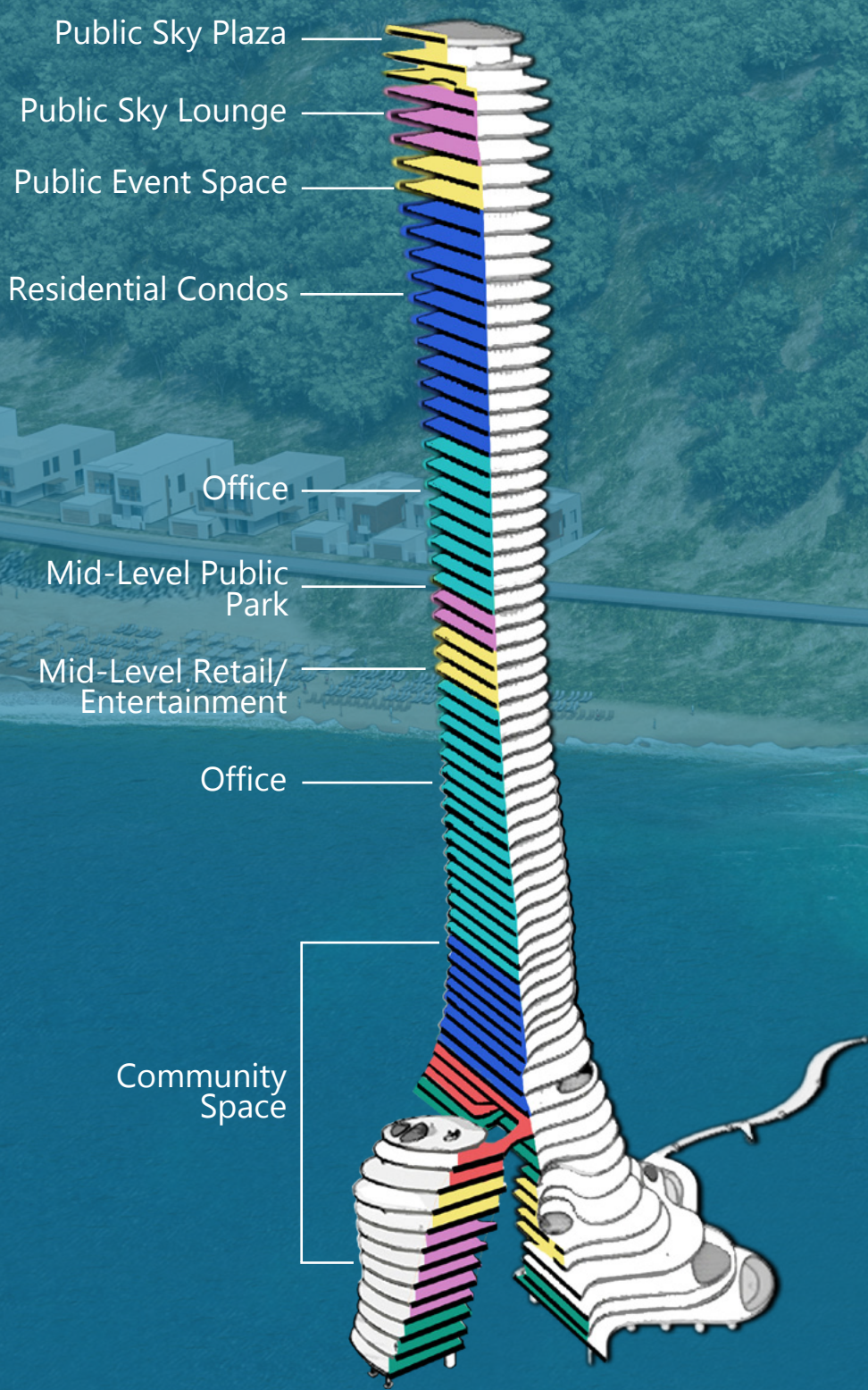


THE REEF

The world's coral reefs are one of the most diverse ecosystems on our planet, a community of living organisms that—in conjunction with non-living organisms—interact to provide a self-sustaining environment for a variety of life. It is diverse, teeming with life, and thus serves as the inspiration behind this project. Akin to a coral reef, the REEF is a vertical 21st century ecosystem, a net-zero living building in the coastal community of Durban, South Africa that will sustain and support healthy living at all levels.

- The REEF harvests the sun's energy through photovoltaic panels integrated into the building envelope.
- Electricity is generated from the ocean with wave energy converters, supporting an automated and centralized building system with lighting and daylight controls.
- Sea water, with the use of an onsite desalination plant, is used to provide potable water to the development.
- A greywater and blackwater onsite reclamation system supplement the sea water. Blackwater will be treated through onsite tidal flow cell tanks. Graywater will be re-purposed for the garden, and green water will be captured at various levels and used for irrigation.
- Food is produced for tenants with multimodal garden systems of hydroponics, aeroponics, and aquaponics, reducing the traditional footprint of food transit, particularly out of season.
- Modular units are to be constructed in a controlled environment, thus reducing time and energy during construction.
- Regenerative elevators will assist in continuing to sustain the building for decades to come.
- UV coated transparent glass allows for natural daylight, while operable windows allow airflow vertically and horizontally through the organically designed variations of the floor plates.
- Its walls are made of carbon-neutral concrete that does not emit gasses. What carbon is emitted naturally will be offset by living walls, acting as the living tissue of the REEF.

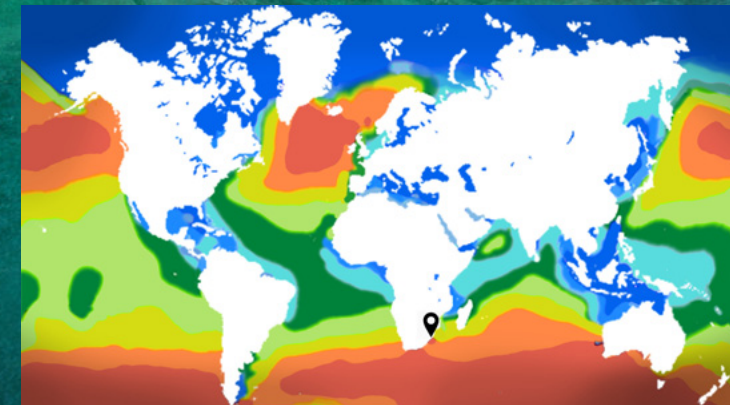
As the programmatic use of REEF evolves, new pods can be fabricated or reconfigured economically by local craftsman. Floors can be reconfigured by removing and replacing dwelling units, flown in place by drones. Offices and retail can constantly adapt to new programs and even incorporate outdoor green spaces. Removed pods and materials will be strictly recycled and reused. A truly living ecosystem, REEF is regenerative at every level.



Coral Reef Map:



Wave Energy Map:



Modular Units:

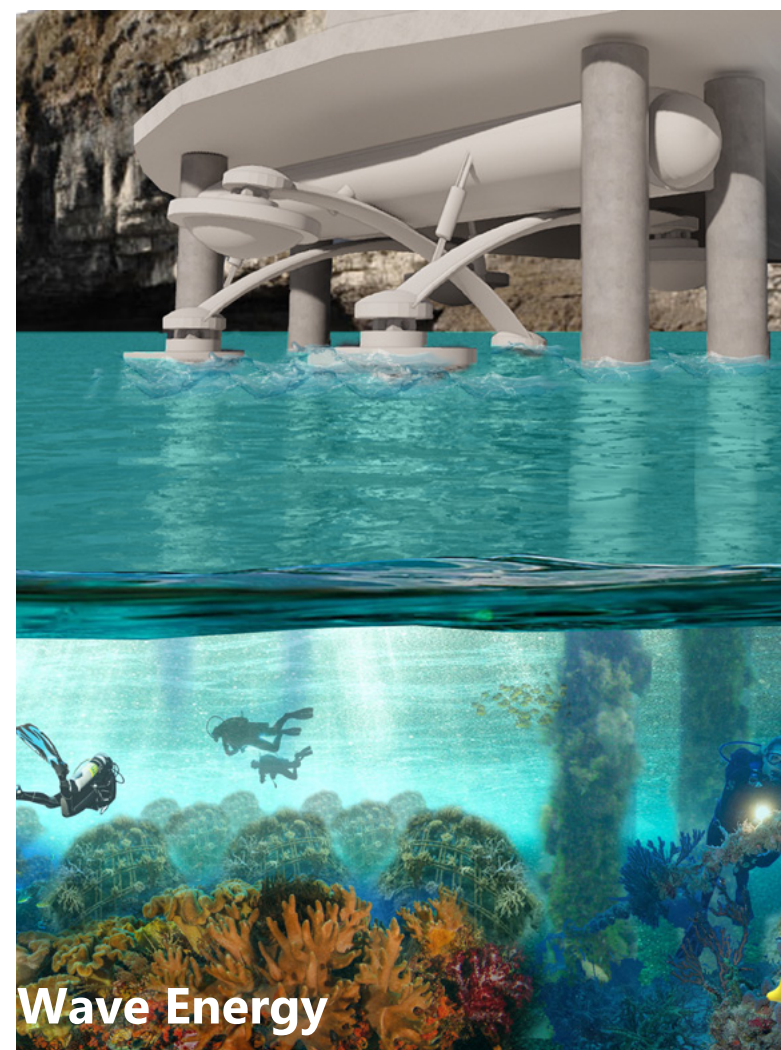
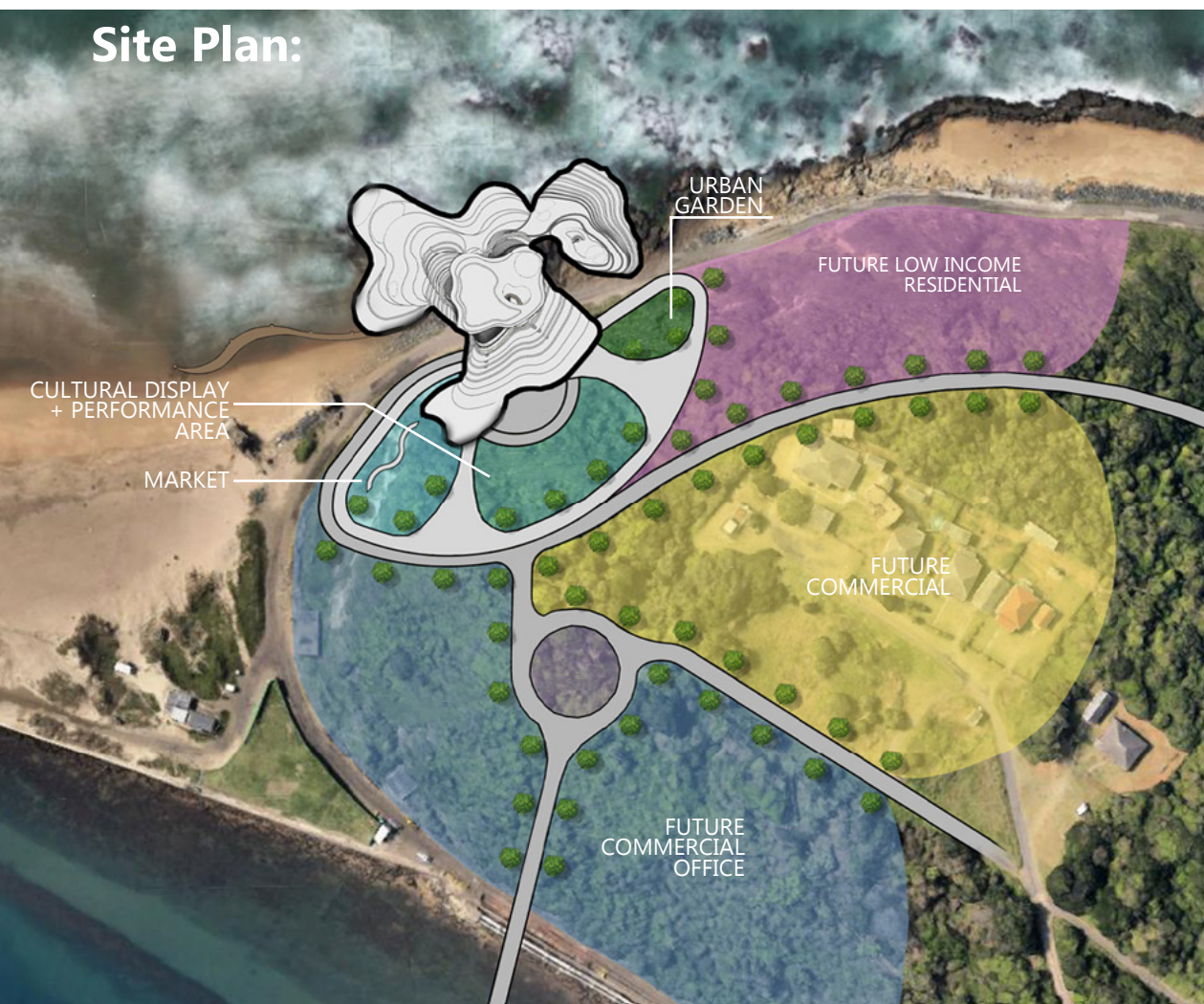


The REEF simulates the infrastructure of a living reef with its layers of coral skeletons, allowing the addition of plug-in modular units. REEF is designed for biodiversity of inhabitants who can live, work, and play in this evolving human-scaled structure. Each modular unit is a living element and contributes to the building's sustainability. A pod can be removed, replaced, or relocated to allow for future adaptation to economic and cultural needs. It's façade: rich colors inspired by the South African culture and the beautiful reefs of the region.

Public Space:



Site Plan:



Wave Energy



The organic concrete structure, made from locally sourced aggregates, provides the framework for a programmatic element. Modular building units will be pre-fabricated off site and hoisted into the structure to provide flexibility, superior quality control, and reuse.