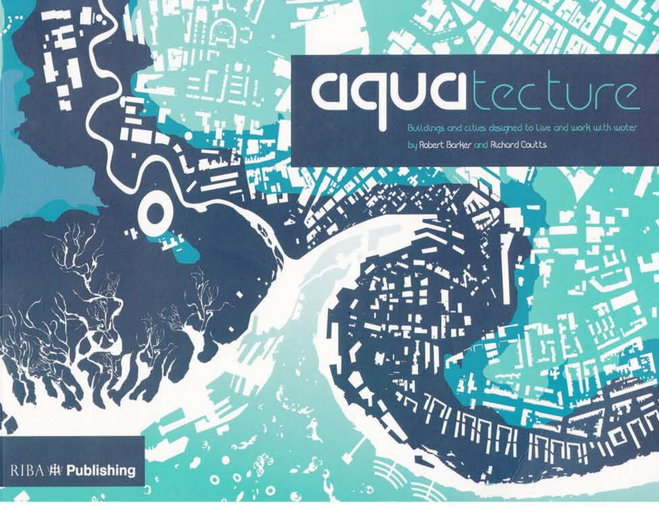


Floating buildings

Description > A floating building is typically a lightweight structure that rests on a buoyant base or foundation designed to rise and fall with the level of the water. For a building to float, the buoyancy must exceed the weight, as determined by Archimedes' principle. This is the same principle that is used to determine whether a boat will float. The floating building is typically tethered to mooring posts that enable it to move up and down but prevent it from floating away. Floating buildings can tolerate high levels of water variation, subject to the flexibility of the access and services. The size of the building that can be supported is determined by the weight during live loads versus the displacement of water.

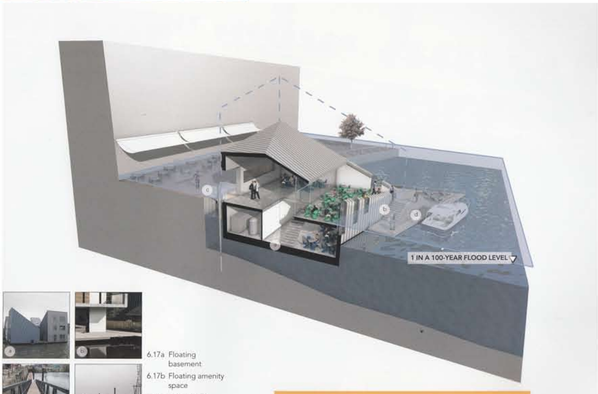
Construction > There are many different types of floating structure. Historically indigenous populations (see *Chapter 1 > Water: Friend or Foe?*) have built floating houses from natural materials, such as straw, bamboo and wood, to form lightweight buildings resting on raft structures. Houseboats have been built with timber, fibreglass, steel and aluminium hulls. More recently, there are modern examples of houses built using polystyrene and concrete rafts, but most are now built with waterproof concrete hulls. This construction provides a good level of stability, durability and minimal long-term maintenance.

Appropriateness > Floating architecture is only normally feasible where water depths exceed 1m. Taller floating buildings require greater water depths (termed 'draft' in marine architecture) to provide sufficient buoyancy for the weight, just as larger boats do. Floating buildings are often mistakenly suggested as a solution to flood risk. Their use as a flood protection measure has to be carefully considered against the flood velocity, due to their inherent instability. After a severe flood it is not uncommon to see boats that have escaped their moorings and been left stranded inland or washed up against structures. If a house weighing in excess of 100 tonnes were to float free from its guides it could cause significant damage. As a consequence, floating architecture is best suited to static bodies of water such as purpose-built docks and inland lakes, where water level variations are predictable and flows are usually low. Man-made harbours could protect communities of floating homes but this should be carefully considered against flood/storm risk. Due to floating architecture's sensitivity to site location, it is important that it is supported by clear and robust planning guidance and building codes.

Other potential benefits > In addition to providing buoyancy, water can be used for heat exchange to reduce energy use in the building. The relatively constant temperature of the water can be exchanged with the cold air to warm houses in the winter and vice versa in the summer. When combined with solar panels or wind turbines, a floating building could be a very sustainable proposition.

Floating architecture does not need to be constructed in isolation. Like land-based development, it can be supported by amenity space and complementary uses, such as floating playgrounds, swimming pools, ice rinks and gardens.

6.16 Floating homes in the Netherlands
6.17 Transect through a floating restaurant



6.17a Floating basement
6.17b Floating amenity space
6.17c Adaptable/ flexible access
6.17d Mobility and boat access

Appropriate for static bodies of water.
Not suitable in areas susceptible to rapid inundation.

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The floating village in the Royal Docks

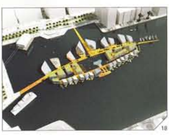
A floating village is planned for London's Royal Docks, which is conceived as a 'Crown' in the docks.[1] Built within the waterspace but set away from the dock edge, the Crown is a coherent development. It is also extendable to form a necklace of floating settlements throughout the dock. Like a village, it is semi-autonomous, complete with all of the facilities one would expect but, in this case, all floating. It is surrounded by water and organised around a village blue, just as a village settlement is an island within the countryside and surrounds a green. It is planned along a water boulevard and water lanes, rather than roads.

The village is accessed by foot or bicycle via two floating causeways; but for the ultimate tourist appeal and visiting dignitaries it is best approached by water, particularly in the summer. Vehicular access is restricted to emergency services, recycling and deliveries.

The buildings, roads, paths and public space are all constructed on a floating platform formed from a series of modular concrete pontoons. This system allows the development to be expanded along the waterspace and interspersed with local facilities such as parks, play areas and commercial areas. The services are provided from the dock edge along the two floating causeways and through the floating surface.

A small boat hire operation would run from the Corniche dock edge or from the floating causeway; rowing boats or pedalos could be hired for visitors to make the short journey to the floating village, arriving in the village blue by boat.

6.18 The floating village as seen from the air
6.19 The village is set around a multifunctional village blue complete with a floating pub



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