CLAIMS

1. A nearshore solution comprising:

a plurality of bottom sitting infrastructure modules defining a boundary of the nearshore solution, each of the plurality of bottom sitting infrastructure modules is adapted to transfer loads of the bottom sitting infrastructure modules to a seabed and withstand surrounding water pressure;

a plurality of floating general purpose modules and a plurality of floating infrastructure modules, each comprising a restraining fitting adapted to anchor the floating general purpose module to an open end of piles extending from the seabed,

a plurality of bottom sitting general purpose modules wherein the plurality of floating general purpose modules, plurality of floating infrastructure modules and plurality of bottom sitting general purpose modules are arranged within the boundary of the nearshore solution;

wherein each of the plurality of floating general purpose modules and the plurality of floating infrastructure modules further comprises:

a first basement layer; and

a second basement layer, wherein the restraining fittings are provided along a perimeter of the floating general purpose module or floating infrastructure module and integrally coupled to the sidewall of the first and second basement layers and wherein the restraining fittings includes rollers between the pile and a guide within the restraining fittings to ensure that the floating general purpose module or floating infrastructure module is restraint by the piles in a lateral direction that is perpendicular to a surface of the first basement layer.

2. The nearshore solution according to claim 1 further comprising gates between two adjacent bottom sitting infrastructure modules.

3. The nearshore solution according to claim 1 wherein each of the plurality of bottom sitting infrastructure modules and the plurality of bottom sitting general purpose modules further comprises:

a plurality of columns adapted to transfer loads of the bottom sitting to the seabed; and

a hull adapted to withstand surrounding water pressure.

4. The nearshore solution according to claim 1 wherein each of the plurality of bottom sitting infrastructure modules and the plurality of bottom sitting general purpose modules further comprises:

a top layer above a water level and adapted for lifestyle and transportation facilities;

a lowest layer configured for storage; and

a plurality of basement layers between the top layer and lowest layer configured for basement lifestyle and transportation network, utility storage facility.

5. The nearshore solution according to claim 4 wherein the lowest layer comprises a ballast system for controlling a buoyancy of the bottom sitting infrastructure module or bottom sitting general purpose module.

6. The nearshore solution according to claim 4 wherein the plurality of basement layers are open spaces.

7. The nearshore solution according to anyone of claims 1-6 wherein each of the bottom sitting infrastructure modules and bottom sitting general purpose modules comprise concrete spacers set in place at the bottom of bottom sitting infrastructure module or bottom sitting general purpose module as a means to adjust a height of the bottom sitting infrastructure module or bottom sitting general purpose module.

8. The nearshore solution according to claim 7 wherein the concrete spacers are concrete blocks.

9. The nearshore solution according to claim 1 wherein the second basement layer comprises a ballast system for controlling the buoyancy of the floating general purpose module or floating infrastructure module.

10. The nearshore solution according to claim 9 wherein the ballast system is an active compensating ballast system adapted to maintain the floating general purpose module or floating infrastructure module to a specific draft and upright.

11. The nearshore solution according to claim 10 wherein the first basement layer comprises internal spaces for basement lifestyle, transport and utility infrastructure for storage, energy generation and power plants.

12. The nearshore solution according to any one of claims 1-11 wherein the bottom sitting general purpose modules, floating infrastructure modules and floating general purpose modules are hexagonal in shape.

13. The nearshore solution according to any one of claims 1-12 further comprising flexible coupling arm configured to couple the bottom sitting infrastructure modules and floating general purpose modules together.

14. The nearshore solution according to any one of claims 1-13 wherein the bottom sitting modules and floating general purpose modules can be considered to be manufactured using recycled concrete aggregates (RCA).