

Case Study: Installation Engineering

1.0 Facts

Services

Installation Engineering

Related Services

Pre-Construction Engineering, Project & QHSE Management, Tendering, Procurement & Financial Support, Offshore Construction Support, Client Representation, Operations & Maintenance and Innovation Development.

Summary Scopes Completed

Installation Engineering: DolWin beta Platform, Luchterduinen, NordLink Interconnector, NorNed Interconnector.

2.0 Introduction

Primo Marine provides Engineering solutions, incorporating experience of all lessons learned during the pre-construction (installation preparation) phase, from its extensive track record, amongst others NorNed, BritNed, NordBalt, IFA2 and NordLink. The solutions have been designed to focus firmly on providing a more realistic CAPEX/OPEX balance for installation projects, especially in terms of ensuring protection to cable by burial throughout the cable's lifetime.

3.0 Subject Matter Expertise

Primo Marine offers a comprehensive capability in regard to the provision of subject matter expertise, covering pro-active problem solving of events, challenges and issues (including the arranging and management of third parties). In summary:

- Peer Reviews.
- Complete onshore and offshore support. Including the management of packages with provisional sum operations.
- The management of survey campaigns, including hydrographic, geophysical and geotechnical disciplines, designed to monitor seabed including specialist packages such as UXO (incorporating UXO desk top studies).
- The interfacing with all significant parties to provide technical solutions.
- The license management and supporting of licences.
- Advising with all project documentation and the management of.
- Translation of technical issues into contract and permit requirements.
- Recommendation on crossings, of 3rd party assets and large obstacles including rock replacement solutions.

4.0 Engineering Pre-Construction (installation preparation)

Primo Marine provides the following preparation expertise required for the installation of cables.

5.0 Seabed Preparation

Providing solutions to seabed preparation in order to reduce risk to cable installation and achieved burial depth of time, such as:

- Levelling or Pre-Sweeping.
- Pre-Sweeping of mobile seabed's including sand-waves (in line with permitting requirements for maximum dredging and volume constraints).
- 3D migration analysis to reroute cables, optimise crossing angles and avoiding number of sand-waves, mobile sections, crests and troughs with wrecks and obstacles.
- Assessment of seabed preparation (by dredging or/and deeper initial installation), with cost of depth of burial maintenance costs.

6.0 Trenching

Providing solutions to reduce risk of not achieving burial requirements, such as:

- Complete onshore and offshore support. Including the management of packages with provisional sum operations.
- Complete onshore and offshore support (assisting with consequences and difficulties arising out of not meeting permit requirements).
- Knowledge of all soil types requiring different capabilities of cable trenchers (covering trencher selection and verification).
- Management support and recommendation in regard to trencher related achievable soil penetration operations, such as simultaneous or post-lay burial (including additional passes).
- Studies and recommendation for trenching and erosion control i.e. plough forces.
- Reviewing of methodologies, procedures and providing confidence in the documentation.

7.0 Dredging

Providing solutions in regard to dredging work scopes:

- Complete onshore and offshore support. Including the management of packages with provisional sum operations.
- Reviewing methodologies, procedure and providing confidence in the documentation.

- Designs and review of dredging works.
- Designs including the calculations of volumes.
- Providing pro-active support to the consequences and difficulties arising out of not meeting permit requirements, such as cost and time through increased operations and maintenance.
- Combined with Seabed Preparation, ensuring the meeting of permit requirements in regard to dredging volumes and constraints.

8.0 Remedial Protection

The conducting of cable protection and other seabed interventions, including remedial solutions such as:

- Complete onshore and offshore support. Including the management of packages with provisional sum operations.
- Reviewing methodologies, procedure and providing confidence in the documentation.
- Additional Passes with Trencher.
- Mass Flow/Controlled Flow Excavation.
- Rock Placement.
- Providing immediate risk mitigation solutions such as Guard Vessels & Buoys.

9.0 Installation Engineering

Incorporating practical offshore installation experience in regard to:

- Complete onshore and offshore support for product lay, installation and burial. Including the management of packages with provisional sum operations.
- Reviewing methodologies, procedure and providing confidence in the documentation.
- Analysis and review of all documentation including method statements, procedures covering risk mitigation, contingencies, cable integrity, pull-in analysis, cable rerouting and pull in forces.
- Reviewing methodologies, procedures for diverse activities such as crossings, permits, HDD entry and exit points.
- Recommending cable protection and seabed intervention methodologies, including immediate risk mitigation solutions.
- Recommendation in regard to installation in mobile seabeds.

10.0 Comprehensive Coordination

This comprehensive offering is designed to focus completely on risk to cable installation and achieved burial depth of time, in order to reduce cost of maintenance over the lifetime of cables.