

# The new Coastal and Ocean Basin (COB)

Dept. of Civil Engineering, Ghent University



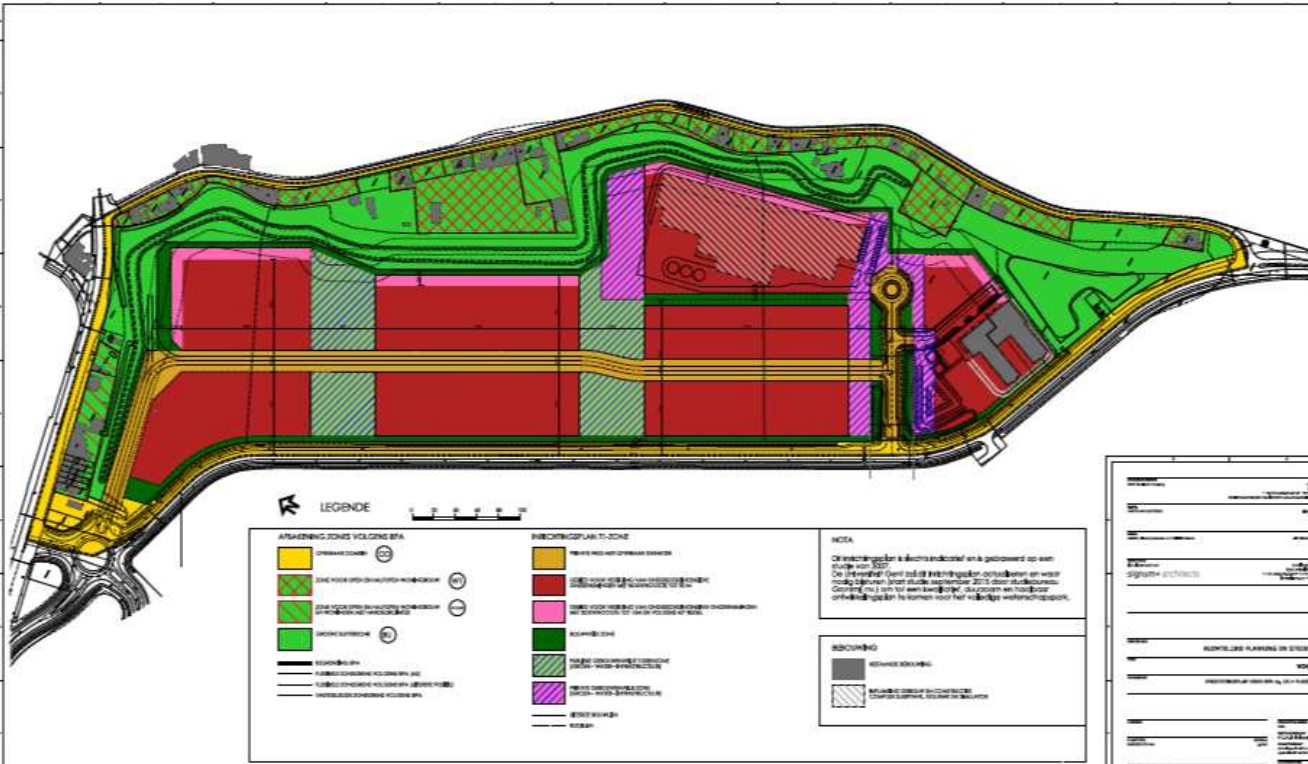
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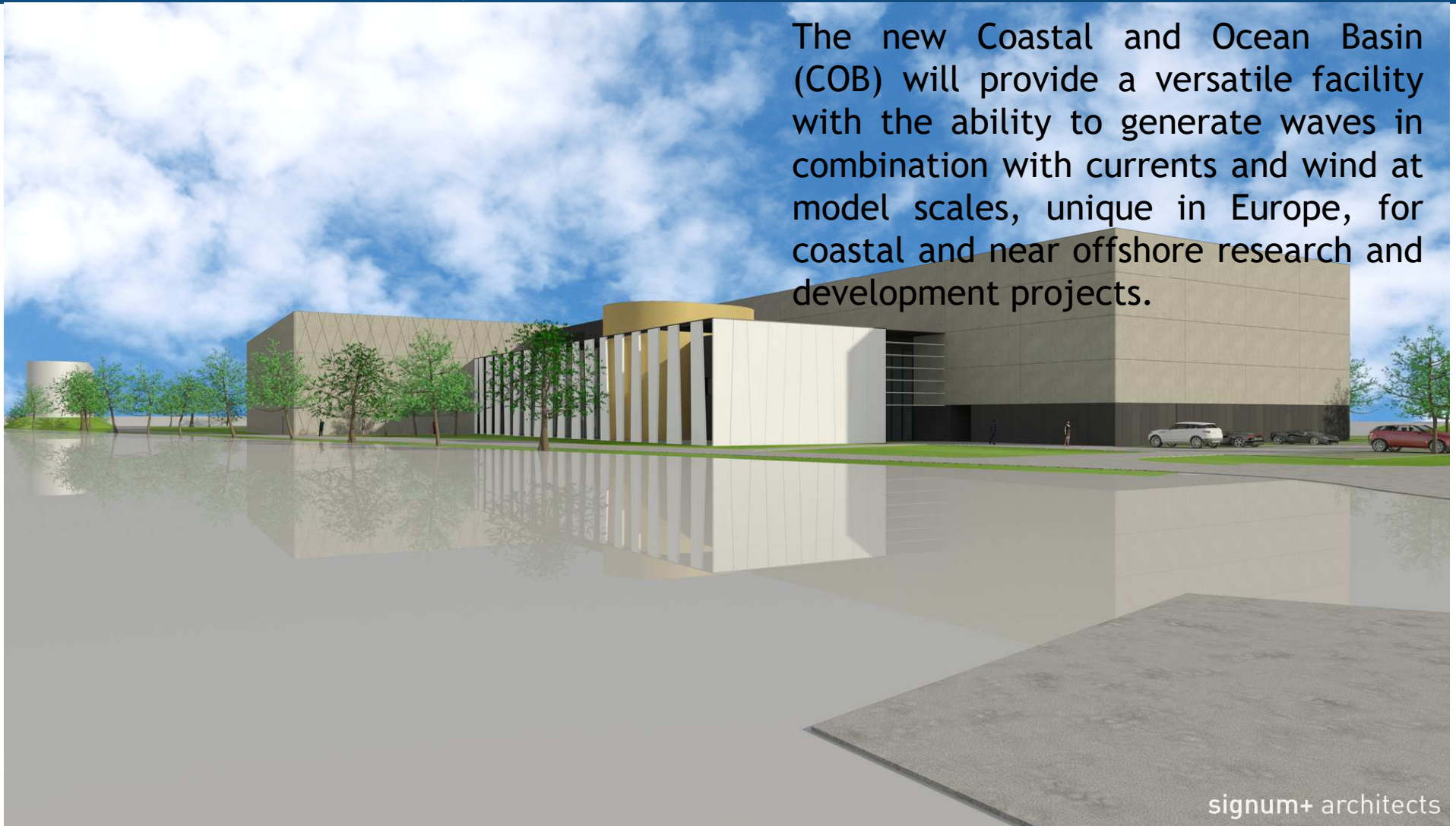
# Introduction

The Ministry of Public Works and Mobility has concluded the design phase of the new Coastal and Ocean Basin (COB) at GreenBridge Science Park Ostend by the end of 2015 and plans the construction phase in 2016-2017.



## Coastal and Ocean Basin (COB)

The new Coastal and Ocean Basin (COB) will provide a versatile facility with the ability to generate waves in combination with currents and wind at model scales, unique in Europe, for coastal and near offshore research and development projects.





## Coastal and Ocean Basin (COB)

The basin will be part of a larger 10000 m<sup>2</sup> building complex that also will include a 200 m long towing tank from the Maritime Access Division of the Ministry of Public Works and Mobility.



## Coastal and Ocean Basin (COB)

This facility is part of the Gen4Wave project on offshore and renewable energy and coastal engineering in Flanders.

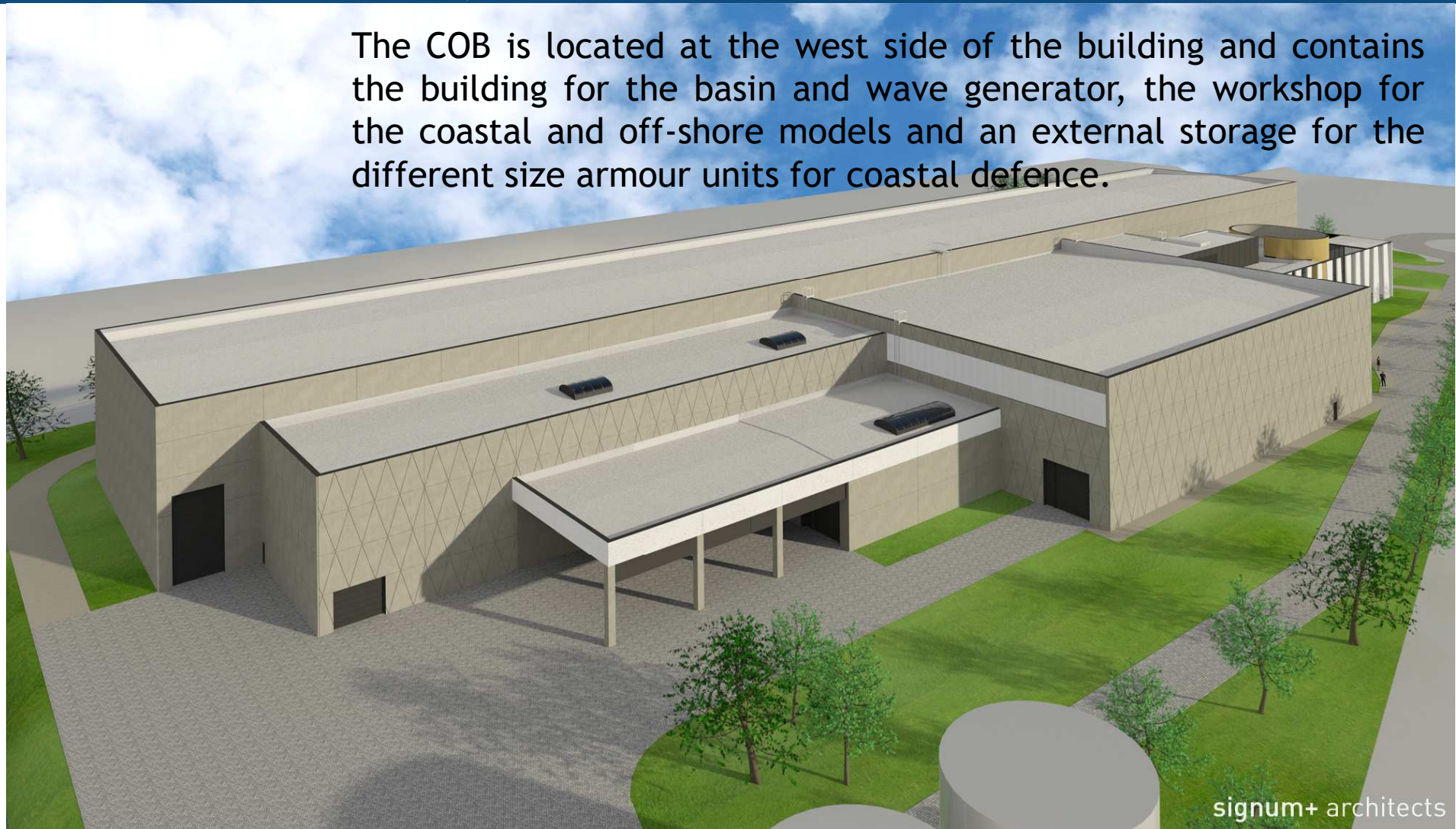


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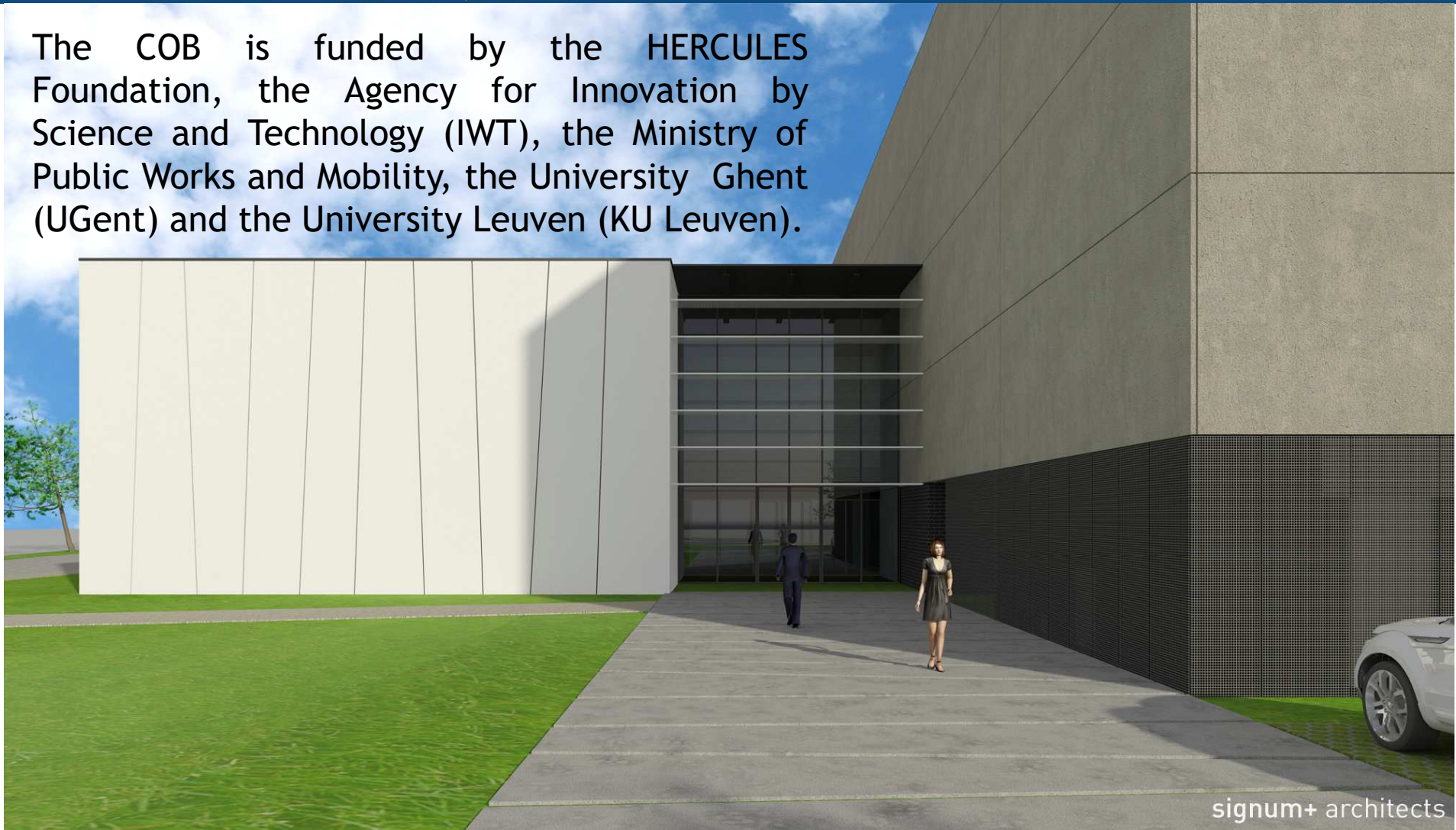
## Coastal and Ocean Basin (COB)

The COB is located at the west side of the building and contains the building for the basin and wave generator, the workshop for the coastal and off-shore models and an external storage for the different size armour units for coastal defence.



## Coastal and Ocean Basin (COB)

The COB is funded by the HERCULES Foundation, the Agency for Innovation by Science and Technology (IWT), the Ministry of Public Works and Mobility, the University Ghent (UGent) and the University Leuven (KU Leuven).





## Coastal and Ocean Basin (COB)



The operational management of the infrastructure will be done by the partnership UGent, KU Leuven and Flanders Hydraulics Research. The offices will contain facilities for lecturing, hosting seminars and meeting rooms.

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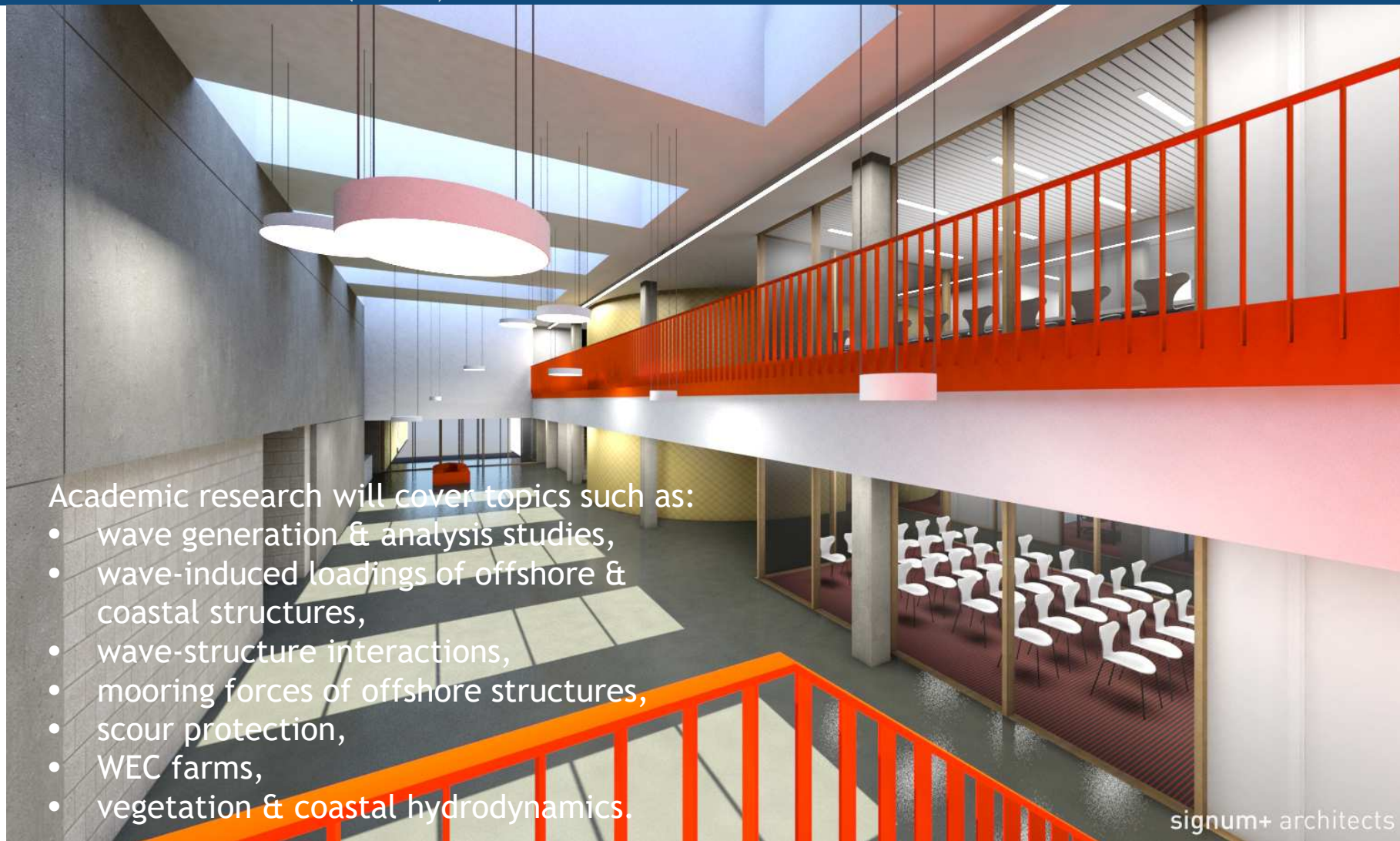
# Coastal and Ocean Basin (COB)



The project aligns perfectly with the action plan of the province of West-Flanders, Factories of the Future “Blue Energy” in supporting developments in the blue energy field and will satisfy the demands from the academic sector and private companies developing coastal and offshore technology.

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# Coastal and Ocean Basin (COB)



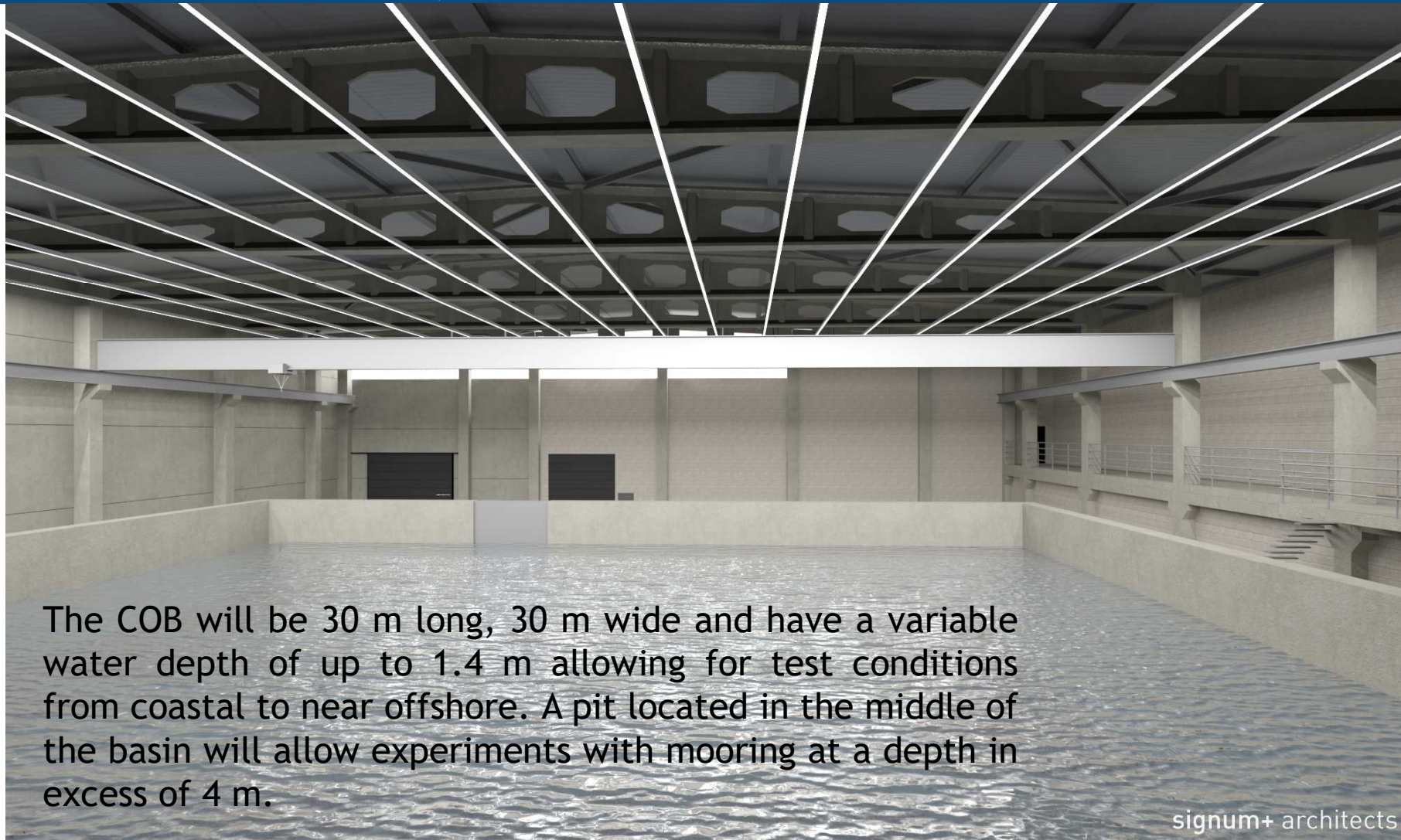
Academic research will cover topics such as:

- wave generation & analysis studies,
- wave-induced loadings of offshore & coastal structures,
- wave-structure interactions,
- mooring forces of offshore structures,
- scour protection,
- WEC farms,
- vegetation & coastal hydrodynamics.

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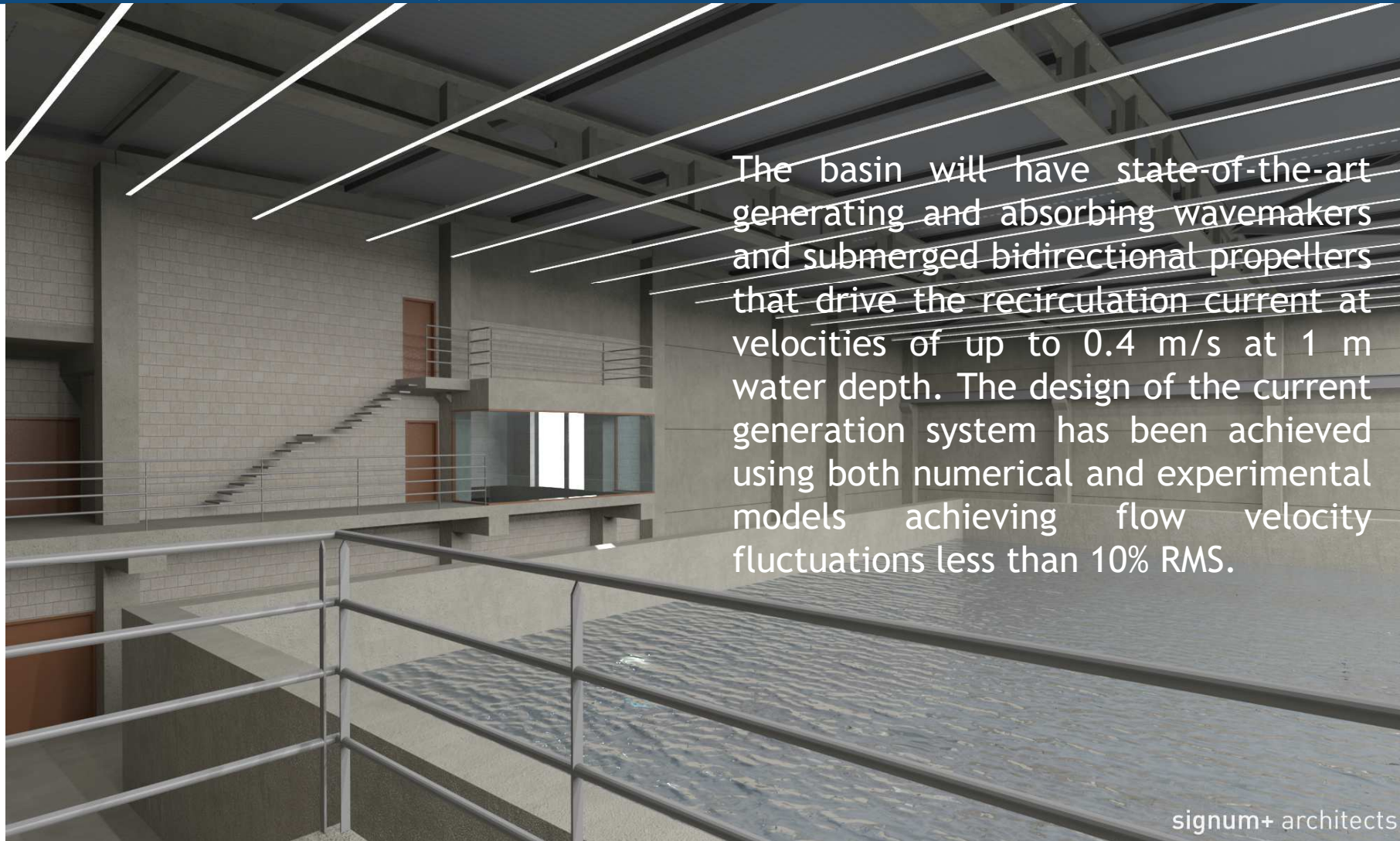
## Coastal and Ocean Basin (COB)



The COB will be 30 m long, 30 m wide and have a variable water depth of up to 1.4 m allowing for test conditions from coastal to near offshore. A pit located in the middle of the basin will allow experiments with mooring at a depth in excess of 4 m.

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## Coastal and Ocean Basin (COB)

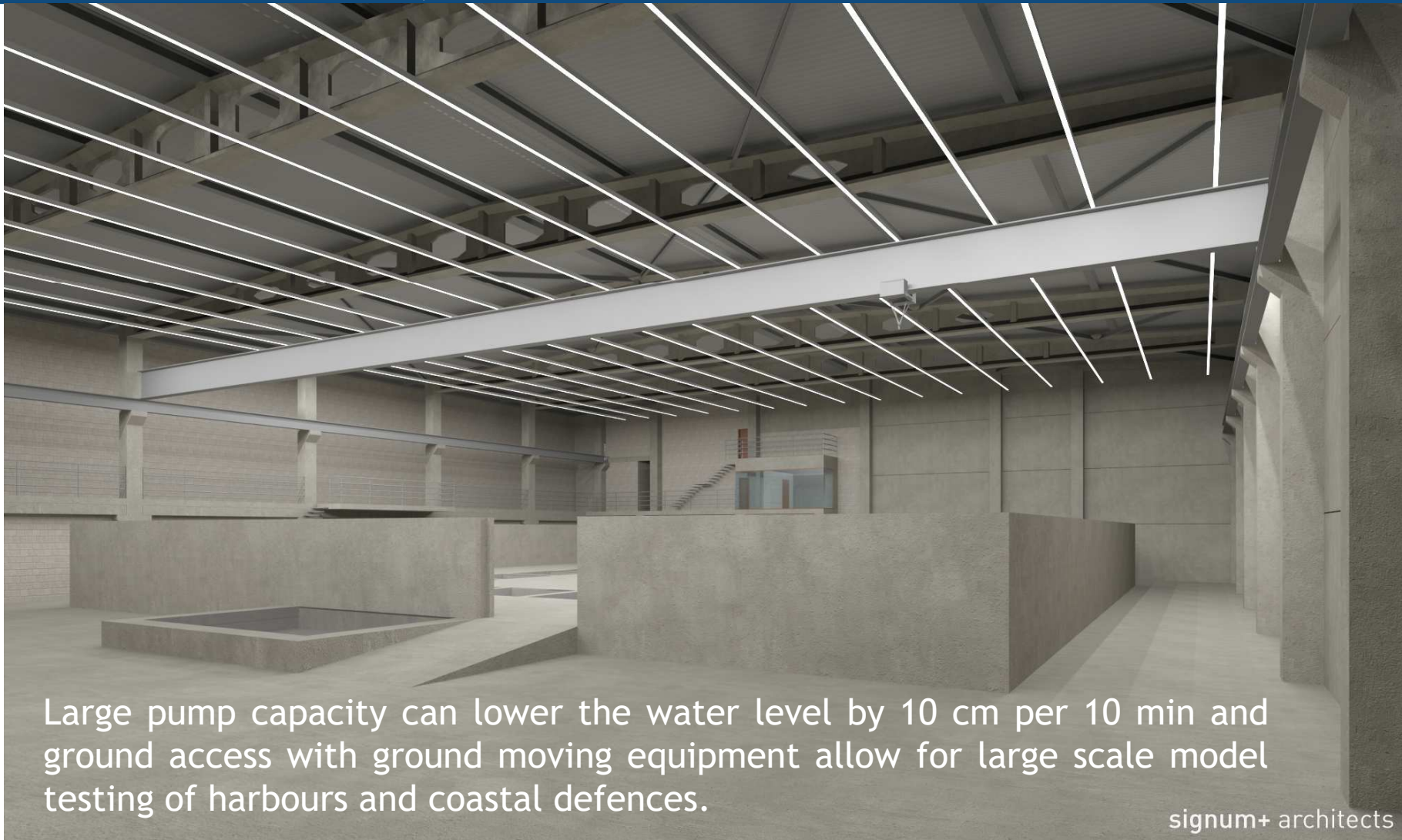


The basin will have state-of-the-art generating and absorbing wavemakers and submerged bidirectional propellers that drive the recirculation current at velocities of up to 0.4 m/s at 1 m water depth. The design of the current generation system has been achieved using both numerical and experimental models achieving flow velocity fluctuations less than 10% RMS.

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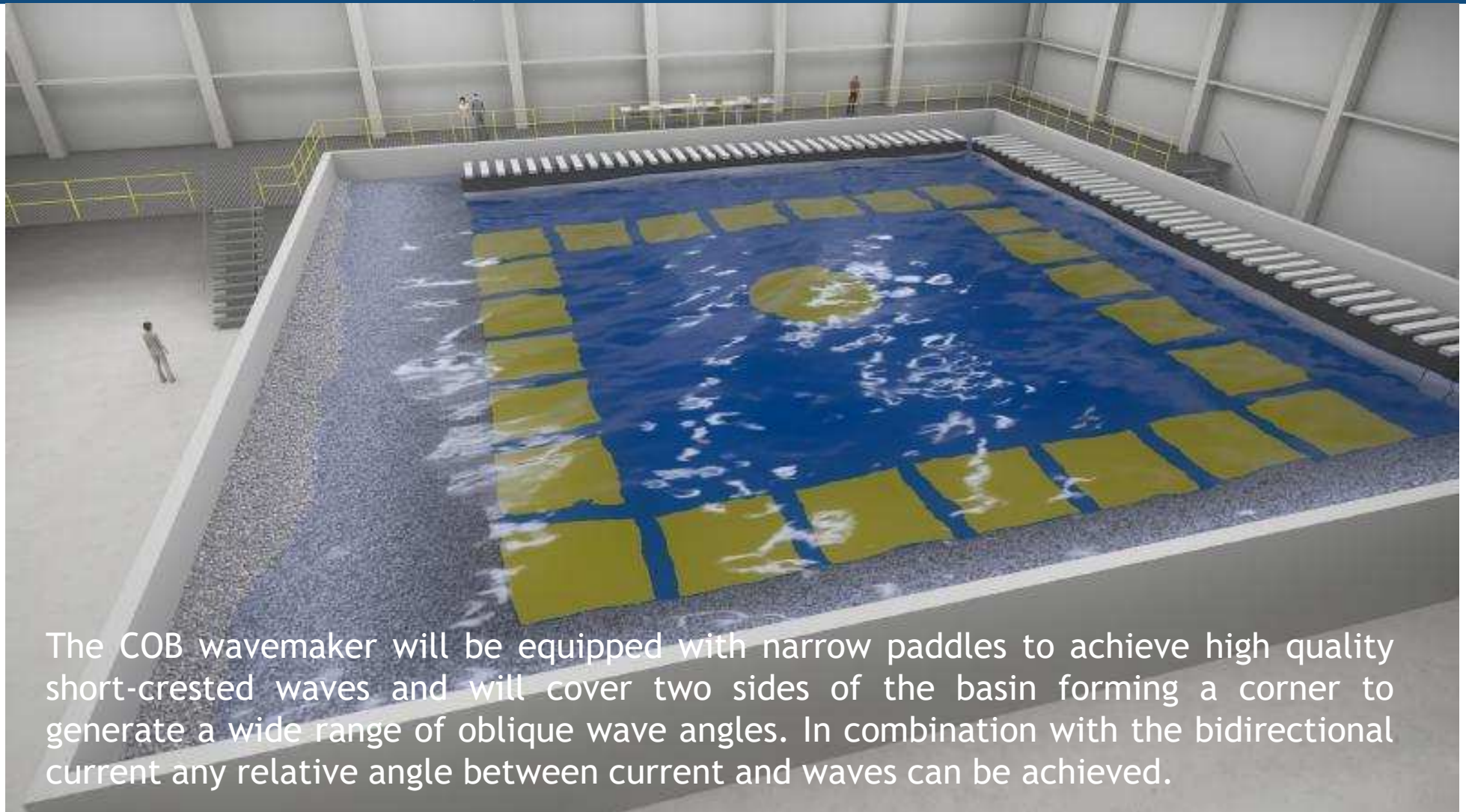
## Coastal and Ocean Basin (COB)



Large pump capacity can lower the water level by 10 cm per 10 min and ground access with ground moving equipment allow for large scale model testing of harbours and coastal defences.

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## Coastal and Ocean Basin (COB)



The COB wavemaker will be equipped with narrow paddles to achieve high quality short-crested waves and will cover two sides of the basin forming a corner to generate a wide range of oblique wave angles. In combination with the bidirectional current any relative angle between current and waves can be achieved.