



Request for Proposals

Provision of marine services for recovery and deployment of the a subsea cabled sensor platform at the Fundy Ocean Research Center for Energy Demonstration Site – Minas Passage

Release date: March 19th, 2013

Fundy Ocean Research Center for Energy (FORCE)

fundyforce.ca

902-406-1166

1. Invitation

Full Proposals are invited from marine contracting firms (hereafter referred to as "contractors") to provide marine services for the deployment and servicing of a cabled subsea instrument platform at FORCE's facility in the Minas Passage, Bay of Fundy.

2. Background

FORCE is building Canada's lead centre for tidal energy technology research and demonstration. FORCE collaborates with industry, government, and researchers to study the interaction between tidal turbines and the Bay of Fundy environment.

FORCE provides a shared observation facility, submarine cables, grid connection, and environmental monitoring at its pre-approved test site. All onshore electrical infrastructure is now complete; subsea cable planning and trials in underway, with deployment of first cable scheduled for 2013. The site is well suited to testing, with water depths up to 45 meters at low tide, a bedrock sea floor, straight flowing currents, and water speeds above 5 metres per second.

Site characterization – the ability to scientifically quantify and understand the physical environment – is critical to future tidal energy development. Well characterized sites will increase public, investor, and stakeholder confidence in tidal energy projects. Experience has shown that high flow sites, like the Minas Passage, demand specialized and robust sensors and the know-how to reliably deploy and recover these instruments. FORCE has a mandate to support innovation and monitor its site and for this reason has initiated this project to support the development of environmental monitoring infrastructure and sensing capabilities in the Minas Passage.

The sensor project is an important step in a planned long-term program to improve site characterization and turbine monitoring. The goals of this program include:

- 1) Public and regulator confidence that FORCE understands its site and can demonstrate the effects of turbines on the environment at its site with particular regard to noise, interaction with animals, and energy extraction.
- 2) Exportable Canadian expertise in tidal site characterization and monitoring.
- 3) Monitoring packages (a so-called "black box") and infrastructure for use by developers, researchers and regulators to
 - a) Characterize and monitor high flow sites,
 - b) Evaluate and monitor the interaction of tidal turbines and the environment at high flow sites.

To achieve these goals, FORCE has partnered with Ocean Networks Canada to construct a cabled subsea sensor platform. This platform is being designed so that a variety of scientific instruments can be installed and operated, in real time, from the FORCE shore station or via the internet. The node will be connected to the shore station via a dedicated data cable, similar to Tyco SL 21.

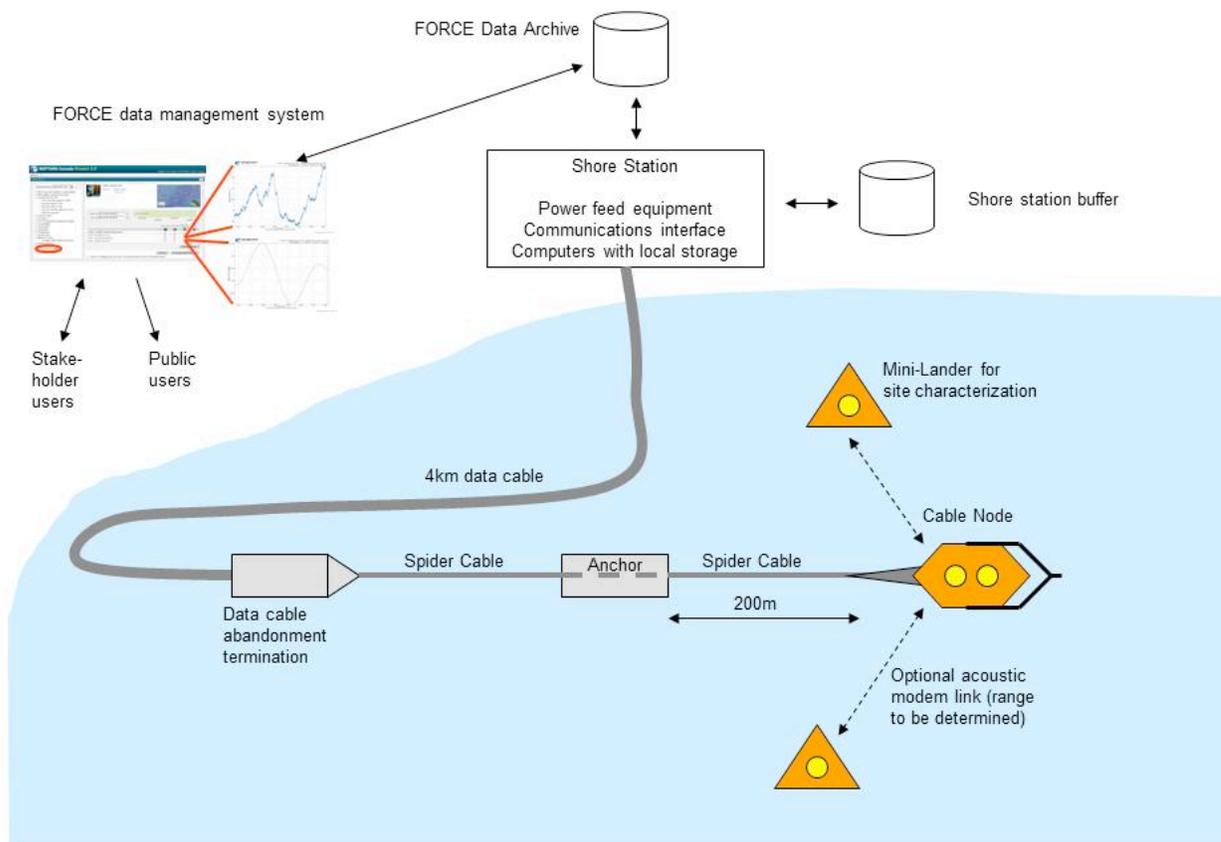


Figure 1: Schematic of the FORCE Sensor Platform Infrastructure

The onboard instruments will be interchangeable and require regular servicing. Therefore, the system will be recoverable. It is envisioned that the sensor platform will be recovered and redeployed two to three times a year.

The preliminary design of the FORCE sensor platform is advancing to the point where the project must now demonstrate that the proposed node can be reliably recovered and redeployed. Demonstration of this capability is essential before FORCE can commit to the final sensor platform design and construction.

Recovery and re-deployment of the node will be demonstrated via a series of marine trials. FORCE is seeking to partner with a regional marine service company with the assets and experience necessary to conduct the proposed trials in a safe and controlled manner. FORCE intends to conduct these marine trials over the summer months of 2013.

3. Overview of Requirements

FORCE is seeking a marine service company to provide marine operational support to the Sensor Platform Project in the Minas Passage area of the Bay of Fundy. This will entail the deployment and recovery of a large cabled bottom mount platform, under controlled conditions, to enable servicing of the onboard scientific instrumentation.

The FORCE Sensor Platform will be constructed from a large triangular gravity base weighing approximately 8 to 10 metric tons with a 4 meter foot print and 0.9 meter in height. An instrument pod will be mounted in the center of the base to house scientific instruments and the float recovery mechanism. (See Appendix 1 – Conceptual Gravity Base Dimensions). The Sensor Platform will be connected to shore by a subsea cable, providing power and data transmission. The overall arrangement of the gravity base, sensor pod and cable is often referred to as “the node”.

Due to the extreme environmental conditions (limited time period availability, tide height and currents), it is assumed a “live boat” operation is not feasible so a multi-point anchored platform is thought to be the preferred option. However, this is not meant to rule out other options and FORCE is receptive to other station keeping proposals. A moored solution would likely include the primary recovery vessel and support vessels to carry out the operations as defined in the Scope of Work. The ability for the contractor to conduct operations in a safe and controlled manner at all times will guide the selection process.

It is assumed that operations in the Minas Passage will be confined to a few days surrounding neap tides. Recovery and redeployment of the node will occur at slack tide. Site data on the seabed geology and tidal currents will be made available to prospective bidders upon signing an NDA with FORCE. Appendix 4 provides an overview of the data available. Upon contract award, FORCE will provide actual ADCP data sets seabed sonar survey data as requested by the contractor.

The proposed marine trials are as follows:

Sheltered Harbour Trials: These trials will involve outfitting a vessel with the necessary lifting equipment (A-frame, winches, tension monitoring equipment) and mooring system (4 or 6 point winch system). The purpose of these trials is to validate the recovery system onboard the node, ensure the node’s gravity base can be recovered reliably and that the recovery vessel can be effectively controlled via its moorings.

Minas Passage Trials: These trials will be conducted in the FORCE test site. These trials will validate the finalized mooring system over multiple tidal cycles. The trial will also serve to ensure the node can be safely recovered in a high flow and limited time frame environment with precise cable tension control at all times.

This demonstration of capability will serve to establish the primary deployment and recovery method to be used in the ongoing servicing of the Sensor Platform project through its lifecycle. This will likely consist of two planned servicing operations a year in the initial stages of the project plus contingency operations as required.

4. Scope of Work

FORCE is seeking bids from qualified contractors to provide the following:

- 1) An engineering study to determine anchor types, size and weight to secure the proposed vessel at the FORCE site in Minas Passage over several tidal cycles.
- 2) A detailed plan to conduct sheltered harbor trials to demonstrate basic capability.
- 3) A detailed plan to conduct on-site trials in Minas Passage to demonstrate "real-life" capability.

Contractors must consider all three components of the proposal and their interrelationships as part of their complete RFP response. The response to the RFP must also take the following into consideration:

Position Control: The position of the vessel must be accurately controlled during recovery operations. Deployment and recovery of the platform will entail precise platform maneuvers to maintain proper tension on the subsea data cable. Trials will serve to validate the capability of the vessel to maintain a controlled position (see Appendix 3 – Positioning Control Requirements). The Sensor Platform's data cable must remain within a controlled tension range at all times.

Test Node: Sea trials will be conducted with a test node and not the actual FORCE Sensor Platform. However, the test node will be of similar weight and size as the Sensor Platform – approximately ten metric tonnes. The test node will be provided by FORCE. It will also include instruments to collect engineering data for analysis purposes. A wire rope cable and anchor will be used to simulate the power/signal cable as fitted in the operational Sensor Platform.

Trial Windows: Operations in the Minas Passage will be timed to coincide with neap tides to take advantage of the best possible environmental conditions. Ideal neap tides only present themselves at very select time periods during the tidal cycle and are seasonally dependant. The contractor must demonstrate a thorough understanding of the different tidal conditions in the Minas Passage.

Deck Equipment: The service vessel will contain all deck equipment necessary to perform the deployment/recovery operations. This will include but not be limited to winch, A-frame, mooring winches, cable chute and capstan. (See Appendix 2 – Conceptual Deck Layout). It is important to note that this is by no means the only acceptable deck arrangement and is provided only to illustrate a generic conceptual arrangement.

FORCE Provisioned Equipment: FORCE will supply the test node, simulated data cable and cable anchor. This equipment will be delivered to the contractor's facility. FORCE will also supply a load multiplying acoustic release for deployment of the node. Instrumentation to measure platform position, cable tensions, real time currents and other parameters will be supplied by FORCE.

Schedule: FORCE intends to conduct Sensor Platform deployment trials over the summer months of 2013. The proposed milestones below outline the planned schedule:

10 Apr:	Bidders Conference
26 April:	RFP submission deadline
06 May:	Begin shortlisted candidates' presentations
10 May:	Notification of successful contractor
31 May:	Contract Award
Summer:	Sheltered Harbour + Minas Passage Trials

A bidder's conference is scheduled for Wednesday, 10th April at 13:00. The meeting will be held at the FORCE Halifax office, located at 5151 George St., Halifax NS. Respondents unable to attend shall be provided with dial in instructions. Prospective bidders should communicate their intention to attend the conference no later than April 5th, 2013.

Please note that response to this Request for Proposals should not be seen as placing any obligation on FORCE to fund or any respondent to carry out any work.

5. RFP Submissions

Prospective marine contractors will provide a detailed description of how they intend to address the following requirements of the RFP:

Part 1: Anchoring System Plan and Engineering Study

Since the ultimate requirement is the successful completion of marine trials at the FORCE test site, a proposal is required for an engineered anchoring design to position the proposed vessel in the desired location in the Minas Passage during several tidal cycles. The vessel will be required to maneuver within a certain prescribed geometry on its moorings at various points of the tidal cycle. (See Appendix 3 – Positioning Requirements).

Part 1 of the bid will include a detailed plan for the proposed mooring arrangement and anchors. This plan is to include the identification all hardware and deck equipment required, along with the necessary marine support to install and recover the proposed anchor spreads.

For part 1, responses shall include:

- A description of the proposed anchoring plan and marine assets required to complete Sheltered Harbour Trials.
- A description of the proposed anchoring plan and marine assets required to complete Minas Passage Trials, including augmented deck equipment required to operate in the Minas Passage – mooring winches, control systems, additional support vessels etc.
- An installation and recovery plan for the mooring spread for Part 2 and Part 3 Marine trials
- A description of the plan to conduct a **detailed engineering analysis** of the proposed anchoring spread in Minas Passage. This analysis will be reviewed by a third party engineering team or contractor before progressing to Part 2 and Part 3 marine trials. The detailed engineering analysis shall include the results of a modeling study or numerical analysis to demonstrate predicted mooring line tensions and that the moorings have sufficient resistive capacity to withstand predicted tension plus safety factor. The study shall also address how the contractor plans to control the position of the vessel through the 13m tide range.

FORCE will provide data required to support this analysis once the contract is issued. (Appendix 4 outlines the data that will be made available.)

Please include the cost to conduct:

- A detailed engineering study of the mooring arrangement.
- An anchoring plan for *Sheltered Harbour Trials*.
- An anchoring plan for *Minas Passage Trials*, including a separate anchor deployment if required.

Part 2: Sheltered Harbor Trials

Sheltered harbor trials are required to assess vessel and deck spread performance, mooring control and rehearse planned operations. This trial can be conducted at a mutually agreed upon location near the home port of the marine assets to reduce transit time.

Objectives of this trial are:

- Platform control and positioning as outlined in appendix 3 with a view to assessing suitability of vessels and assets for the Minas Passage.
- Demonstrate lift capability.
- Refine and rehearse recovery and deployment procedures.
- Evaluate deck layout.
- Testing of Sensor Platform float recovery mechanism.
- Overall evaluation of operations for Part 3 trials in the Minas Passage.

Proposed trial event schedule:

- 1) Mobilization
- 2) Transit to location
- 3) Mooring and platform position control
- 4) Node deployment and recovery
- 5) Float release trials
- 6) Mooring recovery
- 7) Transit from location
- 8) Demobilization

It is expected operations 3-6 will take 3 to 4 days to complete based on 12hr work days.

For Part 2, responses shall include:

- Description of the proposed vessels.
- Crew list, background and experience.
- Identification of suppliers and subcontractors.
- Description of the deck spread required to recover and deploy the node.
- Description of the proposed method to control the position of the vessel to recover the node.
- Description of how the contractor will develop a risk registry for Part 2 activity.

Please include following costs:

- Day Rate for mobilization alongside the contractor jetty.
- Day rate for sheltered harbour trials.
- Day rate for standby as a result of contingency/weather

Part 3: On site trials in Minas Passage

This phase will consist of an onsite trial in the Minas Passage and will simulate operations and conditions as encountered for the actual servicing of the cabled Sensor Platform.

Objectives of this trial are:

- Validation of anchoring spread in Minas Passage conditions.
- Evaluate overall marine asset performance including support vessels and safety infrastructure.
- Verify platform control and positioning as outlined in Appendix 3
- Testing of Sensor Platform recovery mechanism in high flow conditions
- Assess stability of Sensor Platform.
- Final evaluation of marine assets performance, equipment operation and operational procedures.

Schedule of events:

- 1) Mobilization
- 2) Transit to Minas Passage
- 3) Deploy anchor spread
- 4) Mooring and position control
- 5) Demonstration of mooring control during neap flood tide
- 6) Node deployment, float release and recovery
- 7) Float release trials during flood tide
- 8) Pull test on node
- 9) Anchor spread recovery
- 10) Transit from Minas Passage
- 11) Demobilization

It is expected operations 3-9 will take 3 to 4 days to complete. Site trials in the Minas Passage trials may require 24 hrs/day operations to take advantage of available slack water periods during neap tides. PLEASE NOTE: Under 24 hour operations, the contractor must provide a safety and transportation plan for carrying out transfers of personnel at planned shift change periods, understanding that personnel may be transferring under very challenging conditions (see section 6 below).

For Part 3, responses shall include:

- Description of the proposed vessels.
- Crew list, background and experience.
- Description of the deck spread required to recover and deploy the node.
- Description of the proposed method to control the position of the vessel to recover the node.

Please include following costs:

- Day Rate for mobilization alongside the contractor jetty.
- Day rate for transits
- Day rate for FORCE site trials.
- Day rate for standby as a result of contingency/weather

6. Safety Management Plan

All bidders must provide information regarding their safety management planning process. Upon contract award, the successful contractor must prepare a Safety Management Plan specific to the scope of work outlined in this contract. The Safety Management Plan shall include details on how the contractor will manage safety for all of its operations and personnel on site during the course of the contract.

A copy of the Safety Management Plan shall be provided 15 days after contract award for comment and review by FORCE prior to the contract works commencing.

As a minimum the Safety Management Plan shall address the following:

- Leadership – management of the job, establishment of performance standards and communication of these standards.
- Hazard identification and management.
- Work control processes.
- Pre-planning requirements for the job.
- Training and personnel competence.
- Pre-start checks/job hazard assessments.
- Development and implementation of specific procedures to manage the job.
- Auditing compliance against the procedures developed.
- Identification of equipment required.
- Contractor site emergency management
- Identified "High Risk Activities"
- Risk Control Register
- Procedures for changeout of personnel at shift change times

Contractors will provide a detailed description of the safety management planning process used when undertaking operations, including the identification of applicable standards used in the Safety Management Plan.

7. Insurance and Certifications

Operators must meet the minimum Transport Canada insurance requirements and have passenger and third-party liability coverage to the limits specified.

Contractors will meet all Transport Canada certification standards applicable for the planned work. Contractors will demonstrate that all vessels proposed in the RFP meet Transport Canada regulations to at least the standard required for planned work. The vessels will have, through out the operational period, all certificates, lifesaving equipment and apparatus as required by The Canada Shipping Act and pursuant regulations for the crew and additional staff.

8. Conflict of Interest

It is the responsibility of consultants to identify all possible conflicts of interest that may affect services.

9. Guidelines for Submission of Full Proposals

Format: Submissions are to be made as outlined in section 8. The document must be submitted in Word document format as follows: single spaced, single sided, font size 12-point, Times New Roman, 1" margins on all sides, and contain the contents outlined in section 7.

The submission will be evaluated according to the criteria in Schedule A.

10. Checklist: Full Proposal Contents

The Full Proposal shall clearly address all of the information requested in this section.

Since the objective is to produce documents that are easily understood the Full Proposal should demonstrate exemplary communication skills, be complete, and make a convincing case that the consultant can perform high quality work. The Full Proposal shall be organized with the subject headings in the sequence indicated:

OVERVIEW

- **Introduction** including a description of your firm and its areas of concentration, expertise and experience in the field of marine contracting and subsea installations.
- **Experience and Past Performance** in the installation of subsea equipment, marine operations, vessel handling, operating deck equipment, deployment of scientific instruments.
- **Organization and Personnel** include a profile of the project team and identify who will be the primary contact and any personnel proposed to be involved in services to FORCE.
- **Location** of your facilities and from which office the work will be conducted.
- **Availability:** it is essential that this work get underway immediately to meet deadlines associated with FORCE Sensor Platform Project marine trials.
- **Safety Record:** In the proposal please identify that you have all the safety processes and procedures in place to complete this work in a safe manner, including safety management planning process outlined in section 6.

- **References.** You may provide two (2) letters of references for which similar work has been provided.
- **Signature.** The Full Proposal must be signed by an authorized official.

CORE SUBMISSION

- **Proposal.** From section five (5), including responses and pricing for:
 - **Part 1: Anchoring System Plan and Engineering Study**
 - **Part 2: Sheltered Harbor Trials**
 - **Part 3: On site trials in Minas Passage**

11. SUBMISSION

You may respond electronically or by hard copy.

Please submit your Full proposal to:

<i>In writing or on disc/memory stick</i> FORCE C/O Tony Wright P.O. Box 2573 Halifax, NS B3J 3N5	<i>Electronically</i> Tony.Wright@fundyforce.ca Re Marine Services for the Sensor Platform Project
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Full Proposals must be submitted no later than **4PM AST, Apr 26, 2013**. Full Proposals received after that time will not be considered. All Full Proposals received by the deadline will receive an acknowledgement by email.

12. ENQUIRIES

Enquiries regarding the project of the RFP process should be directed to:

Tony Wright
FORCE
E-Mail: Tony.Wright@fundyforce.ca
Phone: (902) 406-1166 ext 6

Alternate:

Matt Lumley
FORCE
E-Mail: Matt.Lumley@fundyforce.ca
Phone: (902) 406-1166 ext 2

FORCE will respond to requests for clarification as soon as is reasonably possible. FORCE will respond in writing or orally as deemed appropriate in the circumstances.

FORCE reserves the right to make any or all questions and answers to enquiries available to all other proponents. Generally, only substantial answers that clarify the process will be distributed.

12. Full Proposal Modification and Withdrawal

Addenda will be accepted until the closing date. Full Proposals may be withdrawn on written request of the proponent any time.

13. Full Proposal Changes and Amendments

FORCE may issue addenda and/or clarification to the Full Proposal as necessary. FORCE, will notify all proponents in writing if any changes are made to the Full Proposal. The closing date may be extended.

14. Principal Contact

Each Full Proposal should include the name and title of one individual who may be contacted in the event that further clarification of the Full Proposal is required.

Schedule A EVALUATION CRITERIA

Evaluation Criteria for Assessment of Full Proposals

The Full Proposal will be evaluated according to FORCE's procurement criteria and their completeness, content, and evidence of successful implementation and management of similar programs for similar organizations, and the abilities of the Proponent and its staff.

The criteria for evaluating Full Proposals are:

- **Experience and Past Performance** in the installation of subsea equipment, marine operations, vessel handling, operating deck equipment, deployment of scientific instruments. **40 points**

- **Full Proposal content and completeness** including a thorough explanation of the company's safety management system as detailed in section 6. **30 points**

- **Budget and Cost** **30 points**

APPENDIX 1 – GRAVITY BASE/INSTRUMENT POD

1.1 Subsea Equipment

The following figures show the subsea equipment elements.

1.2 Recoverable Node Sea Trial Base

The Recoverable Node Sea Trial Base consists of the following equipment:

- Node Gravity Base
- Float Release Device
- Instrument Bay Test Mass

The overall dimensions are 4.2 x 3.8 x 0.9 meters. The weight in air is 10 tonnes and the weight in water is 8.7 tonnes. There are two main lift points located in the centre of the device. One is for deployment while the other is attached to the Float Release lift line

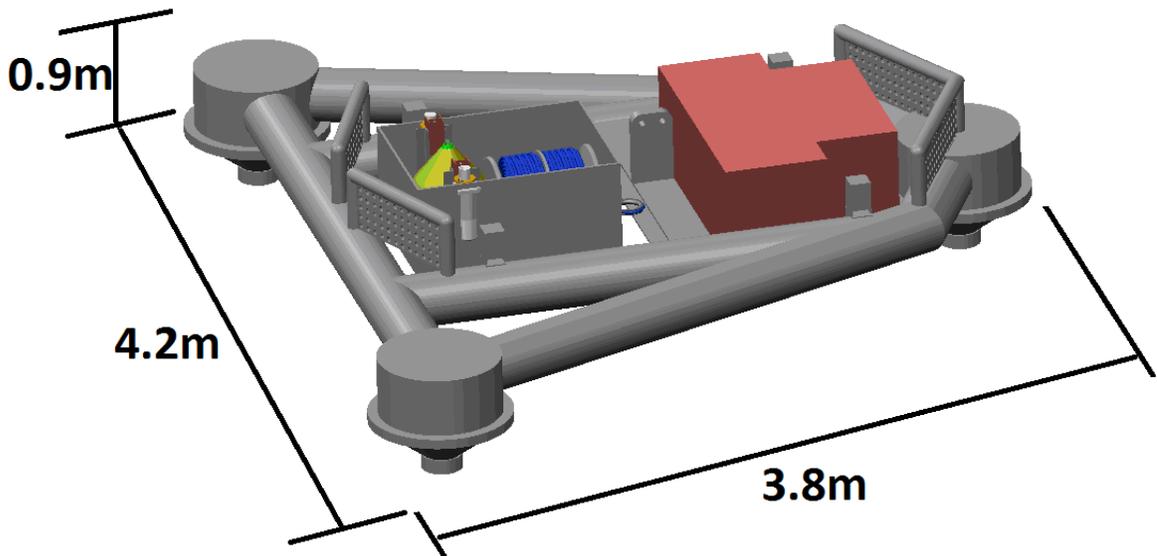


Figure 1 - Node Gravity Base

1.3 Simulated Dynamic Cable with Dead Man Anchor (DMA)

The Cable with (DMA) simulates a cable to shore. It consists of the following:

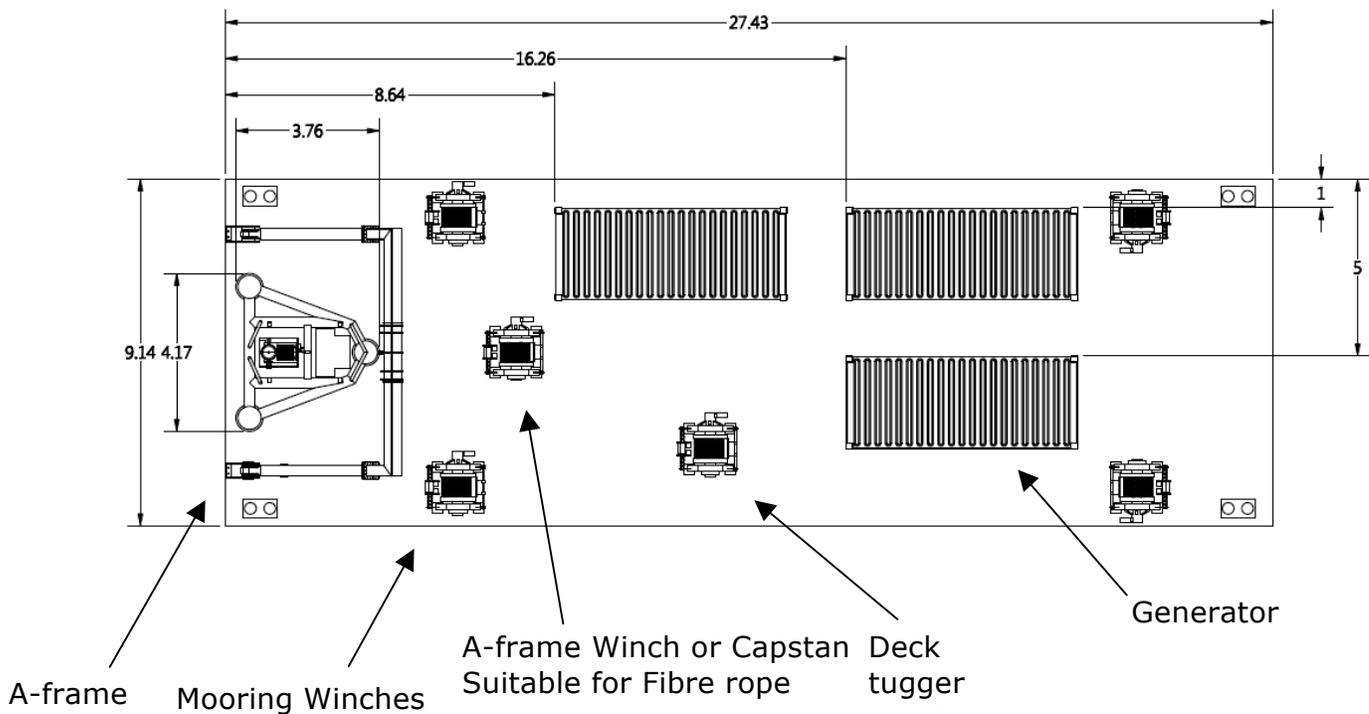
- 5 Tonne Gravity anchor
- 1 inch diameter wire rope approximately 2.75kg/m in water weight

APPENDIX 2 – DECK LAYOUT

2.1 Deck Layout

The marine operator will determine the overall deck layout. A sample deck layout is provided for discussion purposes. It is assumed that support vessels will be required for accommodation, emergency procedures, personnel transfers and vessel position control and transit.

Sample Deck Layout (Dimensions in meters)



2.2 Contractor Provisioned Equipment

The vessel must be configured with the following equipment as a minimum:

- Mooring spread capable of station keeping within watch circles indicated in Appendix 3. Vessel shall be able to be repositioned a distance equivalent to the expected water depth.
- A-frame capable of lifting Recoverable Sea Trial Base & Simulated Dynamic Cable under tension. Dynamic loading shall be taken into account for agreed upon sea state.
- A-frame winch or capstan suitable for loading a fibre rope.
- Deck tugger winch
- Generator

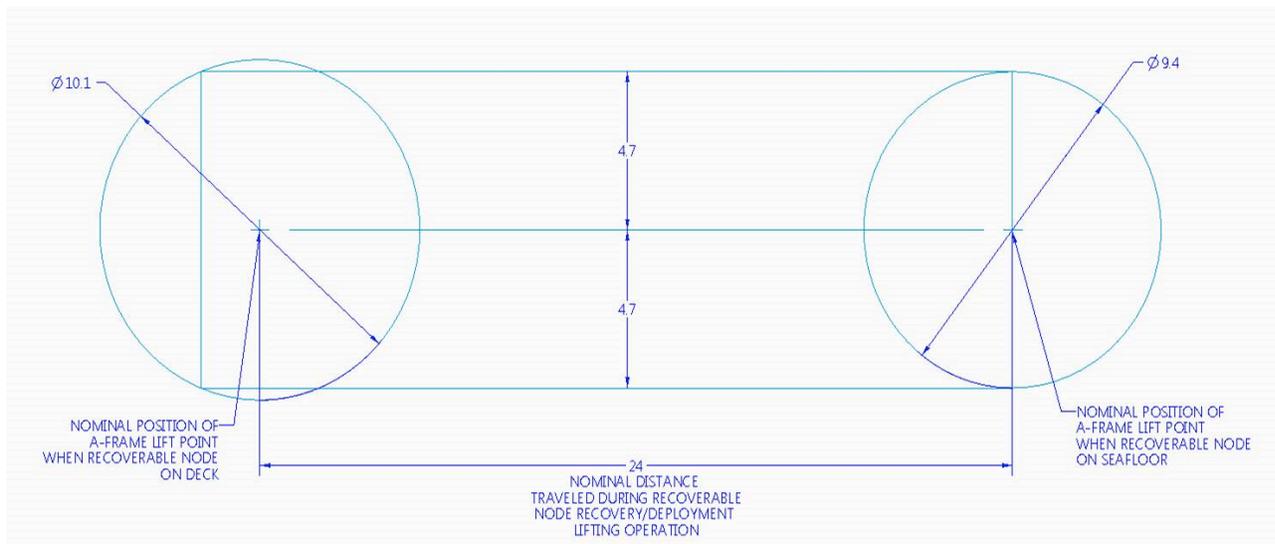
2.2 Contractor Optional Equipment

- Spares / Workshop container
- Control Van
- Deck equipment for mooring deployments and recovery (crane)

APPENDIX 3 – Positioning Requirements

3.1 Vessel Positioning

The vessel will be required to maintain position in the “Watch areas” during the entire lifting phase and when the FORCE Sensor Platform is on deck. When the node is being lifted through the water column, the vessel will transition approximately 24 meters along the direction of current between the node pickup area and the Node on deck area. The watch areas are based on maintaining dynamic cable tension and will need to be developed further. The values shown below are for a seawater depth of 30m. Units of length are in meters.



Watch Area for Vessel Lifting Point

APPENDIX 4 – Site Data

4.1 *FORCE Data supplied for RFP preparation*

FORCE recommends reviewing key data as part of the RFP submission. The following items are available electronically to RFP proponents upon email request to Tony.Wright@fundyforce.ca:

4.1.1 Images and Maps

- FORCE Crown Lease Area General Overview
- Cable Routes and Berth Sites on 2011 Multibeam surface
- FORCE Crown Lease Overview on Multibeam surface – 2m resolution
- Cable Route ADCP Survey Locations

4.1.2 Tidal Current Overview Reports

4.1.3 General Reports

- Geology, Bathymetry, Ice and Seismic Conditions: Minas Passage
- Seabed and Benthic Communities: Minas Passage (includes sea bottom imagery)

Upon contract award, FORCE will work with contractor to review relevant items in the complete data archive.