# SCOPE OF WORK DESCRIPTION ROOF-MOUNTED CARRIAGES OB K665-05

## OSC-30-H004-M-SP-00036

## 1107305 OCEAN SPACE CENTRE

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| Enquiries can be directed to | Statsbygg<br>Postboks 232 Sentrum, 0103 Oslo<br>Telefon: 22 95 40 00<br>Epost: postmottak@statsbygg.no<br>Internett: http://www.statsbygg.no |

# PROJECT OCEAN SPACE CENTRE

# SCOPE OF WORK DESCRIPTION ROOF-MOUNTED CARRIAGES OB

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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 manufacturing, delivery, installation, and commissioning of a new OB Roof-mounted carriage system and OB Work Platform system for the Ocean Basin at the hydrotechnical laboratories at Tyholt, Trondheim.

The new OB Roof-mounted carriage system and OB Work Platform system shall be delivered mechanically completed and ready for operation, with internal rails, structures, bogies, drive motors, electrical power transmission and connection to power supply, cabling, automation and control systems and cabinets.

## 1.2 Description of Delivery

The Ocean Basin (60 x 50 m) shall be equipped with a Roof-mounted carriage system and Work Platform system.

K665-05 Roof-mounted Carriages OB include:

- ***OB Roof-mounted carriage system:*** A carriage system with a gantry frame running on the same rails as the roof mounted cranes, having a suspended *sub-carriage* underneath that can travel over the entire area of the OB. The Roof-mounted carriage will be used during model testing and shall contain measuring and monitoring equipment and be designed for advanced remote/unmanned operations of test objects.
- ***OB Work Platform system:*** An independent *Work Platform* with an integrated 3 ton crane and a walkway for accessing and preparing test models. In the same way as for the sub-carriage on the Roof-mounted carriage, the Work Platform is suspended in a gantry frame.

The new Ocean Basin will be a world leading facility used for advanced hydrodynamic testing. The OB shall be equipped with roof mounted cranes that will run on the same rails as the Roof-mounted carriage and Work Platform.

## 1.3 Definitions and abbreviations

**Definitions:**

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| 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. |
| End-user: | SINTEF Ocean and NTNU |

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| 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. |
| EPC K203 | Building B construction contractor |

**Abbreviations:**

DFO - Documentation for Operation

HLCC - Hydro Laboratory Centralized Control

MC - Mechanical completion

MDP - Master Document Plan

NS - Norwegian Standard

OB - Ocean Basin

OSC - Ocean Space Centre (Note: name will change to “Norwegian Ocean Technology Centre”)

SMB - Seakeeping and Manoeuvring Basin

EPC - Engineering, Procurement and Construction

# 2 The Works

The Works consists of the following main elements:

a) Participation in Joint Collaboration Phase (reimbursable engineering hours)

b) Detail design, 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 OB Roof-mounted carriage system and OB Work Platform system shall fulfil the requirements described herein and in the following documents:

- OSC-30-H004-M-SP-00035 Requirements - Roof-mounted Carriages OB
- OSC-30-H004-S-SP-00001 Requirements for Automation Control – and Safety Systems – User equipment
- OSC-30-H004-Z-RA-00004 Material selection report
- OSC-30-H004-Z-RA-00002 Requirements for Corrosion Protective Coatings
- OSC-80-SB -O-SD-00001 Requirements for supplier documentation including DFO
- OSC-80-SB-O-SD-00008 Strategy for Systematic Completion of BUT
- OSC-80-SB-O-DB-00001 Technical Design Basis
- OSC-80-SB-O-SD-00003 Tagging requirements
- OSC-30-SB-Y-SP-00003 Special requirements for HSWE and seriousness

## 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 hydrodynamic 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.

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: 50 weeks. Expected to be started in March 2023
- Contractor participation period in the JCP: 36 weeks
- Expected Contractor manpower load: Two persons, two days a week

- Main collaboration tool: Teams-meetings, and occasionally physical meeting in Trondheim or Oslo. Exchange of design documentation.

## 2.2 Detail design, engineering, manufacturing, assembly and delivery

The 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.
- Provision, maintenance, operation and demobilisation of all required facilities to complete the design and engineering, manufacturing, assembly and delivery.
- Contractor's system engineering and fabrication engineering
- Provision of materials for fabrication, manufacturing and assembly
- Complete OB Roof-mounted carriage system and OB Work Platform system, including power transmission and electrical drives/control cabinets
- Programming
- Inhouse testing including witness tests
- Documentation of own equipment and functions
- Miscellaneous

Contractor shall perform the system and 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 items as:

- System documentation and calculations for Roof-mounted carriage and Work Platform
- 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 the Roof-mounted carriage and Work Platform

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-80-SB-O-SD-00003, 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 of BUT.

## 2.3 Documentation

Contractor shall provide all engineering and manufacturing documentation, including documentation provided by subcontractors, that are necessary to complete the Works 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
- SIMBA 2.0 General requirements
- OSC-SB-O-SD-00012, Action plan for digitalization
- OSC-80-SB-Å-SD-00001, General attributes and properties in BIM models

The DFO shall be delivered in English and Norwegian language. The DFO shall enable the End-user to operate, calibrate, and maintain the Plant throughout its intended lifetime. The DFO shall specify in detail all maintenance activities necessary to be performed in order to fulfil the guarantee requirements.

## 2.4 Logistics and Transportation

The Roof-mounted carriage and Work Platform 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 installation of the complete OB Roof-mounted carriage system and OB Work Platform system, including power transmission, emergency stop system and cabinets. Before the Work starts, Contractor shall ensure that the installation site including rails (delivered by K203) is ready for start of the installation work.

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

- Verification of relevant interfaces to building contractor K203 (rails and electrical connection boxes)
- Installation of specified equipment (complete OB Roof-mounted carriage system and OB Work Platform system including power transmission and cabinets).

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 interface point(s) for the supply to the Roof-mounted carriage and Work Platform’s conductor rails.

## 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 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 OB Roof-mounted carriage system and OB Work Platform system.

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 on-site 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-00035 Requirements - Roof-mounted Carriages OB
- OSC-30-H004-T-RA-00001 Requirements for Automation Control – and Safety System
- B-01-M-665-60-004 System diagram Roof mounted carriages
- B-01-M-665-60-003 System diagram Working platform OB
- OSC-80-SB-O-DB-00001 Technical Design Basis
- B-01-S-56-60-001 System diagram Automation control and safety system OB
- OSC-30-H004-Z-RA-00002 Requirements for Corrosion Protective Coatings
- OSC-30-H004-Z-RA-00004 Material selection report
- OSC-80-SB -O-SD-00001 Requirements for supplier documentation including DFO
- OSC-80-SB-O-SD-00008 Strategy for Systematic Completion of BUT
- OSC-80-SB-O-SD-00003 Tagging requirements
- OSC-80-SB-O-SD-00002 TFM-Amendment TFM-tagging of User Equipment
- OSC-30-H004-M-LI-00013 K665-05 Equipment list from dRofus - Roof-mounted
- Carriages OB
- OSC-80-SB-Q-SD-00001 Administrative Procedures
- OSC-30-SBY-MA-00005 Statsbygg OSC HSWE Plan
- OSC-30-SB-Y-SP-00003 Special requirements for HSWE and seriousness
- OSC-80-SB-Å-SD-00002 BIM requirements for special equipment
- OSC-80-SB-Å-SD-00003 SIMBA 2.0 General requirements
- OSC-SB-O-SD-00012 Digitalization Action Plan
- OSC-80-SB-Å-SD-00001 General Attributes and properties in BIM models
- OSC-30-SB-O-PL-00001 Project overall progress plan
- OSC-30-SB-O-SD-00008 Grensesnittsbeskrivelse K203 / Interface description K203
- OSC-30-SB-O-SD-00004 Grensesnittsmatrise K203 / Interface matrix K203
- OSC-80-SB-Q-SD-00004 Quality Plan
- OSC-30-SB-O-PL-00015 K665-05 Timeline