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RE-WILDING THE OCEANS

49

WE GROW GIANT KELP FORESTS TO SUPPORT THE HEALTH OF THE OCEANS AND LOCK AWAY CO2.

WE HARVEST THE CANOPY TO ACCELERATE THE SHIFT TO SUSTAINABLE PLANT STIMULANTS AND ANIMAL FEED.

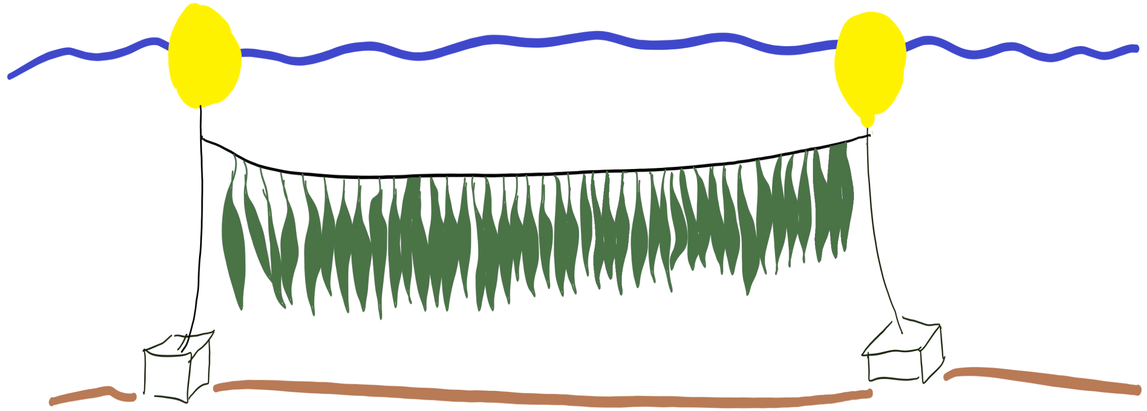
Up to 160 feet tall

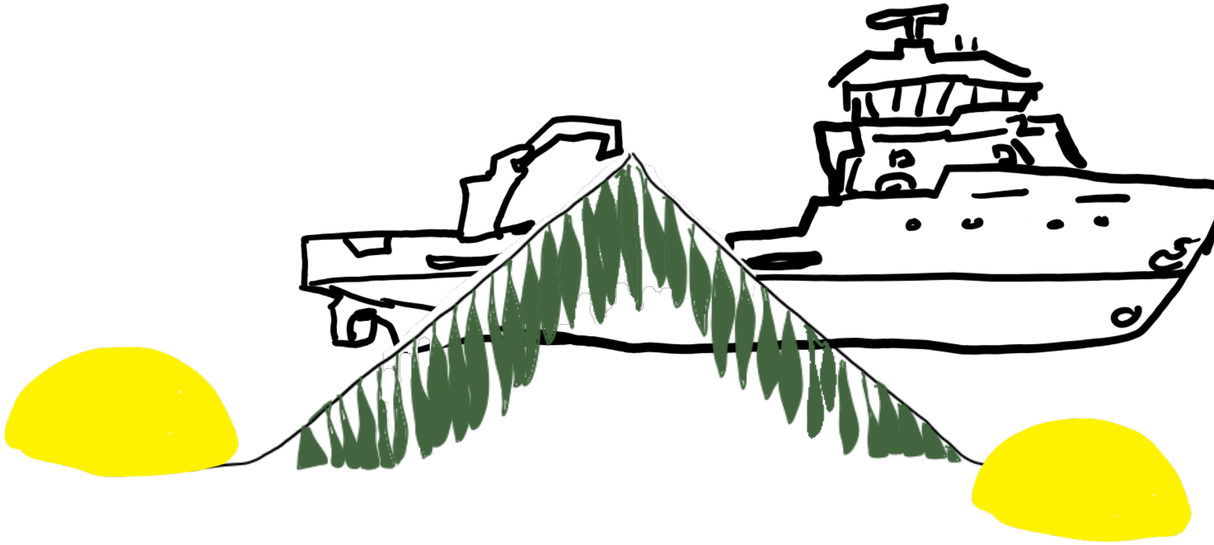
Growth Rate 30 in per day

No known diseases

Supports 800+ species

SUGAR KELP FARMING





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WHAT MAKES US DIFFERENT

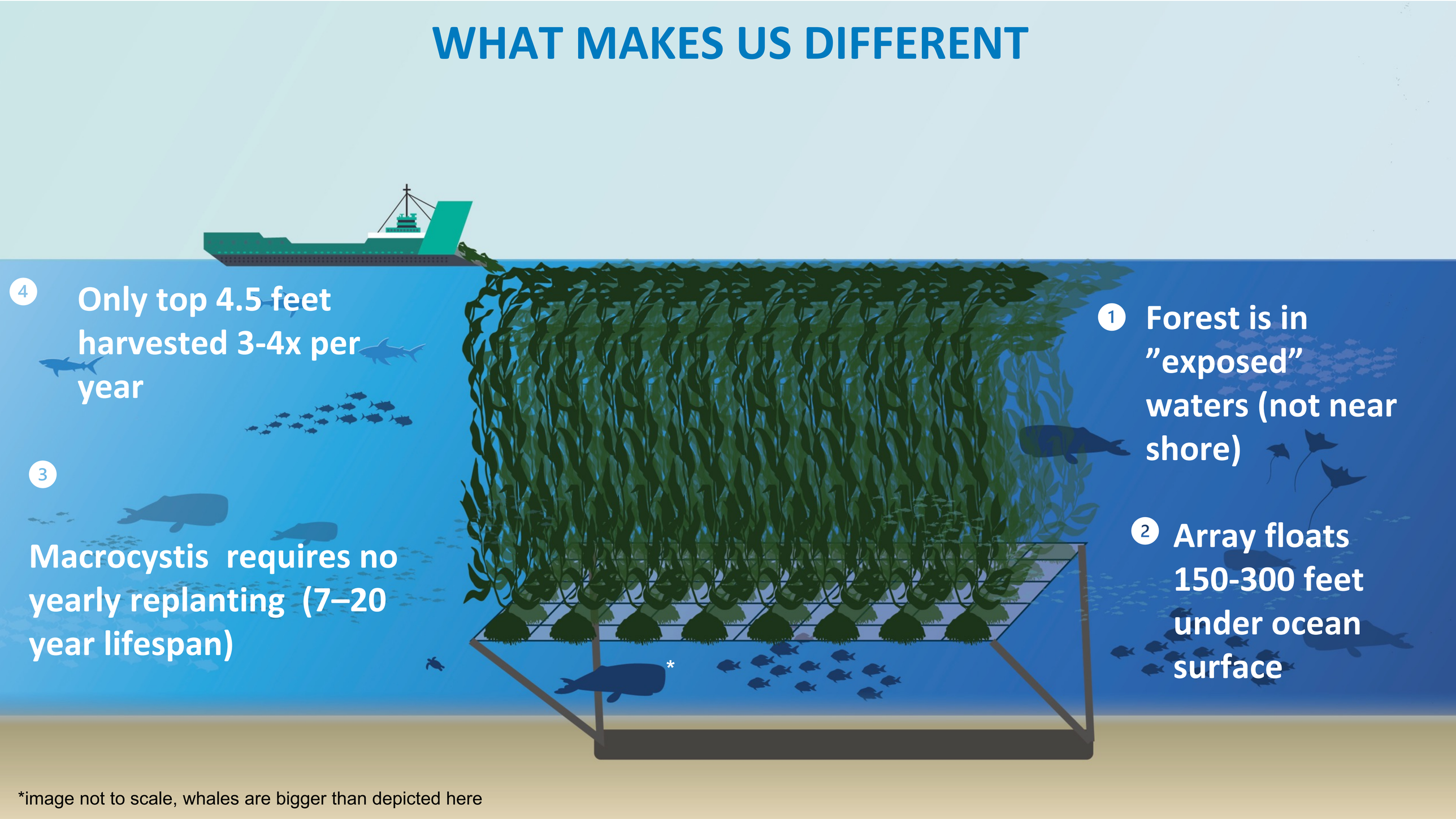

*image not to scale, whales are bigger than depicted here

Hercules Powder Company's Kelp Harvester "Bacchus" 1915

It (and macrocystis) helped us win WWI !

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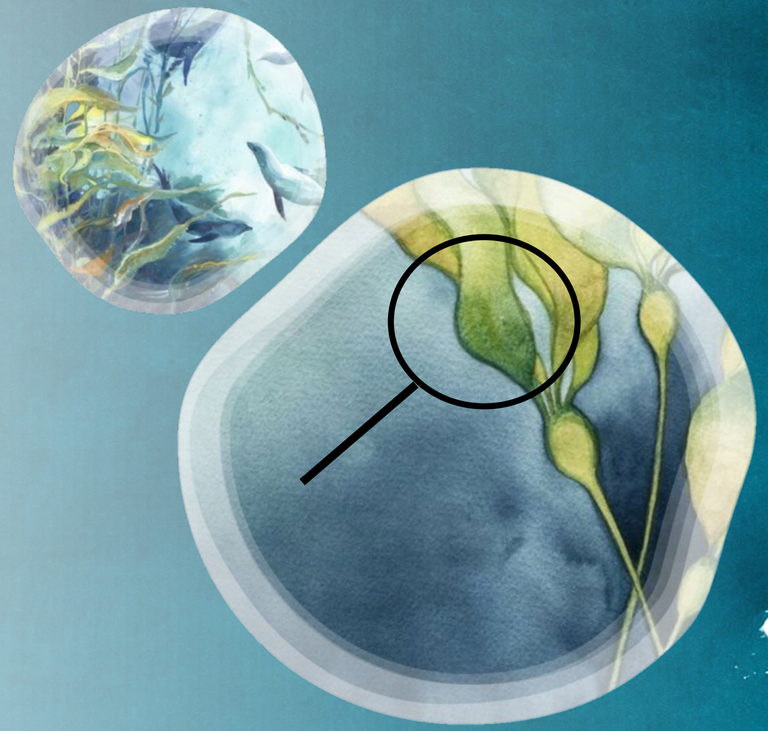
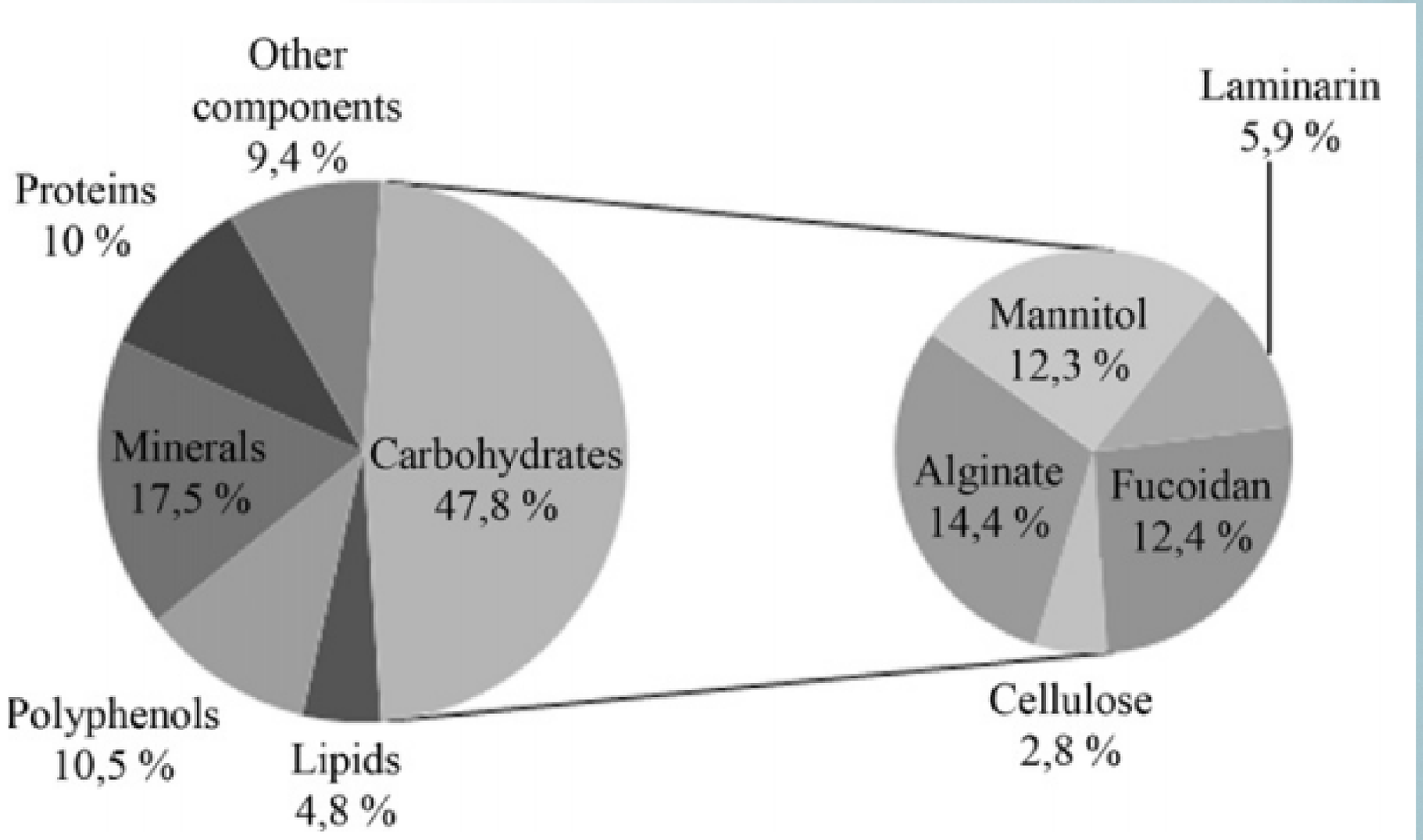
WHAT IS IN OUR KELP





END PRODUCTS WILL TARGET DEEP MARKETS

BIOSTIMULANTS

- Fertilizer and soil improver (milled)
- Concentrated liquid fertilizer

BENEFITS

- Increase plant resilience to disease
- Improves water retention and nitrogen-fixing of soils

Primary

FEED SUPPLEMENTS

- Feed supplement for fish, mollusks, cattle, sheep, horses, swine, poultry

BENEFITS

- Improves animal gut health
- Natural anti-inflammatory Rich source of iodine

Secondary

BIOPLASTICS

- >30 industrial uses

BENEFITS

- Sustainable and biodegradable

Secondary

TEXTILES

- Textile fibers
- Wound dressings and bio-medical textiles and implants

BENEFITS

- Wholly natural and organic fibers with a positive environmental footprint
- Natural anti-septic and anti-inflammatory properties

R&D workstream

BIOMEDICAL MOLECULES

- Ingredients for medical treatments
- Fucoidan

BENEFITS

- Strong anti-viral and anti-cancer properties

R&D workstream

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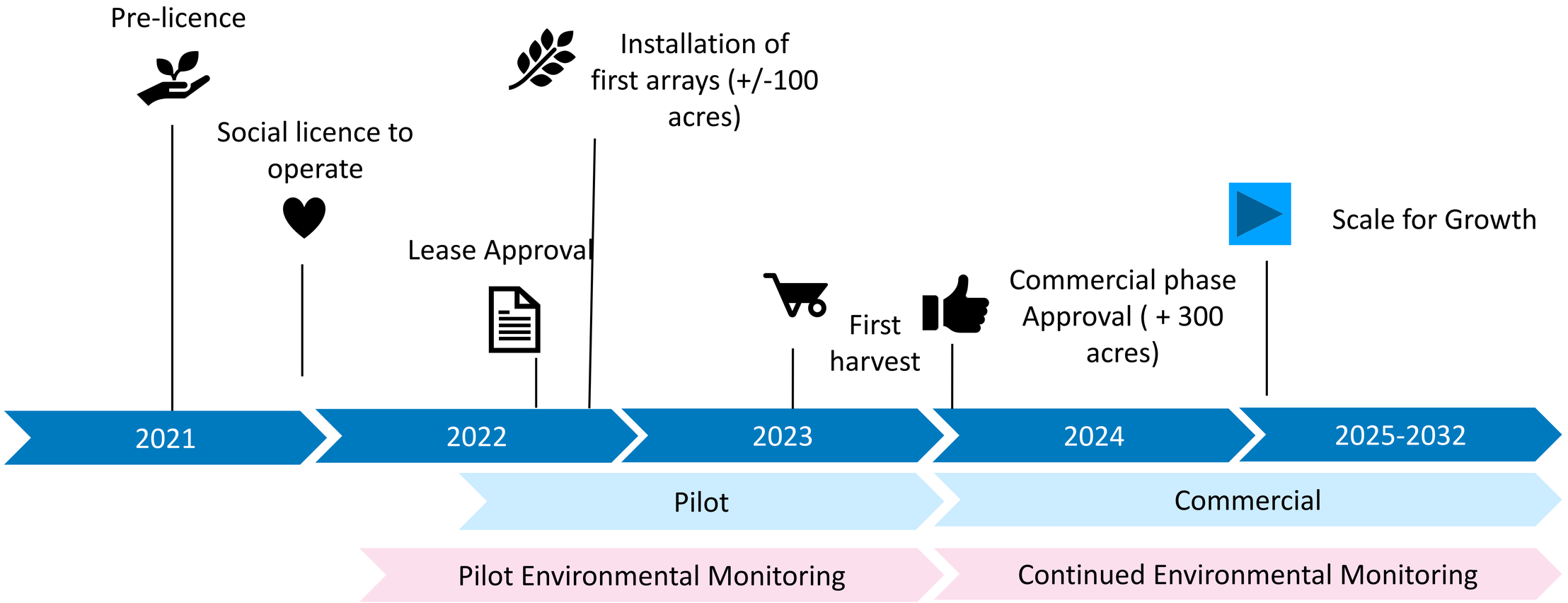
Kelp 49 Blue: Project Schedule



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KELP BLUE 49 2032 VISION

DRAWS DOWN OVER

1 MILLION

TONS CO2/YEAR

3000 ACRES FORREST

BOOST TO REGIONAL FISH STOCKS

Biodiversity boost – typically 200+ species take up residence in kelp understory

CONSISTENT UPWELLING CURRENT

30 JOBS

Array fabrication

10 JOBS

Farm monitoring, harvest and shipping support

10 JOBS

State-of-the-Art Lab/Center of excllelnce Innovative processing of kelp for high value extracts

KELP BLUE EXPECTS TO HAVE EMPLOYED

>70 PEOPLE

LOCALLY BY 2032

20 JOBS

Processing Factory

FRESH KELP

FRESH WATER

Entirely circular processing

BIOSTIMULANTS

6 mln tons

FEED SUPPLEMENTS

750 k tons

TEXTILES

PHARMACEUTICALS & BIOPLASTICS

KELP BLUE TEAM

Daniel Hooft
FOUNDER

Caroline Slootweg
CO-FOUNDER

Maxime Penning
BIOTECHNOLOGY

Hugo Stam
PROJECT ENGINEER

Agathe Bellay
FINANCE

You?
ALASKA MANAGING DIRECTOR

Iriya Jona
CULTIVATION & PROCESSING

Cayne Moffat
STRATEGIC PLANNING

Tom Andrews
CTO

Ferdi Knoester
PROJECT ENGINEER

Dr Sunny Sanderson
STAKEHOLDER ENGAGEMENT

Michael Fleischman
SOURCING & PROPAGATION

Protasius Mutjida
BIOCHEMISTRY

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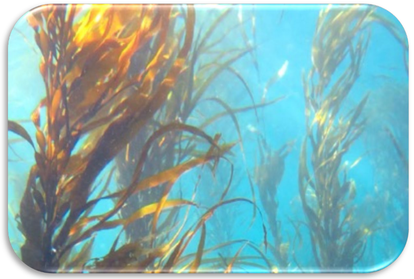
RETURNS, BUT NOT AT THE EXPENSE OF PEOPLE AND PLANET

Biodiversity



CO2 Sequestration

Local involvement to ensure an equitable approach to development: Understudies

Local Employment & Capacity Building

Healthy $ returns through guaranteed off-take agreements

5-10% revenue from CO2 sequestration credits (future revenue)

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KELP FOREST

- FOUNDATION -

To Independently and transparently establish the value of (cultivated) giant kelp forests as a powerful solution to mitigate climate change and increase marine biodiversity

Foundation Members and Participants

KELP FOREST
- FOUNDATION -

CLIMATE REPAIR

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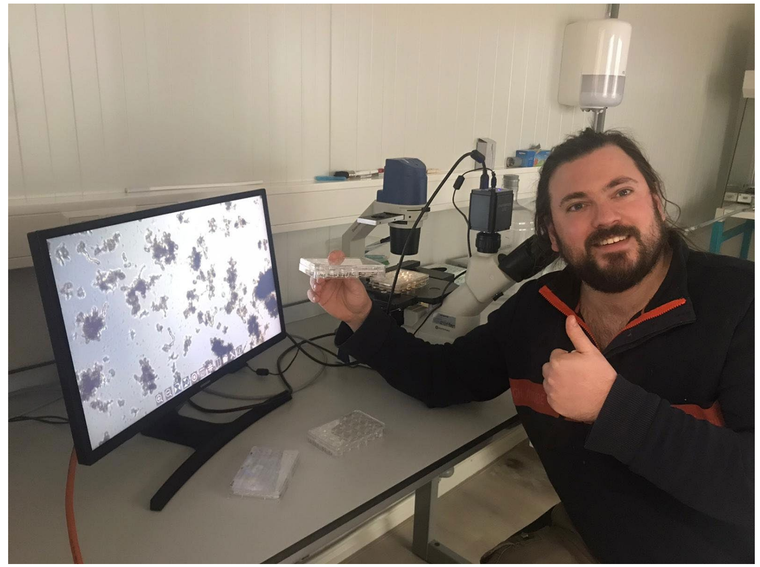
Provides access to cultivated kelp forests for research
Funding contribution

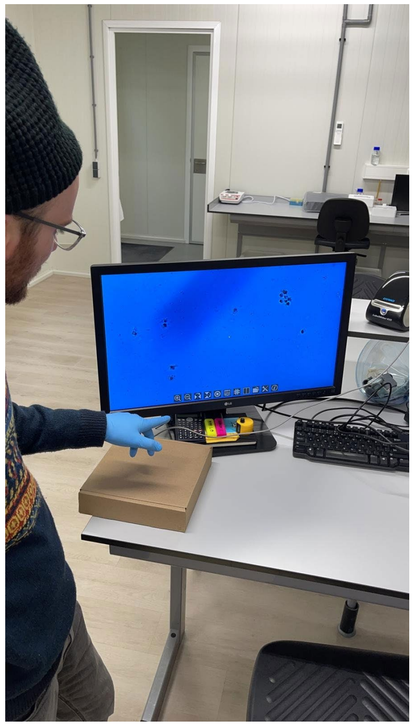
NAMIBIA UNIVERSITY OF SCIENCE AND TECHNOLOGY

HAVEP

UNAM
UNIVERSITY OF NAMIBIA

Progress





Spore collection and propagation
Falklands, South Africa
Chile, California, Argentina
NZ, Tasmania
Kerguelen, Tristan da Cunha

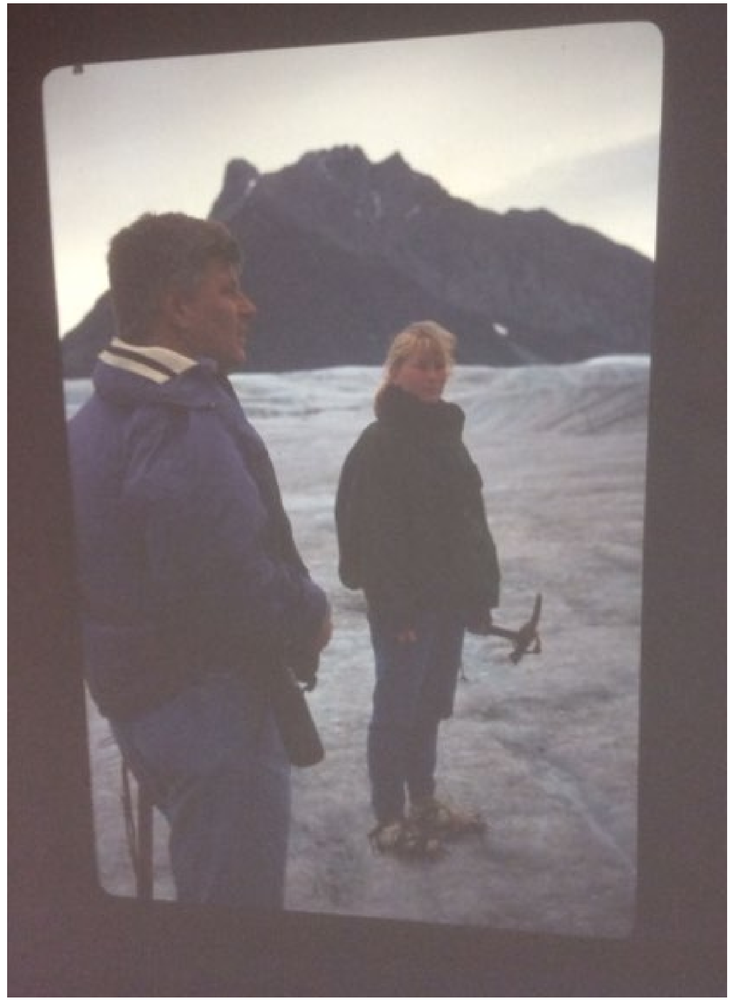
Why Alaska?

- Ocean water (cold, nutritious, clear)
- People (spirit, expertise, capabilities)
- Responsible consideration of natural resources (Alaska Native Corporations, Fisheries)
- Knowledge base (University research, R&D)
- Support for industry growth

Challenges:

- Cost of doing business (energy and water)
    - Shipping/logistics
- (Social) License

(I just want to come back to ALASKA)



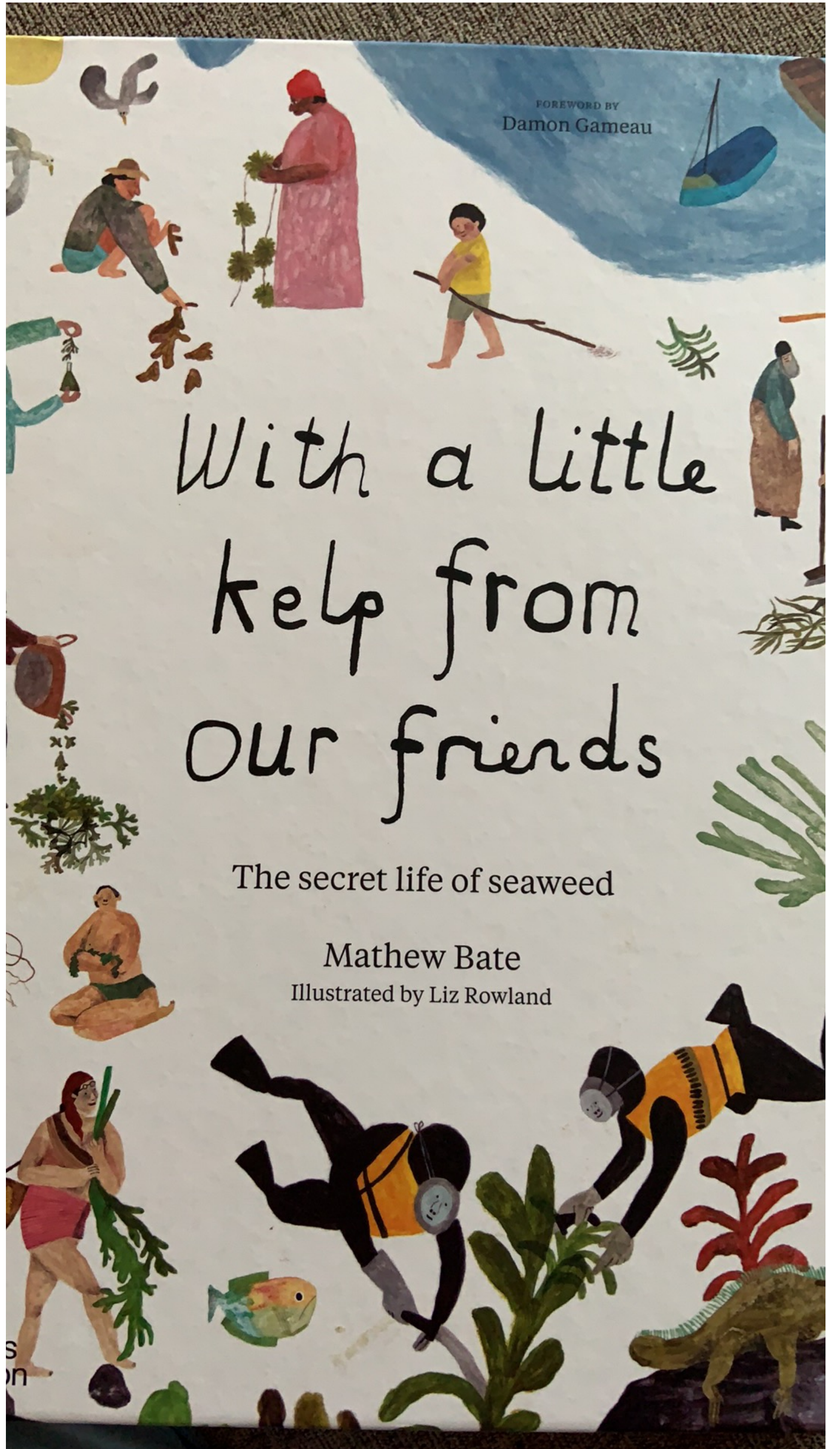
Interested in Seaweed?

Good newsletter:

www.phyconomy.net

also has an excellent database of most of the players in the seaweed supply chain

Good Book:

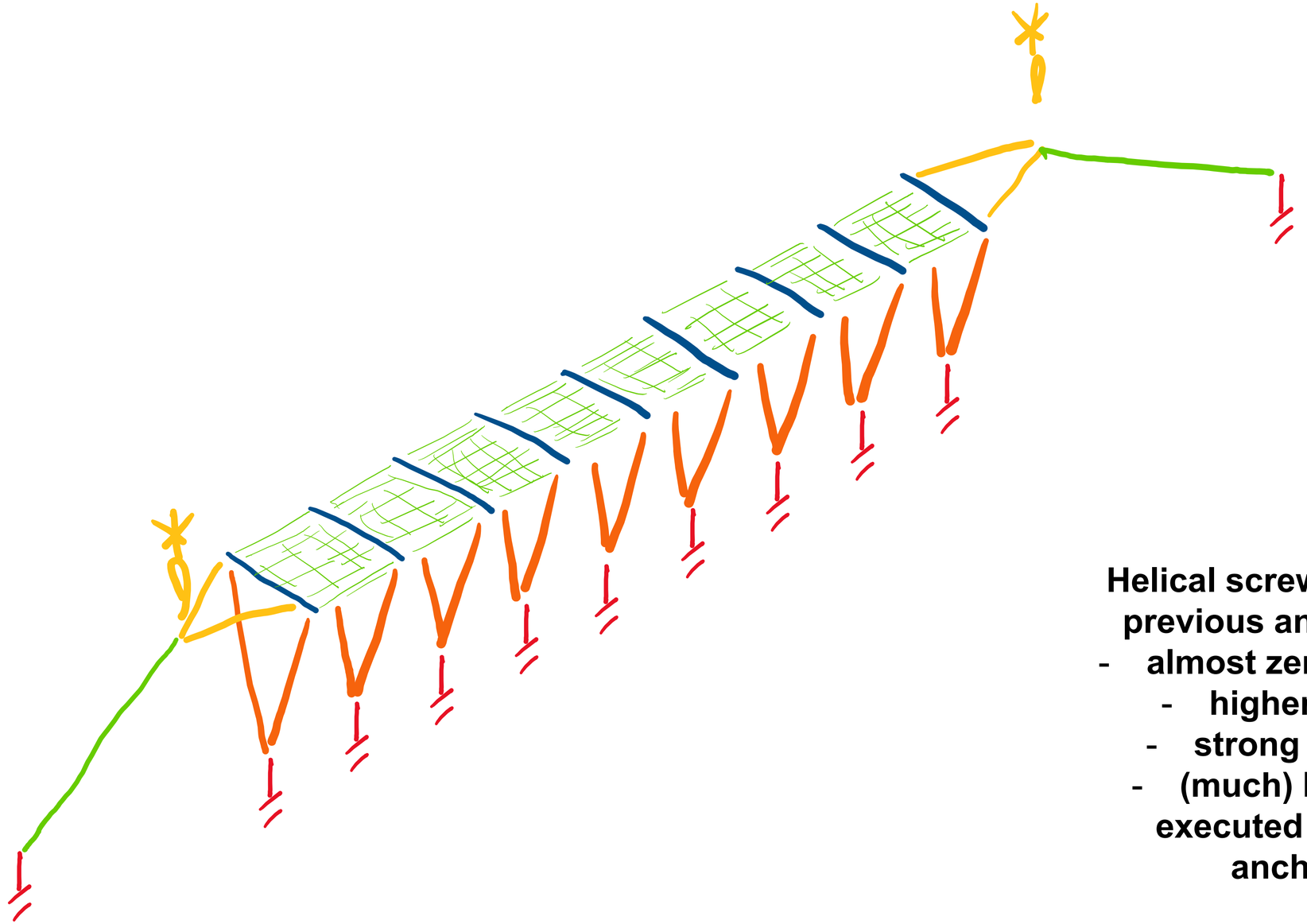


CONTACT

Thank You

Caroline.Slootweg@kelp.blue
Website: kelp.blue
Tel: +31 6 48 91 73 91


KELP
BLUE
Think BIG.



Helical screw anchors replace previous anchoring system:

- **almost zero seabed damage**
- **higher load capacity**
- **strong local capability**
- **(much) lower cost when executed at scale (i.e. >100 anchors per year)**

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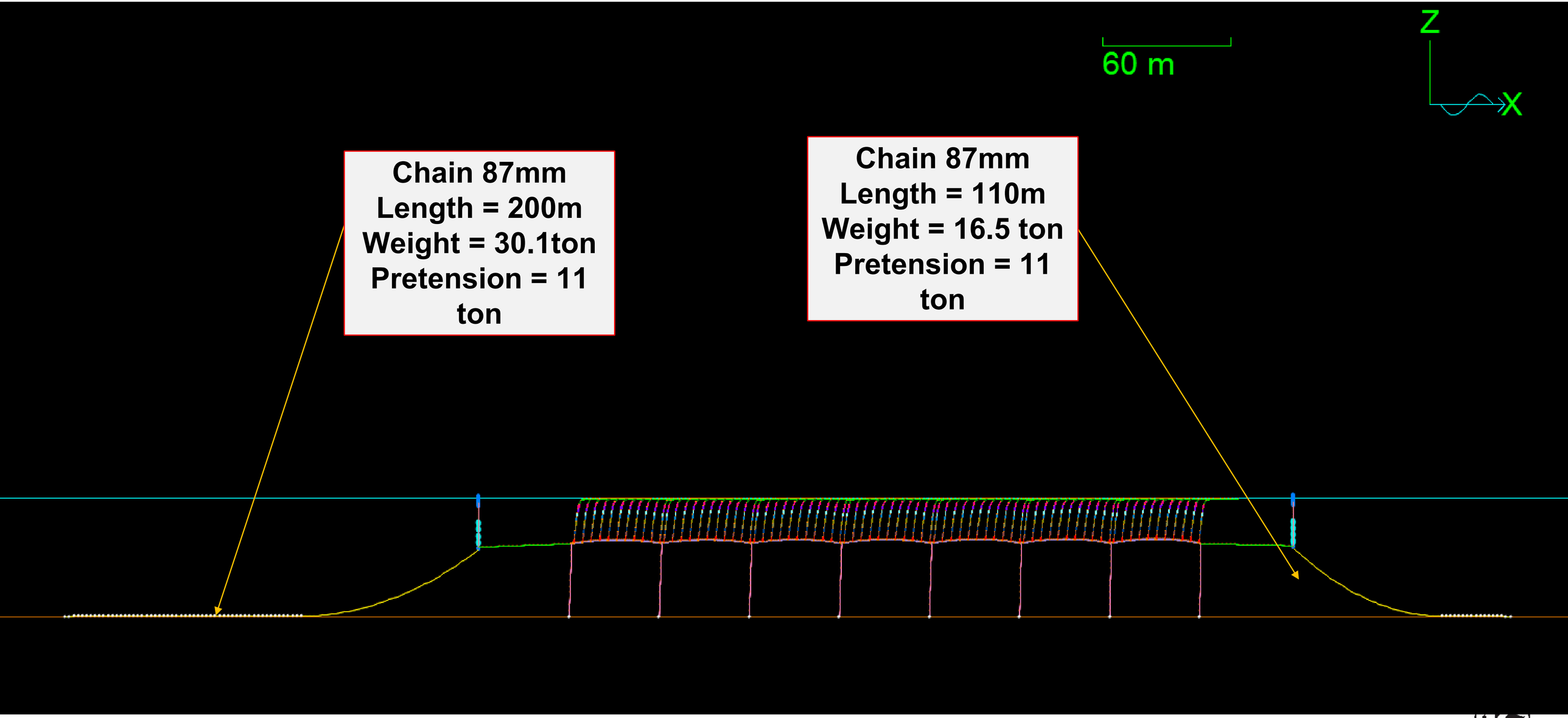
60 m
Z
X
Chain 87mm
Length = 200m
Weight = 30.1ton
Pretension = 11
ton
Chain 87mm
Length = 110m
Weight = 16.5 ton
Pretension = 11
ton

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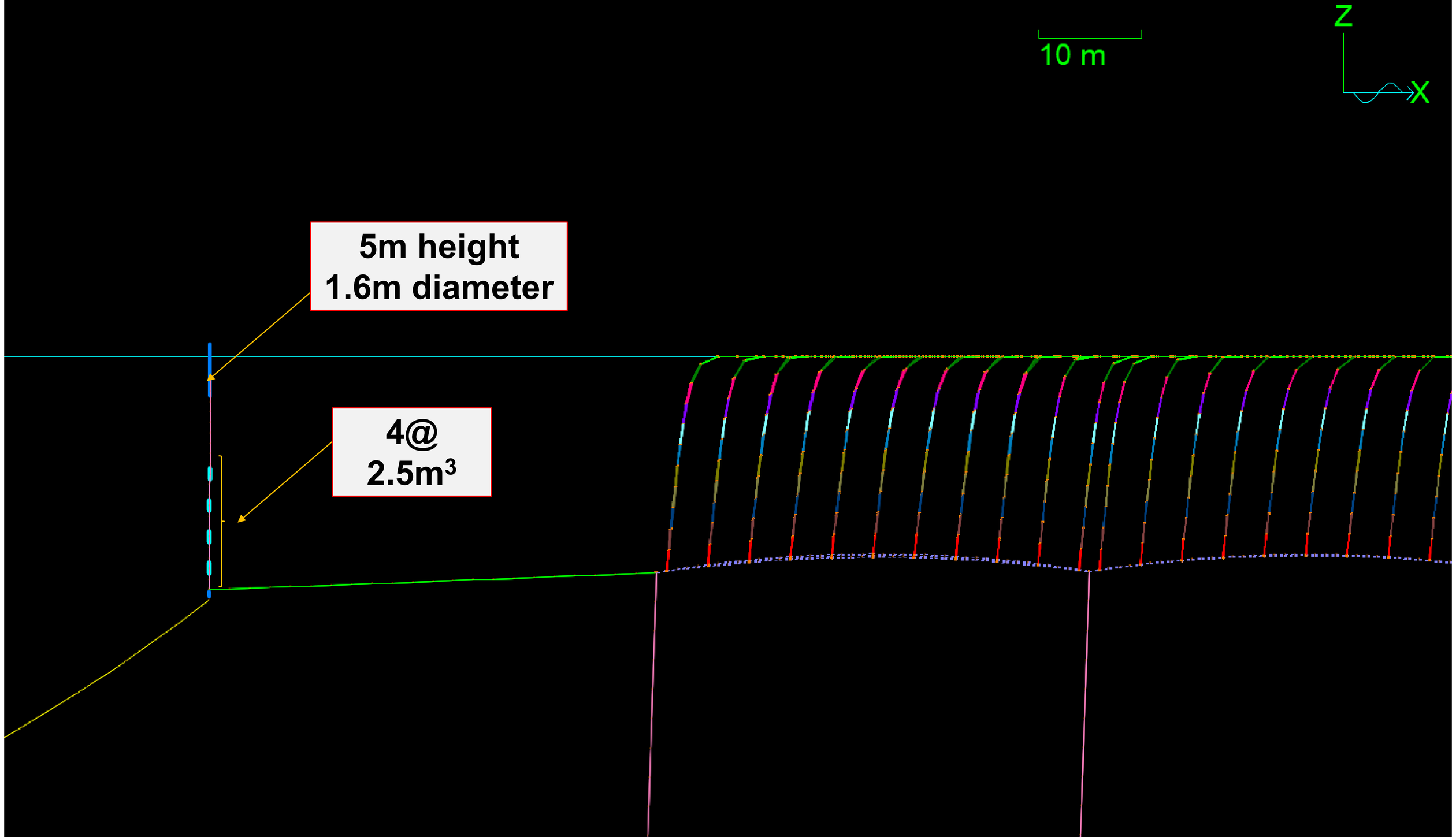
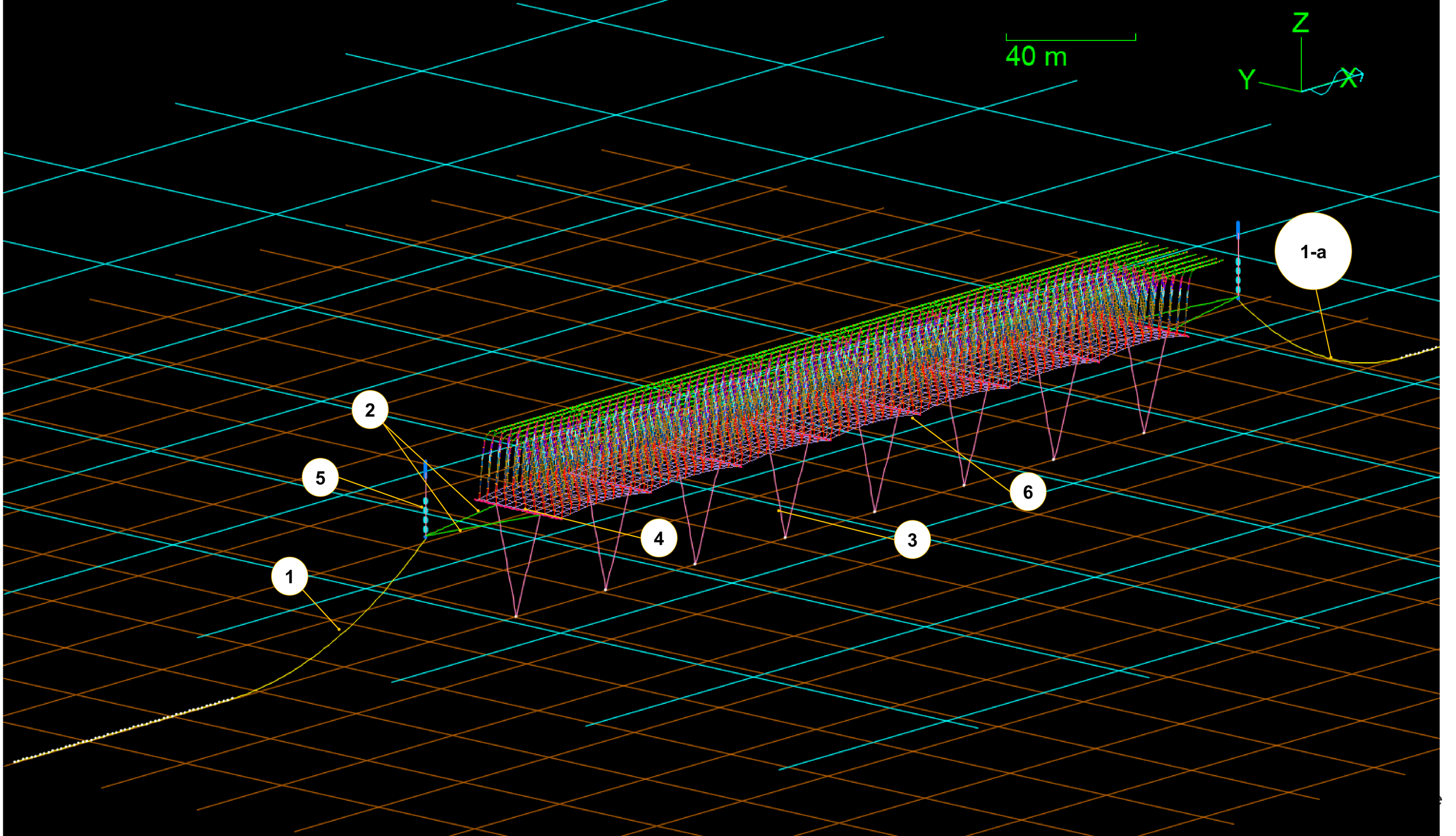

10 m
Z
X
5m height
1.6m diameter
4@
2.5m3


40 m
Z
Y
X
1-a
2
5
6
4
3
1

POS	Item	Description		
			Effective Tension [t]	Bending Moment [t.m]
1	Chain Windward	DN87 STUD LINK GRADE 3	51.6	
1-a	Chain Leeward	DN87 STUD LINK GRADE 3	22.9	
2	Polypropylene Rope	D = 48mm, WLL= 30mT	25.4	
3	Polypropylene Rope	D = 48mm, WLL= 30mT	12.14	
4	Spreader Beam		-6.6	29.7
5	Polypropylene Rope	D = 48mm, WLL= 30mT	19.93	
6	Polypropylene Rope	D = 20mm, WLL= 4.3mT	5.45	

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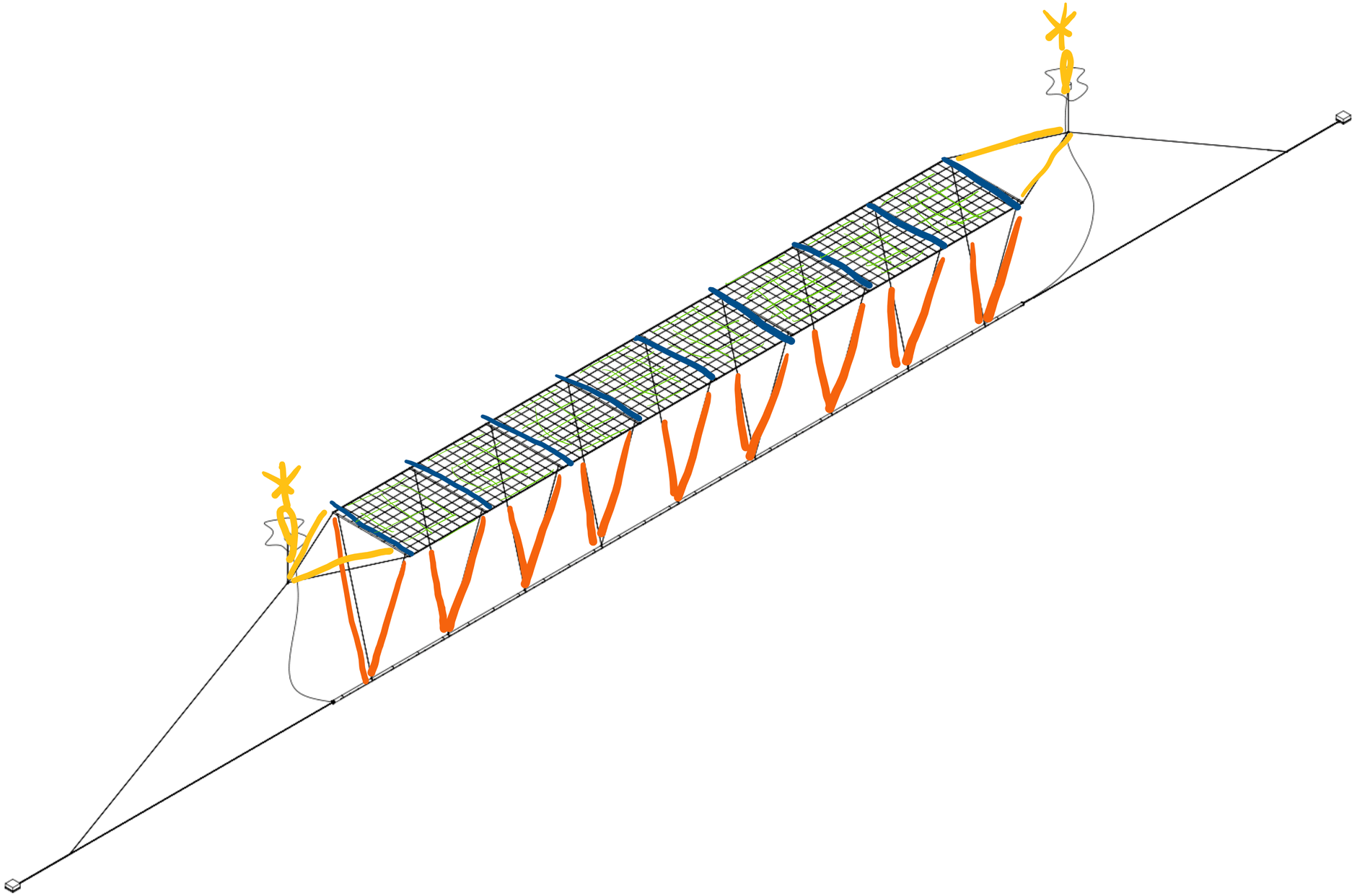

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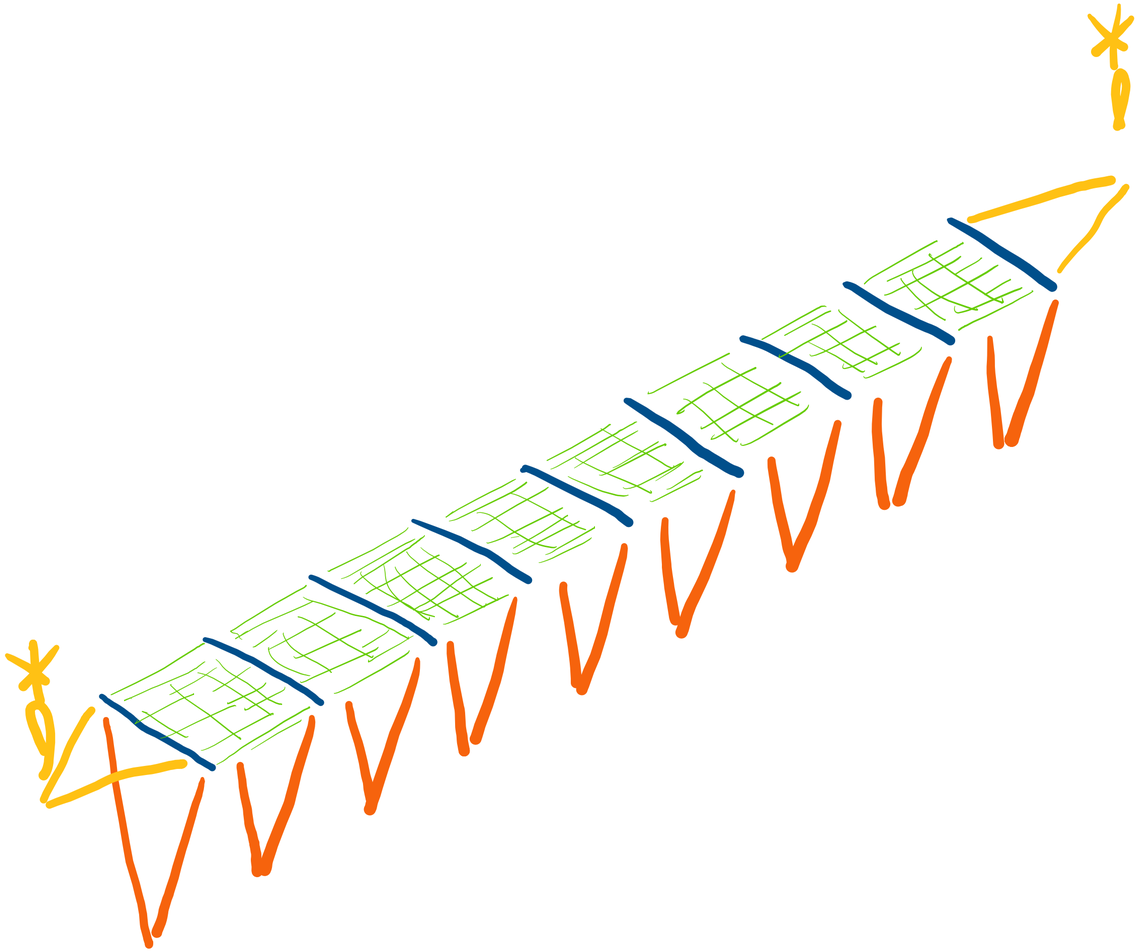

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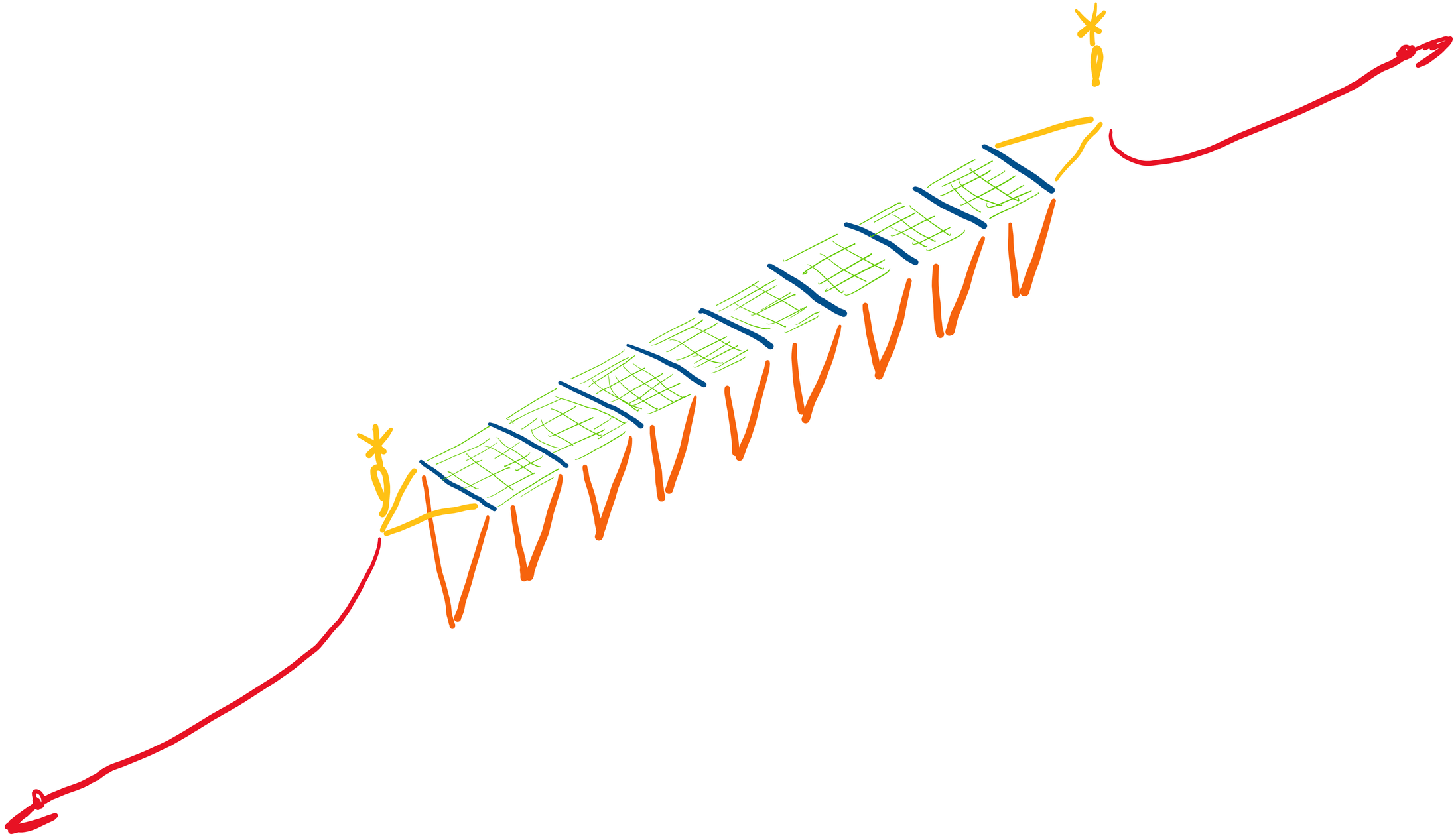

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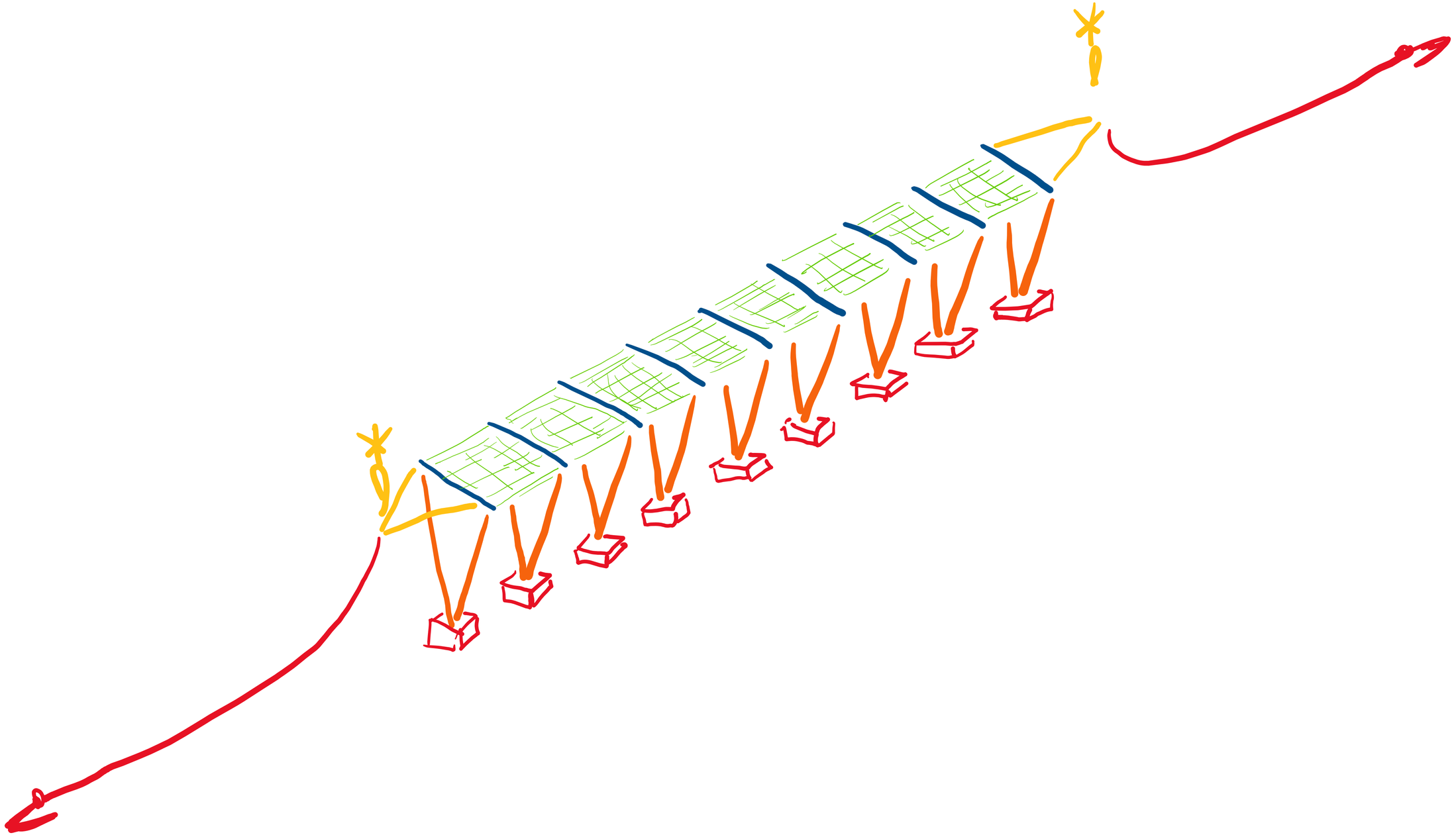

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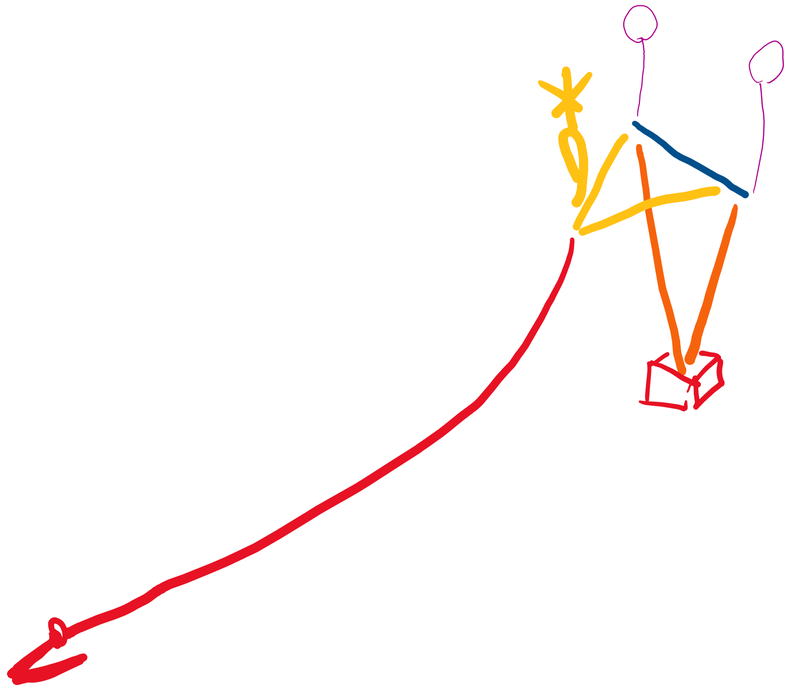

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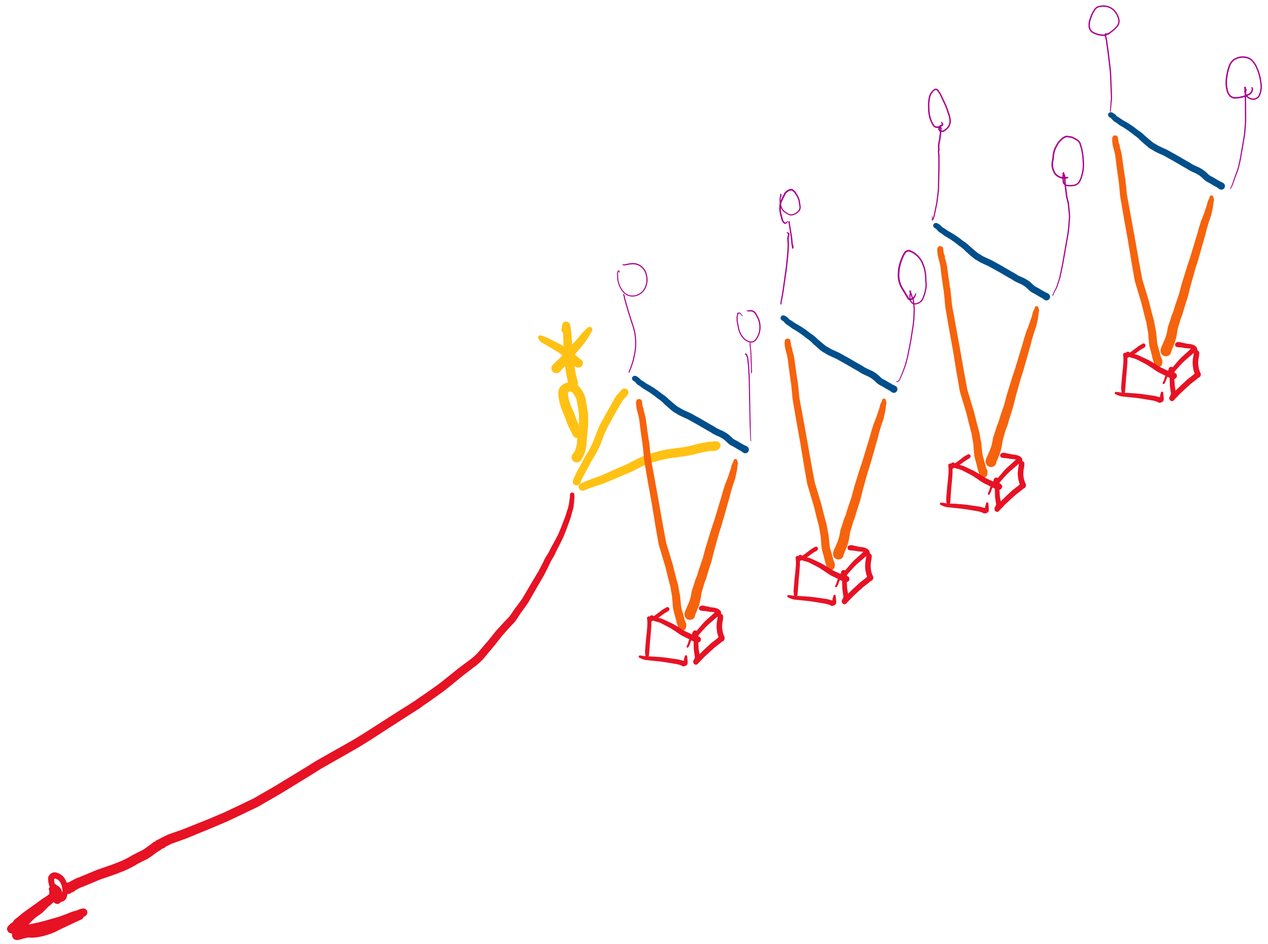

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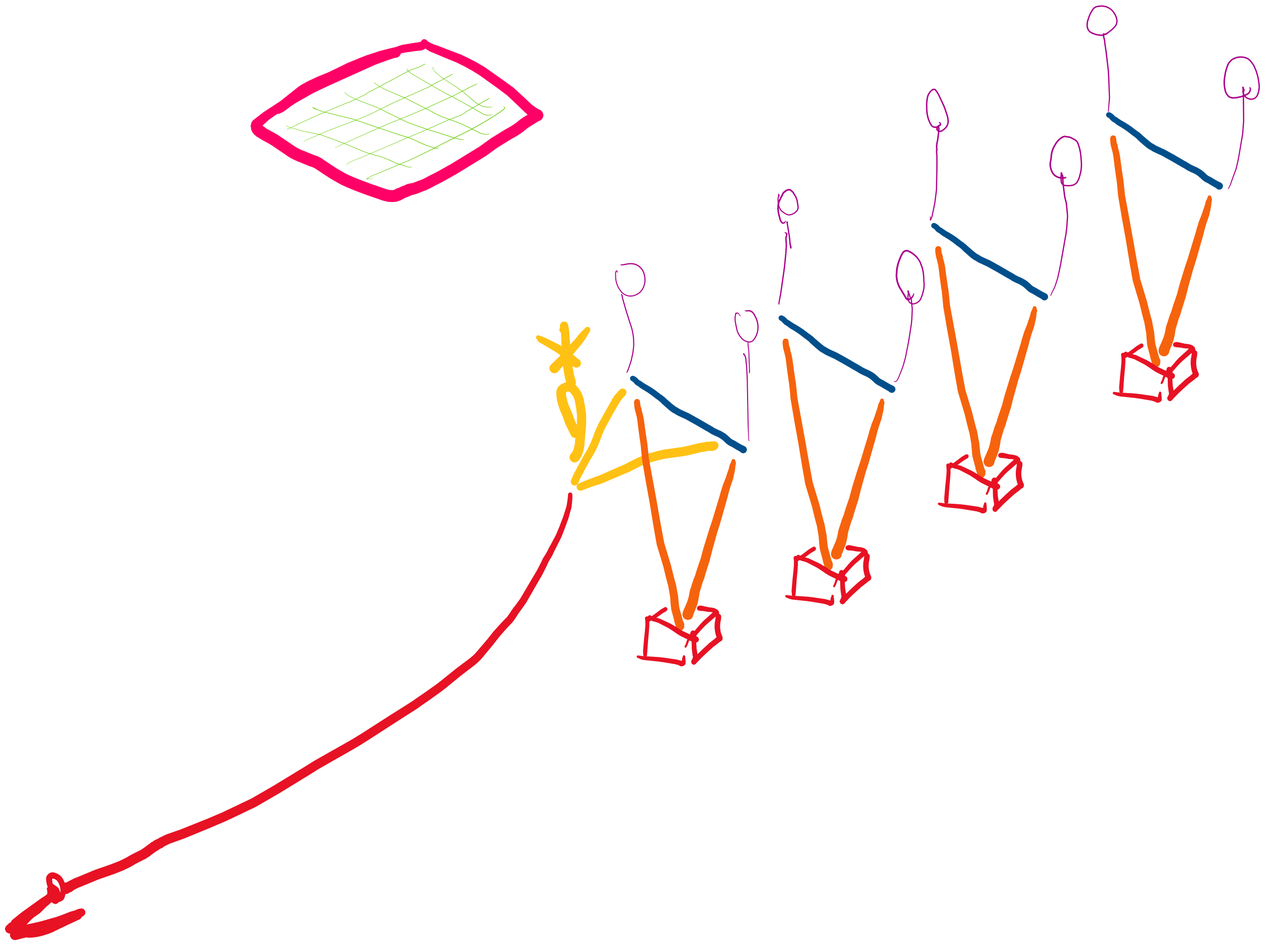

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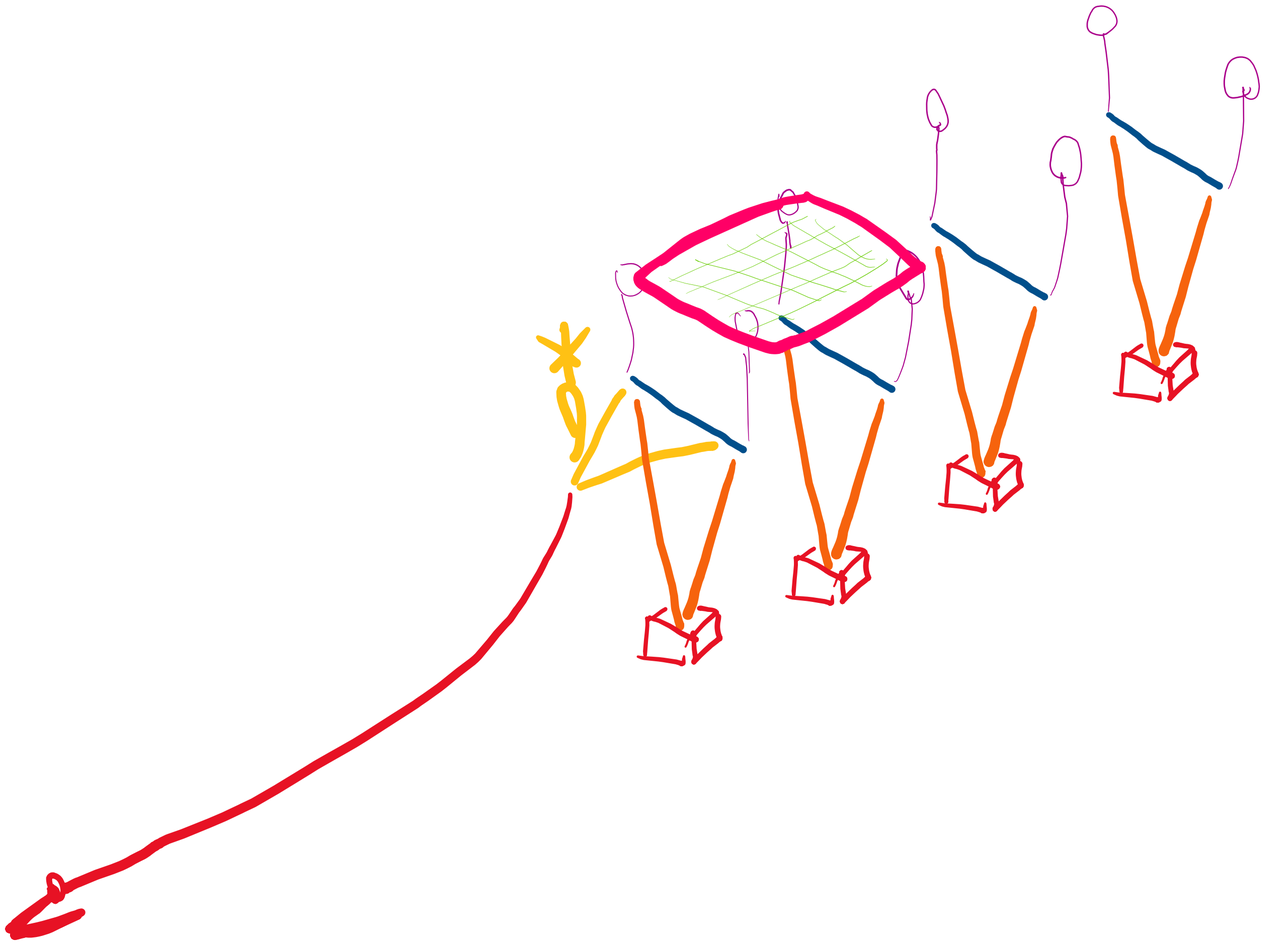

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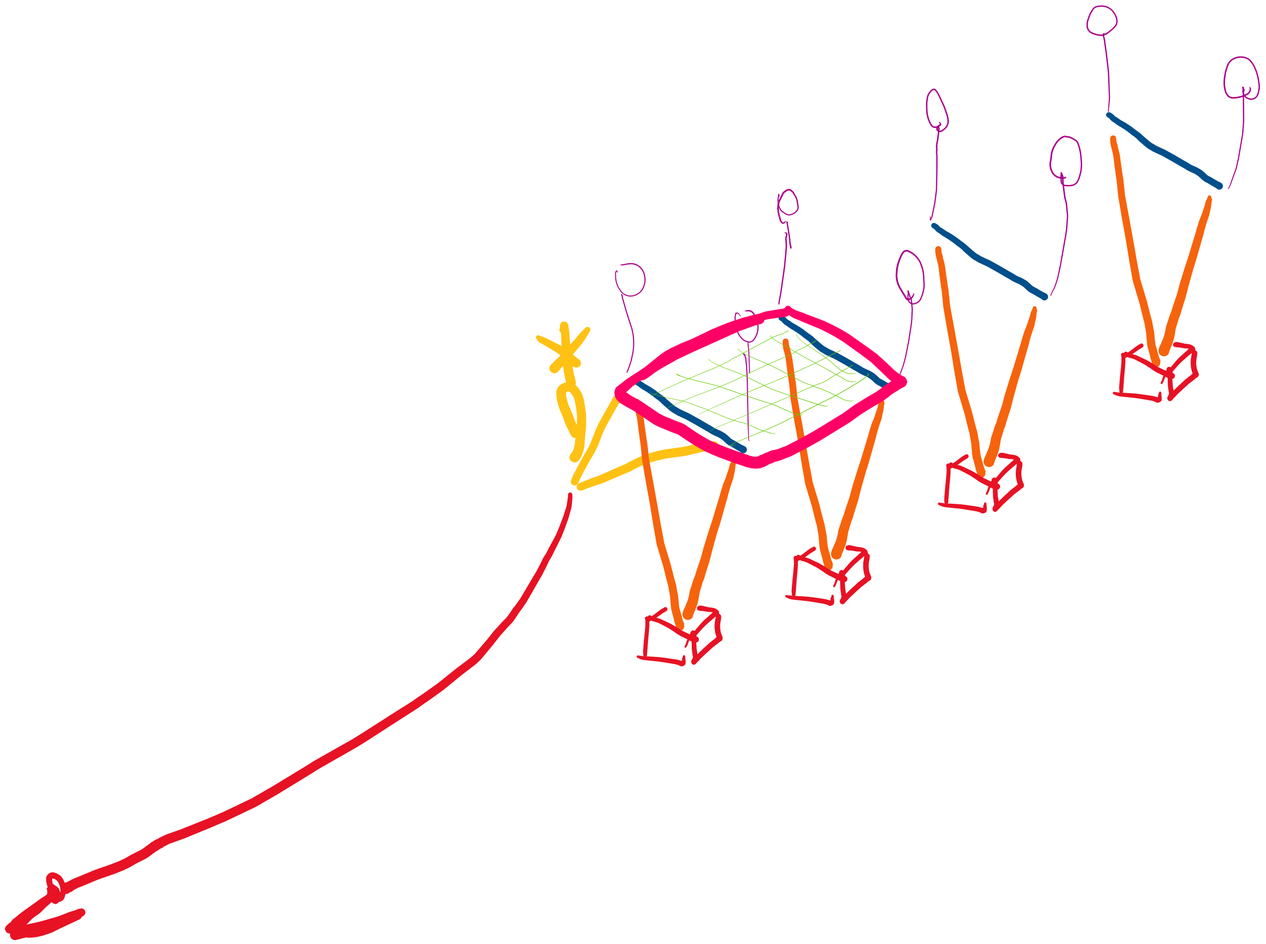

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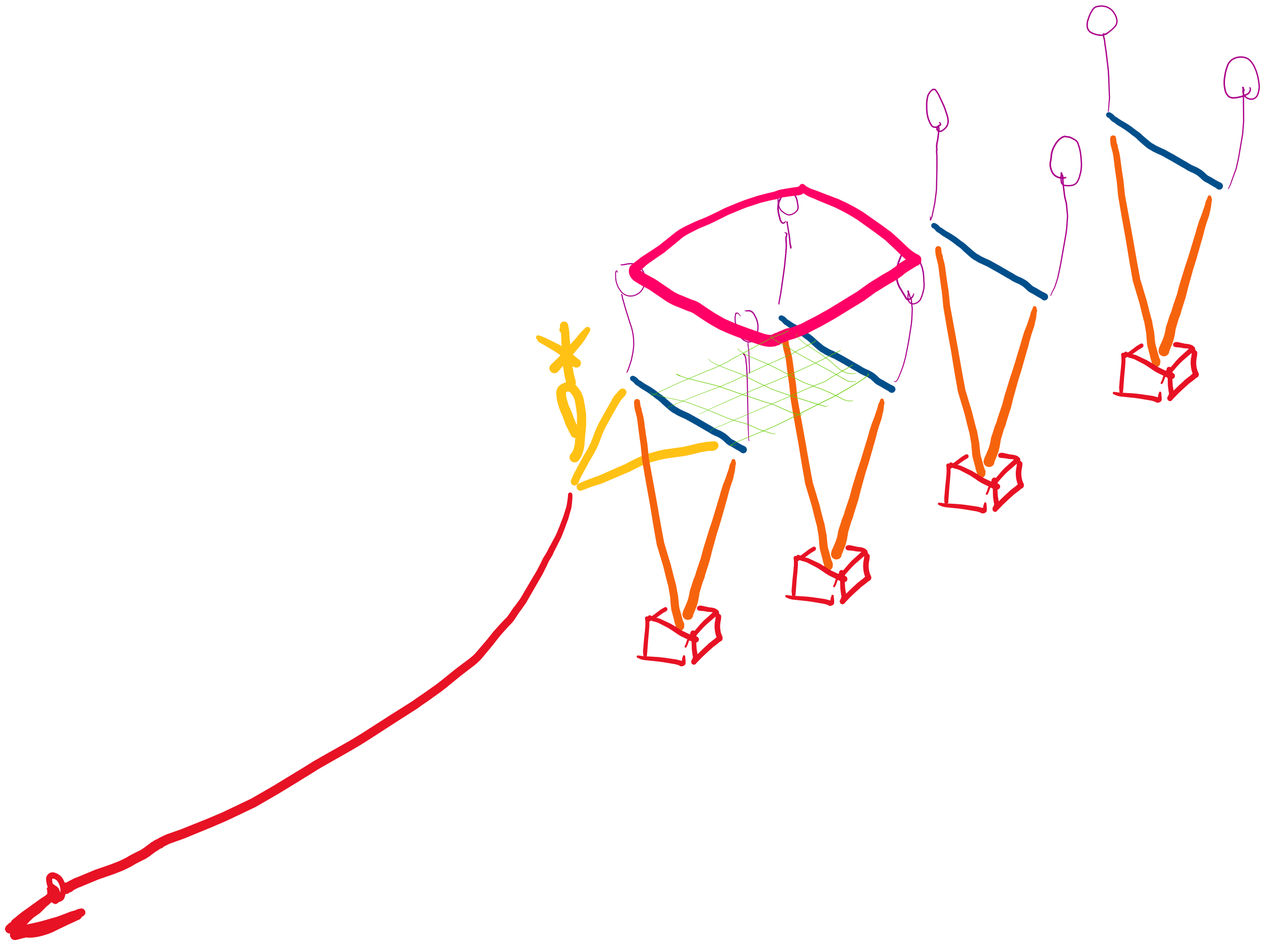

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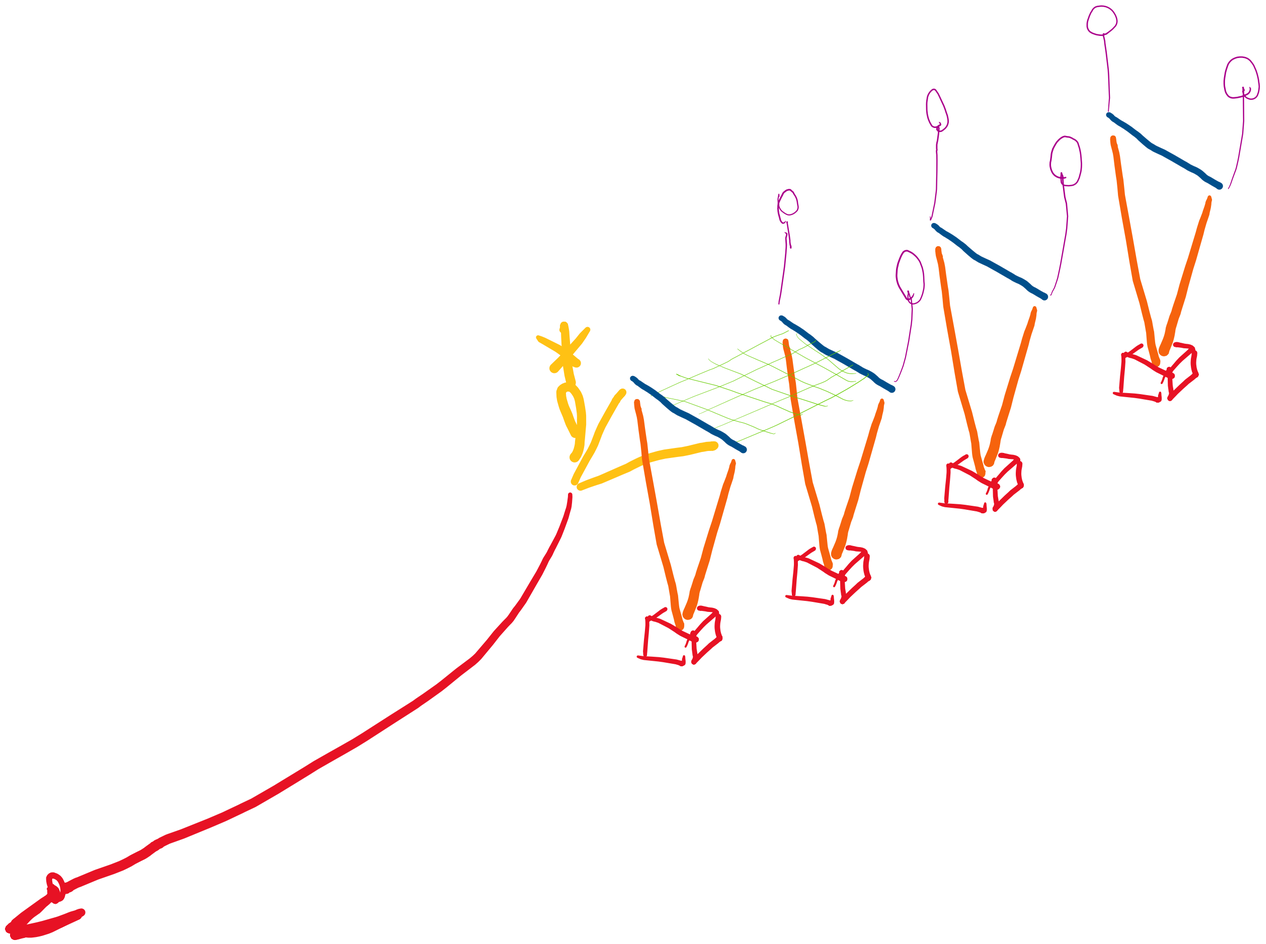

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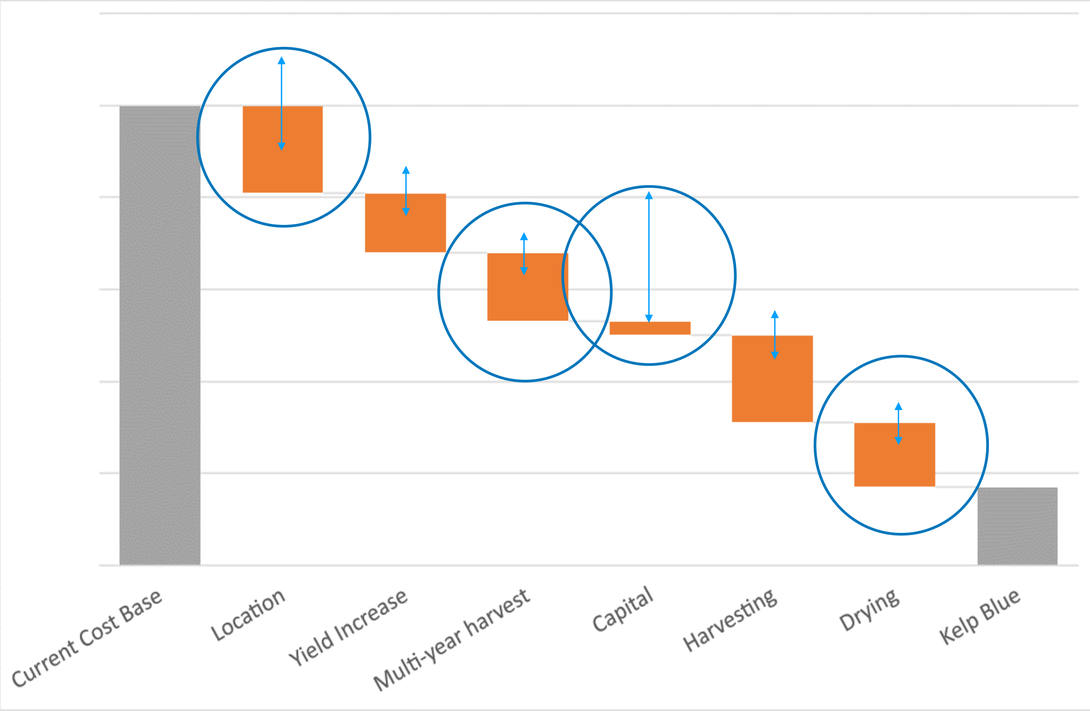
Kelp Blue is aiming for a 90% cost reduction.
The pilot sets out to increase confidence level in the key uncertainties.
Impact of Yield Increase and Harvesting are already at high confidence level.



The main elements of Kelp Blue's ~90% cost reduction

Blue Arrows indicate the uncertainty range
Blue Circles indicate the elements that the pilot will prove within 12-18 months

<u>Confidence Level Needs Improving</u>
Growing Kelp Offshore (Location and Capital elements) has seldom been trialled
- DARPA trials 1974-1978

<u>Confidence Levels High</u>
- Harvesting: continuous benchmark from 1915-2020
- Drying in SA/Namibia – cost of Taurus Kelp (Gansbaai), Kelpak (Southern Cape) is close to zero
- Multi-year harvest: proven 2012-2019 Ocean Rainforest, Faroe Islands
- Yield increase through selective breeding:
  - Chilean Macrocystis farms 1990-2020 4-5x yield increase
  - Saccharina Japonica (Japan, Korea, China) 1980-2020 16-20x yield increase
  - Saccharina Latissima (Norway, Ireland, New England) 2016-2020 50% yield increase

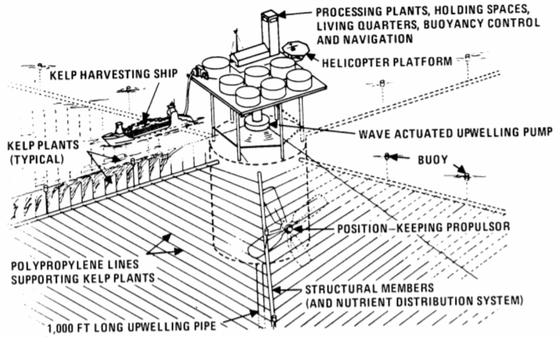
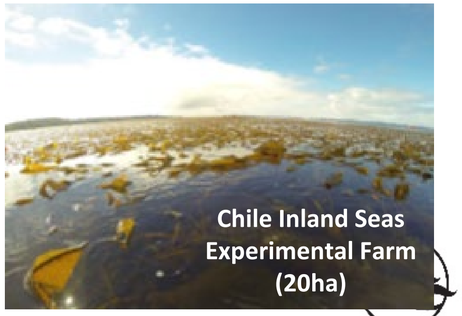


Figure 3. Conceptual design of 405 ha (1,000 acre) ocean food and energy farm unit. (Leese 1976)



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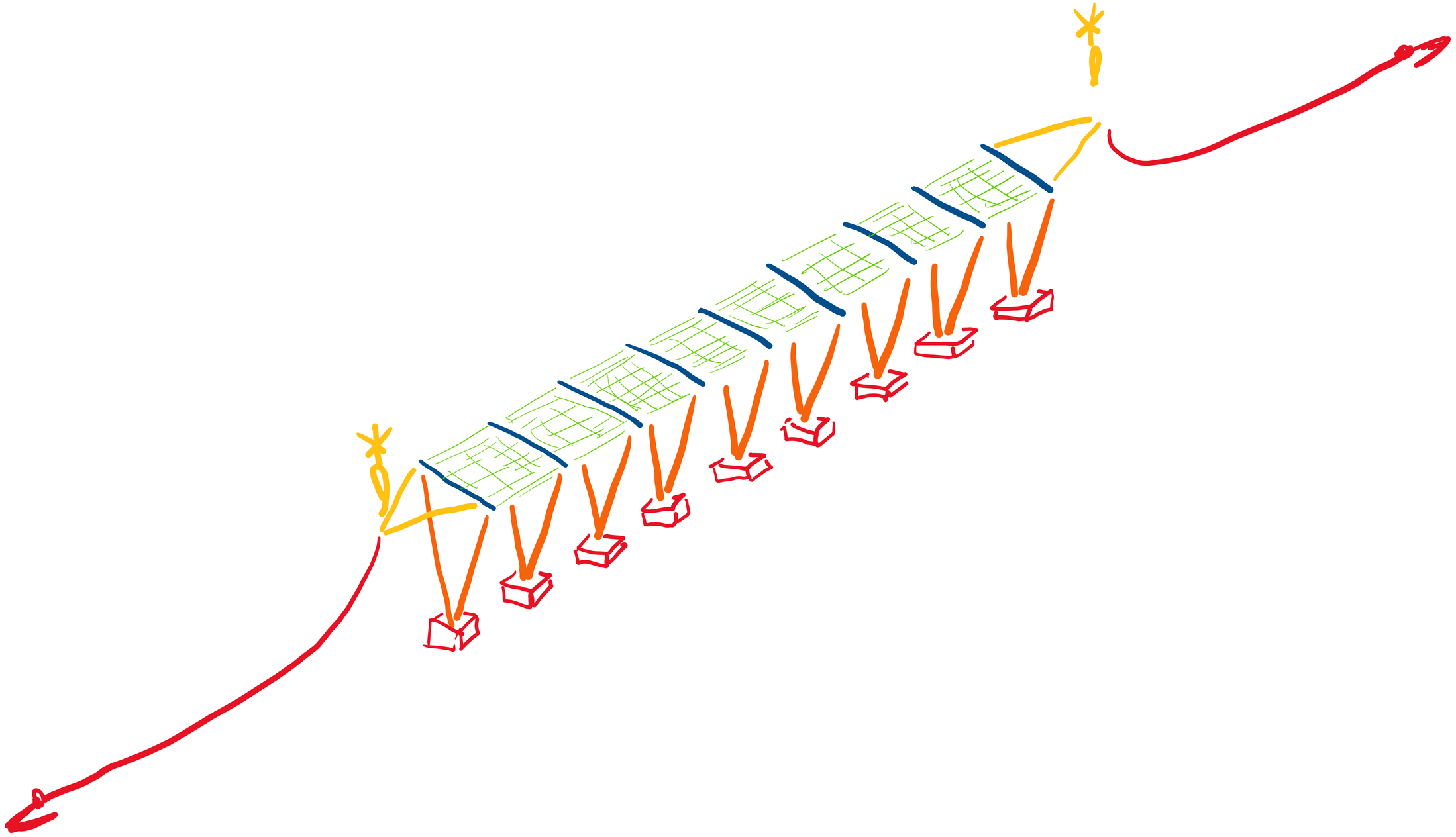

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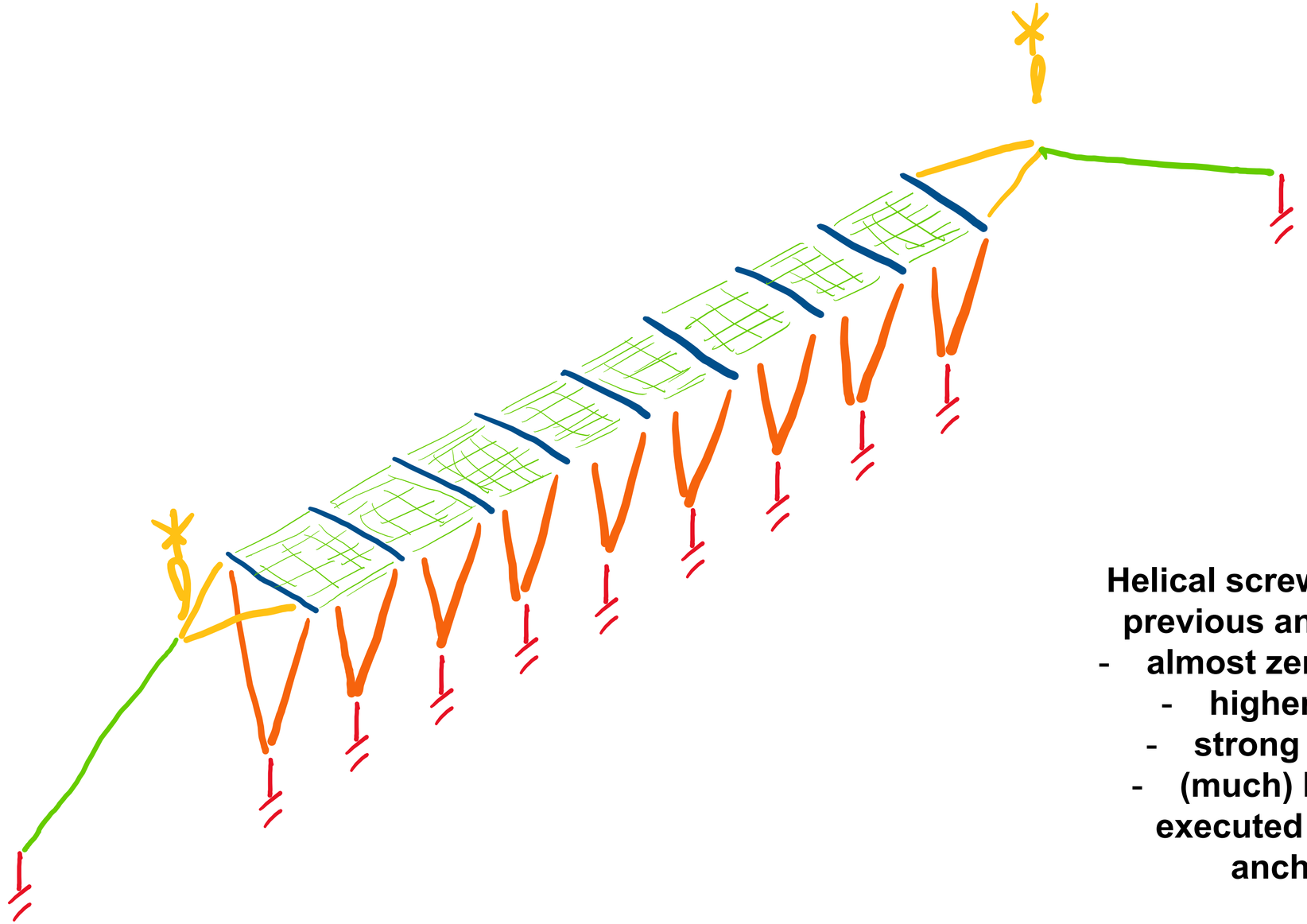

Helical screw anchors replace previous anchoring system:

- **almost zero seabed damage**
- **higher load capacity**
- **strong local capability**
- **(much) lower cost when executed at scale (i.e. >100 anchors per year)**

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Kelp 49 Blue: Project Schedule

Year	2022	2023	2024	2025	2026+
Acres	50+50	+300	+300	+300	+300 (2500)
Funding requirements	$10-$20m	$50m (not incl. debt)			
yield	800 tonnes (81 t per acre)	260,000 tonnes			
	Biostim:4m liters @$2.40 per liter Alg: 80,000 kg @ $12 p/kg				
Revenues	$10.7m	$343m			
EBIDA (margin 50%)	$5.4m	$206m			

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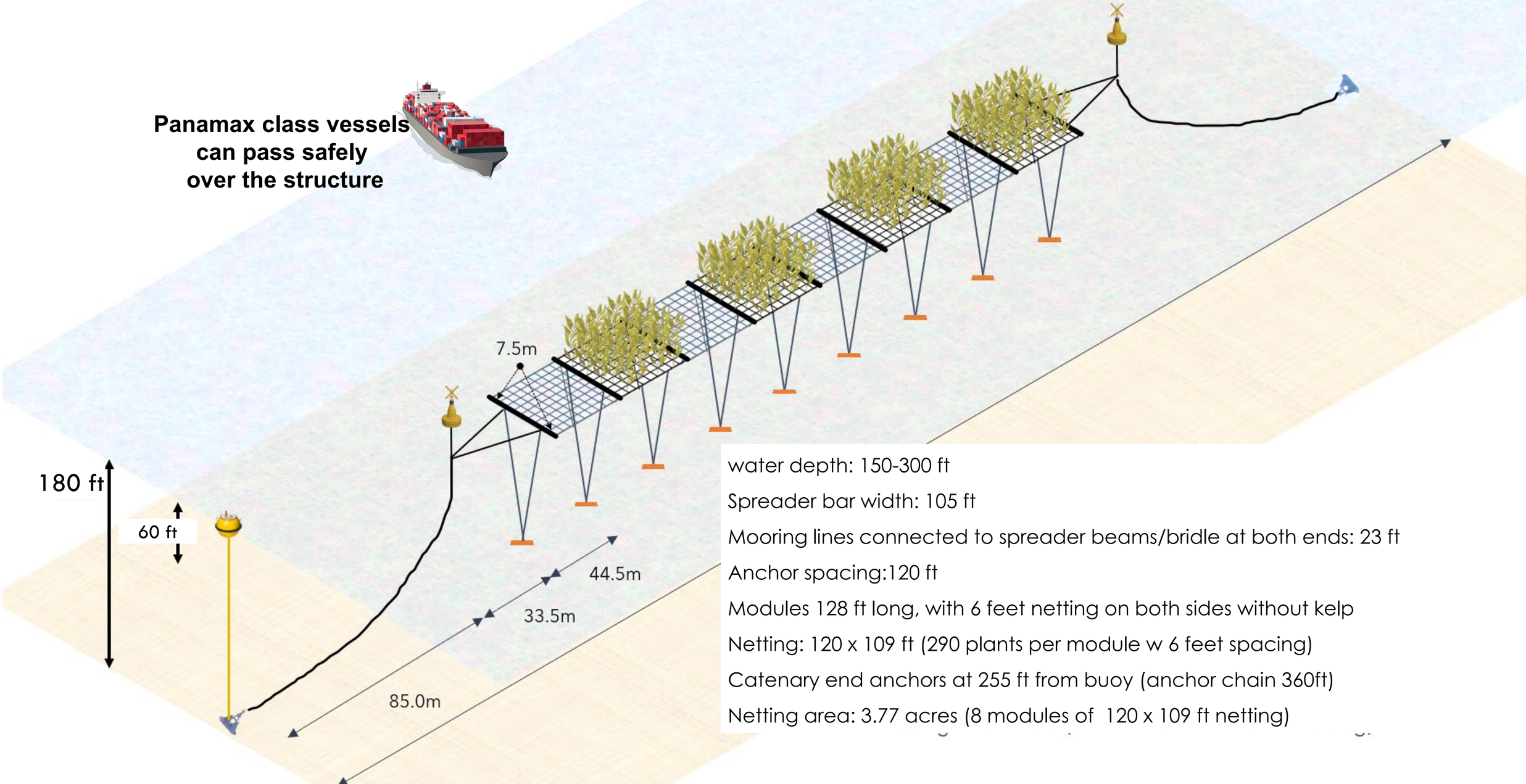
Main dimensions

Panamax class vessels can pass safely over the structure



water depth: 150-300 ft

Spreader bar width: 105 ft

Mooring lines connected to spreader beams/bridle at both ends: 23 ft

Anchor spacing:120 ft

Modules 128 ft long, with 6 feet netting on both sides without kelp

Netting: 120 x 109 ft (290 plants per module w 6 feet spacing)

Catenary end anchors at 255 ft from buoy (anchor chain 360ft)

Netting area: 3.77 acres (8 modules of 120 x 109 ft netting)