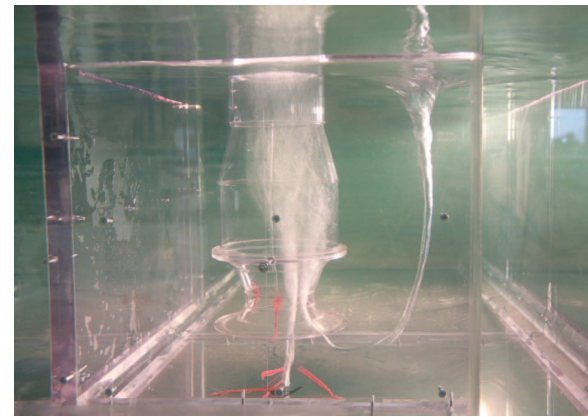


MODELLING |

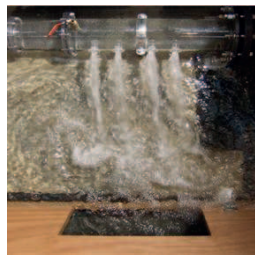
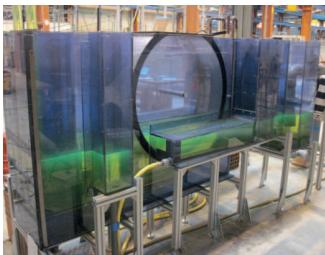
URBAN AND INDUSTRIAL HYDRAULIC STRUCTURES

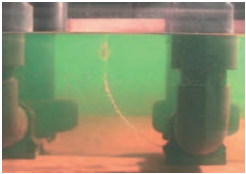
Urban or industrial sites often feature cramped and highly restricted spaces. Hydraulic physical modelling offers a powerful and reliable means of reproducing these highly complex structures, optimising their sizing and reducing project costs.



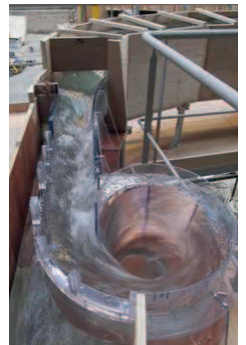
OUR ASSIGNMENTS

- Checking and validating the design and correct hydraulic operation of structures
- Optimising the geometry of structures, with a view to:
 - . minimising hydraulic risks
 - . reducing project costs (civil engineering design and/or works phase)
- Detailed studies of vortex formation risks on the suction side of pumps
- Improving the reliability of technical designs for complex structures

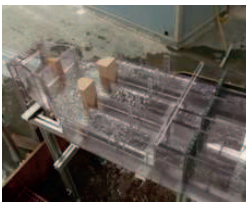




CANADA | Halifax - Scale: 1:10
Pumping station



ITALY | Genoa - Scale: 1:20
Diversion of Ferragiano
Bisagno torrent



FRANCE | Ganay - Scale: 1:20
Stormwater detention basin



FRANCE | Versailles - Scale: 1:15
Vertical stepped shaft



FRANCE | Les Bâteliers model - Scale: 1:15
Flow into the vertical stepped shaft

Laboratory holding
ISO 9001
OHSAS 18001
certification

LABORATORY MODELLING | URBAN AND INDUSTRIAL HYDRAULIC STRUCTURES

OUR SKILLS

- Accurate, detailed representation of complex structural geometry
- Precise 3D physical modelling of:
 - . permanent or transient phenomena
 - . two-phase flows (water + air: shafts, wells, etc.)
- Measuring and recording of decisive hydraulic parameters (velocity fields, flow rates, water levels, pressures, etc.)
- Types of structure studied:
 - . pumping stations
 - . hydraulic structures on urban networks (siphons, canals, etc.)
 - . vertical shafts (vortex-type, stepped, etc.)
 - . distribution chambers

SOPHISTICATED FACILITIES

- Robotic station - model construction and quality control
- 3D scanner - Measurement of topographical and morphological changes
- LabVIEW (NI) - Creation of customised systems for acquiring and processing data
- Balances for 3- or 6-component force measurements
- Wide range of pressure sensors
- Ultrasound level sensors
- Ultrasonic probes
- Photogrammetric scour analyser
- Gates with PID regulators
- Doppler velocimeter
- Large scale particle image velocimetry (LSPIV)
- Sediment analysis and qualification laboratory: loss velocity, grain size distribution, density



FRANCE | Canopy roof - Scale: 1:3.66
The Canopy waterfall
at Forum des Halles (Paris)



FRANCE | Grésillons - Scale: 1:15
Physical scale model and 3D
numerical model