SCOPE OF WORK DESCRIPTION
TRIM DOCK GATES

OSC-30-H004-M-SP-00031

1107305 Ocean Space Centre

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PROJECT OCEAN SPACE CENTRE

SCOPE OF WORK DESCRIPTION
TRIM DOCKS GATES

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1 Table of Content

1 Introduction

1.1 Objective

The purpose of this document is to define the Scope of Work for the design, detailed engineering manufacturing, delivery, installation and commissioning of the trim dock gates at the hydrotechnical laboratories at Tyholt, Trondheim.

The trim docks must be able to be used for, among other things, launching the test model, inspecting the model under water, working on the model and preparing the model for test set-up. The trim docks are to be designed to handle ship models length of max 10 m and height of max 7 m.

1.2 Short introduction of delivery

The rig area between the Ocean Basin and the Seakeeping and Manoeuvring Basin is consisting of three trim docks shortly described below.

The Ocean Basin is equipped with one trim dock to consist of the following gate:

- Trim dock OB with one automatic gate tentative size W3.0 x H4.0 m with control cabinet.

The Seakeeping and Manoeuvring Basin is equipped with two trim docks to consist of the following gates:

- Trim dock 1 (centre of SMB) with one automatic gate, tentative size W2.0 x H2.4 m with control cabinet
- Trim dock 2 (closest to basin wall) with one automatic gate size W6.0 x H2.4 m with control cabinet

1.3 Definitions and abbreviations

Definitions:

Company:	Statsbygg, which is the Norwegian government's key advisor in construction and property affairs, building commissioner, property manager and property developer.
Purchaser:	Company
Contractor:	The party named as such in the Form of Agreement
Subcontractor:	Third Party who has entered into an agreement with the Contractor for the supply of goods or services in connection with the Work.
EPC K202	EPC Contractor responsible for demolition works, ground works for building B and shortening of existing towing tank.
EPC K203	EPC contractor for construction works of building B
End-user:	SINTEF Ocean and NTNU
Plant:	The machinery, apparatus, materials, articles, documentation, software and other products to be supplied by the Contractor under the Contract.
Works:	The plant, installation of the plant and any other work to be carried out by the Contractor under the contract.
Company Materials:	Equipment, systems, and/or materials supplied by Company and which are to be incorporated in the Contract Object.

Abbreviations:

DFO	-	Documentation for Operation
HLCC	-	Hydro Laboratory Centralized Control
MCC	-	Motor Control Cabinet
MC	-	Mechanical completion
MDP	-	Master Document Plan
NS	-	Norwegian Standard
OB	-	Ocean Basin
OSC	-	Ocean Space Centre
SMB	-	Seakeeping and Manoeuvring Basin
JCP	-	Joint Collaboration Phase

2 The Works

The Works consists of the following main elements:

a) Participating in joint collaboration phase

b) Engineering, manufacturing, assembly, delivery

c) Documentation

d) On-site supervision and Installation work

e) Mechanical completion and Commissioning work

f) On-site system acceptance test

g) Training Courses

The equipment attached to the new trim docks shall fulfil the requirements described herein and in the following documents:

- OSC-30-H004-00032 Requirements for trim dock gates
- OSC-30-H004-S-SP-00001 Requirements for Automation Control and Safety Systems – User equipment

2.1 Participation in Joint Collaboration Phase (JCP)

Contractor shall participate in a joint collaboration phase together with the EPC contractor for construction of building B (EPC K203) of the Ocean Space Centre Project. The JCP will be headed by Company. The End User will also be involved in the JCP.

The main purpose of the joint collaboration phase is to implement all requirements of the user equipment for the wet laboratories into the design and construction of building B. The purpose is also to investigate and resolve performance issues related to interaction between other equipment systems and to clarify interfaces to End User control systems. JCP will also include final review of the project's overall logistics plan and delivery schedule. Contractor shall also expect adjustments including value engineering of user equipment design and functionality as a result of the collaboration. Such adjustments shall be listed and be the basis for determination of fixed final Contract price.

To meet the strict overall design requirements, the main design of the trim dock gates will be finalised in the JCP and must consider the interaction with other systems in the basin, e.g. the wave generating systems attached to trim dock gate OB and the current generation system below trim dock gate OB.

During the collaboration phase, all interfaces between each user equipment supplier and EPC K203 shall be identified and agreed. Interface agreements shall be established.

Participation in the JCP will be on a reimbursable basis. As a guidance, Contractor shall anticipate the following:

- JCP duration in total: 25 weeks. Expected to be started in June 2023
- Contractor participation period in the JCP: ca 25 weeks (to be discussed)
- Expected Contractor manpower load: Two persons, two days every second week
- Main collaboration tool: Teams-meetings, and occasionally physical meeting in Trondheim or Oslo. Exchange of design documentation.

2.2 Design, engineering, manufacturing, assembly and delivery

The design, engineering, manufacturing, assembly and delivery comprise of such items as:

- Provision of own organisation including head office support services, administration and a project organisation to manage and control the execution of the Work including complying with all requirements of document OSC-80-SB-Q-SD-00001 Administrative Procedures.
- Optimisation of transportation, logistics and installation to be shown in a separate schedule for size of objects, travel distances, installation needs etc.
- Provision, maintenance, operation and demobilisation of all required facilities to complete the engineering, manufacturing, assembly and delivery.
- Contractor's system engineering and fabrication engineering
- Provision of materials for fabrication, manufacturing and assembly
- Fabrication, manufacturing, assembly of the complete wave generation units and electrical drives/control cabinets
- Programming
- Inhouse testing including witness tests
- Documentation of own equipment and functions
- Miscellaneous

Contractor shall perform the system engineering, fabrication engineering, design and documentation required for the manufacturing, fabrication, assembly, and completion of the Works. Contractor shall also produce all documentation required for the civil interfaces and interfaces to technical systems. Contractor's engineering shall include such as:

- System documentation and calculations for all trim dock gates
- Exchange of engineering data
- Engineering documentation
- Coordination of subcontractors and sub suppliers
- Tag numbering
- Identify necessary civil works, or any works by others required for Trim dock equipment

Contractor shall in good time provide drawings and descriptions showing the manner in which the Plant is to be installed, together with all information required for preparing suitable foundations, for providing access for the Plant and any necessary equipment to the Site and for making all necessary connections to the Works. Contractor shall specify in detail requirements regarding electrical supply and communication network interfaces.

Equipment and main components shall be tagged according to requirements described in document OSC-30-O-H004-SD-00002, Tagging Requirements.

Inhouse testing including witness testing shall include Factory Acceptance Test (FAT) of assembled equipment, units and systems. Contractor shall prepare suitable test procedures for performance of the FAT. FAT shall contain a complete test of as many functions and signals as practical possible according to OSC-80-SB-O-SD-00008 Strategy for Systematic Completion.

2.3 Documentation

Contractor shall provide all engineering and manufacturing documentation necessary to complete the Work in accordance with the requirements prescribed below:

- OSC-80-SB-O-SD-00001 Requirements for supplier documentation including DFO
- OSC-80-SB-Å-SD-00002 BIM requirements for special equipment
- OSC-80-SB-Å-SD-00003 SIMBA 2.0 General requirements
- OSC-80-SB-O-SD-00012 Action plan for digitalization
- OSC-80-SB-Å-SD-00001 General attributes and properties in BIM models

2.4 Logistics and Transportation

The trim dock gates shall be fabricated in suitable sections that can be transported into the basin for assembly and further installation. The Contractor is responsible for transportation and shall perform transportation to the construction site.

The details of the optimisation of transportation, logistics and installation is to be shown in a separate schedule for size of objects, travel distances, installation needs etc.

2.5 On-site supervision and Installation work

Contractor shall perform desktop review of steel reinforcement documentation prior to casting to ensure clashes between support bracket bolts and the reinforcement steel. Relevant documentation will be provided by Company in due time prior to casting.

Contractor shall perform installation of the equipment. Before the Work starts, Contractor shall ensure that the installation site including foundations are ready for start of the installation work.

The installation work to be performed by Contractor will include the following main activities:

- Verification of construction tolerances of foundations
- Installation of specified equipment
- Installation of electrical drive control panels
- Electrical wiring between the specified objects and electrical drive control panel(s)

Necessary cranes, lifting equipment and equipment for transport on the Site will be provided by Company.

Company will provide the following:

- Cable supports, cabling and termination of electrical supply to the electrical drive control panel(s) from existing electrical local distribution board.
- Cabling and communication between HLCC, MCC(s) and Main Interlocking Systems (MIS). The fibre communication interface shall be located in a junction box planned in immediate vicinity of the equipment

2.6 Mechanical completion and Commissioning work

Contractor shall perform mechanical completion activities and commissioning work according to the following requirements:

- OSC-80-SB-O-SD-00008 Strategy for Systematic Completion of BUT

All mechanical completion and commissioning activities shall be documented in Omega365.

The original Systematic Completion documentation shall be filed by Contractor. All MC documentation, which also shall include systematic completion documentation for Subcontractors, shall be compiled in systematic completion dossiers, kept in good order, continuously updated in Omega365 and available for Company before the activity take place. All works, inspections and tests shall be completed, and all punch items shall be identified and registered in Omega365. Any transfer of A-punch items at a phase transition must be approved by Company.

Contractor shall perform all commissioning of the Contract Object, including the provision of procedures, special tools, commissioning spares etc.

2.7 On-site system acceptance test

Based on input from end-user, Contractor shall prepare acceptance criteria for the trim dock gates.

Contractor shall prepare a detailed on-site acceptance test procedure, as well as a test schedule. The on-site acceptance test procedure shall be submitted to Company for approval.

Contractor shall perform the on-site acceptance test including interface to end-user's HLCC system. The on-site acceptance test shall be witnessed by representatives from Company and end-user. Contractor shall specify in writing his requirements concerning performance of the on-site acceptance test including any assistance needed at the latest one month prior to agreed date for starting the acceptance test.

2.8 Training Courses

Contractor shall provide professional training of End-user operators and service/maintenance personnel. Each type of course shall be described, including required equipment and facilities. Training documentation shall be presented latest 4 weeks prior to the training courses will take place. Training shall be held in Norwegian or English language.

3 References

• OSC-30-H004-M-SP-00031	Scope of Works Description Trim Dock Gates
• OSC-30-H004-M-SP-00032	Requirements for Trim Dock Gates
• OSC-80-SB-O-SD-00001	Requirements for Contractor documentation including DFO
• OSC-30-H004-S-SP-00001	Requirements for Automation Control and Safety Systems – User equipment
• B-01-M-669-20-001	System Arrangement Sketches Trim Dock Gates
• B-01-M-669-60-001	System Diagrams Trim Dock Gates
• OSC-30-H004-M-LI-00003	K669-04 Equipment list from dRofus Trim Dock Gates
• OSC-80-SB-O-SD-00008	Strategy for Systematic Completion of BUT
• OSC-80-SB-Q-SD-00001	Administrative Procedures
• OSC-30-H004-Z-RA-00004	Material selection report
• OSC-30-H004-Z-RA-00002	Requirements for corrosion protective coatings
• OSC-80-SB-O-DB-00001	Technical Design Basis
• OSC-30-SB-O-SD-00008	Interface description
• OSC-30-SB-O-SD-00004	Interface matrix