

**Approval Date: 11 August 1999****Reviewed on : 23 October 2007****Version: 1****Purpose**

The steel boat will be used to execute hydrological measurements in rivers, canals and reservoirs. Many of the measurements will be made in very shallow water.

**Conditions & Requirements**

- The boat shall be of such a design that it operates reliably and safely under the prevailing environmental and hydraulic conditions.
- The boat shall be capable to operate in shallow water where repeatedly the hull may impact with rock or sediment.
- All corrosive materials shall be provided with full and durable coating.
- All coatings used shall provide full protection against rusting and corrosion to the steel body, structural parts, and components of the boat.
- All parts, structural members and components of the boat remaining exposed to water shall be provided with complete cathodic protection.
- The boat shall be very sturdy, unsinkable and shall have an adequate stability.
- The boat shall be easy to operate and maintain.
- The boat shall have an expected technical lifetime of not less than 10 years.
- The boat and the outboard engines shall be capable to operate for at least 6 months without any major servicing.
- The boat shall have floatation chambers filled with closed cell foam.
- The boat shall be provided with appropriate fenders.
- The boat's welded and/or riveted joints shall be designed to avoid leakage while taking into account the hostile environment of operation e.g. shallow water, high flow rate, floating debris, high sediment loads.
- The boat shall have a cabin to accommodate equipment and staff.
- The cabin shall, at port and starboard side, have sitting benches.
- The cabin shall have windows and a lockable door.
- On deck adequate workspace (at least 2.3 x 3 m<sup>2</sup>) should be provided to carry out hydrological measurements.
- The rear deck shall be provided with an awning.
- The boat shall be supplied with the accessories as needed for effective deployment.
- The boat shall be fitted with two outboard engines (see 10.036).
- The outboard engines shall be operated by a remote control system, located at the stern side bulkhead of the cabin.
- The control system shall have a starting switch, gear switch and a throttle system for each engine and a steering wheel and emergency stop switch for simultaneous operation of the engines.
- The control system shall match the outboard engines.
- A break water arrangement shall be provided in the front.
- Guard-rail and stanchions with detachable chain will be rigged out around the deck-opening. Suitable guard-rails shall also be provided around the deck.
- Bollards and fairleads are to be provided on the deck for mooring purpose.
- A maintenance manual, related to the type and model of the boat, shall be part of the delivery

## Specifications

### 1. Boat

<b>length</b>	approx. 8 m
<b>width</b>	approx. 2.5 m
<b>draft</b>	approx. 0.5 m
<b>free board</b>	approx. 0.6 m
<b>bottom shape</b>	flat or slightly catamaran
<b>propulsion</b>	2 Nos. of 30 kW (40 HP) outboard engines
<b>carrying capacity</b>	1000 kg (approx.)

### 2. Cabin

<b>length</b>	approx. 3 m
<b>height</b>	ample sitting height
<b>door</b>	lockable
<b>door width</b>	>0.8 m

### 3. Boat outfit

<b>anchor</b>	matching boat, fitted with 5 chain and rope for water depth of 20 m and current velocity of 5 m/s
<b>echo-sounder</b>	indicator type, fitted in the boat
<b>compass</b>	magnetic type, fitted in the boat
<b>fenders</b>	4 of Coir type
<b>paddles</b>	4 for rowing
<b>life-jacket</b>	for each person on board, also for guests
<b>life-buoy</b>	8 pieces with at least 50 m line, readily available on board
<b>fire extinguisher</b>	>5 kg

The fire extinguisher shall be readily accessible in the motor compartment (if any) and in the cabin

## Remarks

For the installation of winches, fitting of survey echo-sounder transducers etc. some local reinforcements and/or supports may be required. Arrangements shall be possible for mounting a duly compensated magnetic compass on to the boat for use in positioning the boat for flow measurements. Arrangements shall exist for mounting the boat outfit (Bracket) and for dropping of the anchor to keep the boat stationary, during velocity measurements. These can only be specified after selection of the survey instruments and other relevant equipment.

Arrangements shall be made for safe working on the boat.

For Indian bidders, the Registrar of Shipping, Mumbai, shall approve the design and drawing. For international bidders the design and drawing shall be approved by a national agency in their country authorised for the purpose and acceptable to the purchaser.

## Option

Optionally, the boat may be fitted with an instrument-well for acoustical and other transducers. Basically, there are two ways to install acoustical transducers, such as echo-sounder and ADCP, on a boat, viz.:

#### 1. Transducers attached to a bracket at the boat exterior

This method can be used virtually on any available boat. However, the bracket and transducer are relatively vulnerable and may generate considerable drag. Further, being at a distance from the boat's centre, external transducers experience all the pitch and roll movements.

## 2. Transducers in a well inside the boat

Transducers in the well are in direct contact with the water and can execute the acoustic measurements but are not exposed to the flow of water, hence much more protected. In particular in case the well is constructed in or close to the boat's centre, then the transducer will experience little effect of pitch and roll movements. This increases accuracy and data quality. The well has to be tailor made and adds to the boat cost. Being inside the boat and for safety reasons it should be of a sound construction.

To construct a well, a pipe with ID of about 0.4 m could be installed in the centre of the boat. The well top should be at about board level. The well bottom should be soundly fixed to the boat bottom. It shall be possible to close the top of the well.

The location and exact size of the well will be specified after selection of the measuring equipment.

The purchaser may execute his judicious discretion in the choice of configuration and options.

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