signals upon completion of construction activities and only after authorisation by the Marine Coordinator and Trinity House. However, this would not be applicable to cable installation works, when e.g. anchor buoy is recovered, the light is recovered with it. (Note, for vessel and anchor lighting no authorisation for removal is required, this is automatic upon relocation.) • Confirm in writing that no residual hazards remain and that the seabed and navigational area are left clear of unmarked obstructions (see Dropped Objects Plan).

4. MARINE AND AVIATION NAVIGATION SAFETY

4.1. LIGHTING AND MARKING PROPOSALS FOR DOUGLAS CCS PLATFORM

OVERVIEW

4.1.1. The Douglas CCS Platform navigation aid and helideck lighting system has been designed in accordance with IALA Recommendation G1162, CAA CAP 437, and Company Specification 20174.ENG.ELE.STD, ensuring full compliance with UK and international offshore marking standards. The system provides clear visibility and identification of the platform to mariners and aircraft under all conditions, with autonomous operation and emergency backup power.

4.1.2. Table 4-1 presents a summary of the lighting and marking proposals for the Douglas CCS platform, which are presented in detail in the following sections and shown on the drawings in Appendix B.

Table 4-1 – Summary of lighting and marking proposals for Douglas CCS platform

Component	Specification	Control / Operation
Main navigation lights	• 2 x 15 NM white LED lanterns	• Automatic (photocell)
Subsidiary lights	• 2 x 3 NM red LED lanterns	• Automatic (photocell)
Fog horn	• Automatic via visibility sensor	• Local/ICIS control
Obstruction lights	• Red steady / fixed per CAP 437	• Continuous
Helideck perimeter lights	• LED, photocell controlled	• Helideck panel
Flood lights	• 4 x LED with visor	• Operator control
Windsocks	• 2 x illuminated	• Helideck panel
Battery backup	• 2 x 24V VRLA sets, 96hr autonomy	• Automatic
Solar backup skid	• 2.85 kWp PV + 2,880Ah batteries	• Temporary/emergency use

AIDS TO NAVIGATION SYSTEMS

4.1.3. Main Lighting Configuration will comprise the following:

- Two main white navigation lanterns, each with a 15 NM range (minimum luminous intensity 1,400 cd).
- Two subsidiary red lanterns, each with a 3 NM range, installed on opposite corners to the white lights so that at least one white light is visible from any direction of approach.
- Lights to be installed in accordance with IALA G1162, with layout verified by the supplier and approved by the Company.

4.1.4. Fog and Sound Signals will comprise the following:

- Fog horns integrated into the system, automatically operated by visibility meters and photocells.

- System designed for fully autonomous operation, initiating automatically in low visibility or darkness.

4.1.5. Control and Power will comprise the following:

- Controlled through a simplified Main Navaid Control Panel located outdoors (IP66).
- The system interfaces with the platform's Integrated Control and Safety System (ICSS) via redundant Ethernet and hardwired safety signals.
- Two battery sets (VRLA Gel type) provide a minimum 96-hour backup for lanterns, fog horns, and radar beacon in the event of power loss.
- Batteries installed in outdoor IP54 boxes (safe area rated, IIC T6).

4.1.6. Temporary and Emergency Power will comprise the following:

- A solar panel skid (6 × 475 Wp panels, total 2.85 kWp) provides autonomous temporary power if main supply is unavailable.
- The skid includes a 24V 2,880Ah VRLA battery system, charge controllers (MPPT), distribution board, and emergency 230V AC charger.

4.1.7. RACON system: The Project incorporates the provision of Radar Beacons (RACONs) as Aids to Navigation (AtoN) in accordance with IALA guidance and the requirements of the UK General Lighthouse Authority (Trinity House). The RACONs are intended to enhance navigational safety and collision avoidance by providing a positive radar-based identification of the offshore installations to passing vessels.

4.1.8. Each RACON operates as a passive radar responder, detecting interrogating radar transmissions from vessels and automatically replying with a coded radar signal on both the X-band and S-band frequencies, consistent with IALA recommendations for radar beacons. The RACON response is displayed on a vessel's radar Plan Position Indicator (PPI) as a Morse-coded character, enabling mariners to readily identify the installation and determine its bearing and range relative to their own position.

4.1.9. The RACON units are permanently mounted on the Douglas CCS platform and the associated satellite platforms (Hamilton, Hamilton North and Lennox), with installation locations selected to provide unobstructed 360-degree azimuth visibility, as required for effective RACON performance. The RACONs are charted as recognised AtoN on UK nautical charts issued by the UK Hydrographic Office (UKHO), ensuring consistency with established navigational information available to mariners.

4.1.10. The Douglas platform RACON is integrated with the platform radar system to prevent self-interrogation, while the satellite platform RACONs operate as autonomous AtoN, responding solely to vessel radar transmissions within their effective range. Two equipment variants are provided: a non-hazardous area RACON for Douglas and ATEX-certified RACON assemblies for the satellite platforms, ensuring compliance with hazardous area requirements while maintaining identical navigational performance characteristics.

4.1.11. The RACON equipment is housed in IP68-rated, nitrogen-pressurised enclosures, designed for long-term offshore operation and high availability in accordance with Trinity House expectations for fixed offshore AtoN. Power is supplied from the

platform navigation aids distribution system, and the RACONs operate continuously to provide a reliable radar conspicuity aid throughout both construction and operational phases of the Project.

HELIDECK LIGHTING SYSTEM

4.1.12. Helideck Lighting Components will comprise the following:

- Designed and installed in accordance with CAA CAP 437.
- Integrated Helideck Light Panel (IP66, Zone 1 IIB T3) to control:
  - Perimeter lights (photocell controlled).
  - Status lights.
  - Floodlights (four deck-level LED units with anti-glare visors).
  - Two illuminated windsocks, powered from the helideck light panel.
  - Aeronautical obstruction lights (always on as per aviation requirements).

4.1.13. The number and layout of perimeter, obstruction, and floodlights to be confirmed by the supplier based on the approved platform layout in Appendix B (Doc. No. 105600DEDD45124).

MARKING AND COLOUR

4.1.14. Marking and colour will comprise the following:

- Lanterns and fittings to be yellow or aviation red, as per IALA and CAP 437 marking requirements.
- All materials to be finished to CX corrosivity class (ISO 12944-2) for extreme offshore conditions.
- All enclosures and structures fabricated in AISI 316L stainless steel.

EARTHING AND BONDING

4.1.15. Earthing and bonding will comprise the following:

- All enclosures, lanterns, and fog horns equipped with external earthing studs (AISI 316L, min. M6).
- The control panel includes an internal copper protective earth busbar, in compliance with LBCCS Limited Electrical System Design Standard 20208.ENG.ELE.PRG.

AUTONOMY AND OPERATION

4.1.16. Autonomy and operation will comprise the following:

- The system operates automatically from 15 minutes before sunset to sunrise, and during visibility <2 NM.
- Backup autonomy of 96 hours is assured under total power loss conditions.
- Fully fail-safe design, with automatic restart after shutdowns or low-visibility activation.

4.2. LIGHTING AND MARKING PROPOSALS FOR SUBSEA CABLES AND PIPELINES

REGULATORY GUIDANCE

4.2.1. General Lighthouse Authorities (GLAs), Trinity House in England and Wales, decide the type, number and light characteristics of Aids to Navigation (AtoN) on a case-by-case basis, using IALA recommendations. Special/temporary marks are common for pipelines/cables.

4.2.2. MCA guidance covers safe navigation around subsea infrastructure and depicts how cables/pipelines are charted and protected.

4.2.3. UKHO charts the features and publishes Admiralty Notices to Mariners (NtMs); licence conditions typically require notification within 10 days of completion so charts can be updated.

4.2.4. KIS-ORCA/Kingfisher disseminates cable awareness info and bulletins to the fishing fleet.

4.2.5. Table 4-2 presents a summary of the lighting and marking requirements during construction.

Table 4-2 – Summary of lighting and marking requirements during construction

Component	Specification	Control / Operation
Cable/pipeline lay and burial	• Work site and route	• Vessels display underwater operations lights/shapes, NtMs; Kingfisher bulletins. When anchoring: anchor buoy lights, Anchor Handling Tugs acting as Guard Vessels.
Repairs/inspection with vessels on site	• Work areas and hazards	• As above; vessels display underwater operations lights/shapes; update NtMs/Kingfisher.
Normal operation after burial	• No surface AtoN	• Depiction on UKHO charts; mariner guidance to avoid damage.
Exposure/free-span (temporary hazard)	• Hazard marked until rectified	• No surface markings, NtMs/Kingfisher updates and Guard Vessels for any exposed cable between lay and protection either burial or final crossing protection, i.e. rock, or concrete mattresses).

4.2.6. In normal operation (after burial and commissioning), no surface lighting or buoyage is normally required for buried subsea CO_2 pipelines or HV cables. The infrastructure is instead depicted on charts; mariners are advised to avoid anchoring, trawling or dredging on charted cable/pipeline routes.

4.2.7. Charting/records will be provided to UKHO (and to the licensing authority per licence condition) detailing the as-built positions so charts and publications can be updated.

4.2.8. If burial is lost (e.g., scour/exposure) or a crossing/free-span forms a hazard, leaving exposed or at-risk sections, Trinity House will be consulted regarding the need to reinstate temporary AtoN (typically yellow Special Marks or Cardinal marks) and promulgate NtMs/Kingfisher bulletins until the risk is removed.

MONITORING AND MAINTENANCE

4.2.9. A risk-based approach has been taken to long-term infrastructure, cable and protection monitoring:

- Lighting and marking equipment will be inspected monthly during construction and quarterly during operation.
- Faults will be reported immediately to the MCA and NRW, with corrective action within 24 hours.
- A maintenance log will be maintained and made available upon request.

5. CONSTRUCTION PHASE

5.1. GENERAL PRINCIPLES

5.1.1. During construction, repair or when a hazard exists the following temporary marking is required:

- Mark the works/route and any hazards with IALA buoys as agreed with the GLA:
  - Special Marks (yellow) to indicate the works area/route or seabed features related to cables/pipelines. Lights (if fitted) show a yellow flashing rhythm agreed with the GLA.
  - Cardinal or Isolated Danger Marks if there is a discrete obstruction, exposure, crossing, or free-span that presents a hazard to navigation.
- Issue Notices to Mariners (local/UKHO) in advance and update them as the workfront moves; UKHO will then reflect changes in weekly Admiralty NtMs.
- Use KIS-ORCA / Kingfisher bulletins to notify fishing interests of vessel routes, timings, safety zones and locations.
- Vessel lighting/shapes: Cable- and pipelaying, trenching and diving support vessels will exhibit lights/shapes for "restricted in ability to manoeuvre" and any underwater operations per COLREGS (enforced by MCA). (See MCA navigation safety MGNs and COLREGS obligations).

5.1.2. On completion of the construction activities, after burial and commissioning, Notification within 10 days will be given to the Licensing Authority (NRW) and UKHO so charting can be updated.

DOUGLAS OFFSHORE CCS PLATFORM (UNDER CONSTRUCTION)

5.1.3. Table 5-1 defines the lighting and marking arrangements to be implemented during the construction and installation phase of the Offshore CCS Platform and associated subsea infrastructure. It ensures compliance with IALA Recommendation G1162, MCA MGNs 372, 401, 543 and 654, and the UK Standard Marking Schedule (DECC, 2011).

5.1.4. All temporary Aids to Navigation (AtoN) will be agreed in advance with the General Lighthouse Authority (Trinity House).

Table 5-1 – Lighting and marking arrangements for Douglas CCS platform during construction

Aspect	Requirement	Duration
Offshore Platform / Jacket (fixed obstruction)	• Main Lights: 2 × flashing white Morse "U" (··–) every 15 s, mounted 12–30 m above MHWS, min. 12,000 cd. • Secondary (Backup) Lights: same Morse "U", min. 1,200 cd, automatic changeover, 96 h autonomy. • Subsidiary Lights: flashing red Morse "U", ≥ 15 cd, marking horizontal extremities. • Fog Signal: Morse "U" every 30 s, audible range ≥ 2 NM, backup ≥ 0.5 NM, 96 h autonomy. • Identification Panels: black lettering ≥ 1 m on yellow background, illuminated or retro-reflective.	• From arrival and leg-deployment / foundation installation until Trinity House confirms replacement by permanent AtoN.

Aspect	Requirement	Duration
Construction Area / Exclusion Zone	• IALA Yellow Special Marks to delineate work area; Cardinal / Isolated Danger Marks where discrete obstructions exist; light characters and nominal ranges agreed with GLA.	• In place while works or hazards exist. Removed only with GLA approval.
Aviation / Tall Structures	• Red obstruction lights on highest points and crane booms per CAA CAP 437; automatically controlled.	• Continuous whenever height > 60 m or crane booms raised.
Control / Power	• Photocell-controlled operation; visibility sensor for fog signal; dual power supplies with 96-hour battery backup; autonomous restart after outages.	• Continuous during installation activities.
Promulgation	• Notices to Mariners (NtMs) will be issued at least 14 days before commencement of marine works and updated as the work front moves. • All AtoN positions and light characteristics will be submitted to the UK Hydrographic Office (UKHO) and Trinity House for charting. • Any failure of lights or fog signals will be reported immediately to Trinity House, MCA, and NRW, with corrective action within 24 hours.	• From pre-arrival through demobilisation

5.1.5. All temporary lights, marks, and buoys shall remain in place throughout the construction phase and until written confirmation from Trinity House authorises their removal.

5.1.6. Permanent operational AtoN will then be commissioned as defined in the approved Lighting and Marking Plan.

5.1.7. Throughout the installation of the new Douglas CCS Platform, the existing Douglas Complex will remain in its current operational state (although not in production), and its approved and existing lighting and marking arrangements will remain unchanged. These arrangements will not be modified and will not be impacted by the new installation.

5.1.8. During installation of the Douglas CCS Platform, lighting and marking will be provided in accordance with installation vessel requirements and applicable COLREGS and project-specific construction AtoN arrangements. Following installation, a temporary platform lighting arrangement will be established. This will include, as a minimum:

- fog signal (fog horn),
- emergency lighting,
- perimeter navigation lights,
- illuminated identification panels.

5.1.9. Where required, temporary lighting may be supplemented by installation support vessels (jack-up unit) until permanent platform systems are commissioned, which are provided and tested prior to leaving fabrication yard and ready to be engaged.

5.1.10. Upon completion of first commissioning activities, the permanent approved AtoN system for the Douglas CCS Platform will be activated and will assume full operational function.

5.1.11. Throughout the transitional phase:

- both structures will be independently marked and lit,
- lighting characteristics will be configured such that the two platforms can be clearly distinguished by mariners as two independent installations in the sea.
- final arrangements will be agreed with Trinity House as part of the AtoN approval process.

5.1.12. The Douglas CCS Platform is located within the existing 500 m safety zone associated with the Douglas Complex. Marine traffic in the area will continue to be managed in accordance with established safety zone controls and standard marine procedures. Full decommissioning which considers removal of the existing Douglas Complex is not currently planned within the near-term project timeframe and it is independent from the installation of the Douglas CCS platform. When decommissioning and full removal occurs in the future, the Douglas CCS platform will retain its approved lighting and marking arrangements and will assume standalone status with respect to navigational marking and associated safety zones.

JACK-UP BARGES

5.1.13. General Lighthouse Authority (GLA) for the area (e.g., Trinity House for England & Wales) agrees the temporary Aids to Navigation (AtoN) scheme for each jack-up and worksite, applying IALA Recommendation G1162 (marking of man-made offshore structures).

5.1.14. MCA guidance (esp. OREI/SAR material) and CAA CAP 437 cover helicopter/aviation obstruction lighting on tall offshore structures (including jack-ups when elevated).

5.1.15. When the jack-up is underway or being towed, it will be treated as a vessel. It will Exhibit COLREGS lights/shapes appropriate to the status (underway, towing, restricted in ability to manoeuvre, etc.). The MCA will enforce these requirements. The jack-up operator will keep a proper VHF/AIS watch and promulgate movements via NtMs as required.

5.1.16. When the jack-up is on site with legs deployed / elevated (i.e., acting as a fixed obstruction), it will be treated as a temporary fixed structure under the GLA's scheme (case-by-case, risk-based) in line with IALA G1162, the requirements of which are summarised in Table 5-2.

Table 5-2 – Lighting and marking requirements of jack-up during construction

Aspect	Requirement	Duration
Underway/tow	• COLREGS lights/shapes; AIS/VHF; NtMs as required	• While in transit/tow
Elevated hull/legs	• Main Navigation Lights: Flashing white Morse "U" (••–) every 15 s mounted 12–30 m above MHWS (min 12 000 cd). • Secondary (Backup) Lights: Same Morse "U" pattern, min 1 200 cd with automatic change-over and ≥ 96 h autonomy. • Subsidiary Lights: Flashing red Morse "U" (••–) every 15 s to mark horizontal extremities (min 15 cd). • Fog Signal: Morse "U" sound every 30 s; range ≥ 2 NM (backup ≥ 0.5 NM). Auto-activated in visibility ≤ 2 NM.	• While jack-up is elevated with legs deployed until demobilisation and GLA approval for AtoN removal.

Aspect	Requirement	Duration
	• Identification Panels: Black lettering ≥ 1 m on yellow background (illuminated or retro-reflective).	
Buoyage / Work Area	• IALA Yellow Special Marks positioned to delineate the jack-up safety/exclusion zone. • Where required, Cardinal Marks or Isolated Danger Marks placed at hazard points or anchors/spud cans. • Light Colour: Yellow; Flash Character: [Insert GLA-agreed character]; Nominal Range: [Insert GLA-agreed range e.g. 2 NM / 3 NM / 5 NM].	• From arrival and leg deployment until jack-up removal and GLA authorisation to recover buoys.
Aviation/helideck (if fitted / legs exceed obstacle thresholds):	• Red obstruction lights on the highest points (leg tips/crane booms) per CAP 437; medium-intensity patterns/locations as required. Additional lighting/marking may be required during crane operations or when heights change.	• Continuous whenever jack-up height > 60 m above sea level or cranes raised.
Worksite hazards	• IALA buoyage (Special/Cardinal/Isolated Danger) to mark exclusion zones/anchors/spudcans if risk warrants	• As directed by GLA; remove on GLA approval
Control/availability:	• Photocell activation for lights / visibility sensor for fog signal; dual power supply with ≥ 96 h battery autonomy; nightly inspection by Marine Coordinator (guard vessel to report status). • Temporary buoys/lights are removed only with GLA agreement once the construction hazard has ceased.	• From pre-arrival through demobilisation
Promulgation	• Local & Admiralty NtMs; updates for moves/failures; coordinate with Trinity House.; UKHO will reflect these in Admiralty NtMs.	• From pre-arrival through demobilisation

PIPELINE SPOOL, CABLE LAY, CROSSING AND PROTECTION VESSELS

5.1.17. Table 5-3 defines the lighting and marking arrangements to be implemented during construction and installation for (a) offshore cable lay, (b) concrete mattress installation, and (c) rock protection/rock placement. It follows IALA G1162, Trinity House (GLA) practice, MCA MGN 654, COLREGS, and charting/notification rules. Exact AtoN (Aids to Navigation) characteristics are agreed case-by-case with the GLA (Trinity House).

5.1.18. All temporary Aids to Navigation (AtoN) will be established, operated, and removed in accordance with:

- **IALA Recommendation G1162:** The Marking of Man-Made Offshore Structures
- **MCA MGNs 372, 543, and 654 (M+F):** Navigational Safety and AtoN Requirements
- **COLREGS 1972 (Rule 27):** Vessels Restricted in Ability to Manoeuvre / Underwater Operations
- **Trinity House (GLA) Guidance:** Temporary Marking of Offshore Construction Works
- Marine Licence **CML2365, Condition 3.30**.

5.1.19. On completion of the construction activities, after burial and commissioning, **Notification within 10 days** will be given to the **Licensing Authority (NRW) and UKHO** so charting can be updated.

Table 5-3 – Lighting and marking requirements for cable and protection installation vessels during construction

Aspect	Requirement	Duration
Cable lay and burial. Pipeline Spool lay.	• Cable lay vessels to display COLREGS Rule 27 lights and shapes for "Restricted in Ability to Manoeuvre". • Anchor pennant buoys and midline buoys to be lit.	• From commencement of cable lay until the workfront has passed, cables are buried and verified safe, and the GLA authorises removal of temporary AtoN.
Concrete mattress installation	• Vessels to display COLREGS Rule 27 lights and shapes. • Notice to Mariners regarding this construction activity.	• During placement and while mattresses remain exposed above seabed or unverified by post-installation survey; removed only after the hazard is cleared and approved by the GLA.
Rock protection / rock placement works	• Rock-dumping and fall-pipe vessels to show COLREGS lights/shapes for underwater operations. • Notice to Mariners regarding this construction activity. Update to be given regarding the navigation depth after the activity (survey results).	• From start of rock placement until surveys confirm the area presents no obstruction to navigation or fishing activity, and GLA approval for removal is received.
Vessels engaged in subsea works	• Display required day shapes (ball–diamond–ball) and lights (red–white–red) per COLREGS Rule 27. • Maintain 500m safety zone around the vessel.	• While engaged in any laying, burial, or placement activity.
Control and power	• All buoys fitted with automatic photocell-controlled lighting. • Battery autonomy ≥ 96 hours; maintained to GLA Category 3 availability (97%).	• Continuous during works.
Notifications and charting	• Notices to Mariners (NtMs): Issued at least 14 days before commencement of works and updated weekly as operations progress. Include coordinates, AtoN positions, vessel activities, and contact details. • UKHO Notification: As-laid and as-built coordinates of cables, mattresses, and rock protection to be submitted to the UK Hydrographic Office for charting updates within 10 days of completion. • Kingfisher / KIS-ORCA Bulletins: Details of vessel routes, timings, safety zones, and cable positions to be promulgated via Seafish Kingfisher Bulletins for awareness of the commercial fishing industry. • Defects / Outages: Any failure or removal of AtoN will be reported immediately to Trinity House, MCA, and NRW, and rectified within 24 hours.	• From pre-arrival through demobilisation

5.1.20. All temporary lights, buoys, and other marks shall remain in place throughout construction and installation activities until:

- Post-installation surveys confirm the seabed is safe and free of navigational hazards; and

5.1.21. Permanent AtoN, where required, will then be established under the approved Lighting and Marking Plan.

EXPOSED CABLES AND PIPELINES

5.1.22. Exposed/wet-stored cables and spools should be treated as temporary hazards: Guard Vessels for any exposed cable between lay and protection (either burial or final crossing protection, i.e. rock or concrete mattresses). Long-term wet stored cable shall be guarded until stabilised by either shallow burial or rock bags. NtM to be issued.

Table 5-4 – Lighting and marking arrangements for exposed cables and pipelines during construction

Aspect	Requirement	Duration
Exposed cable sections (pre-burial, repair, or awaiting protection)	• NtM and Guard Vessel.	• From first exposure (or arrival on site) until the cable is buried/protected and verified safe by survey, NtMs stay in force until withdrawn/updated.
Pipeline spools exposed or wet-stored on the seabed (awaiting tie-in)	• **Wet-storage area / tie-in box:** Mark with Yellow Special Marks; where a spool end or stand presents a discrete hazard, add Cardinal/Isolated Danger marks positioned to cover approach bearings. Use yellow lights with GLA-agreed flash character/range; fit retro-reflective banding and (where appropriate) radar reflectors. • **If near routes/fishing grounds:** AIS AtoN and a wider advisory area in NtMs (per MGN 654 risk approach).	• From placement on seabed (wet-store) until: (i) the spool is tied-in and any protrusions removed/guarded, or (ii) surveys confirm no hazard to navigation/ fishing gear, and GLA confirms marks can be lifted.
Minimum specifications to confirm with the GLA	• **Buoyage:** Yellow body Special Marks for works/areas; Cardinal/Isolated Danger at discrete hazards. Light: yellow; flash character & nominal range to be GLA-agreed (typ. 2–5 NM on primary buoys in trafficked waters). • **Power/control:** Photocell switching; ≥96 h battery autonomy for lighted marks (aligns with UK Standard Marking Schedule's resilience principle for offshore AtoN). • **Availability/inspection:** Meet GLA service expectations; maintain inspection/defect logs; report any outages immediately (and in NtMs if significant). • **Vessels:** Always show Rule 27 signals (red-white-red at night; ball-diamond-ball by day), plus safe-side/obstruction-side lights if relevant; continuous AIS/VHF watch.	• Not tied to any specific duration
Notifications & records	• **NtMs:** Issue ≥14 days before works; update as the workfront moves and when AtoN are established/altered/removed; include coordinates, light characters & ranges, and contacts. • **UKHO Hydrographic Notes:** Send as-laid and as-built positions promptly for chart updates (H102/H102A forms). • **Outages/defects:** Immediate notice to Trinity House/MCA and rectify without delay; keep auditable records (as per UK practice/Standard Marking Schedule).	• Not tied to any specific duration

6. NOTIFICATION PROCEDURES

6.1. PRE-INSTALLATION PROMULGATION OF INFORMATION

SUMMARY OF NOTIFICATION PROCEDURES

6.1.1. This section outlines the procedure for distributing and issuing Notices to Mariners (NtMs) and related stakeholder notifications in accordance with the requirements of Marine Licence CML2365 and associated licence conditions. The process ensures that all relevant marine users are adequately informed of activities that may affect navigational safety during the construction, commissioning, and operational phases of the Project.

LOCAL NOTICES TO MARINERS

6.1.2. Local Notices to Mariners (LNtM) will be issued to a defined list of local and national stakeholders prior to and throughout any licensable marine activity which may influence navigation.

6.1.3. In accordance with Marine Licence CML2365 Condition 3.1:

- LNtMs will be circulated at least 14 days prior to the commencement of the authorised works and periodically during construction.
- Recipients will include, but are not limited to, the United Kingdom Hydrographic Office (UKHO), His Majesty's Coastguard (HMCG), fishermen's organisations, and other identified marine users.
- The stakeholder distribution list will be maintained and updated regularly to ensure accuracy and completeness.
- During construction, further notices will be issued to report progress and any activities that may pose a risk to navigation, including faults to navigational aids.
- Upon completion and commissioning, all relevant stakeholders will be notified via LNtMs, and additional notices will be issued for any planned or unplanned maintenance works beyond routine operations.

6.1.4. In accordance with Condition 3.6.3, the undertaker will notify the UKHO within 10 days of completion of the authorised project (or any part thereof) to enable nautical chart updates. Copies of all NtMs will be provided to NRW and the MCA within five days of issue.

KINGFISHER BULLETINS AND KIS-ORCA NOTIFICATIONS

6.1.5. In compliance with the deemed Marine Licence requirements, the Kingfisher Information Service – Offshore Renewable & Cable Awareness (KIS-ORCA) will be notified at least 14 days before the commencement of marine works, with details of vessel routes, timings, and locations.

6.1.6. The Marine Coordinator (MC) will ensure that the progress of construction and any relevant navigational information is disseminated via the Kingfisher fortnightly bulletins, which will include:

- Project contact details and offshore activity schedules;

- Navigational safety procedures and advisory safety zones; and
- Relevant drawings or spatial data relating to marine activities.

6.2. POST-INSTALLATION

6.2.1. Following construction and commissioning, and during the operational phase, Kingfisher bulletins will continue to be published online to inform the commercial fishing industry of any significant or non-routine maintenance activities associated with the Project.

6.2.2. Post-installation, final as-built coordinates and descriptions will be provided to:

- UKHO (for chart updates).
- Trinity House Lighthouse Service.
- MCA Navigation Safety Branch.
- NRW Compliance Officer.

6.3. ATON CASUALTY AND FAILURE RESPONSE

GENERAL

6.3.1. A casualty is defined as any significant degradation in the performance of an Aid to Navigation (AtoN), including failure, outage, damage, displacement, or reduction in performance below its published characteristics.

6.3.2. Liverpool Bay CCS Limited, as the responsible authority for AtoN provision, shall ensure that procedures are in place to respond to AtoN casualties in accordance with Trinity House requirements and applicable IALA guidance.

6.3.3. The objective of the casualty response procedure is to:

- minimise the risk to navigation;
- restore AtoN to normal operational condition within acceptable timeframes; and
- ensure timely communication with relevant authorities and marine users.

6.3.4. This approach aligns with Trinity House requirements for maintaining AtoN availability and casualty response performance .

DETECTION AND REPORTING OF CASUALTIES

6.3.5. AtoN casualties may be identified through:

- routine inspections and maintenance activities;
- remote monitoring systems (where installed);
- vessel or contractor reports; and
- third-party notifications (e.g. mariners, fisheries, authorities).

6.3.6. All AtoN failures or deficiencies shall be reported immediately to the Marine Coordinator.

6.3.7. The Marine Coordinator shall:

- log the incident;
- initiate a preliminary risk assessment; and
- assign a casualty response priority.

CASUALTY RESPONSE PRIORITISATION

6.3.8. Casualties shall be prioritised based on their impact on navigational safety, in line with Trinity House guidance on casualty response priorities.

6.3.9. Typical priority levels are:

- Priority 1 (Critical): Immediate hazard to navigation (e.g. complete failure of primary light on platform).
- Priority 2 (Urgent): Significant degradation requiring rapid response.
- Priority 3: Response within 24 hours.
- Priority 4: Response within 48 hours.
- Priority 5: Planned maintenance response.

6.3.10. Higher priority events will require immediate mobilisation and implementation of interim mitigation measures.

6.3.11. This prioritisation approach is consistent with Trinity House casualty response principles .

IMMEDIATE ACTIONS AND RISK MITIGATION

6.3.12. Upon identification of an AtoN casualty, the following actions shall be undertaken:

- Risk Assessment:
  - Evaluate impact on navigation safety.
  - Identify affected marine users and traffic density.
- Interim Mitigation Measures (as required):
  - Deployment of temporary AtoN (e.g. lighted buoys).
  - Use of guard vessels.
  - Establishment of advisory or exclusion zones.
- Operational Controls:
  - Increased monitoring of the affected area.
  - Communication with vessels operating in the vicinity.

NOTIFICATION AND COMMUNICATION

6.3.13. The following notifications shall be made as soon as reasonably practicable:

- Trinity House:
  - All relevant AtoN casualties shall be reported via the Local AtoN Reporting System (LARS), once the system is established.
- Maritime and Coastguard Agency (MCA):
  - Notification of significant failures or hazards.
- Natural Resources Wales (NRW):

  - Notification in accordance with Marine Licence requirements.
- UK Hydrographic Office (UKHO):
  - Notification where the casualty presents a navigational hazard requiring dissemination of a Navigation Warning.
- Notices to Mariners (NtMs):
  - Issued where required to inform mariners of:
    - AtoN failures;
    - temporary hazards; and
    - interim control measures.
- Kingfisher / KIS-ORCA Bulletins:
  - Issued where relevant to inform fishing activity.

6.3.14. This ensures compliance with requirements for timely dissemination of navigational safety information.

RESTORATION OF ATON

6.3.15. The objective shall be to restore the AtoN to its published characteristics ("Normal Conditions Restored") as soon as reasonably practicable.

6.3.16. Response actions include:

- mobilisation of maintenance personnel and equipment;
- repair or replacement of failed components; and
- verification testing following reinstatement.

6.3.17. Response time will depend on:

- priority classification;
- weather and access conditions; and
- availability of resources.

RECORDS AND REPORTING

6.3.18. Liverpool Bay CCS Limited shall maintain records of:

- all AtoN failures and defects;
- response times (Mean Time to Restore);
- corrective actions taken; and
- availability performance.

6.3.19. These records shall be:

- available for audit by Trinity House; and
- used to monitor AtoN performance and compliance.

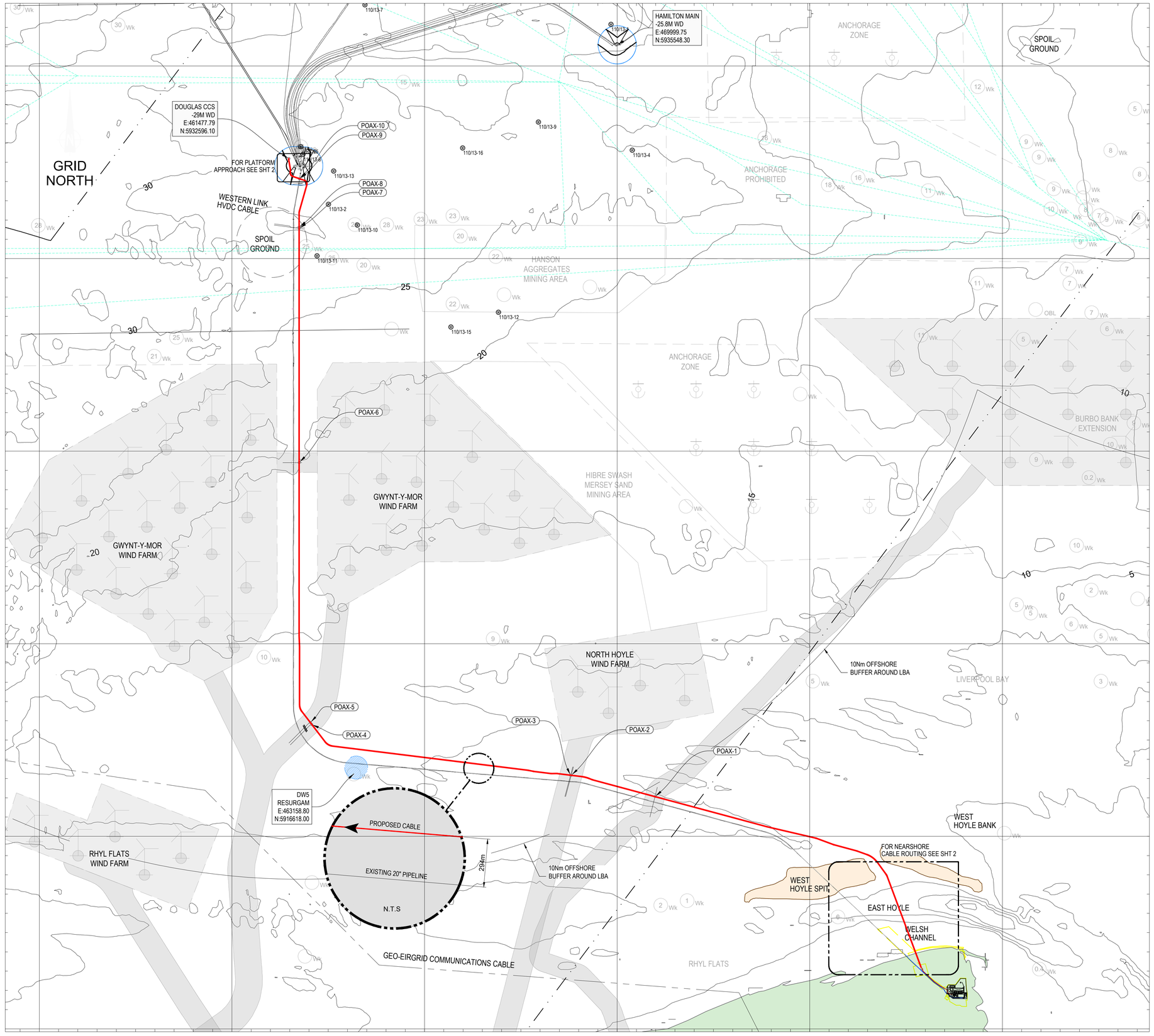
6.3.20. This aligns with Trinity House requirements for maintaining casualty response records and availability statistics.

REVIEW AND CONTINUOUS IMPROVEMENT

6.3.21. Casualty response procedures shall be reviewed periodically and following any significant incident to ensure:

- effectiveness of response;
- compliance with regulatory requirements; and
- continuous improvement of AtoN reliability and availability.

APPENDIX A: PROJECT LAYOUT PLAN (CHART WITH COORDINATES AND ZONES).



REFERENCE DOCUMENTS

NUMBER	TITLE

KEY PLAN

GENERAL NOTES

1. ALL DIMENSIONS AND COORDINATES ARE IN METRES UNLESS NOTED OTHERWISE.
2. GLOBAL COORDINATE REFERENCE SYSTEM: European Datum 1950 UTM Zone 30N (EPSG: 23030)

PROJECTED COORDINATE SYSTEM	European Datum 1950 UTM Zone 30N
PROJECTION	TRANSVERSE MERCATOR
LINEAR UNIT	METERS (1.0)
FALSE EASTING	500000.0
FALSE NORTHING	0.0
CENTRAL MERIDIAN	-3.0
SCALE FACTOR	0.9996
LATITUDE OF ORIGIN	0.0
GEOGRAPHIC COORDINATE SYSTEM	European Datum 1950
ANGULAR UNIT	DEGREE (0.0174532925199433)
PRIME MERIDIAN	GREENWICH (0.0)
DATUM	European 1950
SPHEROID	International 1924
SEMIMAJOR AXIS	6378388.0
SEMIMINOR AXIS	6356911.946127946
INVERSE FLATTENING	297

3. CABLE ROUTING AND CROSSINGS ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON SURVEY INFORMATION.
4. WATER DEPTHS AND SHIPWRECKS (Wk) ARE GIVEN FOR INFORMATION ONLY.
5. LAYOUT IS COMPILED FROM VARIOUS SOURCES AND THEREFORE IS SUBJECT TO CONFIRMATION.
6. PRELIMINARY ROUTING BASED ON EXISTING SEABED ARCHITECTURE AROUND EACH PLATFORM.
7. CABLE APPROACH TO EACH PLATFORM TO BE CONFIRMED.
8. FIELD LAYOUT BASED ON THE PRELIMINARY LOCATION OF NEW J-TUBES AT EXISTING PLATFORMS (HAMILTON MAIN, HAMILTON NORTH, LENNOX) AND DOUGLAS CCS PLATFORM.
9. FINAL LOCATION OF J-TUBES AT DOUGLAS CCS PLATFORM TO BE CONFIRMED.
10. DRILLING JACK-UP CORRIDOR AND FOOTPRINT AROUND PLATFORMS TO BE CONFIRMED.
11. FIELD LAYOUT TO BE REVIEWED AGAINST THE DECOMMISSIONING SCOPE FOR THE PROJECT.

LEGEND

- PROPOSED BOSKALIS CABLE ROUTE (POINT OF AYR - DOUGLAS CCS)
- MARINE TRAFFIC (SHIPPING LANES)
- EXISTING POWER CABLES
- EXISTING PIPELINES / UMBILICALS / POWER CABLES
- AREA LIMITS
- XX Wk — SHIPWRECK LOCATION
- 110/XX-XX — ABANDONED WELL LOCATION AND IDENT
- WIND TURBINE (NOT INDICATIVE OF LOCATION)
- OFFSHORE WIND FARM POWER CABLE CORRIDORS
- RESURGAM EXCLUSION ZONE

Validity Status	Rev. Number	Date	Description	Prepared	Checked	Approved	Approved Eni UK
CD-FE	00	10.02.2026	ISSUED FOR INFORMATION	R.D	M.R	S.G	

Revision index

Company logo and business name: eni uk / eni progetti

Company Document ID: 102700DSDD0014I

Job. N. JA0614

Facility and Sub Facility Name	Project Name	Scale	Sheet of Sheets
POINT OF AYR GAS PLANT - GENERAL	LBA CCS Transport and Storage	150k @A1	1 / 2

Document Title

NEW OFFSHORE POWER CABLE AND FIBRE OPTIC FIELD LAYOUT (OFFSHORE SECTION)

Supersedes N.

Superseded by N.

Plant Area	Plant Unit
N/A	N/A

Software AutoCad

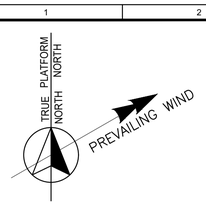
Filename.102700DSDD0014I _CDFE00_01_02.DWG

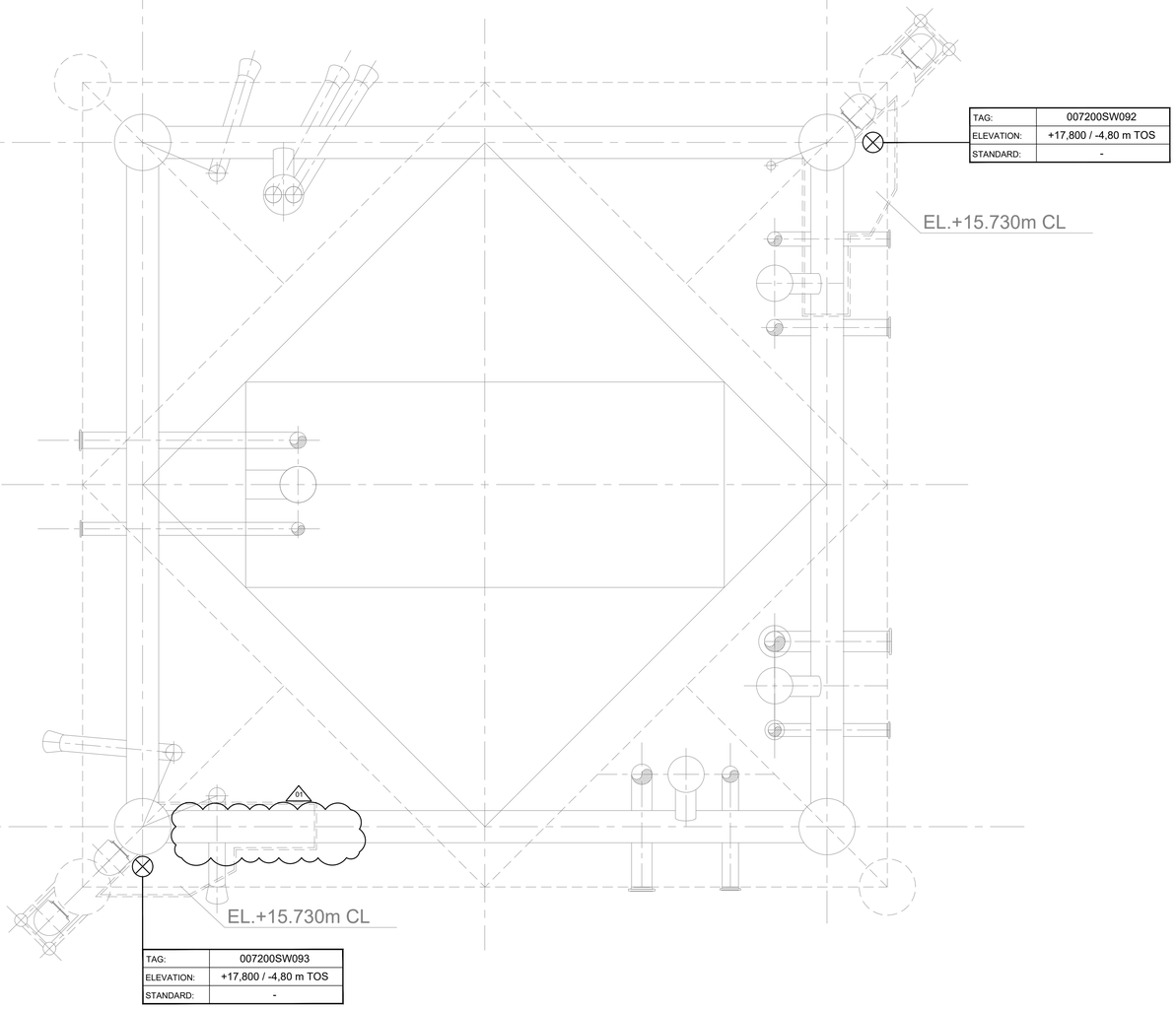
A1 (841 x 594)

APPENDIX B: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUT PLANS

J TUBE, RISER AND PIPE SUPPORT

EL.+22.000m CL





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ELEVATION:	+17,800 / -4,80 m TOS
STANDARD:	-

TAG:	007200SW093
ELEVATION:	+17,800 / -4,80 m TOS
STANDARD:	-

REFERENCE DOCUMENTS

NUMBER	TITLE
105600DTDG65004	DOUGLAS CCS - PLOT PLAN - J TUBE, RISER AND PIPE SUPPORT LEVEL +22.000 CL
105600DGEO15104	DOUGLAS CCS - EQUIPMENT LIST
105600DEDD45109	DOUGLAS CCS - ELECTRICAL EQUIP. LAYOUT-J TUBE, RISER AND PIPE SUPPORT LEV. +22.000 CL
105600DEFU45141	DOUGLAS CCS - ELECTRICAL LEGENDS AND SYMBOLS OFFSHORE SYSTEMS
105600DECE45001	DOUGLAS CCS - ELECTRICAL LOAD LIST AND BALANCE
105600DEDQ45019	DOUGLAS CCS - ELECTRICAL TYPICAL INSTALLATION DETAILS - CABLE ROUTES SYSTEM
105600DEST45067	DOUGLAS CCS - TECHNICAL SPECIFICATION FOR NAV. AID AND HELIDECK LIGHTING SYSTEM
105600DEGA45068	DOUGLAS CCS - TECHNICAL DATA SHEET (TDS) FOR NAV. AID AND HELIDECK LIGHTING SYSTEM

GENERAL NOTES

NOTES:

1. This document is valid only for positioning of Navigation Aid and Helideck light system component.
2. The typical installation of equipments will be defined in the next revision.
3. The installation elevation will be confirmed in the next revision according to vendor information and typical installation detail..
4. "Standard" indicates the typical installation of the individual item. This indication will be updated in the next revision following the supports study.
5. The item 007200EC003 Solar Power skid NAVAID temporary system (for Jacket) also includes temporary main Fog-Horn and main white signal light.
6. 007200EZ007 General photocell to activate the NAVAID system
7. 007200EZ008 Photocell to activate the HELIDECK lighting system
8. The quantity and type of Aeronautical Obstruction Light shall be in accordance with CAP437 and will be confirmed by Vendor.
9. Before each TAG, the facility code 1056 must be taken into account.

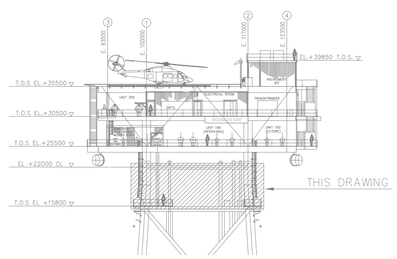
HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

LEGEND:

SYMBOL	QTY	DESCRIPTION
⊗	2	BOAT LANDING STATUS LIGHT

KEY PLAN



0 2m 4m 6m 8m 10m

SCALE 1:100

EX-DE	01	16-07-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO	D. ALIANO	A. FUSCO
EX-DE	00	12-03-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO		
Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval

Revision index

Company logo and business name: liverpool bay ccs

LCI Activity Code: GB202400003

Contract Code: 000593

Company Document ID: 105600DEDD45124

Job. N. JA1130

Contractor logo and business name: ROSETTI MARINO

Contractor Document ID: 124A50-DDL-EL-DL-45124

Contractor N. 4600044564

Vendor logo and business name

Vendor Document ID: N.A.

Purchase Order N.

Facility and Sub Facility Description: DOUGLAS CCS / Douglas CCS General

Project and SoW Description: LBA CCS PROJECT / WP2 EPC

Scale: 1 : 75

Sheet of Sheets: 01 of 06

Document Title: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUTS

Supersedes N.

Superseded by N.

Plant Area: 00

Plant Unit: 720

Software: Autocad

File Name 105600DEDD45124_EXDE01_06.dwg

CELLAR DECK

EL.+25.500m T.O.S.

TRUE NORTH
PLATFORM NORTH
PREVAILING WIND

TAG:	007200SW009
ELEVATION:	+27.500 / +2,00 m TOS
STANDARD:	-

TAG:	007200EZ008 (Note 7)
ELEVATION:	+28.000 / 2,50 m TOS
STANDARD:	-

TAG:	007200EZ007 (Note 6)
ELEVATION:	+27.500 / 2,00 m TOS
STANDARD:	-

TAG:	007200EZ006
ELEVATION:	+27.500 / +2,00 m TOS
STANDARD:	-

TAG:	007200SW008
ELEVATION:	+27.000 / +1,50 m TOS
STANDARD:	-

RAFT
LADDER TO MEZZANINE DECK
L.O.S DISH
LIVING/SLEEP ROOM
TEMPORARY SAFE REFUGE (MUSTER POINT)
006600GE007
'J' TUBES
LADDER TO SEA LEVEL
WATER TOTE TANK 2
UNIT 190 (FUTURE, STAGE 4)
UNIT 190 (OPERATING)
FUTURE TRAP (STAGE 4)
FIBRE OPTIC CABLE TERMINATION BOX
FOR SUBMARINE POWER CABLE FROM PoA 009100EJ001
LADDER TO THE SEA LEVEL
UP
RAFT
001900VL005
001900VL102
001900VR001
001900VL001
001900VL003
001900VL002
001900VL103
001900VL101

REFERENCE DOCUMENTS

NUMBER	TITLE
105600DTDG65006	DOUGLAS CCS - PLOT PLAN MEZZANINE DECK LEVEL +30.500 T.O.S.
105600DGEO15104	DOUGLAS CCS - EQUIPMENT LIST
105600DEDD45110	DOUGLAS CCS - ELECTRICAL EQUIPMENT LAYOUT CELLAR DECK +25.500 T.O.S.
105600DECE45001	DOUGLAS CCS - ELECTRICAL LOAD LIST AND BALANCE
105600DEDQ45019	DOUGLAS CCS - ELECTRICAL TYPICAL INSTALLATION DETAILS - CABLE ROUTES SYSTEM
105600DEFU45141	DOUGLAS CCS - ELECTRICAL LEGENDS AND SYMBOLS OFFSHORE SYSTEMS
105600DEST45067	DOUGLAS CCS - TECHNICAL SPECIFICATION FOR NAV. AID AND HELIDECK LIGHTING SYSTEM
105600DEGA45068	DOUGLAS CCS - TECHNICAL DATA SHEET (TDS) FOR NAV. AID AND HELIDECK LIGHTING SYSTEM

GENERAL NOTES

NOTES:

1. This document is valid only for positioning of Navigation Aid and Helideck light system component.
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8. The quantity and type of Aeronautical Obstruction Light shall be in accordance with CAP437 and will be confirmed by Vendor.
9. Before each TAG, the facility code 1056 must be taken into account.

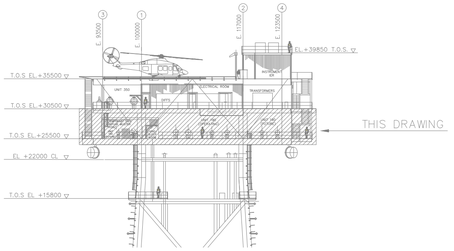
HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

LEGEND:

SYMBOL	QTY	DESCRIPTION
	1	VISIBILITY METER
	2	MAIN & SECONDARY WHITE LANTERNS
	2	PHOTOCHELL

KEY PLAN



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SCALE 1:100

Revision index								
Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval
EX-DE	01	16-07-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO	D. ALIANO	A. FUSCO
EX-DE	00	12-03-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO		

Company logo and business name: liverpool bay ccs
LCI Activity Code: GB202400003
Contract Code: 000593
Company Document ID: 105600DEDD45124
Job. N. JA1130

Contractor logo and business name: ROSETTI MARINO
Contractor Document ID: 124A50-DDL-EL-DL-45124
Contractor N. 4600044564

Vendor logo and business name
Vendor Document ID: N.A.
Purchase Order N.

Facility and Sub Facility Description: DOUGLAS CCS / Douglas CCS General
Project and SoW Description: LBA CCS PROJECT / WP2 EPC
Scale: 1 : 75
Sheet of Sheets: 02 of 06

Document Title: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUTS

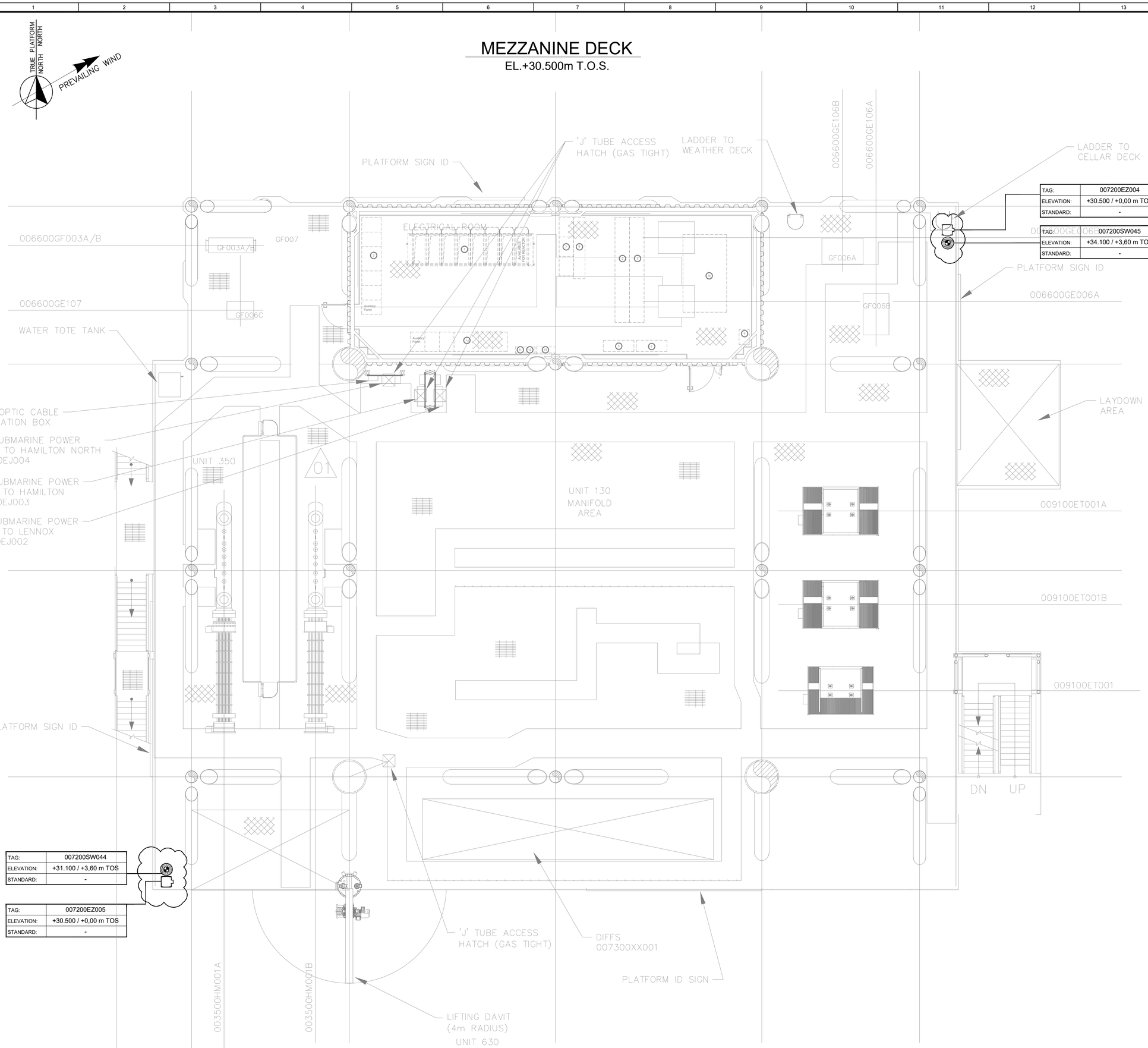
Supersedes N.
Superseded by N.
Plant Area: 00
Plant Unit: 720

Software: Autocad

File Name 105600DEDD45124_EXDE01_06.dwg

MEZZANINE DECK

EL.+30.500m T.O.S.



REFERENCE DOCUMENTS

NUMBER	TITLE
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105600DECE45001	DOUGLAS CCS - ELECTRICAL LOAD LIST AND BALANCE
105600DEDQ45019	DOUGLAS CCS - ELECTRICAL TYPICAL INSTALLATION DETAILS - CABLE ROUTES SYSTEM
105600DEFU45141	DOUGLAS CCS - ELECTRICAL LEGENDS AND SYMBOLS OFFSHORE SYSTEMS
105600DEST45067	DOUGLAS CCS - TECHNICAL SPECIFICATION FOR NAV. AID AND HELIDECK LIGHTING SYSTEM
105600DEGA45068	DOUGLAS CCS - TECHNICAL DATA SHEET (TDS) FOR NAV. AID AND HELIDECK LIGHTING SYSTEM

GENERAL NOTES

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8. The quantity and type of Aeronautical Obstruction Light shall be in accordance with CAP437 and will be confirmed by Vendor.
9. Before each TAG, the facility code 1056 must be taken into account.

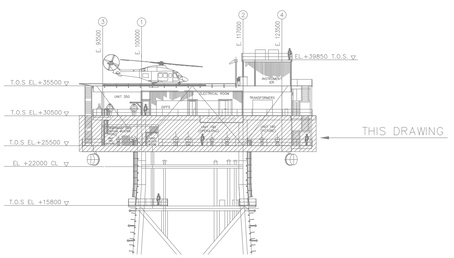
HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

LEGEND:

SYMBOL	QTY	DESCRIPTION
	2	FOGHORN
	2	RED SUBSIDIARY LANTERN

KEY PLAN



0 2m 4m 6m 8m 10m

SCALE 1:100

Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval
EX-DE	01	16-07-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO	D. ALIANO	A. FUSCO
EX-DE	00	12-03-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO		

Revision index

Company logo and business name: liverpool bay ccs

LCI Activity Code: GB202400003

Contract Code: 000593

Company Document ID: 105600DEDD45124

Job. N. JA1130

Contractor logo and business name: ROSETTI MARINO

Contractor Document ID: 124A50-DDL-EL-DL-45124

Contractor N. 4600044564

Vendor logo and business name

Vendor Document ID: N.A.

Purchase Order N.

Facility and Sub Facility Description: DOUGLAS CCS / Douglas CCS General

Project and SoW Description: LBA CCS PROJECT / WP2 EPC

Scale: 1 : 75

Sheet of Sheets: 03 of 06

Document Title: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUTS

Supersedes N.

Superseded by N.

Plant Area: 00

Plant Unit: 720

Software: Autocad

File Name 105600DEDD45124_EXDE01_06.dwg

WEATHER DECK - HELIDECK

EL.+35.500m T.O.S.

TRUE NORTH
PLATFORM NORTH
PREVAILING WIND

TAG:	007200SW039
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200EJ003
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW010
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW011
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW012
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW013
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW014
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW015
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW016
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW017
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW002
ELEVATION:	+38.900 /+0,00 m TOS
STANDARD:	-

TAG:	007200SW018
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW019
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW004
ELEVATION:	+38.900 /+0,00 m TOS
STANDARD:	-

TAG:	007200SW020
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW021
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW022
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW023
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW024
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW025
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW026
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW027
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW006
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200EZ003
ELEVATION:	+38.000 / +2.50 m TOS
STANDARD:	-

TAG:	007200SW005
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW038
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW037
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200EZ002
ELEVATION:	+38.000 / +2,50 m TOS
STANDARD:	-

TAG:	007200SW046/063
ELEVATION:	+35.500 / +0,00 m TOS
STANDARD:	-

TAG:	007200EJ001
ELEVATION:	+35.500 /- 0,00 m TOS
STANDARD:	-

TAG:	007200SW064/091
ELEVATION:	+38.900 / +0,00 m TOS
STANDARD:	-

TAG:	007200EJ002
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW001
ELEVATION:	+38.900 /+0,00 m TOS
STANDARD:	-

TAG:	007200SW036
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW035
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW034
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW033
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW032
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW003
ELEVATION:	+35.500 /+0,00 m TOS
STANDARD:	-

TAG:	007200SW031
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW003
ELEVATION:	+38.900 /+4,30 m TOS
STANDARD:	-

TAG:	007200EV001
ELEVATION:	+35.500 / +0,00 m TOS
STANDARD:	-

TAG:	007200EC002
ELEVATION:	+36.300 / +0,80 m TOS
STANDARD:	-

TAG:	007200EZ001
ELEVATION:	+36.900 / +1,40 m TOS
STANDARD:	-

TAG:	007200EB001
ELEVATION:	+35.500 / +0,00 m TOS
STANDARD:	-

TAG:	007200EC004
ELEVATION:	+35.900 / +0,40 m TOS
STANDARD:	-

TAG:	007200EC001
ELEVATION:	+36.700 /1,20 m TOS
STANDARD:	-

TAG:	007200SW030
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW029
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

TAG:	007200SW028
ELEVATION:	+35.500 /0,00 m TOS
STANDARD:	-

REFERENCE DOCUMENTS

NUMBER	TITLE
105600DTDG65007	DOUGLAS CCS - PLOT PLAN WEATHER DECK - HELIDECK LEVEL +35.500 T.O.S.
105600DGEO15104	DOUGLAS CCS - EQUIPMENT LIST
105600DEDD45112	DOUGLAS CCS - ELECTRICAL EQUIPMENT LAYOUT - WEATHER DECK - HELIDECK +35.500 T.O.S.
105600DECE45001	DOUGLAS CCS - ELECTRICAL LOAD LIST AND BALANCE
105600DEDQ45019	DOUGLAS CCS - ELECTRICAL TYPICAL INSTALLATION DETAILS - CABLE ROUTES SYSTEM
105600DEFU45141	DOUGLAS CCS - ELECTRICAL LEGENDS AND SYMBOLS OFFSHORE SYSTEMS
105600DEST45067	DOUGLAS CCS - TECHNICAL SPECIFICATION FOR NAV. AID AND HELIDECK LIGHTING SYSTEM
105600DEGA45068	DOUGLAS CCS - TECHNICAL DATA SHEET (TDS) FOR NAV. AID AND HELIDECK LIGHTING SYSTEM

GENERAL NOTES

NOTES:

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2. The typical installation of equipments will be defined in the next revision.
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4. "Standard" indicates the typical installation of the individual item. This indication will be updated in the next revision following the supports study.
5. The Item 007200EC003 Solar Power skid NAVAID temporary system (for Jacket) also includes temporary main Fog-Horn and main white signal light.
6. 007200EZ007 General photocell to activate the NAVAID system
7. 007200EZ008 Photocell to activate the HELIDECK lighting system
8. The quantity and type of Aeronautical Obstruction Light shall be in accordance with CAP437 and will be confirmed by Vendor.
9. Before each TAG, the facility code 1056 must be taken into account.

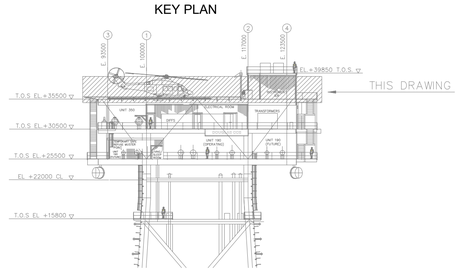
HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

LEGEND:

SYMBOL	QTY	DESCRIPTION
	30	HELIDECK GREEN PERIMETER LIGHT
	4	HELIDECK FLOODLIGHT
	2	HELIDECK STATUS LIGHT
	28	HELIDECK - LIT HELIDECK IDENTIFICATION "H" MARKING
	18	HELIDECK - LIT TOUCHDOWN/POSITIONING MARKING CIRCLE
	1	MAIN NAV AIDS CONTROL PANEL (NCCP) / BATTERY CHARGER
	1	HELIDECK LIGHTING AND STATUS LIGHTS SYSTEM CONTROL PANEL
	2	ILLUMINATED WINDSOCK
	1	JUNCTION BOX FOR TD/PM CIRCLE-H LIGHTING
	2	JUNCTION BOX FOR FLOODLIGHT CONNECTIONS
	1	TEMPORARY SOLAR POWER SKID
	1	BATTERY CIRCUIT BREAKER BOX
	1	BATTERY BANK BOX
	1	BOAT LANDING STATUS LIGHTING CONTROL PANEL
		CABLE WAY FOR SPECIAL CABLE SUPPLIED BY VENDOR

KEY PLAN



0 2m 4m 6m 8m 10m

SCALE 1:100

Rev.	Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval
EX-DE		01	16-07-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO	D. ALIANO	A. FUSCO
EX-DE		00	12-03-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO		

Revision index

Company logo and business name: liverpool bay ccs

LCI Activity Code: GB202400003
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Company Document ID: 105600DEDD45124
Job. N. JA1130

Contractor logo and business name: ROSETTI MARINO

Contractor Document ID: 124A50-DDL-EL-DL-45124
Contractor N. 4600044564

Vendor logo and business name

Vendor Document ID: N.A.
Purchase Order N.

Facility and Sub-Facility Description: DOUGLAS CCS / Douglas CCS General

Project and SoW Description: LBA CCS PROJECT / WP2 EPC

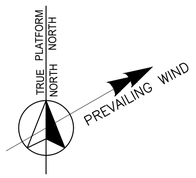
Scale: 1 : 75
Sheet of Sheets: 04 of 06

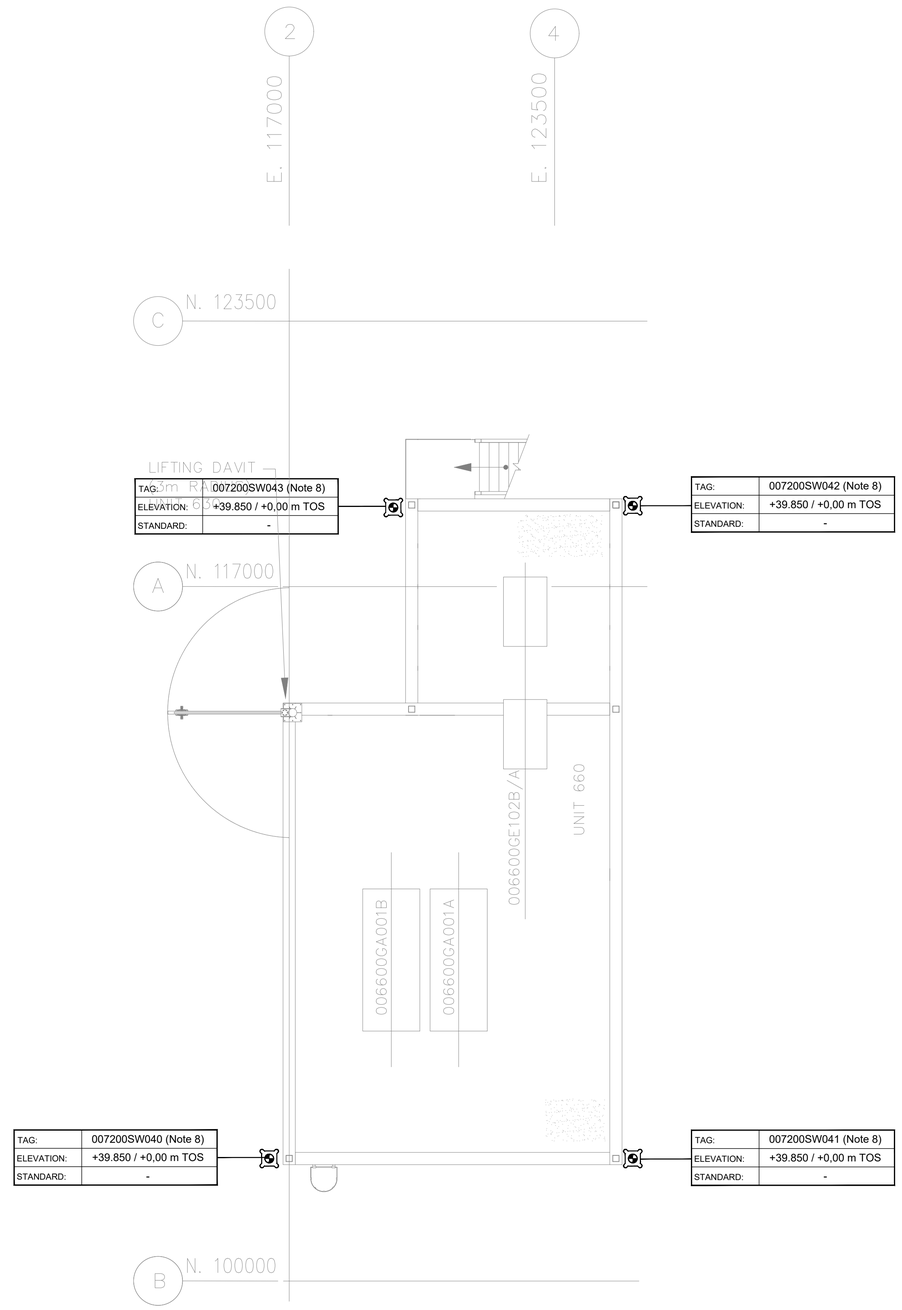
Document Title: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUTS

Supersedes N.
Superseded by N.
Plant Area: 00
Plant Unit: 720

Software: Autocad

File Name 105600DEDD45124_EXDE01_06.dwg





TAG:	007200SW043 (Note 8)
ELEVATION:	+39.850 / +0,00 m TOS
STANDARD:	-

TAG:	007200SW042 (Note 8)
ELEVATION:	+39.850 / +0,00 m TOS
STANDARD:	-

TAG:	007200SW040 (Note 8)
ELEVATION:	+39.850 / +0,00 m TOS
STANDARD:	-

TAG:	007200SW041 (Note 8)
ELEVATION:	+39.850 / +0,00 m TOS
STANDARD:	-

ROOF OF INSTRUMENT EQUIPMENT ROOM

EL.+39.850m T.O.S.

REFERENCE DOCUMENTS

NUMBER	TITLE
105600DTDG65007	DOUGLAS CCS - PLOT PLAN WEATHER DECK - HELIDECK LEVEL +35.500 T.O.S.
105600DGEO15104	DOUGLAS CCS - EQUIPMENT LIST
105600DEDD45112	DOUGLAS CCS - ELECTRICAL EQUIPMENT LAYOUT - WEATHER DECK - HELIDECK +35.500 T.O.S.
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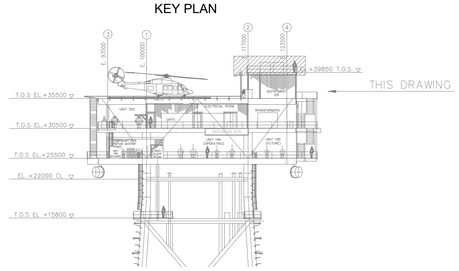
HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

LEGEND:

SYMBOL	QTY	DESCRIPTION
	4	AERONAUTICAL OBSTRUCTION RED LED LIGHTS (NOTE 8)

KEY PLAN



0 2m 4m 6m 8m 10m

SCALE 1:100

Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval
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Revision index

Company logo and business name: liverpool bay ccs

LCI Activity Code: GB202400003

Contract Code: 000593

Company Document ID: 105600DEDD45124

Job. N. JA1130

Contractor logo and business name: ROSETTI MARINO

Contractor Document ID: 124A50-DDL-EL-DL-45124

Contractor N. 4600044564

Vendor logo and business name

Vendor Document ID: N.A.

Purchase Order N.

Facility and Sub Facility Description: DOUGLAS CCS / Douglas CCS General

Project and SoW Description: LBA CCS PROJECT / WP2 EPC

Scale: 1 : 75

Sheet of Sheets: 05 of 06

Document Title: DOUGLAS CCS - NAVIGATION AID AND HELIDECK LIGHTING SYSTEM GENERAL LAYOUTS

Supersedes N.

Superseded by N.

Plant Area: 00

Plant Unit: 720

Software: Autocad

File Name 105600DEDD45124_EXDE01_06.dwg

ITEM LIST

Pos.	TAG	ITEM DESCRIPTION	LOCATION
1	007200EB001	Nav Aids Battery Box	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
2	007200EC001	Helideck Lighting and Status Lights System Control Panel	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
3	007200EC002	Main Nav Aids Control Panel (NCCP) / Battery Charger	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
4	007200EC003	Solar power skid NAVAID temporary system (For Jacket)	J TUBE, RISER AND PIPE SUPPORT - EL.+22.000m CL
5	007200EC004	Boat Landing Status Lights Control Panel	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
6	007200EV001	Temporary Solar power skid	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
7	007200EZ001	Nav Aids Battery Cut-off Box	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
8	007200EZ002	Illuminated Windsock Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
9	007200EZ003	Illuminated Windsock Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
10	007200EZ004	Fog Horn	CELLAR DECK - EL.+25.500m T.O.S.
11	007200EZ005	Fog Horn	CELLAR DECK - EL.+25.500m T.O.S.
12	007200EZ006	Visibilty meter (Fog Detector)	CELLAR DECK - EL.+25.500m T.O.S.
13	007200EZ007	General Photocell	CELLAR DECK - EL.+25.500m T.O.S.
14	007200EZ008	Helideck ligh panel Photocell	CELLAR DECK - EL.+25.500m T.O.S.
15	007200SW001	Helideck Foodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
16	007200SW002	Helideck Foodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
17	007200SW003	Helideck Foodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
18	007200SW004	Helideck Foodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
19	007200SW005	Helideck Status Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
20	007200SW006	Helideck Status Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
21	007200SW008	Main and secondary Signal Light White	CELLAR DECK - EL.+25.500m T.O.S.
22	007200SW009	Main and secondary Signal Light White	CELLAR DECK - EL.+25.500m T.O.S.
23	007200SW010	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
24	007200SW011	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
25	007200SW012	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
26	007200SW013	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
27	007200SW014	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
28	007200SW015	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
29	007200SW016	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
30	007200SW017	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
31	007200SW018	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
32	007200SW019	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
33	007200SW020	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
34	007200SW021	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
35	007200SW022	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
36	007200SW023	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
37	007200SW024	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
38	007200SW025	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
39	007200SW026	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
40	007200SW027	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
41	007200SW028	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
42	007200SW029	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
43	007200SW030	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
44	007200SW031	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
45	007200SW032	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
46	007200SW033	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
47	007200SW034	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
48	007200SW035	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
49	007200SW036	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
50	007200SW037	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
51	007200SW038	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
52	007200SW039	Helideck Green Perimeter Light	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
53	007200SW040	Aeronautical Obstruction Light	ROOF OF INSTRUMENT EQUIPMENT ROOM - EL.+39.850m T.O.S.
54	007200SW041	Aeronautical Obstruction Light	ROOF OF INSTRUMENT EQUIPMENT ROOM - EL.+39.850m T.O.S.
55	007200SW042	Aeronautical Obstruction Light	ROOF OF INSTRUMENT EQUIPMENT ROOM - EL.+39.850m T.O.S.
56	007200SW043	Aeronautical Obstruction Light	ROOF OF INSTRUMENT EQUIPMENT ROOM - EL.+39.850m T.O.S.

ITEM LIST

Pos.	TAG	ITEM DESCRIPTION	LOCATION
57	007200SW044	Subsidiary Light Red	CELLAR DECK - EL.+25.500m T.O.S.
58	007200SW045	Subsidiary Light Red	CELLAR DECK - EL.+25.500m T.O.S.
59	007200SW046	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
60	007200SW047	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
61	007200SW048	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
62	007200SW049	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
63	007200SW050	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
64	007200SW051	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
65	007200SW052	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
66	007200SW053	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
67	007200SW054	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
68	007200SW055	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
69	007200SW056	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
70	007200SW057	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
71	007200SW058	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
72	007200SW059	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
73	007200SW060	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
74	007200SW061	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
75	007200SW062	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
76	007200SW063	Lit Touchdown/Positioning Marking Circle	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
77	007200SW064	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
78	007200SW065	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
79	007200SW066	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
80	007200SW067	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
81	007200SW068	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
82	007200SW069	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
83	007200SW070	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
84	007200SW071	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
85	007200SW072	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
86	007200SW073	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
87	007200SW074	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
88	007200SW075	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
89	007200SW076	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
90	007200SW077	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
91	007200SW078	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
92	007200SW079	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
93	007200SW080	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
94	007200SW081	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
95	007200SW082	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
96	007200SW083	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
97	007200SW084	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
98	007200SW085	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
99	007200SW086	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
100	007200SW087	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
101	007200SW088	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
102	007200SW089	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
103	007200SW090	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
104	007200SW091	Lit Helideck Identification "H" Marking	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
105	007200SW092	Boat Landing Status Light	J TUBE, RISER AND PIPE SUPPORT - EL.+22.000m CL
106	007200SW093	Boat Landing Status Light	J TUBE, RISER AND PIPE SUPPORT - EL.+22.000m CL
107	007200EJ001	Jb helideck floodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
108	007200EJ002	Jb helideck floodlight	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.
109	007200EJ003	Jb helideck - For TD/PM Cicle -H Lighting	WEATHER DECK - HELIDECK - EL.+35.500m T.O.S.

REFERENCE DOCUMENTS

NUMBER	TITLE
105600DGEO15104	DOUGLAS CCS - EQUIPMENT LIST
105600DECE45001	DOUGLAS CCS - ELECTRICAL LOAD LIST AND BALANCE
105600DEDQ45019	DOUGLAS CCS - ELECTRICAL TYPICAL INSTALLATION DETAILS - CABLE ROUTES SYSTEM
105600DEFU45141	DOUGLAS CCS - ELECTRICAL LEGENDS AND SYMBOLS OFFSHORE SYSTEMS
105600DEST45067	DOUGLAS CCS - TECHNICAL SPECIFICATION FOR NAV. AID AND HELIDECK LIGHTING SYSTEM
105600DEGA45068	DOUGLAS CCS - TECHNICAL DATA SHEET (TDS) FOR NAV. AID AND HELIDECK LIGHTING SYSTEM

GENERAL NOTES

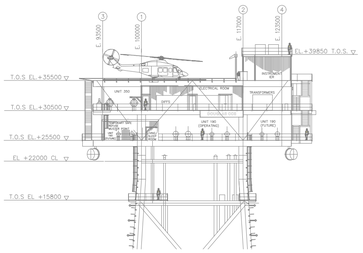
NOTES:

1. This document is valid only for positioning of Navigation Aid and Helideck light system component.
2. The typical installation of equipments will be defined in the next revision.
3. The installation elevation will be confirmed in the next revision according to vendor information and typical installation detail..
4. "Standard" indicates the typical installation of the individual item. This indication will be updated in the next revision following the supports study.
5. The Item 007200EC003 Solar Power skid NAVAID temporary system (for Jacket) also includes temporary main Fog-Horn and main white signal light.
6. 007200EZ007 General photocell to activate the NAVAID system
7. 007200EZ008 Photocell to activate the HELIDECK lighting system
8. The quantity and type of Aeronautical Obstruction Light shall be in accordance with CAP437 and will be confirmed by Vendor.
9. Before each TAG, the facility code 1056 must be taken into account.

HOLDS:

1. Position and quantity of NAVAID item to be confirmed by Vendor

KEY PLAN



SCALE 1:100

EX-DE	01	16-07-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO	D. ALIANO	A. FUSCO
EX-DE	00	12-03-2025	ISSUED FOR REVIEW	F. PISTONE	G. DELUCCHI	D. ALIANO		
Validity Status	Revision Number	Date	Description	Prepared by	Checked by	Approved by	Contractor Approval	Company Approval

Revision index

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