PROJECT ALPINE

PROVISION OF UMBILICALS

Umbilical - EPC Statement of Work

1.0 INTRODUCTION

1.1 Project Overview

1.1.1 Asset Context

The identified resource is located within the offshore exploration block designated as Horizon South, part of the broader Pelagia Basin, situated off the northeastern seaboard of Valmora Island. The Horizon South block is operated by Stratos Energy Ltd. (40% interest), with co-investments from Novara Petrochem (30%) and Helix GeoVentures (30%). The license was awarded under a modernized shared-risk production framework on August 22, 2019, with commercial operations deemed effective from January 26, 2020.

Initial exploration drilling in this block commenced with the deployment of the Aurora-1 well, operated by TerraNova Drilling Co., which was spudded on May 21, 2002, in a water depth of 2,436 feet. The well was drilled to a total measured depth of 13,441 feet (with a true vertical depth of 13,100 feet below sea surface), and operations concluded by June 7, 2002.

Earlier hydrocarbon indications in the same structural corridor were confirmed by the successful drilling of the Epsilon-4 well in 2001, operated by a former license holder, BlueArc Resources. The Aurora-1 and Epsilon-4 wells are located on the southwestern flank of the main geological structure, separated by a subsurface saddle feature.

1.2 Field Development Strategy

The proposed development plan involves a subsea tieback of the new field to pre-existing offshore infrastructure. This concept takes advantage of available processing and transportation capacity in maturing production assets projected to enter late-life phases. The tie-in site is favorably located near the Central Nexus Facility, minimizing the need for extensive retrofitting and enabling a streamlined integration into the existing production system.

2.0 Regulatory Framework, Standards, and Compliance Requirements

The CONTRACTOR shall adhere to all applicable regional and global regulatory frameworks governing marine operations, offshore development, and industrial safety. Full compliance is expected with both national maritime laws and international standards regulating offshore engineering practices. The CONTRACTOR is required to implement all technical norms and codes identified in reference [3], *Catalog of Governing Standards and Practices*.

In the event of discrepancies between this Scope of Work and the referenced regulations, the hierarchy of authority shall be interpreted in the following descending order of precedence:

1. Governing Laws and Regulations (Regional and International);
2. PRIME ENERGY's Technical Guidelines;
3. PRIME ENERGY's General Engineering Standards;
4. Industry Codes and Norms.

Should contradictions arise, the provisions of the formal Contract Agreement shall override items 2, 3, and 4 listed above.

For each work package or activity, the applicable codes and specifications are further detailed in corresponding discipline documents. Unless otherwise specified, the latest officially published edition of each referenced rule or code shall apply as of the effective date of the Contract.

2.1 Reference Materials

2.1.1 Technical Background – Informational Use Only

The following project records are classified as *Informational Reliance Documents* to support general technical understanding. These documents are not prescriptive but must be considered during design and execution planning.

Ref.	Document Title	Document ID
[17]	System Design Framework	52003-ORBX-GEN-001
[18]	Environmental Oceanographic Study – Executive Summary	ZX1343-R2-FNL
[19]	Oceanographic Parameters – Northshore Basin Project	RP_NSB_2020_04R1
[20]	Seafloor Survey Report – Preliminary Assessment	TBD

Table 2-2 – List of Informational Technical References

2.1.2 PRIME ENERGY Engineering Standards

While all Company-specific technical references are included in [3], the following key procedural and operational documents are highlighted here for clarity within this Scope of Work:

Ref.	Document Title	Document ID
[21]	Standard for Engineering Documentation Formatting	90112.PEN.ENG.STD
[22]	Asset Lifecycle Information Governance Protocol	80223.PEN.LCM.STD
[23]	Technical Information Transmission Guidelines	75019.PEN.SND.STD
[24]	Facility Completion Workflow Procedure	64088.OPS.FNL.STD
[25]	Site Construction & Mechanical Quality Assurance Framework	64089.OPS.QUAL.STD
[26]	Operational Start-Up and Commissioning Specification	64090.OPS.COM.STD
[27]	Maintenance Data Acquisition for Integrated Support Systems (ISS-CMMS Module)	64092.ITM.CMMS.STD
[28]	Addendum to API 17E: Umbilical Systems for Subsea Infrastructure (Extended Scope)	77712.MEC.UMB.STD

Table 2-3 – Internal Engineering Standards (non-exhaustive)

2.1.3 International Technical Standards

All global norms, regulatory codes, and international engineering standards relevant to this scope are listed in reference [3]. Unless explicitly mentioned otherwise, the applicable version shall be the latest valid edition in effect as of the Contract's commencement date.

2.2 Language Requirements

All technical documents, specifications, and reports associated with the project scope must be provided in English. Where legal, environmental, or permitting documentation is required in alternate languages, PRIME ENERGY will issue specific guidance on a case-by-case basis.

2.3 Measurement Systems

The primary system of units for all engineering, design, and execution documentation shall be the International System of Units (SI). Imperial units may be used for nominal references such as pipe diameters where industry conventions apply. All measurement-related references in this document default to SI units unless explicitly stated otherwise.

3.0 EXECUTIVE SUMMARY OF THE WORKS

3.1 Overview of Scope of Work

The SERVICE PROVIDER's scope encompasses the full range of tasks and deliverables outlined in the contract agreement.

SERVICE PROVIDER shall supply all necessary personnel, management oversight, engineering expertise, and IT support; provide all required materials, consumables, tools, equipment, labor force, vessels, utilities, and transportation; as well as any additional services and facilities essential for the successful execution of the assigned activities.

The scope of work includes but is not limited to the following key activities:

a) Project leadership and monitoring;
b) Comprehensive engineering design;
c) Procurement and supply chain management for materials, equipment, and consumables, including expediting, packaging, logistics, delivery, and warehousing;
d) Fabrication and assembly operations;
e) Implementation of quality assurance and quality control processes;
f) System integration and functional testing;
g) Delivery logistics aligned with the OPERATOR's deployment schedule;
h) Support during offshore installation, pre-commissioning, and coordinated commissioning phases as applicable;
i) Execution of minor repairs to subsea umbilical systems during installation, including outer sheath maintenance if required.

The SERVICE PROVIDER assumes full accountability for the effective management and timely delivery of all contracted work. This includes providing all necessary management, labor, supervision, storage and handling facilities, equipment, security, testing instruments, consumables, protective materials, and any additional resources required for project completion. All operations must be conducted following current industry best practices for offshore oil and gas developments and comply with established marine and safety standards.

3.2 SERVICE PROVIDER Operational Boundaries

To define clear interface responsibilities and delineate the obligations of all parties engaged in the project, reference should be made to the Project Responsibility and Interface Matrix document provided in [4].

3.3 OPERATOR Implementation Plan

For detailed scheduling, execution methodologies, and operational workflows, please refer to the OPERATOR's official Project Execution Plan.

4.0 MANAGEMENT, ADMINISTRATION, AND OVERSIGHT

4.1 General

The SERVICE PROVIDER shall assign a dedicated management and supervisory team to ensure continuous oversight and control of all Scope of Work (SOW) activities and relevant interfaces throughout the PROJECT. This team will operate both from the CENTRAL OFFICE and the primary Fabrication facilities, including any SUBCONTRACTORS' locations. The SERVICE PROVIDER shall submit and confirm the appointment of key personnel.

The SERVICE PROVIDER must demonstrate sufficient managerial capacity, supervisory expertise, and organizational support to effectively administer the SOW and Services. Adequate corporate resources must be allocated to provide appropriate management personnel with the necessary authority to coordinate and direct the workforce, SUBVENDORS, SUBCONTRACTORS, and consortium or joint venture members to meet quality, safety, and schedule requirements. Specifically, the SERVICE PROVIDER is accountable for managing:

- All interfaces to ensure smooth transitions between sequential WORK elements, across multiple sites, and among involved entities including corporate groups, consortia, or joint ventures;
- Offshore activities and their interfaces with participating corporate, consortium, joint venture members, or SUBCONTRACTORS.

The SERVICE PROVIDER's management, execution, and administration of the WORKS shall comply with OPERATOR standards and be aligned with ISO 9001:2008 or equivalent internationally recognized quality systems (such as APIQ1, TQM), though formal ISO certification is not mandatory.

Periodic progress and execution meetings shall be convened by the SERVICE PROVIDER with OPERATOR and relevant SUBCONTRACTORS/SUBVENDORS on a weekly, biweekly, or monthly basis. The OPERATOR may request attendance with three working days' notice to participate in such discussions.

4.2 Management

4.2.1 Formation of the Management Team

The SERVICE PROVIDER's management team shall include, but not be limited to, the following key roles:

- Project Manager;
- Engineering Manager;
- Project Controls Manager;
- QA/QC Manager and Quality Coordinator;
- Interface Manager;
- Health, Safety & Environment (HSE) Manager;
- Offshore Installation Manager;
- Onshore Construction Manager;
- Procurement Manager (including expediting);
- Logistics Coordinator.

This management team must be mobilized within fourteen (14) calendar days following CONTRACT AWARD. The Project Manager will act as the SERVICE PROVIDER's official Representative with full authority to liaise and make decisions on all matters and serve as the primary contact with the OPERATOR. Key personnel must be approved by the OPERATOR prior to WORKS commencement and may only be replaced with OPERATOR's prior consent.

The SERVICE PROVIDER shall maintain adequate staffing levels at all times to fulfill project requirements.

4.2.2 Management Support Facilities

The SERVICE PROVIDER shall provide the OPERATOR with the following support as needed:

- Technical, secretarial, and administrative personnel services;
- Fully equipped office accommodation and logistical support for OPERATOR personnel at the central management location, which hosts PROJECT management, engineering, and procurement functions;
- Management systems including computer hardware/software, document reproduction, stationery, communications infrastructure (telephone, fax, radio, internet, email), postage, and courier services;

- Transportation and travel facilities for OPERATOR personnel between the central office and the WORKSITE.

4.2.3 Management and Project Controls Responsibilities

Throughout the WORKS duration, the SERVICE PROVIDER's management and project control team shall:

- Assume full responsibility for planning, scheduling, administration, control, verification, and reporting to ensure proper and complete SOW execution;
- Provide a dedicated Project Management Team for continuous supervision;
- Deliver a detailed Project Execution Plan outlining the methodology for executing and managing all project activities;
- Serve as the primary liaison with the OPERATOR regarding contract administration and document control per OPERATOR's submission and review protocols;
- Manage approved personnel mobilization, establish work criteria, and direct site operations;
- Facilitate mobilization of all facilities, resources, equipment, plant, offices, and logistics;
- Oversee engineering, procurement, logistics, and expediting management;
- Ensure dissemination and compliance with OPERATOR-approved procedures related to work, safety, and project control;
- Submit a Quality Plan for OPERATOR approval and maintain a consistent quality system across all involved entities;
- Monitor and audit quality systems regularly to maintain effectiveness;
- Attend all required OPERATOR meetings;
- Distribute all project documentation, including reports, minutes, operational procedures, and testing records to the OPERATOR;
- Keep the OPERATOR fully informed on progress, activities, and critical issues throughout the WORKS.

4.2.4 Interface Management

The SERVICE PROVIDER's management team shall:

- Appoint a dedicated Interface Coordinator to manage interface processes using the OPERATOR's designated interface management platform;

- Identify and manage internal and external interfaces impacting project success, including those with the OPERATOR, other contractors, SUBCONTRACTORS, and SUBVENDORS;
- Actively participate in Interface Management Teams;
- Organize, lead, and contribute to interface coordination meetings to resolve interface issues promptly;
- Collaborate with all relevant parties to define interface deliverables and deadlines;
- Proactively identify potential interface risks and raise non-compliance issues to the OPERATOR for resolution;
- Submit interface requests and data sheets for all external interfaces at the earliest stages of the project.

4.2.5 Site Management

At each worksite, the SERVICE PROVIDER shall establish a Site Management Team responsible for daily management, coordination, and supervision of the WORKS under the Central Office's oversight. Each team will be led by a designated SERVICE PROVIDER Representative responsible for site activities and reporting directly to the OPERATOR's Site Representative.

SERVICE PROVIDER Representatives shall collaborate closely with OPERATOR site personnel to resolve operational matters effectively. Site Management Teams must consistently coordinate with Central Office Management to fulfill contractual responsibilities timely and efficiently.

4.2.6 Core Management Duties

Through the Central Office Management, the SERVICE PROVIDER shall continuously support and monitor site teams to ensure proper handling of all management, coordination, and administrative tasks related to:

- Engineering;
- Procurement, logistics, and expediting;
- Fabrication;
- Onshore, offshore, and marine operations;
- Quality assurance and control;
- Contract and subcontract administration;
- Project services.

4.2.7 Engineering

The SERVICE PROVIDER shall assume full management, coordination, and direction of all engineering tasks throughout the project phases, including but not limited to:

- Reviewing and endorsing all OPERATOR-supplied documentation related to the SERVICE PROVIDER's scope.
- Performing detailed design of the subsea umbilical system and ancillary equipment based on the FEED package, with reference to the Project Responsibility and Interface Matrix (see ref. [4]).
- Executing detailed engineering activities as outlined in the Project Responsibility and Interface Matrix.
- Ensuring full compliance with the OPERATOR's system completion and pre-commissioning strategy (ref. [16]).
- Preparing hazard identification and risk assessment sessions for all SOW operations.
- Maintaining design integrity across all project phases.
- Collecting and consolidating as-built and as-installed data, submitting completed dossiers per the approved Master Document Register.
- Preparing all necessary engineering deliverables, including drawings, reports, data sheets, calculations, specifications, registers, studies, procedures, manuals, fabrication drawings, and related documents essential for WORKS completion.
- Providing documents to OPERATOR in a timely manner according to mutually agreed schedules for review and approval.
- Issuing all documentation with OPERATOR-compliant numbering and headings per the document control procedure (ref. [21]).
- Reviewing, checking, and approving all engineering documents produced by SUBCONTRACTORS before submission to OPERATOR.
- Maintaining up-to-date project documents and drawings at the SERVICE PROVIDER's Central Office and all offshore and onshore sites, ensuring accessibility for OPERATOR personnel and regular updates incorporating any design changes during WORKS execution.

At each site, the SERVICE PROVIDER shall ensure onsite engineering personnel:

- Execute all site engineering activities;

- Verify Approved For Construction (AFC) drawings from the Central Office;
- Notify OPERATOR of any changes or amendments to AFC drawings;
- Implement Change Control Procedures for technical queries and document COMPANY-issued Variation Orders;
- Coordinate with construction and all technical or administrative disciplines onsite;
- Liaise across sites to ensure engineering consistency;
- Prepare as-built documentation referencing the Master Document Register;
- Ensure all drawings, revisions, queries, and documentation are communicated to management.

4.2.8 OPERATOR Document Review

The SERVICE PROVIDER shall formally review and endorse OPERATOR project documents, specifications, and drawings within the ITT package, flagging any discrepancies or required changes necessary for safe and effective SOW execution.

The SERVICE PROVIDER shall adhere to the Interface Management procedures during all review and coordination phases.

OPERATOR will return documentation with comments as appropriate; however, the absence of comments does not release the SERVICE PROVIDER from contractual obligations.

Both parties will collaborate proactively on a case-by-case basis to minimize schedule impact and facilitate smooth project delivery. The SERVICE PROVIDER shall comply with the base review cycle requirements outlined in APPENDIX G of the Contract (HOLD 1).

4.2.9 Supplementary Information

OPERATOR may issue supplementary or revised information at its discretion. Upon receipt, the SERVICE PROVIDER shall review and respond within ten (10) calendar days, identifying any potential impacts on timely project delivery and proposing mitigation measures to ensure successful WORKS completion within the agreed schedule.

4.2.10 Procurement and Logistics (Purchasing, Services, Expediting, Transportation, Storage)

The SERVICE PROVIDER shall provide comprehensive management and coordination of procurement and logistics activities, including:

- Maintaining professional and ethical standards throughout procurement processes.
- Ensuring all requisitions, orders, and SUBCONTRACTS are processed according to approved procedures, schedules, and programmes.
- Purchasing all equipment, materials, and services specified in the Contract and within the SERVICE PROVIDER's responsibility per ref. [4], except items supplied directly by OPERATOR.
- Implementing an effective expediting program to guarantee timely delivery of all materials and equipment to site, including transportation arrangements.
- Supporting OPERATOR and other contractors with customs clearance and tracking of all SERVICE PROVIDER materials, equipment, and marine assets entering or leaving the jurisdiction (e.g., continental shelf, economic zone).
- Assisting OPERATOR with transportation and integrity monitoring of SERVICE PROVIDER and OPERATOR-supplied items between work sites.
- Ensuring the presence of an independent inspector during manufacturing/fabrication to verify material certificates (minimum ISO 10474:2013 Certificate 3.2 for specified equipment such as umbilical steel tubes). Independent inspection does not absolve SERVICE PROVIDER's quality responsibilities.
- Supervising material controllers at site and overseeing procurement close-out.
- Ensuring proper receipt, unloading, inspection, storage, and protection of all site-delivered materials and equipment. Any non-conformities, shortages, or damages shall be documented and reported promptly for remedial action.
- Providing, subject to OPERATOR approval, appropriate storage facilities for fully assembled and tested equipment (post FAT/EFAT) at the manufacturing site for up to 180 days, including preservation measures per ISO 13628-5, at no additional cost.
- Verifying quantities, condition, and markings of OPERATOR-Provided Items (OPI) upon receipt.
- Promptly notifying OPERATOR of any damage or defects found in OPIs and cooperating in evaluating and rectifying such issues per OPERATOR instructions.
- Maintaining secure, environmentally controlled storage conditions for all supplied items, with UV protection for umbilicals, cables, and connectors from manufacture through transport.

- Implementing inspection programs for stored items with reports submitted to OPERATOR per APPENDIX E of the Contract (HOLD 2).
- Conducting any necessary repairs during storage under controlled conditions to avoid damage or contamination.
- Ensuring all materials are available on site as scheduled for WORKS inclusion.
- Keeping comprehensive records for full traceability and audit purposes.
- Arranging disposal of material waste after project completion in compliance with applicable laws and regulations, including all manufacturing remnants and returned items.

While OPIs remain under SERVICE PROVIDER custody, they must be handled per the manufacturer's Preservation and Storage Maintenance protocols.

4.2.11 Fabrication

The CONTRACTOR shall oversee and coordinate all fabrication processes across designated sites, ensuring seamless integration with design, supply chain, and offshore/onshore project components.

For each fabrication facility, CONTRACTOR responsibilities include:

- Daily administrative oversight of fabrication operations.
- Completion of all required WORKS, including warehousing, safeguarding, component assembly, installation, inspection, mechanical handover, and initial commissioning.
- Optimized use of available resources and materials.
- Strict adherence to weight and dimensional specifications.
- Execution of any approved design changes authorized by the CLIENT during the build phase.

4.2.12 Offshore and Marine Operations

The CONTRACTOR shall provide technical and logistical assistance during offshore transport and installation operations, supporting CLIENT and its appointed partners. Duties include:

- Strategic planning of maritime logistics and activities, with CLIENT notified of all regulatory submissions or approvals.
- Managing commissioning and validation operations, including real-time updates to CLIENT.

- Acting as liaison between CLIENT and government agencies or third-party contractors for all permits or declarations.
- Enforcing environmental safeguards and spill-prevention protocols as mandated under the CONTRACT and regional maritime laws.

4.2.13 Onshore Coordination

The CONTRACTOR shall appoint competent management and supervisory staff to support onshore fabrication, construction, and systems testing. Key responsibilities include:

- Pre-mobilization planning and regulatory notifications for onshore works.
- Deployment of operational units and personnel at scheduled times and locations.
- Coordination of inspection and pre-operational validation activities.
- Facilitating regulatory interactions between CLIENT and government or local authorities.
- Safe deployment of calibration-certified machinery; certifications must accompany all test equipment.
- Implementation of environmental protocols in line with CONTRACT stipulations.
- Development of operations and maintenance documentation.
- Rehabilitation of impacted areas post-works, compliant with environmental body recommendations, including safe disposal of contaminated or hazardous waste.
- Engagement with local community stakeholders where required.

4.2.14 Quality Assurance & Quality Control (QA/QC)

The CONTRACTOR and all its affiliates must implement a documented Quality Management System (QMS) consistent with international standards such as ISO 9001:2015 or ISO 29001:2010, subject to CLIENT review and approval.

The QA/QC system must:

- Align with the detailed requirements outlined in Appendix F of the CONTRACT.
- Be maintained and enforced by all subcontractors and vendors involved in the WORKS.

Deliverables include, but are not limited to:

- A CONTRACTOR-specific QA Plan and Quality Control Manual.

- QA plans for vendors handling high-criticality components.
- Inspection and Testing Plans (ITPs) for all Tier I/II critical components.
- Approved criticality ratings and analysis worksheets prior to issuing RFQs.
- Quality control workflows specific to this PROJECT.
- Internal and external audit schedules.
- Performance statistics from design, procurement, and construction phases.
- Non-conformance logs, trend analyses, and resolution procedures.
- Project quality KPIs and regular reports.
- Archival and documentation protocols, including final data books.
- Preservation and handling procedures for sensitive materials.
- A Lessons Learned Registry and procedural workflow.

The combined PROJECT QA strategy must:

- Ensure compliance with CLIENT quality benchmarks.
- Prevent premature work initiation without finalized and approved documentation.
- Establish a traceable record of issues, resolutions, and verifications.
- Provide continuous quality metrics and performance dashboards, updated monthly or as required.

CLIENT oversight (audits or reviews) does not relieve CONTRACTOR of ultimate quality responsibility.

4.2.14.1 Deviations and Non-Conformances

Any departures from contract specifications must be proactively reported to CLIENT, even if CLIENT or third-party reviewers have signed off on associated documentation. Failure to report deviations may result in liability for corrective actions. Delays in communication are solely CONTRACTOR's responsibility. CLIENT reserves the right to claim compensation for related setbacks.

4.2.15 Contract & Subcontract Oversight

CONTRACTOR must maintain ethical and professional integrity throughout the lifecycle of the CONTRACT and all SUBCONTRACTS. Responsibilities include:

- Ensuring contractual terms are upheld across all parties.

- Preparing and pricing all change requests per CLIENT requirements.
- Managing invoices, payments, and certification processes.
- Coordinating closeout procedures and compiling final accounts.
- Maintaining documentation and cost substantiation for all financial adjustments.

4.2.16 Project Support Services

4.2.16.1 Management Systems and Procedures

CONTRACTOR must implement robust project control frameworks tailored to the SCOPE OF WORK. All systems shall be subject to CLIENT validation before execution.

4.2.16.2 Schedule Management and Reporting

The CONTRACTOR must adhere to CLIENT's Work Breakdown Structure (WBS) and Cost Breakdown Structure (CBS) through a structured scheduling approach:

- **Level 2:** Master Execution Schedule
- **Level 3:** Detailed Control Schedule
- **Level 4:** Task-specific Implementation Plans

These must be reflected in the CONTRACT Execution Plan. Revisions must receive CLIENT's prior written approval.

Scheduling systems must be digital, milestone-driven, and synchronized with CLIENT’s coordination protocols. Refer to APPENDIX G – Coordination Manual (HOLD 1) for additional guidance.

4.2.16.3 Financial Oversight and Cost Governance

The CONTRACTOR shall maintain rigorous financial control mechanisms and continuous cost surveillance across all phases of the PROJECT. These activities shall include, but are not limited to:

- **Budget Reporting** aligned with the PROJECT Execution Framework, utilizing a structure consistent with the CLIENT’s defined Work and Cost Breakdown Architectures (WBS/CBS).
- **Expenditure Forecasting** to assess the financial performance of the WORK at any given milestone, enabling accurate projections of remaining cost-to-complete.

For further direction on cost management methodologies, refer to **APPENDIX G – Execution Interface Protocol (Rev. HOLD 1)**.

5.0 HEALTH, SAFETY, AND ENVIRONMENT (HSE)

5.1 General Requirements

Throughout the execution of the PROJECT activities, the CONTRACTOR shall apply, at a minimum, the baseline standards and requirements relating to Occupational Health, Safety, Environmental Protection, Public Well-being, Quality Assurance, and Radiation Safety as outlined in **Annex E** of this AGREEMENT.

It is the CONTRACTOR’s duty to ensure all assigned personnel, including those of its SUBCONTRACTORS, comply with these provisions and continuously pursue excellence in HSE performance.

The CONTRACTOR is accountable for the full integration and enforcement of the safety, environmental, and quality requirements specified within the PROJECT DOCUMENTS and any relevant guidelines or procedural frameworks mandated by the CLIENT. These shall be tailored to reflect the specific scope and risks of the CONTRACTOR's assigned tasks.

A dedicated HSE Management Plan shall be developed, drawing from the CONTRACTOR’s established internal systems. This plan will require endorsement by the CLIENT and approval from applicable regulatory authorities prior to implementation.

The CONTRACTOR’s HSE Management System shall meet the following minimum criteria:

- Possession of a formal and signed HSE Policy, endorsed by senior leadership (e.g., CEO/Managing Director), demonstrating a commitment to continual improvement and operational safety.
- A structured system for hazard identification and control, covering activities executed directly or through SUBCONTRACTORS.
- An integrated approach to managing environmental and health impacts from all PROJECT operations.
- Strict adherence to mitigation strategies for identified hazards/risks, including those outlined by the CLIENT.
- Deployment of competent, trained personnel with adequate knowledge of HSE procedures.
- Formal notification to CLIENT of any updates, modifications, or revisions to the CONTRACTOR’s HSE system throughout the PROJECT duration.
- Annual review and adjustment of the HSE system to align with evolving site conditions and PROJECT scope.

CONTRACTOR must demonstrate proactive compliance with industry best practices across all HSE-related operations. For a full outline of responsibilities and deliverables, refer to **Annex E and Annex G** of the AGREEMENT (Rev. HOLD 1 & HOLD 2). These obligations include but are not limited to:

- Implementation of a comprehensive HSE Policy.
- Development of an HSE Management System specific to the PROJECT.
- Submission and approval of a detailed HSE Execution Plan.
- Routine audits and reporting mechanisms.
- Designation of clear roles and documentation practices.
- Compilation and submission of an HSE Closure Report.

5.2 Risk Management and Safe Operations

The CONTRACTOR shall ensure that all operational risks, including those affecting the environment, public safety, or individuals involved in the PROJECT (directly or indirectly), are identified and evaluated systematically. This shall be done in alignment with CLIENT guidelines and international best practices.

Risk identification and mitigation strategies must be embedded into the design and execution phases and monitored for effectiveness through all lifecycle stages.

The CONTRACTOR shall conduct comprehensive risk assessments, including but not limited to HAZID (Hazard Identification) and HAZOP (Hazard and Operability) studies, at all relevant phases. These assessments shall be reviewed periodically to ensure continued relevance and effectiveness.

Risks shall be reduced to ALARP (As Low As Reasonably Practicable) through engineered controls, procedural safeguards, and continuous hazard monitoring. CONTRACTOR shall develop and enforce safe work protocols including:

- A formal and monitored permit-to-work system.
- Routine updates and reviews of the hazard and risk registers.
- Preparation of procedures for non-routine or high-risk tasks.
- Risk assessments such as COSHH or equivalent, for chemical or hazardous substance exposure.
- Use of suitable safety gear, warning signage, and protective systems.
- Implementation of additional protective measures as recommended by CLIENT HSE teams.

The CONTRACTOR shall maintain records of all hazard identification and mitigation actions.

Prior to initiating any site activities, the CONTRACTOR must submit a **Task-Specific HSE Operational Plan** for CLIENT review and approval. This plan shall:

- Detail execution steps.
- Address safety interactions across SUBCONTRACTOR interfaces.
- Account for simultaneous operations and shared work zones.

No physical works shall commence until the CLIENT grants written approval of the HSE Operational Plan. The CLIENT reserves the right to request revisions or enhancements to the submitted HSE Plan as necessary.

6.0 PERMITTING AND CERTIFICATION REQUIREMENTS

6.1 Overview

The CONTRACTOR is accountable for securing all necessary permits, clearances, authorizations, notifications, registrations, approvals, and relevant documentation essential for the execution of the SCOPE OF WORK. The CLIENT may, at its discretion, assume responsibility for a subset of key regulatory submissions specific to the PROJECT.

Both CLIENT and CONTRACTOR shall collaborate in a timely and organized manner to compile, submit, and track required documentation for regulatory approval. Engagement with applicable governmental or regional authorities in the host nation—here referred to as **Serandia**—must be proactive to ensure that no delays impact the progress of the WORK.

Adequate lead time shall be built into the schedule to accommodate processing durations for statutory documentation and associated approvals.

The CONTRACTOR shall, as a baseline, be responsible for the following:

1. Work authorizations, employment licenses, and immigration documents including work visas and permits for CONTRACTOR and its SUBCONTRACTOR personnel.
2. Licensing and clearance for the importation, internal movement, and controlled use of any radioactive materials and related equipment.
3. Equipment import permits and transport approvals, aligned with Serandian Energy & Industry Regulation No. 041/Year 2021.

4. Design compliance and construction-related regulatory authorizations applicable to the CONTRACTOR’s defined scope.
5. Communications equipment licenses and operational permits for CONTRACTOR and its subcontracted entities.

In parallel, the CLIENT shall retain responsibility for acquiring overarching operational licenses that impact post-commissioning activities or fall outside CONTRACTOR's technical remit.

To ensure alignment on permit ownership and responsibilities, periodic interface and coordination meetings between the CLIENT and CONTRACTOR shall be conducted. CONTRACTOR shall also maintain a registry of all applicable regulations and be subject to compliance checks initiated by the CLIENT.

As part of shared responsibilities, CONTRACTOR shall support CLIENT in obtaining the required environmental discharge approvals for the following pre-commissioning activities under CLIENT control:

- Controlled release of chemically treated fluids during cleaning, hydrotesting, and pipeline preparation.
- Methanol and glycol discharge during pipeline conditioning and flow assurance treatments.

CONTRACTOR shall supply updated Material Safety Data Sheets (MSDS) and related chemical information as needed to support the CLIENT’s environmental permitting applications.

A comprehensive matrix of permits, certifications, and approvals required for the execution of the PROJECT is listed in Table 6-1. CONTRACTOR shall review this list and provide notification of any additional documentation necessary to ensure seamless completion of the WORK. Any such additional items will fall within the CONTRACTOR’s contractual obligations.

Table 6-1 – Required Permits, Licenses, and Certifications for PROJECT ALPINE

No.	Permit / Certification / Approval	Type	Responsible Party
1	Environmental Impact Assessment (EIA)	Document	CLIENT
2	Drilling Environmental Management Plan	Document	CLIENT
3	Produced Water Discharge License	Permit	CLIENT

No.	Permit / Certification / Approval	Type	Responsible Party
4	Custody Transfer Metering Certification	Permit/Cert.	CLIENT
5	Zone Access Clearance (Restricted Area)	Permit	CLIENT
6	Lifting Equipment Safety Certification	Certificate	EPC CONTRACTOR
7	Workplace Safety Approvals (COI, Operational Fitness, etc.)	Certificate	CLIENT + Regulator Liaison
8	On-Site Medical Personnel Certification	Certificate	CLIENT / EPC CONTRACTOR
9	Community Awareness Campaign	Approval	CLIENT / EPC CONTRACTOR
10	Marine Vessel Compliance – Regulation PM 47/2022	Certificate	EPC CONTRACTOR
11	Industrial Waste Stewardship (B3 Class)	Permit	EPC CONTRACTOR
12	Waste Handling (Transport & Processing – B3)	Permit	EPC CONTRACTOR
13	Oil Waste Disposal Approval	Permit	EPC CONTRACTOR
14	Marine Logistics (Barges, Tugs, Crew Boats)	Permit	EPC CONTRACTOR
15	Navigational Safety During Subsea Deployment	Permit	EPC CONTRACTOR
16	Chemical Usage in Hydrocarbon Sector	Permit	EPC CONTRACTOR
17	Vessel Construction Liaison Officer Registration	Permit	EPC CONTRACTOR

No.	Permit / Certification / Approval	Type	Responsible Party
18	Maritime Security Approval – Pipeline Deployment	Permit	EPC CONTRACTOR
19	Underwater Construction (Salvage, Cutting, etc.)	Permit	EPC CONTRACTOR
20	Welding Procedure and Qualification Approvals (WPS/PQR)	Certificate	EPC CONTRACTOR
21	Welder Certifications	Certificate	EPC CONTRACTOR
22	Special Radio Communications Licensing	Permit	EPC CONTRACTOR
23	Trunk Radio System Permit	Permit	EPC CONTRACTOR
24	Quarry and Natural Resource Extraction Approval	Permit	EPC CONTRACTOR
25	Road Freight Oversize Load Dispensation	Permit	EPC CONTRACTOR
26	Equipment and Personnel Mobilization Certification	Document	EPC CONTRACTOR
27	Onsite Catering Provider License	Certificate	EPC CONTRACTOR
28	Foreign Vessel Dispensation Letter	Approval	EPC CONTRACTOR
29	Cabotage Law – Foreign Vessel Usage Approval	Approval	EPC CONTRACTOR
30	Import/Customs Documentation	Document	EPC CONTRACTOR
31	Radioactive Material Permitting		

No.	Permit / Certification / Approval	Type	Responsible Party
	a. Importation Authorization	Permit	EPC CONTRACTOR
	b. Entry Approval	Approval	EPC CONTRACTOR
	c. Transportation Clearance	Approval	EPC CONTRACTOR
	d. Material Transfer to CLIENT	Permit	EPC CONTRACTOR
	e. Operational Utilization License	Permit	CLIENT

7.0 PRIME ENERGY ACCOMMODATION AND FACILITIES

7.1 PRIME ENERGY's Dedicated Accommodation and Support Areas

The Contractor shall supply the premises, furnishings, and operational services described herein for the sole use of PRIME ENERGY personnel assigned to **PROJECT ALPINE**. These provisions must enable PRIME ENERGY to manage and oversee the WORKS efficiently for the full duration of the Contract.

Where the scope specifies dedicated on-site staff for PRIME ENERGY, the Contractor shall ensure such roles are staffed at all times, maintaining adequate personnel coverage during public holidays, planned leave, or unexpected absences.

The Contractor is responsible for the upkeep and repair of all facilities, equipment, and services provided under this section, including replacing any items damaged or rendered unusable during normal operations.

For worksites located outside Serandia, the Contractor shall act as the official sponsoring entity for PRIME ENERGY staff in matters such as visas, work permits, and other regulatory clearances, with all governmental or third-party fees borne by PRIME ENERGY.

7.1.1 PRIME ENERGY Accommodation and Primary Fabrication Sites

7.1.1.1 General

The Contractor shall provide secure, lockable office spaces exclusively for PRIME

ENERGY personnel at each fabrication site associated with PROJECT ALPINE. These offices must be air-conditioned, appropriately furnished, and equipped with consumables as needed for PRIME ENERGY's operational requirements.

Staffing at the primary fabrication locations will comprise up to two (2) PRIME ENERGY representatives. The Contractor shall provide, as a baseline, one (1) fully furnished office room of no less than twelve (12) square meters, plus one (1) optional room of the same standard. Additionally, there must be at least one dedicated conference or meeting room capable of seating a minimum of twenty (20) people, fully furnished and equipped with:

- Digital telephone system and modern video-conferencing capability
- Ceiling-mounted digital projector with screen
- Interactive digital whiteboard
- Network-connected personal computer and printing facilities

All work areas and meeting rooms must be lockable and fitted with suitable safety provisions, including fire extinguishers, alarms, and hose reels. Utilities such as power, ventilation, high-speed internet (LAN-based), and exclusive sanitary facilities for PRIME ENERGY personnel must be provided. Amenities shall include a coffee machine (espresso-capable), tea service, microwave oven, and hot/cold water dispenser.

7.1.1.2 Office Equipment

The Contractor is responsible for procuring, installing, and maintaining all office hardware provided for PRIME ENERGY's exclusive use throughout the Contract. This includes ensuring that any defective equipment is repaired or replaced within twenty-four (24) hours, with temporary alternatives provided in the interim.

Computer Systems

At the Contractor's expense, each PRIME ENERGY office (as defined in 7.1.1.1) shall be fitted with:

- Branded docking station compatible with PRIME ENERGY's laptop specifications
- Bluetooth/USB optical mouse and keyboard
- 27" Full HD LED monitor
- Integrated Bluetooth/USB headset with microphone

Networking Equipment

Each location shall have one (1) new wireless router meeting at least the following:

- Four (4) Gigabit LAN ports, one (1) Gigabit WAN port

- Full IPv4/IPv6 compatibility and advanced VLAN/WPA2 security
- Wireless-N (2.4 GHz) connectivity with QoS prioritization
- Guest network segregation
- VPN tunneling support

Two (2) spare network cables per room are to be supplied. Internet connectivity must be a high-speed service of at least 10 Mbps, with all subscription and usage costs covered by the Contractor.

Printing & Document Systems

- One (1) A3 colour laser printer (≥1200x1200 dpi, ≥40 ppm in colour and mono)
- Fax machine with minimum 600x600 dpi print resolution, memory for ≥450 pages
- High-capacity multifunction copier/scanner (A4/A3, ≥50 ppm, duplex, collating)

The Contractor shall provide all necessary consumables, including paper, toner, and transparency film, as well as a dedicated document shredder.

Communications
The Contractor shall install and maintain telephone and internet systems at each site, ensuring each PRIME ENERGY desk has:

- A conference-capable telephone connected to the Contractor’s central exchange
- One (1) independent direct line

Call and connection costs for PRIME ENERGY’s business use are to be borne by the Contractor. Quarterly cost reports must be supplied to PRIME ENERGY for review.

7.1.1.3 Welfare Provisions
PRIME ENERGY staff shall have full access to the site’s canteen and welfare facilities during all operational phases of PROJECT ALPINE.

7.1.1.4 Engineering Tools and Equipment
The Contractor shall:

- Supply all necessary calibrated engineering tools for oversight of the WORKS (e.g., theodolites, callipers, micrometers)
- Manage fabrication/manufacturing interfaces and respond to technical queries
- Coordinate FAT/SIT testing and quality assurance inspections
- Provide all certified scaffolding and temporary access structures required for inspections, with adequate notice given before removal of any such structures

7.1.1.5 Security

Site security shall be maintained to PRIME ENERGY's satisfaction, including:

- 24/7 security personnel presence (including weekends and public holidays)
- Controlled access for all personnel and vehicles
- Inspection of incoming/outgoing vehicles
- Maintenance of visitor logs
- Removal of unauthorized individuals
- Adequate lighting for night security

7.1.1.6 Site Housekeeping

The Contractor shall maintain a clean, hazard-free worksite, ensuring waste and hazardous materials are safely removed and disposed of with traceability documentation.

7.1.1.7 Safety Gear

Sufficient quantities of PPE (boots, gloves, helmets, safety glasses) shall be provided for PRIME ENERGY personnel and approved visitors at all fabrication yards.

7.1.1.8 Parking Facilities

The Contractor shall allocate secure parking spaces adjacent to PRIME ENERGY's designated offices at each approved worksite location.

7.2 Medical Evacuation (Medivac)

The Contractor shall prepare an Emergency Response Plan, to be approved by PRIME ENERGY before services begin. The Contractor is responsible for the medivac of its own personnel for both onshore and offshore activities, with PRIME ENERGY providing helicopter transport to shore where required.

7.3 Additional Services

The Contractor shall provide, within **Appendix B** of the Contract, a complete unit-rate schedule for all accommodation and facility services described in this section, enabling PRIME ENERGY to request supplemental services such as mobilization of additional personnel to fabrication sites.

8.0 RESPONSIBILITIES OF PRIME ENERGY

8.1 Equipment, Supplies, and Support Services

PRIME ENERGY will furnish equipment, materials, and services as detailed in the Project Responsibility and Interface Matrix (reference [4]). It is incumbent upon Stratos Energy Ltd., hereafter referred to as the Contractor, to thoroughly review this documentation to identify any discrepancies or challenges that could impact the successful completion of the assigned scope of work.

Should any such issues be detected, the Contractor must propose technical solutions or highlight potential impacts that may affect execution.

Requests for deviations or qualifications regarding PRIME ENERGY-supplied items' specifications may only be accepted by PRIME ENERGY during project execution and prior to delivery, managed through established interface procedures. Any deviations or qualifications raised by the Contractor post-delivery shall be the sole responsibility of the Contractor if resulting from neglect.

However, if the Contractor demonstrates due diligence during the interface process, PRIME ENERGY will indemnify the Contractor against costs or schedule delays arising from deviations or qualifications raised after material delivery.

8.1.1 Materials Provided by PRIME ENERGY

Outlined below are the principal items supplied by PRIME ENERGY for the umbilical scope; further details are available in the PRIME ENERGY Plan and interface matrix.

Quantity	Item Description	Remarks
1 set	Tensioner Tracks/Pads from the Installation Contractor	
1 set	Electrical test connectors (onshore and subsea types) for Umbilical Termination Assembly (UTA)	Required for testing terminated umbilicals during manufacturing, transport, deployment, and commissioning
2 units	Test and flush stab plates for access to steel tube internals on UTA	Used during manufacturing, load-out, transport, and installation
2 sets	Electrical and hydraulic Long Term Production Control (LTPC) for UTA	If optional scope is activated, same quantity applies

Quantity	Item Description	Remarks
2 units	Umbilical Termination Heads (UTH) with hydraulic/chemical stab plates and electrical connectors	Optional quantities as above
1 set	Rigging, lifting, and installation equipment for onshore UTA handling	Specifications to be finalized during detailed engineering; Contractor responsible for storage and maintenance until delivery
1 set	Steel tube samples (all sizes) used in UTH welding qualification	For welding certification by the Umbilical contractor

Table 8-1 – PRIME ENERGY Supplied Items for Umbilical Delivery

All listed components will be supplied free of charge by PRIME ENERGY to the Contractor in appropriate quantities for integration and testing of the Umbilical System.

The Contractor shall establish and communicate the latest acceptable delivery dates for these items to ensure integration, testing, and verification do not impact the contractual delivery schedule. These milestones must be incorporated into the Contract Execution Plan and Baseline Schedule.

For returnable items supplied by PRIME ENERGY, the Contractor shall perform Preservation and Storage Management (PSM) prior to returning them.

Additionally, the Contractor is required to witness pre- and post-load-out testing of PRIME ENERGY-supplied items.

8.1.2 Onsite Support and Services Provided by PRIME ENERGY

At the offshore installation location, PRIME ENERGY will provide:

- Utilities such as water, air, steam, drainage, condensate return, fuel, hydraulic fluids, and electrical power for Contractor equipment; availability to be confirmed during execution.
- Welding down of equipment skids and containers to the rig deck, including scaffolding as necessary.
- Office accommodations with adequate communication infrastructure (telephone, copier, etc.) for Contractor personnel.
- Accommodation and meals for Contractor staff on installation vessels and drilling rigs.

8.1.3 Engineering Data and Documentation

The Contractor is responsible for reviewing all PRIME ENERGY-supplied design data and information relevant to the scope of work and must consider this data when conducting detailed design activities.

In the event of any inconsistencies, conflicts, or insufficient data, the Contractor shall notify PRIME ENERGY and collaboratively determine corrective actions. Technical Queries (TQs) shall be raised as per contract management procedures to seek clarifications.

8.2 Site Representation

PRIME ENERGY will assign site management personnel and representatives as specified in the contract. Their roles will include reviewing the Contractor's design documentation, fabrication methods, QA/QC processes, supervising changes, and inspecting works execution.

9.0 PROJECT INTERFACES AND RESPONSIBILITIES

The Project Responsibility and Interface Matrix (reference [4]) provides a comprehensive overview of the anticipated interfaces related to the scope of works. This facilitates thorough consideration of direct and indirect impacts on the Contractor's execution strategy and schedule.

The Contractor retains overall responsibility for the execution of works as defined in this document and associated contractual agreements, including but not limited to:

- Quality and quantity assurance of engineering and construction tasks within the Scope of Work.
- Manufacturing and delivery of umbilicals complete with all appurtenances.
- Obtaining all permits necessary to fulfill the contractual scope.
- Providing support during offshore testing, installation, pre-commissioning, commissioning, and start-up phases of the umbilical system.
- Pre-assembly, handling, transportation, and on-site storage of materials.
- Holding valid certification from recognized maritime classification societies.
- Provisioning of necessary equipment, personnel, and materials to complete the works per contract requirements.
- Recording data on appropriate digital media.
- Preparation and submission of technical reports.

The Contractor shall manage project interfaces in close cooperation with PRIME ENERGY and other appointed contractors.

It is the Contractor's duty to ensure all interfaces between their scope and those of other involved parties are identified, managed, and maintained. PRIME ENERGY has developed a comprehensive Interface and Responsibility Matrix (reference [4]) identifying all known interface points between Contractor scope and those of PRIME ENERGY and third parties.

The Contractor must promptly report any new or unidentified interfaces to PRIME ENERGY at the earliest stage of the project. PRIME ENERGY will assess and assign the appropriate stakeholders for interface resolution.

The Contractor shall adhere to PRIME ENERGY's Interface Management Procedure, which outlines protocols for interface coordination.

Key responsibilities of the Contractor include:

- Identifying and managing technical, executional, and organizational interfaces with PRIME ENERGY and other contractors.
- Managing internal interfaces within the Contractor's organization that may influence project delivery.
- Preparing project-specific Requests for Interface Information (RFII) and Interface Data Sheets for all external interfaces.
- Actively participating in Interface Management Team meetings.
- Scheduling, facilitating, and, when appropriate, chairing interface coordination meetings involving PRIME ENERGY, other contractors, subcontractors, and vendors.
- Collaborating with other contractors under PRIME ENERGY's control to agree on interface deliverables and timelines.
- Working proactively with PRIME ENERGY and contractors to identify and resolve potential interface issues before they affect project progress.
- Escalating unresolved interface issues promptly to PRIME ENERGY for intervention.
- Designating an Interface Coordinator to represent the Contractor in overseeing interface management and liaising with the project-wide interface system.

10.0 SCOPE OF SUPPLY

10.1 Overview

This chapter outlines the equipment supply scope for **PROJECT ALPINE**, consistent with the design principles established in the Basis of Design (reference [17]).

PRIME ENERGY emphasizes product standardization to facilitate potential expansion to additional fields within the Horizon South block by utilizing equipment built on the same fundamental design. Confirmation of this potential will be made once further details for these optional developments are finalized.

Certain specifications detailed below presuppose particular equipment configurations which may evolve as the design matures. Finalized scope and quantities will be determined at the Contract Award stage between the Contractor and PRIME ENERGY. It is the Contractor's obligation, subject to PRIME ENERGY's approval, to update this scope as designs develop to guarantee delivery of the required equipment in accurate quantities, fulfilling all project objectives and ensuring system operability.

The Contractor must identify all equipment and tooling necessary to meet contractual requirements—including compliance with the External Interface and Responsibilities Matrix (reference [4])—prior to Contract Award, incorporating them into both Scope of Supply and Scope of Work, and including them in the commercial proposal.

Any components omitted from the Master Equipment List but required for system functionality shall be supplied at the Contractor's cost. Modifications to scope, such as additions or reductions driven by PRIME ENERGY instructions or emergent needs, will be managed via Variation Orders. PRIME ENERGY will not accept Variation Orders arising from the Contractor's failure to identify required items during initial planning, considering such omissions a contractual breach.

Additionally, the Contractor is responsible for supplying all proprietary special tools essential for successful completion of the works that are unique to the Contractor's technology and unavailable from third parties.

The Contractor shall also include in the scope sufficient fabrication spares, particularly for long lead-time items, to prevent project delays due to manufacturing issues.

10.2 Equipment Qualification Criteria

The Contractor shall propose field-proven equipment wherever possible. Should any components require qualification specifically for PROJECT ALPINE, these must be identified during the bidding stage within the initial technology evaluation, along with a comprehensive qualification plan.

A thorough assessment of Technology Readiness Level (TRL) and Technical Risk Categorization (TRC) shall be performed covering all critical subsea components, documented in a dedicated report for PRIME ENERGY review and approval. Prior to Contract Award, this assessment must define:

- The agreed scope and criteria for testing and acceptance of equipment requiring qualification.
- A technology assessment report detailing all key subsea equipment proposed, substantiating TRL and TRC levels against project demands.
- Qualification plans for any equipment below TRL 4, including the scope of testing during execution to be agreed with PRIME ENERGY.
- Integration test plans and evidence (e.g., prototype testing, endurance tests, computational analysis) for equipment rated TRL 4 or 5 but not yet proven in operational environments.

Where the Contractor asserts certain equipment is field proven (TRL 6 or 7), adequate substantiation must be provided upon request, including:

- Reference projects with installation and operational timelines.
- Design parameters such as pressure, temperature, and water depth limits of qualified equipment.
- Certified qualification reports covering PR2 and endurance testing, available for PRIME ENERGY's review.

If such evidence is lacking, a contingency qualification plan must be included with the bid. PRIME ENERGY reserves the right to reject unproven designs or technologies, especially where project schedule constraints are critical.

10.3 Equipment Inventory

The following sections detail the major system components to be supplied:

10.3.1 Umbilical System

The Contractor shall deliver the Umbilical System as described in references [11], [12], [13], [14], [17], and [20]. This system comprises the following elements:

Description	Reference
Umbilical sections	10.3.1.1
Ancillary equipment	10.3.1.2
Additional items and hardware	10.3.1.3
Reels / Carousels	10.3.1.4

Description	Reference
Spare parts and umbilical spares	10.3.1.5
Operational spares	10.3.1.6
Optional components	10.3.1.7

Table 10-1 – Umbilical System Components

Within the Contract's Price List, the Contractor shall provide an optional quote for on-site storage of the umbilical system at the Contractor's base near the designated Delivery Point.

10.3.1.1 Umbilical Sections

The static umbilical configuration consists of one (1) section with the preliminary length indicated below:

Length (m)	Description	Remarks
8,549	Static infield umbilical	Final length to be determined by Installation Contractor in line with field layout

Table 10-2 – Umbilical Sections

The final umbilical lengths will be adjusted to reflect the detailed route and installation study completed by the Installation Contractor or subcontractor. The length specified here represents the two-dimensional layout and does not incorporate seabed contours or geological hazards. The Contractor must utilize geophysical and geotechnical survey data provided by PRIME ENERGY to finalize lengths that align with detailed routing and installation plans.

During detailed design, the Contractor may optimize umbilical cross-sectional design, subject to PRIME ENERGY approval, based on analyses of electrical power, communication, hydraulic flow, chemical delivery, and subsea system architecture.

The Contractor shall source electrical cables and steel tubes meeting the performance criteria derived from the subsea production system analysis. Cross-sectional layout may include filler materials (e.g., PVC, PE) to facilitate manufacturing efficiencies such as extrusion and laying-up operations.

10.3.1.2 Ancillary Equipment

As integral components of the Umbilical System, the Contractor shall supply all ancillary hardware directly or indirectly attached to the umbilicals necessary for full system functionality, in accordance with Contract requirements. The following non-exhaustive list defines key ancillary equipment items:

Quantity	Description	Notes/Remarks
2	Subsea end terminations/interface units (STI for UTA)	
As required	End fittings, plugs, couplings, adapters	
As required	Bend limiters/restrictors at subsea terminations	
As required	Sets of bolts, nuts, washers, gaskets, fasteners, seal rings	
As required	Crossing protection	Quantity per field layout to be defined by Contractor
As required	Escarpment protection	Quantity based on field layout and dedicated geophysical surveys to be performed
As required	Vortex Induced Vibration (VIV) breakers	
As required	Earthing straps	
As required	Anchoring collars/tethers	Installation methodology-dependent

Table 10-3 – Ancillary Equipment for Umbilical System

The Contractor is responsible for design and procurement of all umbilical protections mounted on the cross-section, coordinating with the Installation Contractor, who will also manage installation and related intervention works such as grout bags, sleepers, bitumen mattresses, and sand bags.

10.3.1.3 Additional Components and Equipment

Quantity	Description	Notes / Remarks
1	Offshore Repair Kit / Major Joint	Includes all necessary materials, consumables, and tools to perform full cross-sectional repairs offshore, restoring the integrity and functionality of the umbilical system without degradation. Kit shall contain sufficient splices, joints, and consumables to connect the unterminated spare umbilical to the main umbilical section, including terminations at both ends. Contractor shall submit detailed offshore repair procedures for approval by Client.
1	Outer Jacket Repair Kit	
2 sets	Dummy Bend Stiffener Flanges	
1	Lifting Equipment	Equipment for handling and lifting umbilical ends during manufacturing, load-out, and onboard installation vessels (including assemblies). Includes all lifting gear for handling reels onshore and offshore.
1	Emergency Abandonment Kit	Contains abandonment cap equipped with pad-eye for recovery operations.
1 set	Packaging Equipment (with UV Protection)	Includes tarpaulins for safe storage and transport of umbilical sections to the installation location; packaging solutions suitable for offshore commercial shipping for loose components.
As required	Test Equipment	Available on a rental basis.
1	Umbilical Monitoring Kit	Enables pressurization, monitoring, and re-pressurization of umbilicals during transit and installation. Comprised of a manifold with dedicated gauge, pressure relief valve, discharge line, and tank. Purchased item.

Quantity	Description	Notes / Remarks
1	Spare Umbilical Monitoring Kit	Similar to above but intended for spare umbilical sections. Purchased item.
As required	Repair and Maintenance Equipment	
As required	Loose Items	Storage containers suitable for offshore transportation including certified lifting slings. Must remain compliant with installation contractor requirements throughout installation campaign and return to delivery site.
As required	Installation and Commissioning Spares	Similar requirements to loose items above.
1	Hold-Back Clamp	For emergency temporary hold-back operations.
TBD	Umbilical Flat Desk Samples	
TBD	Umbilical Telescopic Desk Samples	
As required	Earthing Straps	
1 off	Umbilical Cross-Section Prototype	Length approx. 50 meters, terminated for load testing and supplied on reel. Available for collection by installation contractor prior to main load-out.

10.3.1.4 Reels and Carousels

For Umbilical 1, dedicated reels are not expected to be required due to the volume; the umbilical will be transpooled directly onto the installation vessel’s carousel. Responsibilities related to delivery, load-out, transportation, and installation are as defined in reference [4].

Optional umbilical sections and spare umbilicals shall be supplied on individual reels.

The Contractor shall provide all certified rigging required for securing umbilicals on reels or carousels and ensure all rigging is inspected and recertified as necessary during operations. Reels must include cradles, spreader bars, rigging, and UV protection (tarpaulins). Reels and cradles shall be suitable for offshore installation, compatible with standard industry under-rollers or reel hub drive units.

Reels must have proper partitions and side windows to allow easy access to umbilical terminations for electrical, optical, and hydraulic inspections during transport and installation. Multiple umbilicals may be coiled if required.

Installation reels, if used, remain the property of the Contractor and shall be provided to Client for the duration of the project.

10.3.1.5 Spare Parts and Spare Umbilical

Contractor shall prepare and submit for Client approval a detailed list of recommended spare parts and repair kits for the entire Umbilical system covering phases such as Offshore Installation, Testing, Hook-Up, and Pre-Commissioning.

Client specifically requests the following minimum spares:

Quantity	Description	Notes / Remarks
10% of project umbilical length	Spare Umbilical Section	Delivered on reels, unterminated, sealed with corrosion-resistant caps and equipped with monitoring kits to maintain cleanliness and fluid integrity. Electrical lines shall be sealed with water-resistant resin caps.
10% of subsea installed quantity	Spare Bend Restrictors	
As required	Loose Spare Items	For small items like washers, bolts, nuts, fittings, etc., 100% spare parts requested by Client.

Spare umbilicals shall be stored on dedicated reels compatible with under-roller spooling and transpooling operations, complete with cradles, rigging, and certified spreader bars.

Each reel shall be covered with a protective tarpaulin or equivalent. Spare umbilicals must have integrated pressure monitoring systems.

Following Client’s acceptance of the spare parts list, all spares required for installation, testing, hook-up, and pre-commissioning shall be delivered concurrently with the main equipment.

Reels shall have partitions and side windows for easy access to umbilical terminations for integrity checks.

10.3.1.6 Operational Spares

No operational spares are anticipated for the umbilical system, as the equipment and ancillary components are designed to operate without routine maintenance or part replacement during their design life.

Should the Contractor recommend operational spares, these must be supplied at no additional cost to the Lump Sum contract price.

10.3.1.7 Optional Scope

The Contractor shall consider an optional scope for the supply of the following umbilical system:

Preliminary Length	Description	Notes / Remarks	Option Confirmation Date
2572 m	Static Infield Umbilical (Umbilical 2)	Length to be finalized by Installation Contractor based on field layout	TBD

This optional scope shall adhere to the requirements set forth in section 10.3.1.1 and shall include all necessary ancillary and other equipment as per sections 10.3.1.2 and 10.3.1.3 for installation and operation.

The Contractor shall confirm whether the equipment listed in section 10.3.1.3 suffices for the optional umbilical; if not, the Contractor shall include additional required items.

The optional umbilical and spare sections shall be delivered on individual reels. Spare sections of the optional umbilical may be delivered on the same reel as the spare umbilical from section 10.3.1.5.

Certified rigging shall be provided for packaging umbilicals on reels or carousels, with inspection and recertification during operations. Reels must be fitted with cradles, spreader bars, rigging, and UV protection (tarpaulin), suitable for offshore installation using standard industry equipment.

Reels shall have partitions and side windows for easy access to umbilical terminations during transport and installation, allowing coiling of multiple umbilicals if needed.

Installation reels for this option shall be provided to Client on a rental basis.

Spare parts requirements for the optional umbilical shall follow the provisions in section 10.3.1.5.

All applicable requirements for Umbilical 1 apply equally to the optional scope if exercised by Client.

11.0 SCOPE OF WORK AND SERVICES

11.1 General Overview

This section outlines the detailed responsibilities assigned to the CONTRACTOR for the Project, which must be executed in strict accordance with the Contract requirements, the developed Front-End Engineering Design (FEED), CLIENT's technical specifications, and applicable regulatory standards.

All phases of work carried out by the CONTRACTOR, ranging from engineering to dispatch, pre-commissioning, and as-built documentation, shall be subject to CLIENT's inspection and formal approval.

For further scope details not explicitly covered here, CONTRACTOR shall refer to the Project Responsibility and Interface Matrix (reference [4]).

11.2 Summary of Scope of Work

11.2.1 Detailed Engineering Phase

11.2.1.1 General Engineering Requirements

The CONTRACTOR shall develop all detailed design and installation engineering documents, covering both temporary and permanent works essential for successful Project completion. This includes engineering support for:

- Procurement
- Fabrication
- Testing
- Load-out and sea fastening
- Transportation
- Pre-commissioning support

- Integrated commissioning assistance

The complete Umbilical System, including any third-party supplied equipment, must be covered. The CONTRACTOR shall provide experienced personnel and necessary facilities to ensure high-quality delivery of all engineering services.

Where subcontractors produce engineering deliverables, the CONTRACTOR remains responsible for thorough review, verification, and approval of their documentation prior to submission to CLIENT and other relevant parties. Given the Project's fast-track nature, concurrent reviews with subcontractors may be permitted, subject to mutual agreement.

The CONTRACTOR shall schedule and conduct periodic design reviews (number to be agreed) with CLIENT participation, providing advance notice per Contract Coordination procedures. These reviews shall be reflected in the CONTRACTOR's project schedule.

Upon CLIENT's request, the CONTRACTOR shall review documents from other contractors or third parties and actively participate in coordination and interface meetings.

It is the CONTRACTOR's obligation to deliver a fully safe, operational subsea system for the entire design life. All engineering must ensure that equipment meets functional and safety requirements. Upon request, the CONTRACTOR shall demonstrate compliance through calculations and technical data (excluding proprietary content), available for CLIENT's review.

11.2.1.2 Basic Engineering and FEED Package Endorsement

Prior to Contract Award, the CONTRACTOR shall perform a comprehensive review of the Basic Engineering and FEED documentation included in the Invitation to Tender (ITT) package, resolving inconsistencies and acquiring any missing data needed to complete the WORK.

The CONTRACTOR shall endorse the FEED package issued by CLIENT (excluding RELY UPON INFORMATION sections). Updates stemming from newly received information during detailed design and execution phases shall be the CONTRACTOR's responsibility to incorporate. Any inability to do so, or impacts on cost or schedule, shall be promptly communicated to CLIENT, with further action agreed upon collaboratively.

A Design Verification Report highlighting errors, omissions, or discrepancies, along with an FEED Acceptance Note, shall be submitted for CLIENT approval.

This endorsement process shall include, but not be limited to:

- Verifying consistency across reports, drawings, specifications, and data sheets.

- Reviewing hydraulic and electrical analyses.
- Confirming incorporation of appropriate safety instrumentation and compliance with relevant codes and regulations.
- Endorsing subsea distribution P&IDs and umbilical datasheets (excluding flow assurance, hydrate mitigation, and chemical hydraulic studies).
- Validating mechanical design conditions to meet project requirements.
- Identifying and resolving inadequacies or conflicts in CLIENT-supplied specifications.
- Addressing outstanding FEED actions from HAZOP and HAZID reports via necessary design modifications.
- Integrating all endorsed documentation into the final detailed design package.

11.2.1.3 Detailed Umbilical System Design

The CONTRACTOR shall perform the detailed design of the umbilical system and associated ancillary equipment, ensuring full compliance with CLIENT requirements, project standards, applicable laws, and norms.

The CONTRACTOR shall submit for CLIENT approval detailed physical and performance data, including but not limited to:

- Fatigue analysis and detailed design of vortex-induced vibration (VIV) mitigation devices, if applicable.
- Design inputs for protective measures, supports, and corrections to free spans.
- Minimum bend radius as a function of tension under load- and displacement-controlled conditions.
- Bend stiffness.
- Overall outer diameter.
- Maximum permissible free span.
- Weight per unit length in air (empty and filled with shipping fluids).
- Weight per unit length in seawater (with seawater in interstices and operating fluids in tubes).
- Maximum allowable loading conditions.
- Accumulated Plastic Strain (APS), accounting for steel tube reeling, manufacturing, packing, load-out, transportation (including vessel-to-vessel

transpooling if required), and one recovery/re-installation cycle. APS must remain within a 15% nominal limit.

The CONTRACTOR shall coordinate with the Installation Contractor through interface management to validate key assumptions such as vessel chute radius, reel diameter, and deflector radius, ensuring alignment with the installation methodology.

Deliverables shall include detailed design reports, drawings, memoranda, engineering philosophies, material take-off (MTO), and all required documentation.

The CONTRACTOR shall develop design briefs covering:

- Required inputs for analyses.
- Applicable codes, CLIENT specifications, and project standards.
- Analytical methods, modeling techniques, assumptions, and post-processing approaches.
- Software tools employed.
- Methodology, to be submitted for CLIENT approval prior to commencing analyses.

11.2.1.4 Detailed Design of Foundations (Piles and Mudmats)

The CONTRACTOR shall confirm the suitability of foundations supporting all subsea structures. The following deliverables shall be submitted for CLIENT review and approval:

- Design assumptions for foundations;
- Geotechnical design report for foundations;
- Structural design report for foundations, including load calculations;
- Foundation layout and fabrication drawings.

Given the known uncertainties in geotechnical and geophysical data since tendering, CLIENT requires that any redesign of foundations due to updated soil information be covered by a comprehensive set of unit rates (e.g., steel weight, fabrication, vessel day rates). CLIENT will not accept change orders related to engineering redesign efforts.

11.2.1.5 Weight Control

The CONTRACTOR shall implement and maintain a system for tracking the weight and center of gravity of all equipment under this contract. Regular reports of weight data and center of gravity shall be provided to CLIENT.

All equipment shall remain within agreed weight limits. The CONTRACTOR must obtain CLIENT approval prior to executing any work that may cause weight limits to be exceeded.

The CONTRACTOR shall conduct all weighing activities according to submitted procedures subject to CLIENT approval. Each major equipment item shall be weighed upon completion, prior to shipment, with weight data marked on the item and recorded in as-built documentation.

Weight control shall comply with CLIENT's standards (e.g., document refs 20186.ENG.MET.REL, 20187.ENG.MET.REL) and internationally recognized standards such as ISO 19901-5.

11.2.1.6 CONTRACTOR's Specification Development

The CONTRACTOR shall prepare a complete list of specifications required for SUBCONTRACTOR work to ensure proper performance and project completion. Any additional specifications beyond the Contract documentation must be provided to CLIENT.

11.2.1.7 Engineering Support

The CONTRACTOR shall provide engineering support from their base location during and following Site Integration Testing (SIT), Site Readiness Testing (SRT), pre-commissioning, final commissioning, and start-up activities. This support shall be considered an integral part of the contract with no separate variation claims permitted.

This support is distinct from reimbursable Technical Assistance Services.

Minimum scope for up to 24 months after the effective date includes:

- Updates to records and as-built drawings;
- Technical investigations and troubleshooting;
- Creation of new documentation as required;
- Revisions of operations and maintenance manuals and procedures;
- Support for CONTRACTOR personnel offshore;
- Support through installation and commissioning phases.

11.2.1.8 Technical Assistance Services

On a reimbursable basis, the CONTRACTOR shall provide technical assistance for:

- Integration activities at third-party fabrication yards;

- Installation support on other contractors' marine spreads during installation, pre-commissioning, commissioning, and start-up;
- Commissioning and start-up support on Floating Production Units (FPUs).

11.2.1.9 Failure Mode, Effects, and Criticality Analysis (FMEA) and Reliability, Availability, Maintainability (RAM)

The CONTRACTOR shall perform and submit a detailed FMEA for all scope items, emphasizing critical components. A risk-based criticality assessment shall be developed early during detailed engineering to identify critical items.

The CONTRACTOR shall provide necessary input data to support RAM analyses performed by other parties.

The RAM analysis outputs will guide maintenance strategy development, planning, and identification of critical parts.

Overall system reliability shall comply with requirements specified in the Basis of Design (ref. [17]).

11.2.1.10 Hazard Identification and Operability Studies (HAZID and HAZOP)

The CONTRACTOR shall organize internal HAZID and HAZOP workshops and notify CLIENT with sufficient lead time for participation.

Follow-up and close-out reports for all HAZID and HAZOP actions shall be issued.

11.2.2 Procurement Activities

11.2.2.1 Procurement Management System

The CONTRACTOR shall establish and maintain a procurement management organization staffed with qualified personnel responsible for purchasing, expediting, inspection, transportation, and delivery of all materials and equipment required to fulfill the scope.

An Approved Vendor List shall be proposed in the technical proposal and maintained for CLIENT approval during execution.

11.2.2.2 Material Take-off

The CONTRACTOR shall prepare detailed material take-offs, including required site delivery dates, covering all items, including those supplied by CLIENT.

11.2.2.3 Procurement Planning and CLIENT Involvement

Procurement activities shall commence sufficiently early to comply with the overall Project schedule. The CONTRACTOR shall prepare a Procurement Plan including specification preparation and supplier/subcontractor prequalification.

The CONTRACTOR must keep CLIENT fully informed of all materials and equipment incorporated into the scope for quality control and certification purposes.

All procurement documentation must be submitted timely for CLIENT review and approval without delaying the CONTRACTOR.

CLIENT's approval of procurement activities does not transfer responsibility or liability to CLIENT for the materials or equipment.

If CLIENT reasonably rejects any materials or equipment due to origin, specification, or quality concerns, the CONTRACTOR shall propose alternatives at no additional cost or schedule impact.

CLIENT reserves the right to inspect any material or equipment at CONTRACTOR or subcontractor facilities.

11.2.2.4 Third Party Inspection

CLIENT may appoint third-party inspectors to verify fabrication and supply compliance.

CONTRACTOR shall coordinate and provide 10 calendar days' written notice for inspection readiness.

No work shall be concealed or removed without CLIENT notification, allowing inspection without project delays.

Adequate safety and access facilities must be provided to inspectors.

If CLIENT identifies non-compliance, CONTRACTOR shall at its cost:

- Rectify defects, including redesign, repair or replacement;
- Repeat tests or inspections as required on similar affected components.

11.2.3 Fabrication Activities

11.2.3.1 General Requirements

Manufacturing shall conform to this Scope, CLIENT's Basis of Design (ref. [17]), approved CONTRACTOR documents, and applicable codes and standards.

Materials must be clearly marked and traceability maintained throughout fabrication.

CONTRACTOR shall perform all fabrication, assembly, erection, and testing necessary to complete the WORK.

11.2.3.2 Welding

Welding procedures and specifications shall be clearly identified in design documents and submitted to CLIENT for approval prior to fabrication start.

Pre-qualified procedures from previous projects (e.g., Jangkrik, Merakes) may be accepted if they meet current requirements or are supplemented by mock-up testing.

All welders must be qualified per approved procedures.

Repair welding requires prior CLIENT approval of repair procedures.

CONTRACTOR scope includes welding of steel tubes within umbilical termination heads (UTH), including welding collars and adaptors.

Dissimilar metal welding considerations (e.g., 25Cr SDSS, 6Mo, Alloy 625) must be accounted for, with necessary procedure qualifications by third parties if transition pieces are not supplied.

11.2.3.3 Assembly

Assembly shall follow CONTRACTOR-generated drawings and procedures aligned with CLIENT specifications.

11.2.3.4 Repairs

Ongoing repair activities must be monitored, documented, and reported to CLIENT.

Defect management follows CLIENT’s specifications and contract appendices.

CLIENT response time for major non-conformance reports is two weeks.

The CONTRACTOR assumes risk for parallel handling of non-conformances; CLIENT reserves right to reject non-compliant items.

11.2.3.5 Temporary Protection

The CONTRACTOR shall provide adequate temporary protection against weather, ambient conditions, and damage risks during fabrication, storage, transport, and load-out. Long-term storage protections may require CLIENT approval.

11.2.3.6 Inspection

A comprehensive inspection plan shall be developed by CONTRACTOR and submitted for CLIENT approval.

CLIENT reserves rights to witness inspections, which must be completed and documented before shipment.

The CONTRACTOR shall ensure all inspections verify compliance with specifications, interfaces, finish, and damage-free condition.

Inspection records shall be provided to CLIENT upon request.

CLIENT may require additional inspections or tests as necessary.

11.2.4 Onshore Testing

11.2.4.1 Overview

The CONTRACTOR shall execute all necessary testing to verify the integrity and suitability of all supplied products, adhering to ISO 13628-5, applicable international standards, Project documentation, referenced specifications, and CONTRACTOR's Detailed Design. A comprehensive test program shall be developed, covering but not limited to the following:

- Compatibility testing of materials;
- Umbilical product qualification tests;
- Component testing during manufacturing;
- Verification tests of umbilical design;
- Factory Acceptance Tests (FAT) of umbilical and components;
- Extended Factory Acceptance Test (EFAT) program;
- Pre-load-out testing;
- Monitoring of pressure and electrical parameters during load-out;
- Post-load-out verification testing.

At every testing stage, the CONTRACTOR shall demonstrate compliance or superiority relative to specified test requirements and acceptance criteria for materials, components, sub-assemblies, or complete systems.

11.2.4.2 Umbilical Qualification and Design Verification

Qualification tests for the umbilical are not mandatory if sufficient historical performance data is provided.

Verification testing shall be performed on umbilical cross-sections in accordance with COMPANY specifications and ISO 13628-5. The CONTRACTOR shall ensure availability of sufficient umbilical samples for test procedures and equipment, specifying test lengths within documentation submitted for COMPANY review and approval.

Refer to Ref. [11] for the detailed list of verification tests.

11.2.4.3 Factory Acceptance Testing (FAT)

Each individual component, equipment piece, and fully assembled system shall undergo Factory Acceptance Testing to confirm compliance with performance criteria.

The CONTRACTOR shall prepare and submit Inspection and Test Plans (ITP), FAT programs, and procedures including acceptance criteria for COMPANY's review and approval.

COMPANY reserves the right to require additional tests or amendments to the FAT program to ensure product suitability. No FAT may commence without prior COMPANY approval of the test procedures.

All approved test documentation shall be available on-site prior to FAT execution. The CONTRACTOR shall provide advance formal notification of FAT schedules and promptly communicate any changes.

COMPANY will arrange for qualified representatives to witness testing.

Completion of all tests and inspections under approved FAT protocols, and issuance of a release certificate by the COMPANY inspector, are prerequisites for shipment of equipment.

The CONTRACTOR shall provide all required resources including equipment, tools, fluids, instrumentation, power, and consumables for FAT execution.

11.2.4.4 Extended Factory Acceptance Testing (EFAT)

Following assembly of umbilical end termination units (UTHs), the Umbilical System shall undergo an Extended Factory Acceptance Test.

The CONTRACTOR shall generate EFAT procedures and documentation, subject to COMPANY review and approval prior to commencement.

EFAT will be performed at the umbilical manufacturer's facility after the main FAT and closure of punch list items.

EFAT objectives include, but are not limited to:

- Flushing and filling hydraulic and chemical injection lines with designated shipping fluids, including purging and drying as required;
- Verifying connection continuity and integrity between hydraulic lines and subsea umbilical termination pipework;

- Ensuring no functional misalignments or swapping in hydraulic couplings and electrical connectors on termination exteriors;
- Conducting tests aligned with COMPANY specifications and ISO 13628-5 Annex B, replicating operational configuration;
- Confirming proper installation of electrical connectors, including wet-condition insulation resistance testing post cable termination;
- Verifying integration of all Umbilical System components;
- Performing mechanical and structural fit checks;
- Conducting fitment trials for all ancillary equipment including bend restrictors and rigging tools, demonstrating bend restrictor assembly avoids locking during lay;
- Performing pull tests on sample sections with hold-back clamps, including destructive tests to assess damage;
- Validating hydraulic and electrical functions prior to offshore installation per ISO 13628-5 testing scopes;
- Executing any additional tests requested by COMPANY before final packing on reels or carousels.

COMPANY and other contractor representatives shall have full access to witness tests and inspect equipment.

All EFAT testing and punch list resolutions must be completed before the load-out phase.

11.2.4.5 Fit-Up Testing

All fit-up and assembly tests of ancillary equipment shall be conducted at the CONTRACTOR’s facility to confirm proper integration of all supplied components.

The CONTRACTOR is responsible for identifying and performing all fit-up tests necessary to avoid impacts on the installation schedule or project start-up. Any delays or constraints resulting from omission of required fit-up tests are the sole responsibility of the CONTRACTOR.

Fit-up testing includes interface verification for installation aids that connect with subsea umbilicals.

11.2.4.6 Site Integration Testing (SIT)

11.2.4.6.1 SIT Execution by CONTRACTOR

The CONTRACTOR shall conduct Site Integration Tests to verify the compatibility and installation feasibility of the umbilical system.

Umbilical SIT
The objective is to confirm that the umbilical can be safely installed with the proposed equipment. The scope shall include, but is not limited to:

- Conducting friction and crush tests on the umbilical using the actual tensioner pads intended for use on the installation vessel;
- Performing installation trials for clamps or bend restrictors on representative umbilical samples, where applicable.

11.2.4.6.2 Support for SITs by Other Parties

The CONTRACTOR shall participate in any SITs executed by other contractors involving its equipment, represented by qualified personnel and design engineers engaged in the WORK. Any design modifications arising from these tests shall be agreed upon with COMPANY before implementation.

Where required, the CONTRACTOR shall supply and transport dummy equipment to designated SIT locations.

11.2.4.7 Pre-Load-Out Testing

If ISO 13628-5 conditions necessitate, the CONTRACTOR shall perform pre-load-out testing. Such testing shall be witnessed by COMPANY and the installation contractor, adhering strictly to ISO 13628-5 requirements.

The CONTRACTOR shall prepare and submit a Pre-Load-Out Test Procedure for COMPANY approval. This procedure shall detail the tests to be performed at dockside immediately before load-out to validate umbilical integrity.

Following successful testing and COMPANY acceptance, a release certificate will be issued permitting shipment from CONTRACTOR’s facility.

11.2.4.8 Post-Load-Out Testing

Upon completion of transpooling, the CONTRACTOR shall conduct post-load-out tests to confirm that no damage occurred during handling and load-out operations. COMPANY and the installation contractor shall witness these tests.

The CONTRACTOR shall prepare a Post-Load-Out Test Procedure for COMPANY approval, outlining the integrity checks to be performed.

A release certificate will be issued by COMPANY after successful completion and acceptance of these tests prior to shipment from the CONTRACTOR’s facility.

11.2.4.9 Monitoring During Load-Out

The CONTRACTOR shall continuously monitor the integrity of steel tubes and electrical cables in the umbilical throughout transpooling, load-out, and transport, consistent with ISO 13628-5.

This monitoring will be achieved by connecting pressure and electrical instrumentation to both umbilical terminations, with real-time data reviewed near the main carousel operator.

All necessary equipment—manifolds, valves, gauges, transmitters, etc.—shall be provided to monitor all tubes and cable cores, including spares.

Monitoring data shall be recorded and included in the umbilical manufacturer’s data book post-transpooling.

Personnel support and appropriate facilities shall be provided by CONTRACTOR during transpooling, lifting, load-out, and testing operations per COMPANY specifications and industry standards.

11.2.4.10 Handover

The official transfer of custody from CONTRACTOR to COMPANY’s appointed installation contractor will occur after successful completion and COMPANY approval of post-load-out tests and documentation. A delivery certificate will be issued accordingly.

Final transfer from CONTRACTOR to COMPANY requires mutual written acceptance of testing outcomes and documentation.

CONTRACTOR shall notify COMPANY and permit representative attendance during pre-load-out and post-load-out tests.

Transportation frames, rigging, and installation aids must be certified for offshore and vessel-to-vessel transfer per relevant standards. CONTRACTOR shall re-certify these items prior to handover, ensuring certificates have at least ten months’ validity at the time of transfer.

11.2.5 Storage and Transportation Activities

11.2.5.1 Storage

CONTRACTOR shall provide a suitable storage facility for all fully assembled and tested equipment, subject to COMPANY approval, at no additional cost. Storage may last up to 180 days at CONTRACTOR’s manufacturing site before load-out.

Upon removal from storage, equipment shall be re-tested per agreed procedures to confirm it retains its "as tested" status.

A dedicated packing and preservation procedure shall be developed for each equipment item, detailing inspection, maintenance, and preservation tasks during storage. Re-certification of lifting devices during storage shall be accounted for by CONTRACTOR.

The storage environment must be controlled, secure, and protect equipment integrity and longevity.

CONTRACTOR shall verify performance and integrity of all stored items to ensure suitability for operation.

Storage and testing procedures shall be submitted for COMPANY review and approval and shall cover at minimum:

- Protection from weather and ambient conditions;
- Storage maintenance;
- Periodic inspections and maintenance;
- Notification procedures for equipment usage;
- Corrosion protection and temporary coatings;
- Storage conditions including temperature and humidity ranges.

If storage exceeds 180 days, CONTRACTOR shall have provisions to continue storage upon COMPANY request and agreed costs, for up to two additional years post-delivery. Such extended storage shall be reimbursed per the contract's compensation terms.

11.2.5.2 Equipment Release Process

Prior to shipment, an Inspection Release Note (IRN) shall be signed by both CONTRACTOR and a COMPANY representative or designated staff.

The IRN will confirm that all manufacturing tests and inspections have been completed and that the equipment complies with contract requirements.

Despite COMPANY's IRN sign-off, the CONTRACTOR retains responsibility for the shipped items.

11.2.5.3 Packaging

After storage and COMPANY approval for delivery, CONTRACTOR shall package and ship the goods per Scope of Work requirements and Ref. [3].

Rental tools shall be packed in reusable metal boxes or frames, with baskets supplied for offshore transport.

Reel marking requirements shall include, at minimum:

- Gross weight (wet and dry);
- Direction of reel winding;
- Associated packing drawing number;
- Identification details such as umbilical ID and manufacture date.

Reels shall be designed for offshore installation compatibility, supporting standard hub drive systems and under-roller installation methods.

Complete reel systems shall include cradles, rigging (spreader bars, slings), and heavy-duty tarpaulins to protect against weather, UV, and rough seas. Tarpaulin designs for reels stored on transportation carousels shall be approved by COMPANY.

Direct welding of umbilicals to reels is prohibited. All sea-fastening shall connect mechanically to pre-installed fittings like D-rings or pad eyes. Sea-fastening components shall be installed empty or welded only to reel ancillary structures.

Major reel modifications require oversight by an independent verification organization.

Reel hub interface templates shall be provided if requested by COMPANY.

Recent third-party inspection reports shall be supplied for reels, with 100% magnetic particle inspection (MPI) and visual inspection of critical welds before use.

Transportation reel/carousel designs must be certified by recognized independent bodies (e.g., DNV, ABS).

CONTRACTOR shall ensure adequate tensioning during umbilical reeling to prevent slack and residual torsion during installation.

Compatible cradles, spreader bars, rigging, and UV protection shall be supplied with packaging reels.

Shipping lists detailing description, dimensions, weight, and quantity of all equipment to be loaded on installation or transportation vessels shall be submitted for COMPANY approval.

11.2.5.4 Load-Out, Transport, and Delivery

Load-Out begins immediately before lifting of CONTRACTOR-supplied equipment or transpooling of umbilicals onto the Installation Contractor’s designated vessel and concludes once that vessel departs the quayside.

Any delays during load-out attributable solely to the CONTRACTOR's management or control will be the CONTRACTOR's responsibility, limited to direct costs incurred.

The CONTRACTOR shall handle transportation and delivery of equipment to other COMPANY contractors' sites as required.

To facilitate this, the CONTRACTOR shall perform the umbilical system load-out, providing all personnel, equipment, procedures, and engineering analyses necessary to guarantee safe handling. All documentation related to load-out activities must be submitted for COMPANY review and approval.

Temporary steelwork required to move equipment from the CONTRACTOR's logistics facility to the vessel's sea-fastening grillages shall be supplied by the CONTRACTOR.

Pre-load-out testing shall be completed prior to load-out.

During load-out, equipment must be staged close enough to the quay edge for vessel crane access. The specific transportation vessel type and class will be determined during detailed engineering.

CONTRACTOR shall provide 24/7 shore base support, facilities, equipment, and assistance to COMPANY and the installation contractor for all load-out activities.

Prior to load-out, all goods and equipment shall be inspected visually for completeness and condition by representatives of CONTRACTOR, COMPANY, Installation Contractor, and any third parties. Inspection results must be documented and signed off by all parties. Verification against the approved shipping list shall also be conducted.

During transpooling, the CONTRACTOR shall assist the Installation Contractor in planning and executing operations to meet safety, security, schedule, and technical requirements. CONTRACTOR will provide all necessary onshore equipment and services such as rollers, tensioners with towers, walkways, and lighting.

The CONTRACTOR shall ensure the first umbilical end termination is positioned on the quay for crane lifting by the Installation Contractor.

A communication system and protocol shall be established, agreed upon by all parties, to coordinate personnel during transpooling operations.

Continuous monitoring of the umbilical's integrity during transpooling will be the CONTRACTOR's responsibility, working closely with the Installation Contractor to provide data and assurance of product condition.

Upon completion of transpooling, the CONTRACTOR shall ensure the final end termination is positioned for crane lifting and shall conduct post-load-out testing before handing over the equipment.

Office accommodations for COMPANY, Installation Contractor supervisors, and third-party representatives shall be provided at the load-out or quayside facilities, if separate from the CONTRACTOR's main site.

Lifting equipment must be coordinated in advance between quay and vessel, with clear communication to the vessel's bridge about loading operations.

All necessary documentation to complete handover, including the Handover Certificate, must be submitted to COMPANY by CONTRACTOR.

Umbilical steel tubes shall be pressurized to a level equivalent to the operating water depth, with final pressure values defined during contract execution. Variations in temperature and installation sequence shall be considered to prevent seawater ingress.

The CONTRACTOR is liable for goods until handover, which only occurs after successful post-load-out testing. For detailed responsibilities between CONTRACTOR and installation contractor, refer to [4].

All lifting equipment for operations shall be supplied by CONTRACTOR; however, lashing and sea-fastening is the Installation Contractor's responsibility.

11.2.5.5 Sea-Fastening Study

As a contractual deliverable, the CONTRACTOR shall prepare a sea-fastening study including but not limited to:

- Procedures;
- Design assumptions;
- Sizing calculations;
- Drawings.

This study must cover all items supplied under the contract and be suitable for COMPANY's use during offshore transportation of the equipment.

11.2.5.6 Support After Handover

To support COMPANY during commissioning and start-up phases, CONTRACTOR shall provide services upon COMPANY request.

The CONTRACTOR shall maintain 24-hour daily support onboard the Installation Vessel and HOST FACILITY during offshore operations involving the umbilical system, including but not limited to:

- Transportation to offshore site;

- System monitoring and testing offshore;
- Preparation and execution of deployment;
- Subsea tie-ins;
- System abandonment and possible future recovery;
- Pull-in and hook-up to control platform;
- Pre-commissioning, commissioning, and start-up activities.

On the HOST FACILITY, support includes pull-in, hook-up, and commissioning activities.

Reimbursement for offshore support shall follow APPENDIX A of the contract covering personnel and equipment.

CONTRACTOR representatives on vessels and facilities shall ensure handling, installation, and testing comply with recommended guidelines and procedures, possess necessary qualifications, and be capable of umbilical outer sheath repairs if needed.

The CONTRACTOR shall calculate and confirm to the Installation Contractor, through COMPANY interface management, the volume of hydraulic shipping fluids required for monitoring, refilling, and offshore testing.

Rental of installation and testing tools for installation, pre-commissioning, and commissioning shall be provided by CONTRACTOR, including tools for topside umbilical termination connections.

A qualified team equipped for major umbilical repairs, including dynamic section replacement and splicing, shall be maintained on standby and mobilized as required throughout the offshore campaign until commissioning completion.

Personnel selected for offshore assistance must be supplied with suitable PPE, comply with all health, safety, and offshore regulations, and meet immigration requirements including visas, medicals, and permits.

11.2.5.7 Daily Progress Reports

All offshore support teams, logistics bases, and onshore fabrication sites shall issue detailed daily progress reports, including comments and observations from COMPANY representatives as needed.

11.2.6 Maintenance and Repair

11.2.6.1 Maintenance and Repair Procedures

The CONTRACTOR shall provide detailed maintenance and repair procedures for all equipment, specifying part numbers, for the entire equipment lifecycle. These shall be submitted to COMPANY for review and approval before equipment delivery.

The information shall include at minimum:

- Scope of services including personnel, facilities, and spare parts;
- Step-by-step maintenance procedures with exploded views;
- Location of workshops and service offices;
- Contact personnel with phone numbers;
- Comprehensive spare parts lists with delivery lead times and recommended inventory levels.

The CONTRACTOR shall update maintenance and repair documentation throughout the equipment's operational life up to warranty expiration and provide these updates to COMPANY.

Any changes to the maintenance program that could negatively affect the system require COMPANY approval and prior notification.

Maintenance procedures shall at least cover:

- Routine preventive maintenance;
- Storage maintenance for both short- and long-term;
- Repair or replacement of minor failed components;
- Repair of major component failures;
- Refurbishment after operational use;
- Field repair of coatings;
- Fault diagnosis;
- Management of spare parts and sub-assemblies.

11.2.6.2 Maintenance and Repair Services

Following delivery of the supplied equipment to COMPANY (particularly for purchased items), the CONTRACTOR shall guarantee and carry out continuous preventive maintenance and regular post-operation servicing throughout the entire installation campaign. Additionally, the CONTRACTOR shall provide repair services during offshore activities and post-operation maintenance until the applicable warranty period expires, ensuring equipment remains operational at all times.

These services will be performed by CONTRACTOR's offshore and onshore personnel as part of the technical assistance scope included within the CONTRACTOR's lump sum/reimbursable personnel costs.

Extraordinary maintenance or repairs required due to damage caused by COMPANY or its affiliates shall be charged separately according to the rates defined in the CONTRACT's Compensation section. Only these extraordinary services will be reimbursed additionally.

For rental equipment, routine preservation and maintenance services are included within the rental fees detailed in the CONTRACT's Price List and are not subject to further adjustments.

11.2.7 Pre-Commissioning and Commissioning

The CONTRACTOR shall assist COMPANY and other contractors in developing procedures for hook-up, pre-commissioning, commissioning, and start-up covering the entire Scope of Supply. These procedures will be systematized and agreed with COMPANY during execution.

The CONTRACTOR shall provide comprehensive engineering support, services, and offshore assistance as required throughout hook-up, pre-commissioning, commissioning, and start-up phases. Offshore services provided by CONTRACTOR personnel will be reimbursable as Technical Assistance Services (see section 11.2.1.8) at rates defined in the CONTRACT's Compensation section.

All CONTRACTOR personnel assigned offshore must be fully qualified and familiar with the equipment on which they will operate.

The CONTRACTOR shall ensure all personnel deployed offshore comply with mandatory health and safety regulations as specified by the Health and Safety Executive and the CONTRACT's "HSE-R" requirements.

11.2.8 CMMS Input Data

Based on the Project Master Equipment List and maintenance procedures prepared for each system or equipment, the CONTRACTOR shall complete and submit CMMS input data sheets for COMPANY approval as specified in references [24], [27], and [28]. These CMMS inputs are part of the Life Cycle Information (LCI) deliverables and must be incorporated in the CONTRACTOR's LCI plan.

The CONTRACTOR shall provide adequate resources to support COMPANY in implementing the CMMS for its scope and supply the necessary input data.

Scope of work includes but is not limited to:
a) Customization of the CMMS software—CONTRACTOR will fully support

COMPANY's Flowline & Installation contractor in tailoring the system, allocating sufficient man-hours as included in the firm scope of APPENDIX A of this CONTRACT.
b) Management of inspection, testing, and certification (including FAT, SIT, SRT) of CONTRACTOR-supplied items. CONTRACTOR shall utilize its own systems but must ensure all signed certification documents are traceable within the system.
c) Item preservation tracking.
d) Punch list management.

11.2.9 Spare Parts

The CONTRACTOR shall submit a comprehensive, priced, and coded spare parts and consumables list covering all supplied equipment, complying with CONTRACT requirements. The Spare Parts Interchangeability Record (SPIR) form included in ref. [27] shall be completed accordingly.

Efforts should be made to maximize spare parts commonality with the Jangkrik project equipment. The spare parts list shall include both categories described in sections 11.2.9.1 and 11.2.9.2, combined into the same SPIR form. Lead times and recommended reorder quantities shall be detailed. Spare parts for subcontractors' equipment must also be included with corresponding subcontractor part numbers.

11.2.9.1 Spare Parts for Onshore/Offshore Testing, Installation, Pre-Commissioning, Commissioning, and Start-Up Periods

To define the appropriate quantity of spare parts for these phases, the CONTRACTOR shall assume that a well must be drilled and completed (including associated Xmas Trees), and the entire subsea network installed to achieve the development project's start-up.

The CONTRACTOR is fully responsible for determining the correct types and quantities of spare parts required to avoid downtime of drilling rigs and installation vessels based on installation requirements and COMPANY's installation philosophies.

The CONTRACTOR shall propose this recommended spare parts list for COMPANY's agreement on type and quantity prior to contract award. This list will form part of the lump sum pricing. COMPANY reserves the right to review and verify this list during detailed engineering.

The CONTRACTOR must procure these spares in a timely manner to ensure availability for each project phase. Delays caused by unavailable spare parts will be the CONTRACTOR's responsibility.

Adjustments in spare parts quantities due to additional COMPANY requests—provided these are not due to CONTRACTOR's oversight—will be managed per the pre-agreed rates in the CONTRACT's Compensation section.

11.2.9.2 Spare Parts for Initial Two Years of Operation

Pricing and a preliminary list of spare parts for the first two years of operation shall be established prior to contract award and included in the relevant CONTRACT appendix.

A detailed list of operational spare parts with types and quantities will be provided by the CONTRACTOR within six months after contract award and requires COMPANY approval.

COMPANY will purchase these parts on a reimbursable basis at fixed prices specified in the CONTRACT appendix.

12.0 DOCUMENTATION

12.1 General

The CONTRACTOR shall provide technical documentation to achieve the following objectives:

- Demonstrate that the system and equipment comply with the agreed specifications and requirements.
- Supply all information necessary for the design of the system and interfacing or interacting equipment and systems.
- Provide all data required for procurement, fabrication, testing, installation, construction, operation, and maintenance of the system/equipment.

The CONTRACTOR must submit all technical documents prepared by themselves or their subcontractors during project execution for COMPANY’s information, even if those documents are not included in the agreed Master Document Register. COMPANY reserves the right to review any submitted documentation and request revisions as necessary.

Certain technical documents issued by CONTRACTOR will require COMPANY’s formal approval. COMPANY will provide a list of such documents during the Kick-Off meeting, aligned with Appendix D of the CONTRACT.

12.2 Facilities Life Cycle Information

Facilities Life Cycle Information (LCI) ensures that all engineering data is available throughout project execution and subsequent operations.

The CONTRACTOR shall execute design activities in accordance with COMPANY technical specifications and standards, including:

- 28080.VAR.LCI.STD – Facilities Life Cycle Information Management Procedure

- 06219.VAR.LCI.STD – Information Submission

These documents define COMPANY's requirements for LCI, ensuring traceability and completeness of plant information during the development process and the full operational life of the facility.

Within 60 days of contract award, an LCI Plan shall be delivered outlining responsibilities, reporting, quality plans, and schedules, coordinated with project detailed engineering timelines and COMPANY's operations preparation.

CONTRACTOR is responsible for the quality, consistency, and completeness of all LCI data produced by themselves and their subcontractors/vendors and shall deliver this information to COMPANY.

CONTRACTOR shall grant COMPANY free access to all documents, drawings, specifications, graphical materials, photographs, models (including 3D physical models), and all related information generated or acquired in fulfilling contract obligations.

12.3 Document Management System

12.3.1 Data and Documentation Management

Design activities must comply with COMPANY's standards governing document and data management. These include:

- Organization of document and material control;
- Minimum technical data requirements for design documents;
- Comprehensive document planning and progress reporting;
- Document approval processes;
- Life Cycle Information management;
- Delivery of models and spare parts data for maintenance integration;
- Guidance for implementation of COMPANY's proprietary CAE software or other recommended tools.

Relevant COMPANY specifications include (but are not limited to):

Code	Title
06215.VAR.LCI.STD	Facility Functional Units
20189.VAR.LCI.STD	Document Numbering

Code	Title
20198.VAR.LCI.STD	Item Numbering
20259.ENG.PRC.STD	P&ID – Piping and Instrumentation Diagram
06222.ENG.PRC.STD	Equipment Summary Preparation
06784.ENG.PRC.STD	Functional Unit List Preparation
27608.VAR.LCI.STD	Management of Approval of Technical Documentation
28080.VAR.LCI.STD	Facilities Life Cycle Information Management Procedure
27913.VAR.LCI.STD	Intergraph Software Implementation and Deliverables
20205.VAR.LCI.STD	Procedure for 3D CAD Models Preparation and Deliverables
20203.VAR.LCI.STD	Data Model of Plant Components and Key Products
06219.VAR.LCI.STD	Information Submission

Guidance on the Engineering Document Approval Management (EDAM) system is also provided.

12.3.2 Contractor Document Numbering

All engineering drawings and documents shall be numbered according to COMPANY's numbering system, except for qualification certificates, material certificates, and test/inspection certificates from CONTRACTOR, subcontractors, or suppliers.

The Master Document Register shall cross-reference CONTRACTOR's document identifiers with COMPANY's numbering.

CONTRACTOR may optionally apply dual document numbering—COMPANY's primary system plus CONTRACTOR's internal system.

12.3.3 Document Submission to COMPANY

CONTRACTOR shall submit documents to COMPANY for information, review, comment, or approval as outlined in the approved Master Document Register.

COMPANY shall provide responses within agreed timeframes, either approving or issuing comprehensive comments.

Documentation shall be submitted progressively during the project and compiled for final handover.

12.3.4 Document Review

All documentation related to design, fabrication, testing, installation, pre-commissioning, and operation—whether prepared by CONTRACTOR, subcontractors, or vendors—may be subject to COMPANY's review and approval.

Documents submitted for review must include supporting calculations or explanations, clearly defining terms and assumptions. Computer output summaries shall be included if requested.

Documents shall be submitted in a sequence allowing COMPANY sufficient information for timely review.

COMPANY's review does not absolve CONTRACTOR from full compliance or responsibility for errors due to CONTRACTOR's assumptions or omissions.

Documents requiring Certifying Authority review will be forwarded by COMPANY. CONTRACTOR shall identify and submit any documents requiring other authority reviews to COMPANY, who will manage submissions and feedback.

Comments from authorities will be reviewed by COMPANY and forwarded to CONTRACTOR for incorporation.

Documents requiring Marine Warranty Surveyor review shall be submitted directly by CONTRACTOR, with COMPANY copied in correspondence.

12.3.5 Non-Conformances in Documentation

If documents deviate from CONTRACT requirements, CONTRACTOR shall clearly identify and explain such deviations in transmittals to COMPANY.

Failure to disclose deviations does not release CONTRACTOR from responsibility to execute WORK according to CONTRACT, even if documents have been reviewed by COMPANY.

12.3.6 Master Document Register

CONTRACTOR shall maintain a document register recording all document revisions.

A proposed Master Document Register shall be submitted as part of the EPCI Execution plan.

Upon COMPANY approval, this register will list all documents generated through design, fabrication, construction, testing, installation, and pre-commissioning, including authorized deviations.

Documents shall be available for COMPANY review throughout the CONTRACT duration.

The full document list—including subcontractor documents necessary for WORK completion—shall be submitted within 15 working days after contract award for COMPANY approval.

COMPANY will specify which documents require review and approval versus review only.

Any addition of documents after initial submission must be notified to COMPANY with an updated register at least 10 working days before issuance.

12.3.7 Document Quality

All documents prepared by the CONTRACTOR shall maintain a high-quality standard, with sufficient detail to ensure the successful completion of the WORK. The CONTRACTOR must ensure that all drawings and documents provided by SUBCONTRACTORS meet the same standards and detail requirements.

12.3.8 Document Size

Drawings and documents shall be provided in the following standard sizes:

- A1 – 594 mm x 841 mm
- A2 – 420 mm x 594 mm
- A3 – 297 mm x 420 mm (preferred size for drawings)
- A4 – 210 mm x 297 mm (preferred size for all other documents)

12.4 Dispatch Dossier

For each item shipped to COMPANY, the CONTRACTOR shall prepare a Dispatch Dossier. This dossier shall be printed in one hard copy to accompany the shipment and provided on DVD in two copies—one with the shipment and one handed over to the COMPANY REPRESENTATIVE.

The Dispatch Dossier shall include at minimum the following documentation:

- Certificate of Conformity (COC)
- Completed and signed Mechanical Completion Check Records and Punch Lists
- List of shipped loose items
- Certifications including:
    - Weight certificates

    - Load test procedures, results, and certificates
    - Load and material certificates for lifting equipment
    - Pressure test and flushing procedures, reports, and certificates
    - Material and EX certificates as applicable
- Signed Factory Acceptance Test (FAT), Enhanced FAT (EFAT), Site Integration Test (SIT), and Site Release Test (SRT) reports where relevant
- Inspection Release Notes (IRN)
- Safety data sheets including HSE and chemical inventory lists
- As-built drawings such as technical datasheets, general arrangement (GA) drawings, and interface drawings
- Packing lists or material movement tickets including photographs
- Procedures for handling, preservation, packing, and storage, including “Data for Material Storage” documents listing size, weight, and specific storage requirements for capital spares, operational spares, and leftover materials
- Installation, operation, and maintenance manuals
- Proforma invoices including customs clearance paperwork where applicable
- Photographs of the equipment

12.5 Final Documentation Dossier

Upon project completion, the CONTRACTOR shall compile a Final Documentation Dossier that organizes all documents produced during execution.

All documents in this dossier shall reflect an As-Built status, documenting any modifications made during late-stage activities such as interface test adjustments or refurbishment.

The dossier shall be delivered to COMPANY as follows:

- 10 DVD copies
- 1 printed copy (subject to confirmation and agreement early in the project)

An index of the Final Documentation Dossier shall be submitted within six months after commencement of the WORKS for COMPANY approval.

The dossier shall include, but is not limited to:

12.5.1 Engineering Dossier

Complete record of all documents and drawings related to detailed design.

12.5.2 Materials Dossier

Complete records and certificates for all materials procured and incorporated.

12.5.3 Fabrication Dossier

Includes:

- Description of fabrication processes
- Installation records, including electronic pipe logbooks, welding and welder qualifications
- Non-destructive testing (NDT) logs and welding repair records with personnel qualifications
- All fabrication documentation including drawings (As-Built), reports, procedures, quality control, inspections, tests, process/operator qualifications
- Records related to pre-commissioning, testing, transport, and shipping
- All approved technical clarifications, deviation requests, non-conformance and concession reports

12.5.4 Load Out Dossier and Installation Guidelines

Packing and preservation plans including procedures, records, and drawings from packing and load-out. Installation, transport, and pre-commissioning guidelines shall be provided to support the installation contractor in procedure and equipment list development.

Load Out Dossier (Revision 1) shall be submitted 60 days before load-out for COMPANY review, including test records available to that date. Final revision shall include post-load-out test records.

Installation guidelines must include project-specific data regarding torsional forces on the umbilical during installation, allowable rotation, expected turns and direction, and contingency plans for ROV rotation to ensure proper landing orientation. Special attention to deepwater torsion and material integrity during second-end laydown and engagement is required.

12.5.5 As-Built Dossier

Includes all documentation reflecting the final As-Built status of the subsea system.

12.5.6 Pre-commissioning Activities Documentation

Comprehensive records and certificates related to subsea system pre-commissioning.

12.5.7 Operating Manuals

All necessary documentation for routine operation, start-up, shutdown, and emergency shutdown procedures for equipment.

An emergency procedures manual must describe safety measures and actions for hazardous events, with the latest revision available onboard Marine Spread Units, Logistic Support Bases, and Construction/Fabrication Sites for consultation by CONTRACTOR and COMPANY personnel.

For major deep-sea transport of critical equipment, CONTRACTOR shall prepare and distribute a Disaster Recovery Plan including shore support contacts.

12.5.8 Inspection, Maintenance and Repair Manuals

Documentation necessary for inspection, preventive, and corrective maintenance.

12.6 Statutory Manuals

Where applicable, CONTRACTOR shall provide input in COMPANY's specified format for updates to Project Statutory Operations and Emergency Procedures Manuals.

Coordination with COMPANY is required to ensure format and content compatibility.

12.7 Documentation for Authorities

CONTRACTOR shall prepare all technical reports and documents required by COMPANY or governing regulatory and certifying authorities, incorporating any comments or requirements arising therefrom.

12.8 Miscellaneous Requirements

12.8.1 Documents Format and Native Files

CONTRACTOR shall provide COMPANY with native file formats for:

- P&IDs
- Equipment 3D models (e.g., STEP files) and layout drawings
- Operation & Maintenance Manuals
- Master Document Register (MDR)
- Master Equipment List (MEL)
- Cross-reference lists
- TAG lists

All other documentation shall be submitted in Adobe PDF format as standard delivery.

12.8.2 Stack-Up Drawings and Posters

Illustrative stack-up drawings and posters shall be produced for as-built status of main systems such as the Umbilical System. Details to be agreed during execution.

12.8.3 Peer Review and Independent Project Review

12.8.3.1 Peer Reviews

Peer Reviews will be conducted in two sessions upon COMPANY's request.

They shall cover all project aspects. COMPANY will issue a Peer Review Report with recommendations that CONTRACTOR must implement.

Prior to reviews, CONTRACTOR shall:

- Prepare Peer Review Terms of Reference
- Provide pre-reading materials to COMPANY
- Present the design subject to review
- Make personnel available for interviews

12.8.3.2 Independent Project Reviews (IPRs)

COMPANY will lead up to five IPRs to monitor progress and compliance with the Scope of Work.

IPRs include key personnel interviews (1-2 hours each) and document reviews lasting up to two weeks.

CONTRACTOR will be notified in advance and shall participate as needed.

Findings will be documented, and resolutions tracked per Appendix B, requiring COMPANY approval before continuation.

13.0 Critical Engineering Documentation

Per CONTRACT terms regarding liquidated damages, the following documents are deemed critical and must be prepared and delivered by CONTRACTOR:

Nr.	Description	Notes
1	Cross-section drawings and calculations	Including mechanical data such as MBR, capacity curves, etc.
2	Umbilical Termination Interface data	Includes tubes and cables layout, interface flange, etc.
3	Inspection and Test Plan for Umbilical System manufacturing	
4	Inspection and Test Plan for Long Lead Items (LLIs)	
5	General Arrangement / Reel packing of Reels	
6	Dynamic Analysis Report	To confirm design suitability for project geohazards
7	Umbilical interface data for in-place and installation analysis	
8	Maximum Allowable Free Span calculation	
9	Crush and Friction Test Procedures	Endorsement by installation contractor if required
10	Installation Guidelines	
11	Pull-in and Hang-off Guidelines	

14.0 COMPLIANCE MATRICES

14.1 Compliance Matrix for Analysis Requirements

The table below outlines the required analyses that the CONTRACTOR must perform for the PROJECT. This table will be tailored specifically to each project.

For every item listed, the CONTRACTOR shall indicate whether it is included in their proposal, substantiating each response accordingly.

Compliance Matrix for Minimum Analysis Requirements - To be finalized filled on project basis						

Included in the Offer	Y
Not included in the Offer	N
Not Applicable	NA

No	Description	PROJECT req. (Y/N/NA)	Main Umb - Static (Y/N/NA)	Main Umb - Dynamic (Y/N/NA)	Infield Umbilical (Y/N/NA)	Contractor additional response (if any)
1	Dynamic Analysis					
2	Fatigue Analysis					
3	Free Span Analysis					
4	Global Strength Analysis					
5	Interface Load Analysis					
6	Interference Analysis					
7	On-bottom Stability Analysis					
8	Preliminary Installation Analysis					
9	Pull-in Analysis					
10	Pull-out Analysis					
11	Stress Analysis (Detailed)					
12	Thermal Analysis					

14.2 Compliance Matrix for Testing Requirements

The following table specifies the testing activities the CONTRACTOR shall perform for the PROJECT. The table will be customized per project specifics.

For each test, the CONTRACTOR shall confirm whether it is included in their offer, with explanations as necessary.

Included in the Offer	Y
Not included in the Offer	N
Not Applicable	NA

No	Description	PROJECT req. (Y/N/NA)	Main Umb - Static (Y/N/NA)	Main Umb - Dynamic (Y/N/NA)	Infield Umbilical (Y/N/NA)	Contractor additional response (if any)
1	**Qualification and Verification tests**					
1.1	Bend Stiffness test					
1.2	(Umbilical) Bundle Impact Test					
1.3	Combined Tension and Bending Test					
1.4	Combined Torque Balance and Tension Test					
1.5	Crush Test					
1.6	Fatigue Test (dynamic)					
1.7	Free Flooding rate					
1.8	Friction Factor Assessment (internal/external)					
1.9	Hydrostatic diameter reduction and collapse resistance of Cross section Test					
1.10	Lay-up Trial					
1.11	Repair Splice Qualification Test					
1.12	Strength of end terminations (pull-head and subsea termination)					
1.13	Topside and Subsea Termination Interface Test					
2	**Integrated Tests**					
2.1	Buoyancy Module Fit up Test					
2.2	HOST Pull Tube Interface Test					
3	**Interface Tests**					
3.1	Functional check of all Interfaces with equipment internal and external to the UMBILICAL SYSTEM					
3.2	ROV/diver access check and operation of all intervention interface parts of the UMBILICAL SYSTEM					
4	**Final Tests**					
4.1	FAT, including communication test inclusive of sensitivity test					
4.2	EFAT					
4.3	Pre LOAD-OUT Test					
4.4	Post LOAD-OUT Test					
5	**Others**					

5.1	Monitoring of Umbilical Integrity during Installation (Umbilical prepared for)					

14.3 Compliance Matrix Templates

The CONTRACTOR shall complete and submit the attached compliance matrix templates for sections 14.1 and 14.2 as part of the bid documentation for COMPANY's evaluation and approval.

Once approved, these matrices shall be incorporated as part of the contractual documentation.