

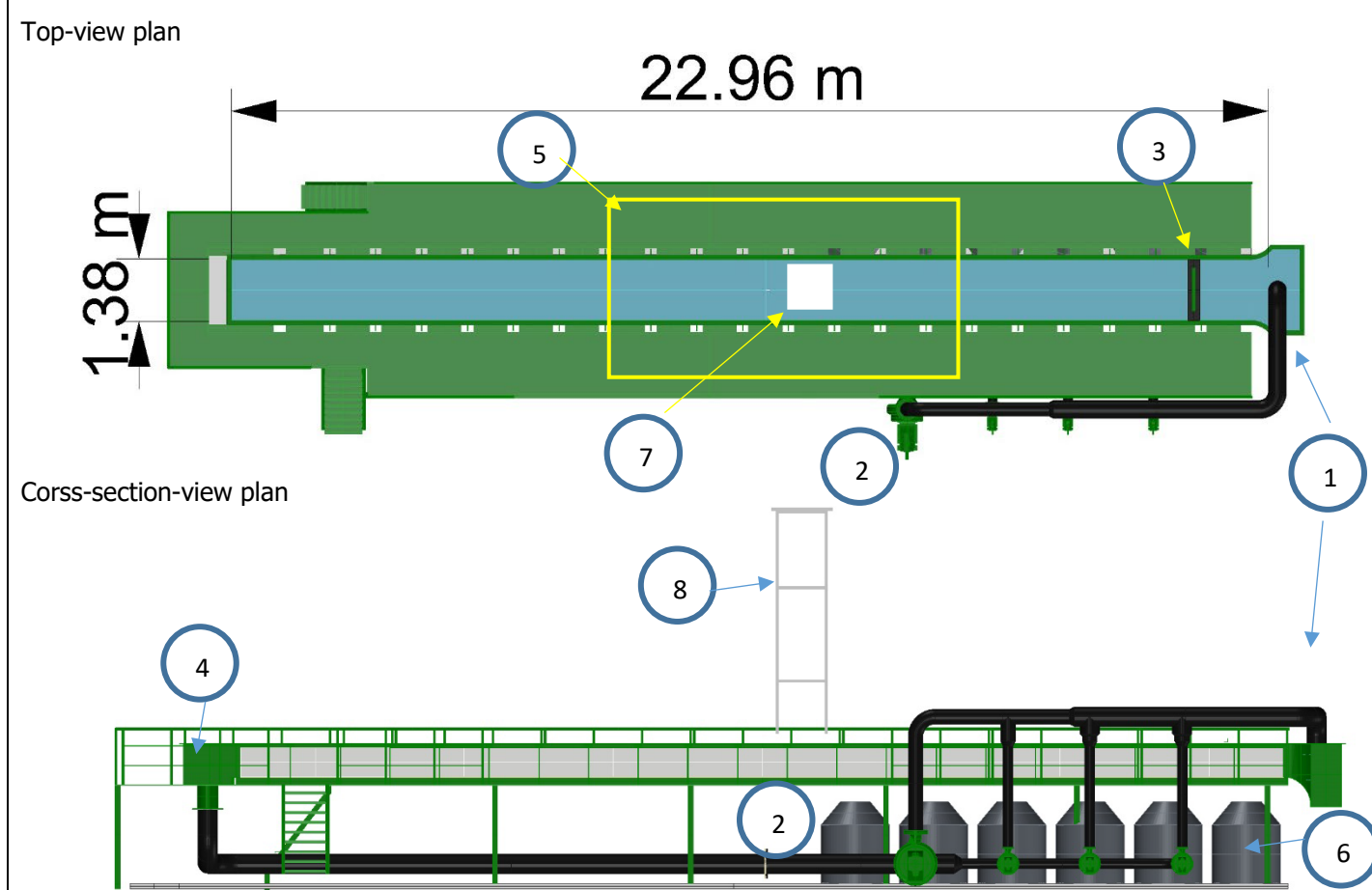
<b>Name of organization</b> Laboratório de Ondas e Correntes (Laboratory of Waves and Currents) - Federal University of Rio de Janeiro (LOC/COPPE – UFRJ)	<b>Year of information updating</b> 2020
<b>Year established</b> 1999	<b>Year of joining the ITTC</b> 2021
<b>Address</b> Av. Athos da Silveira Ramos, Block I, Room 104, University City, RJ - Brazil.	<b>Status in the ITTC</b> Member
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<b>Type of facility</b> Circulating current channel	<b>Year constructed/upgraded</b> Construction: 1973 / Upgrade1: 1999 / Upgrade2: 2019
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<b>Name of facility</b> Laboratório de Ondas e Correntes (LOC/COPPE – UFRJ)	<b>Location</b> (if different from the above address)
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**Main characteristics** (dimensions of tank/basin/test section; for simulators: full mission, part task or desk top)  
L x B x D = 23 x 1.4 x 0.6 m

**Drawings of facility**



1	Water inlet	4	Water outlet	7	Glass-bottomed section
2	Pumping system	5	Test section	8	4m tower
3	Honeycomb	6	Water reservoir		

## **Detailed characteristics** (carriages, wave/current/wind generators, instrumentations, etc.)

Features installed at wave channel:

- Test section: 5 m long
- Glass sidewalls all along channel
- Glass bottomed section for flow visualization in test section
- Planar Motion Mechanism (PMM) installed
- Vertical oscillator
- 6m high tower for pendular assembly
- Wedge wavemaker
  - Regular wave generation
- Honeycomb at the inlet (turbulence reduction)
- Mobile passive beach at outlet

Instrumentation:

- Load cells
  - In-house built ring-type (for measuring tension in mooring lines)
  - Commercial 1D compression loadcells
  - In-house built 3D loadcell (drag, lift, moment measurements)
- ADV (current measurements)
- Dynamic torquemeter (measure torque and rotation speed)
- Optical tracking systems
  - Commercial: Qualysis®
  - In-house device
- Particle Image Velocimeter (PIV)
- Capacitive wave gauges
- Pressure sensors

## **Applications** (Tests performed)

- Captive resistance test
  - Fixed models
  - Dynamic trim and sinkage
- VIV and VIM tests
  - Pendular assembly
  - Flow visualization with Particle Image Velocimetry (PIV)
- Hydrodynamic coefficients (with PMM)
- Current turbine efficiency tests
- Drag / lift experiment
  - Drag / lift / moment measurements for different geometries under steady current
  - Drag / lift / moment measurements for different geometries under steady current with oscillating (combined with PMM or vertical oscillator)
- Seakeeping experiment for regular waves
  - Stationary model
  - Wave-current interaction
- Propeller open-water test

## **Published description** (Publications on this facility)

Recent scientific publications:

- GU, JIAN ; FERNANDES, Antonio Carlos ; SALES, JOEL SENA . Alternative insight to understand the Reynolds number effects in vortex-induced vibration. MARINE STRUCTURES, v. 69, p. 102686, 2020.
- BAKHSHANDEH ROSTAMI, ALI ; FERNANDES, Antonio Carlos . Evaluation of dynamics of fluttering and autorotation of a rigid plate in a flow using far-field method. NONLINEAR DYNAMICS, v. 1, p. 1-15, 2018.
- ROSTAMI, ALI BAKHSHANDEH ; MOBASHERAMINI, MOHAMMAD ; FERNANDES, Antonio Carlos . Strouhal number of flat and flapped plates at moderate Reynolds number and different angles of attack: experimental data. ACTA MECHANICA **JCR**, v. 1, p. 1-17, 2018.
- ROSTAMI, ALI BAKHSHANDEH ; FERNANDES, Antonio Carlos . Mathematical Model and Stability Analysis of Fluttering and Autorotation of an Articulated Plate into a Flow. Communications in Nonlinear Science and Numerical Simulation **JCR**, v. 1, p. 1-12, 2017.
- ROSTAMI, ALI BAKHSHANDEH ; FERNANDES, Antonio Carlos . From fluttering to autorotation bifurcation of a flat plate in a current. JOURNAL OF THE BRAZILIAN SOCIETY OF MECHANICAL SCIENCES AND ENGINEERING (ONLINE) **JCR**, v. 1, p. 1-20, 2017.
- ARMANDEI, M. ; FERNANDES, A. C. ; ROSTAMI, A. B. . Marine Current Energy Extraction through Buffeting. INTERNATIONAL JOURNAL OF MARINE ENERGY, v. 1, p. 1-16, 2016.
- FERNANDES, A.C.; MIRZAEISEFAT, S. . Flow induced fluttering of a hinged vertical flat plate. Ocean Engineering **JCR**, v. 95, p. 134-142, 2015.

#### Recent congress publications:

- AMINI, M. M. ; FERNANDES, A. C. ; ALVES, L. ; ELWANGER, G. B. . Behavior evaluation of subsea jumpers exposed to current by experiment and FEM. In: 37th International Conference on Ocean, Offshore and Arctic Engineering OMAE2018, 2018, Madrid. Proceedings of 37th International Conference on Ocean, Offshore and Arctic Engineering OMAE2018. v. 1. p. 1.
- GU, J. ; FERNANDES, A.C. ; J.S.Sales . New Insight on the Effects of Reynolds Number in Vortex Induced Vibration. In: 37th International Conference on Ocean, Offshore and Arctic Engineering OMAE2018, 2018, Madrid. Proceedings of 37th International Conference on Ocean, Offshore and Arctic Engineering OMAE2018, 2018. v. 1. p. 1.
- COSTA DA SILVA JUNIOR, JULIO CESAR ; FERNANDES, Antonio Carlos . Influência de ESDs na Eficiência Propulsiva. In: 27º CONGRESSO INTERNACIONAL DE TRANSPORTE AQUAVIÁRIO, CONSTRUÇÃO NAVAL E OFFSHORE, 2018, Rio de Janeiro. 27º Congresso Internacional de Transporte Aquaviário, Construção Naval e Offshore, 2018.
- PADILHA DE LIMA, JOÃO VICTOR ; SENA SALES JUNIOR, JOEL ; FERNANDES, Antonio Carlos . Aparato para medição dos coeficientes de arrasto e sustentação em canal de correntes. In: 27º CONGRESSO INTERNACIONAL DE TRANSPORTE AQUAVIÁRIO, CONSTRUÇÃO NAVAL E OFFSHORE, 2018, Rio de Janeiro. 27º Congresso Internacional de Transporte Aquaviário, Construção Naval e Offshore, 2018.
- GU, JIAN ; FERNANDES, Antonio Carlos ; SALES JUNIOR, JOEL SENA . Investigação experimental de vibração induzida por vórtices através de aparelho oscilatório translacional e pivotado. In: 27º CONGRESSO INTERNACIONAL DE TRANSPORTE AQUAVIÁRIO, CONSTRUÇÃO NAVAL E OFFSHORE, 2018, Rio de Janeiro. 27º Congresso Internacional de Transporte Aquaviário, Construção Naval e Offshore, 2018.
- LAMAS, Francisco ; RAMIREZ, MIGUEL A. M. ; FERNANDES, Antonio Carlos . Yaw Galloping of a TLWP Platform Under High Speed Currents by Analytical Methods and its Comparison With Experimental Results. In: ASME 2017 36th International Conference on Ocean, Offshore and Arctic Engineering, 2017, Trondheim. Volume 1: Offshore Technology. p. V001T01A007.