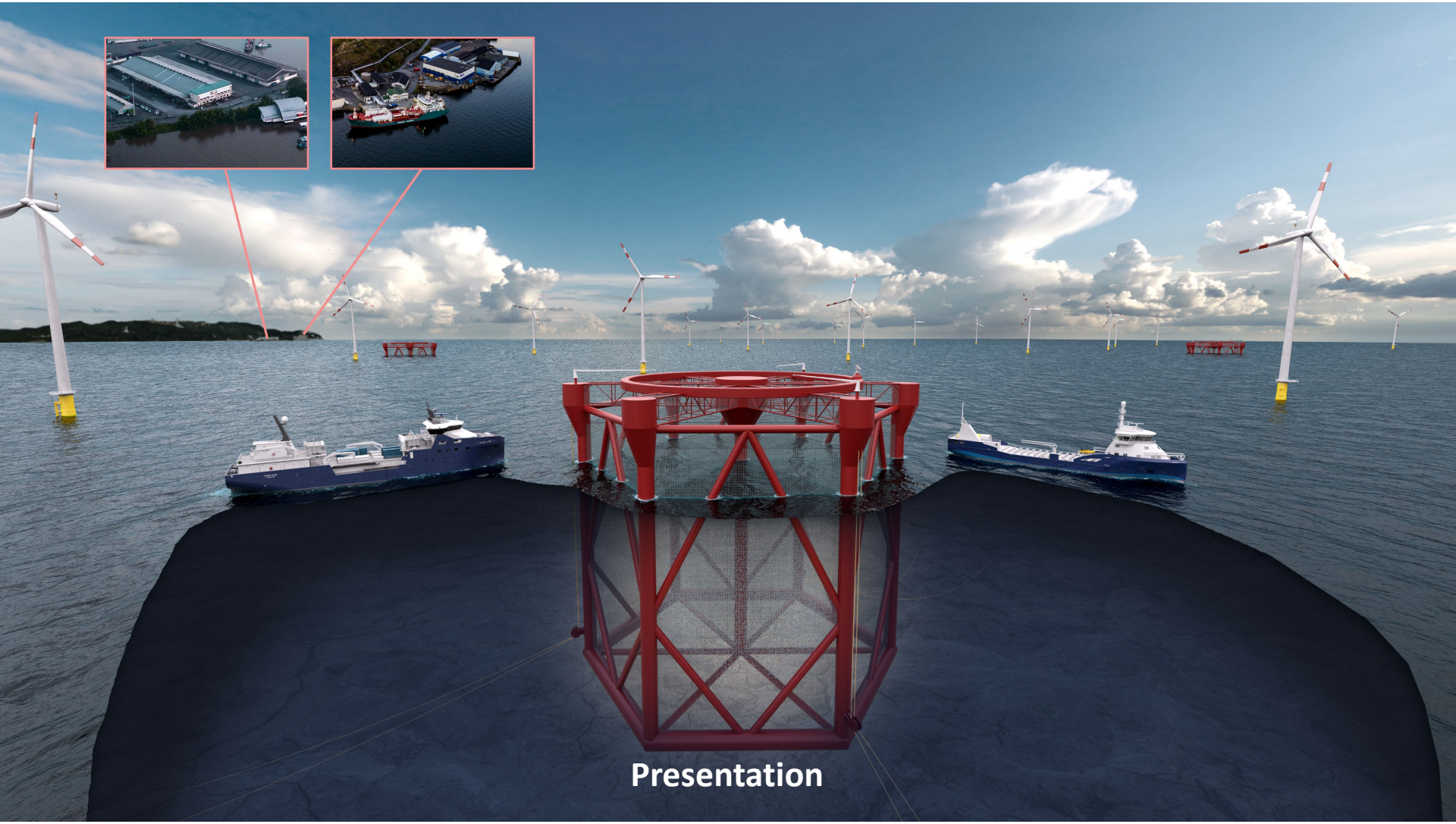
Technology for a sustainable future – Onshore/Offshore



Presentation

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The Company

Who are we ?

- **Ocean Aquafarms** was established in 2015, transferring experience from large and complex oil and gas projects to aquaculture.
- **Ocean Aquafarms** is part of a group of companies that have been in operation in Norway for over 20 years concentrating mainly on projects with China.
- Over $4 bn of business has been done between Norway and China. In all our projects, we aim to cooperate with strong Norwegian and Chinese partners which has given us success.
- Check our website www.oceanaquafarms.com .

What do we do?

- **Ocean Aquafarms** develops new technology.
- We have two main products, hydroloop and HEX BOX
- Both technologies are new solutions for large industrial scale fish farming. One is land based and one is offshore.
- These technologies are unique to us and are designed to produce large quantities of high-quality fish which is both sustainable and in an environmentally efficient way.
- Atlantic salmon is the fish we will start with.

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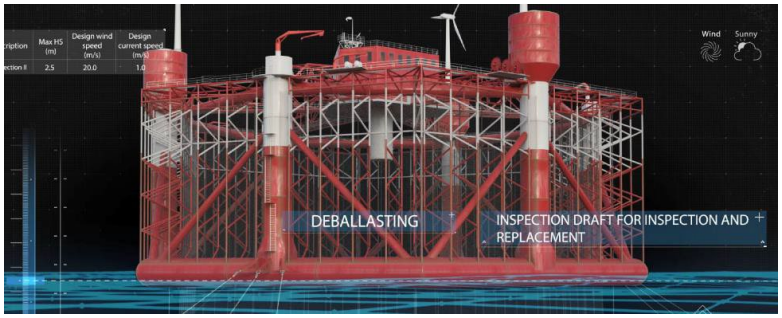
From rigs to fish

Expertise and knowledge from Norway - Products to be built in China

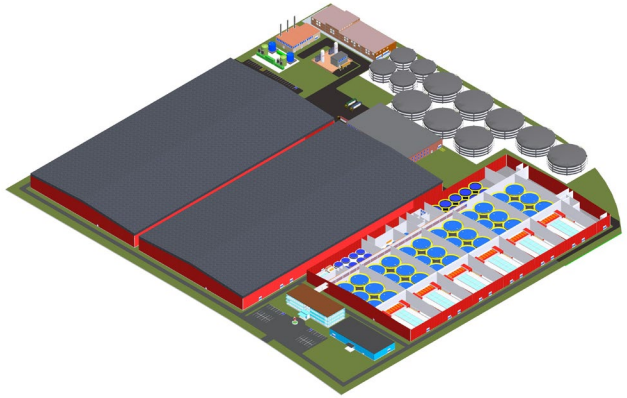
Norwegian Technology and Experience

Manage large construction projects

Large offshore fish cages



Large onshore fish production (RAS)



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Fish Cages designed for China – Possible for Saudi

// Main Dimensions

Length: 30m

Width: 31.5m

Depth: 26m

Draft: 18.5m

Volume: 63T

// Main Dimensions

Length: 40m

Draft: 10m

Volume: 27,000m³

Accommodation Area: 500㎡

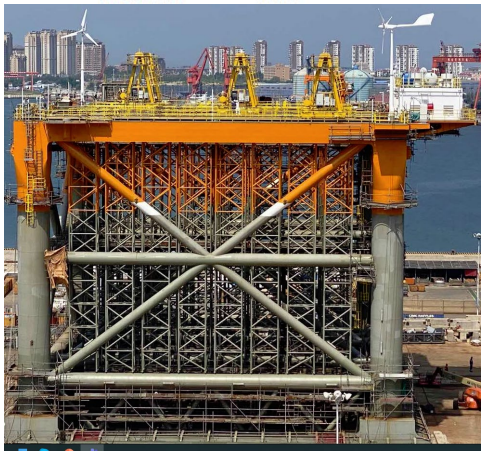
// Main Dimensions

Length: 66m

Width: 66m

Draft: 30m

Volume: 64,000m³



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Lower Cost seabed Cage suitable for Saudi[<30m water depth]

"Big Whale 1#" Intelligent and Bottom Supported Offshore Cage

Possible to up-scale to 40m water depth

"Big whale 1" is the chinese first intellegent aquaculture net cage which is applied in deep water with bottom supported, this is the first model production fabricated and designed by CIMC BLUE. The main functions are fishery breeding and recreational fishing. The major diameter is 66m x 66m, height of up ring is 34m, Max. operation water level is 30.5m, volume is 60000m³.

High molecular polyethylene net, automatic bait casting, underwater monitoring system, net cleaning system, automatic fishing system is quipped in this project. Automatic design will effectively improve the intelligent level and reducing the labor input. This is also can ensure the safety and economic behavior of the cages to the greatest extent. The structure is designed by villa style and will meet with fishing and tourism.

"Big Whale 1#" Intelligent and Bottom Supported Offshore Cage

Main Diameter

Length	:	66m x 66m
Outside diameter between two columns	:	59.4m
Upper ring	:	34m
Mat size	:	10m
Max. operation water level	:	30.5m
Air gap for structure	:	7m
Volume	:	~60000m³

Design Condition

Condition parameter	Storm condition	Operation condition	Remark
Environment Temp.	-10℃~35℃		
Design water depth(m)	26.5~30.5		
Wind speed(m/s)	36.0	17.1	Wind speed per minute
Max. wave height(m)	8.4	5.8	
Wave period(s)	12.5	10.3	
Design flow velocity(m/s)	1.2/0.8	1.2/0.8	Surface/Bottom

Photovoltaic Power Generation System

Polycrystalline silicon photovoltaic panels(270W)	:	135P
Off-grid inverter all-in-one(60KVA)	:	1set
Battery(200Ah/12V)	:	90P

Generator

Generator(380V/50Hz,150eKW)	:	1set

UPS Power

UPS power	:	1set

Water Generator

Water generator (2T/day)	:	1set

Sanitary Treatment System

Sanitary treatment system (10person/day)	:	1set

Safety Equipment

Water fire protection system	:	1set
Dry powder fire extinguisher (6kg)	:	7pcs
CO_2 fire extinguisher	:	3pcs
Life jackets	:	30pcs
Life raft (30 persons)	:	2pcs
Life buoy	:	8pcs
Distress smoke signal	:	1pcs

General Guide Device

Radar	:	1set
AIS	:	1set
VHF with DSC	:	1set
Portable VHF	:	1set
Radar transponder	:	1set
Manual whistle	:	1set

Feeding Facility

Net cleaning machine (App. 400m² per hour)	:	1set
Automatic feeding machine	:	1set
Deck crane(3T)	:	1set
Deck crane(5T)	:	2set

Under Water Monitoring System

Water quality sensor		
- Dissolved oxygen	:	1pcs
- Salinograph	:	1pcs
- Temperature	:	1pcs
- PH value	:	1pcs
Hydrological sensor		
- Water depth	:	1pcs
- Flow velocity	:	1pcs
- Flow direction	:	1pcs
Underwater photography	:	1set
Remote automatic lifting winch	:	1set
Remote control monitoring system	:	1set

Net System

Net:4cm Dyneema (High molecular polyethylene)+coating

Tensioning winches (8 x 10KN)	:	4set
Rising Winches(8 x 10KN)	:	2set

Positioning Way

Sea water ballasted bottom support + solid ballast

Tank Volume

Fresh water(3m³)	:	1pcs
Spare fresh water tank(5m³)	:	1pcs
Fuel oil (750L)	:	1pcs

The Advantage Of Bottom Supported Cage

New design structure, wave and tide resistant, enough huge fishing volume, high qualified production, easy to catch, more profit

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Lower Cost Floating Cage suitable for Saudi[>50m water depth]

HAINAN LINGSHUI DEEP WATER INTELLIGENT AQUACULTURE CAGE

HaiNan LingShui deep water intelligent quadrilateral aquaculture cage consists of four columns,upper ring, lower ring and bracings. it is positioned by mooring which is capable of withstanding level 17 typhoon. The dimension of the cage is 70m*70m which supply a 125,000 cubic aquaculture space.T he cage can be operated with a water depth of more than 50 meters.

The cage is equipped with automatic feeding,net washing and underwater monitoring system,by which the cage is made more intelligent and manning level was reduced. all these technologies maximized the safety and economic of the cage system.

HAINAN LINGSHUI DEEP WATER INTELLIGENT AQUACULTURE CAGE

Principal Dimmensions

Cage Dimmension	:	70m*70m
Column Height	:	34m
Aquaculture Volume	:	125,000m³

Design Condition

S/N	Name	Sea Condition		Note
1	Operation Mode	Normal Operation Condition	100 Year Extreme	
2	Operation Depth(m)	>50	>50	Tide is considered
3	Tide Range(m)	1.98	2.42	
4	Wind speed(m/s)	34.9	63.1	Average in 1 min
5	Significant Wave Height(m)	3.97	11.25	
6	Maximum Wave Height(m)	5.8	16.43	
7	Wave Spectrum Peak Period(s)	9.77	14.29	
8	Wave Spectrum Zero Crossing Period(s)	7.44	11.41	
9	Flow Speed(m/s)	0.82/0.74/0.48	2.37/2.17/1.16	Top/Middle/Bottom

Disel Generators

Disel Generator	:	1
Emergency Generator	:	1

UPS

UPS	:	1

Safety Equipment

Water Fire Extinguishing System	:	1
Dry Powder Fire Extinguisher (6kg)	:	7
CO_2 Fire Extinguisher	:	3
Suivival Suit	:	12
Life Rafts (6POB)	:	2
Life buoy	:	8
Smoke Distress Signal	:	1

Ballast System

Ballast Pump	:	2
HPU	:	1
Remote Controlled Valves System	:	1

Storage Capacity

Fresh Water Tank	:	1
Back-up Fresh Water Tank	:	1
Fuel Oil Tank	:	1

Telecommunication

Radar	:	1
AIS	:	1
VHF with DSC	:	1
Potable VHF	:	2
Radar Transponder	:	1
Manual Whistle	:	1

Aquaculture System

Net Washing Equipment (Appr. 400m³/h)		1
Automatic Feeding Equipment	:	2
Handling Crane (3T)	:	1
Handling Crane (5T)	:	2
ROV	:	1

Enviroment Monitoring System

Meteorological Sensors:		
-Temperature	:	1
-Humidity	:	1
-Atmospheric Pressure	:	1
-Precipatation	:	1
-Wind Speed	:	1
-Wind Direction	:	1
Water Quality Sensor:		
-Dissolved Oxygen	:	1
-Salinity	:	1
-Temperature	:	1
-PH	:	1
Hydrological Sensors:		
-Water Depth	:	1
-Flow Speed	:	1
-Flow Direction	:	1
Cloud Underwater Camera	:	1
Remote Controlled Winch	:	1
Remote Controlled Monitoring	:	1

Net System

Inner Net: Mesh Size 6.5cm,UHMWPE+coating protection
Outer Net: Mesh Size 20cm,UHMWPE+coating protection

Key Advantages

Innovated structure,Strong resistance to wind and waves,Sufficient aquaculture production volume,High quality fish product,Quick and convinient fish-catching,High ROI and highly compatible to different market.

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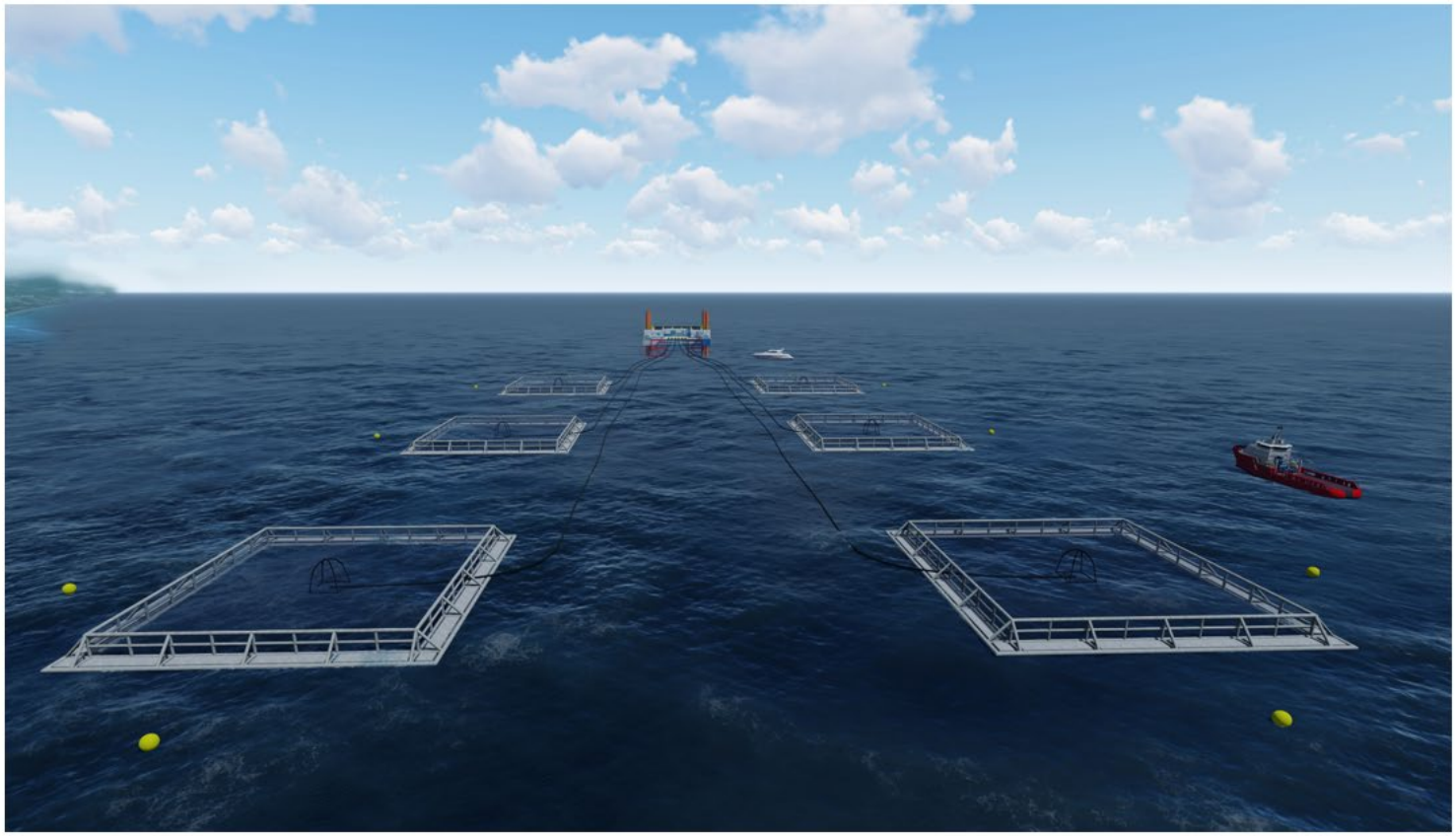
Alternative net solutions for Saudi

One Proposed prototype

One of our proposals could be a fixed Jack Up platform and independent nets. Each platform can support up to 24 nets.



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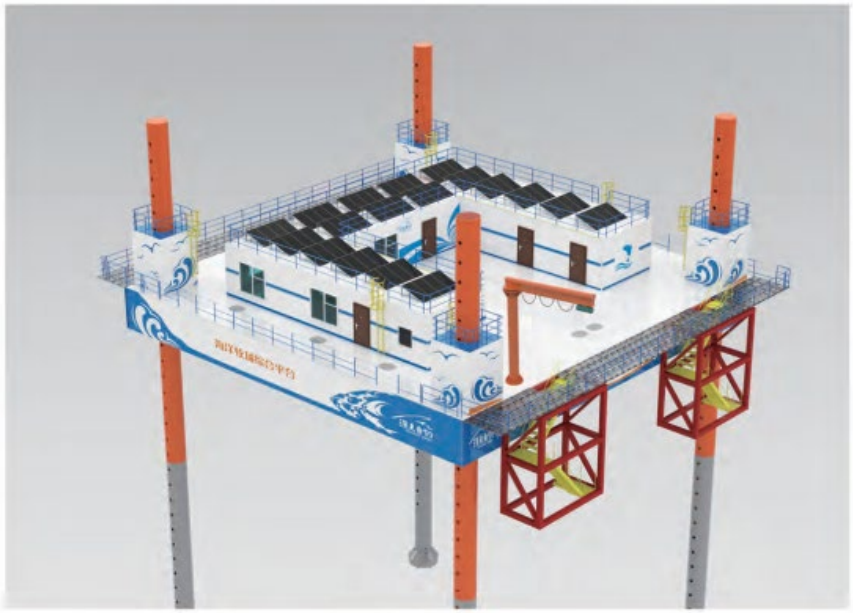
Aquafarm Platform for Saudi

25m × 25m Self-elevating Multifunctional Aquafarm Platform

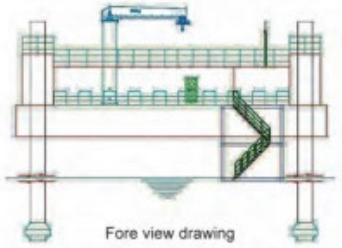


25m × 25m Self-elevating Multifunctional Aquafarm Platform

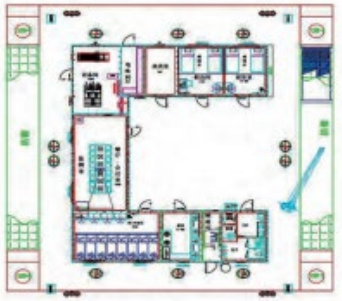
Main Hull Parameters		
Length overall	:	25m
Breadth overall	:	25m
Depth overall	:	2.5m
Design water height	:	5~20m
Fixed configure person	:	2-4person
Leg number	:	4pole
Leg style	:	Cylindrical
Lifting style	:	Hydraulic latch style

Equipment Configure		
Solar panels	:	80 sq.m
Rectifier	:	30KVA
Inverter	:	30KVA
Storage battery	:	~800Ah
Energency generator(380V,50Hz)	:	~100kW
Deck crane	:	1pcs

The Other Configure		
Satellite television system	:	1set
Radar	:	1set
Monitored control system	:	1set
Life buoy	:	8pcs
Fire extinguisher	:	6pcs
Domestic water supply system	:	1set



Fore view drawing



Main hull arrangement drawing

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HEX BOX

Hex Box offshore fish farm is designed for harsh environments and has a size the area of a football field but built to handle the rough environment of the open sea.

This new sustainable technology is based on experience from large and complex oil and gas projects.

Hex Box has been designed to be very flexible.

It is a scalable solution that is tailored to be the best fit covering cost/size/water depth/fish type/location.

Hex Box for Norway is a top of the range solution, utilizing the best Norwegian technology and experience, as well as incorporating cost-effective marine fabrication expertise. This solution is applicable to salmon farming worldwide.

Hex Box global solutions include smaller and simpler solution but still uses the latest Norwegian technology which makes it suitable for variable water depths (either floating or fixed to the seabed) and is suitable for alternative fish types.

It is designed to be either stand alone or in a cluster with a jack up platform or mother ship to provide utilities.

This solution can be used word wide especially in less harsh weather locations.

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Hex Box Standard Design (Hs 10m)

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