

SEAPOD

FLOATING SMART HOME





FLOATING COASTAL COMMUNITY



CONTENTS

What is a SeaPod?

Flagship & Eco Models

Showcase Home

Production

Parts of a SeaPod

Engineering and Structural Analysis

Manufacturing Standards

Stability

Ocean Mounting Options

Wave Height Tolerance

SeaPod Living Area

No Propulsion

Electrical Systems

Plumbing Systems

Insurance

Digital Security

Physical Security

Electromagnetic Security

Corrosion Protection

Grey Water Treatment

Blackwater Treatment

Garbage, Recycling, and Compost

Aerial Delivery

Smart Ring Control

Reef AI

Bed Presence Detector

Gesture AI

Lifeguard AI

Theft AI

Aquascan

Ocean Cleanup Robot

Environmental impact & Restoration

Safety Equipment

Safety Signage

Lighting Beacon

Safety Orientation Training

Emergency Contacts

Fire Safety

Environmental Safety

Lightning Protection

Emergency Exits

Floatation

Maintenance, Safety & Inspection Schedule

More Information

Aerial Delivery

PARTNERSHIPS



MEDIA COVERAGE

Robb Report

MAXIM

The A-List of Travel ©
LUXURY TRAVEL
MAGAZINE

uncrate

designboom®

Luxurylaunches®

INTERESTING
ENGINEERING

MENS GEAR

TECH
TIMES

CNN travel

INSIDER

TRAVEL+NOIRE

yahoo!

USA
TODAY
A GANNETT COMPANY

Futurism

msn

The
National

GREENMATTERS

South China
Morning Post

TRAVEL+
LEISURE

ACUMEN GALERIE
JOSEPH PARIS

TOYI
NO TOYI

Forbes

FOX
WEATHER

CNBC

CNN

NATIONAL POST

NavyTimes

reason



Ocean Builders is building SeaPod floating homes with the goal of providing on-the-water living space in the Republic of Panama in various areas including locations where most boats are not comfortable anchoring and in the coming years we will expand into international locations. This is possible because of the breakthrough technology and structure make these homes stable and comfortable in waves of up to 5 meters. We believe that this will create a great opportunity for countries we operate in as it creates a new industry with this unique product and the lifestyle it offers.

These homes will need to be registered as a marine vessel so that they abide by local laws.

SEAPOD FLOATING HOMES



The Ocean Builders SeaPod consists of two major components:

1. Above water living area (SeaPod)
2. Supporting floating structure (TriPod) which provides buoyancy and ballast.

The design philosophy of these floating homes is meant to provide owners with a living experience closer to that of living on land than living on a boat which usually implies severe limitations on the amount of fresh water availability, limited food, limited energy, smelly bathrooms, the need to regularly empty grey water and blackwater tanks, having a cramped living space, and having a home that can be uncomfortable to live in when there is any amount of wave action.

WHAT IS A SEAPOD?

4 PILLARS OF INNOVATION

1. Engineering
2. Architecture
3. Eco restoration
4. Technology Innovation





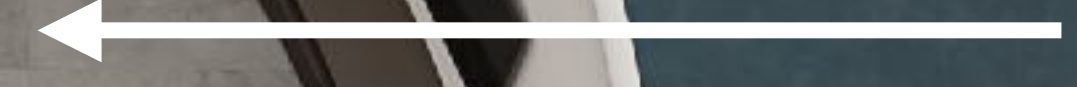
ECO MODEL



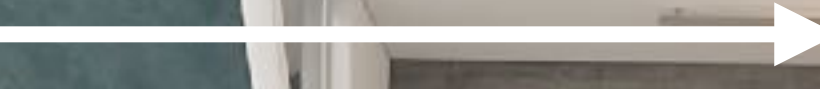
KITCHEN



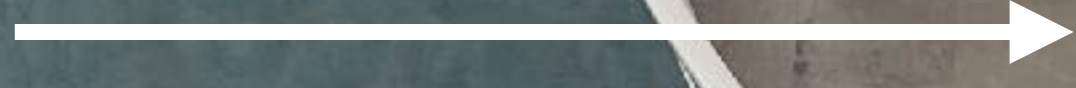
LIVING ROOM



MAIN ENGINEERING



BEDROOM



BATHROOM



FLOORPLAN



FLOORPLAN

ASSEMBLY PLANT

In Linton Bay Marina, Panama

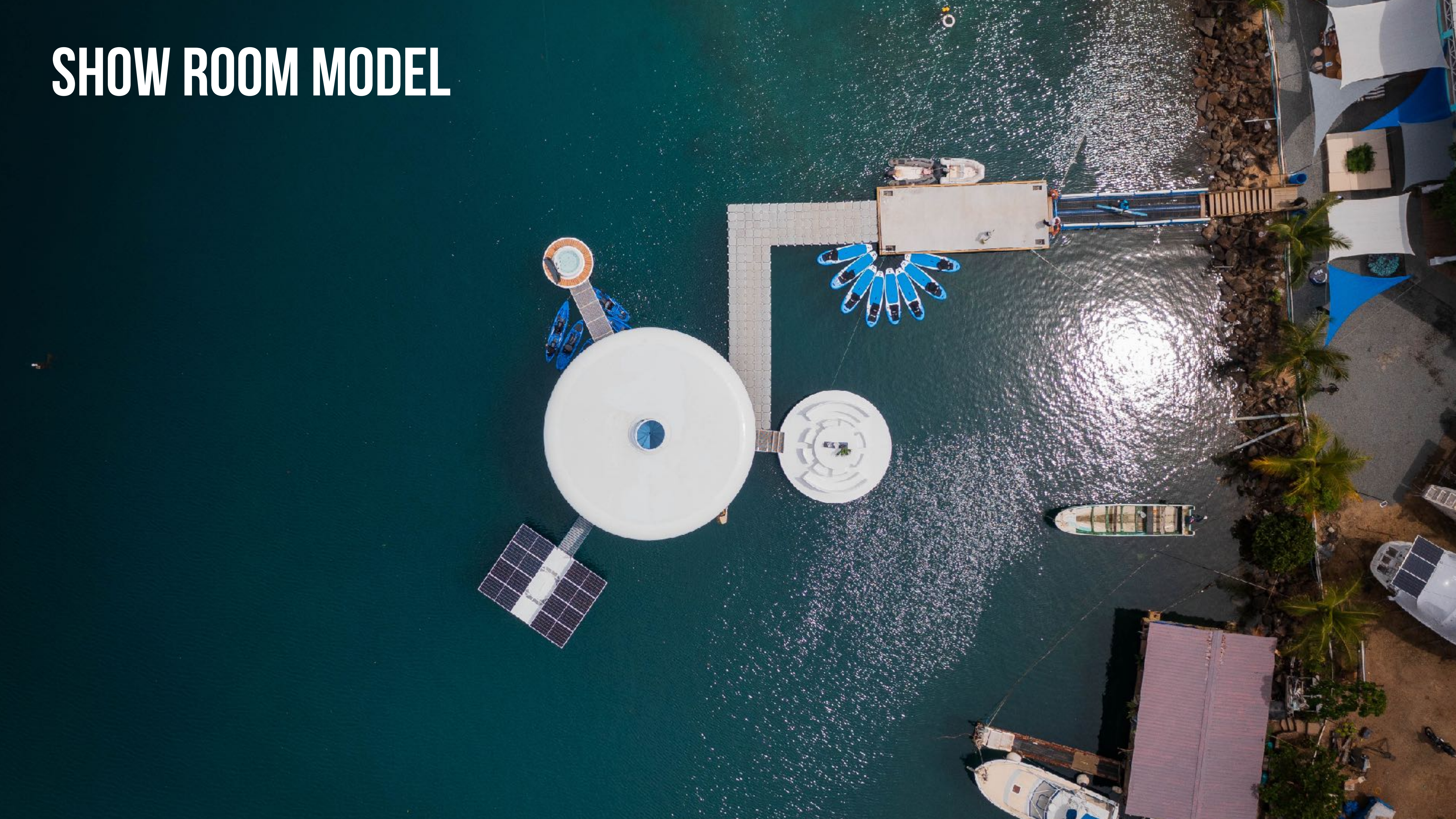


LAUNCH DAY



Workers gathered around the SeaPod to celebrate a successful launch on August 22, 2022

SHOW ROOM MODEL



SHOW ROOM MODEL



SHOW ROOM MODEL

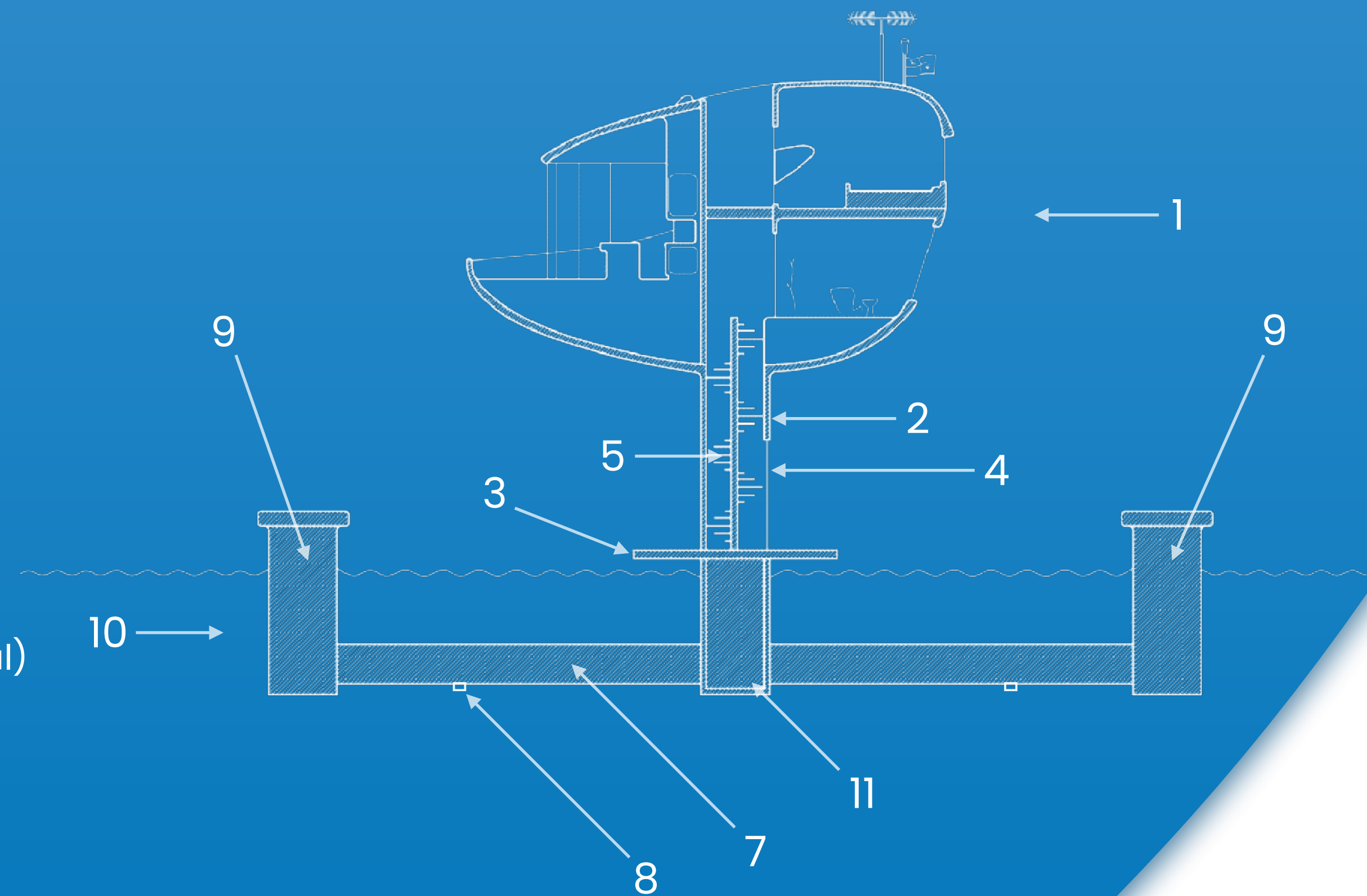


SHOW ROOM MODEL



PARTS OF A SEAPOD

1. Living Area
2. Center Spar
3. Dock
4. Entrance
5. Spiral Staircase
6. Brace (not pictured)
7. Pontoon (3 in total)
8. Anchor Points
9. Outer Spars (3 in total)
10. Hull
11. Sump



COMPLEX ENGINEERING

SeaPods are a complex combination of multiple fields of study

- Mechanical Engineering
- Software Engineering
- Hardware Engineering
- Civil Engineering
- Mechatronics
- Marina Engineering
- Marine Biology

MANUFACTURING STANDARDS

Ocean Builders has a goal of achieving ISO 9001 certification in 2024/2025.

ISO 9001 is an international standard for defining a quality management system (QMS). It outlines various criteria (or standards) to define quality management principles such as focusing on the customer, optimizing leadership and management within the organization, improving and fine-tuning internal processes, and general methods of continuous improvement.





BUOYANCY

At first glance it seems like the SeaPod is mounted directly into the sea floor.

SeaPods actually floats and can be anchored to stay in place similar to a boat at an anchorage. They get their buoyancy and floatation from their three horizontal pontoons with a volume of 28.5 cubic meters resulting in a buoyant force of 29 metric tons. This buoyant force allows us to support 9 to 17 metric tons of weight in the living quarters of the SeaPod Floating House.

The SeaPod is lifted a few meters above the water level by the tubular center spar and pontoons filled with air.



3 KINDS OF MOUNTING

- 1. SHALLOW WATER**
- 2. DEEP WATER**
- 3. SEA PILING**



MOUNTING METHOD 1

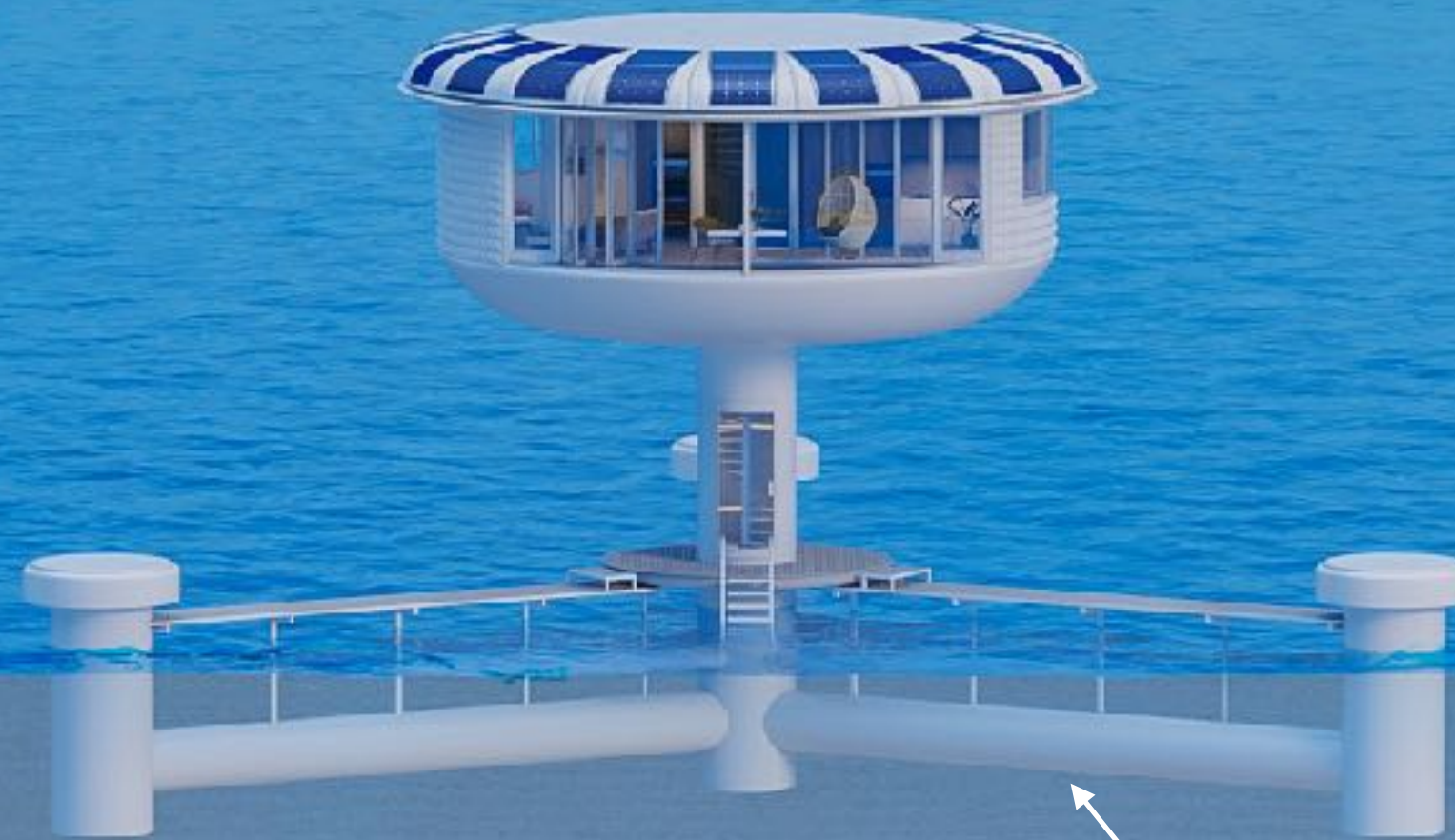
SHALLOW WATER MODEL



ABOVE WATER VIEW



MOUNTING METHOD 1
**SHALLOW WATER
MODEL**

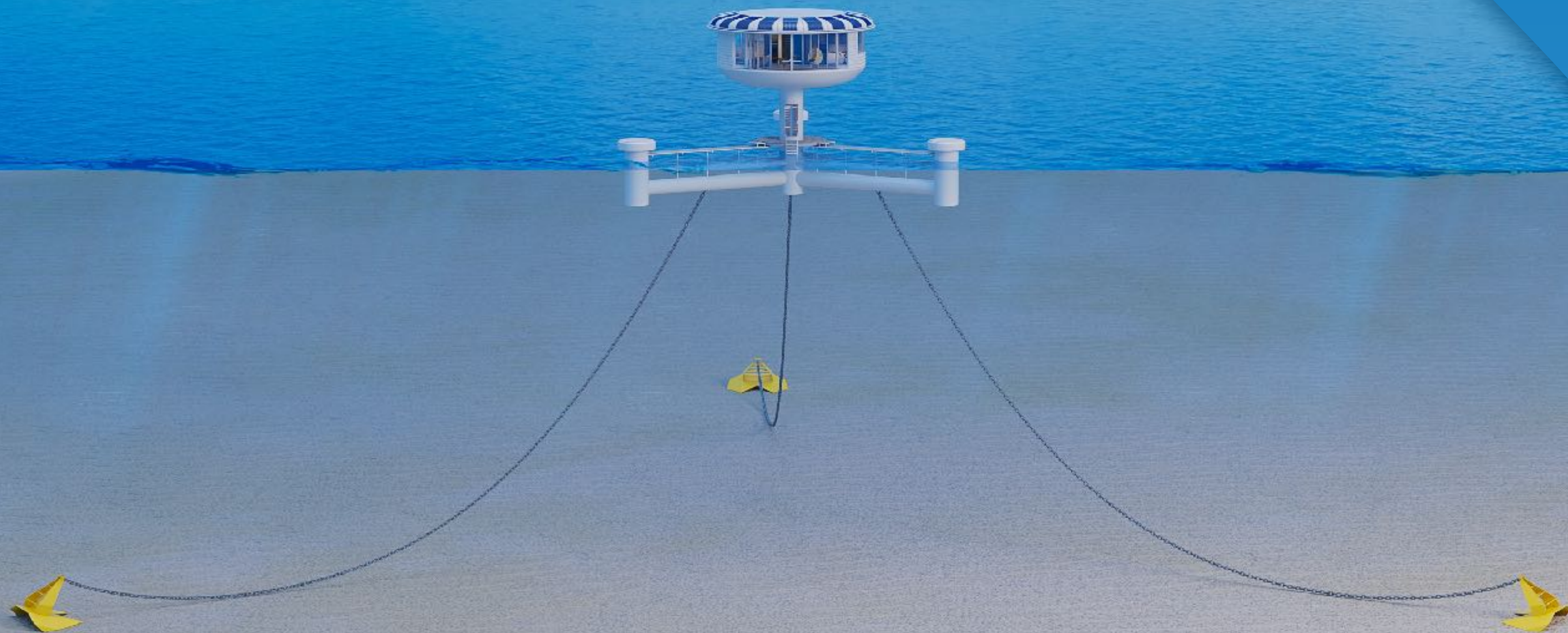


Three underwater tubes filled with air give stability and buoyancy

UNDERWATER VIEW



MOUNTING METHOD 1
**SHALLOW WATER
MODEL**



ANCHORED VIEW



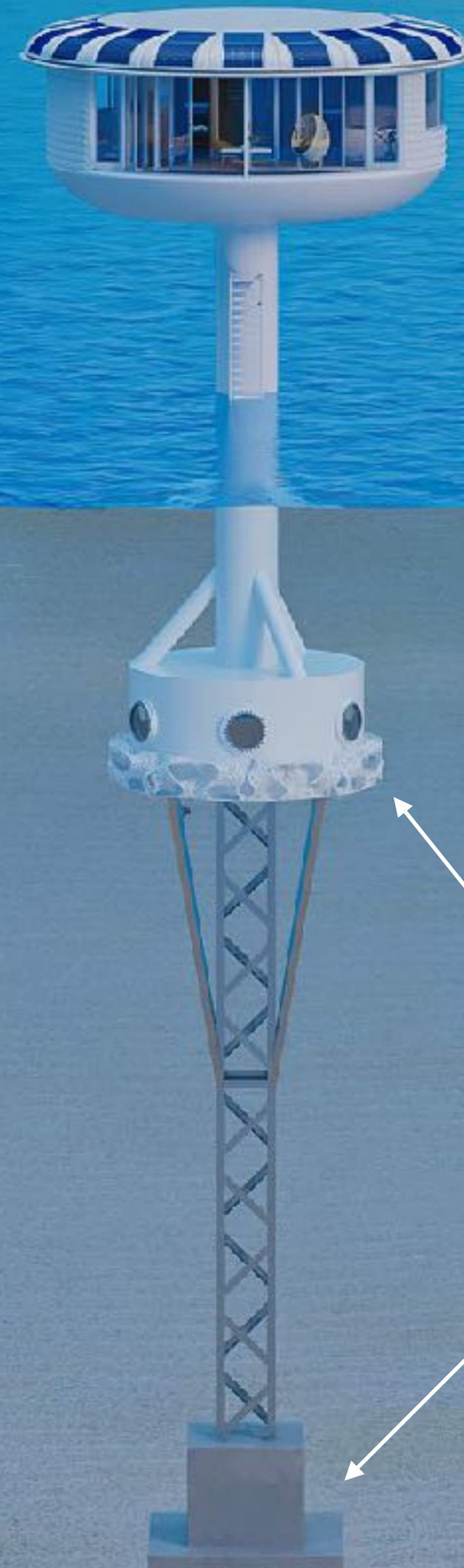
MOUNTING METHOD 2

DEEP WATER MODEL



ABOVE WATER VIEW

DEEP WATER MODEL



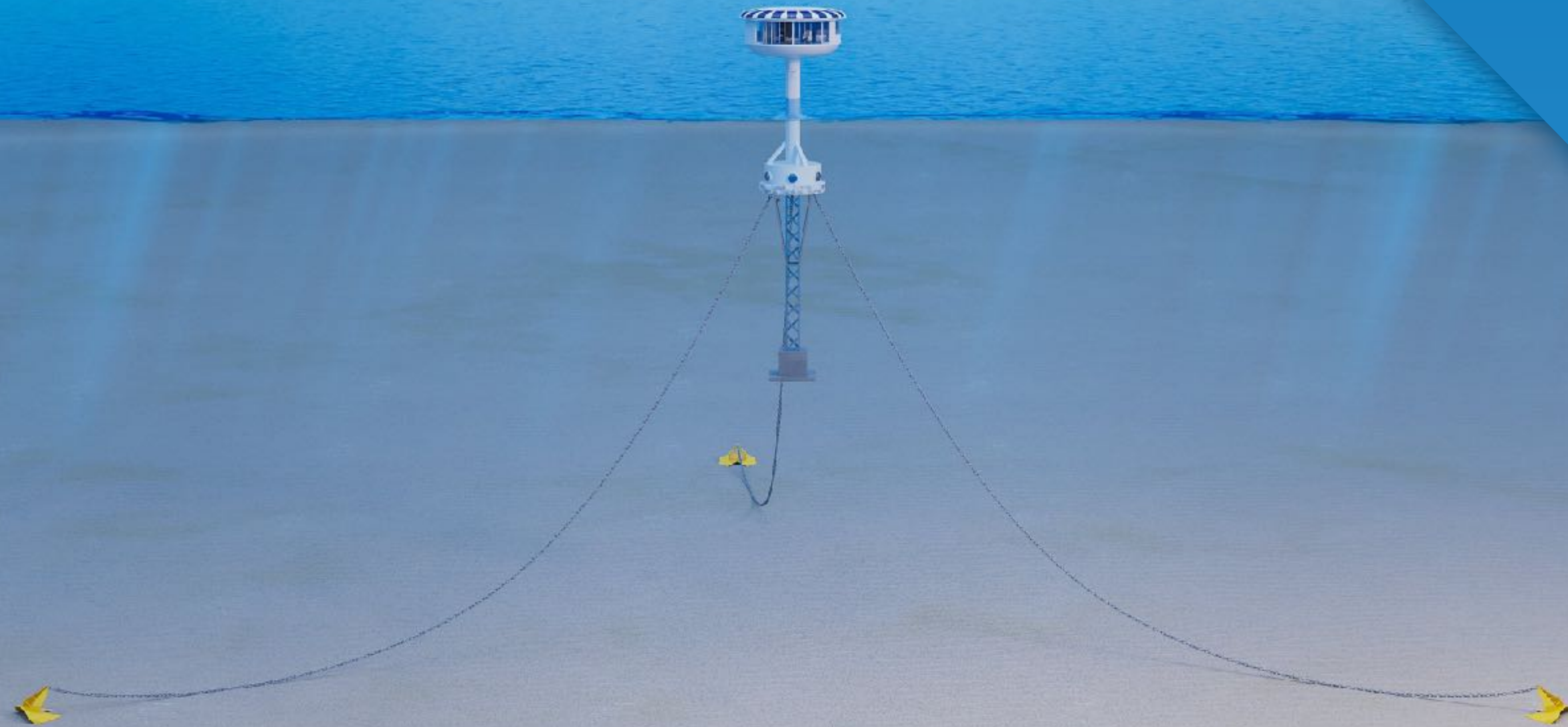
Large underwater room filled with air gives buoyancy

Large weight far below the structure gives stability

UNDERWATER VIEW



MOUNTING METHOD 2
DEEP WATER MODEL
ANCHOR VIEW



ANCHORED VIEW



MOUNTING METHOD 3
SEA PILING
CROSS SECTION VIEW



Tube goes directly into sea floor

SEA FLOOR VIEW

SAMPLE PRODUCTION SCHEDULE



Process	Day by day estimate of work
Customization & Consultation	1 → 14
Determine Location & Location Planning	1 → 30
Spar Configuration - Finalize Design Based on Location	1 → 30
Re-zoning and Re-titling	1 → 240
Environmental Impact Study	1 → 360
Order Windows	30
Order Steel	30
Order Fiberglass & Resin	30
Order Smart home technology	30
Windows Arrive	150
Steel Arrive	150
Fiberglass & Resin Arrive	150
Smart home technology Arrive	180
Fiberglass Pod Manufacturing & Assembly	150 → 240
Interior Design Build Out	240 → 310
Smart home tech installation	300 → 345
Steel Riser Manufacturing	150 → 240
Programming Smart Home Technology	345 → 360
Flagging	345 → 360
Site Preparation	240 → 360
On Site Assembly	Depending on location
On Site Foundation	240 → 360
Buffer - 2 months	360 → 420

RESIDENCY IN PANAMA



Residency in Panama is not required to buy and own property in Panama. If you are interested in getting a second residency we will connect you with lawyers that will work with you to find the best residency program and walk you through the process to make it easy. Some of the main paths to residency are:

- Friendly Nations Visa
- Retirees & Pensioner Visa
- Reforestation Visa
- Self Solvency Visa
- Private Income Retiree Visa
- Married with Panamanian
- Panama Italy Treat Visa
- Digital Nomad Visa

BALLAST AND STABILITY



“Ballast is material that is used to provide stability to a vehicle or structure.” Wikipedia

We have engineered strategic positioning of ballast in the SeaPod. Ballast is essential in stabilizing the structure and minimizing the effects of the movement of waves. This is what makes living on a SeaPod comfortable and more similar to living on land than living on a boat which moves with the waves. The SeaPod has several tons of ballast in the side spars of the Shallow Water model and 100 tons of ballast in the Deep Water model. The ballast consists of concrete, steel, and water. The majority of ballast is set when the pod is put in the water so the height and balance can be fine tuned for leveling of the SeaPod.



STABILITY CALCULATIONS



Here, we consider the righting moment when tilting a symmetry axis. As there are 3 symmetry axes which can be considered equal, every other case can be obtained through linear superposition, assuming that we are looking at small angles. The largest angle before capsizing is reached when a side spar is completely submerged. In case of a tilt towards the side spar on the symmetry line, this is

$$\tan(\varrho) = \frac{h}{l} ; \varrho = 6.7^\circ$$

At an angle of 6.7°, the righting moment is at a maximum, which means that the structure will capsize if this angle is exceeded through wind forces. So this angle determines the maximum permissible wind force and by including the drag of the seapod, the maximum wind speed.

The righting moment is the moment generated by all 3 side spars minus the overturning moment created by the displacement of the Seapod towards lee.

$$M = l \cos(\varrho) * V * g + 2 l \cos(\varrho) \cos(\theta) * \frac{V}{2} * g - H \sin(\varrho) * m_s * g = 245 \text{ kNm}$$

For small angles it is possible to approximate $\sin(\rho) = \rho$ and $\cos(\rho) = 1$, so the growth of the righting moment with the angle is almost linear between 0° and 6.7°.

The resulting wind force is at 9 meters above the anchor points, centered in the seapod, thus the wind force at capsizing is 27.2 kN. Aerodynamic drag is

$$F = \frac{1}{2} C_D \rho A v^2$$

Solving for v gives a windspeed of 44.4 m/s or 86 knots sustained wind. This means the Shallow Water Seapod can withstand a category 1 hurricane but not category 2 and higher. This calculation assumes that the seapod is at the maximum permissible load of 17t, i.e. worst case.

If mass is removed from the seapod, the overturning moment is also reduced so the angle - righting moment curve gets steeper. In addition, the side spar's height is increased so that the maximum tilt angle is increased. Repeating the calculation with $h = 1.6 \text{ m}$ and $m_s = 1 \text{ t}$ yields a capsizing wind speed of more than 100 knots. Thus in preparation for extreme weather, ballast should be removed as much as possible, especially from the seapod, but also from the side spars.

STABILITY CALCULATIONS



A = projected area of the seapod = 50 square meter

CD = drag coefficient = 0.45

F = wind force

g = earth's gravitational acceleration = 9.81m/s²

h = height of the side spars above the water line = 1.3m

H = height of the center of gravity of the seapod = 9m

mS = maximum mass of seapod = 17t

M = righting moment

v = wind speed

V = volume of the side spars above the water line

ρ = air density = 1.225kg/m³ // also tilt angle of the structure

θ = ½ angle between the outriggers = 60°

CENTER OF GRAVITY

The Center of Gravity is the average location of the weight of an object.

The Center of Gravity of the SeaPod has been engineered to be as far below the Center of Buoyancy as possible.

In addition, the three horizontal pontoons add significant stability.

CENTER OF BUOYANCY

The Center of Buoyancy is the Center of Gravity for the volume of water which a hull displaces.

WAVE HEIGHT & WAVE LENGTH TOLERANCE

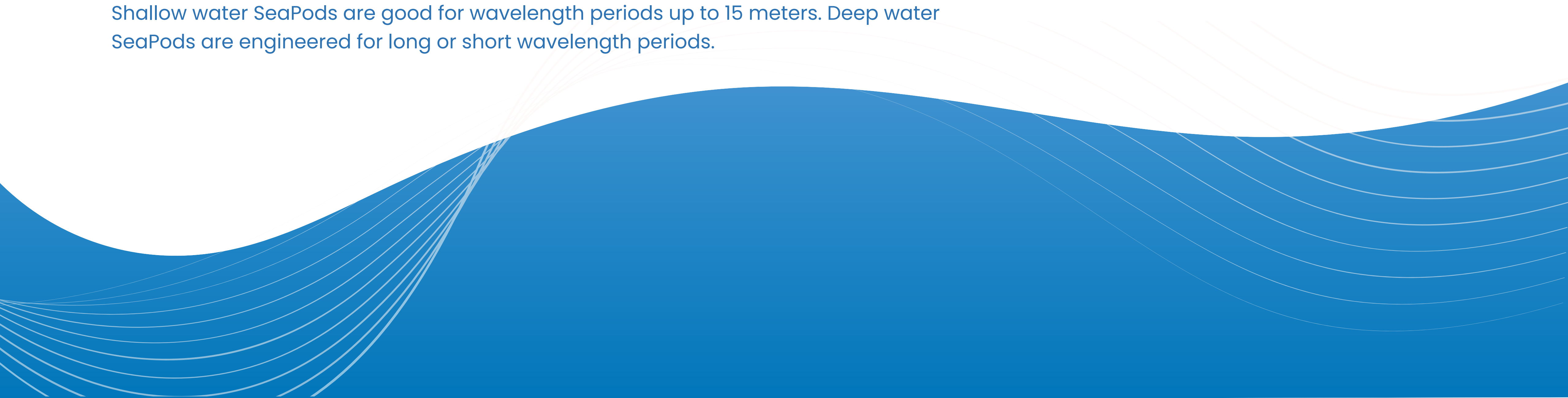
We are choosing locations that are naturally protected from high waves. Ideal waves are under 1m. We have engineered the shallow water SeaPod to a maximum wave height of 5 meters.

From 0 to 1.5 meter waves the motion inside a SeaPod is minimal especially when compared to a boat.

From 2 to 3 meter waves the motion is manageable but not good for long term living.

Higher or lower wave height models can be built as needed.

Shallow water SeaPods are good for wavelength periods up to 15 meters. Deep water SeaPods are engineered for long or short wavelength periods.



HURRICANE ENGINEERING

SeaPods are engineered for the specific environmental conditions of where we are going to place them. Our current production model is engineered for locations that are outside of hurricane zones and is safe for winds of up to 80 MPH.

Due to SeaPod demand in areas that have occasional hurricanes we have begun engineering a specific SeaPod model that can withstand hurricane wind and wave conditions. This is a 6 step process:

- Initial engineering & calculations
- Computer Modeling & Simulations
- 3D printed model for small scale testing
- Larger scale model testing
- One third scale model fabrication and testing
- Full scale model testing in large scale wind tunnel

NO PROPULSION

The SeaPod does not have a motor or source of propulsion. It relies on an anchor(s) to stay in place. It can be easily moved with the use of a tow boat as needed.



ELECTRICAL SYSTEMS

Energy is supplied by solar panels and a backup propane generator. Electricity is stored in lead acid or lithium batteries located in a secured compartment in the outer spar with battery isolation protection. Complete details on the self-sufficient solar electric system is [here](#).

An isolation transformer to help prevent the risk of shock for swimmers nearby is optional.

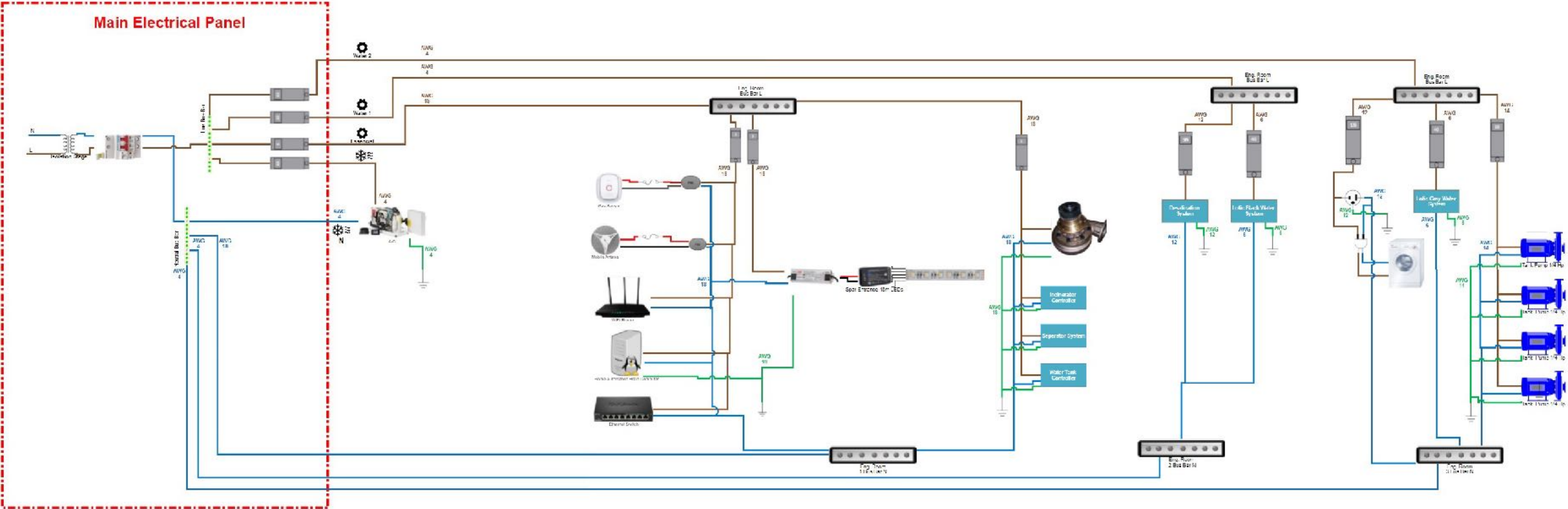
There are two inverters. High amperage appliances like HVAC and an inductive stovetop have their own inverter so as to not disrupt other critical systems in case of failure.

Power is available in 110VAC power outlets with GFCI and thermo magnetic circuit breakers from the main electrical panel in the engineering room. All AC outlets are grounded. DC Power is supplied in 5, 12, 24, and 48 in various locations throughout the house. UL1426 certified IP65 electrical components (standard used for marine installations) is used wherever possible. Complete electric system details including all known electrical loads, wire gauges, fuses, etc. can be found [here](#).

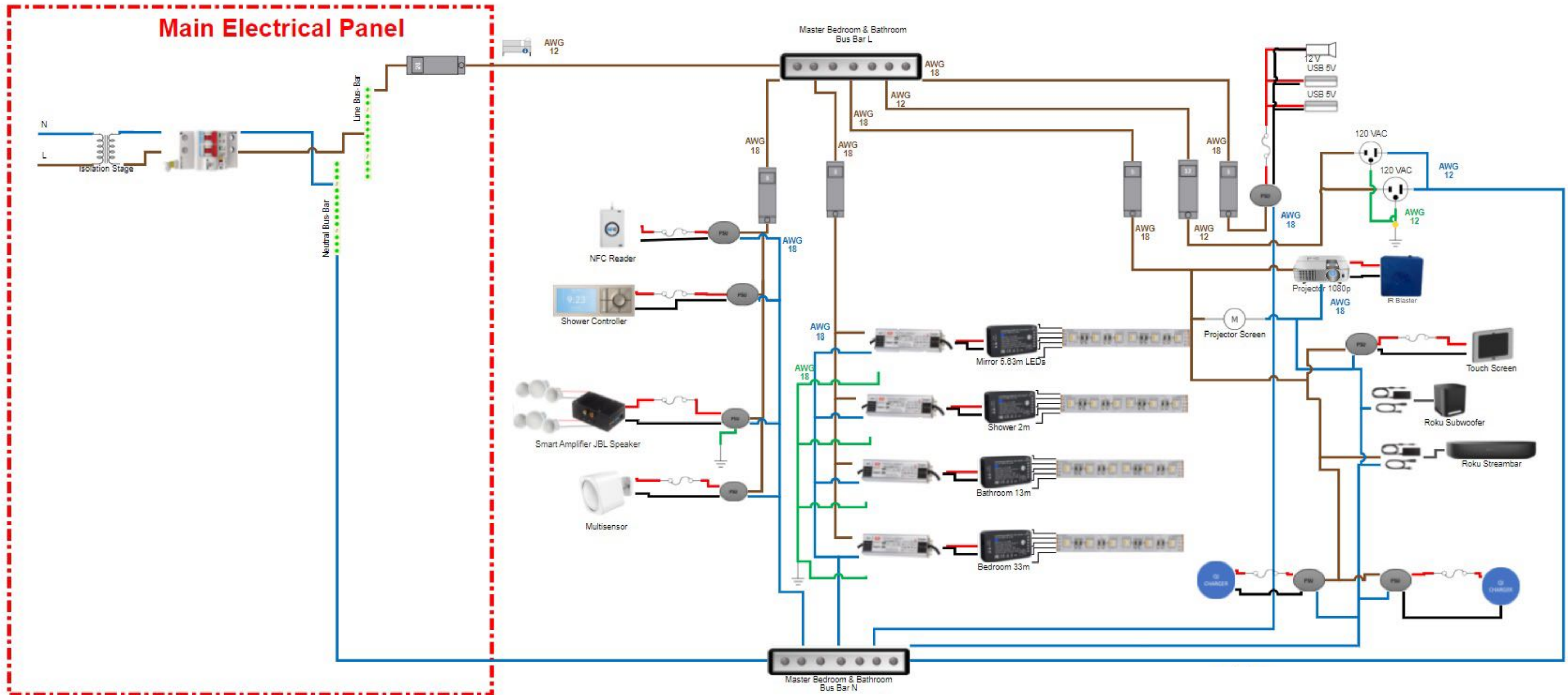
Upon completion of the complete system we will certify the entire installation and all homes will be inspected by certified electricians. Wiring for each room can be found [here](#) (finalized line drawings are available in the owners manual to your pod).



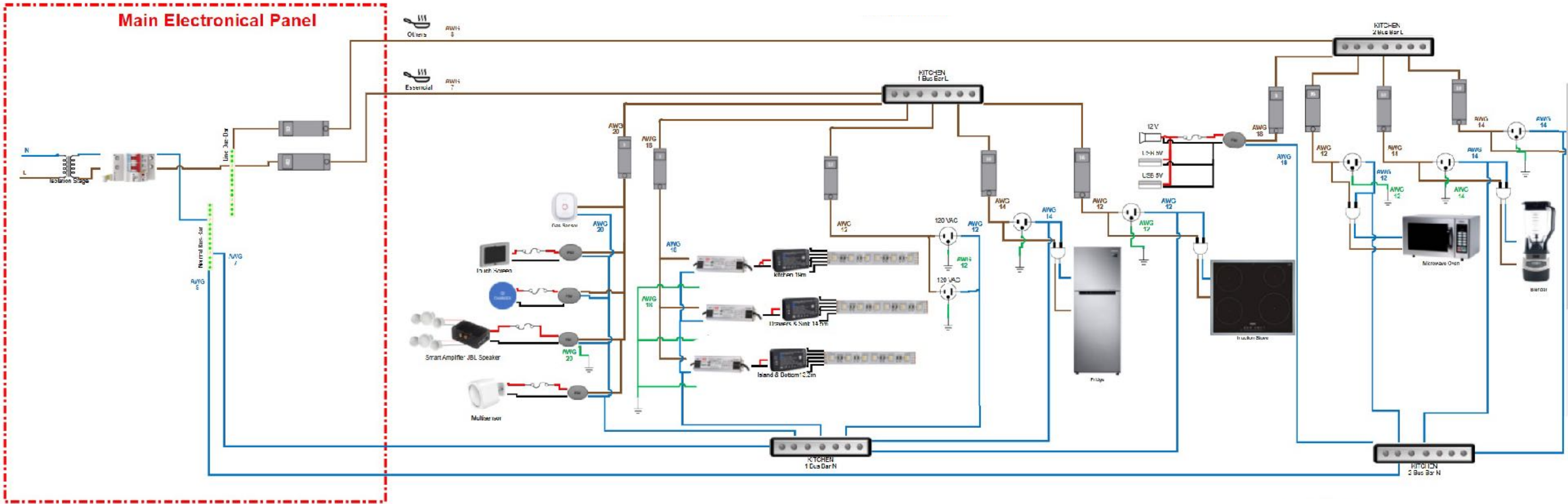
ENGINEERING ROOM ELECTRICAL



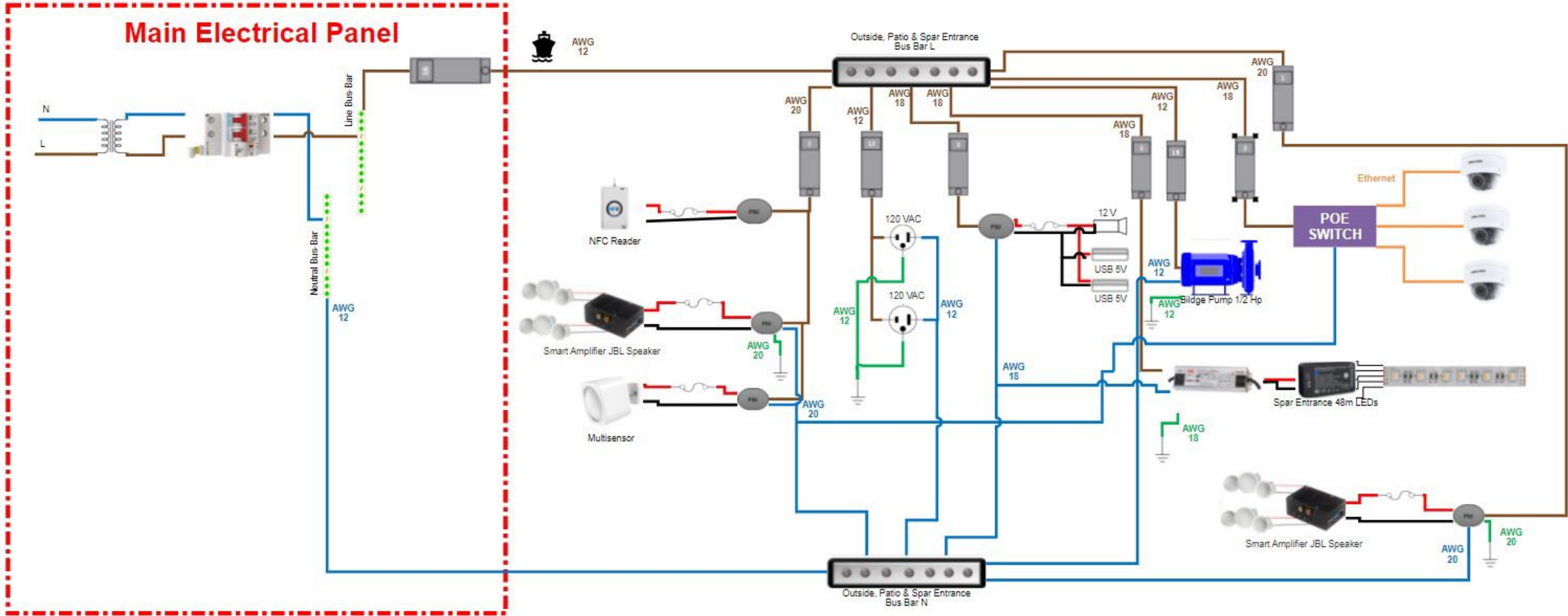
MASTER BEDROOM ELECTRICAL



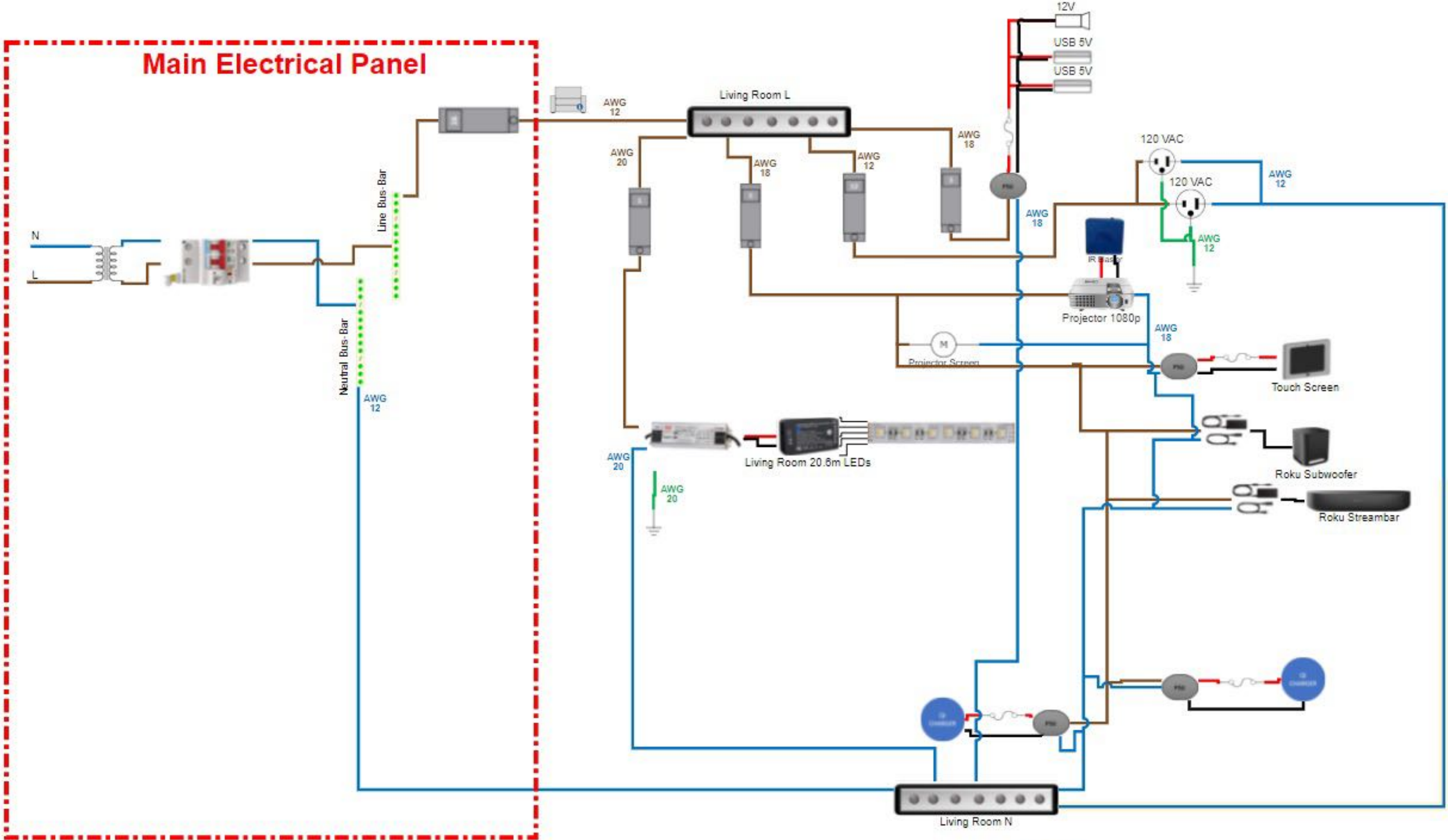
KITCHEN ELECTRICAL



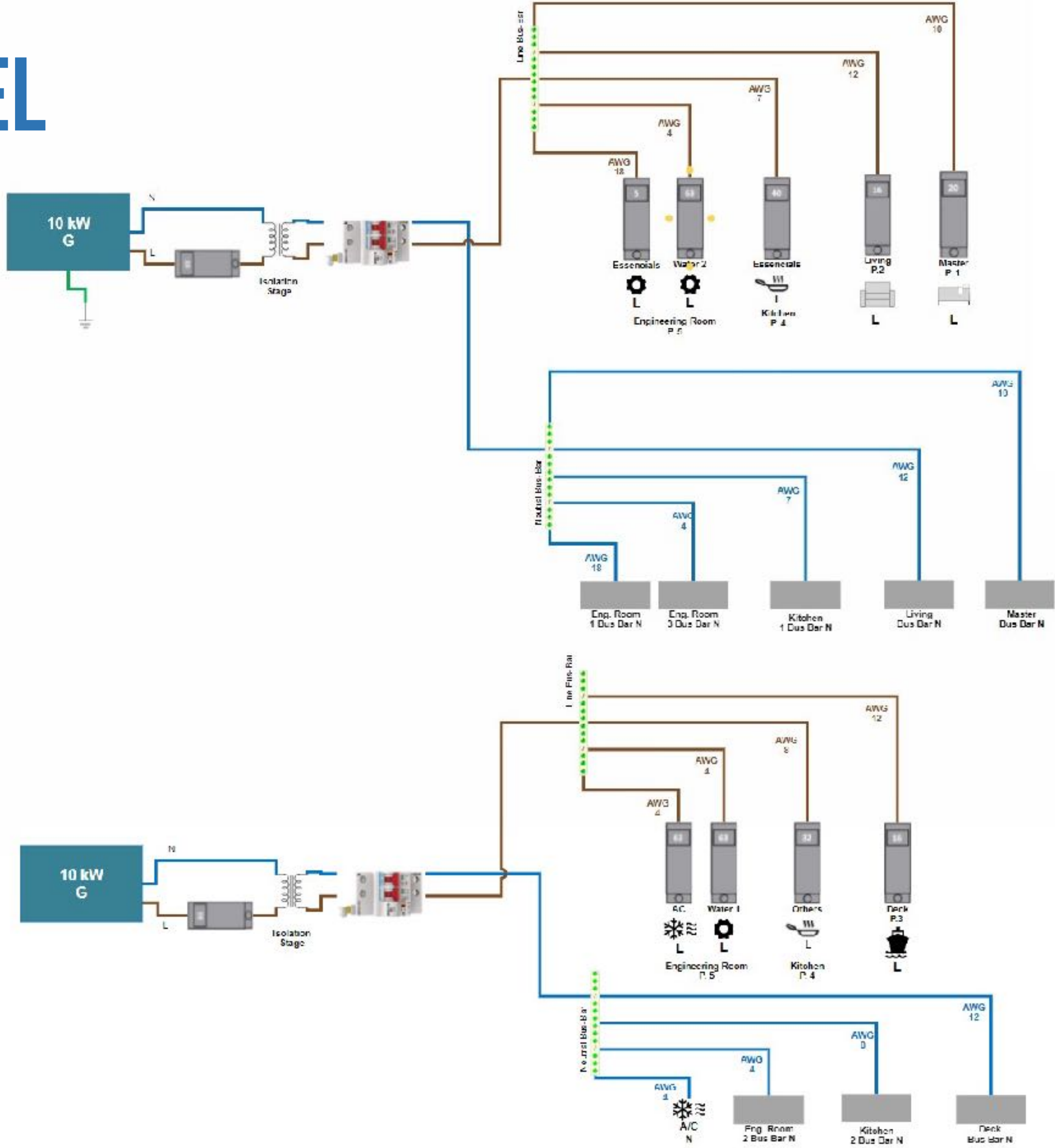
DECK ELECTRICAL



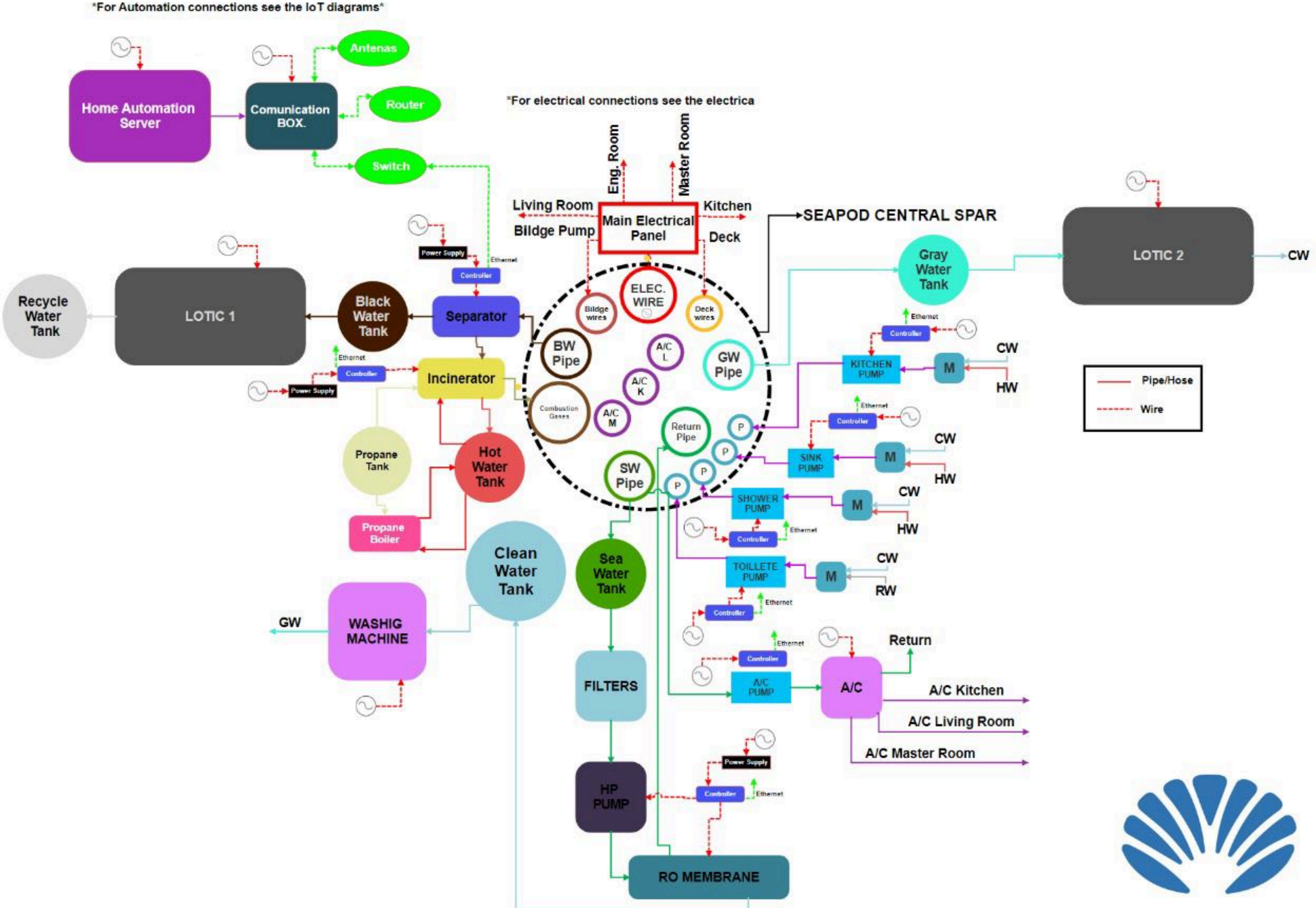
LIVING ROOM ELECTRICAL



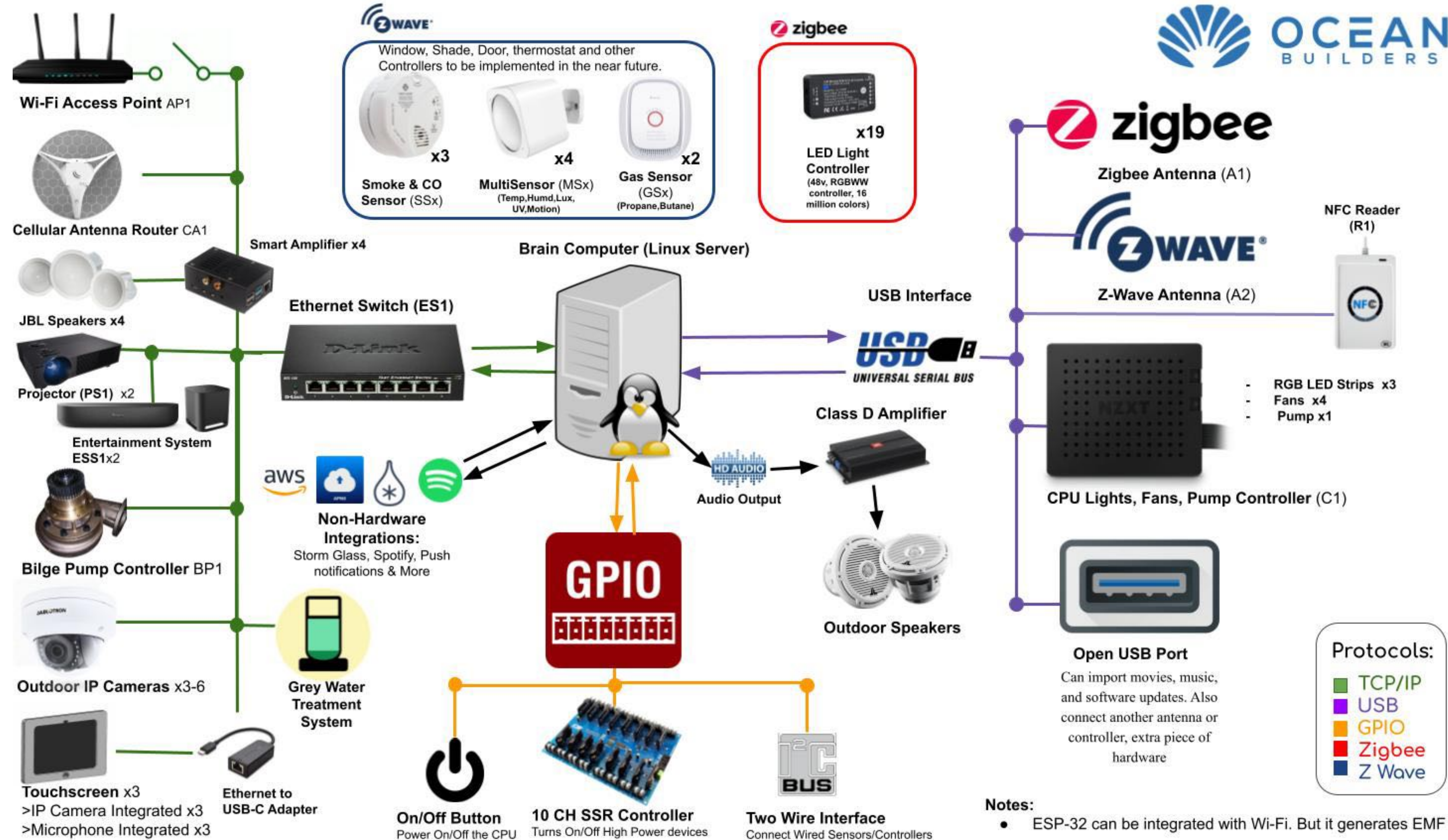
MAIN ELECTRICAL PANEL



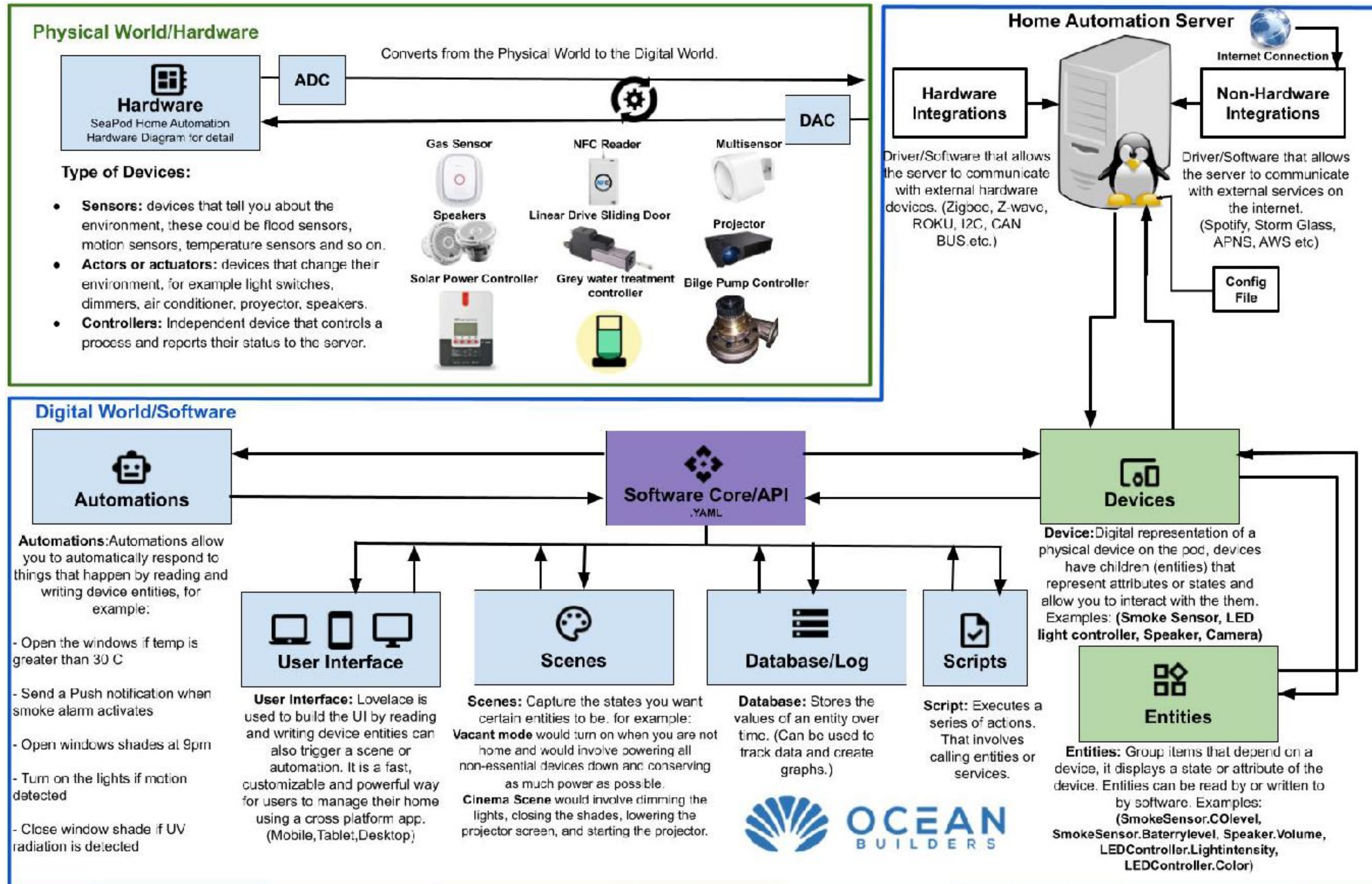
ENGINEERING ROOM LAYOUT OVERVIEW



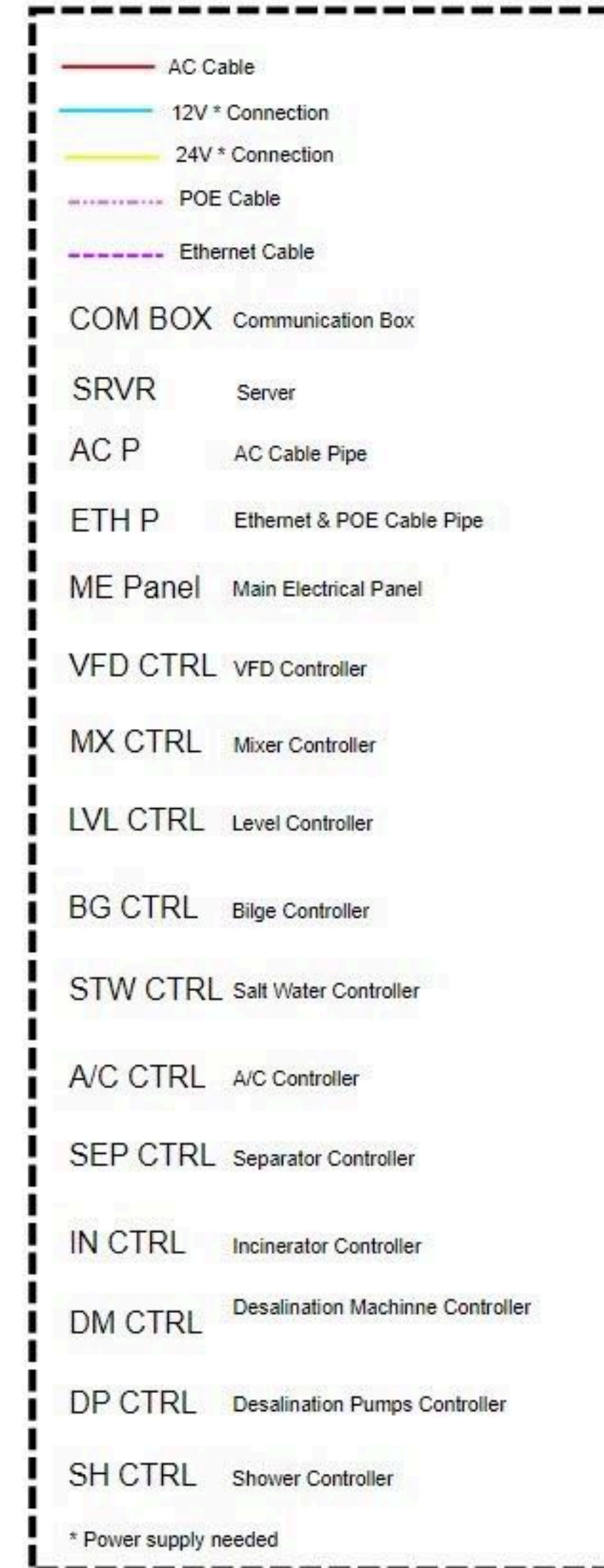
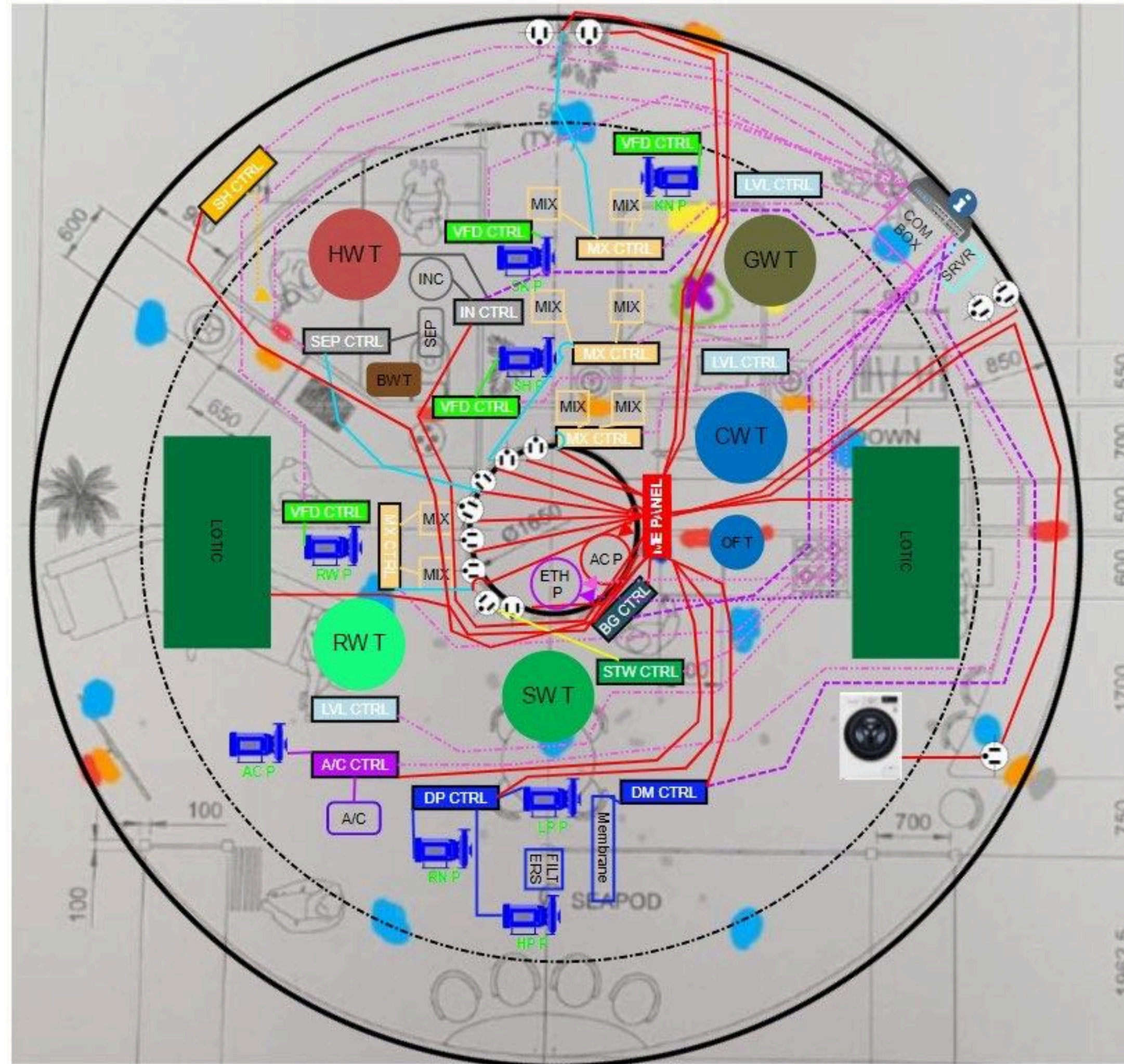
HOME AUTOMATION OVERVIEW



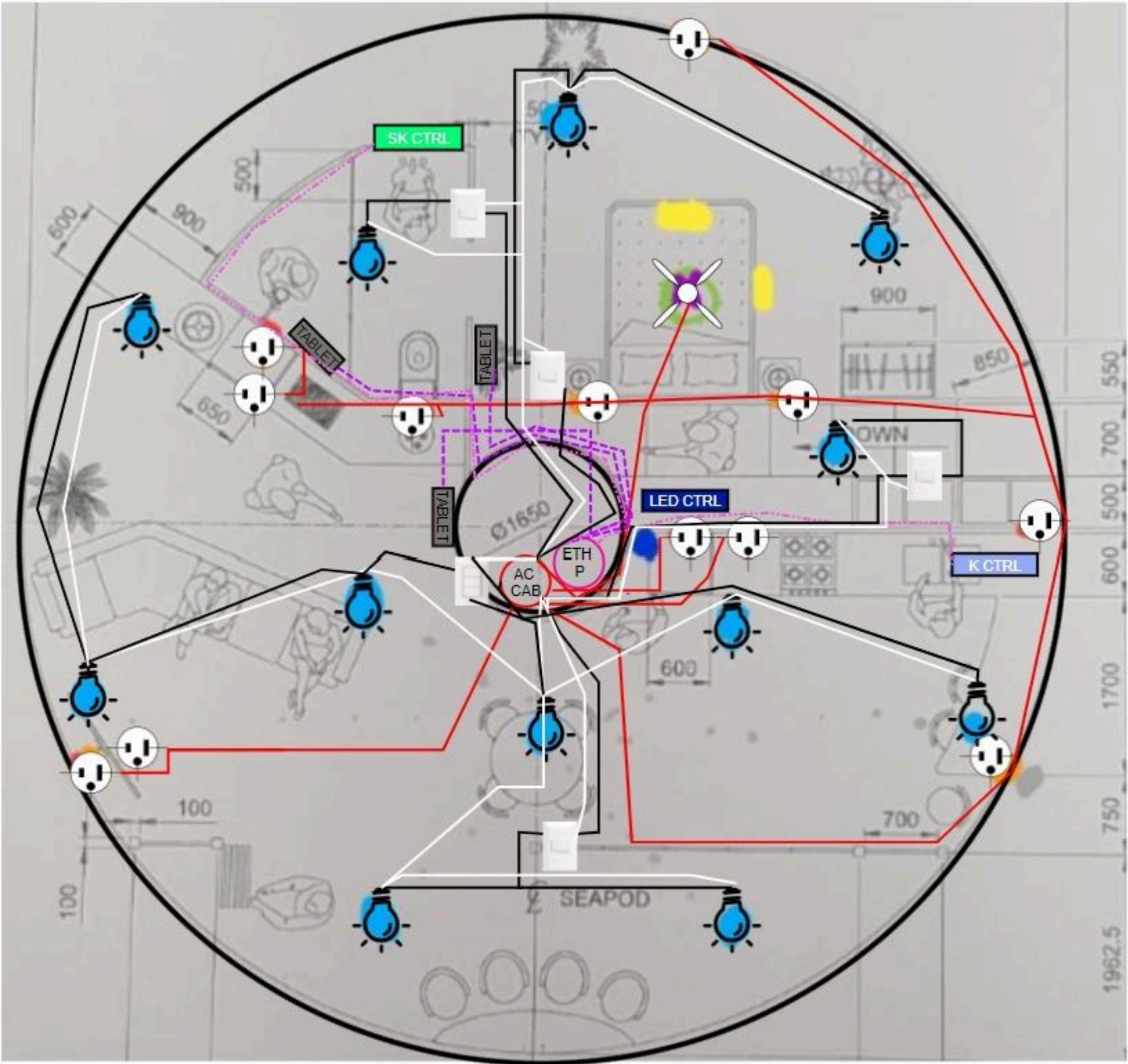
HOME AUTOMATION DIAGRAM



MAIN ENGINEERING ROOM LAYOUT - ELECTRICAL



LIGHTING AND ELECTRICAL LAYOUT





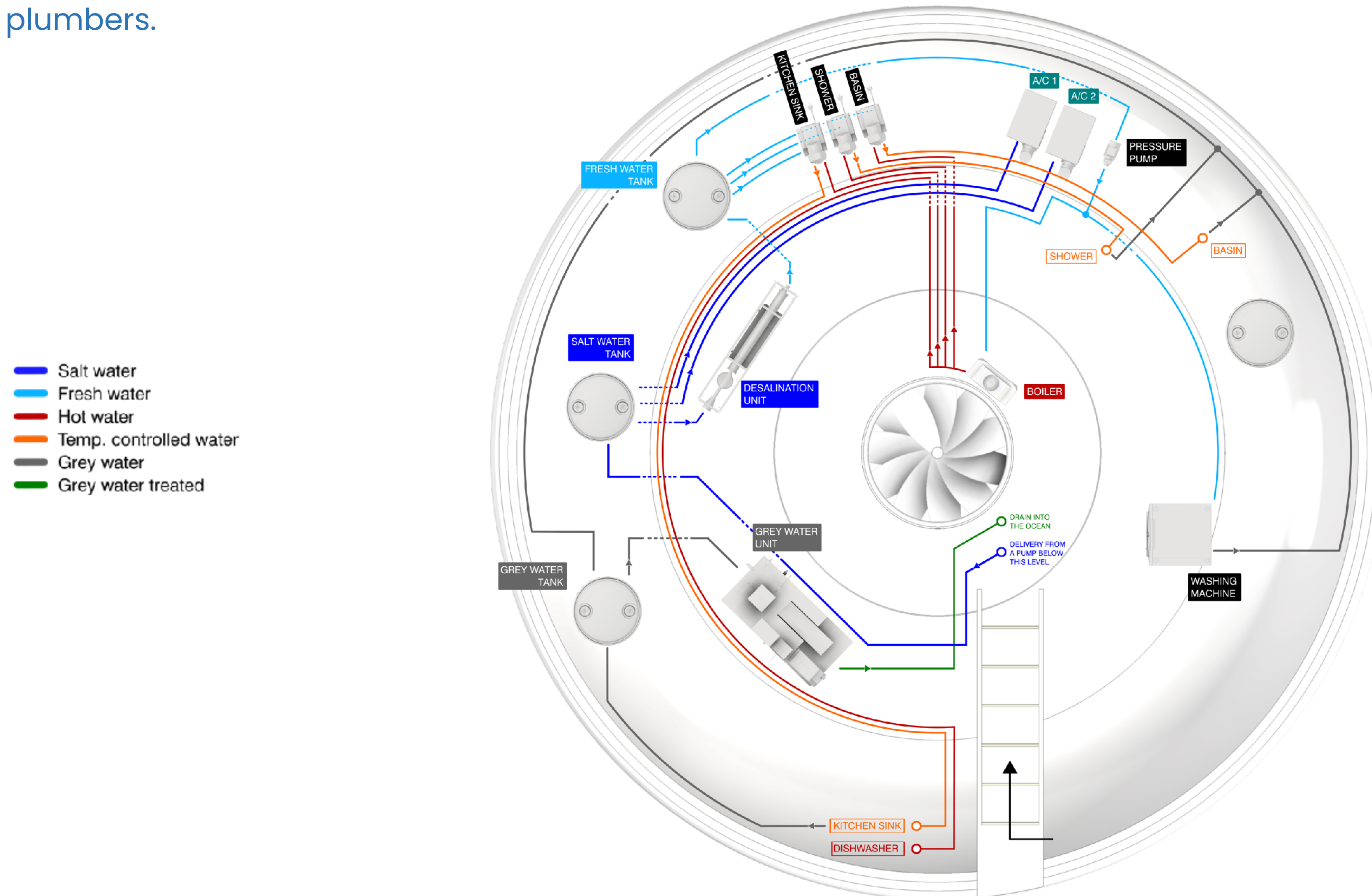
PLUMBING SYSTEMS

The plumbing for each SeaPod will be inspected by certified plumbers.

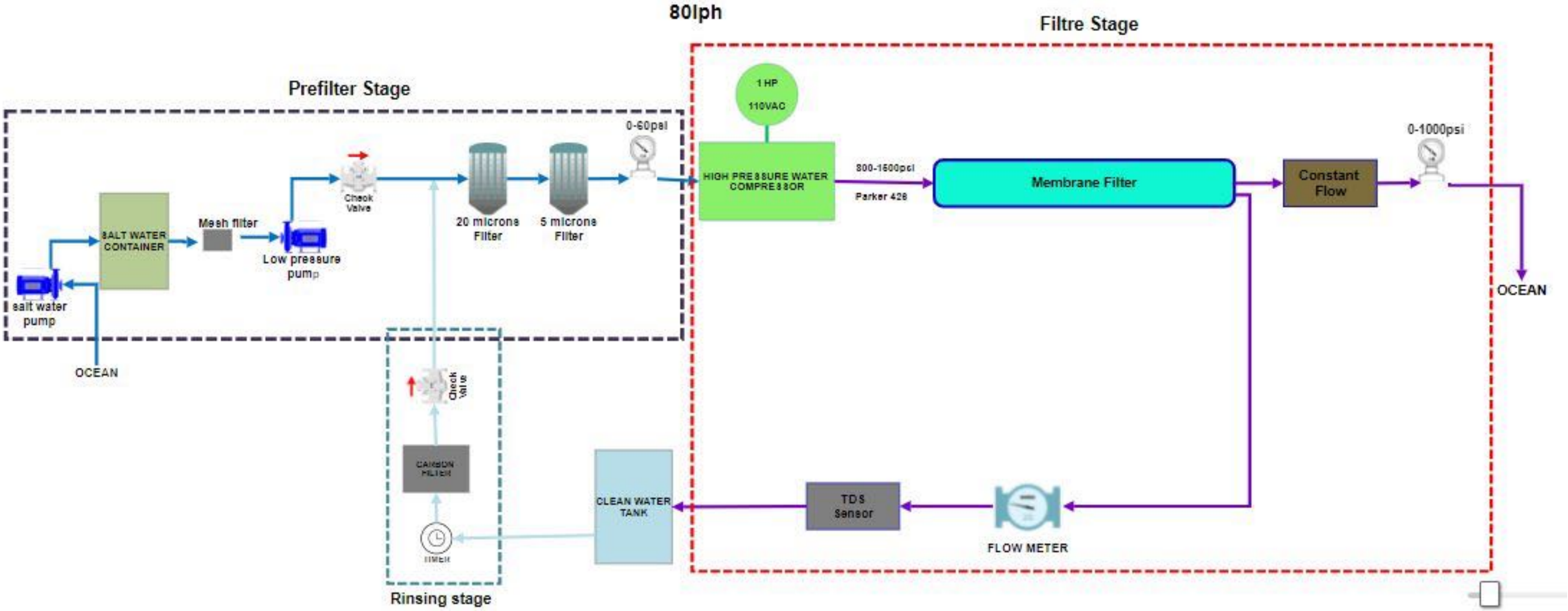
Plumbing plans for the SeaPod will be available [here](#).

MAIN ENGINEERING ROOM LAYOUT - PLUMBING

The plumbing for each SeaPod will be inspected by certified plumbers.



DESALINATION MACHINE





GAS SYSTEMS

We use a high efficiency and low noise backup generator with a 20 gallon propane tank located on the outer spar and separated from the living area.

A second 20 gallon propane tank is used to incinerate solid waste from the toilet incinerator. This is located in the storage room.

Gas line drawings will be available [here](#).

INSURANCE

SeaPods are registered in the Floating Houseboat category by the Panama Maritime Authority (AMP). Insurance is available for SeaPods as it is for other boats.

DIGITAL SECURITY

Access to the home automation system is via encrypted communication on iOS and Android Apps or by tablet computers in the home.

The home tablets have a direct wired and encrypted connection to the home computer located in the Main Engineering Room. Some home functionality is only available on the physical tablets in the home itself to prevent outside access to core home functionality for security purposes.

Remote access to the home is available via iOS and Android Apps. Access is secured with Amazon Web Service (AWS) Cognito Single Sign On Hosted UI.

Digital Voice Assistants and microphones can be disconnected using a software switch or a manual disconnect switch for people that are concerned about digital privacy.

Video surveillance camera's can be disconnected using a software switch or a manual disconnect switch for people that are concerned about digital privacy.

Data stored on servers is encrypted and can only be unencrypted by authorization from the home owner.

ELECTROMAGNETIC SECURITY

A growing number of people are expressing concerns of sensitivity to electromagnetic radiation (EMF) coming from radio's, wifi, cell phones, bluetooth devices, wireless internet of things (IoT) devices, and other sources of electromagnetic radiation.

We have significantly reduced the amount of EMF produced in the home by using wired connections to the majority of electronic components. There is only one wireless IoT device in the home which uses zwave radio frequency which is the lowest EMF output protocol that is currently available.

The wifi on SeaPods can be turned on and off on a schedule or by using the wired onboard tablet or remote app. Users on the SeaPod can access the internet using an ethernet cable and avoid wifi if they choose. Ethernet cables are located in every room.

PHYSICAL SECURITY

A SeaPod is not a simple home to break into.

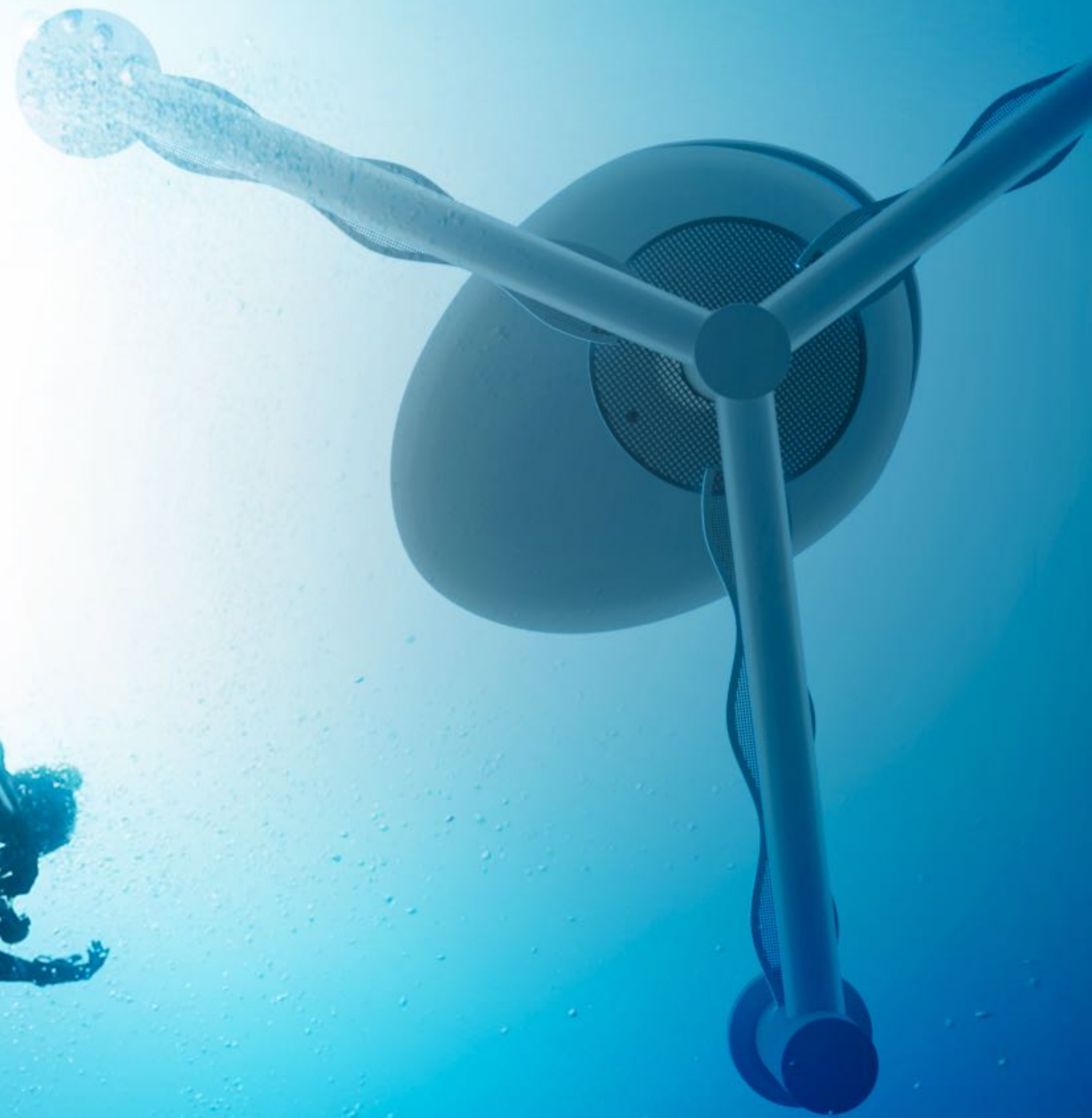
Thieves will be easily seen approaching the home in their boats.

Entrance to a SeaPod is from a fortified door at water level which is difficult to break open. Owners will have the option of using standard physical keys or single/two factor authentication to electronically unlock the door. Two factor authentication is given via facial recognition, secure NFC access and/or PIN code.

The living area is 3.5 meters above water level and you have to climb a narrow staircase to gain access making the SeaPod a difficult target for casual thieves.



UNDERWATER VIEW OF A SEAPOD FLOATING HOME





AERIAL DELIVERY

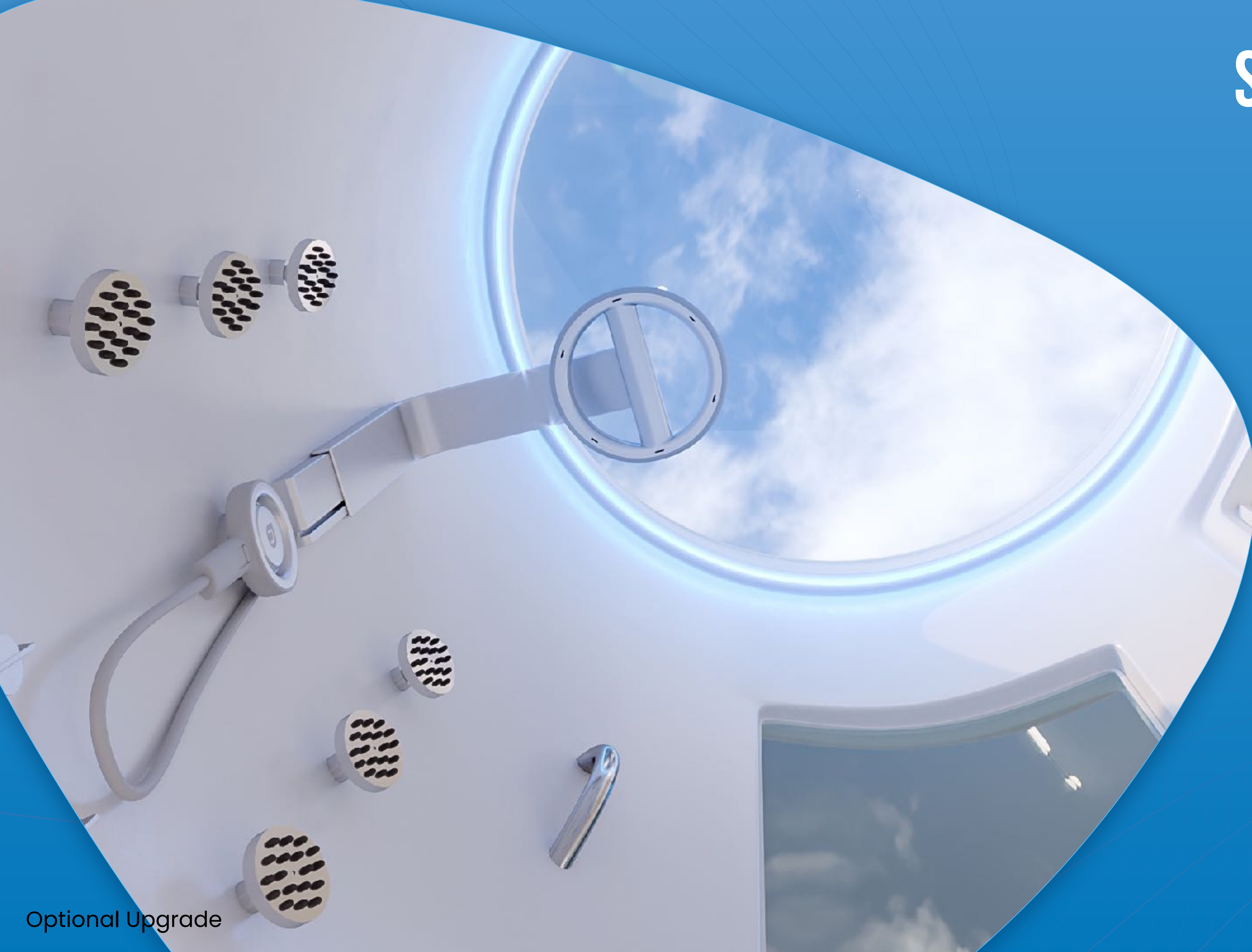
You can order food, drinks, convenience store items and more by drone delivery which will be built in to the Pod Companion home app. Aerial drone delivery is more ecologic and energy efficient compared to driving a car or boat to a store for pickup.

Available in select locations

SMART SHOWER

The smart shower upgrade allows you to activate the shower by swiping your smart ring before getting in the shower and the shower automatically turns itself on to your preferred temperature and pressure settings before you get in.

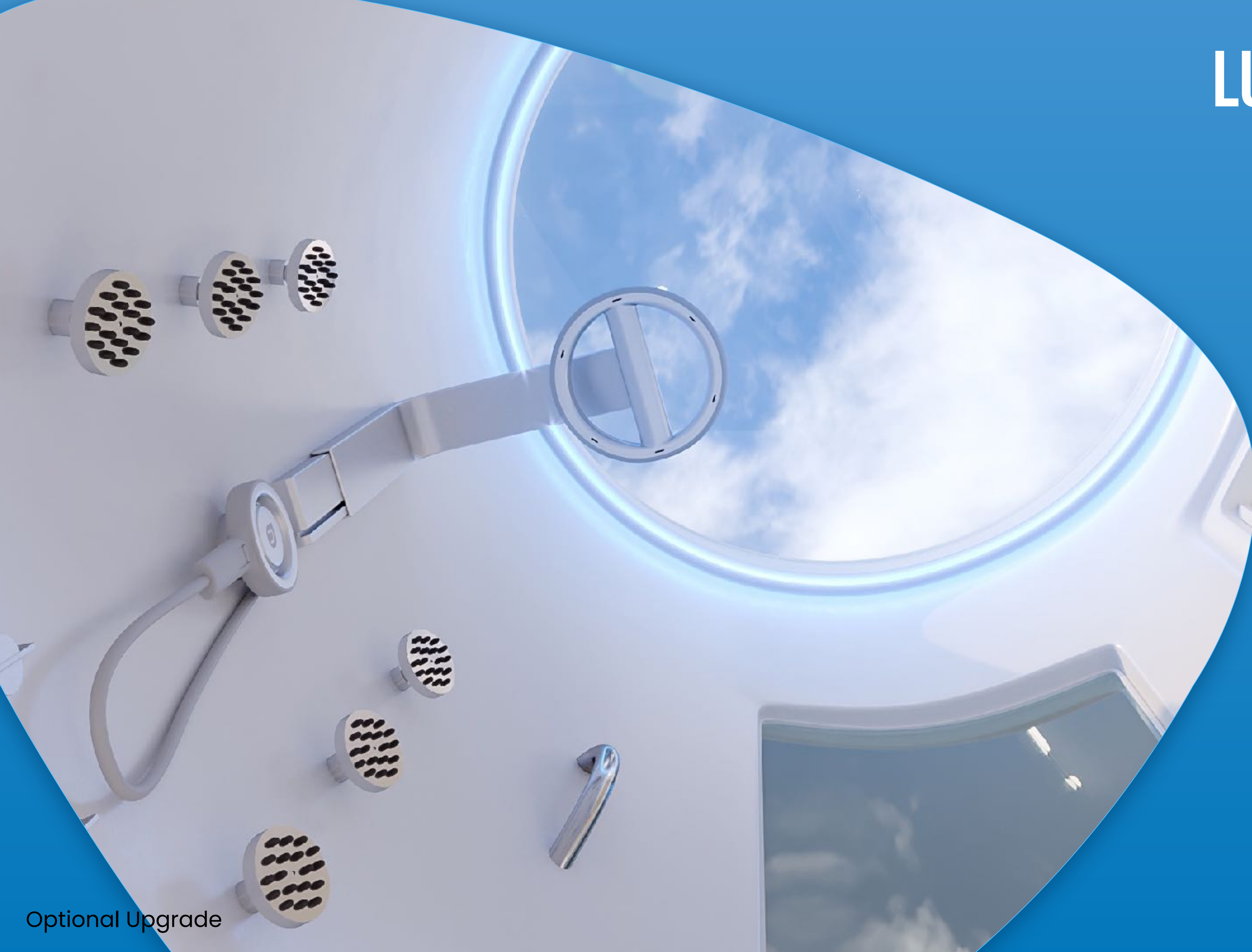
You can adjust the temperature, pressure, or which jets are used from the in-shower tablet or by voice control.



Optional Upgrade

LUXURY SHOWER

The shower can be upgraded to include 6 body massage jets, overhear rainshower, and handheld massager .



Optional Upgrade

SMART TOILET

The smart toilet can flush without having to touch a button or a remote. You can flush by voice, app, remote control, or by swiping your foot in front of a sensor. You can use them as a regular toilet if you wish or you can go paperless with the bidet sprayer and drier.



Optional Upgrade

EMBEDDED CHARGING SURFACES

Charge your mobile devices on built-in wireless charging surfaces throughout the house. You choose where you want your charging surfaces to be and we install them.



Optional Upgrade

SMART RING

Unlock advanced functionality of your pod

Pods have hidden hot spots throughout your home. A hotspot can be any small surface on a counter or a wall. When you swipe your smart ring over the surface it can trigger custom automations. We will help you configure your automations.

Automations can be one simple smart action in your home or a complex combination of actions like turning on dinner music and special dinner lighting and triggering aerial drone delivery service for champagne that will deliver in 30 minutes at the end of your meal.





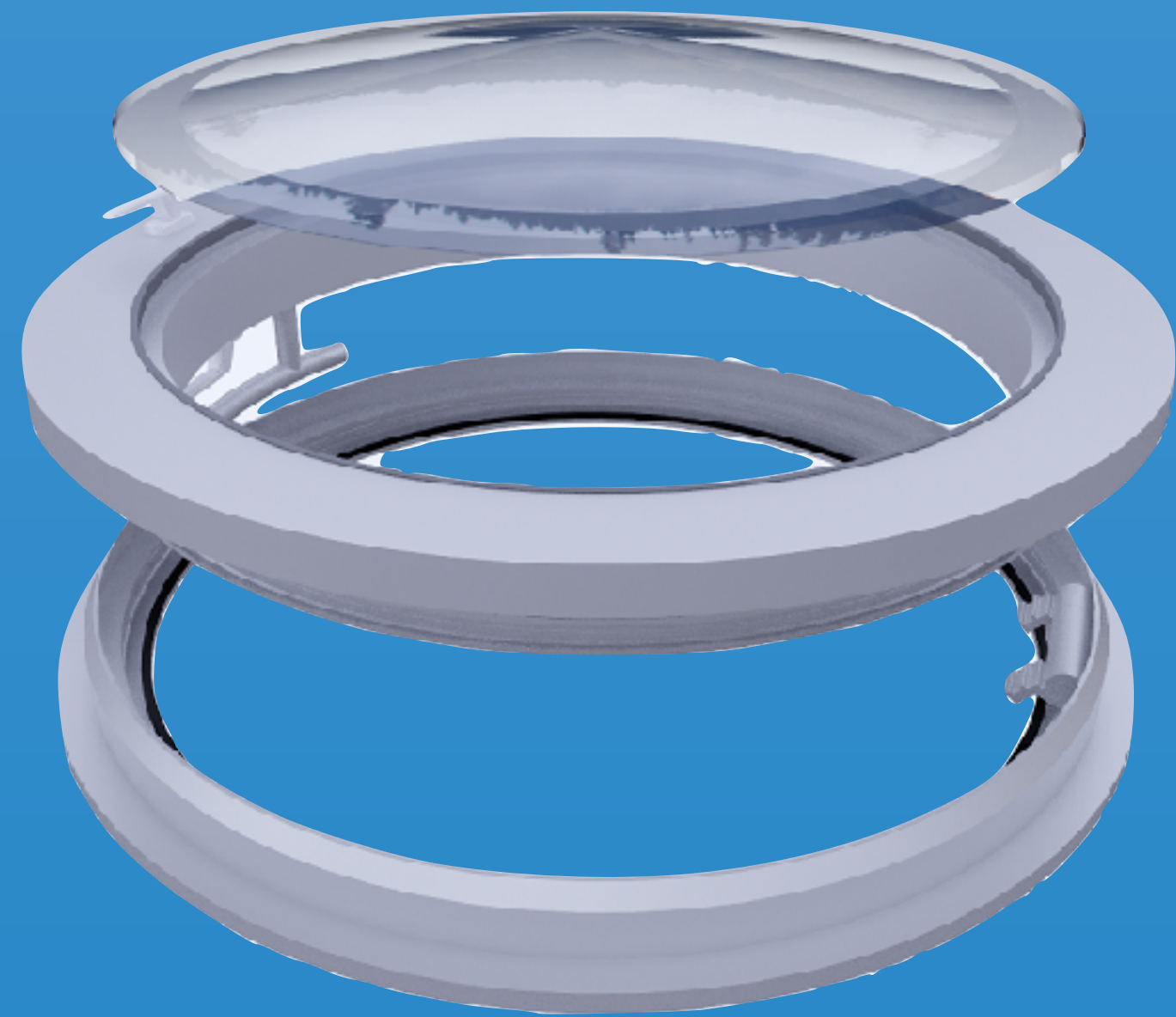
MIELE SMART APPLIANCE INTEGRATION

Ocean Builders has partnered with the high end home appliance manufacturer, Miele, to bring their line of smart appliances to Pods and together we are building deep integration and functionality so you can control all your appliances and automate your home in a way that has never been possible before now.



Optional Upgrade

SMART SUNROOF



Sunroofs can open automatically to help cool the house down to reduce the need for A/C and to improve airflow. They will close automatically if it starts to rain or if it gets too windy.



STAINLESS STEEL SMART TANKS

Pods have stainless steel double wall tanks with a vacuum layer to keep hot water hot more than 10X longer than with uninsulated tanks. They are made from stainless steel so there is no leaking of chemicals from plastics into the water. The tanks have water temperature sensors and level sensors to help manage water usage better.



PRIVATE VOICE ASSISTANT



Your Pod can be controlled by voice. At launch you will be able to control many aspects of the smart home by voice. Additional functionality will be added over the coming months. In the near future you will be able to trigger complex automations with a simple command. We have integrated an open source voice assistant which does not send data to any third party or cloud service for processing but if you prefer to use Siri or Google Assistant you can use them as well.

SMART BLINDS

You can add regular or blackout smart blinds that open and close automatically in the morning/evening or by voice, tablet, or gesture control.

GPS & MOVEMENT SENSOR

Pods have a 9 axis movement sensor that can pick up the smallest wave movement as well as detect your Pods precise GPS location. The Pod can use this information to dynamically stabilize itself when there are major redistributions of weight on the Pod which is something that few boats are able to do.

WHOLE HOME AUDIO

You can customize your Pod with high quality audio sound system installed throughout your home using JBL speakers.



Optional Upgrade

FOLLOW ME

Unlock advanced functionality of your pod

Your Pod preferences are saved to your profile. With our award winning Follow Me service you can take your Pod Preferences with you anywhere you go. If you have multiple pods in different locations your pod will automatically configure itself to your preferences the moment you swipe your smart ring at the front door.





REEF AI

Self-Cleaning Underwater Camera's powered by AI will allow you to get notifications when your favorite sea life is under your Pod. This is in partnership with Fathom Ocean. This is an optional upgrade.

Camera POV #1



BED PRESENCE DETECTOR



We have optional pressure sensors built into the bed so you can start any number of automations just by laying down or getting out of bed. The system can automatically trigger a nighttime routine when you lay down to sleep. The routine can close the windows, close the blinds, turn on your reading light, and do whatever else you would like your home to do. When you get up in the middle of the night it will automatically turn on a nightlight to guide you to the bathroom. In the morning getting out of bed will turn your coffee machine on and make you your perfect cup of coffee.



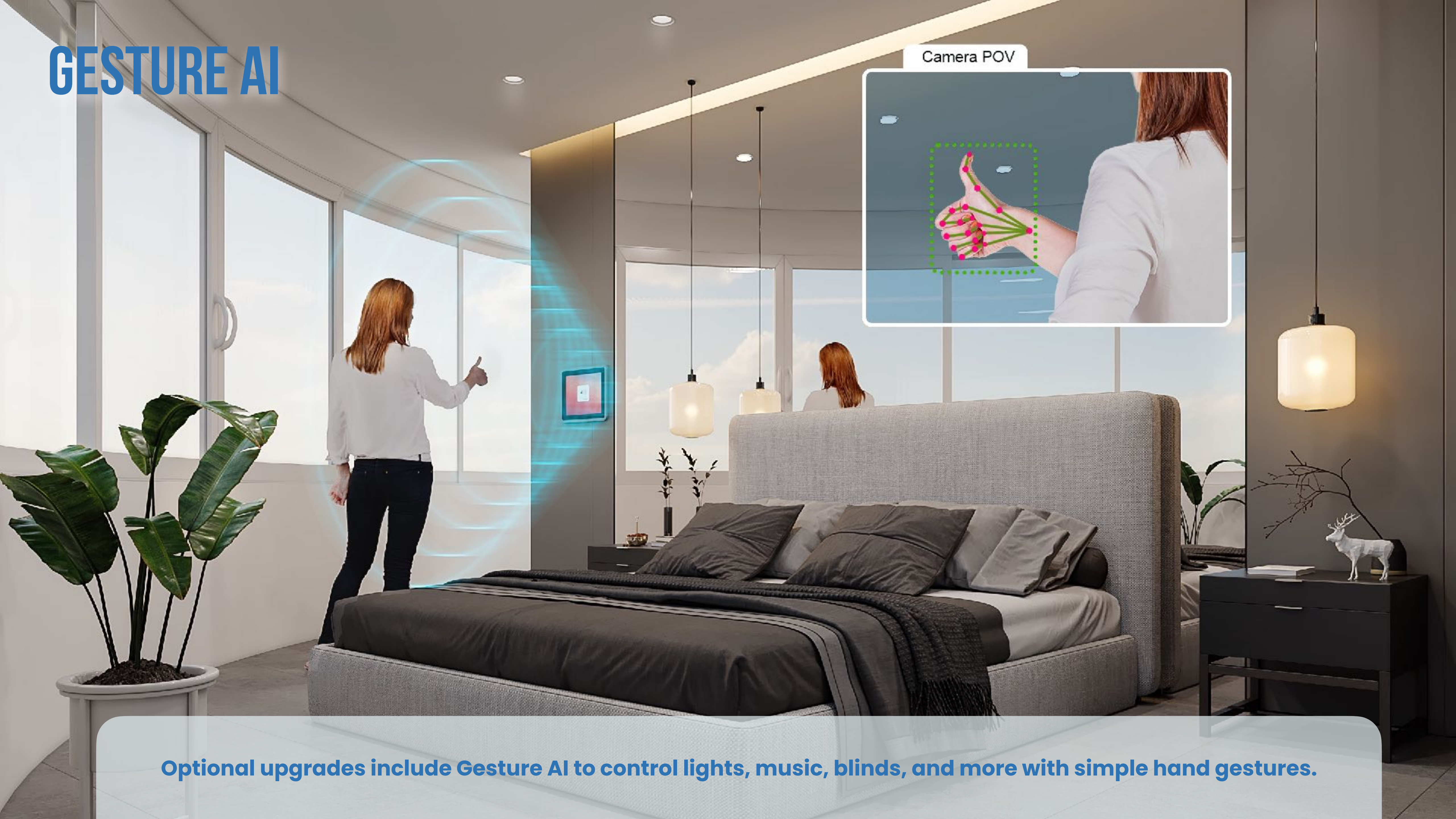
Optional Upgrade

TABLET CONTROL

You can control your whole Pod from tablets located throughout your home.



GESTURE AI



Camera POV



Optional upgrades include Gesture AI to control lights, music, blinds, and more with simple hand gestures.



LIFEGUARD DRONE

The first generation lifeguard drone will be a remote controlled water floatation device that can be deployed to save nearby swimmer that are at risk of drowning. Future versions can include a GPS enabled wristwatch with a panic button which deploys the lifeguard drone on command. The wristwatch has a range of 15km.



RAINWATER COLLECTION

Our Eco model on land and sea offer flat roofs designed to collect rainwater so you can be more water independent.

Optional Upgrade



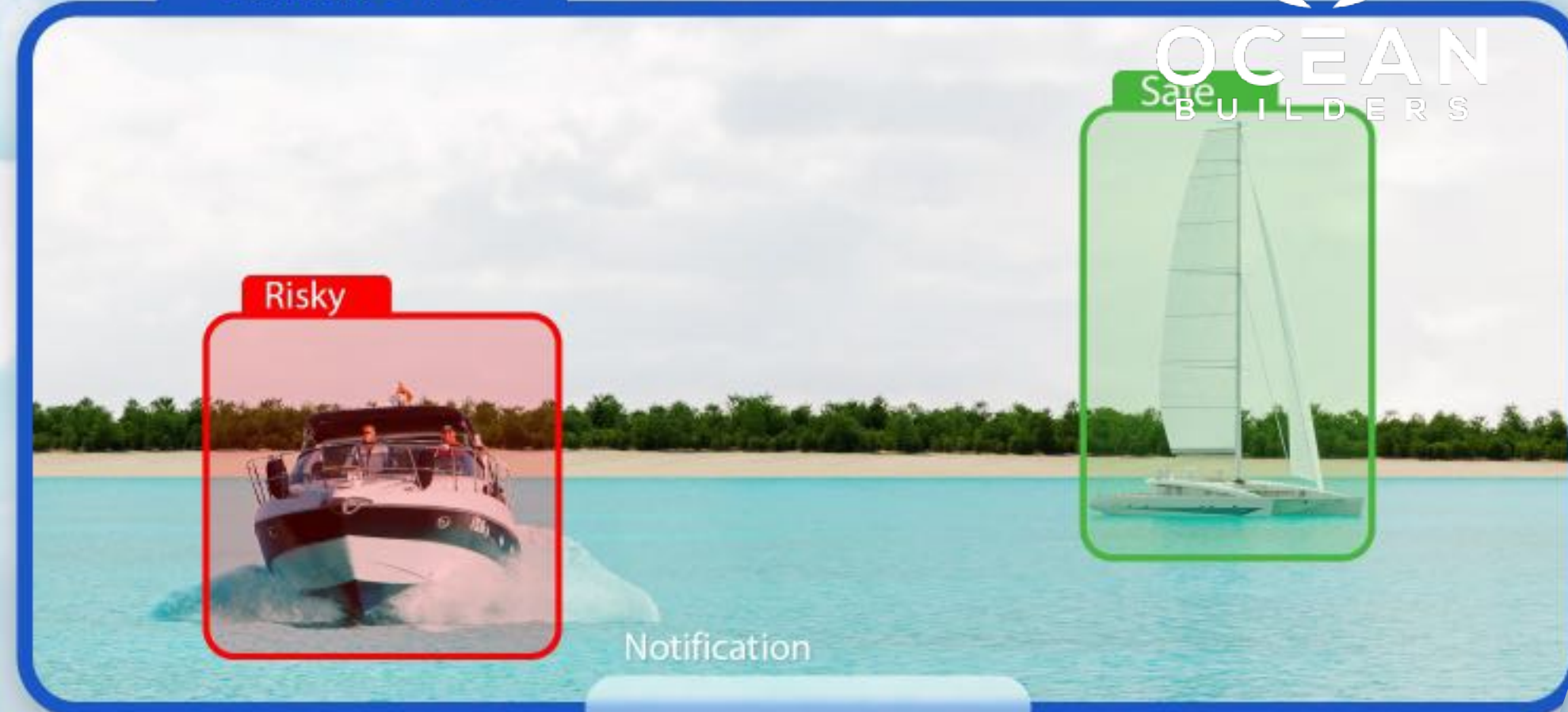
HELICOPTER LANDING

Our Eco model on land and sea offer flat roofs which can be specially reinforced to allow you to land a helicopter or passenger drone on the roof. We are making this available because we believe passenger drones will become practical within a few years and we want all Pods to be fully compatible.



OCEAN
BUILDERS

Camera POV #1



Risky

Safe

Notification
Alert sent to Pod owner

THEFT AI

Pods have optional PTZ camera's with zoom capable of seeing boats coming from many miles away and using AI to identify if they are friendly, unfriendly, or unidentified.

Optional Upgrade

AQUA SCAN

Ocean Builders has an autonomous underwater drone that uses multiple sensors to take readings of the local marine environment so we can measure our impact on the local sea life and scientifically prove restoration effects as well as being able to create photorealistic and accurate underwater maps.



CORROSION PROTECTION

The SeaPod uses 3 methods of protecting the marine grade steel structure from rust and corrosion.

1. Zinc Thermospraying. This is an anti-corrosive protection system for very long life corrosion resistance. In this process zinc wire is melted, atomised, and sprayed in molten form onto the metal surface being treated.
2. Active Electric Protection. The marine industry often uses cathodic protection to prevent rusting of steel hull boats. In our case we are using Titanium MMO (Mixed Metal Oxide) to pass an electric current through the steel. We use 3.3V at 20amps. See details [here](#).
3. Some sections of the steel structure is protected with an anti corrosive epoxy primer and anti fouling paint. Details [here](#). We are using industry standard anti-corrosive paint at the beginning and will be testing a new non-toxic anti-fouling protective coating to see if it is viable for use in our structures in the near future.



WATER RECYCLING



A onboard water recycling system is used to immediately re-use up to 70% of shower, sink, and washing machine water. This is accomplished using a combination of filters and sensors that detects how dirty or clean the water is and when it reaches a level that it is too dirty for simple recycling then it is sent to the greywater recycling system for treatment.

GREYWATER RECYCLING



SeaPods use a little known grey water treatment technology called Electrocoagulation. The processing takes place in the main engineering room. The machine is able to recycle 100% of grey water at a rate of 1.5 liters per minute with 400 watts of power consumption. The machine is able to treat water with soap, oils, fats, cleaning products, and other toxins typically found in homes. Normally, these types of elements are difficult or impractical to filter out. Until now this process has only been used in industrial water treatment systems since it was invented in 1958. We use electrocoagulation combined with ozonation and filtration. Filters need to be changed once or twice per month depending on usage. Technical details on the water treatment system and water quality test results can be found [here](#) and line drawings and details of the system can be found [here](#).



BLACKWATER TREATMENT



SeaPods have a novel blackwater treatment machine located in the main engineering room. Solid waste of particles larger than a large grain of sand is separated out from the toilet and incinerated into harmless ash. The remaining blackwater liquid from the toilet and urinal is recycled at a rate of 1.5 liters per minute with 400 watts of power consumption. It is treated with a similar device than what is used to treat grey water in the SeaPod. Filters need to be changed once or twice per month depending on usage. The recycled liquid blackwater is returned to the toilet water reserve tank and reused for the next flush. By the time the liquid gets through to the filters it is completely neutralized and non-toxic. Technical details on the water treatment system and water quality test results can be found [here](#) and line drawings and details of the system can be found [here](#).



GARBAGE, RECYCLING, AND COMPOST

Garbage from the Pod is collected and periodically removed by an autonomous trash collection robot.

Recycling is collected and periodically removed and brought to the recycling station in the City of Knowledge in Panama City.

Compostable organic waste can be disposed of in the garbage or brought to a composting site nearby.

Available in select locations





AUTONOMOUS OCEAN CLEANUP ROBOT

The autonomous trash, recycling, and compost robot also serves as an ocean cleanup device. It has a built in net which skims the surface of the water to collect plastic and waste that has been discarded by nearby cities and beaches.



Available in select locations

JETSKI DOCK

EXPANSION PACK



Optional Upgrade

SOLAR STATION

EXPANSION PACK

The solar expansion pack allows you to add a clean renewable energy power source to your Pod.





SOLAR ROOF

This solar roof gives you 36m² of solar charging space on the roof

ENVIRONMENTAL IMPACT & RESTORATION



The global marine ecosystem is in serious danger. Ocean acidification is causing coral bleaching and most of the worlds reefs have lost 30–80% of their living coral. SeaPods establish a localized **Marine Restoration Zone** in their immediate environment. This is accomplished in the following ways:

- Creation of a Micro Marine Habitat
- Accelerated Coral Growth
- Marine Restoration Trials



SEAPODS AS A MARINE HABITAT



Marine life forms, like fish and crustaceans, always look for closed places, crevices, covered areas, shades and shelters to form colonies and for the propagation of their species. The environment the SeaPod creates gives escape routes and hiding spaces for smaller marine life from predators. They attract marine life by offering a safe habitat.

The SeaPods floating steel structure is biocompatible with marine life. Barnacles begin to grow immediately when steel is placed in the water and life starts to flourish in the local area.



ACCELERATED CORAL GROWTH

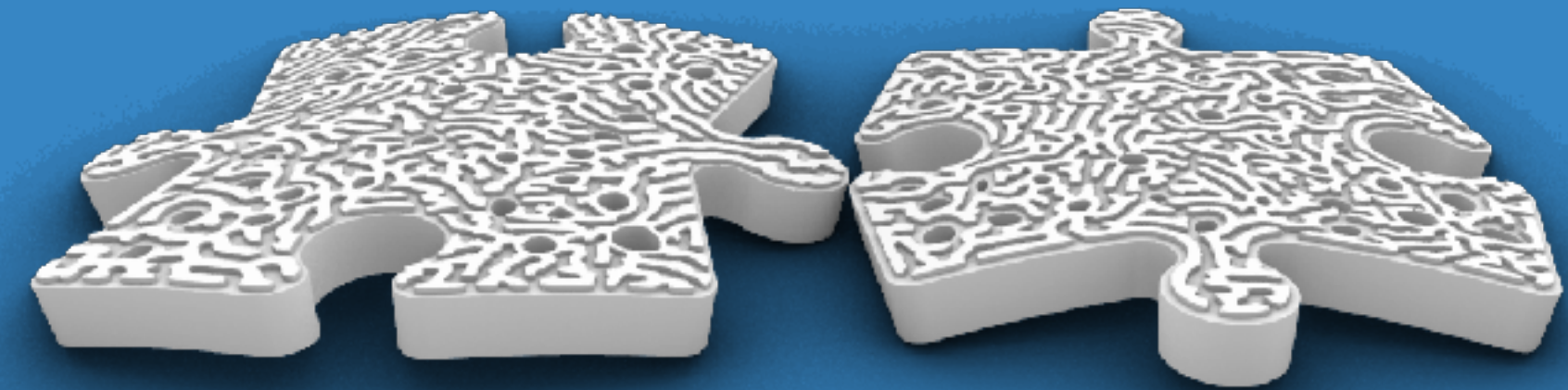
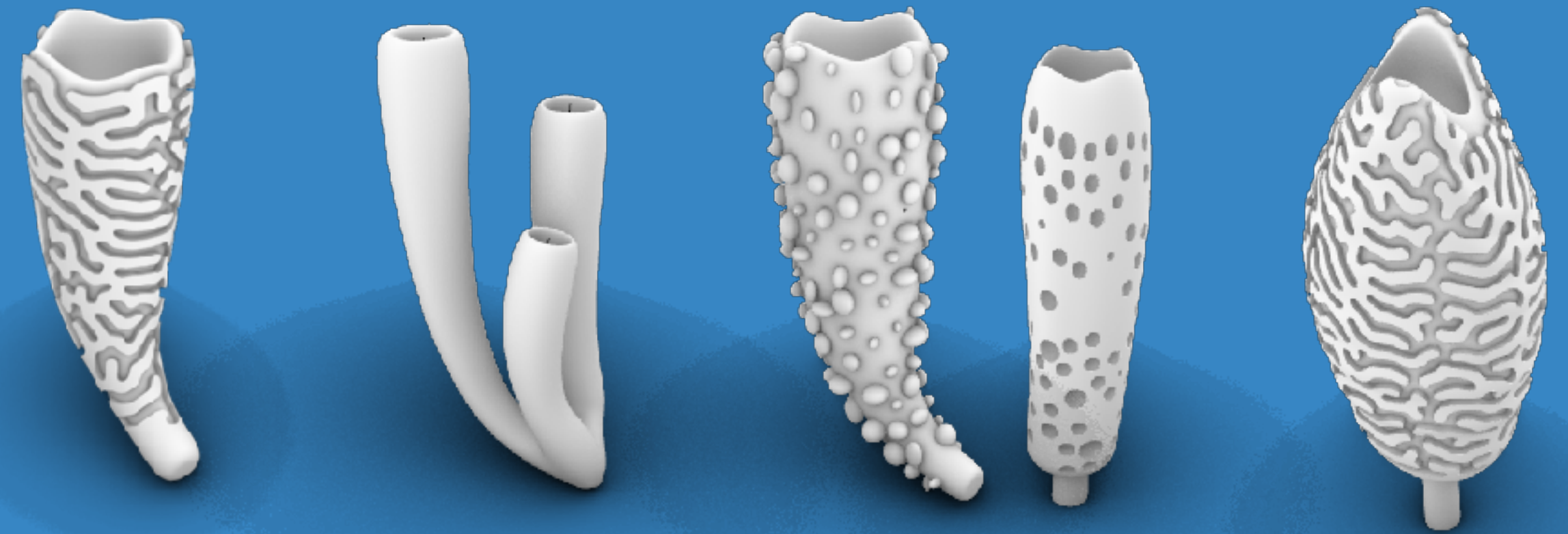


Normally when you place steel in water it begins to rust. Researchers have found that when you conduct a small electric current through steel it prevents it from rusting.

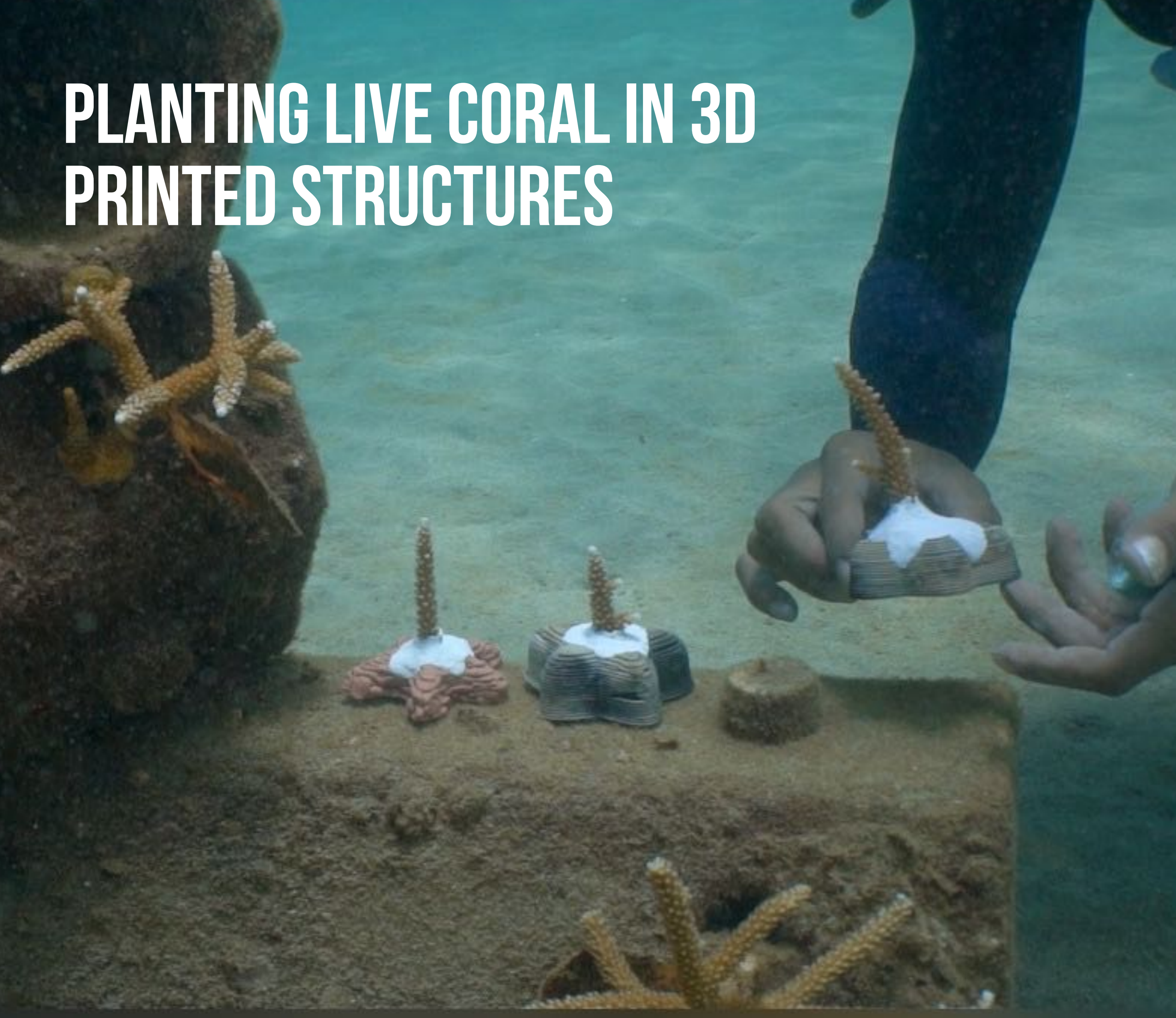
If you put slightly more current through steel, then it begins to greatly accelerate the process of coral regrowth as calcium carbonate from the water begins to collect on the steel at a high rate. We will use this technique to not only protect our steel structure but to create a local **Marine Restoration Zone**. This will make SeaPods a biologically productive area for marine life.

EXPERIMENTAL 3D PRINTED CORAL

Ocean Builders has the only 3D coral printer in Central America and has already printed several hundred coral samples which will be planted in collaboration with local coral restoration foundations in Panama. If trials go well then the program will be extended.



PLANTING LIVE CORAL IN 3D PRINTED STRUCTURES

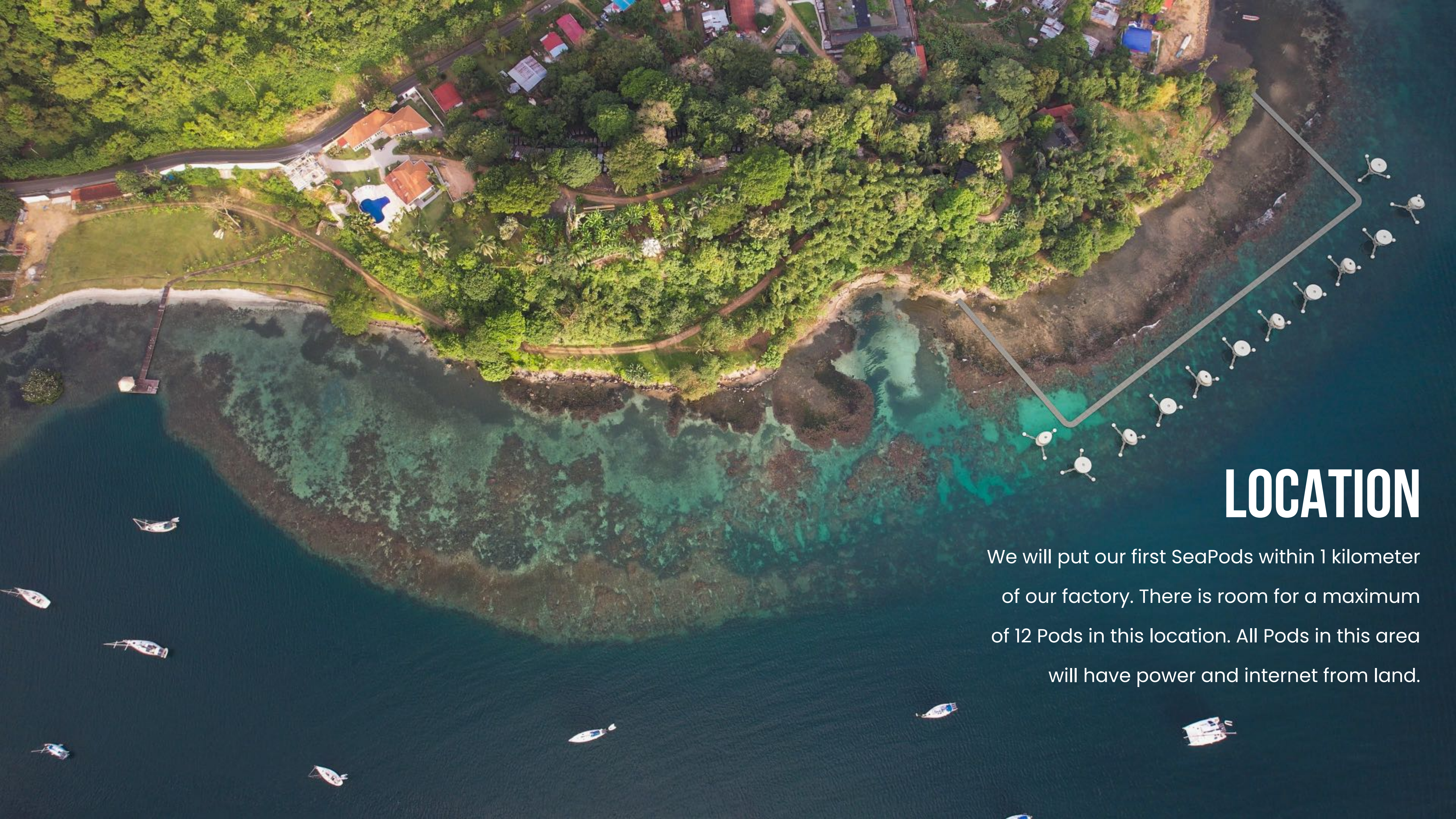


MARINE RESTORATION TRIALS



Trial Partnerships with like minded businesses like [PanaSea](#) in Linton Bay, Panama, could lead to each SeaPod becoming a significant contributor to local marine restoration efforts.

PanaSea has developed Sea cucumber farms. We will begin trial experiments placing our SeaPods in an area with a Sea Cucumber farm. SeaPods and Sea Cucumbers compliment each other perfectly. Sea Cucumbers are an organic sea life form that looks like a giant worm. Sea Cucumbers are essential nutrient recyclers like earthworms are on land. Their digestive processes increase the water's pH which counteracts ocean acidification and hence help to prevent coral bleaching. They free up calcium carbonate which is essential "food" for coral to grow. They prevent disruptive algal blooms by breaking down organic matter in the water. Finally, they help support healthy seagrass which absorb significant amounts of carbon and are thus a big step in the goal of pulling carbon out of the environment.



LOCATION

We will put our first SeaPods within 1 kilometer of our factory. There is room for a maximum of 12 Pods in this location. All Pods in this area will have power and internet from land.

SAFETY EQUIPMENT

Some of the safety equipment you will find onboard:

- Comprehensive First Aid Kit
- Portable waterproof VHF radio
- AIS transmitter (transponder optional)
- Water sensor & automatic sump pump in the hull
- Pyrotechnical signaling devices
- 10 Life jackets
- 1 inflatable Life Raft
- Four sets of Snorkeling Fins & Masks
- Online safety equipment training will be available [here](#)

SAFETY SIGNAGE

All safety equipment, emergency exits, and signage for emergency procedures will be prominently displayed and marked.



LIGHTING BEACON

Each of the three Outer Spars have illuminated beacon lights at night to prevent collision with nearby vessels.



SAFETY ORIENTATION

A safety orientation video and printed manual will be available in English and Spanish. An online version will be available [here](#).



EMERGENCY CONTACTS

Emergency contact information for local medical services, police, marina and security services is available in the onboard information manual. Your owners manual will list the relevant emergency contacts for your area.



FIRE SAFETY

Every room of a SeaPod has certified fire, smoke, CO2, and gas sensors. If any of these sensors are activated a loud alarm will be triggered, the LED lighting system in the house will flash red and notifications will be sent to the owners of the SeaPod. Each room in the SeaPod has a fire extinguisher.

The kitchen has a fire blanket.

Propane tanks for the backup generator are located outside in a storage container on the outer spar away from the living area.

We recommend that all sensors are to be manually tested on a monthly basis to ensure they work properly.

All electrical cables are inspected every three months.

Owners have the option to have the smart home system continuously monitor all sensors and electrical systems to have early detection of any issues that can cause fire.

Fire and Material Safety sheets for walls, floors, ceilings, and other construction materials can be found in your owners manual.

Fire safety training will be provided to all owners.

LIGHTNING PROTECTION

SeaPods use proven lightning prevention systems from Evodis. Details and studies available [here](#).





The dock around the entrance of the floating house is the main meeting area in case of emergency.

The main emergency exit is the front door of the floating house. The entrance and spiral staircase inside the spar are made with steel and fire-retardant paint so there is a clear and safe path to evacuate the floating home in case of a fire.

It is important to keep the spiral staircase free of any obstacles and combustible materials at all times to ensure that there is always a clear path to evacuate the home.

A secondary emergency exit from the home is from the patio. The patio is 4 meters above the water level and is a safe height to jump into the water.

There is an emergency life raft located under the stairs of the entrance to the house. A marked pull handle will release the raft and inflate it.

Rescue boats can pull up to the dock at the entrance level of the floating house as needed.

Safety training will be provided to all owners.

EMERGENCY EXITS

FLOATATION

The underwater hull section of the floating spar structure is the source of floatation and it is important to keep it free of water at all times. It is a design philosophy to not have any type of water feed through going into the spar below the water line.

The underwater hull is sealed off from the upper spar by a hinged water tight flood door.

The spar is made from 12–15mm thick marine grade steel and protected with 200µm zinc electroplating & active electric protection ([see details](#)). The condition of the underwater steel should be manually inspected on a monthly schedule to verify the continued integrity of the hull and any problem areas should be reported and immediately addressed to prevent the possibility of water leaks.

The bilge inside the spar in the underwater section of the hull should always be kept completely dry. The spar is equipped with a sump with a bilge pump. This bilge pump can handle up to 750 gallons per hour. The bilge pump works automatically when water is detected. If water reaches a higher level or if the bilge pump fails to activate a notification is immediately sent to the owners mobile phone and optionally to a maintenance team. The LED lights in the house will also flash RED to indicate a problem.

MAINTENANCE, SAFETY & INSPECTION SCHEDULE

A Routine Maintenance and inspection schedule is highly recommended and includes:

- Plumbing connections and fittings
- Drinking water quality testing
- Grey water and blackwater filters
- Grey water and blackwater recycling unit
- Steel hull
- Fire Safety Equipment
- Water sensor & automatic pump in the hull
- All electronic sensors and systems
- All safety equipment
- Rehearse Safety Drills
- Inspection schedules will in included in your owners manual

MAINTENANCE PACKAGE FOR CHARTER OWNERS

This is a special plan that allows us to give our initial owners highly personalized service at a very special price. This is to fulfill our commitment to make sure Pod owners have the best possible experience and become our biggest and best source of product testimonials.

This package includes a combined 10 hours maintenance or service per month covering the following:

- All scheduled maintenance checks.
- Cleaning exterior of windows once per month
- Customizing Home Automation Programming.
- Home Monitoring (optional).
- Other maintenance calls. Cost of materials will be billed separately for items not covered under warranty.
- Unused hours do not carry over month to month.

\$495/month and \$49/hour after those hours.

WARRANTY

Steel

- 50 year life expectancy
- 10 year warranty
- Must be maintained according to the maintenance manual
- Steel at the waterline must be repainted every 5 years by lifting the vessel with airbags and repainting the waterline according to the maintenance manual
- Bilge must be kept clear
- Anodes need to be inspected according to the maintenance manual
- Basic system must be remotely monitored including bilge pumps, movement sensors, cathodic protection anodes, and other systems deemed vital to ensure longevity and safety of the steel structure.
- Steel hull must be inspected according to the maintenance manual recommendation

Fiberglass

- 50 year life expectancy
- 10 year warranty
- Fiberglass is damaged most by being at or below the waterline where there is osmosis leading to damage. Our fiberglass is elevated over the water which significantly reduces damage
- External Gel Coat - The top layer needs to be polished every 5-7 years (using polishing paste & fur like material). It is users responsibility to do this.
- Internal & External Cosmetic Cracks. 5 years. Normal use is covered. User abuse is not covered.
- Internal and External Structural Deterioration. 10 years. Normal use is covered. User abuse is not covered.
- Must be maintained according to the maintenance manual

Ocean Builders Electronics

- 10 year life expectancy
- 2 years warranty
- Must be maintained according to the Ocean Builders maintenance manual

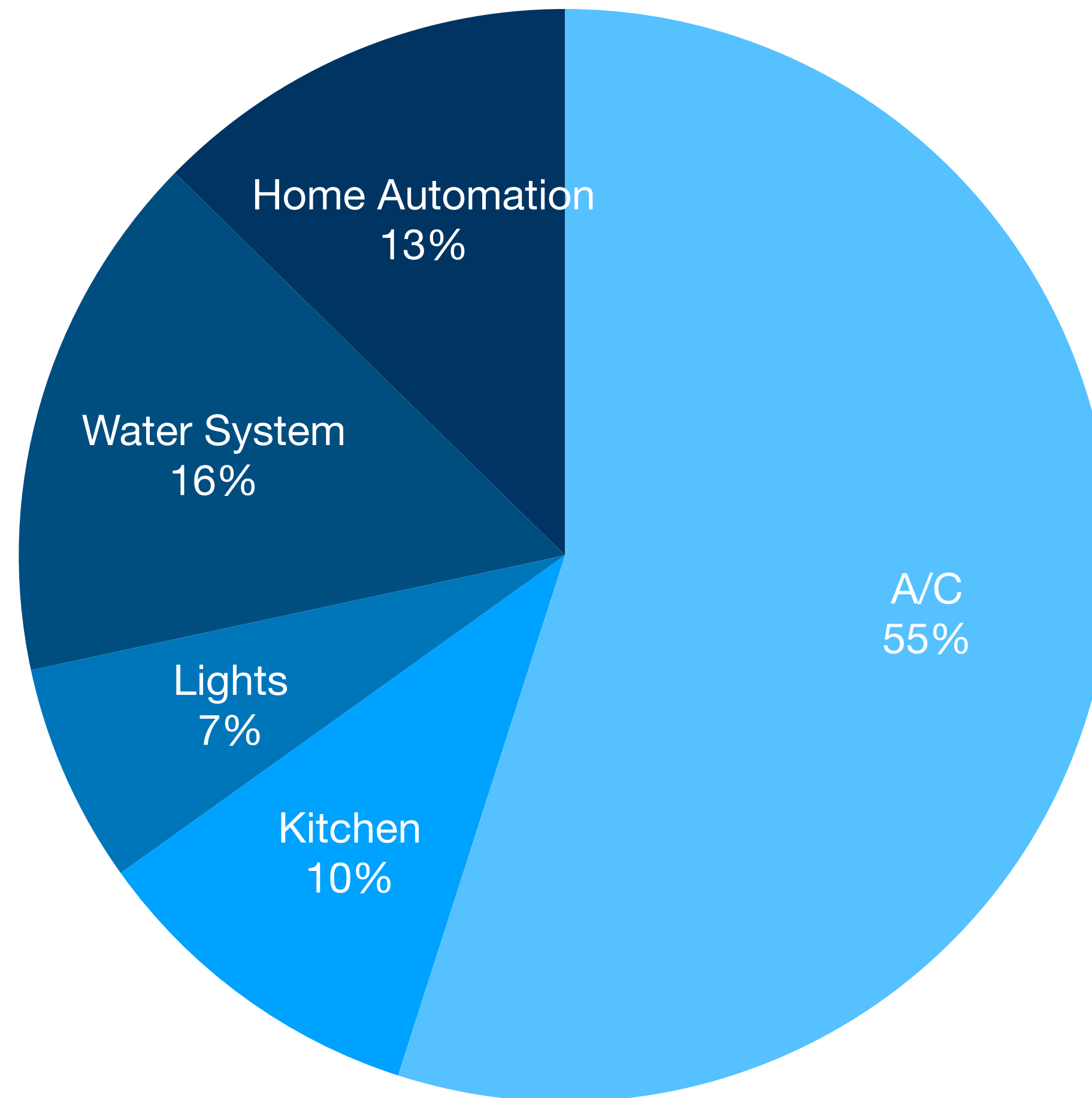
Other Electronics

- According to manufacturers warranty policy

Anchoring System

- 3 years - conditional on it being installed by qualified by professional
- Must be maintained according to the maintenance manual

POWER CONSUMPTION ESTIMATES



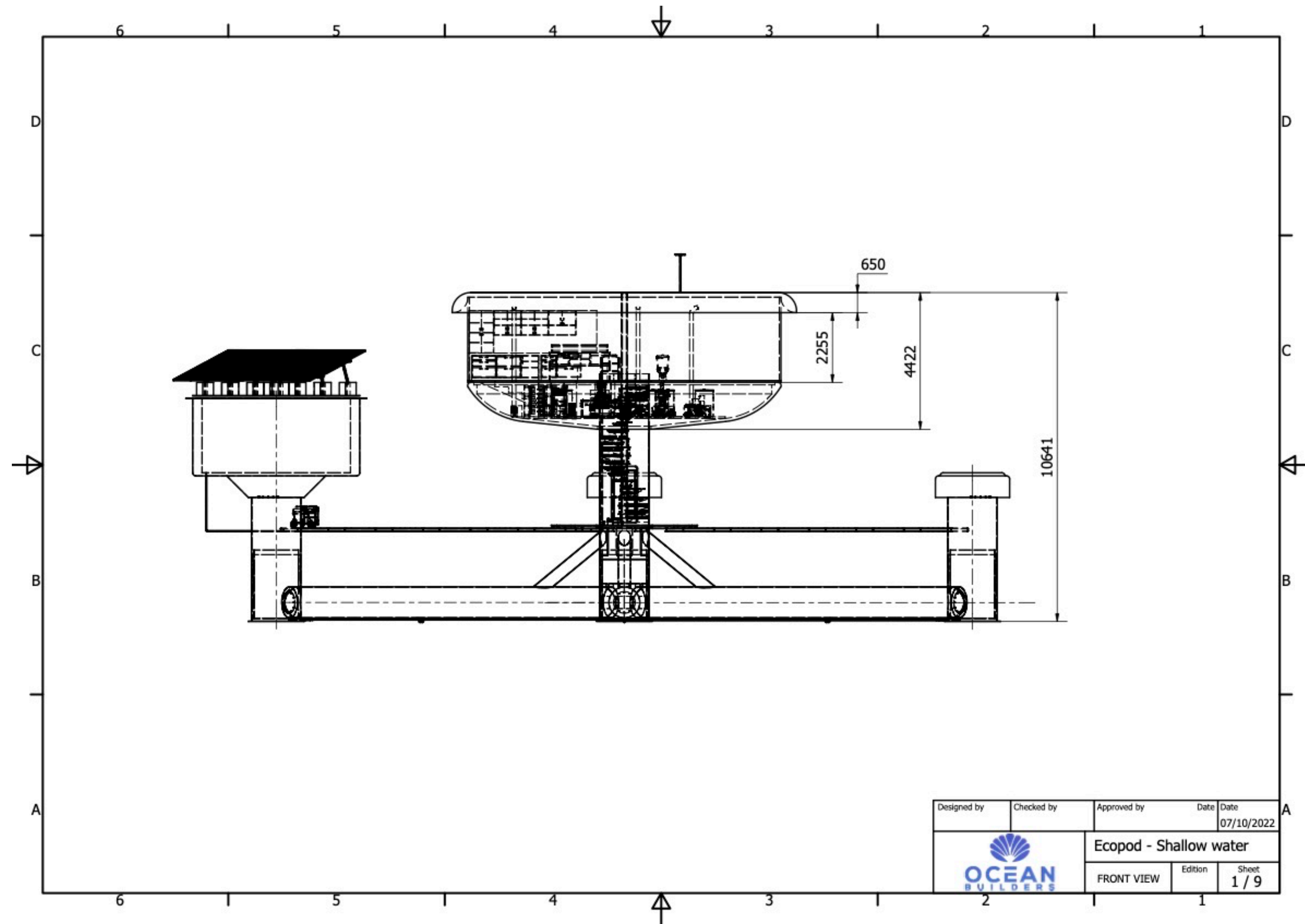
Actual power consumption can vary widely depending on individual preferences and usage. This is based on 32 kilowatt hours usage per day

GENERAL SPECIFICATIONS

	Sea Piling	Shallow Water Model	Deep Water Model
Water Depth	5m max	5-50m	40-200m
Wave Height Conditions	Customizable	4-5m	5m
Wave Period Conditions	All	15m or less	All
Wind Conditions	80 mph+	80 mph	80 mph
Approvals	Check local country rules	Check local country rules	Maritime flagging may be required depending on location
Tide Conditions	Customizable	Any	Any
Expected Lifespan	50 years with proper maintenance	50 years with proper maintenance	50 years with proper maintenance
Weight of SeaPod Superstructure	8-9 tons	8-9 tons	8-9 tons
Weight of Steel Substructure	8+ tons depending on foundation	28 tons	120 tons+
Foundation Required	Concrete or insert steel tub substructure into sea floor	Three Point Chain Anchoring/ Mooring	Three Point Chain Anchoring/ Mooring

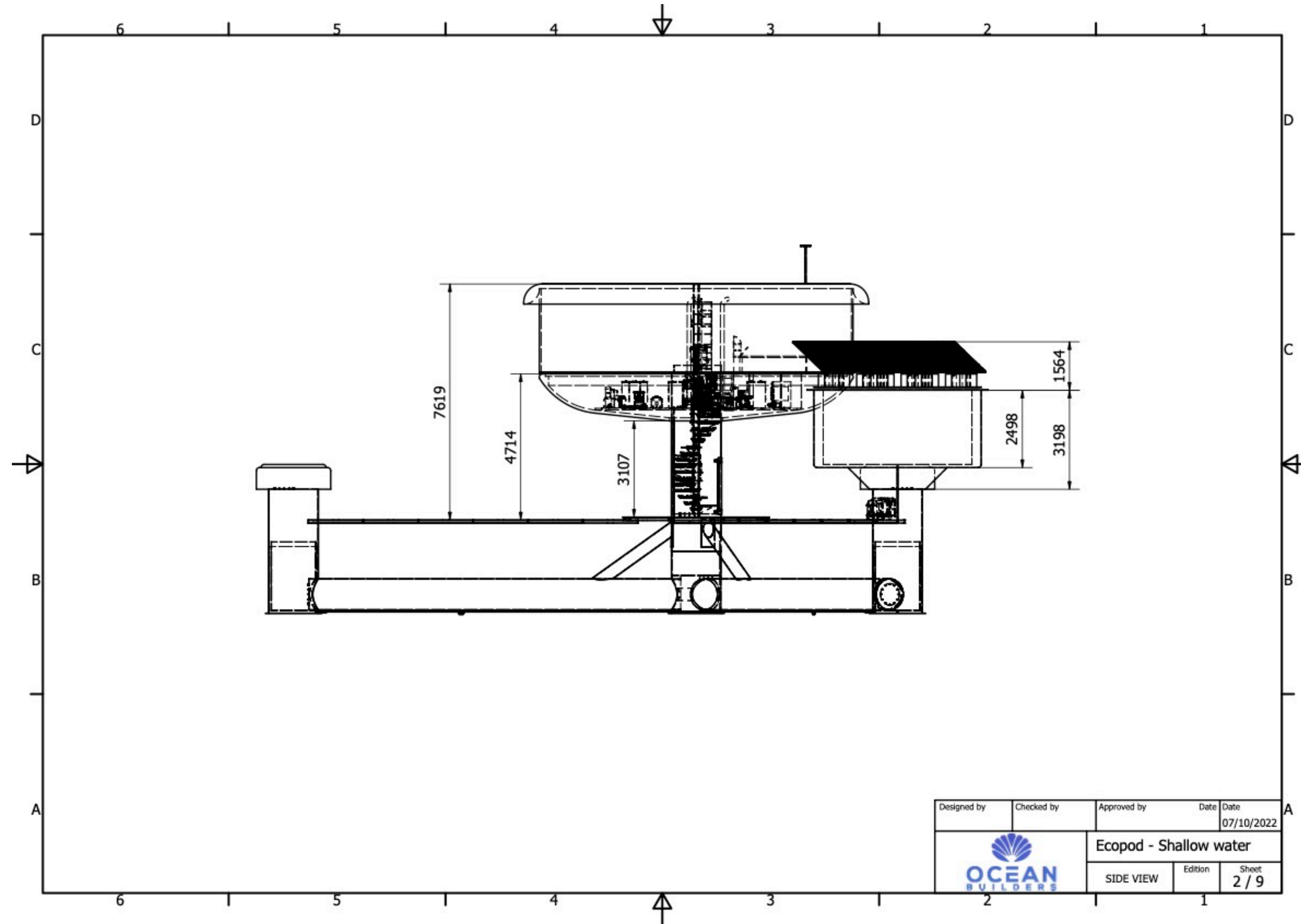
ENGINEERING DESIGNS

Side profile view



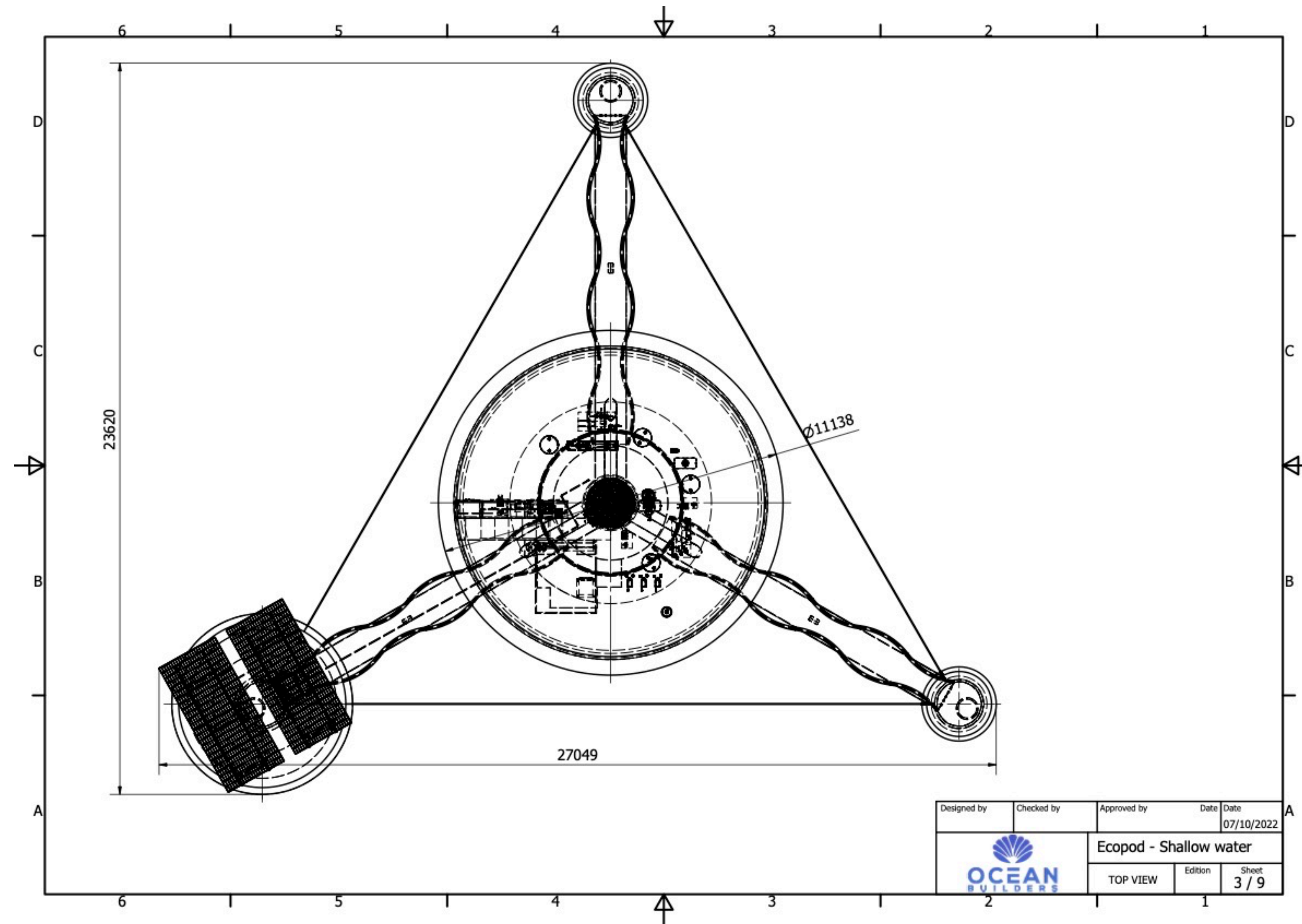
ENGINEERING DESIGNS

Side profile view



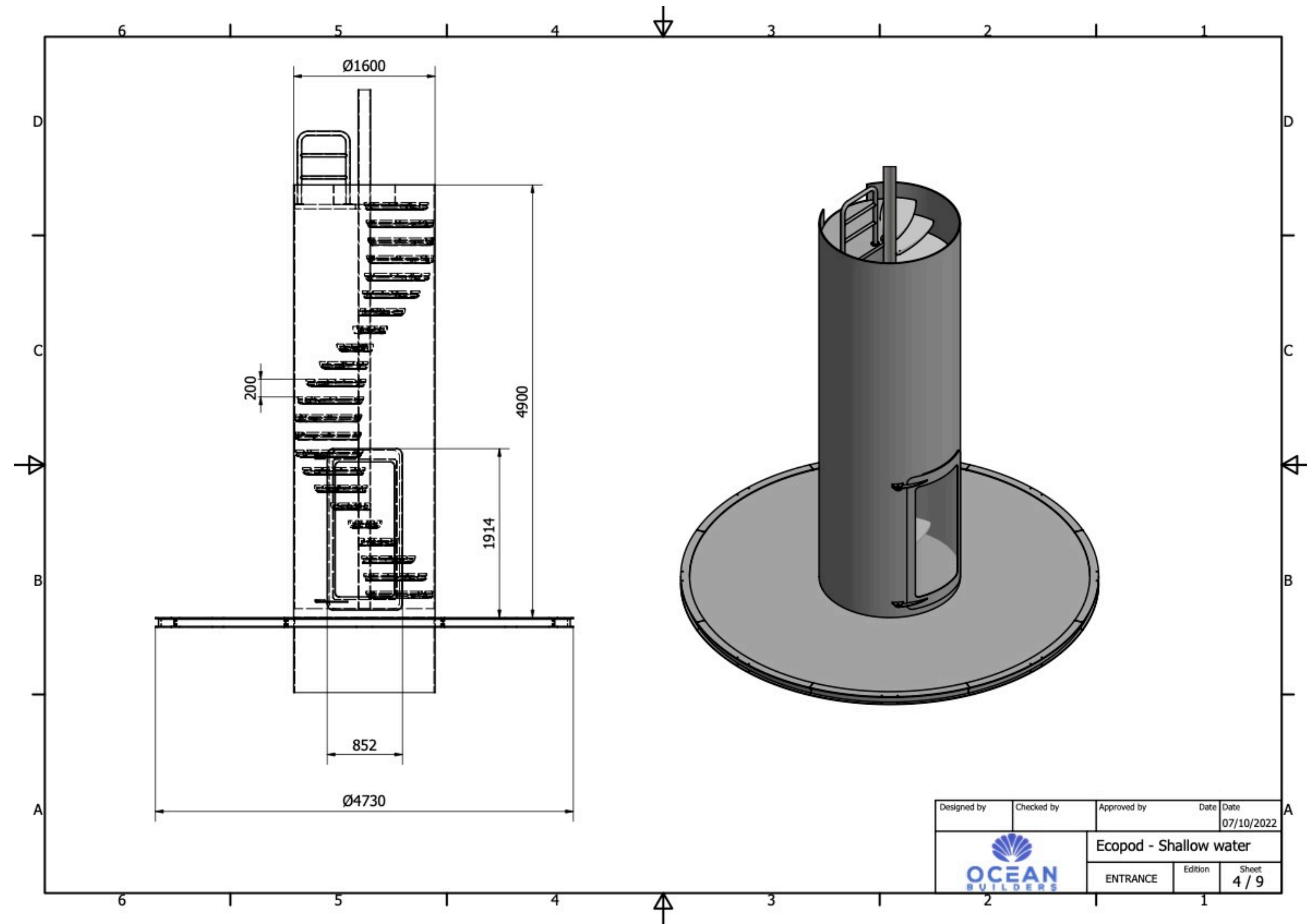
ENGINEERING DESIGNS

Overhead view



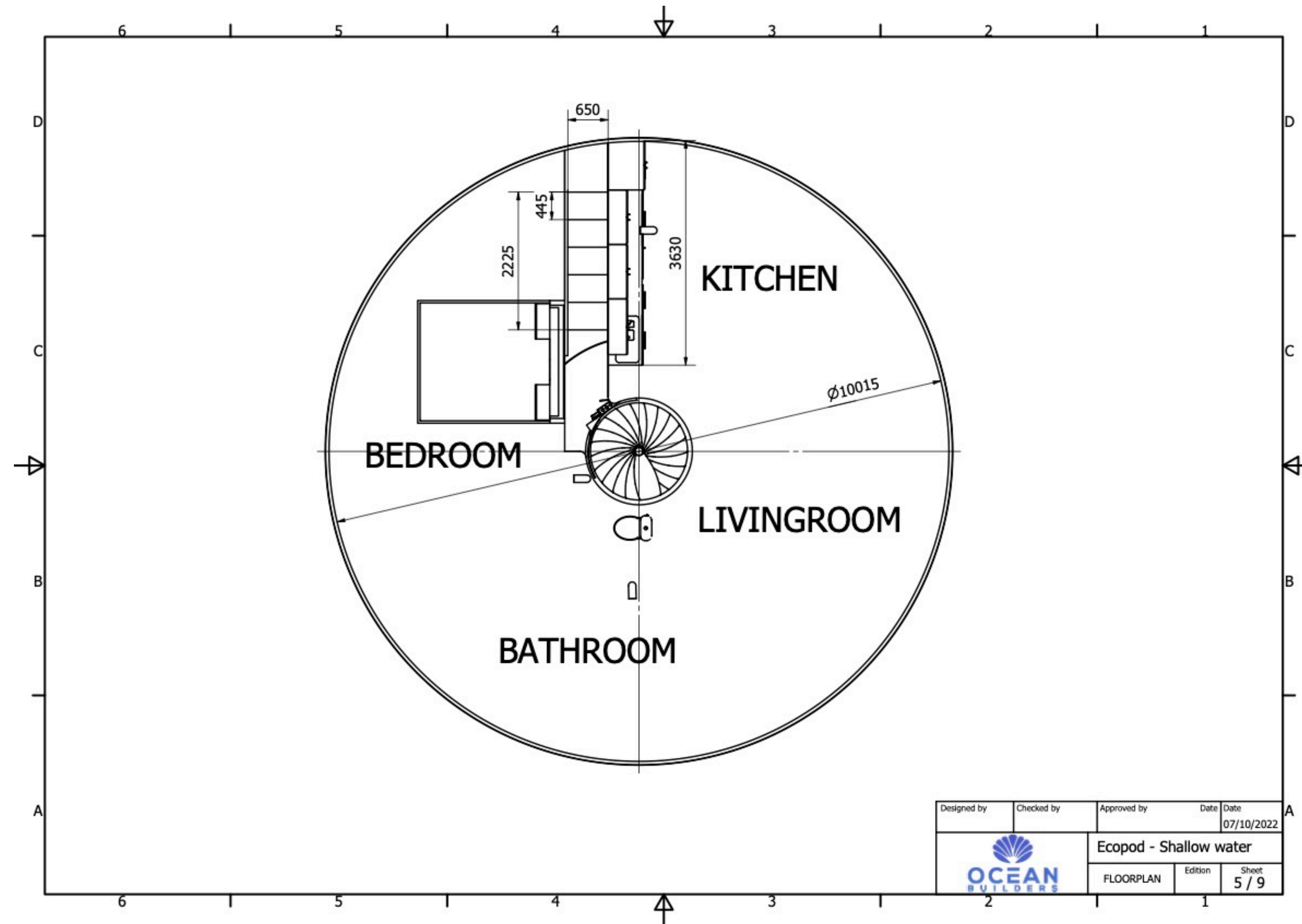
ENGINEERING DESIGNS

Main entrance and spiral staircase



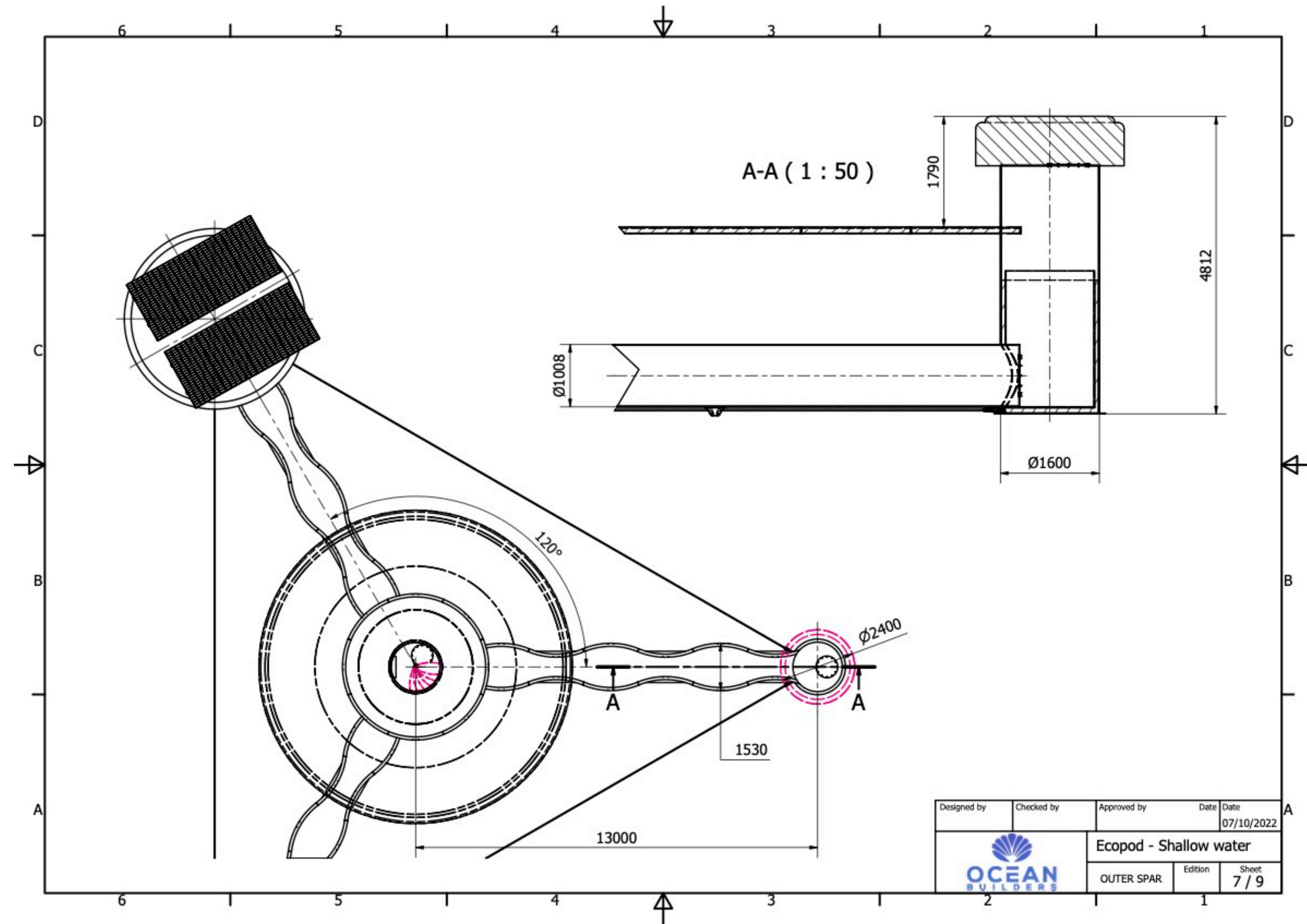
ENGINEERING DESIGNS

Floorplan



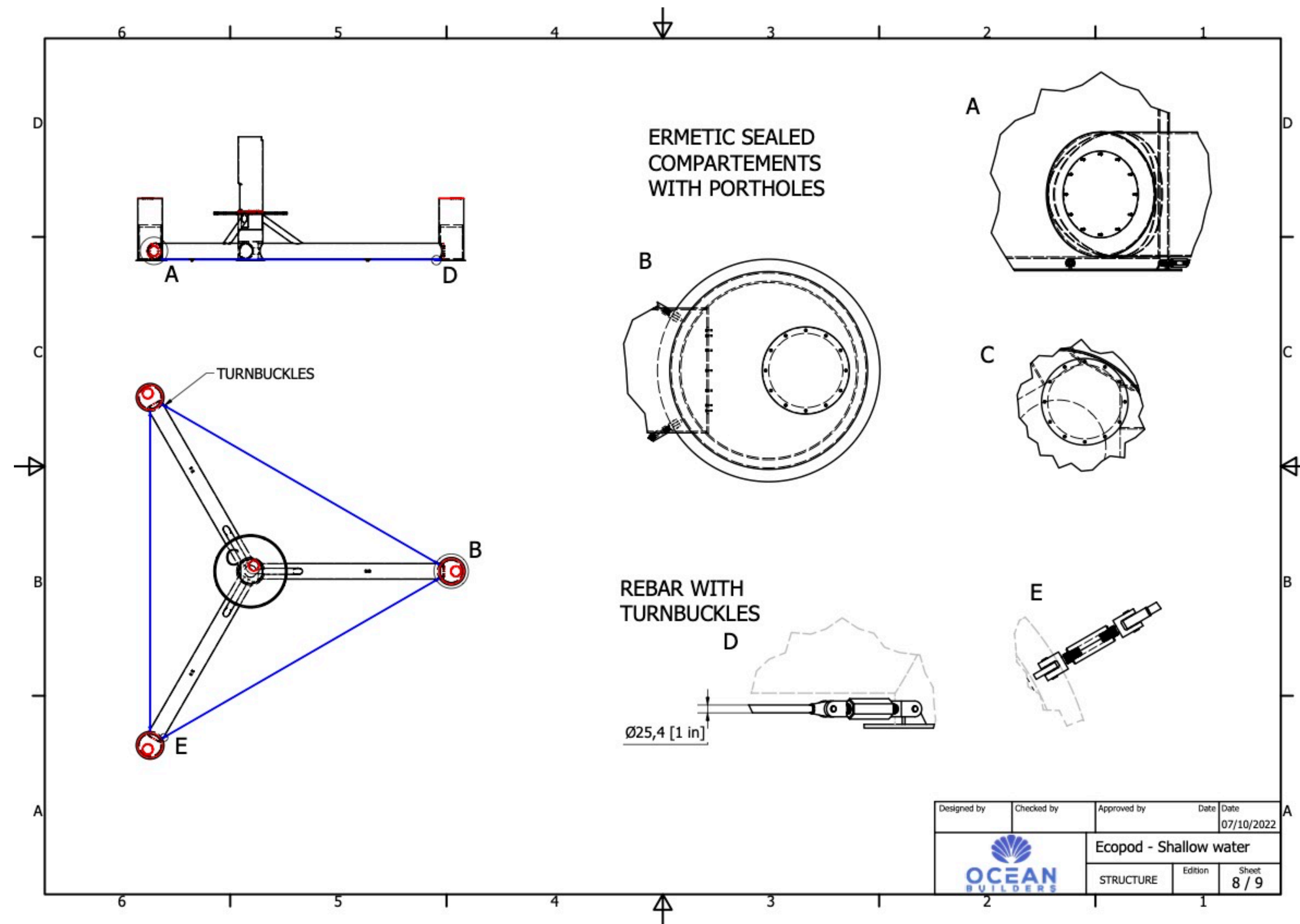
ENGINEERING DESIGNS

Side spar view



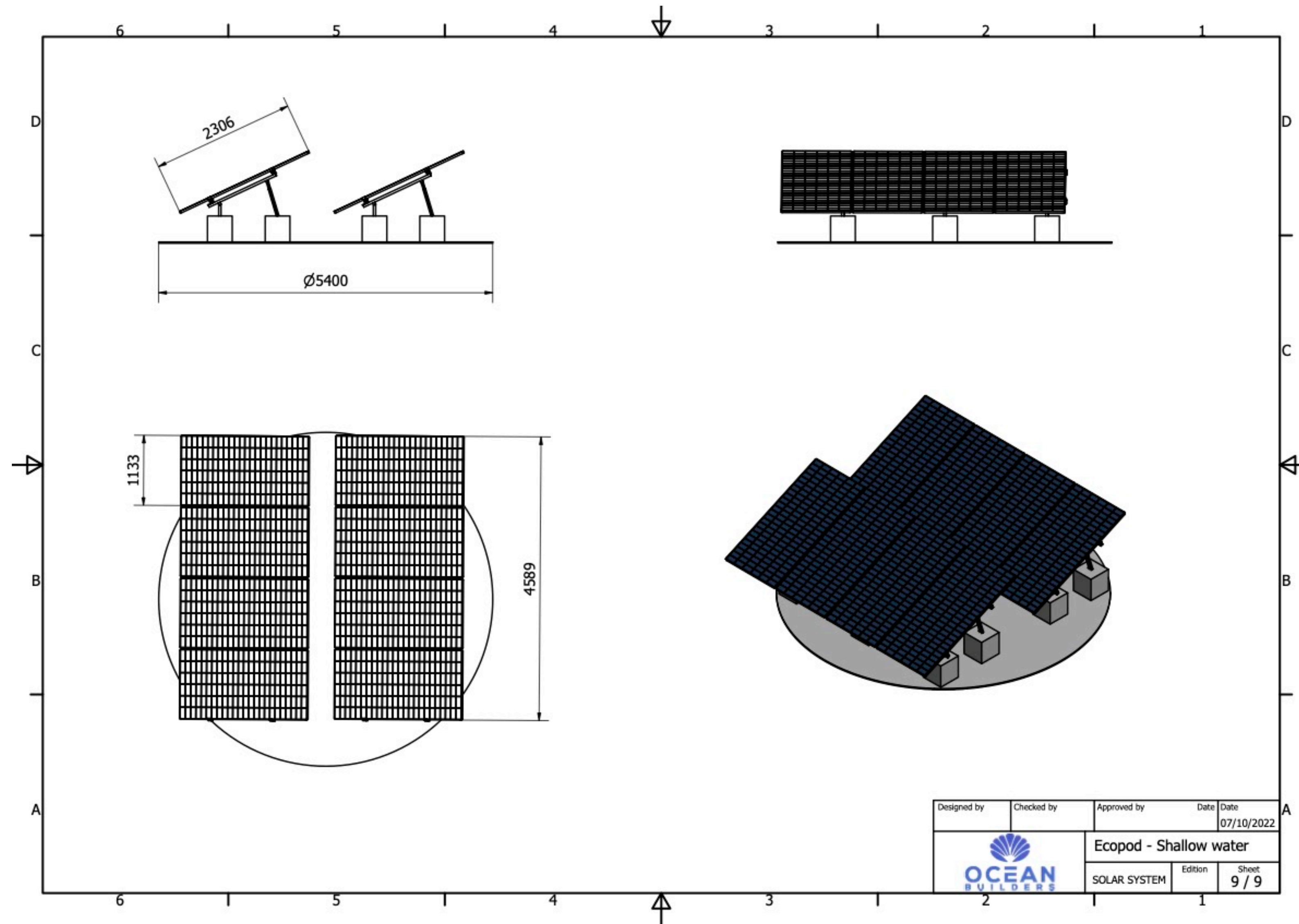
ENGINEERING DESIGNS


Hermetically sealed compartments



ENGINEERING DESIGNS

Solar panel configuration



Designed by	Checked by	Approved by	Date	Date
				07/10/2022
		Ecopod - Shallow water		
		SOLAR SYSTEM	Edition	Sheet
				9 / 9

MORE INFORMATION

Contact Us for more information
grant@oceanbuilders.com

Or visit OceanBuilders.com

OUR CO-FOUNDERS



RÜDIGER KOCH

President & Chief Engineer

Rüdiger Koch is an aeronautical engineer from Heidelberg Germany, formerly of the German Navy who spent most of his years as a contractor creating several advanced military and weapons systems for the air and sea.

He was able to put together his original prototype of the floating sea home in the Andaman Sea and has taken the lessons learned from that first model to come up with a much better design, constantly improving and expanding the vision of living on the sea.



GRANT ROMUNDT

CEO

Grant has a talent for spotting innovative technology and figuring out ways to use it to make life better. He has been an early adopter across many fields. He was the first and youngest to write a software program in Canada and compete in a science fair in 1980 at the age of 8, he had the most advanced mobile paperless office in Canada in 1995 including being the first to use VoIP technology in Canada, and he lived in a tech “frat-house” in San Francisco with one of the 6 co-founders of PayPal.

Today he owns several businesses specializing in software development, video production, education, sales, and training. His customers include billion-dollar multinational companies like Wella Professionals, OPI, Clairol, Nioxin, Sebastian, L’Oreal Professional, and many others.

For the past four years, he has been living in a floating home and he is bringing his years of experience in innovation, business leadership, and design, to Ocean Builders to develop the technology & systems needed to build open-source eco-restorative futuristic floating homes on the blue frontier.