GREEN BOATS AND PORTS III

Presentation by Gregory C. Marshall

It is an Honor to be back here. Thank you Dean Corliss and Team for inviting me:

MY OFFICE IS CURRENTLY DESIGNING ONE OF THE "GREENEST" VESSELS ON EARTH

MY OFFICE IS CURRENTLY DESIGNING ONE OF THE "GREENEST" VESSELS ON EARTH

- If is Ocean Going
- Super Efficient Hull form
- Extremely reliable
- Virtually unsinkable
- Made Entirely of Organic materials
- Painted with Biodegradable organic paints
- Totally sustainable
- Proven Technology

Can travel Thousands of Miles

Completely Sustainable

Requires very little Maintenance

Construction from one tree

Biodegradable when done

Efficient Hull Form

Oceangoing

WE HAVE KNOWN HOW TO BUILD A GREEN SHIP FOR SEVERAL THOUSAND YEARS. THE REAL PROBLEM IS THAT WE JUST DON'T WANT TO

GREEN SHIPS

More of a Social Challenge than a technical one

A LITTLE BIT ABOUT MY OFFICE

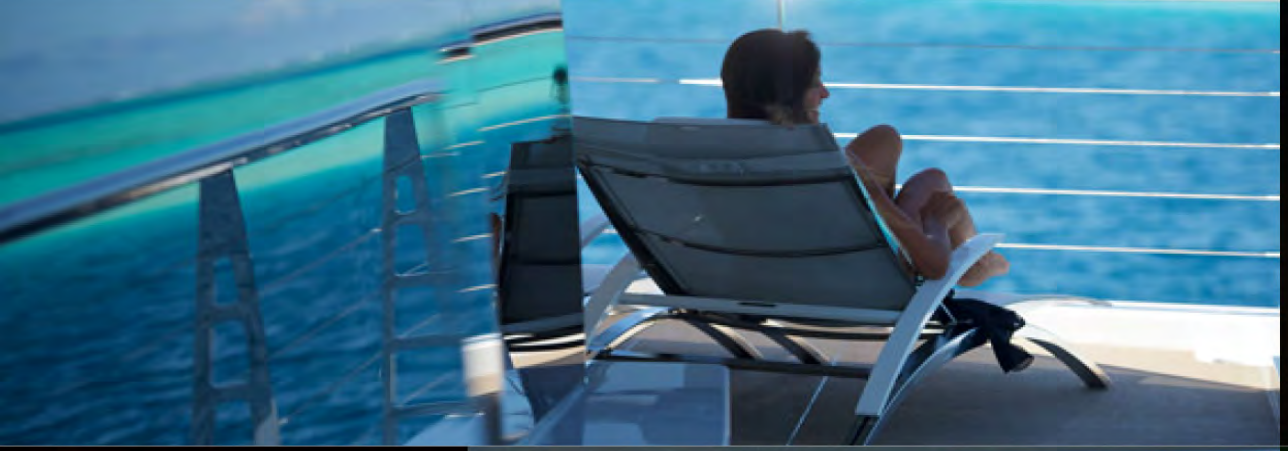
- Based in Victoria B.C. Canada
- Twenty highly imaginative people
- Smallest Project is a 15 foot Canoe
- Largest Project is a 250 million dollar Superyacht currently under construction in Germany
- We are involved in Ultra Light Carbon Fiber Projects
- Fast Patrol boat Projects
- Sailing Yachts
- Oceanographic ships
- Building in Wood, Steel, Aluminum and Composite
- Projects are going on all continents except Antarctica

AT OUR CORE WE DESIGN YACHTS

AT OUR CORE WE DESIGN YACHTS

- We Style them
- We do the Naval Architecture
- We do the Structural Engineering
- We do the Mechanical and Electrical
- We design the interiors
- And we Accessorize them


McMULLEN & WING
bigfish
TRANZCARR
HEAVY HAULAGE LTD.
PH: (09)263-9900

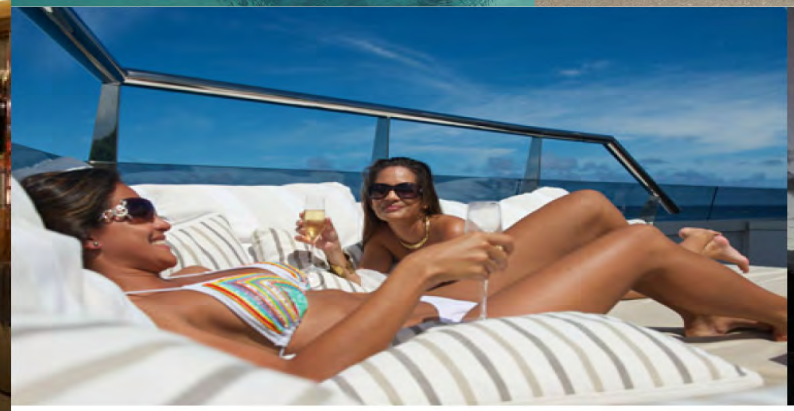








“Sophisticated”



“Playful”


IF YOUR FEELING TOO LAZY TO WALK TO THE
BOW YOU CAN ALWAYS TAKE A HELICOPTER
ATTESSA IV

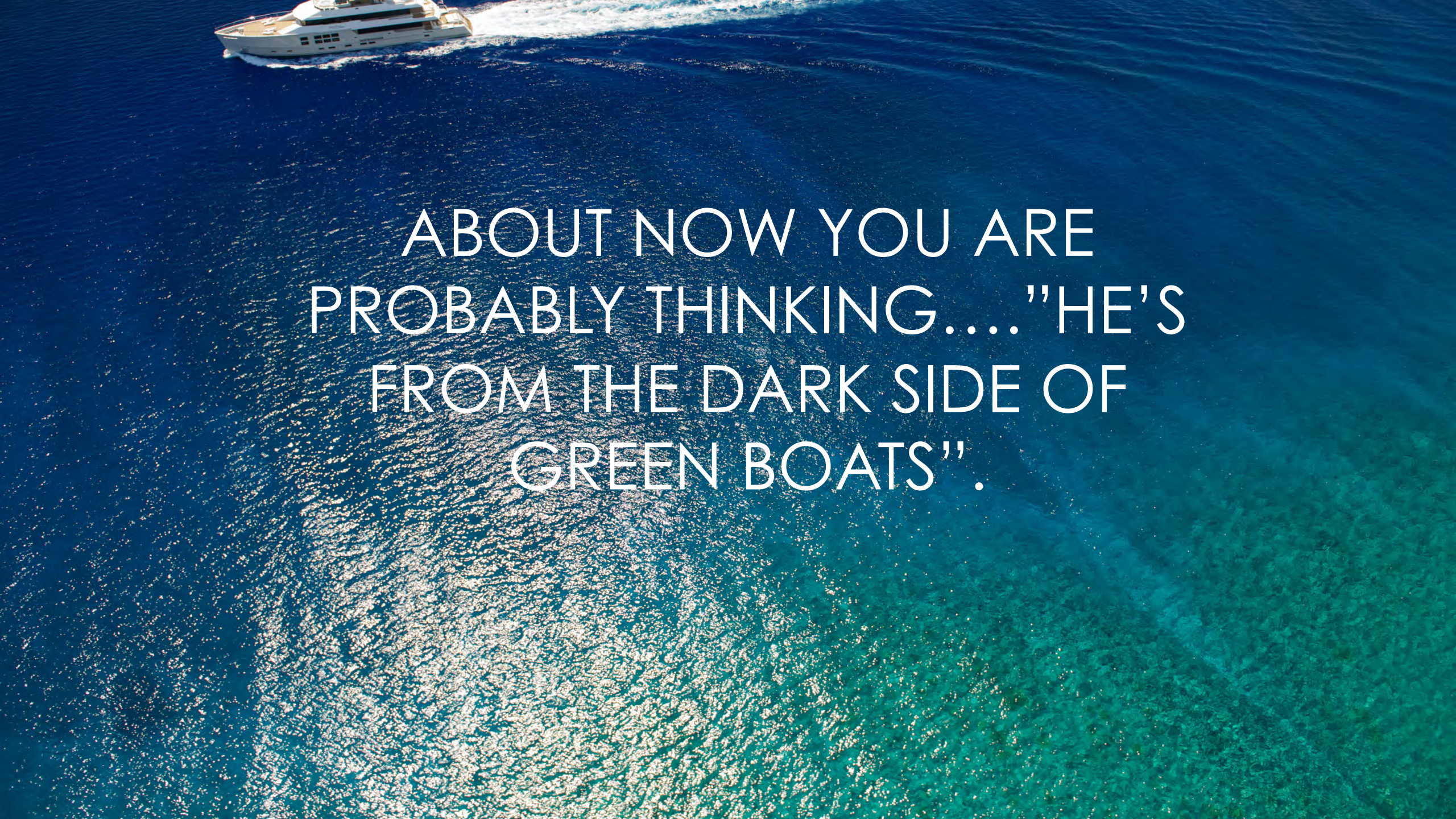
WE LOVE DESIGN & ENGINEERING CHALLENGES OF ALL KINDS


ALONG THE WAY WE PICKED UP SOME
UNIQUE SKILL SETS

The “Arktos” High Latitude Evacuation Craft


“ THAT INSPIRED US MAKE YACHTS THAT CAN GO THERE”


SO WE CAN GO WAKEBOARDING IN ANTARCTICA
YAMAHA
50


ABOUT NOW YOU ARE
PROBABLY THINKING…."HE'S
FROM THE DARK SIDE OF
GREEN BOATS".


NOT EXACTLY

NOT EXACTLY

- I drive a high performance electric car

NOT EXACTLY

- I drive a high performance electric car
- My house is powered by 82 Solar panels

NOT EXACTLY

- I drive a high performance electric car
- My house is powered by 82 Solar panels
- In two months my office will be “off the Grid”

IN 2010 WE SET A FIRM MANDATE WITHIN OUR COMPANY TO MAKE REAL AND SIGNIFICANT CHANGE TOWARDS SUSTAINABLE SHIPS BY 2020

ABOUT THE SAME TIME THAT
PLANETSOLAR WAS LAUNCHED

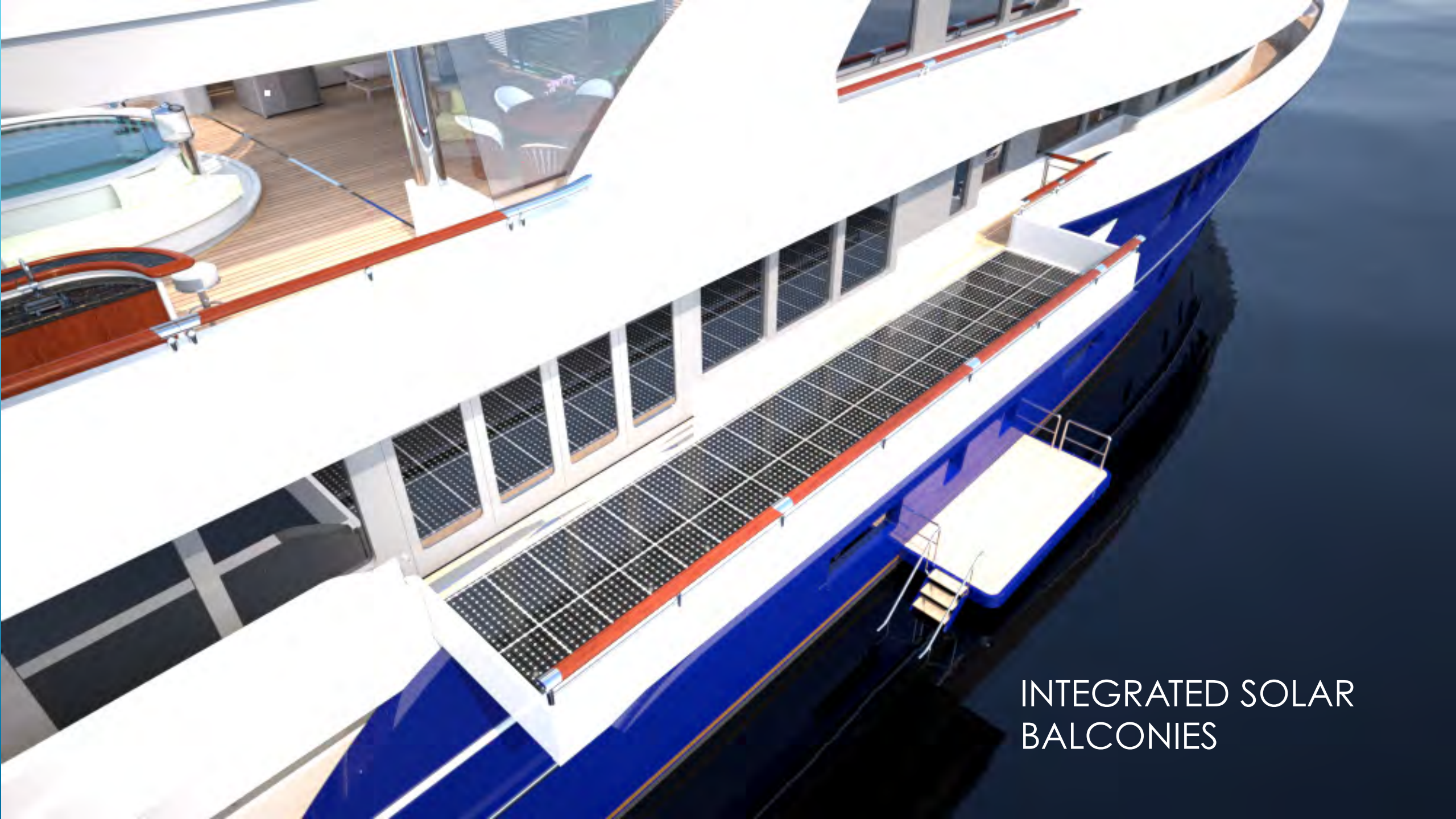
THE CHALLENGE IS THAT NONE OF OUR CUSTOMERS WANT TO GIVE UP ANYTHING
"YES, THIS TOY GARAGE IS TRULY GOING ON ONE OF OUR PROJECTS"


MY FIRM IS A
"FOR PROFIT BUSINESS"

IF WE CAN'T DEMONSTRATE THAT IT IS BETTER AND CHEAPER AND MORE RELIABLE OR PROVIDES A BETTER USER EXPERIENCE T OUR CLIENTS ARE SIMPLY NOT INTERESTED IN BUYING


JUST A FEW CURRENTLY AVAILABLE TECHNOLOGIES THAT ARE ALREADY MAKING OUR BOATS QUIETER, MORE RELIABLE, AND A BETTER USER EXPERIENCE .....AND GREENER

AESTHETIC INTEGRATION OF SOLAR


INTEGRATED SOLAR
BALCONIES

SOLAR PANELS ON THE HELICOPTER PAD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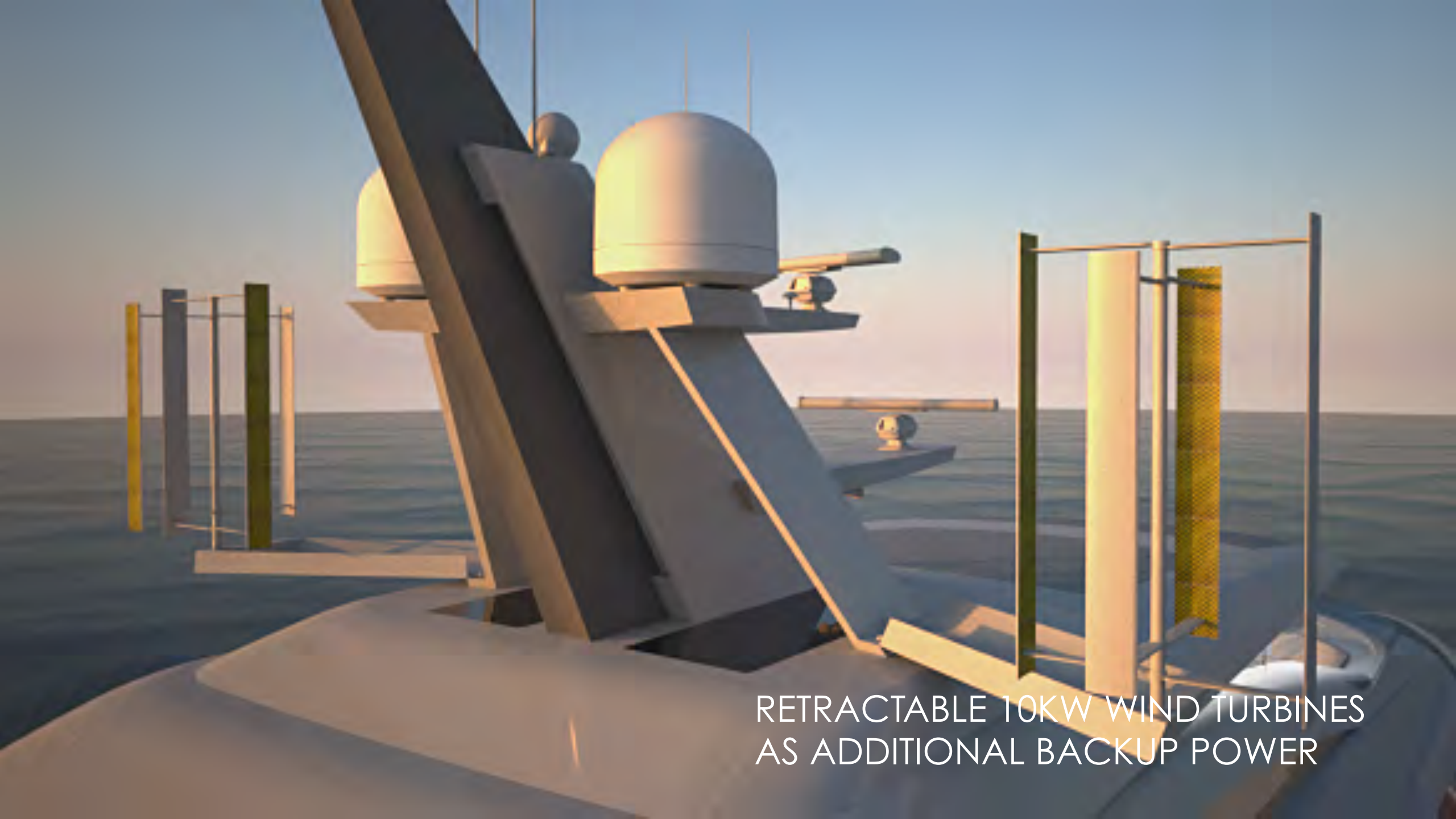
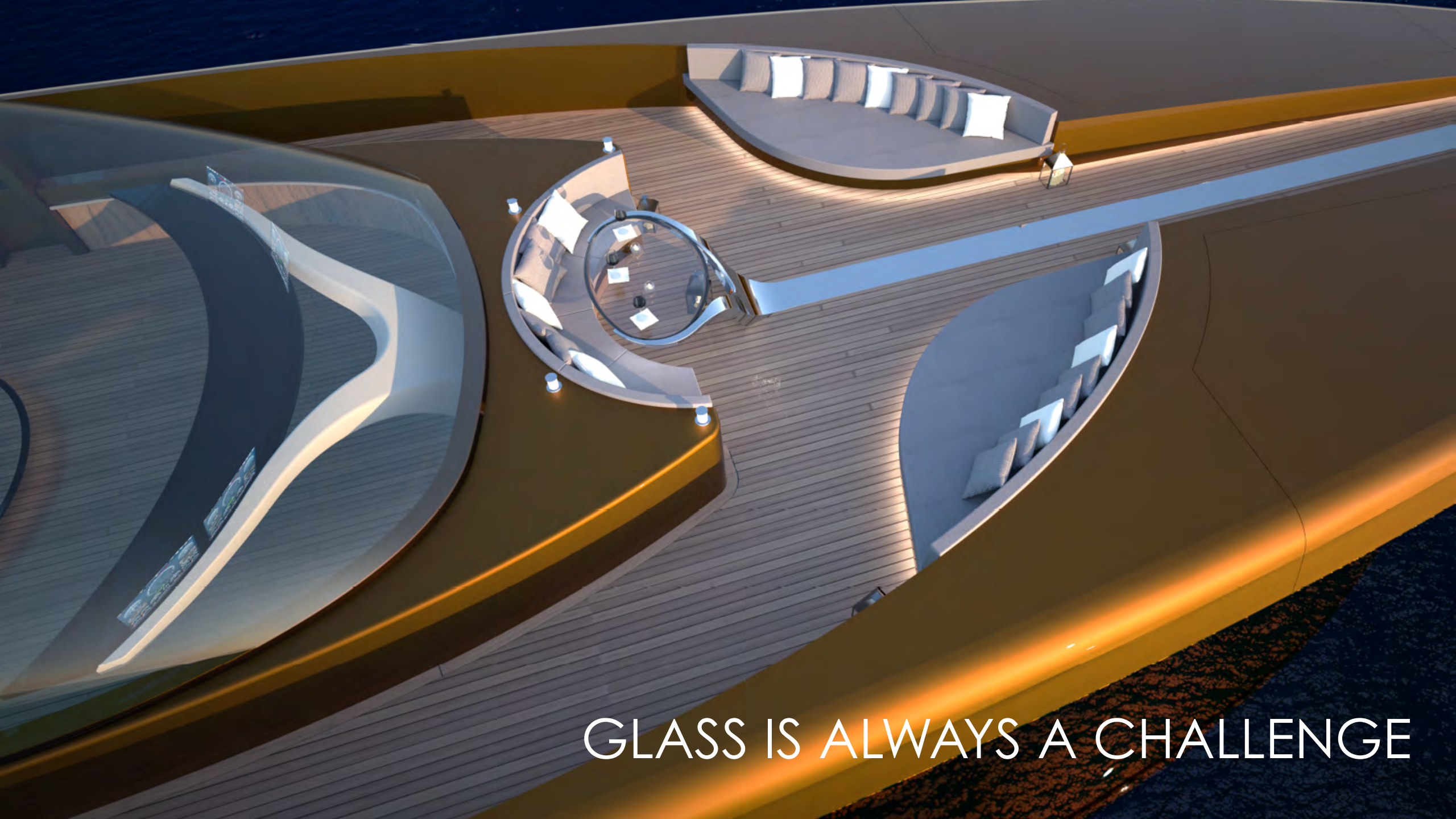
NAVAL ARCHITECT LTD.

INTEGRATION OF WIND TURBINES


RETRACTABLE 10KW WIND TURBINES
AS ADDITIONAL BACKUP POWER

ELECTROCHROMIC GLASS

- Reduces HVAC loading by up to 60%
- Can be live to position of sun
- Completely solid state
- Powered by 1 watt per panel
- Eliminates the needs for costly blinds
- Can be arranged as art form


GLASS IS ALWAYS A CHALLENGE


ELECTROCHROMIC GLASS

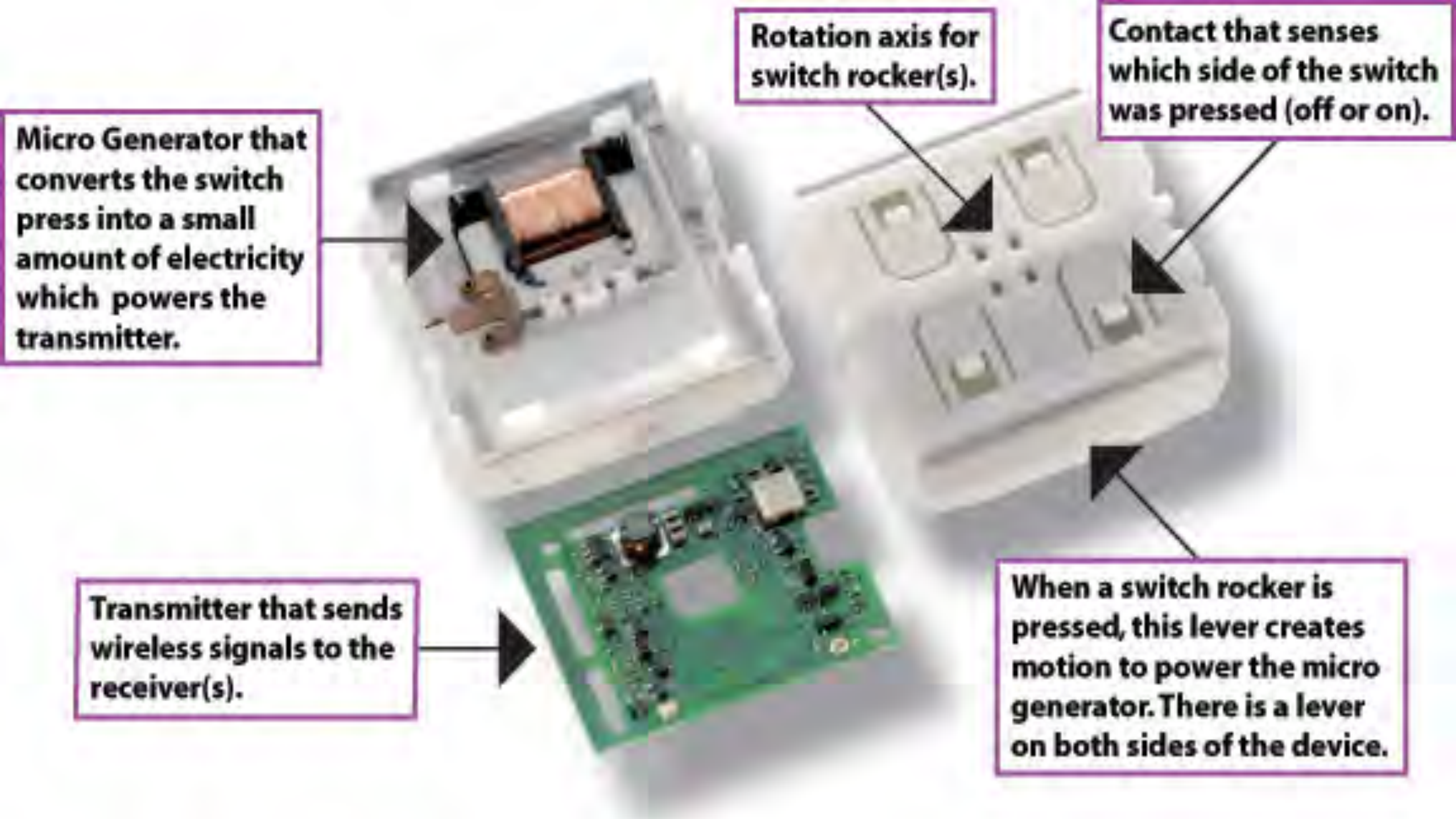

ELECTROCHROMIC GLASS

ELECTROCHROMIC GLASS IN THIS APPLICATION WILL REDUCE HVAC LOADING BY 40%.
IT ALSO ELIMINATES THE NEEDS FOR BLINDS AND IS MAINTENANCE FREE

ENERGY HARVESTING

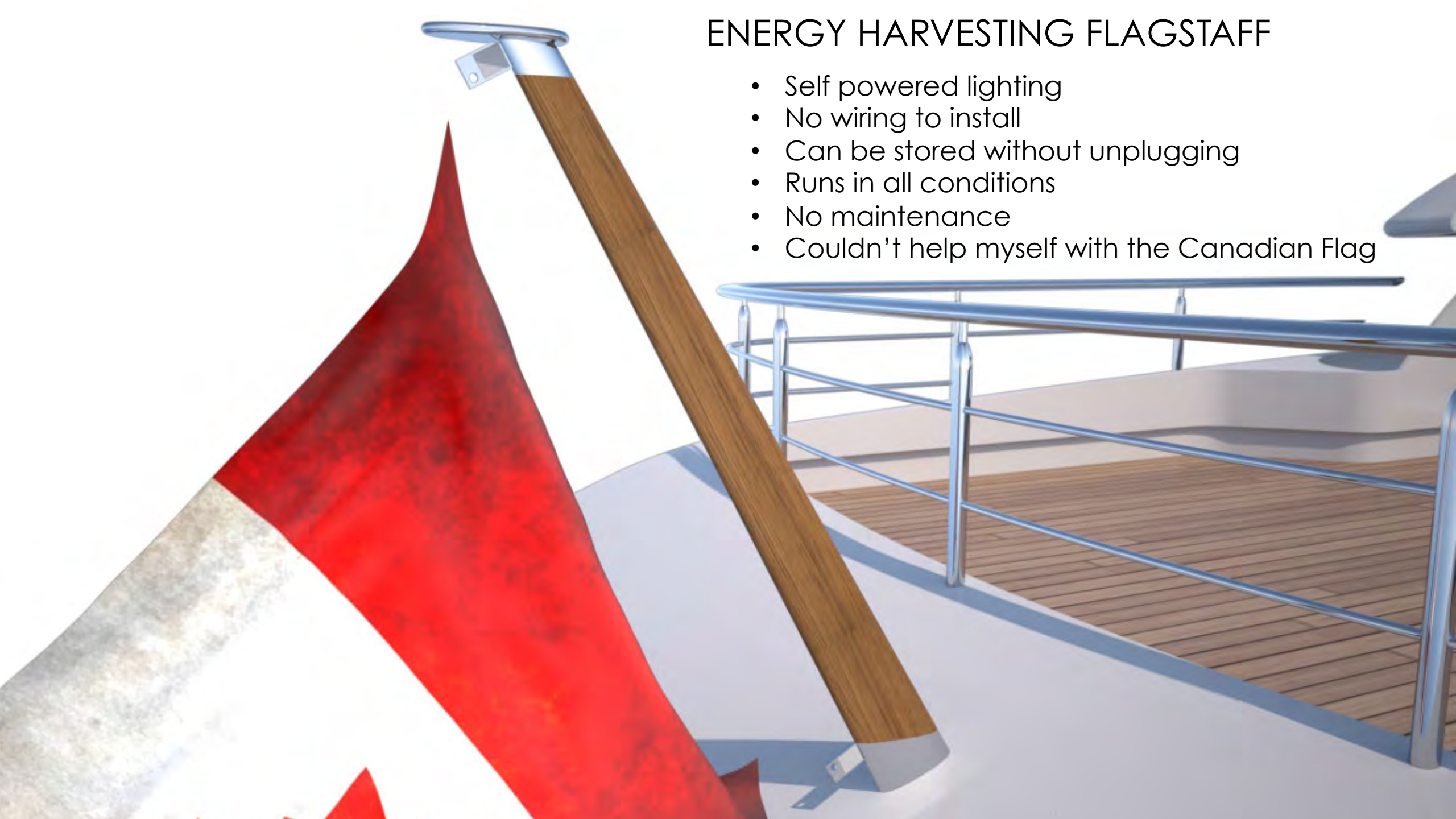
- Free power that would otherwise be wasted
- Localized power to reduce weight and complexity
- Increased reliability
- Vastly improved Owner Experence

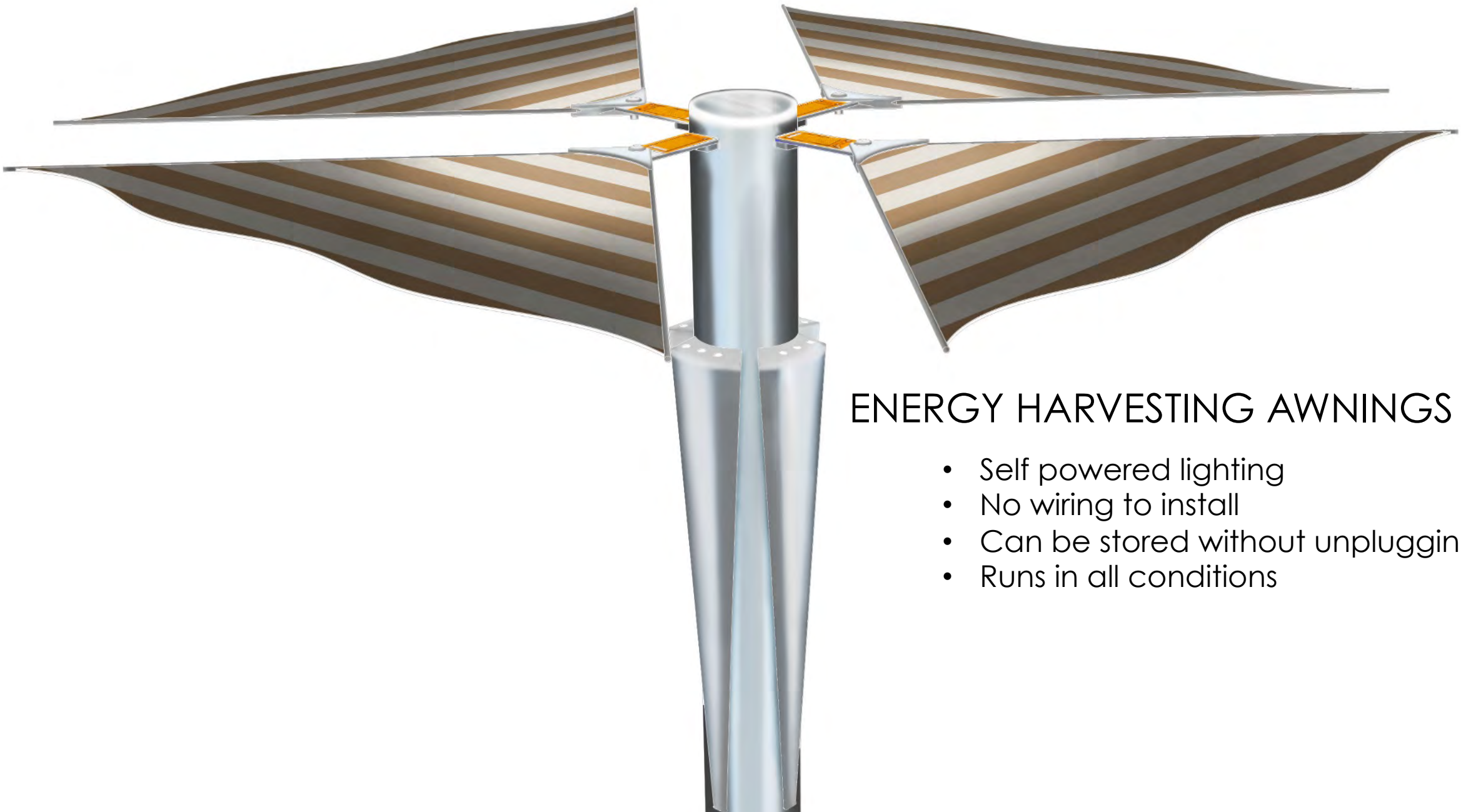
THIS TECHNOLOGY SAVES APPROXIMATELY
400,000 DOLLARS IN A 50 METER SUPERYACHT


Micro Generator that converts the switch press into a small amount of electricity which powers the transmitter.
Rotation axis for switch rocker(s).
Contact that senses which side of the switch was pressed (off or on).
Transmitter that sends wireless signals to the receiver(s).
When a switch rocker is pressed, this lever creates motion to power the micro generator. There is a lever on both sides of the device.

ENERGY HARVESTING FLAGSTAFF

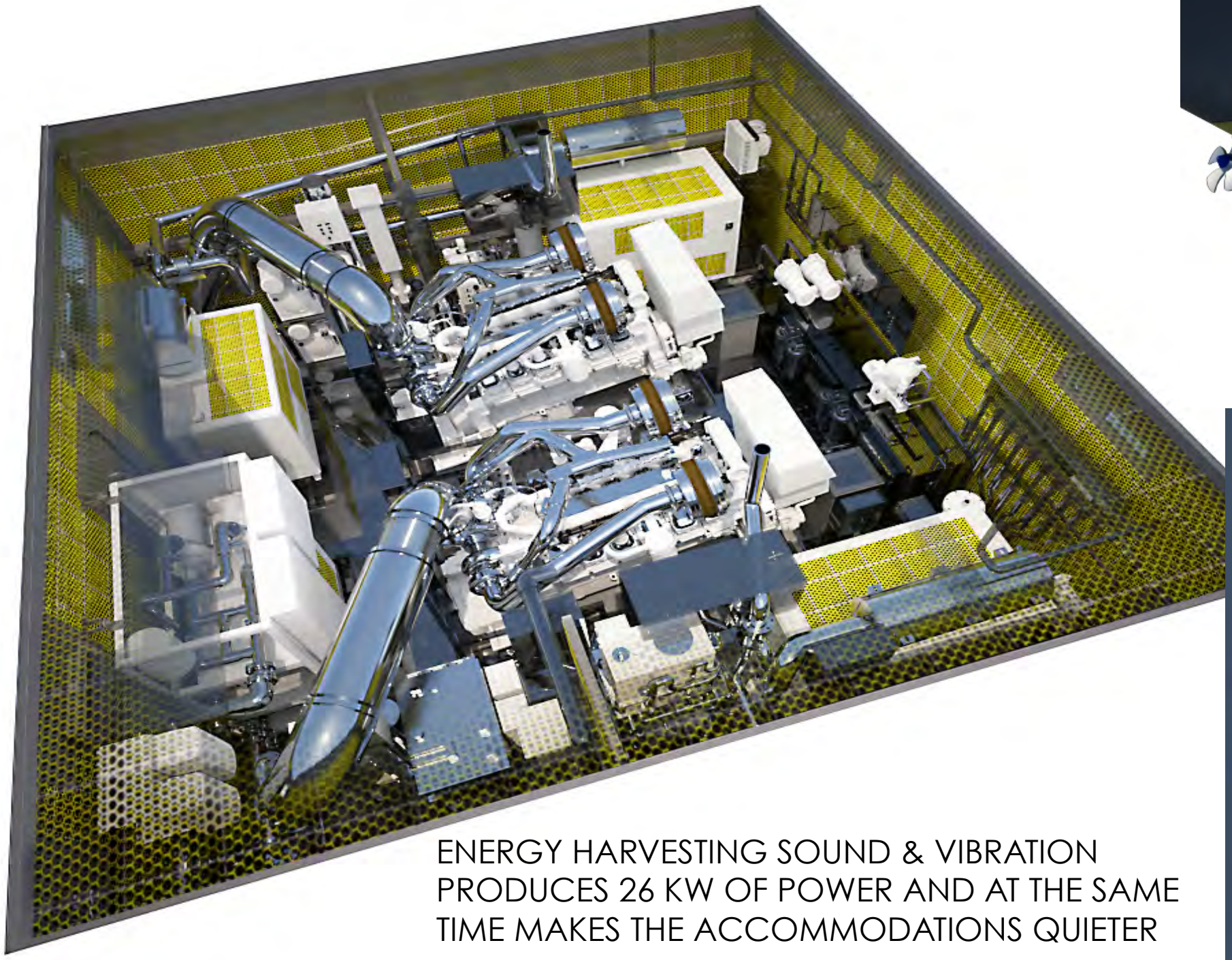
- Self powered lighting
- No wiring to install
- Can be stored without unplugging
- Runs in all conditions
- No maintenance
- Couldn’t help myself with the Canadian Flag

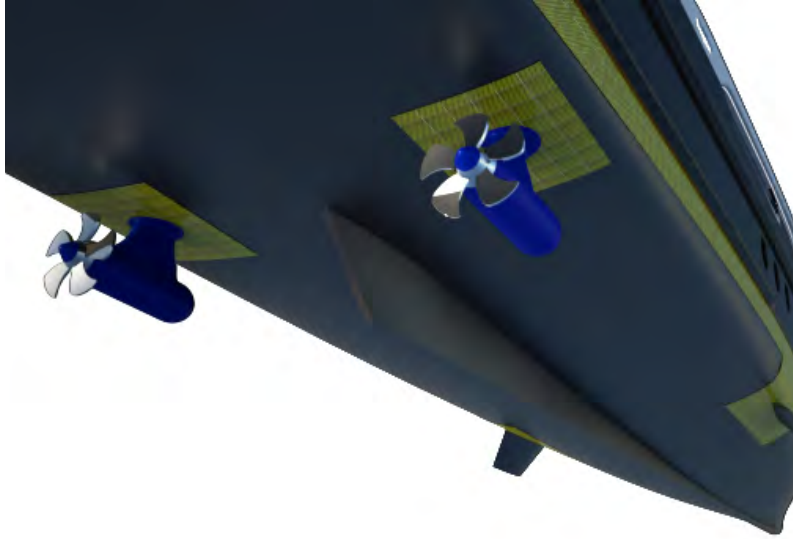


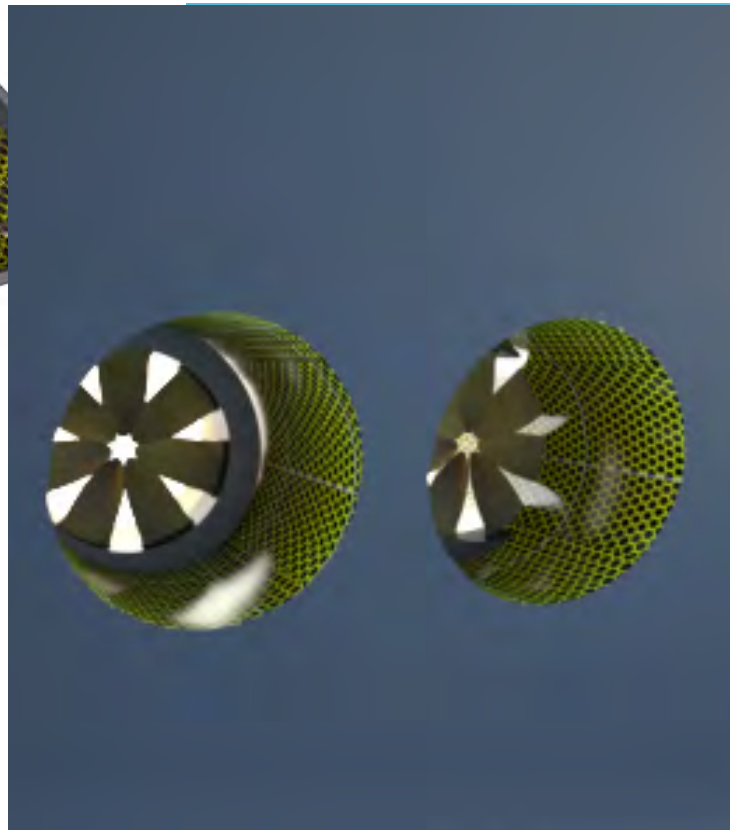


ENERGY HARVESTING AWNINGS

- Self powered lighting
- No wiring to install
- Can be stored without unplugging
- Runs in all conditions







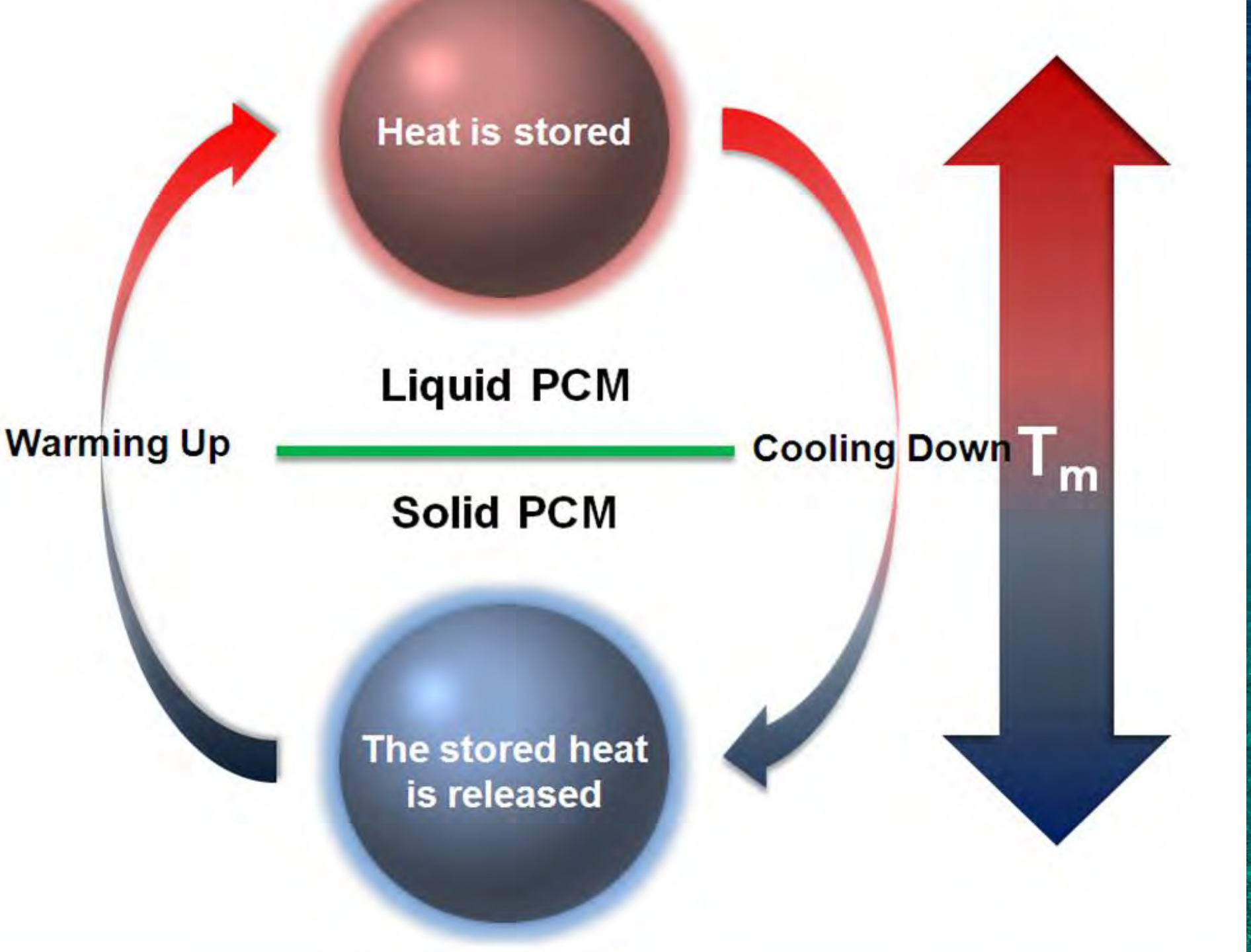
ENERGY HARVESTING SOUND & VIBRATION
PRODUCES 26 KW OF POWER AND AT THE SAME
TIME MAKES THE ACCOMMODATIONS QUIETER

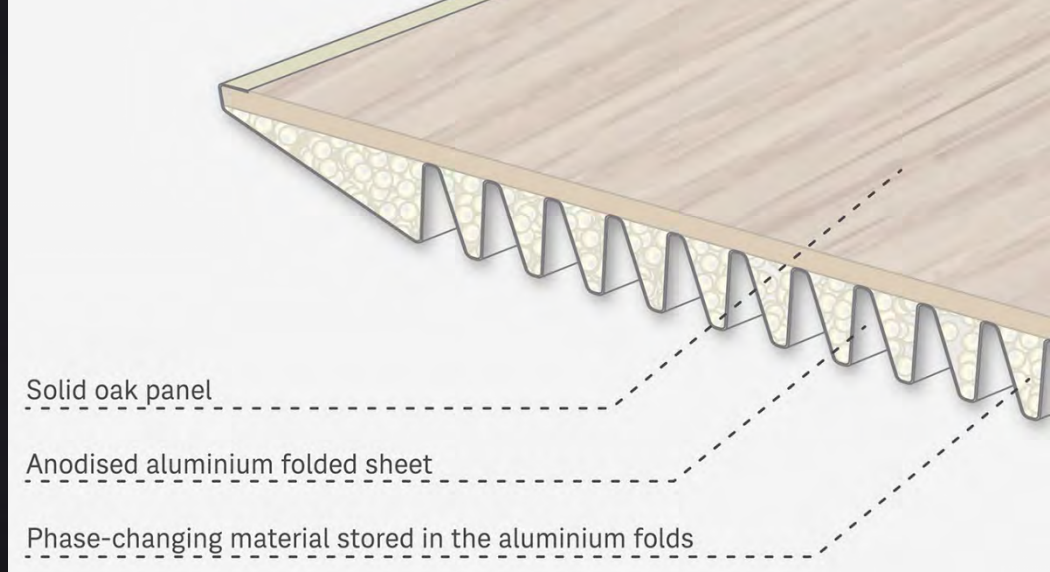

THEN TO THE SLIGHTLY MORE OBSCURE

ENERGY HARVESTING AS A LIFESAVER

ENERGY HARVESTING FOR ENTERTAINMENT

PHASE CHANGING MATERIALS (PCM'S)


Heat is stored
Liquid PCM
Warming Up
Cooling Down
Solid PCM
The stored heat is released
T_m



PHASE CHANGING FURNITURE

PCM'S AIR CONDITION THIS ENTIRE ROOM WITHOUT POWER
LIGHTING IS ENTIRELY SOLAR POWERED. ALL IN COMPLETE SILENCE

MAIN SALON WINDOWS ARE ELECTROCHROMIC TO REDUCE HEAT LOADING.
AIR CONDITIONING THROUGH PHASE CHANGING MATERIALS
ALL LIGHTING IS SOLAR POWERED

Completely “Off the Grid” Tai Chi Room

BUILDING TECHNIQUES

BUILDING TECHNIQUES AS A GREEN TECHNOLOGY

BUILDING TECHNIQUES AS A GREEN TECHNOLOGY

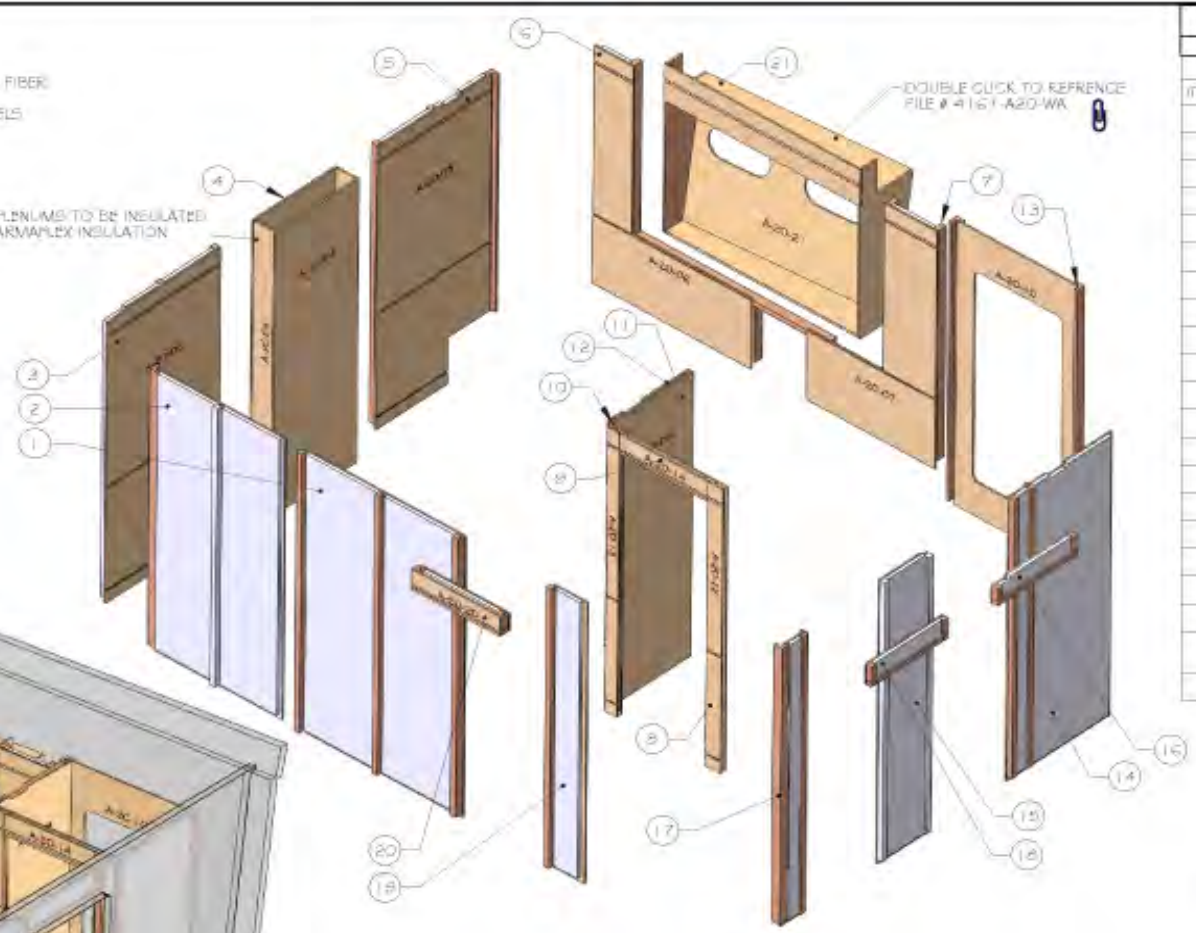
- Faster Build times means less energy used
- CNC cutting and 3D printing for Reduced wastage
- Shorter build times mean Better Client Experience

STANDARD WALL PANEL NOTES:

- ALL SHEETING TO BE 1/2" PLYWOOD
- INSULATION TO BE 12 MM TECHNICON STANDARD ACOUSTICAL FIBER
- FRAMING TO BE SOLID MAHOGANY WOOD
- USE #8 SS WOOD SCREWS FOR FASTENING FRAMING AND PANELS
- FOR ALL CORNER BLOCK DETAILS SEE FILE #4161-60A-08
- ALL WOOD SURFACES TO BE SEALED PRIOR TO INSULATION

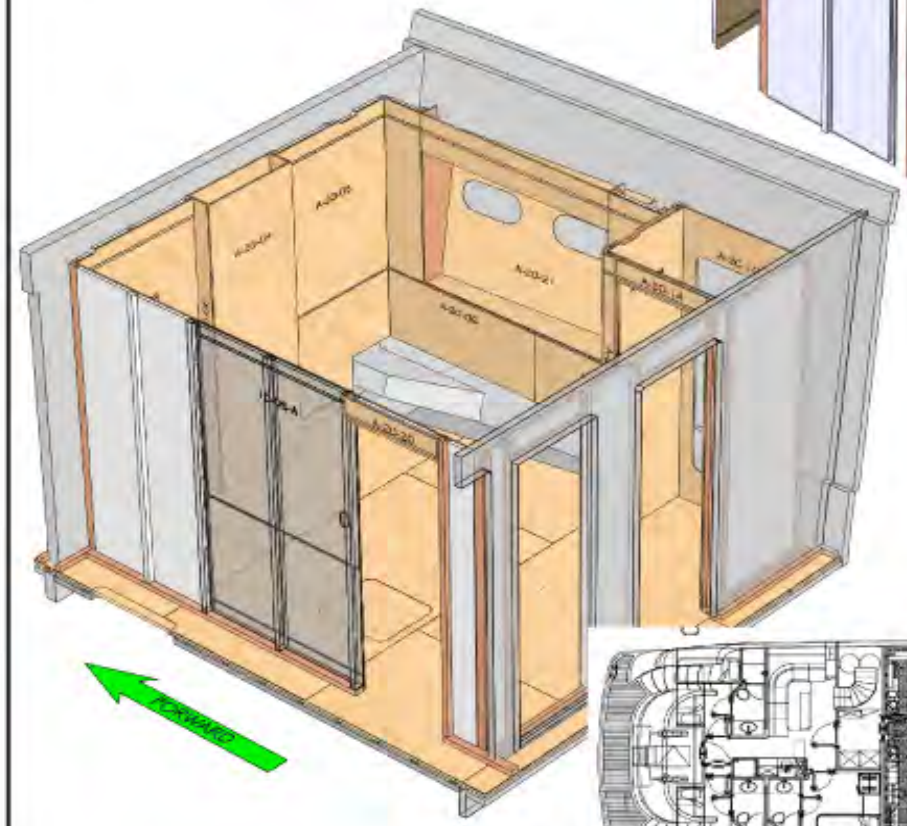
ALL HVAC PLENUMS TO BE INSULATED WITH 1/4" ARMAFLEX INSULATION

DOUBLE CLICK TO REFRENCE FILE # 4161-A20-WA



INSULATION

Standard Acoustical Polyester Fiber: Color: White
PF-012: 1.7 lb/ft³ Polyester Fiber - Flammability: UL94 HF-1
Standard Thickness: 1"



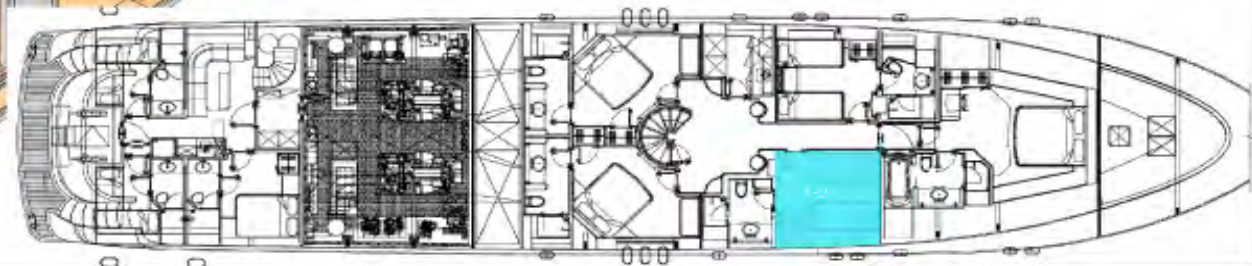
WALL PANEL CONSTRUCTION:

- INBOARD WALL PANELS SHEET # 3
- FORWARD WALL PANELS SHEET # 4
- OUTBOARD WALL PANELS SHEET # 5
- AFT WALL PANELS SHEET # 6
- WARDROBE PANELS SHEET # 7

ATTACHED FILES:

DOUBLE CLICK FOR ATTACHED CNC FILE

DOUBLE CLICK FOR 3D MODEL



REVISIONS

REV.	DESCRIPTION	DATE

STBD FORWARD GUEST ROUGH IN PANELS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	Material	Finish
1	4161-A20-01	ROUGH IN PANEL	1	1/2" Ply	SEALED
2	4161-A20-02	ROUGH IN PANEL	1	1/2" Ply	SEALED
3	4161-A20-03	ROUGH IN PANEL	1	1/2" Ply	SEALED
4	4161-A20-04	HVAC PLENUM	1	1/2" Ply	SEALED
5	4161-A20-05	ROUGH IN PANEL	1	1/2" Ply	SEALED
6	4161-A20-06	ROUGH IN PANEL	1	1/2" Ply	SEALED
7	4161-A20-07	ROUGH IN PANEL	1	1/2" Ply	SEALED
8	4161-A20-12	ROUGH IN PANEL	1	1/2" Ply	SEALED
9	4161-A20-14	ROUGH IN PANEL	1	1/2" Ply	SEALED
10	4161-A20-13	ROUGH IN PANEL	1	1/2" Ply	SEALED
11	4161-A20-09	ROUGH IN PANEL	1	1/2" Ply	SEALED
12	4161-A20-08	ROUGH IN PANEL	1	1/2" Ply	SEALED
13	4161-A20-10	ROUGH IN PANEL	1	1/2" Ply	SEALED
14	4161-A20-11	ROUGH IN PANEL	1	1/2" Ply	SEALED
15	4161-A20-15	ROUGH IN PANEL	1	1/2" Ply	SEALED
16	4161-A20-16	ROUGH IN PANEL	1	1/2" Ply	SEALED
17	4161-A20-17	ROUGH IN PANEL	1	1/2" Ply	SEALED
18	4161-A20-18	ROUGH IN PANEL	1	1/2" Ply	SEALED
19	4161-A20-19	ROUGH IN PANEL	1	1/2" Ply	SEALED
20	4161-A20-20	ROUGH IN DOOR HEADER	1	1/2" Ply	SEALED
21	4161-A20-WA	WINDOW ALCOVE	1	1/2" Ply	SEALED

FOR CONSTRUCTION

GREGORY C. MARSHALL
NAVAL ARCHITECT, LTD.

1571 WEST BURNSIDE ROAD
VICTORIA, B.C.
CANADA
V9E 3E2

PHONE: (250) 386-9995
FAX: (250) 386-4280
EMAIL: info@gregmarshalldesign.com
WEBSITE: www.gregmarshalldesign.com

130 MOTORYACHT
FOR
JERRY JOHNSON

STRBD FOR GUEST STATEROOM ROUGH IN

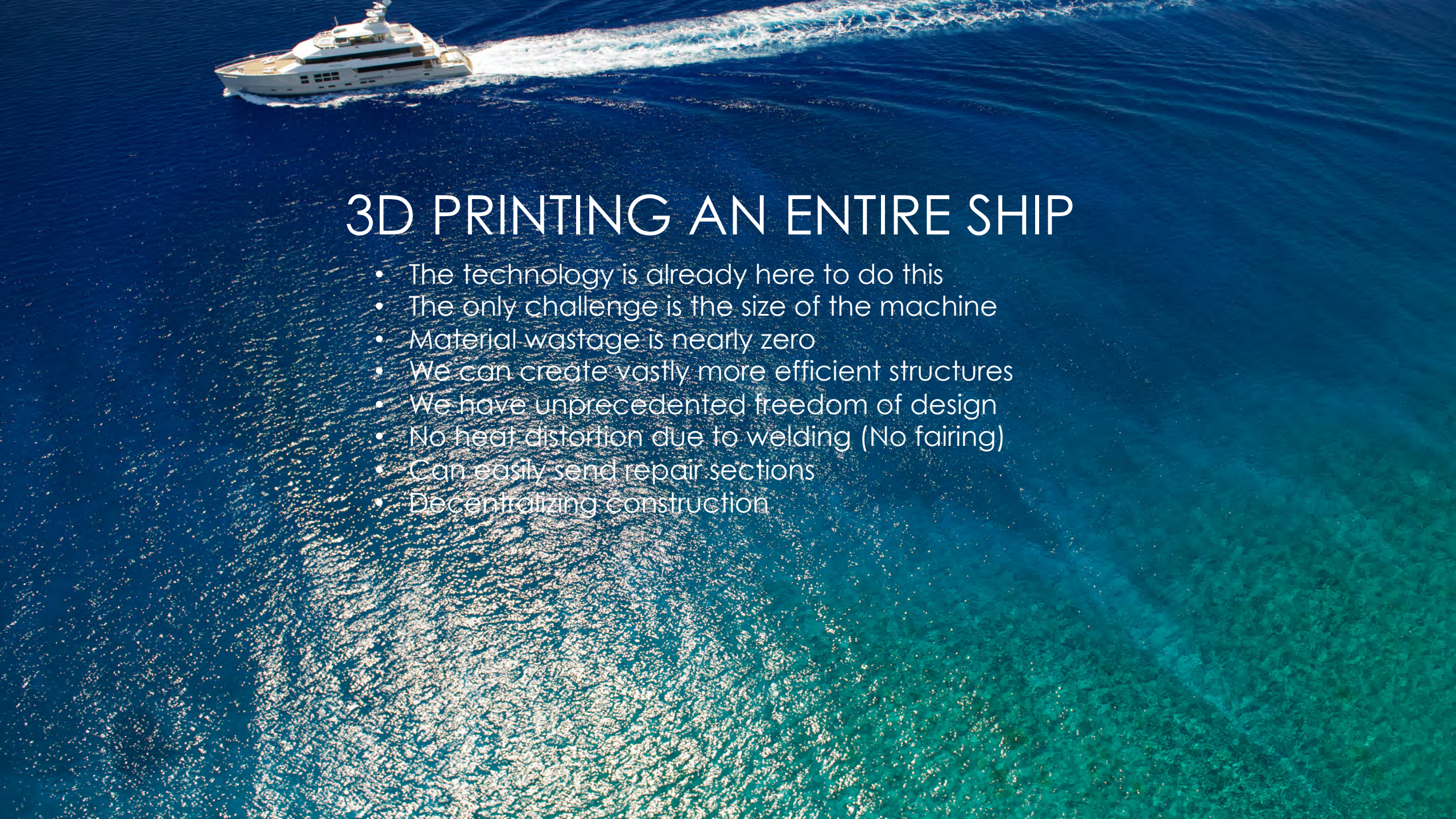
DRAWN BY: PVT		CHECKED BY:	
UNITS: INCHES		SCALE: NOT TO SCALE	
CLIENT PROJECT NUMBER:	S130-014	ISSUED ON:	16/01/2007
GCM PROJECT NUMBER:	4161	SHEET NUMBER	sheet1

DRAWING NUMBER: 4161-A20 REV: -.06


ENTIRE LOWER ACCOMMODATION ROUGH IN BUILT BY THREE PEOPLE IN 11 DAYS WITH LESS THAN 2% WASTAGE USING A 15 YEAR OLD CNC MACHINE

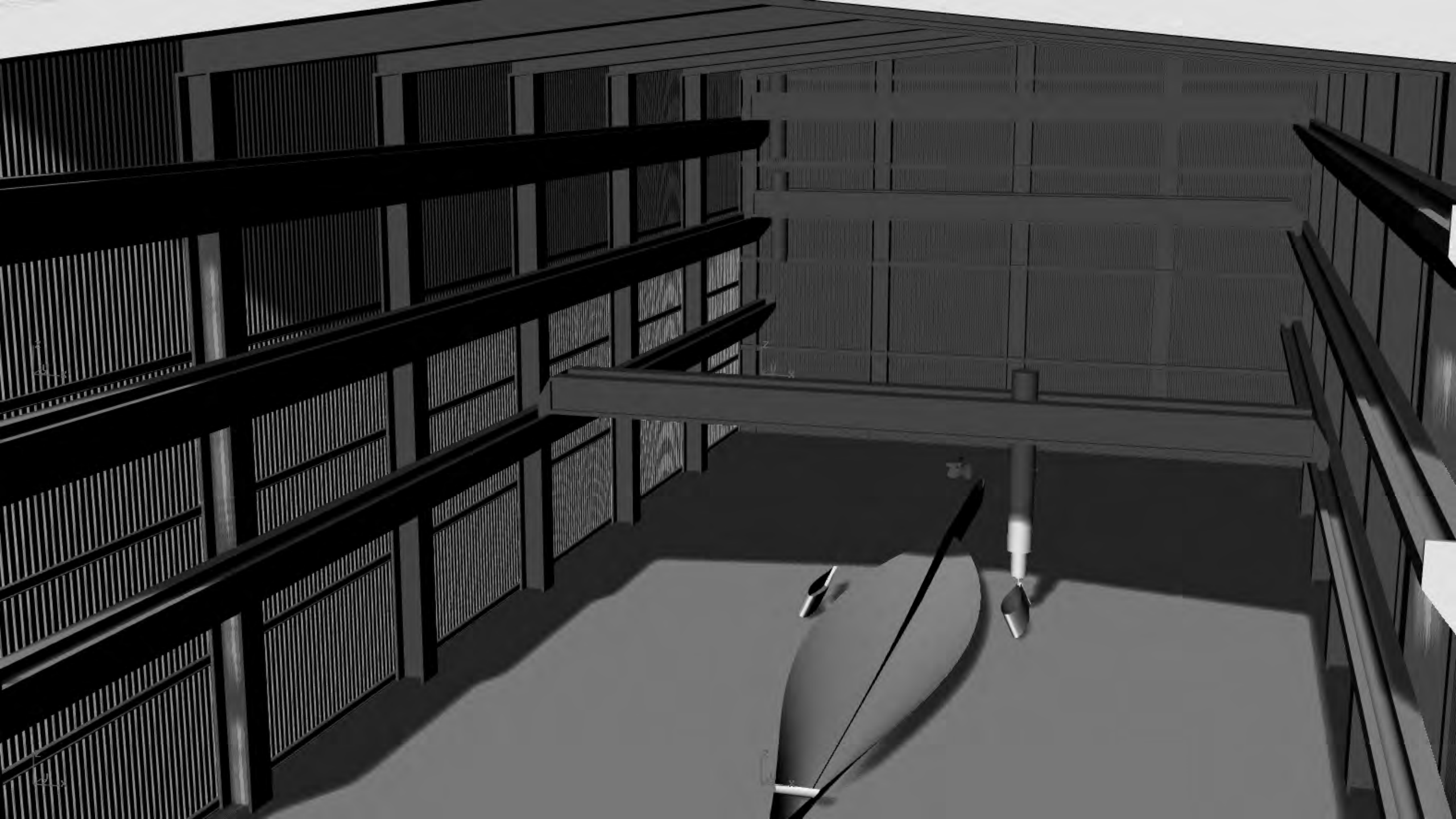
3D PRINTING

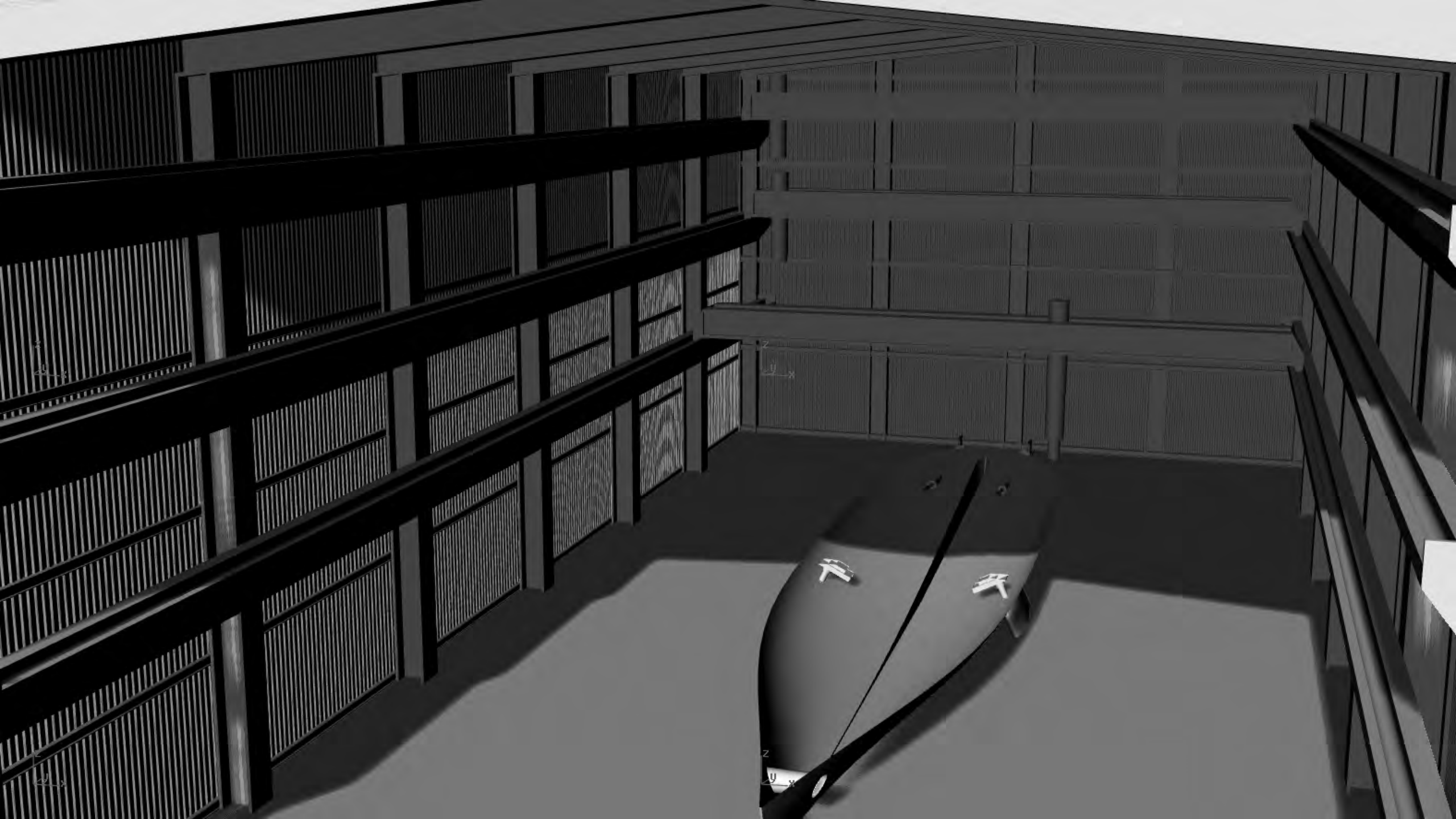
3D PRINTING AN ENTIRE SHIP

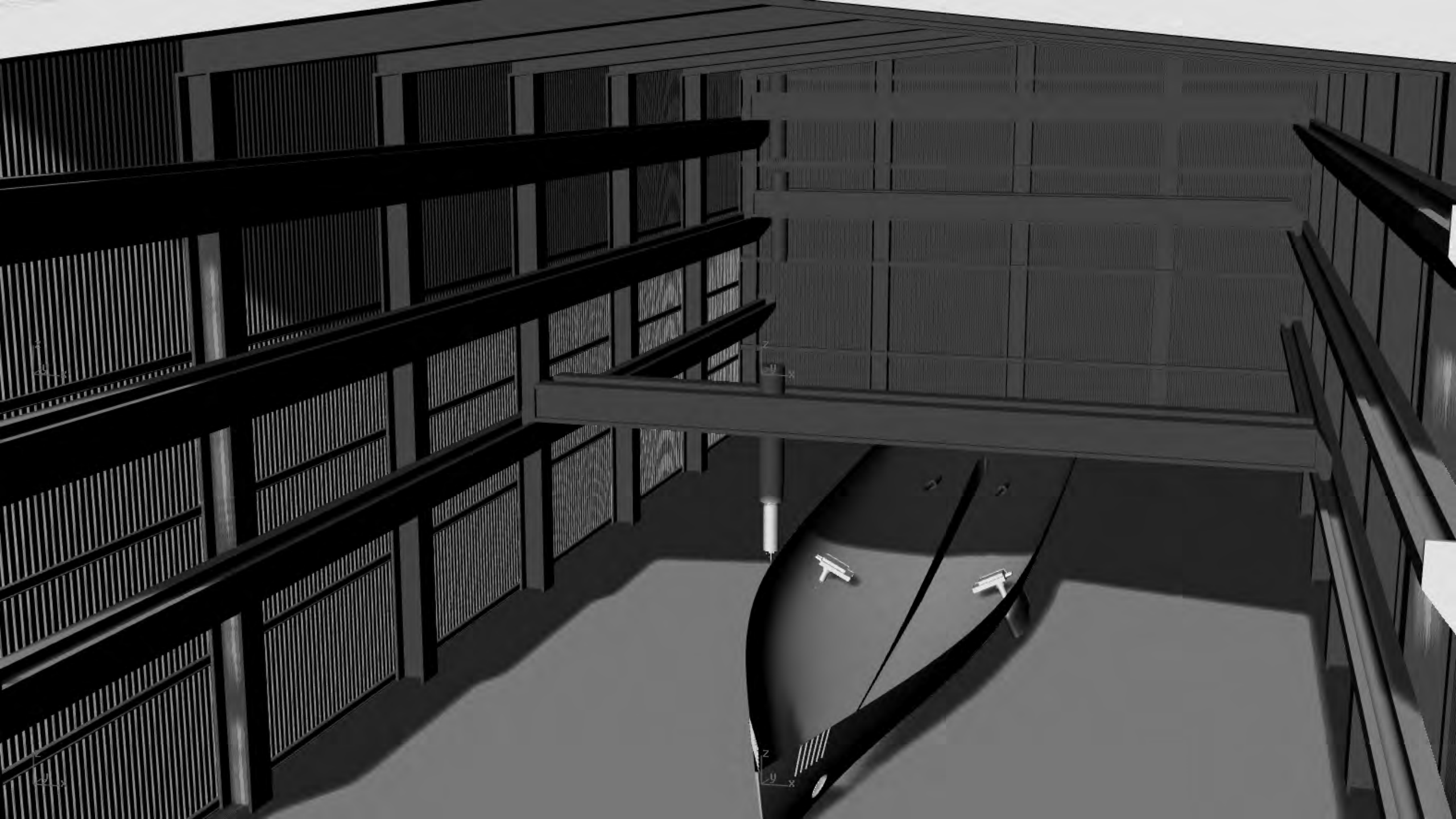


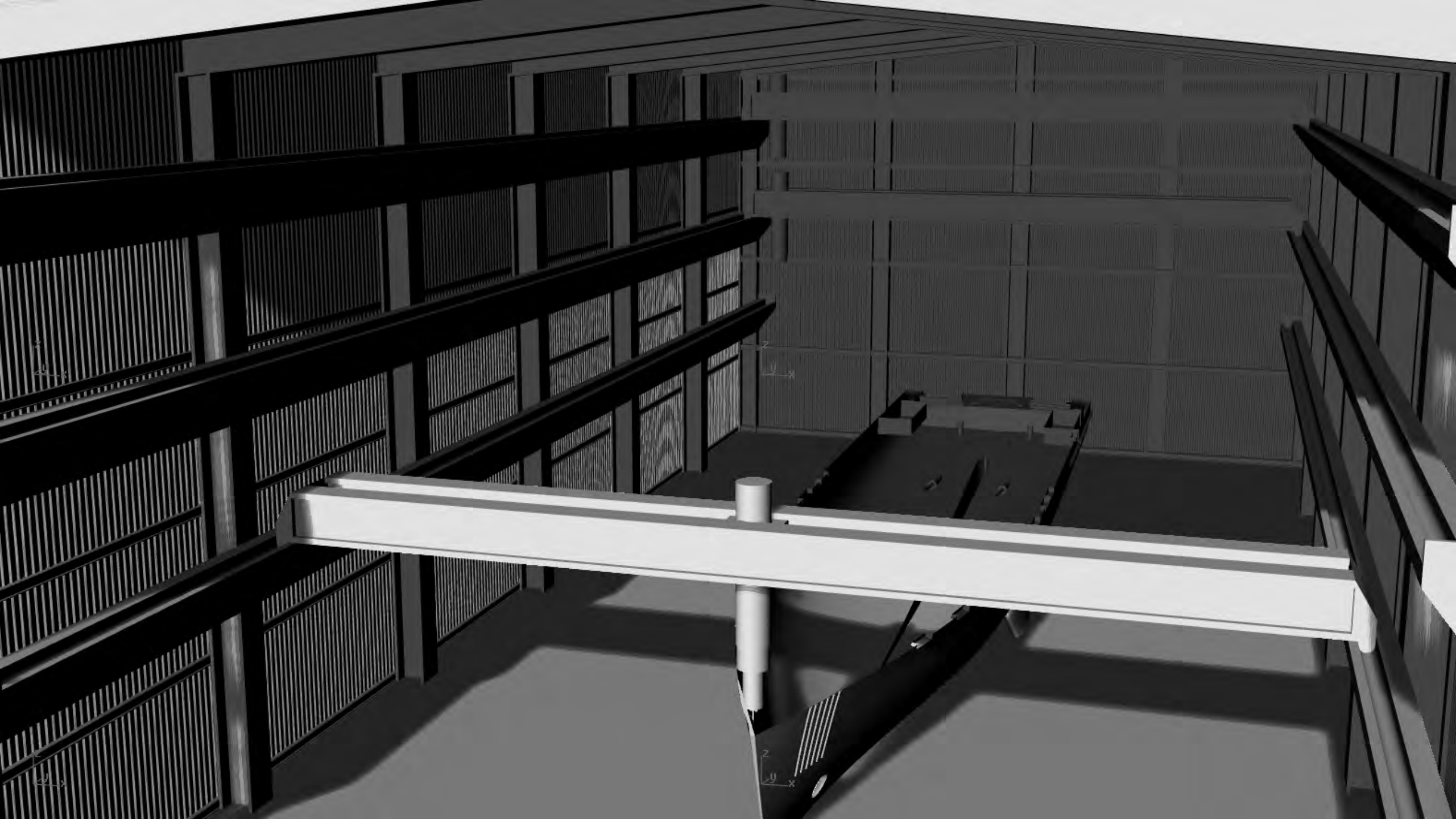
3D PRINTING AN ENTIRE SHIP

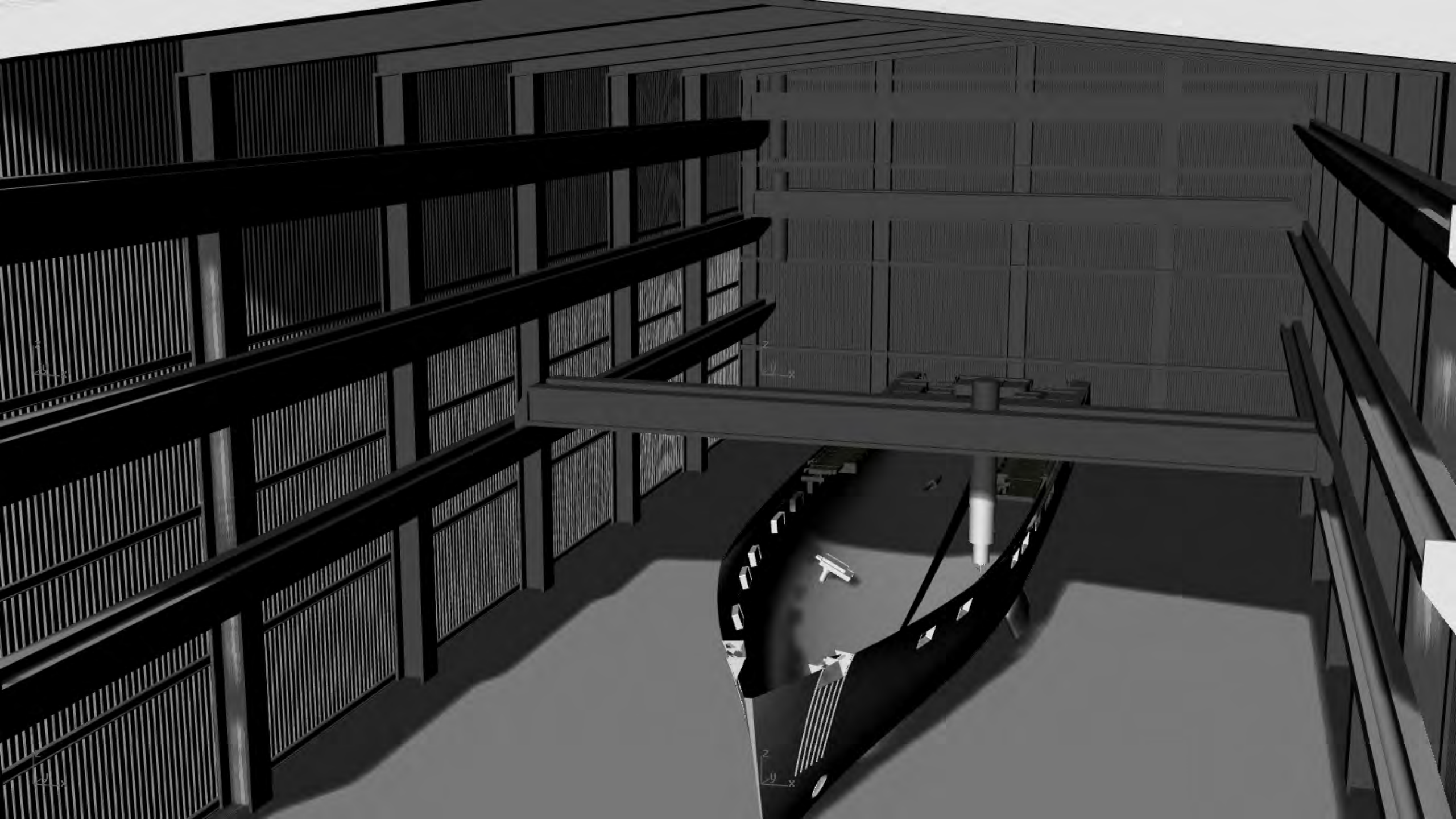
- The technology is already here to do this
- The only challenge is the size of the machine
- Material wastage is nearly zero
- We can create vastly more efficient structures
- We have unprecedented freedom of design
- No heat distortion due to welding (No fairing)
- Can easily send repair sections
- Decentralizing construction

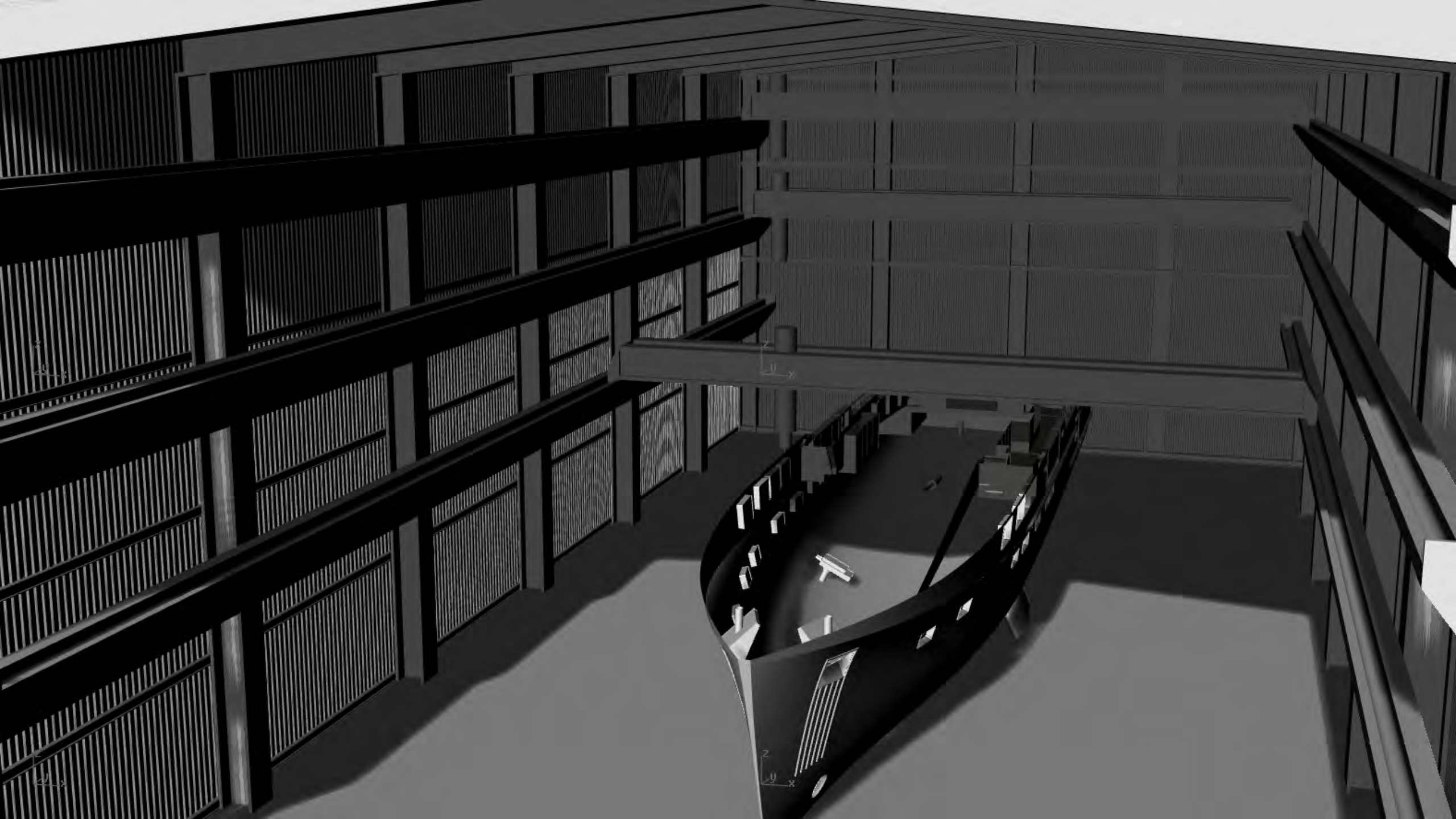


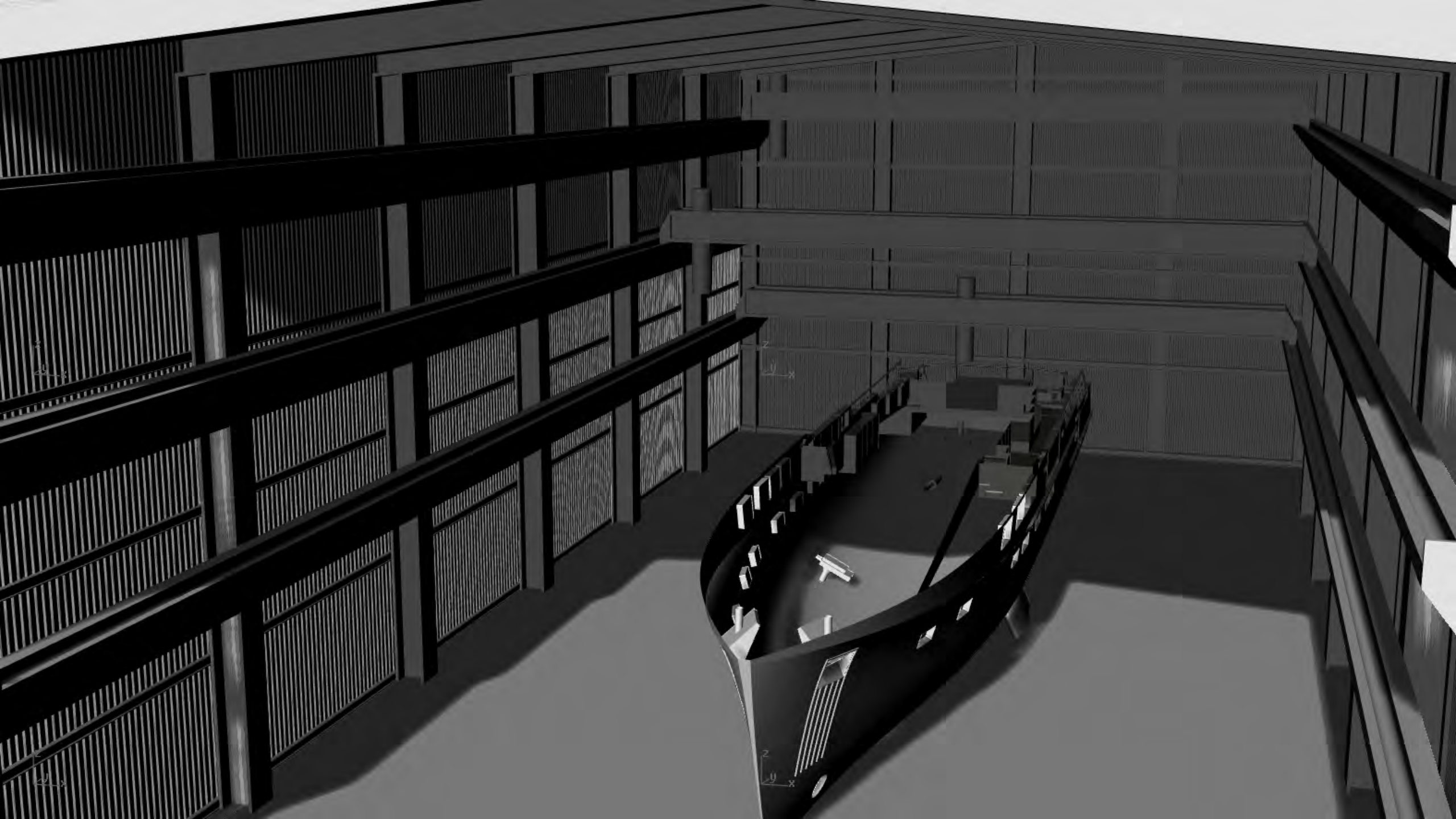


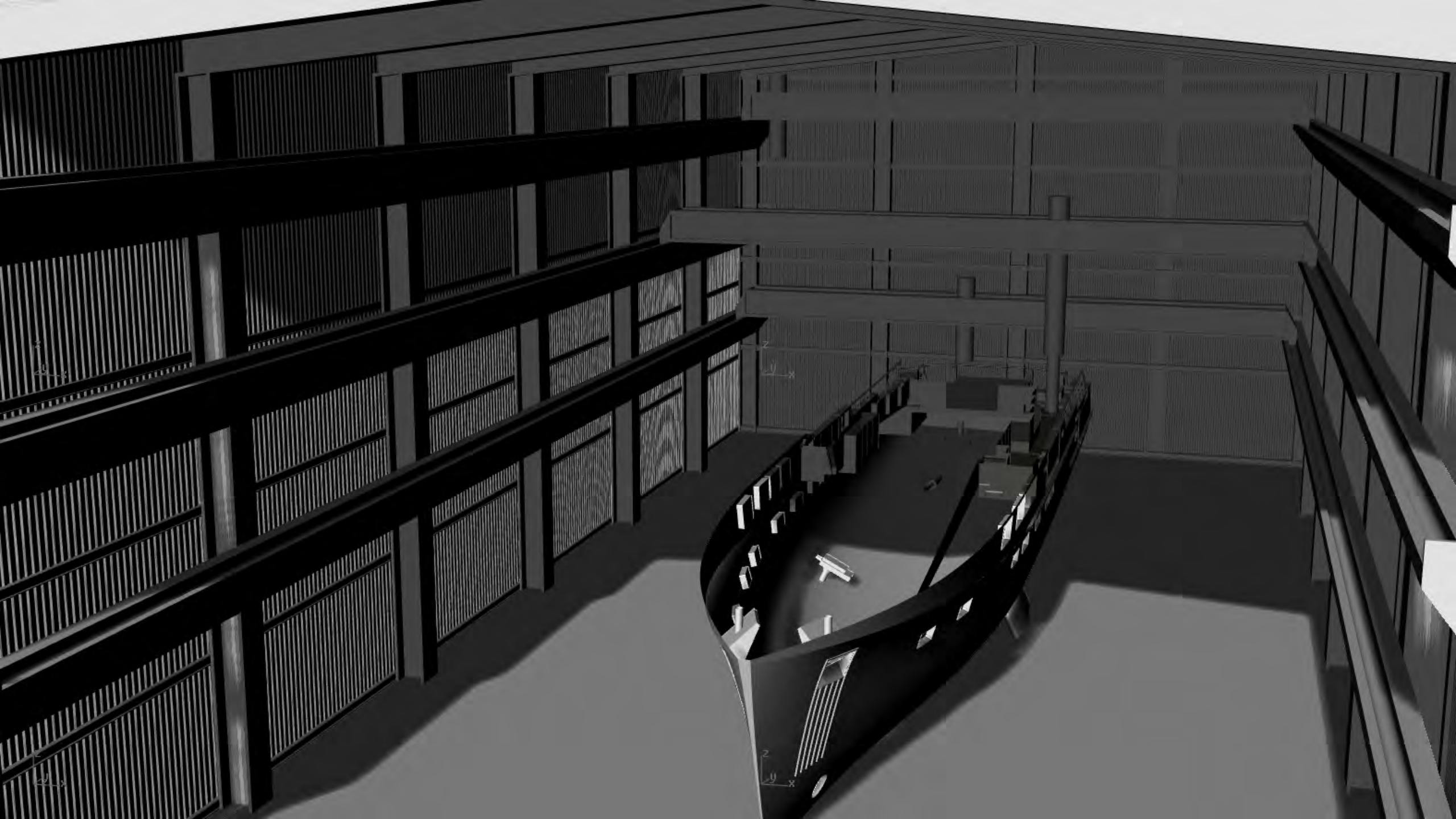


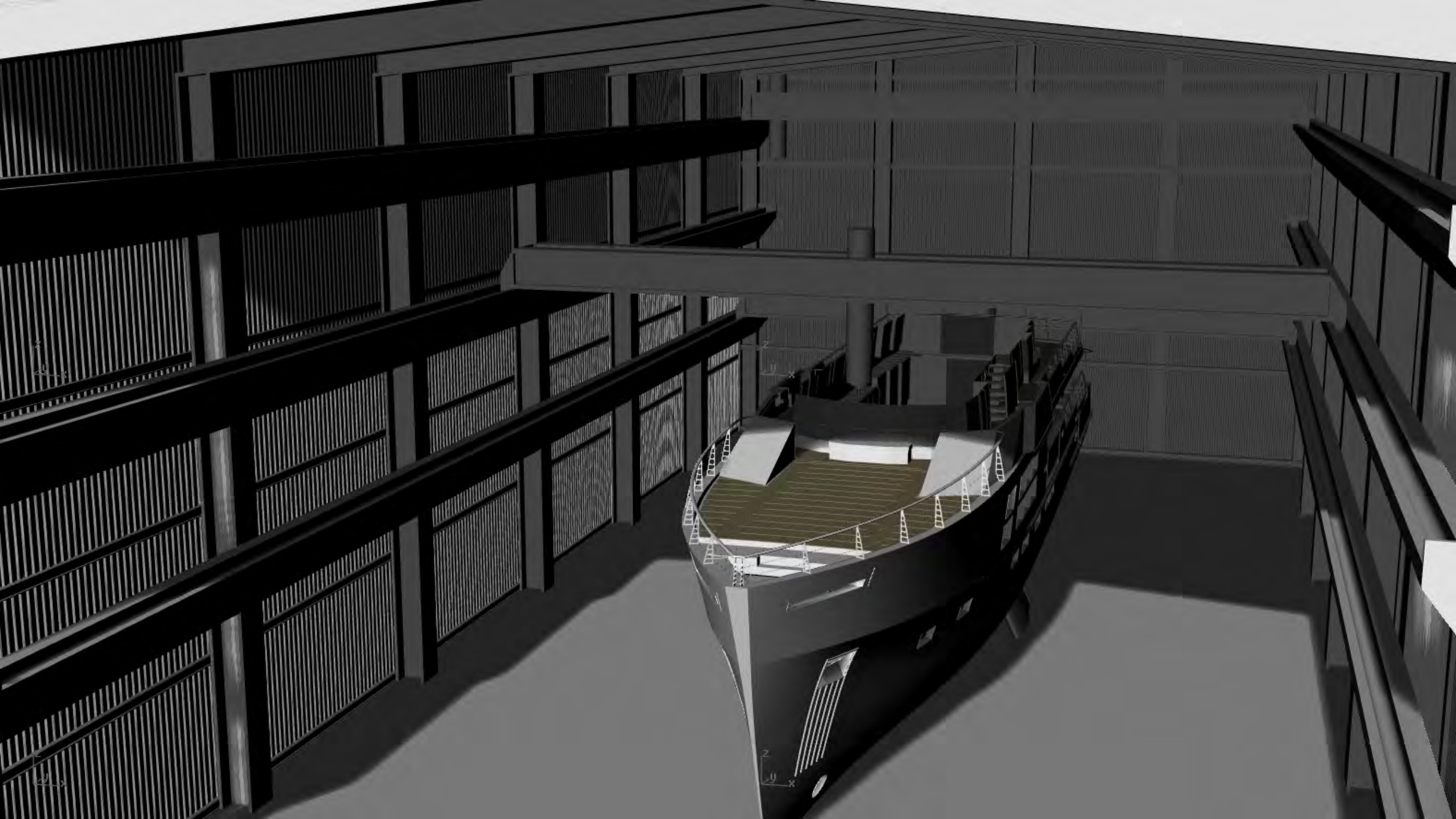


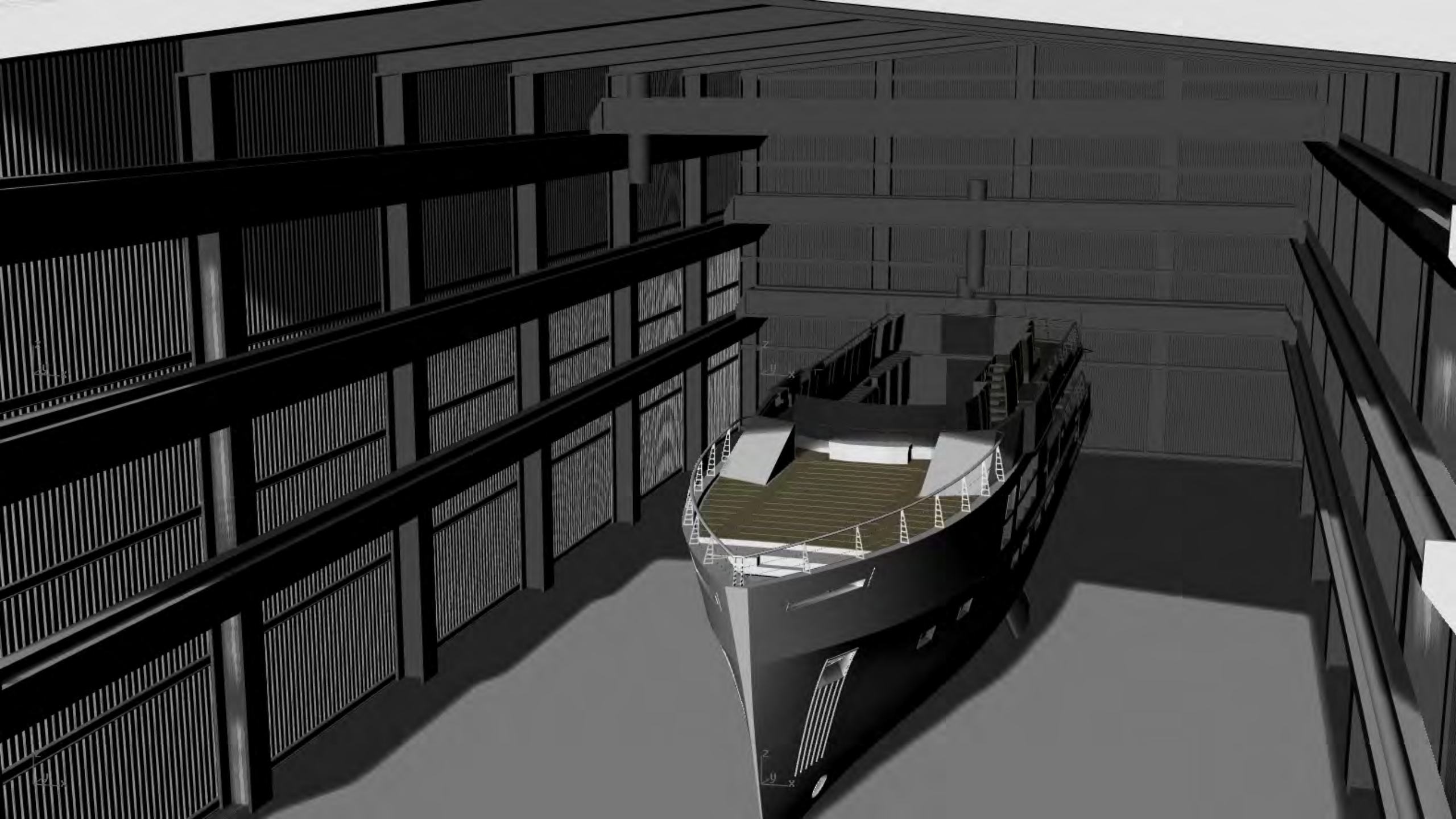


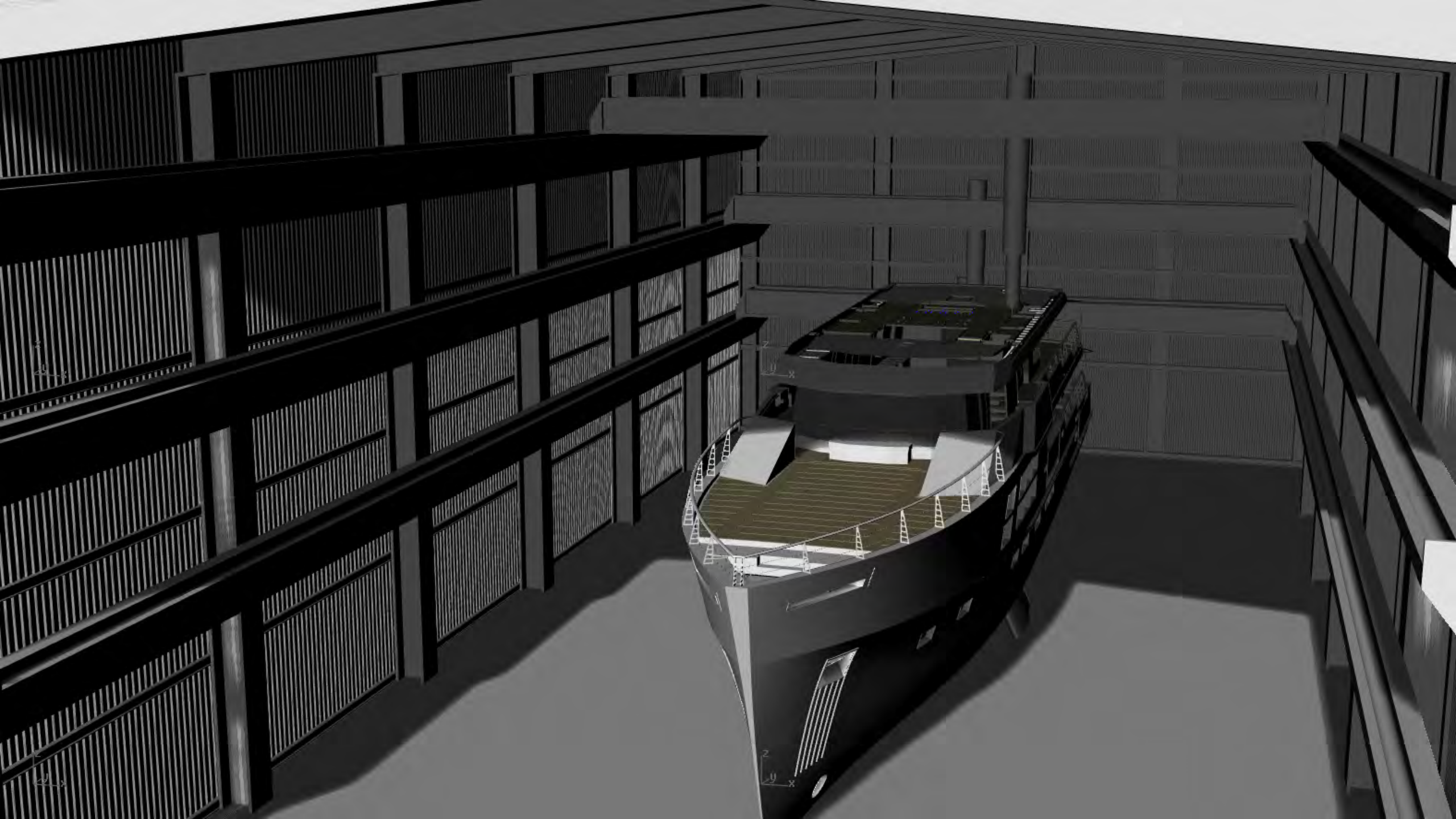


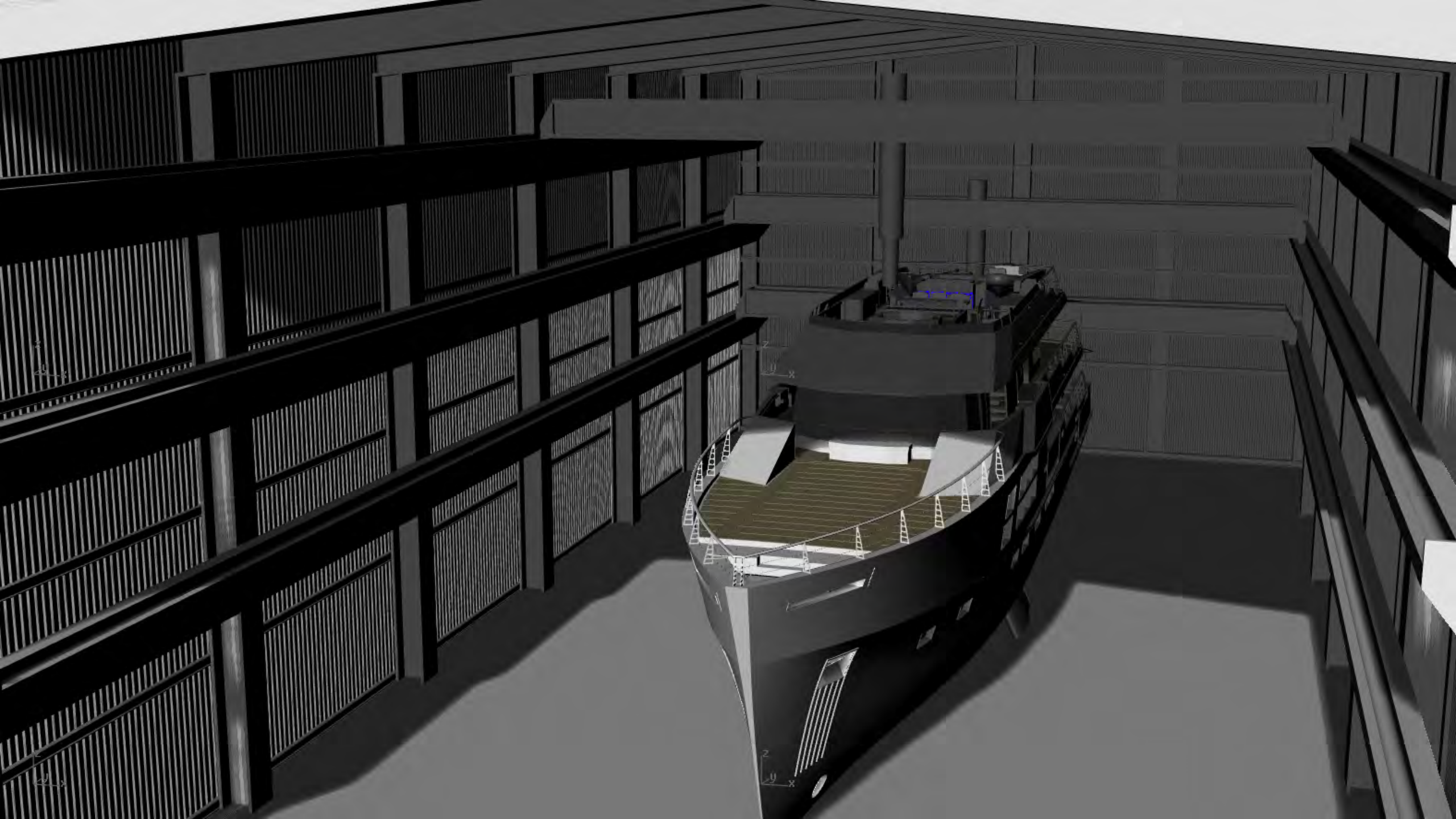


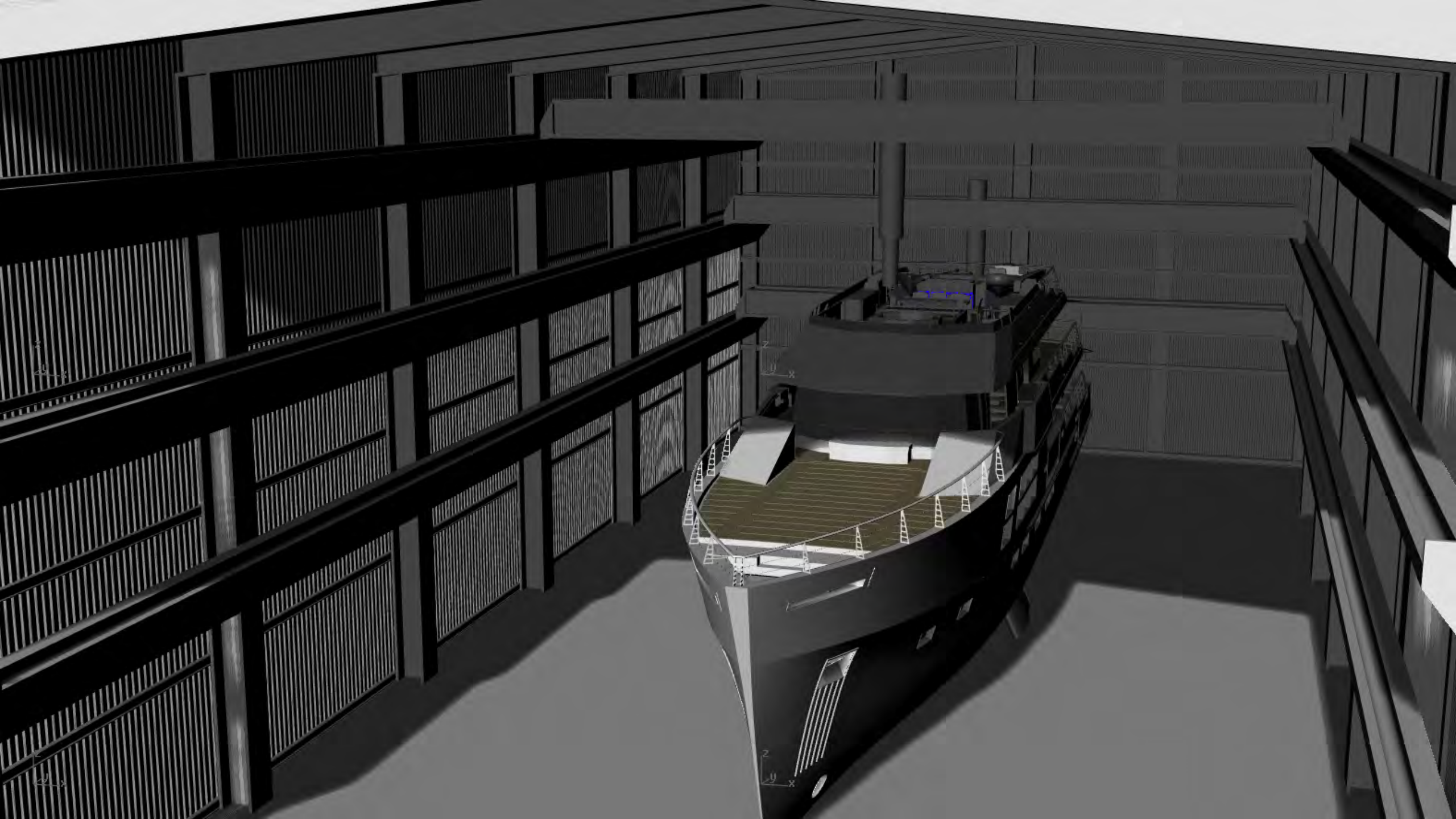


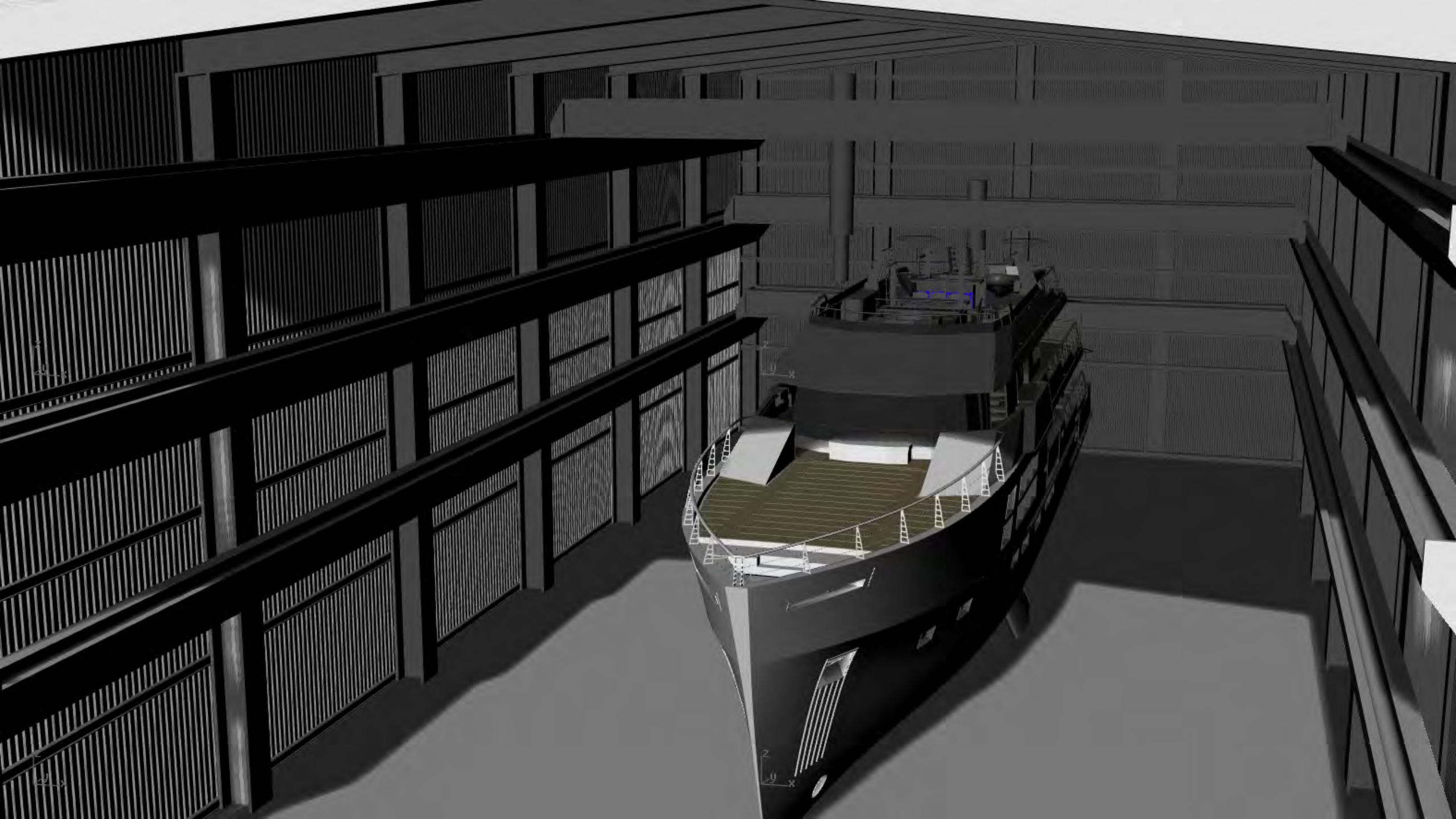


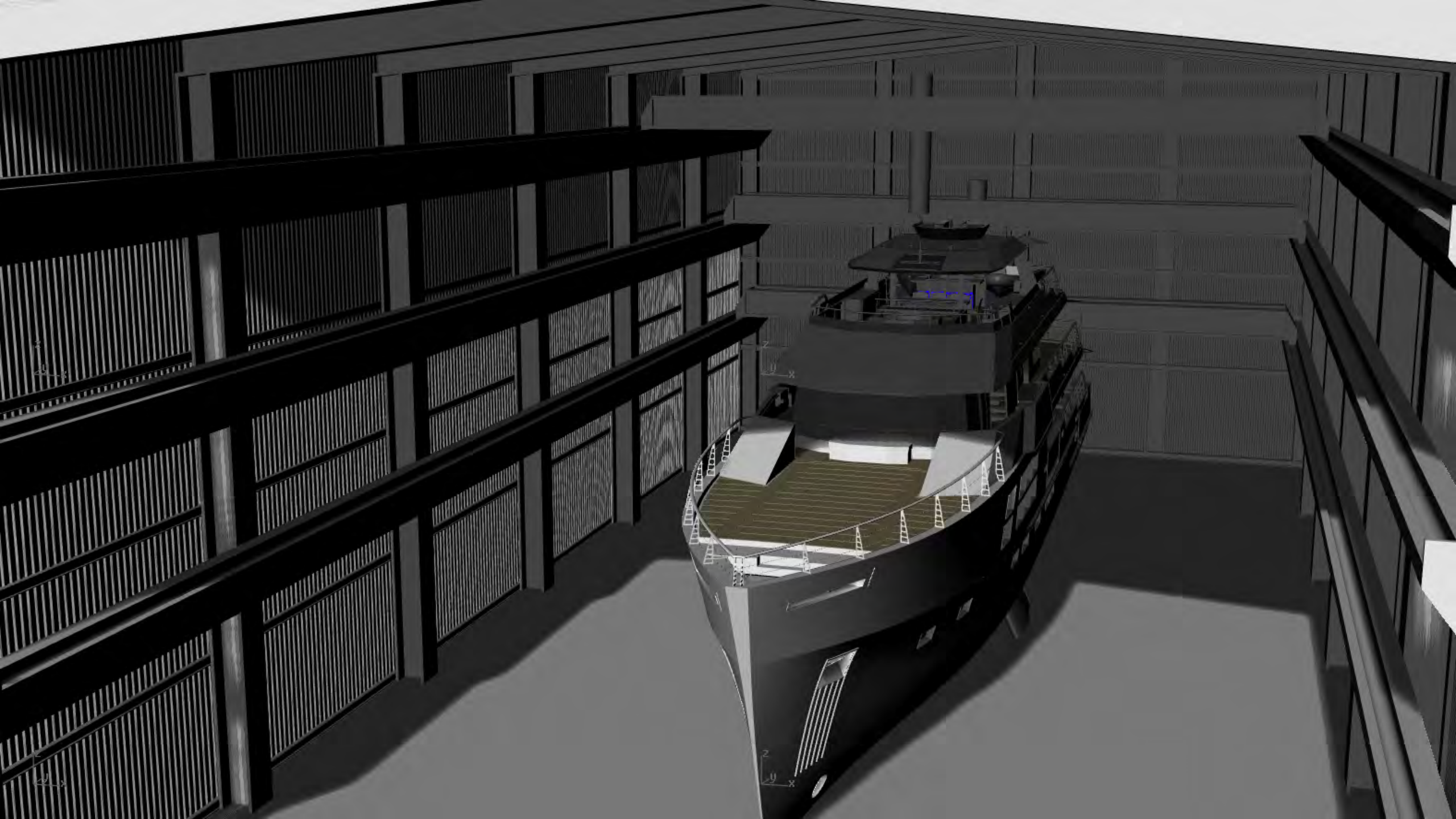


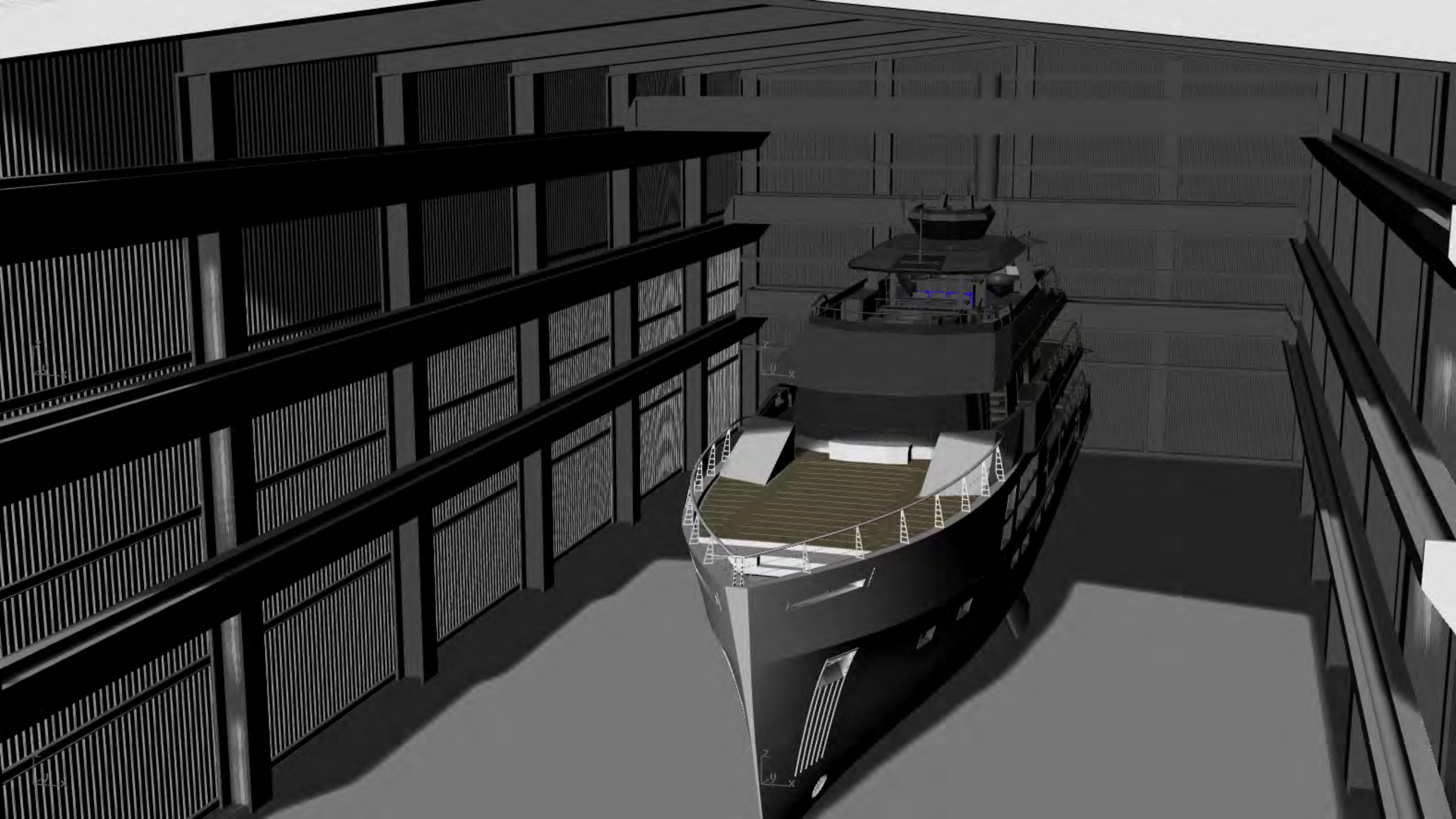


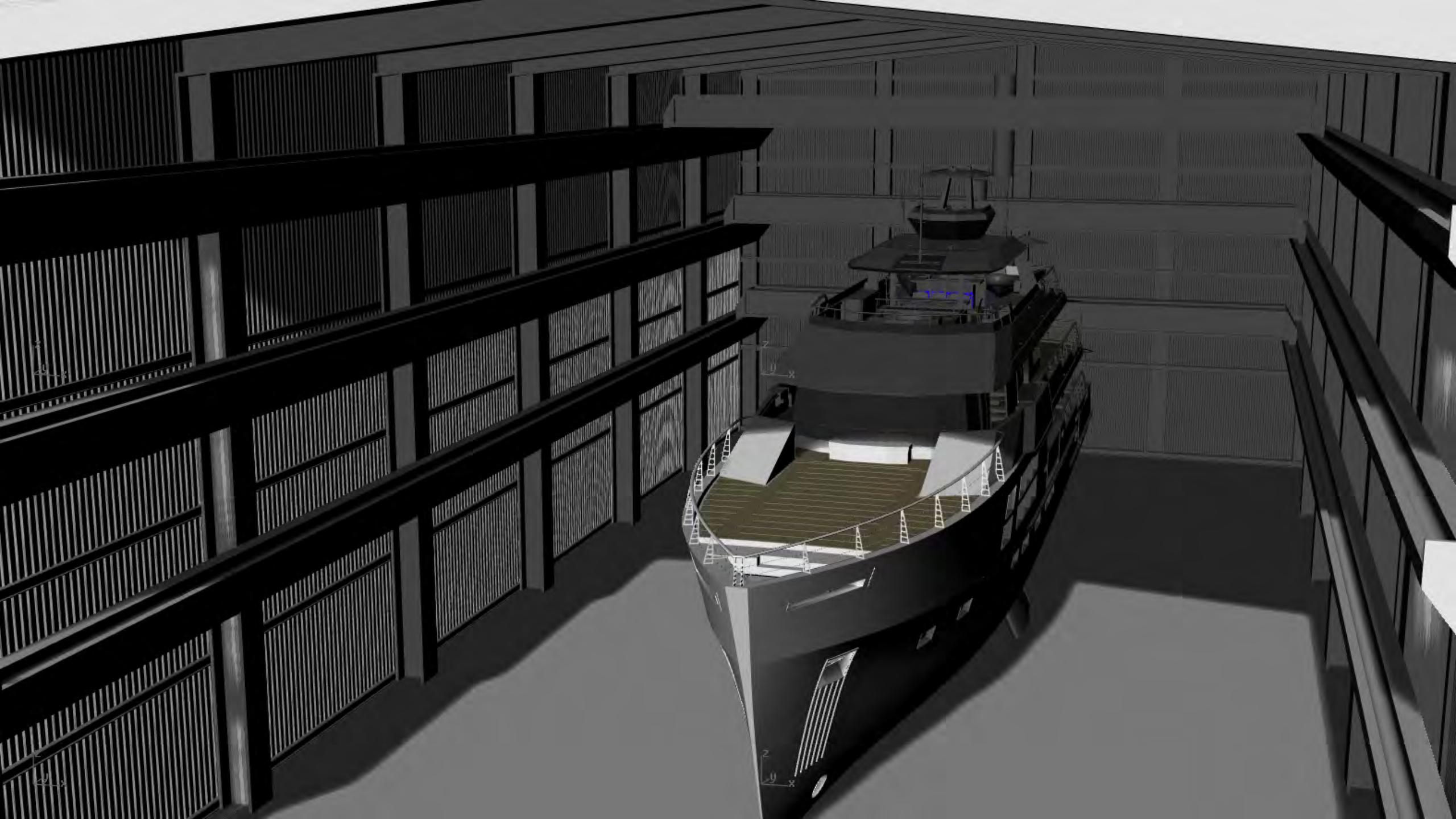


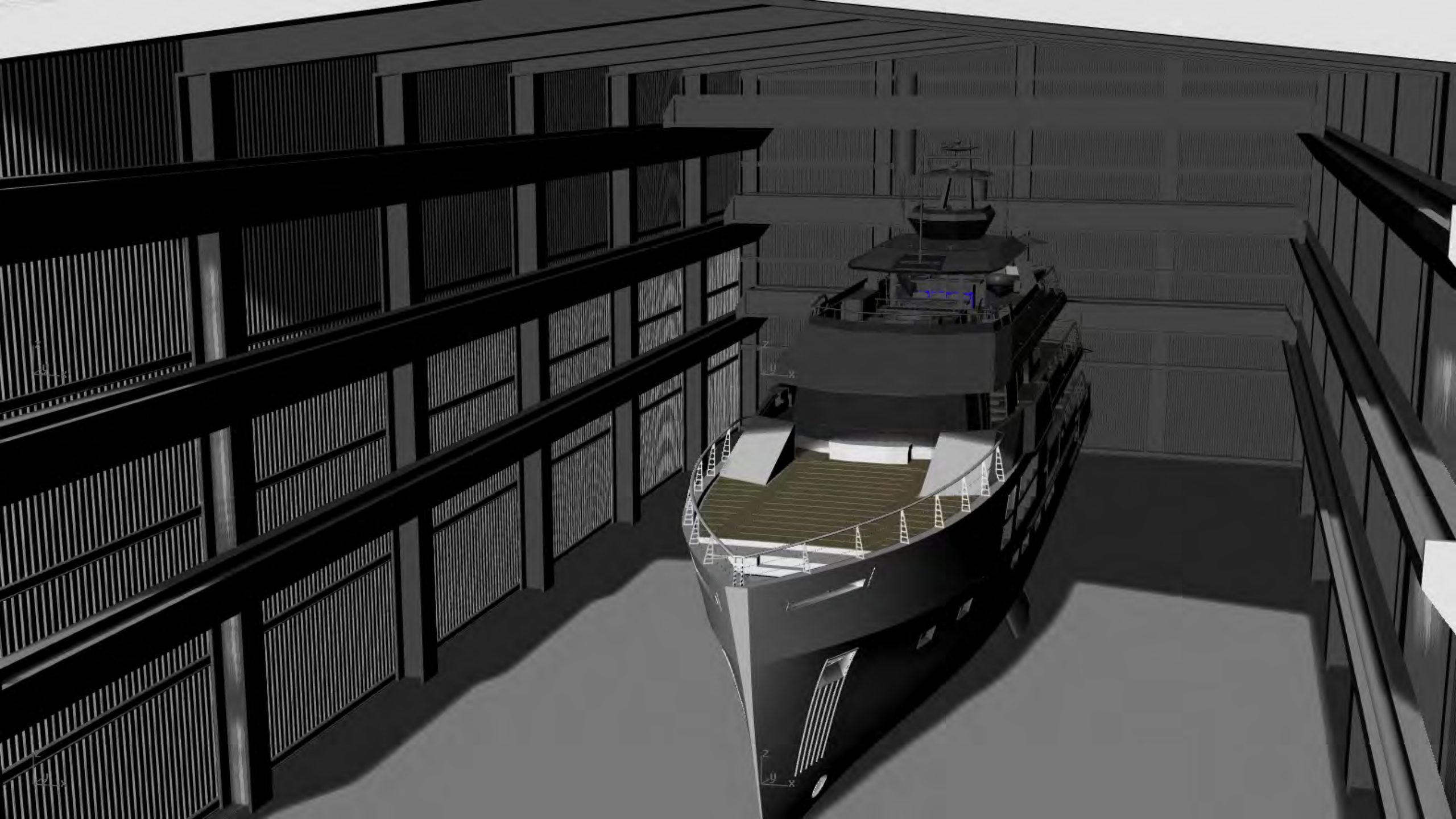


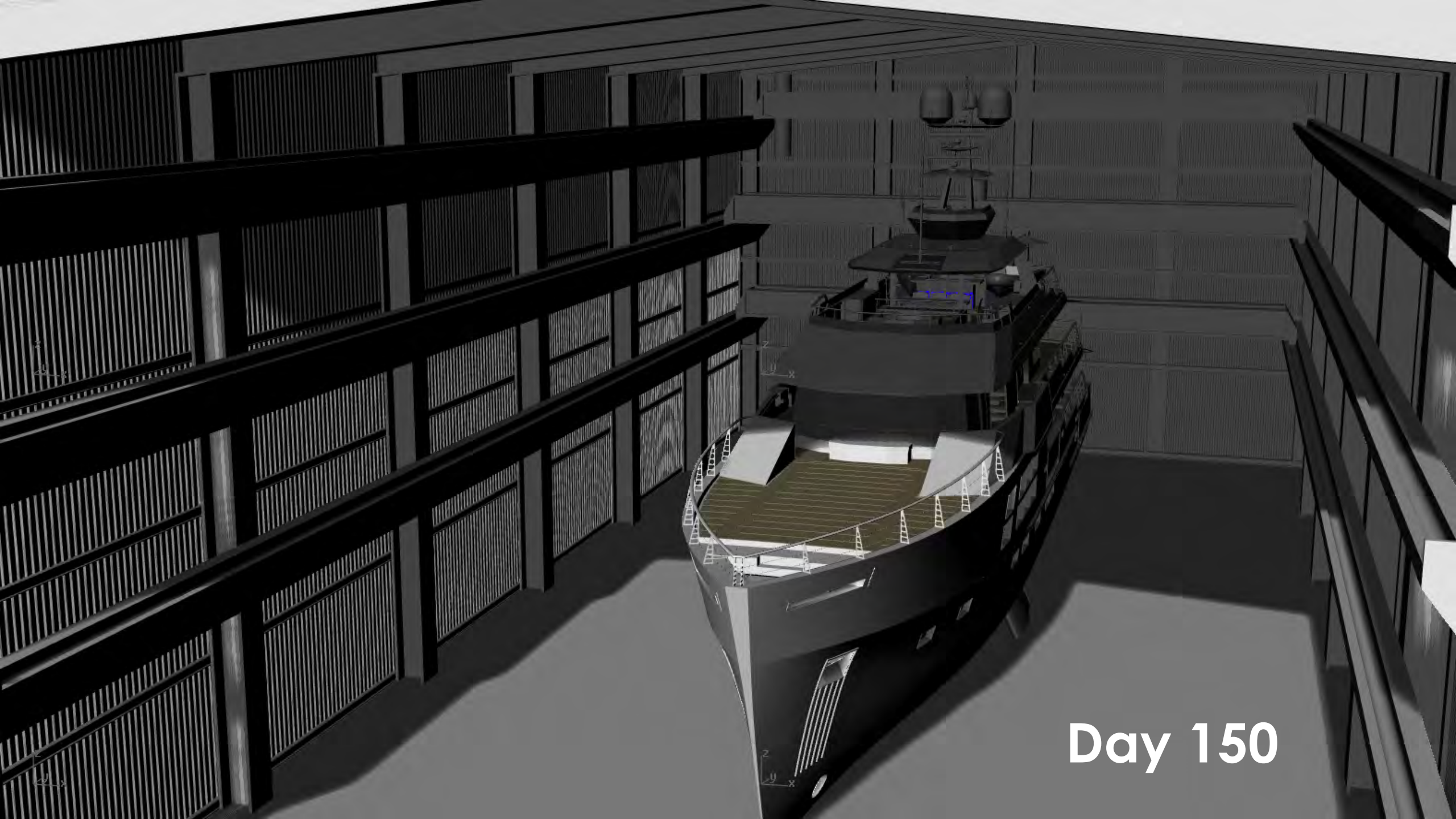






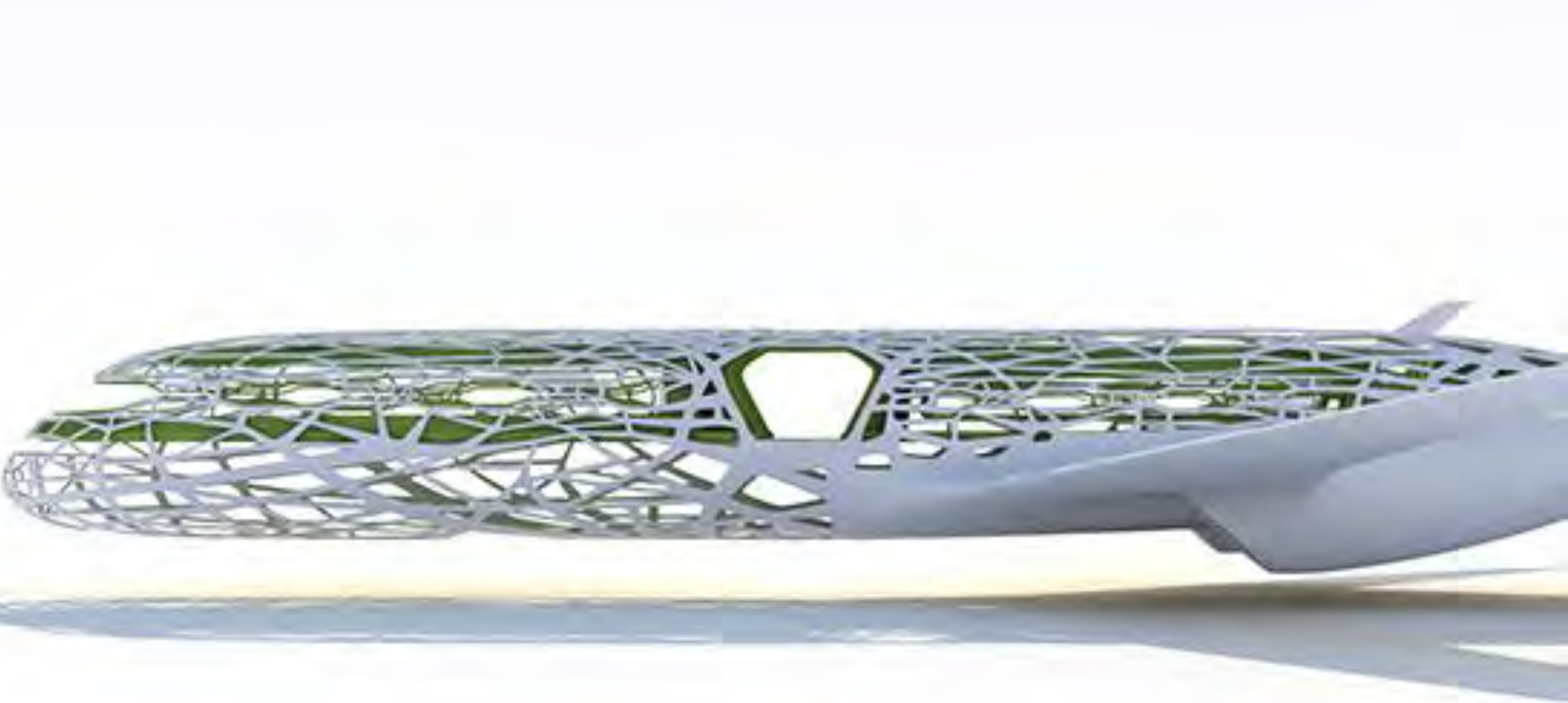





Day 150


THIS MAY SEEM FAR FETCHED


3D PRINTED CAR



Airbus has a goal to build a 3D printed Airplane by 2050


integrated wiring
pathways

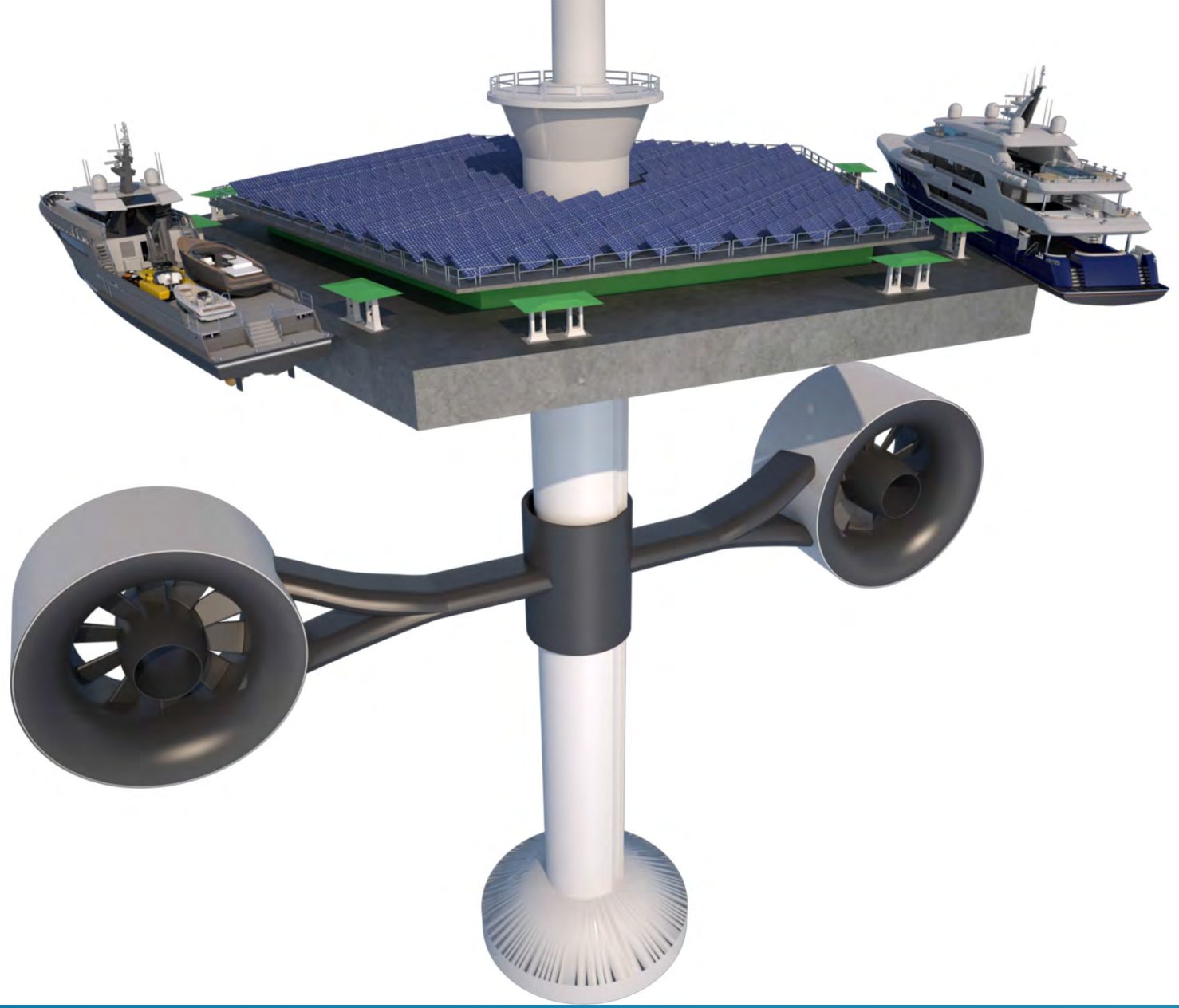
3D PRINTED AIRCRAFT


WE ARE CURRENTLY
ENGINEERING THE
FIRST TEST SECTION

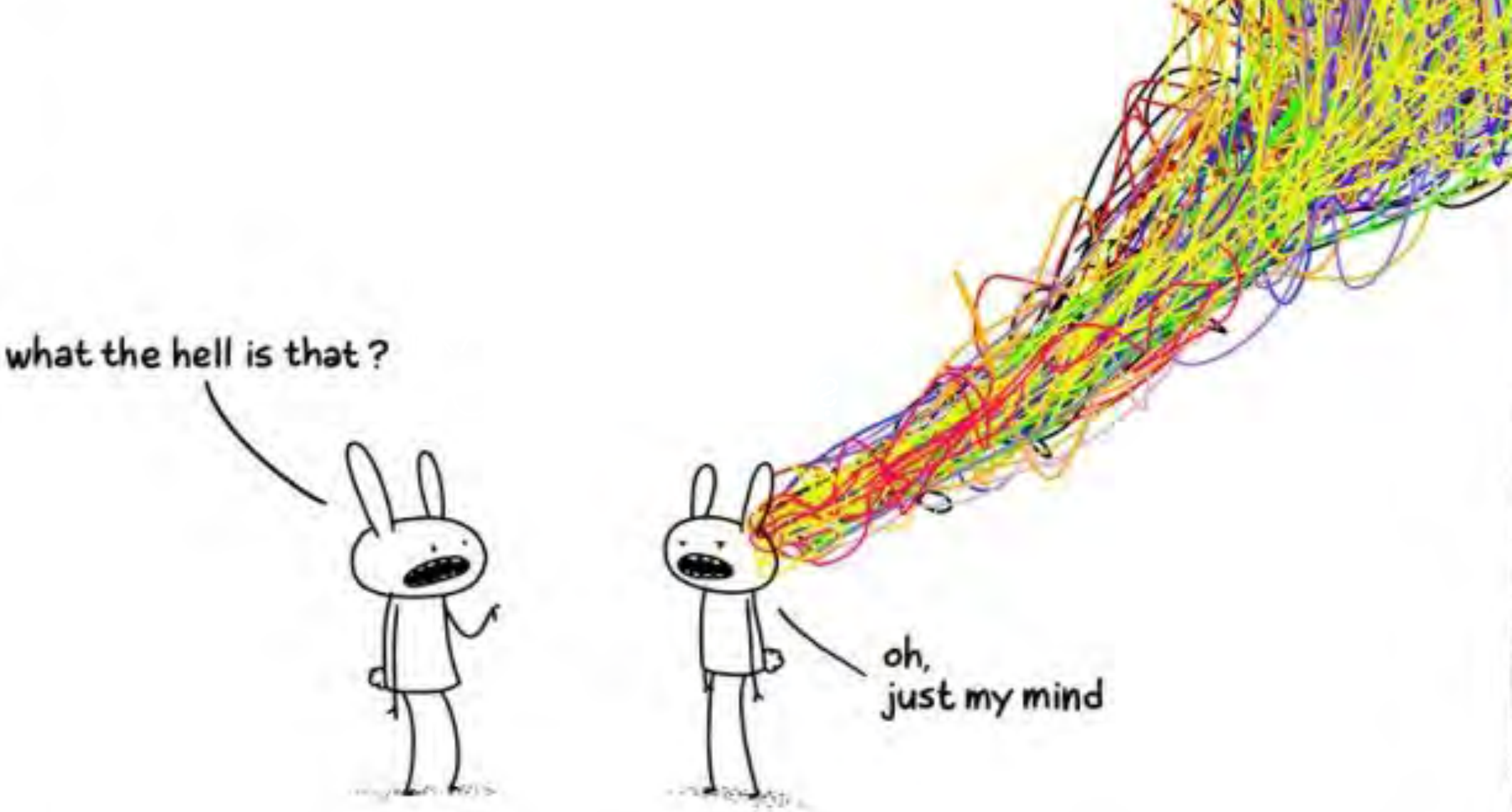

ANYTHING ELSE
BEFORE 2020 ?


AT SEA SUPERCHARGING STATIONS


EDF
EDF



“AT SEA” SUSTAINABLE CHARGING STATIONS



Thank You