

> MAJOR STRUCTURES

Towers and high rise buildings

30 years of expertise in
construction and renovation

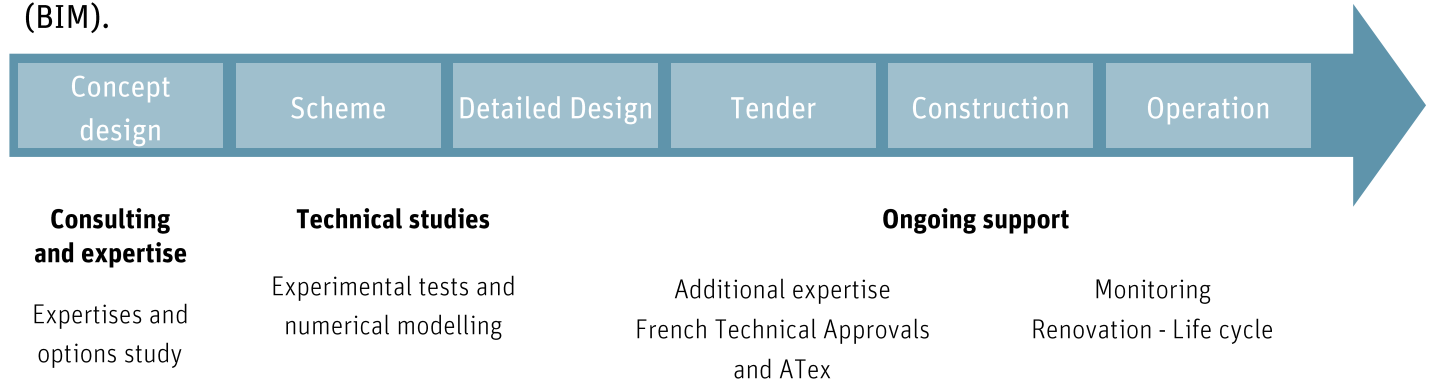
An integrated physical and numerical approach.
Exceptional experimental facilities.
<http://recherche.cstb.fr/en/>



Sisters Towers : 2Portzamparc - L'Autre image

> The CSTB supports tower & tall building design around the world

The CSTB provides scientific and technical expertise supporting designers and clients throughout the project cycle, from conceptual design to construction and operation. It is a major partner in the Digital Transition Plan for Building, thanks to its independence and expertise in Building Information Modelling (BIM).



Supporting structural design

- > Wind loading of facades and structures,
- > Climatic loads: wind, rain, snow,
- > Seismic actions,
- > Construction site safety in strong winds.



Examining fire safety

- > Structural fire resistance,
- > Structural stability under real fire scenarios,
- > Smoke extraction engineering,
- > Simulation of the movement of people, realistic evacuation scenarios.



Optimising health and comfort for building users

- > Indoor and urban acoustics, electromagnetism,
- > Lighting: shadow casting and visual accessibility,
- > Wind comfort and safety,
- > Natural ventilation, indoor air quality,
- > Climatic, global and felt (sensory) comfort.



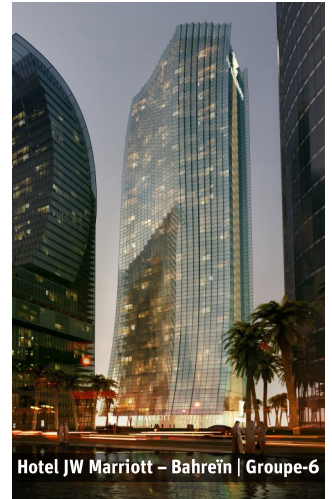
Studying energy, water and the environment

- > Thermal and energetic performance: control of in-service performance,
- > Environmental performance, HQE certification,
- > Green roofing,
- > Property management,
- > Carbon impact: optimisation strategy, linked to the E + C- and BBCA labels.

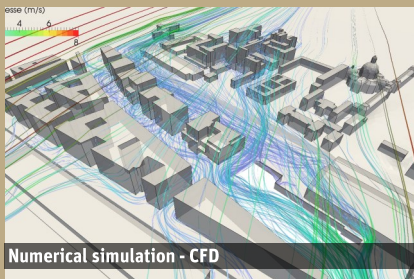
The CSTB is a major European research, testing and certification centre for the construction sector with numerous tests facilities and modelling tools and ~ 1000 staff.

> Middle-East focus

The CSTB has a long experience supporting designers across the Middle East region analysing MET data, interpreting local and international codes and standards and exploring design options as well as performing numerous numerical and experimental studies for major and unique structures.



> Exceptional experimental facilities



- > 6 wind tunnels with an integrated numerical simulation team
 - Preliminary structural load estimates,
 - Detailed wind loading studies (local and global loads and dynamic contribution),
 - Wind resistance and vibrational behavior of facade elements (full-scale),
 - Aeroacoustic behaviour,
 - Characterisation and optimisation of wind comfort.



- > Vulcain, the major research facility for the fire resistance of innovative structures
 - Combined full-scale testing and numerical simulation,
 - Exceptional furnace dimensions for testing long or tall structural elements,
 - Full-scale component and system testing.



- > The CSTB European Acoustics Laboratory tests all types of materials, products and equipment to international standards (NF, EN, ISO or ASTM).
 - Acoustic insulation,
 - Sound absorption coefficient,
 - Shock noise level,
 - Rain noise level,
 - Power levels.



- > The immersive rooms of the CSTB provide virtual reality environments facilitating design, consultation and communication
 - Project model exploration in advance of construction (BIM),
 - Real time navigation and interaction,
 - Visualisation of physical phenomena,
 - Component modification and verification of their technical and environmental impact.

> References worldwide

TOWERS AND HIGH RISE BUILDINGS

New York Times Tower (NY, USA) - Intesa Sanpaolo (Turin, Italy) - Straj Ural Towers (Russia) - Jabal Omar (KSA) - Interseguro Towers (Lima, Peru) - JW Marriott Hotel (Bahrein) - Sisters, Trinity, Air2, Saint-Gobain, D2, Phare, EDF, FIRST, GAN/CB21, Athéna, Exaltis, Piazza, Grande Arche (La Défense, Paris) - Triangle, Tours du pont de Sèvres (Paris) - La Marseillaise (Marseille) - Oxygène, Incity (Lyon) - Odéon, Testimonio 2 (Monaco)



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