

Ts'ai Shien

110m, level 5 autonomous superyacht for a Chinese customer in 2045

The aim of this project is to **re-evaluate both the design and functionality** for a futuristic superyacht in **2045**.
By abolishing the traditional tiered design with a sleek, **privacy driven** exterior form. This allows the introduction of **robotic crew** that pushes the boundaries, integrating future technology into yachts.



China creates 4 Billionaires a week.



2,400 Chinese individuals with a net worth of more than 2 billion yuan.



These 2,400 individuals have a combined net worth of \$4 Trillion US Dollars. \$200 Billion more than the GDP of Germany, the 4th highest country in the world for GDP.

Source: Hurun China Rich List via Quartz News

Only 3 of the worlds largest 200 yachts are owned by Chinese buyers, this is despite no other country having as many domestic billionaires.

As China's socialist market economy (SME) becomes more capitalist with special economic zones, such as Shenzhen, laws on flaunting wealth are likely to reduce and yacht ownership will soar.



As the **closest major port to Beijing is Tianjin**, I believe this is where wealthy individuals such as Jiao-Long will dock their boats due to accessibility.

Chinese culture embraces respect and humbleness.

Therefore, creating a yacht that values privacy whilst respecting the environment is perfect for the new emerging Chinese market.

Abolishing western flamboyance, for subtlety and respecting traditional Chinese interior design, is the way to approach this market.



Jiao-Long

Background

Jiao-Long is a self made tech start-up billionaire, producing Nuralink augmented reality micro-chips, as well, as owning the second largest robotics company in the world.

From humble beginnings, Jiao-Long has learnt to respect traditional Chinese culture, whilst embracing modern technology.

Being a shy and traditional man, he does not like ostentatious displays of wealth, and would like a yacht that reflects these beliefs.



Privacy

The perceivable moodboard shows how Jiao-Long wants the yacht to look, with both interior & exterior design.



Futurism



Tradition

Perceivable

Atmospheric

Natural

Light

Commodious





East/South
China sea



¥5,425,000,000
£600,000,000
(Adjusted for inflation for 2045, around
£290,000,000 in 2020 @3%)



110m



8
(7 Guest)



Robotic staff



Voith-Schneider
propeller



Aluminum
displacement hull



Level 5
autonomy



6000km



Hydrogen fuel



Rotatable roof



14 Knots

Background

Ts'ai Shen

“Chinese god of spiritual wealth & materialistic prosperity”

Ts'ai Shen Is the Chinese god of wealth. In mythology Ts'ai Shen portrayed him riding on the back of a black tiger and always carrying a club or stick made of gold. This is echoed in the design with a black facade and a gold stripe along the waterline.

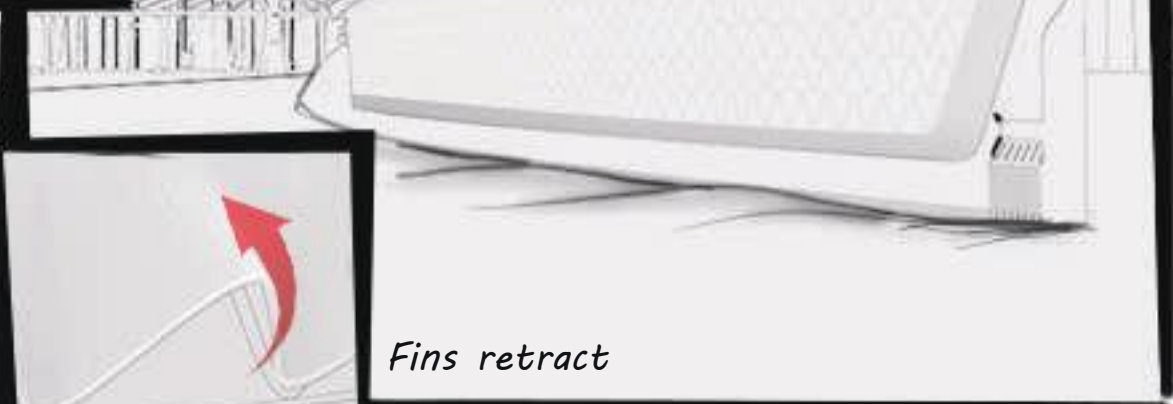
As well as the god of wealth, he is also said to be the god of spiritual wealth and well-being. Hence the quality of life activities on board the yacht to reflect this.

Storyboard

Yacht autonomously
leaves port



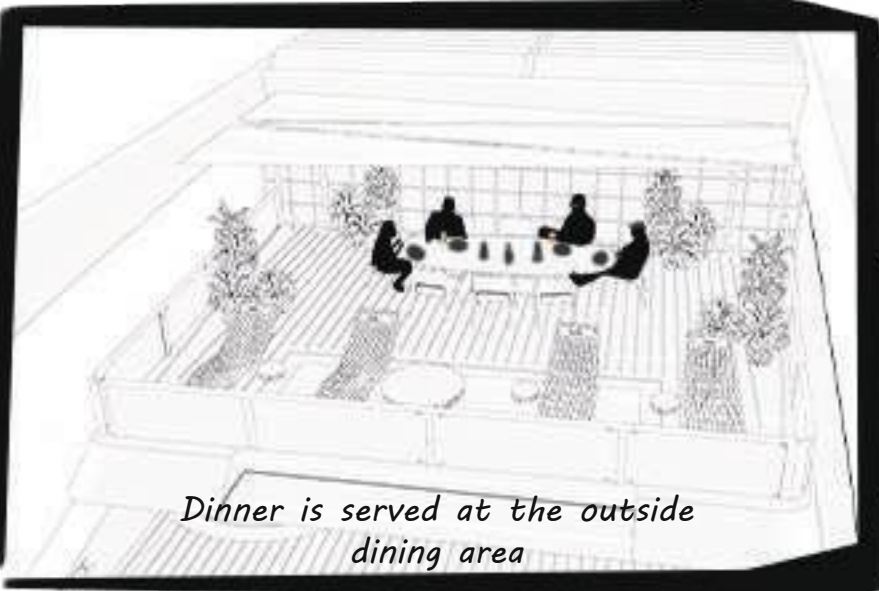
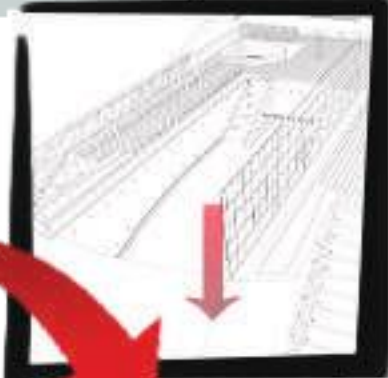
Jiao-Long leaves work on
the company helicpoter



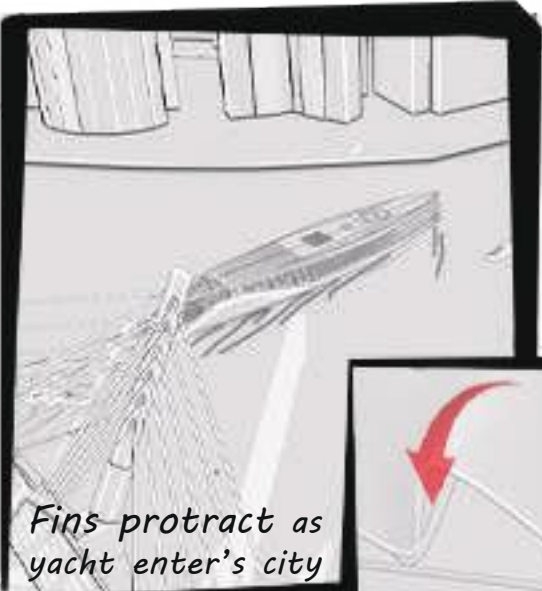
Fins retract



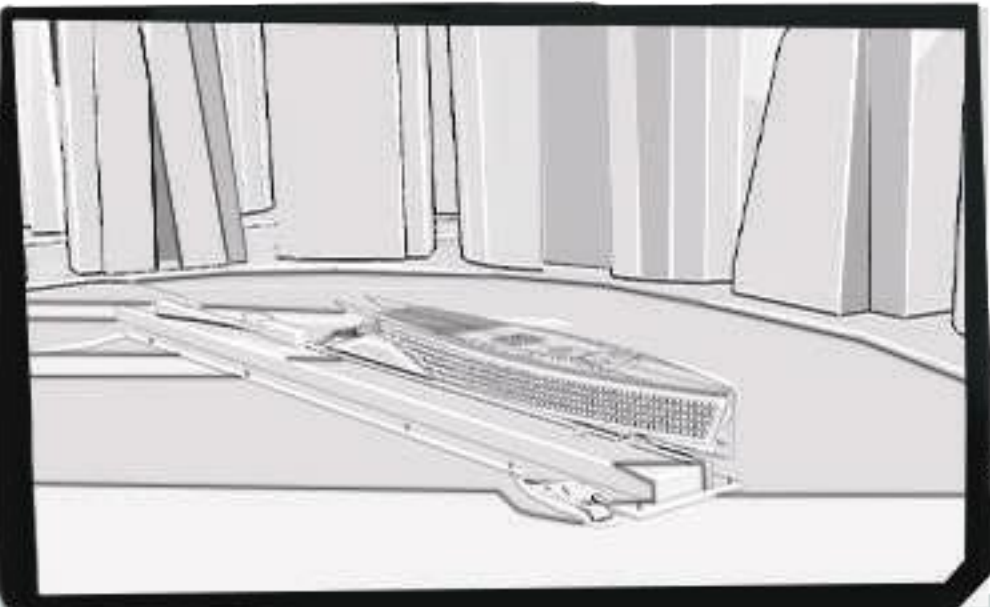
Pool cover retracts and fills with
water



Dinner is served at the outside
dining area



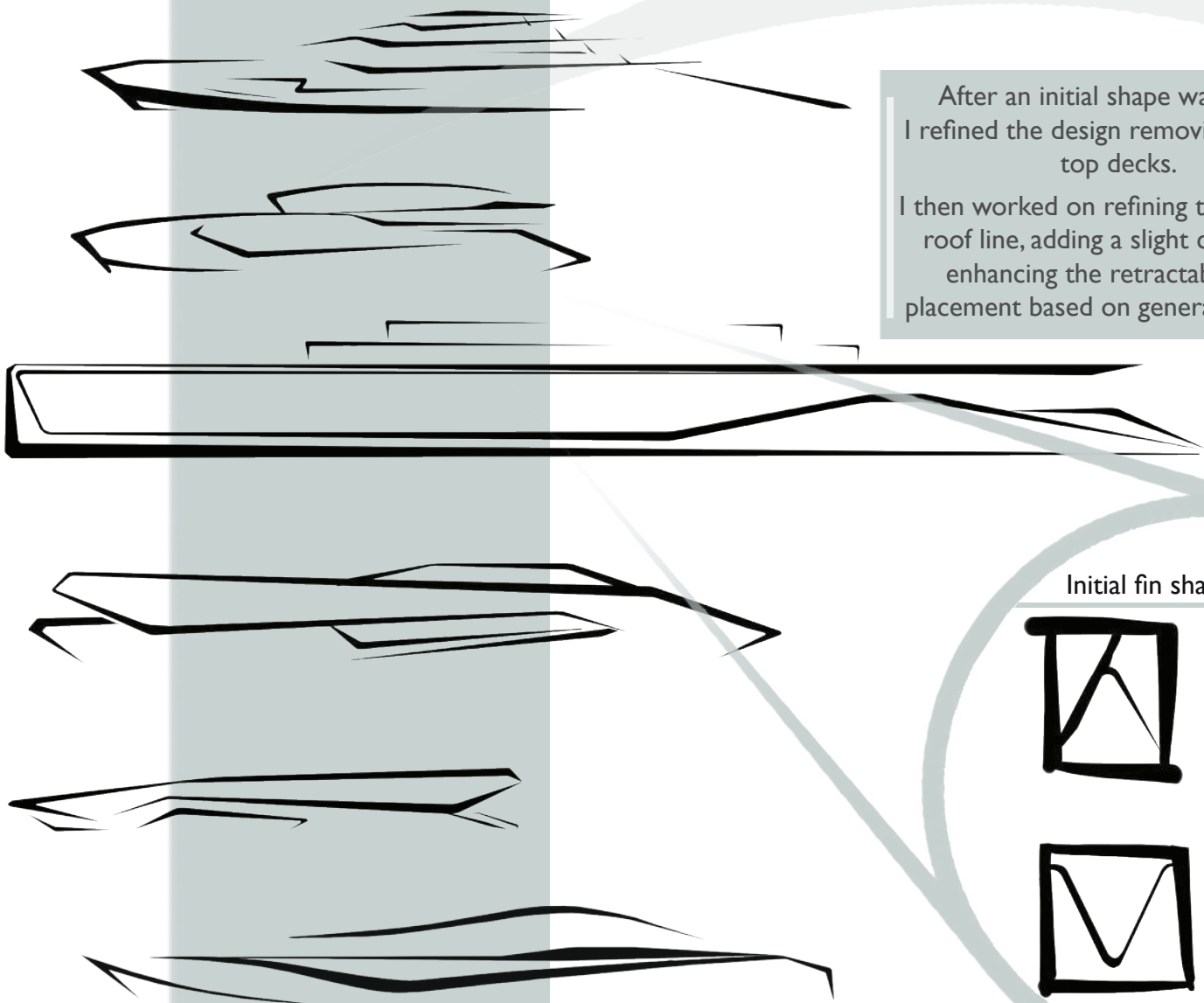
Fins protract as
yacht enter's city



Jiao-Long leaves the yacht
on his motorcycle

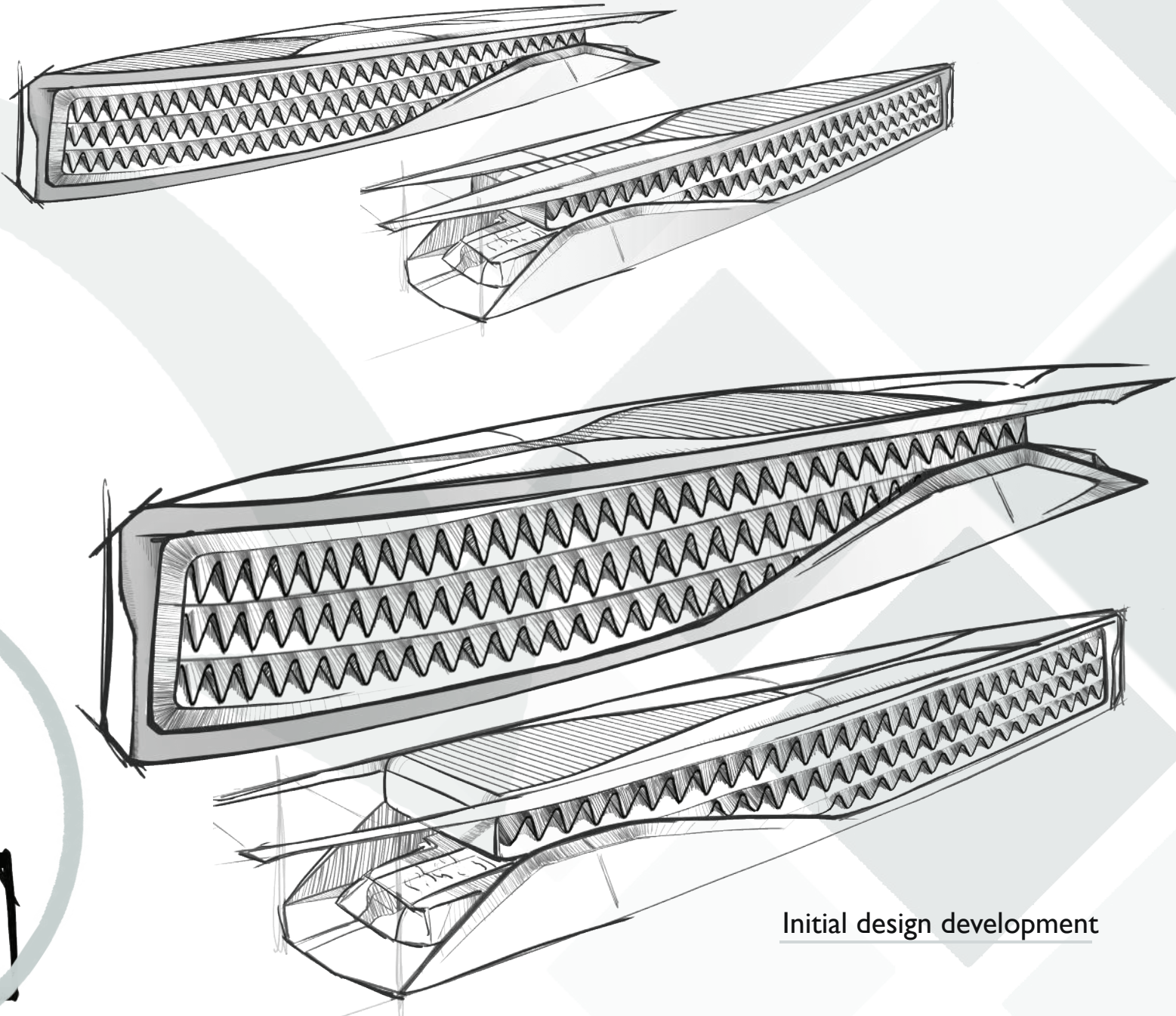
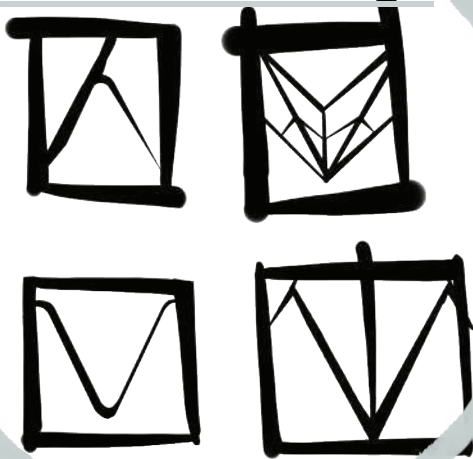
Exterior development

Initial ideation



After an initial shape was found, I refined the design removing the two top decks. I then worked on refining the roof and roof line, adding a slight curve, and enhancing the retractable roof placement based on general assembly.

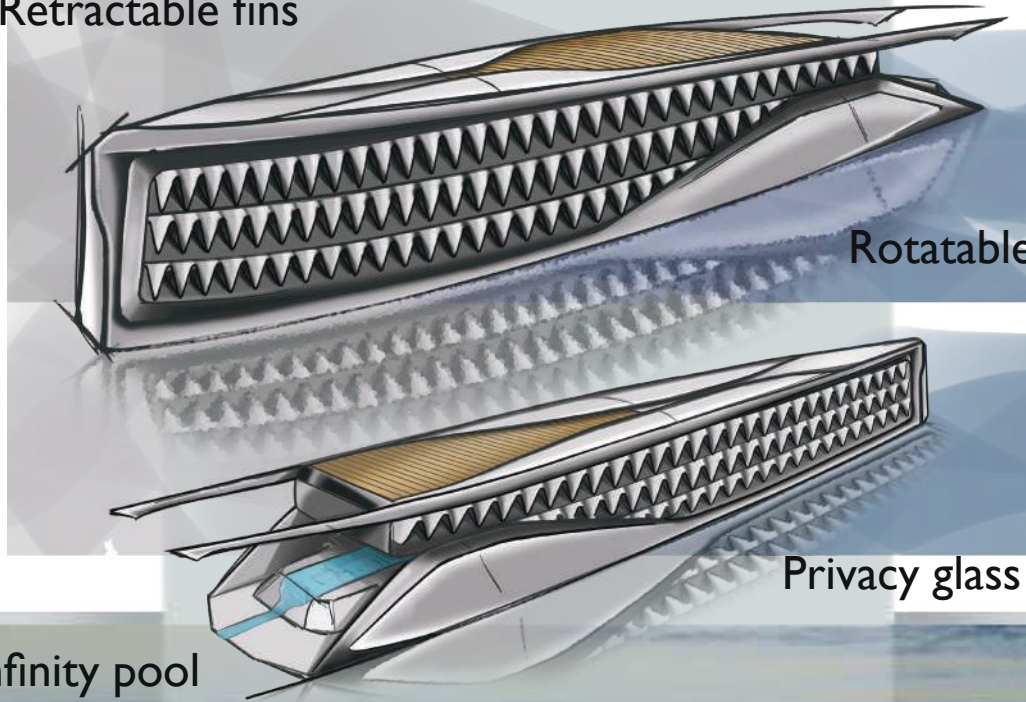
Initial fin shape ideation



Initial design development

Exterior development

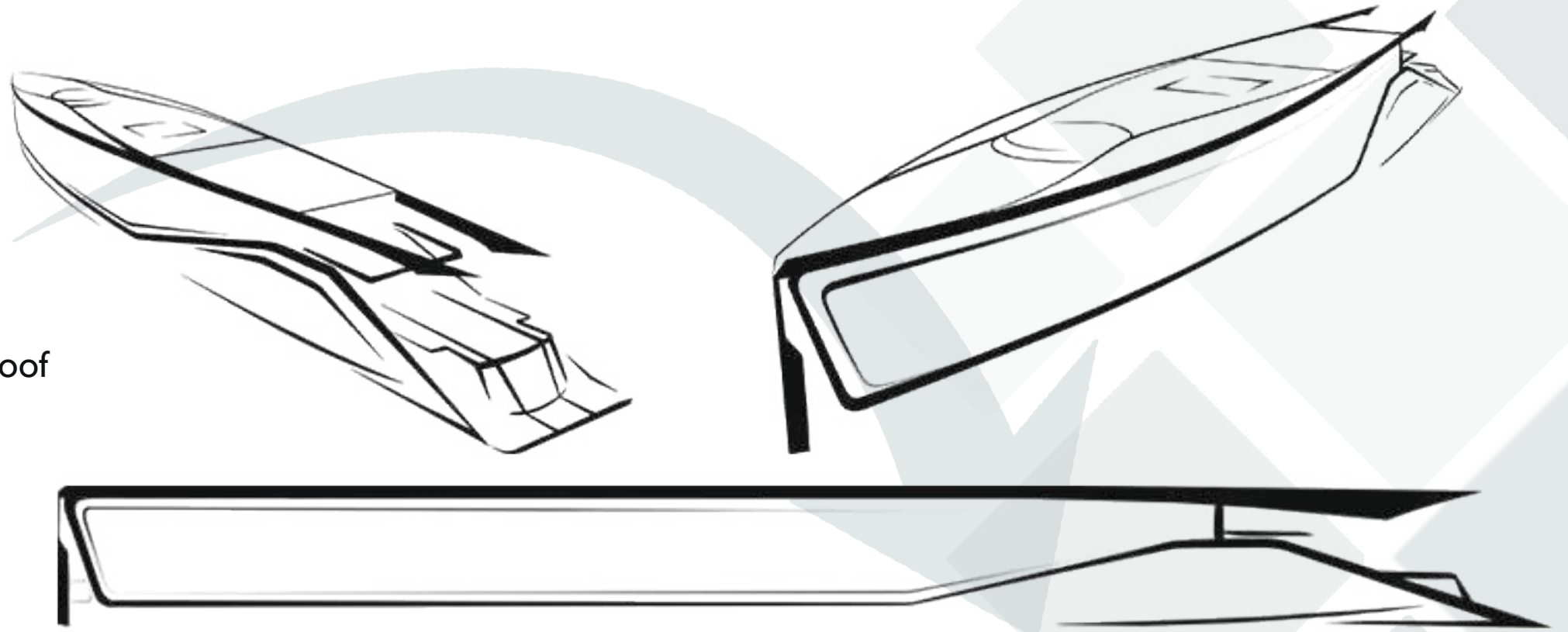
Retractable fins



Rotatable roof

Privacy glass

Infinity pool



Final design

With this design, I tried to re-imagine the general assembly and layout of a superyacht.

Abolishing tiered design with this sleek form, enhances space and innovates by maximising natural light, whilst still respecting privacy when in port.

This avant-garde style to exterior design, with a focus on privacy and futurism, perfectly fits with Jiao-Long's vision for his yacht. Innovative and original to him.





Sleek

Individual

Avant-garde

Exterior renders



Black tinted glass



Black/Grey fabric



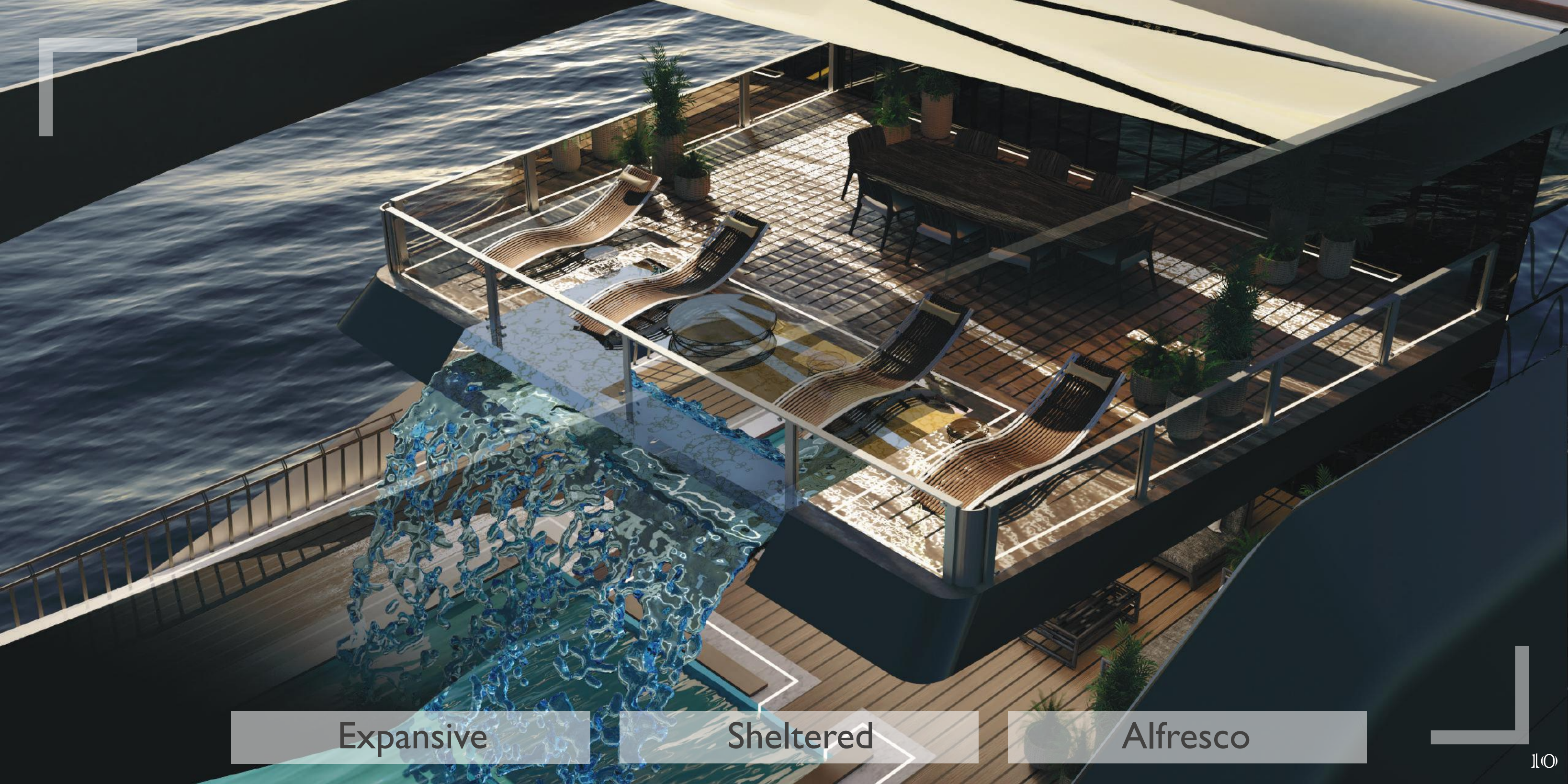
Gold plating



Teak flooring



Aluminum

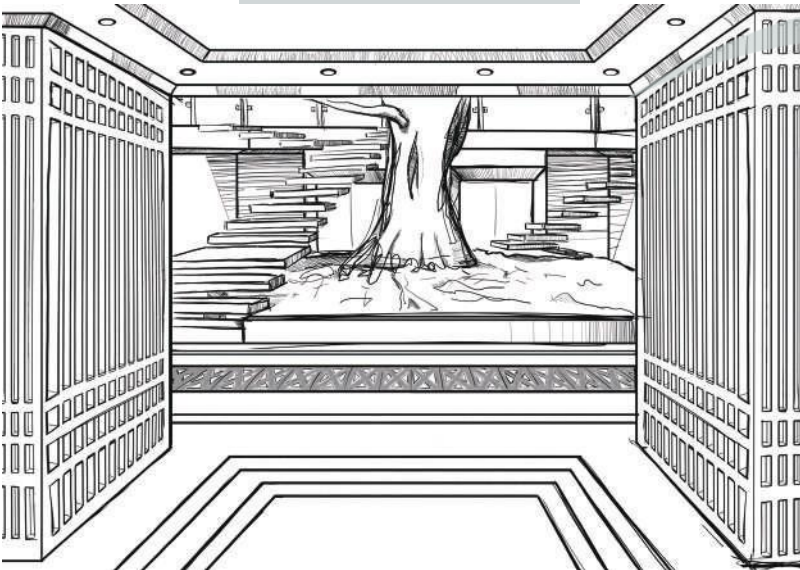


Expansive

Sheltered

Alfresco

Interior sketches

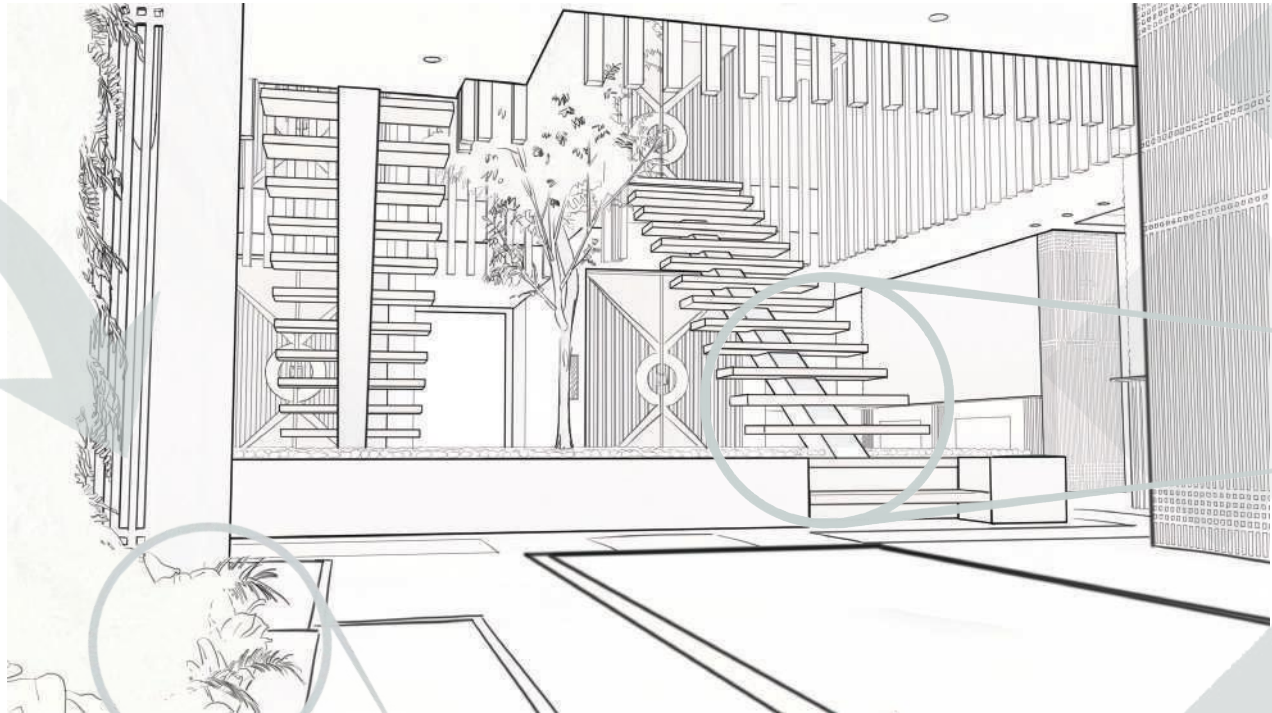


Reference images

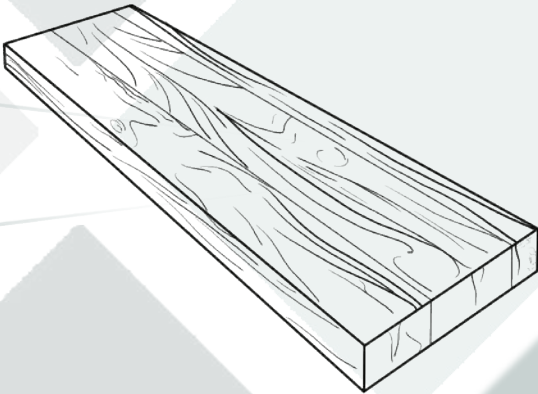


Chinese culture is steeped heavily in **respect** and **tradition**.

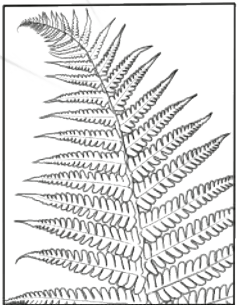
This interior concept bridges the gap between traditional Chinese interior design, with dark stained oak and natural light, environmental contemporary design with inset floor lighting, metal insets and an abundance of ecological features.



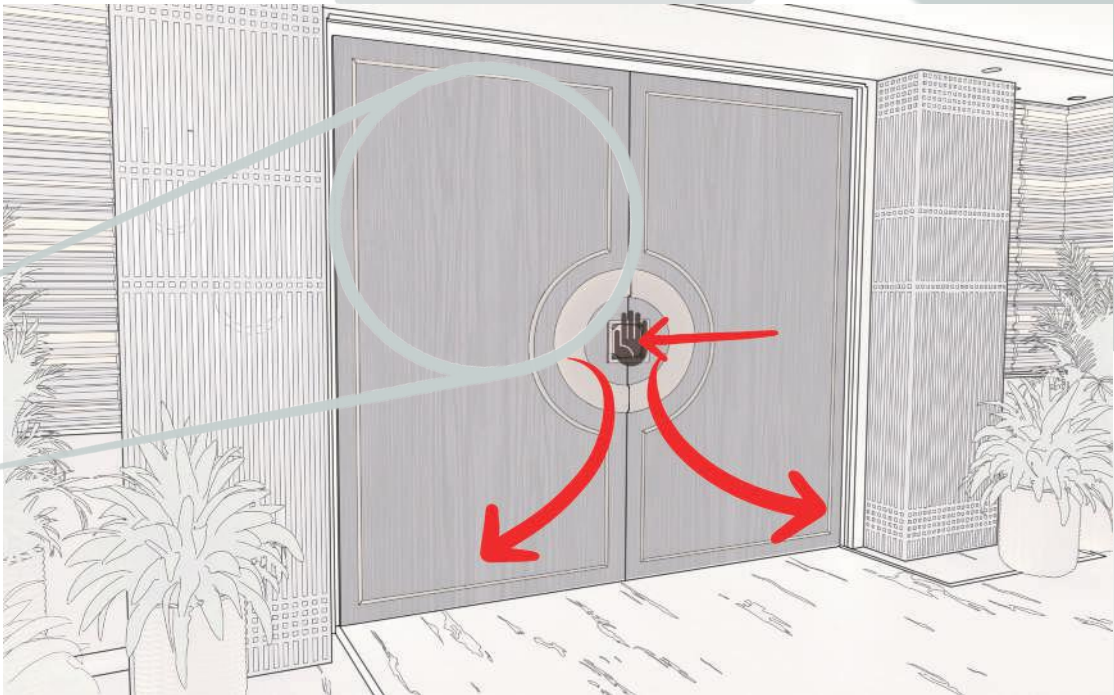
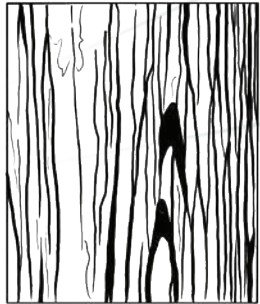
Walnut stairs



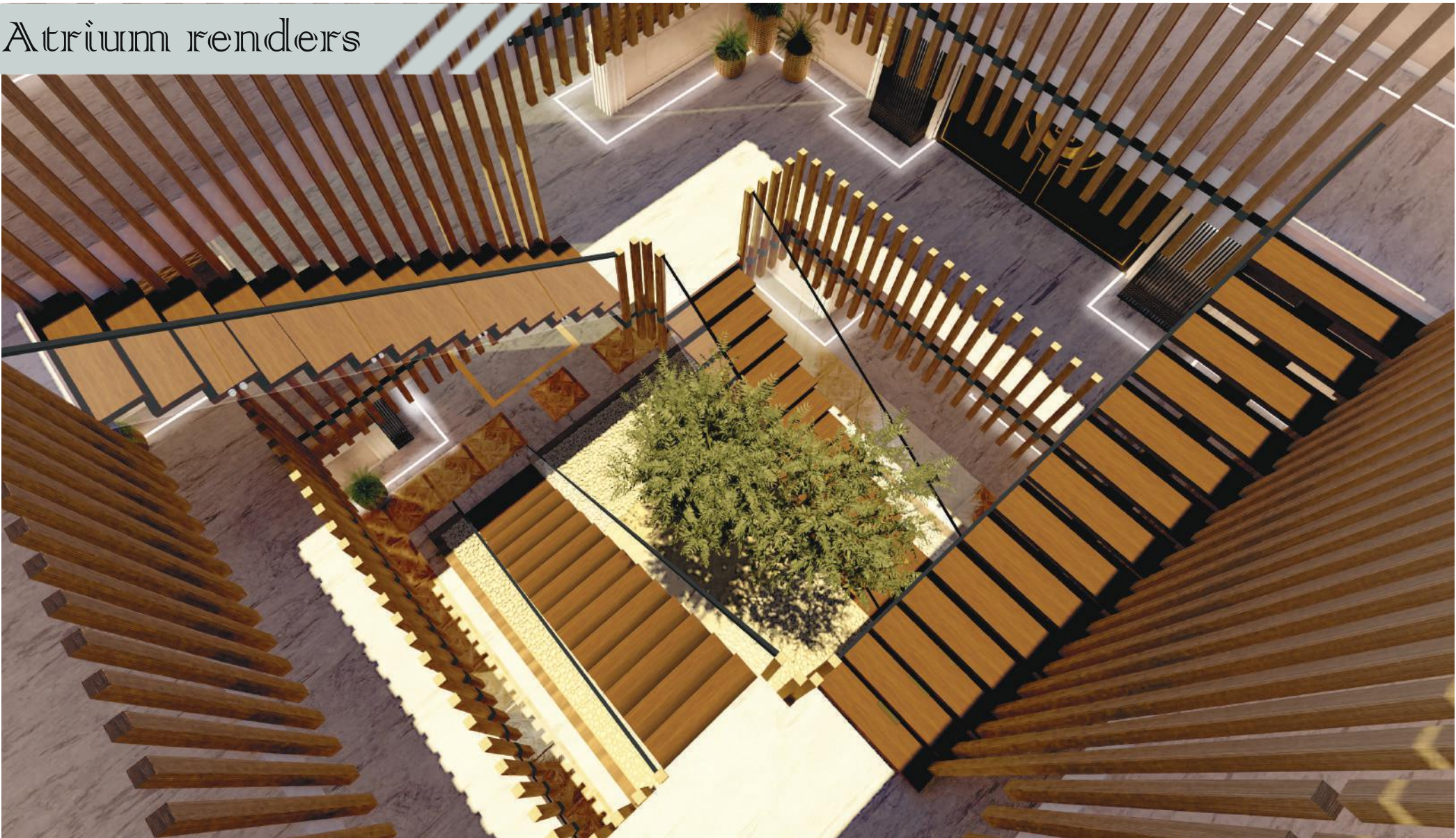
Ferns



Open pore Oak



Atrium renders



Cedar
wood



Milled
3D walnut



Walnut
wood



Tulip
tree



White
pebbles





Traditional

Ecological

Contemporary

Social area renders



Black
stained
oak



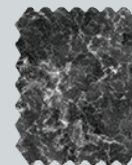
Areca
palm



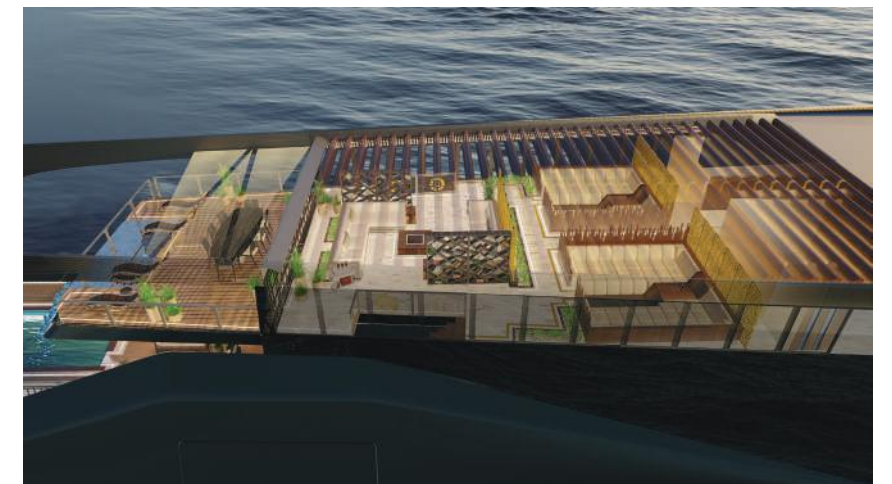
Staturio
marble



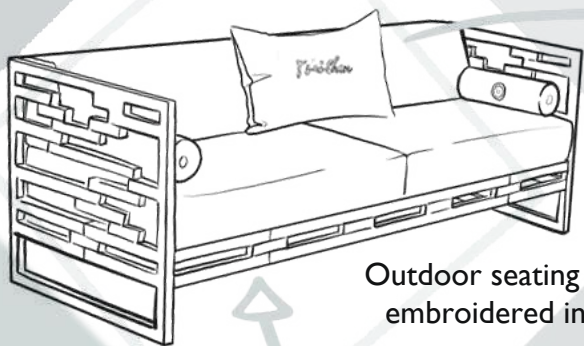
Beige
fabric



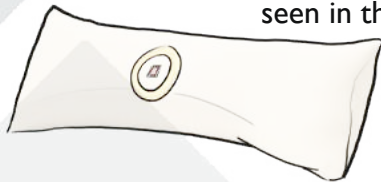
Negro
Marquina
marble



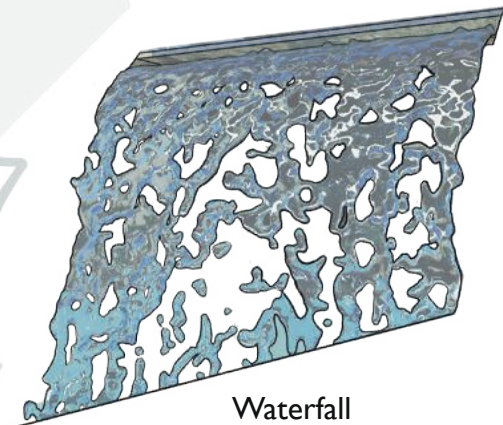
Exterior detailing



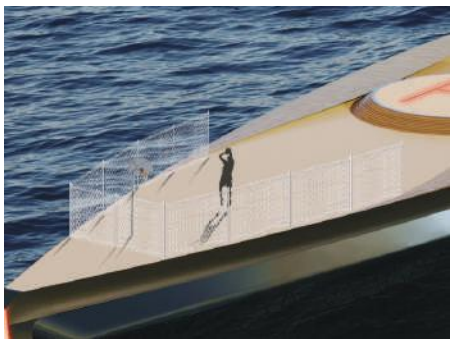
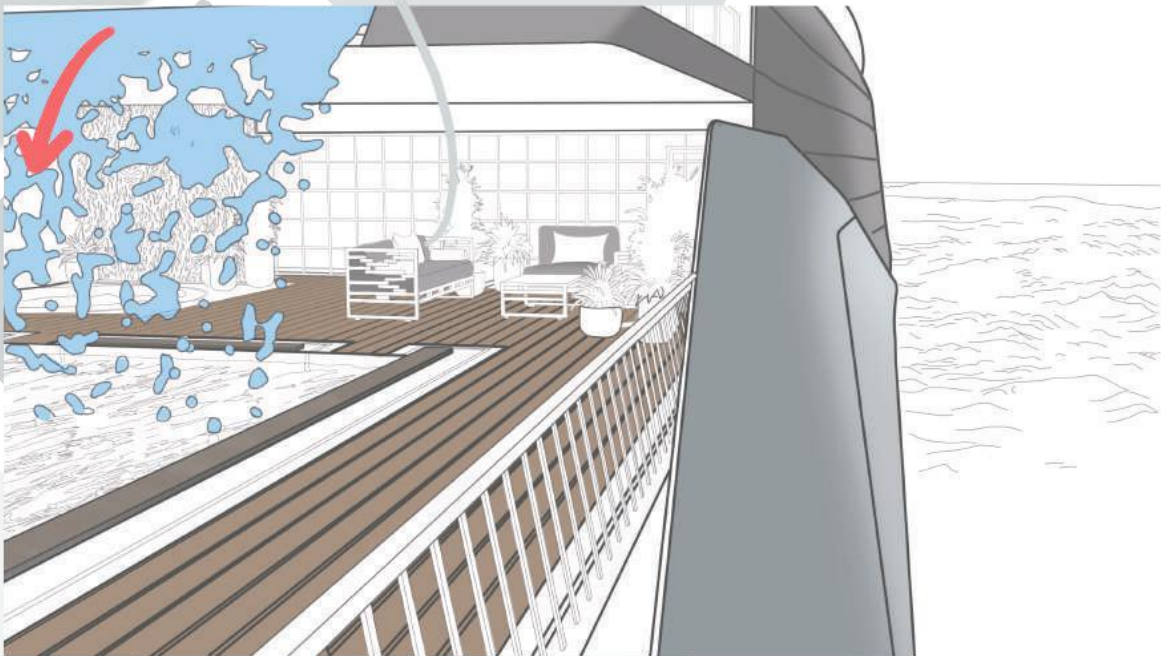
Outdoor seating with 'Ts'ai Shen' embroidered into the cushion.



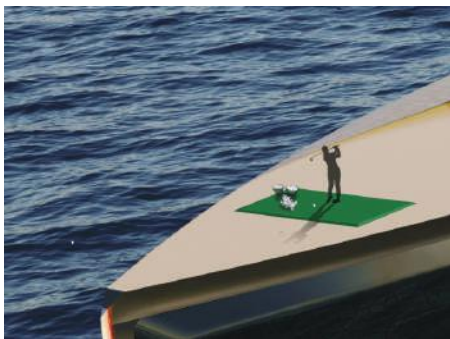
Smaller cushions have the ancient coin symbol embroidered, as seen in the detailing page.



Waterfall

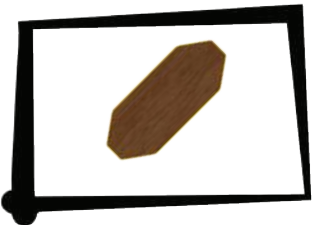


The roof at the bow can be used for activities such as basketball, golf and as a rooftop bar. All equipment is situated in storage when not in use and assembled by robots.

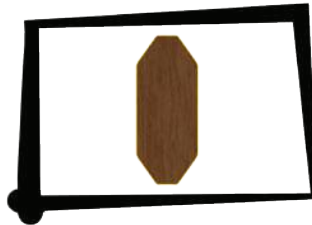


Cross section

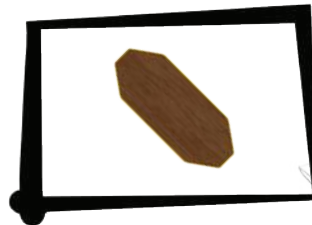
Bow facing



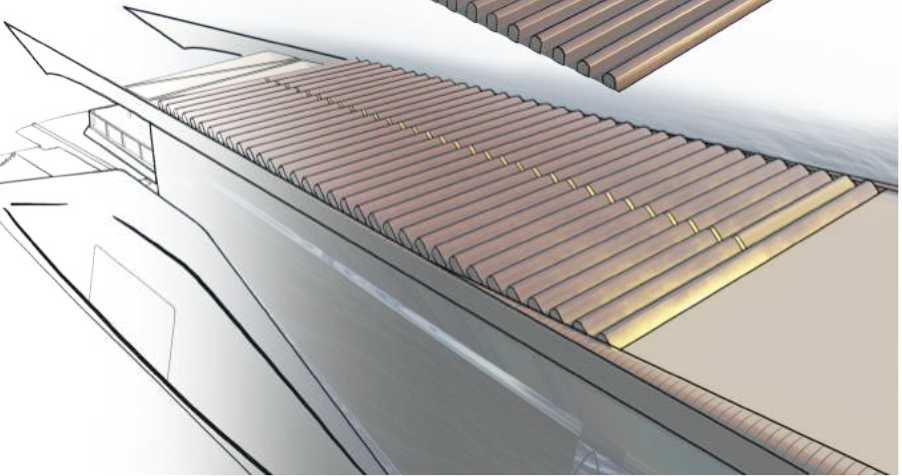
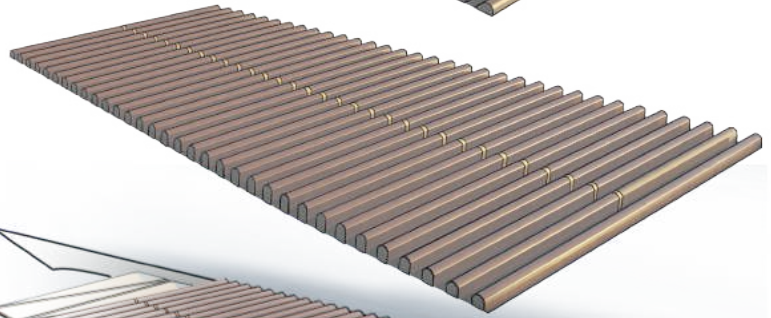
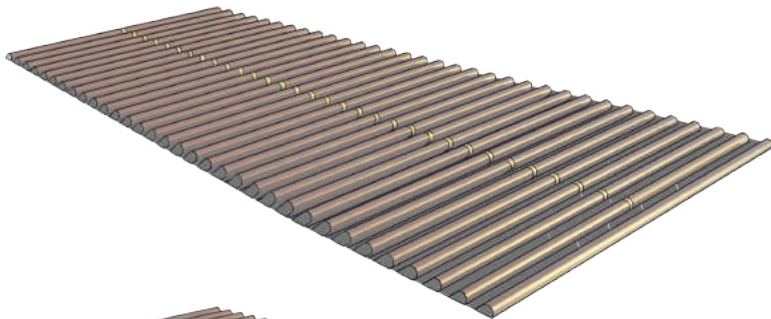
Vertical



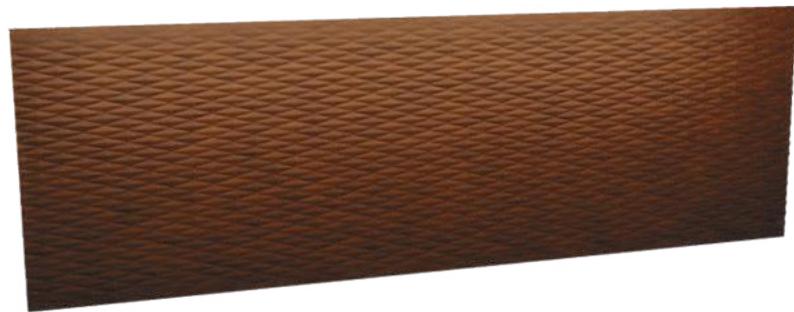
Stern facing



This shows the wooden beams of the top floor social area in their rotated states.



Detailing



3D atrium walnut walls



3D Key room walls



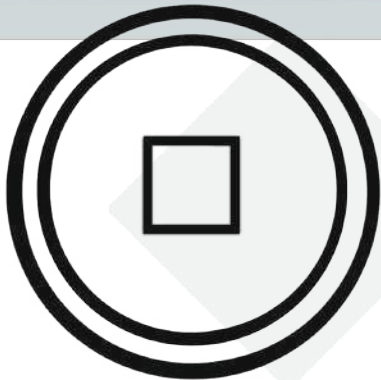
Master suite walkway walls



Door Handles



Ancient coins from the Xin dynasty, 9AD



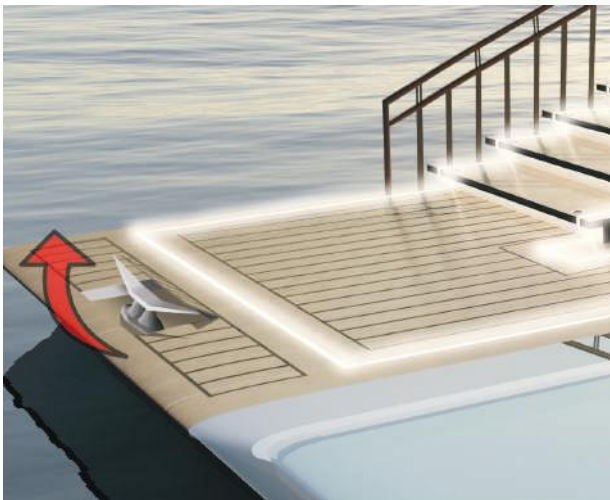
Simple outline of coin



Coin has been used to shape the 3D pushable door handle

Door handles on Ts'ai Shen are in the shape of this ancient Chinese coin. These subliminal details add to the crossover between tradition and contemporary.

Tie up point open



Retracted tie up point



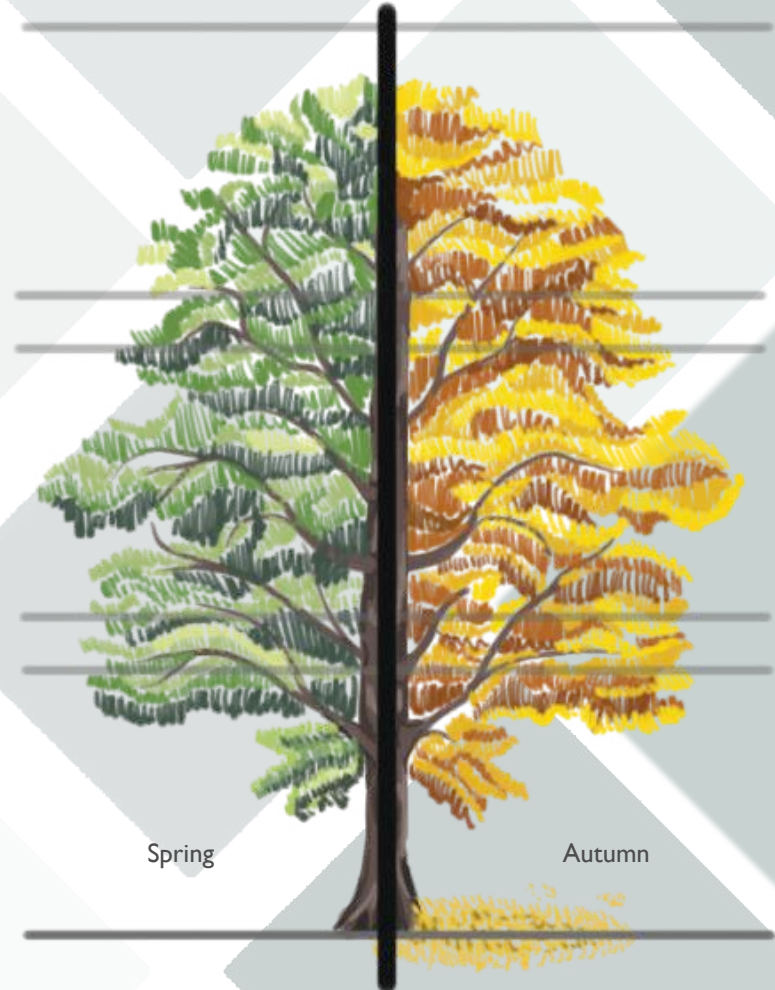
All tie up points are hidden and retract below the deck surface.



Tree research



Tree when
planted

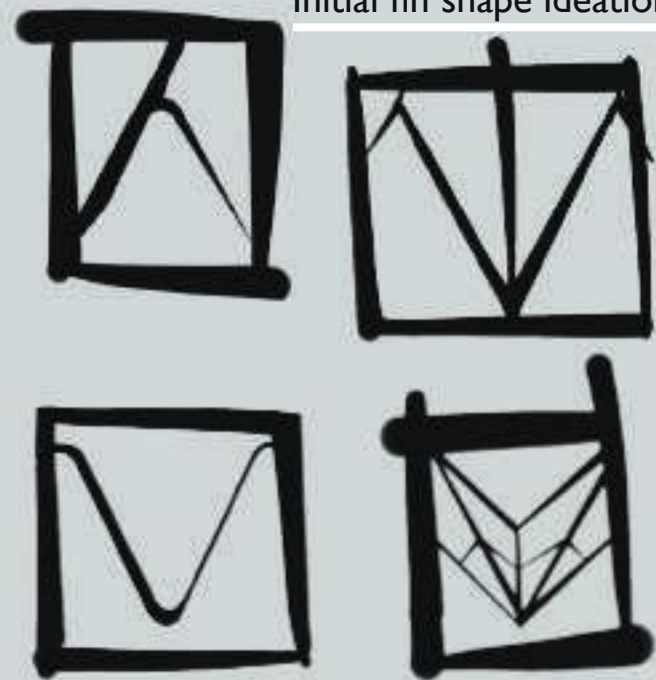


Fully grown tulip tree

This design focuses around ecology, tradition and the use of natural light. With this in mind creating an atrium, a central part of traditional east Asian architecture, that is based around a tree with natural light creating a sense of grandeur and presence. In the same fashion, the natural walnut staircase envelopes the tree, essentially hugging the leaves as it ascends upwards.

Fin design

Initial fin shape ideation



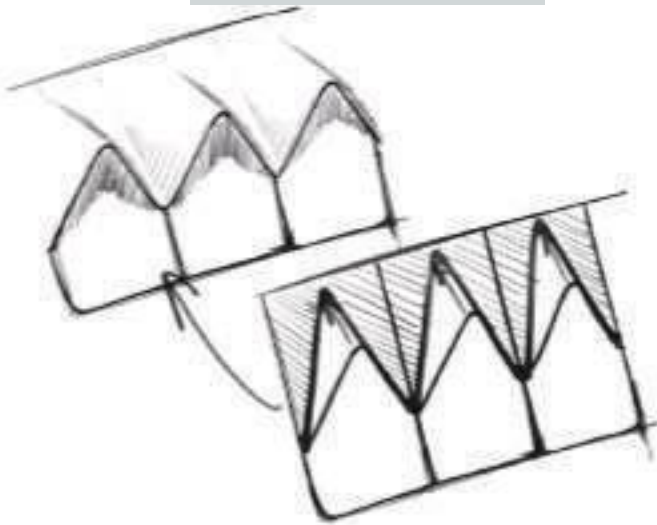
Referance images



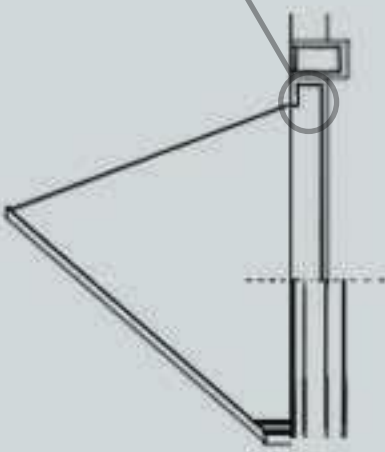
Undulating fin placement

Fin placement undulates to protect private areas of the yacht, such as bedrooms. Smaller fins are placed near the atrium to let natural light in at all times.

Design development

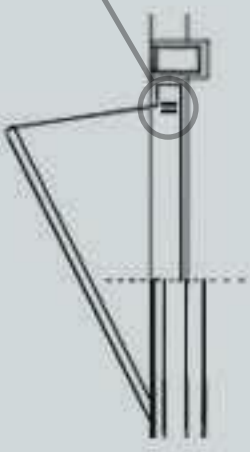


Fin storage empty



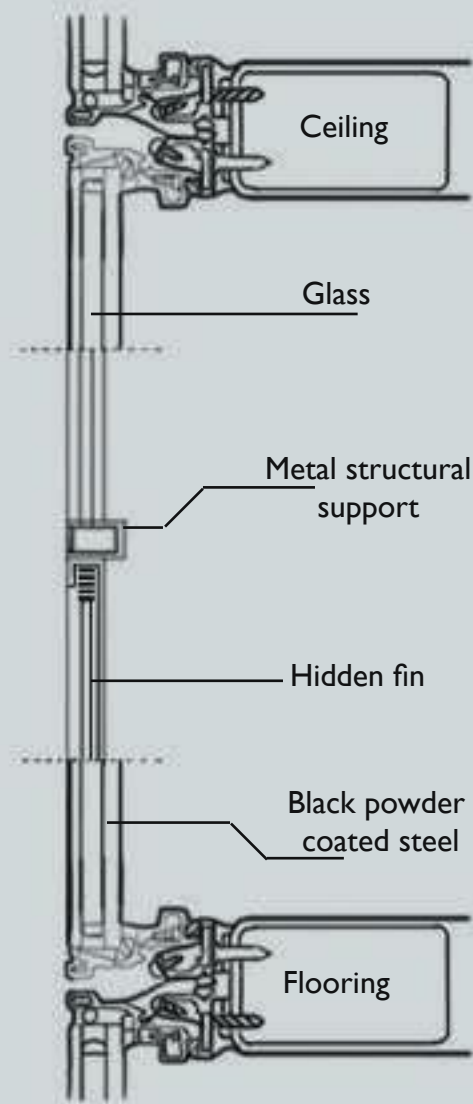
Fully protracted

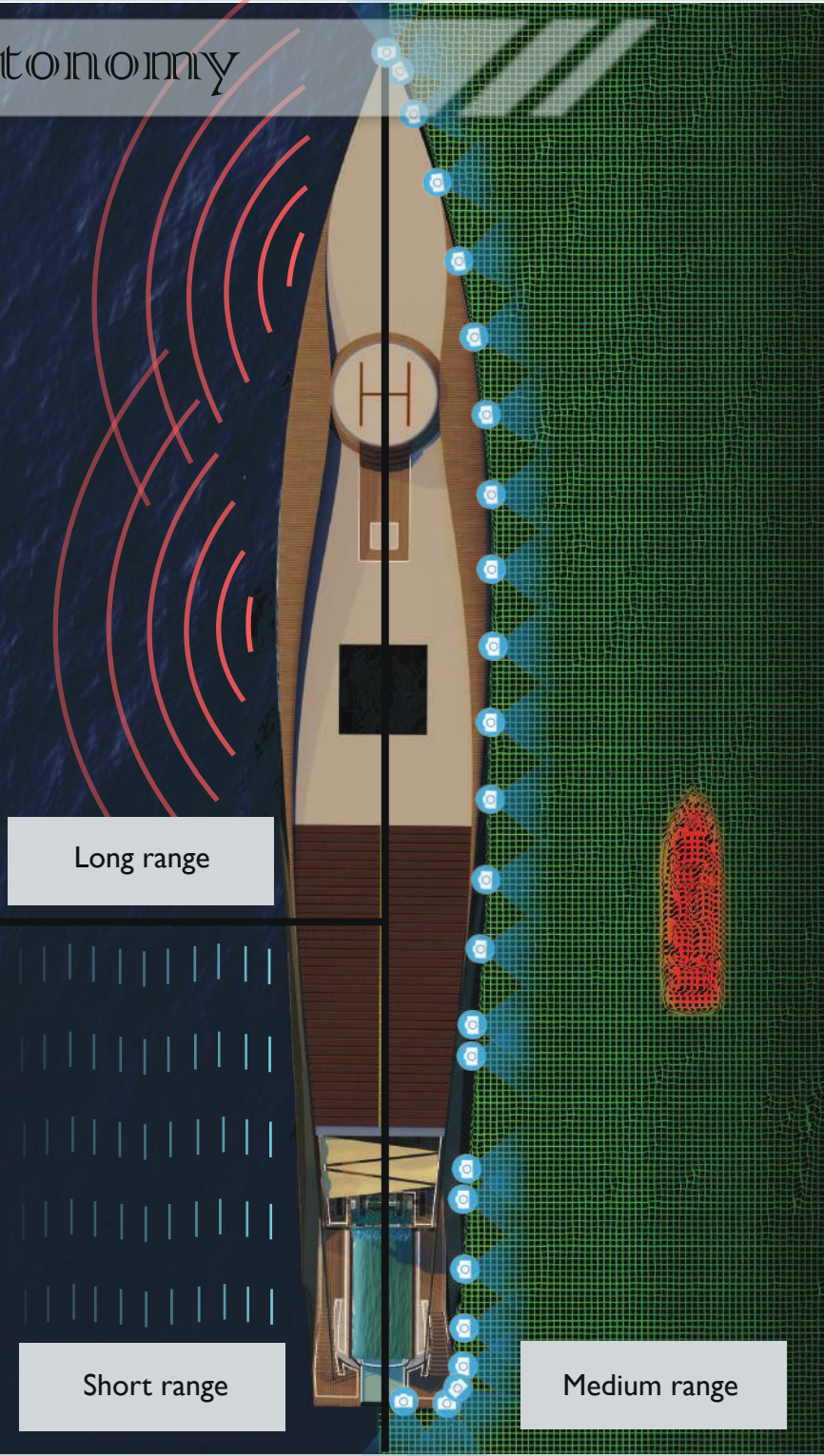
Half fin stored



Half protracted

Cross section





Sensors are key to the autonomy of the yacht. With no captain or crew-hands it is up to the on-board sensors, cameras and navigation equipment to guide the yacht.

The yacht uses 3 different ranges of equipment to achieve this:

Short range
Ultra-sonic Sensors x220



Medium range
LIDAR x1



Cameras with machine learning x84



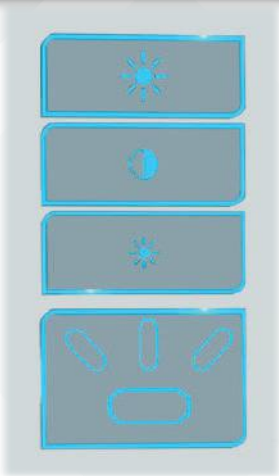
Long range
Sonar x1



Garmin GPSMAP x1



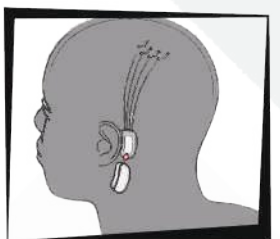
Here is a representation of how the HMI would look to those with a Nuralink chip. All screens would create a virtual hologram that 'projects' out at the user and can be used much the same. Users would be able to change TV channels, dim lights, etc without needing to go to a traditional light switch.



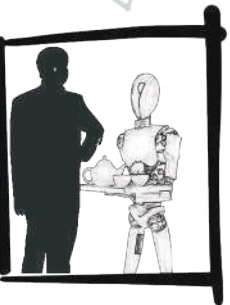
Representation of onboard HMI. Big icons can be selected quickly and easily whilst being on the move.



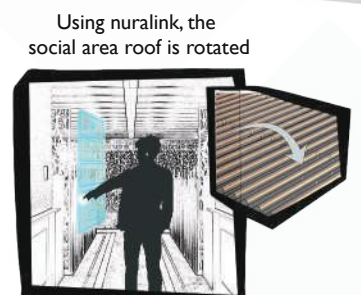
Nuralink chip connected to your brain



Using nuralink, Jiao-Long watches the news and orders tea upon his arrival



Tea is served upon arrival, bags are taken to his room



Using nuralink, the social area roof is rotated



Jiao-Long then changes channel and volume on the main holographic television

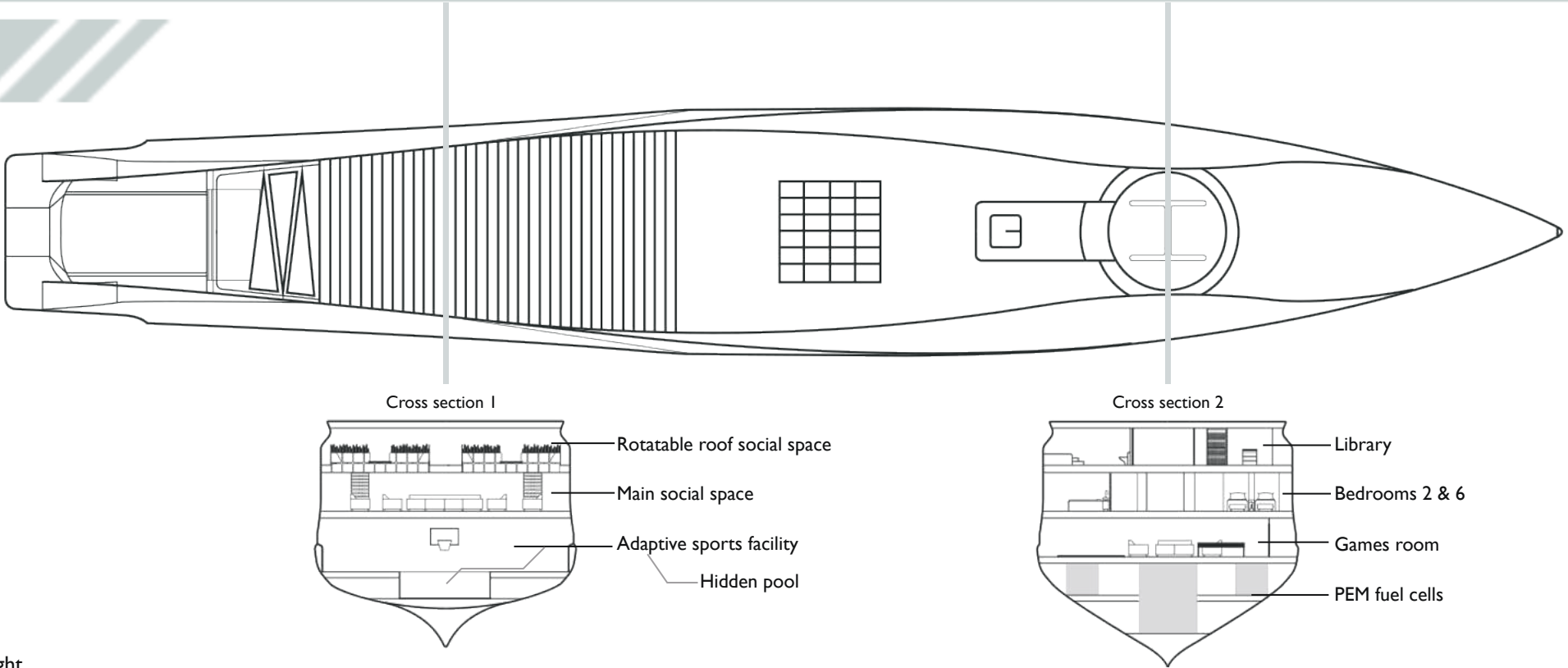
Package

Persona factors

Sailing location	East/South China Sea
Price estimate	¥5,425,000,000 £600,000,000 (Adjusted for inflation for 2045, around £290,000,000 in 2021 @3%)

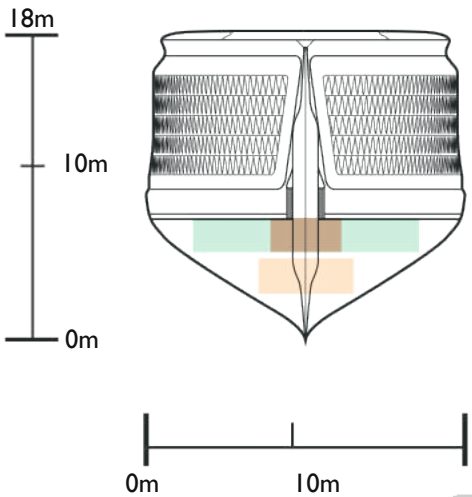
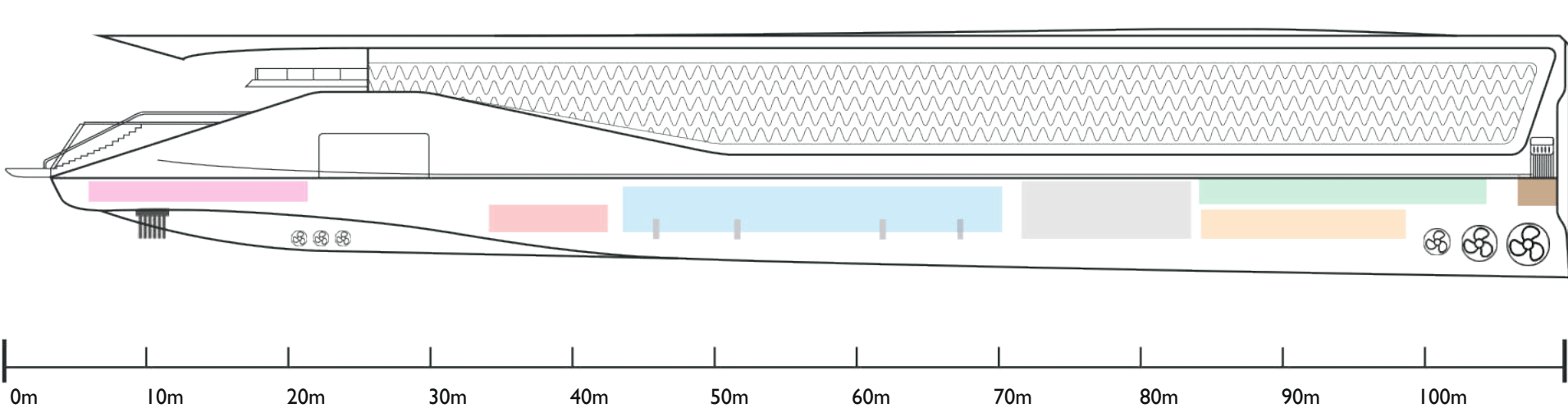
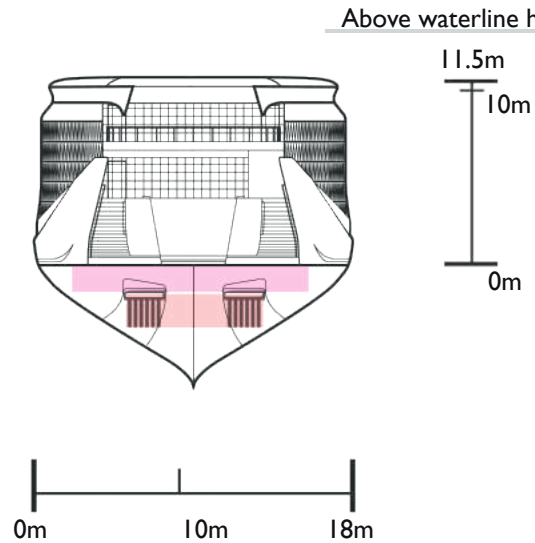
Manufacturing factors

Hull configuration	Modified displacement
Hull material	Aluminium
Superstructure	High carbon steel
Deck material	Teak



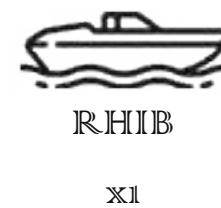
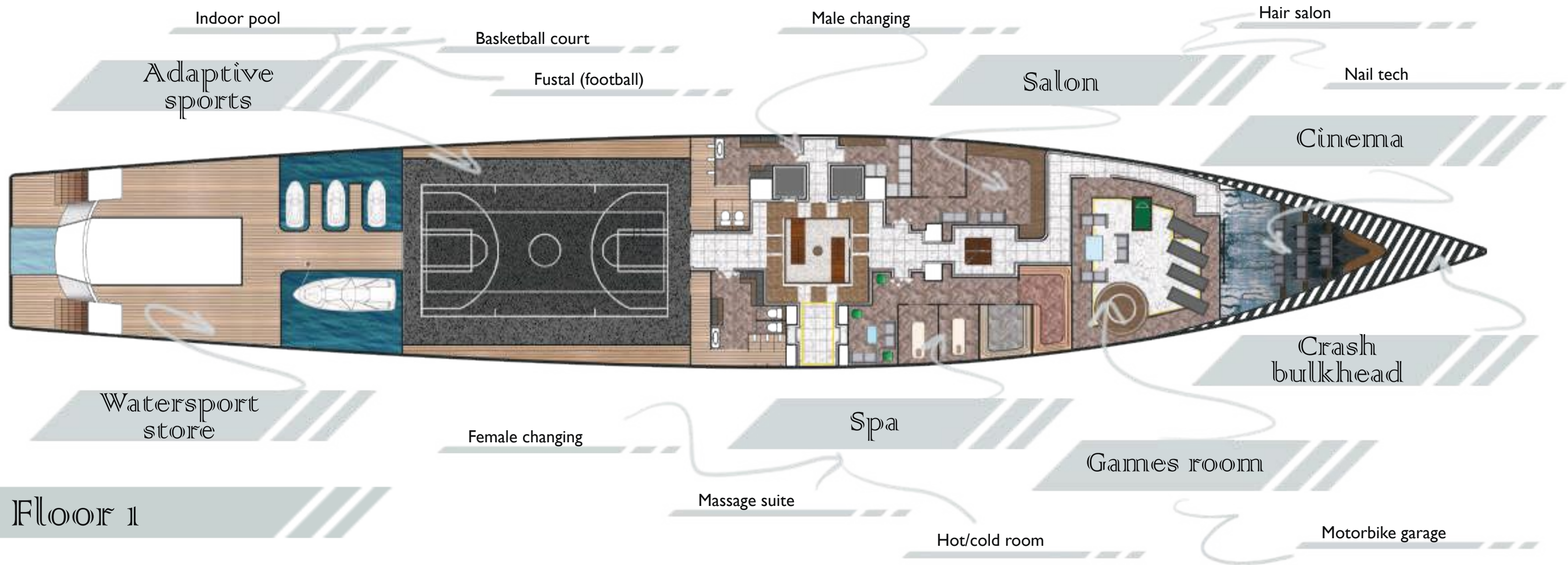
Technical factors

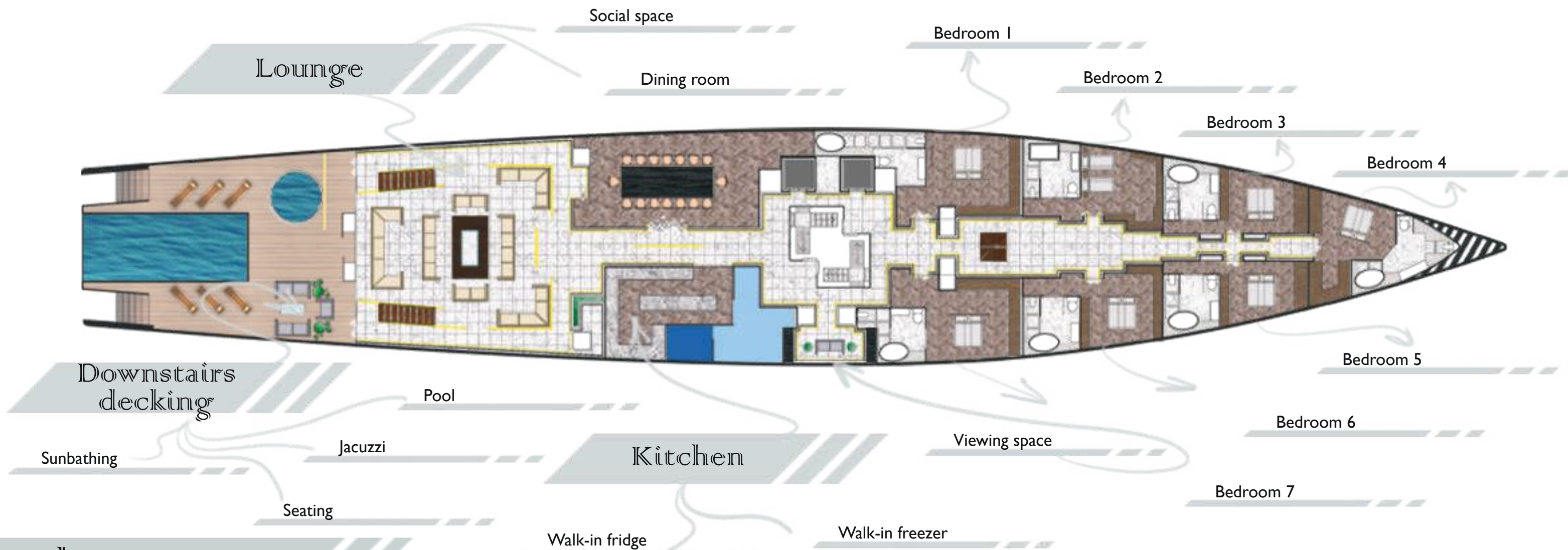
Length	110m
Beam	18m
Draft	6.5m
Gross tonnage	3,700
Number of decks	5 (3 above waterline)
Number of bedrooms	8 (7 guest)
Max speed	14 knots
Cruising speed	9 knots
Motors	Electric propulsion motors @1MW each
Batteries	Li-ion batteries @3MWhr
Propeller used	Voith-Schneider propeller
Range	6000KM
Fuel cells	PEM Fuel cells @6MW
Fuel	Hydrogen



110m

18m





Floor 2



12m Pool

x1



Jacuzzi

x1



Sunbeds

x1



Lounge

x1



Dining room

x1



Viewing area

x1



Fridge/Freezer

x2



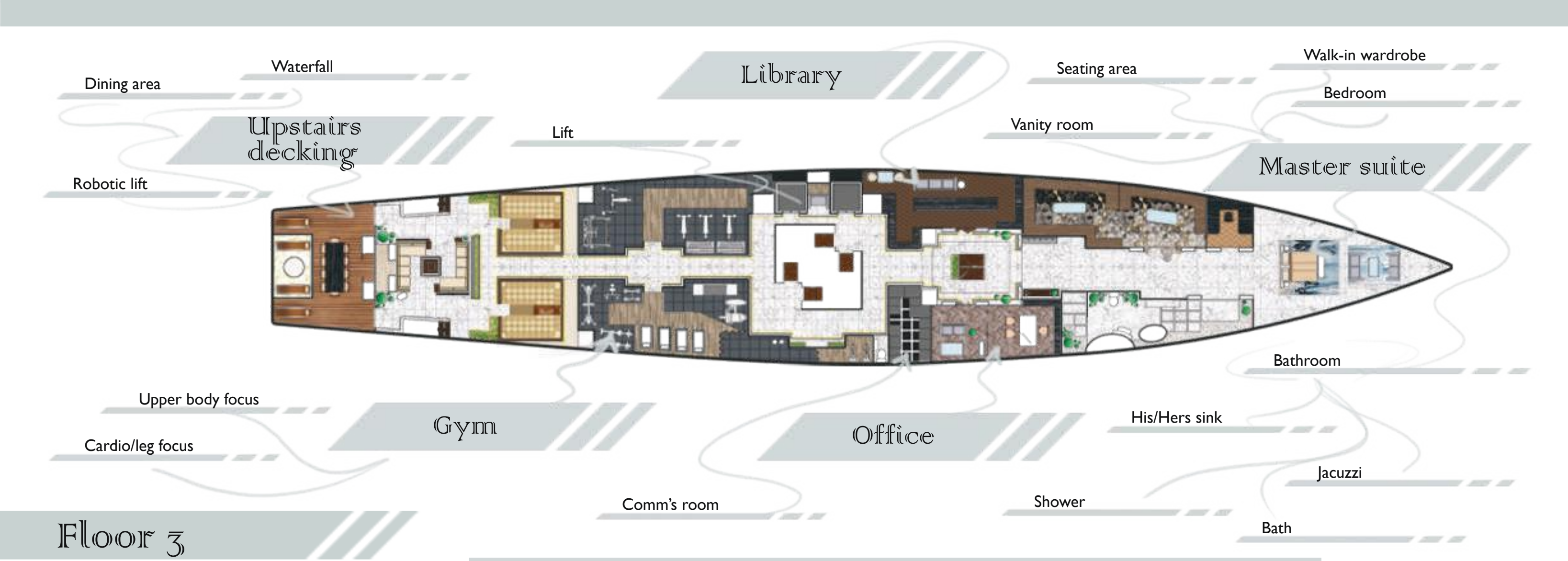
Kitchen

x1



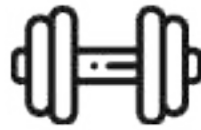
Bedrooms

x7



Waterfall

x1



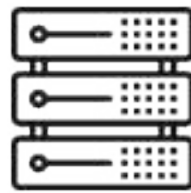
Gym

x2



Library

x1



Comm's room

x1



Office

x1



Bathroom suite

x1



Walk-in wardrobe

x1



Vanity room

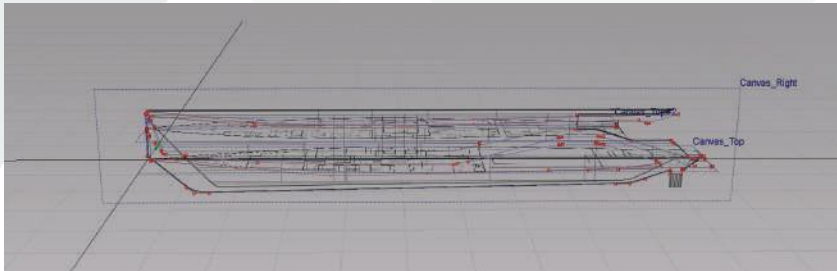
x1



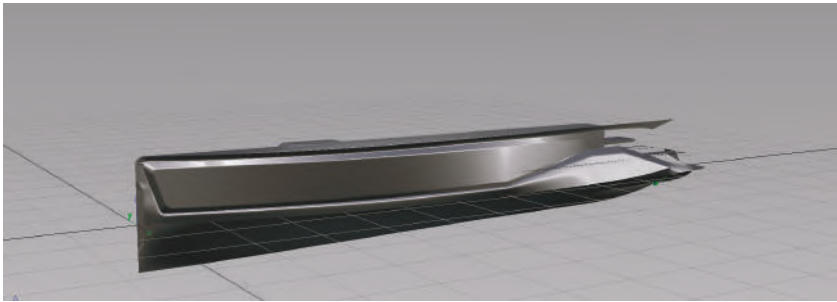
Master bedroom

x1

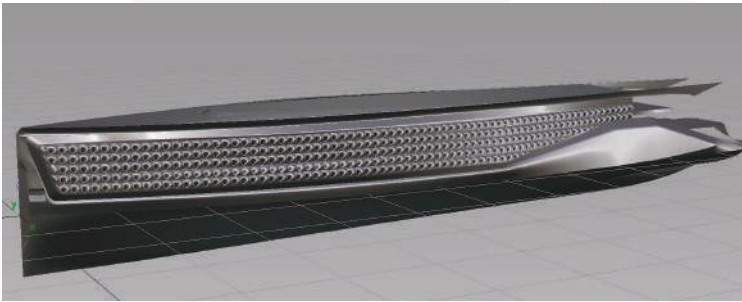
Modeling process



I initially set up the model by adding the orthographic projections and the GA for each floor.



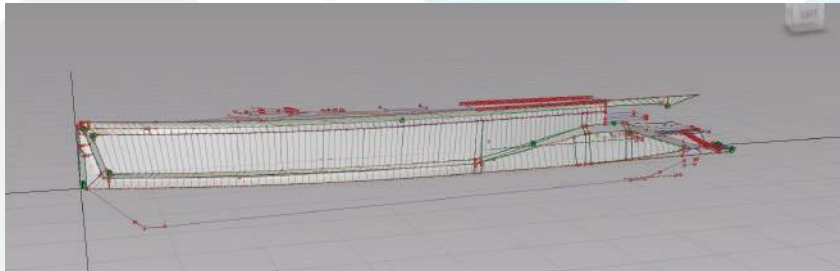
With all main materials placed, I used the user defined diagnostic shader to make sure all materials aligned.



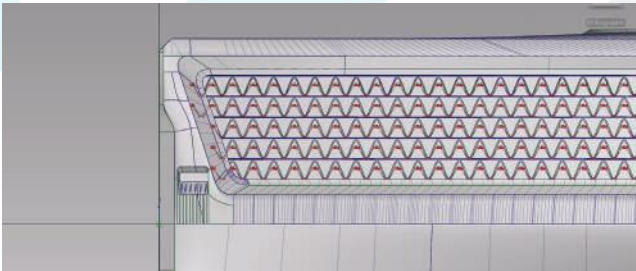
With fins and detailing added, all materials aligning, I grouped the model by material and exported these as OBJ's. I then imported into blender.



Object list, materials tab.

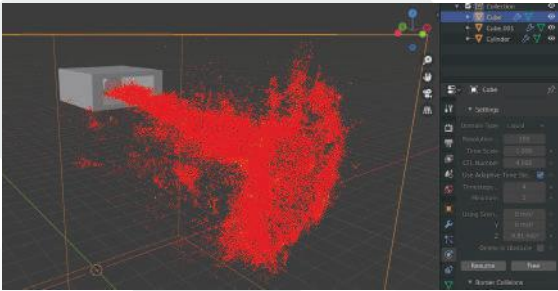


I skinned and trimmed the main surfaces and worked off these surfaces for continuity.



I then project and trimmed the fins into the main glass side panelling.

Waterfall



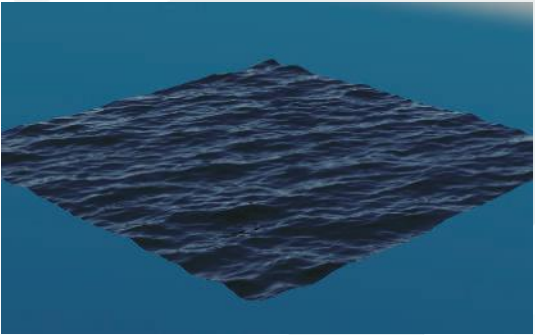
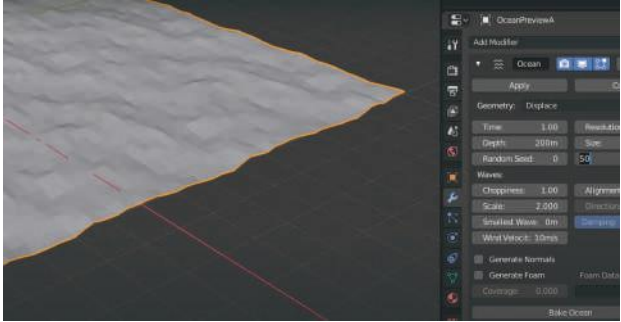
Waterfalls on blender use fluid dynamics. This uses a 'source' and 'effectors' to calculate the fluids flow and movement.

The waterfall is then 'baked', converted into a solid object, animation and a material added.

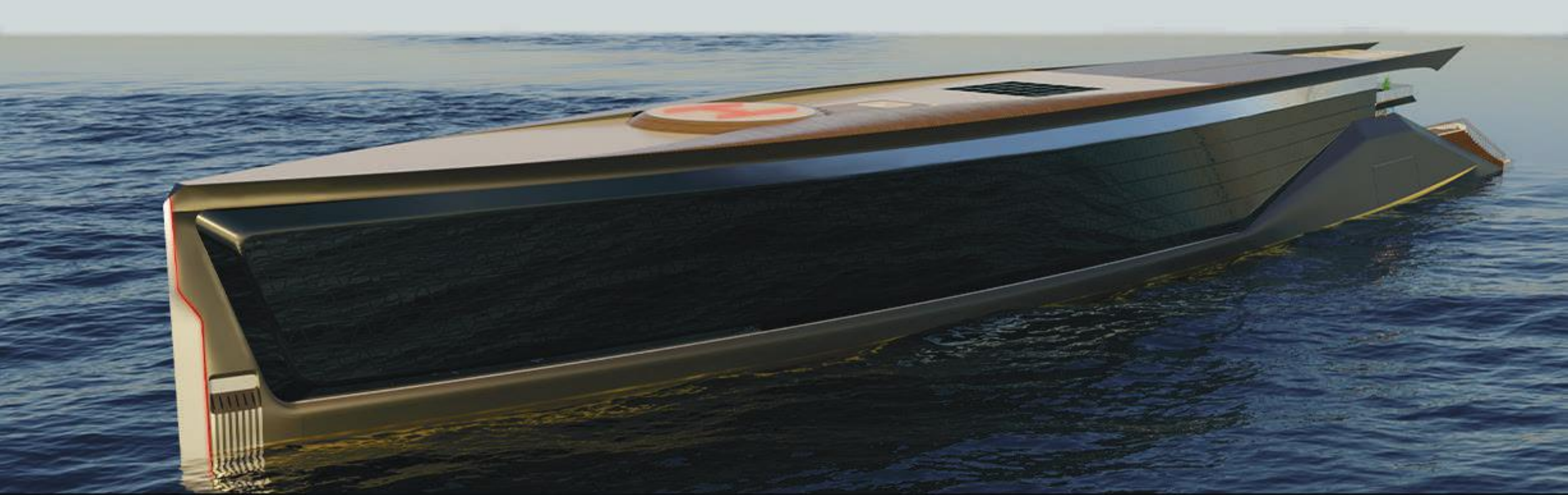


Ocean

A plane is created, ocean modifier added, then reduced in size and procedurally generated.



Texture is then added, lighting set up and calm patches of water are added to create a realistic ocean effect.



Thank you

Aiden May

Plants

<https://www.turbosquid.com/3d-models/plants-338-3d-model-l655602>
<https://www.cgtrader.com/3d-models/plant/leaf/vertical-garden>
<https://www.cgtrader.com/free-3d-models/architectural/other/pebble-stones-2242278fa7a3b58245f5b51fa0dc0cd5>
<https://www.cgtrader.com/free-3d-models/plant/other/xfrogplants-curry-leaf-tree>

Table & chairs

<https://www.turbosquid.com/3d-models/joco-dining-table-3d-model-l161137>
<https://www.cgtrader.com/free-3d-models/furniture/chair/sunset-teak-lounge-chair>
<https://www.cgtrader.com/free-3d-models/interior/living-room/sofa-modelo-3d>
<https://www.cgtrader.com/free-3d-models/exterior/other/garden-sofas>
<https://www.cgtrader.com/free-3d-models/furniture/chair/swing-sun-lounger-d20c66b81a26f1d41265c4ef4c757c51>

Walls & flooring

<https://www.cgtrader.com/free-3d-models/architectural/decoration/decorative-seamless-floral-pattern-l>
<https://www.cgtrader.com/free-3d-models/interior/living-room/3d-wall-penals-bundel>
<https://www.cgtrader.com/free-3d-models/textures/architectural-textures/10-seamless-parquet-texture>

Alcohol

<https://www.cgtrader.com/free-3d-models/food/beverage/remis-martin-louis-xii-cognac>
<https://www.cgtrader.com/free-3d-models/furniture/furniture-set/set-collection-of-glass>
<https://www.cgtrader.com/free-3d-models/industrial/other/wine-bottle-b3f6d632-a3b1-4194-8a59-a7c8bc807ea1>

Lights

<https://www.cgtrader.com/free-3d-models/various/various-models/lamp-63-am152>
<https://www.cgtrader.com/free-3d-models/interior/house/lighting-l>
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All models of CGtrader or TurboSquid