Dave Pigram
ERA
PORTFOLIO

Morning Walk
Richard Glover
IMAGE

Original Creative Work
Architectural Project
TYPE

Dave Pigram, University of Technology, Sydney
Iain Maxwell, University of Canberra
John Buttles, Texas Wind Towers
Altair
AUTHORS

Super Floater
Offshore Floating Wind Turbine Platform
PROJECT TITLE

RESEARCH STATEMENT

Architectural Project

Researchers: Dave Pigram [University of Technology Sydney]
Iain Maxwell [University of Canberra]

Title of Work: SuperFloater

Peer-Review: SuperFloater is currently sortlisted in the Architecture Australia AA Prize for Unbuilt Work 2025.
[National Shortlist — final result pending]

SuperFloater was a key project highlighted as part of *supermanoeuvre* winning/being named: 'Best International Architecture Practice: Design for Decarbonisation', Build Design Awards [UK Based].
[International Winner]

SuperFloater was a key project highlighted as part of *supermanoeuvre* being shortlisted [1 of 4] in the 'Sustainable Small Practice Category' in the Sustainability Awards hosted by Architecture & Design magazine.
[National Shortlist]

Research Background
SuperFloater is a project in the fields of computational design, construction innovation and design for decarbonisation.

Research Contribution
SuperFloater is a US and EU patented design for an Ultra-High Performance Concrete [UHPC] Offshore Floating Wind Platform [OFWP] generated by an innovative design method [also US patented] combining structural topological optimisation, navel design simulation and fabrication-aware formfinding.
This project asks: 'how can embedding feedback, simulation and encoded fabrication constraints into computationally enacted design processes enable plural performance form discovery? and 'how can architectural design intelligence contribute to the design of energy infratstructure critical to addressing the climate crisis?'

Research Significance
This project's purpose is to reduce the Levelised Cost of Energy [LCOE] for offshore wind power, a key renewable, low-carbon energy source necessary to addressing the climate-crisis. It does this by increasing floating platform service life, minimising material use and fabrication cost by finding synergies between structural and naval performance. While these forms of performance are the primary considerations for this multi-million-dollar infrastructure, aesthetics are key to earning public acceptance and support for broader adoption.
SuperFloater was shortlisted in the 'AA Prize for Unbuilt Work' run by Architecture Australia, the national magazine of the Australian Institute of Architects.

1 InDesign Media Asia Pacific [Nov 2024] *Sustainable Building Awards 2020*.
https://www.sustainablebuildingawards.com.au/ [Accessed 15 November 2020]
2 Australian Institute of Landcape Architects. [June 2021] *AILA NSW 2021 Winners Gallery*.
https://aila.awardsplatform.com/gallery/ByEWDMxa [Accessed 20 June 2021]

AA PRIZE FOR UNBUILT WORK [NATIONAL]
ARCHITECTURE AUSTRALIA

NATIONAL SHORTLIST

AA Prize for Unbuilt Work 2025

Experimentation, speculation, invention – celebrating the unbuilt

(JURY)
L–R: Nic Brunsdon, principal and creative director, Brunsdon Studio; Jocelyn Chiew, director City Design, City of Melbourne; Michael Mossman, associate dean Indigenous strategy and services, University of Sydney School of Architecture, Design and Planning; Georgia Birks (chair), associate editor of *Architecture Australia*.

(JURY CHAIR OVERVIEW)

As our lives become more dependent on digital technology, it is increasingly important to prioritise our relationships with nature and with one another. This cause is a common theme across the submissions of the 2025 AA Prize for Unbuilt Work. Acts of repair and connection are drivers for a majority of the schemes, whose designs consider solutions to contemporary issues such as social isolation, cultural acknowledgement, and the climate and housing crises.

Repair is explored as regeneration of ecology, recognition of cultural histories and reinvigoration of dormant existing buildings. Common-wealth by Nicky and Nicole (honourable mention) speculates on ways to incentivise circular building technologies. The scheme experiments with the balance between landscape revitalisation and local manufacturing. The Mill by Ariani Anwar (honourable mention) considers the future of abandoned industrial sites and explores how rewilding can assist in bioremediation and the spatial quality of public amenity.

Connection is investigated across different scales through design interventions that encourage social interaction between neighbourhood and city. Productive Edge by Phorm Architecture and Design with Silvia Micheli and Antony Moulis (special mention) critiques the Australian suburban fence, reimagining it as a space for enterprise and commerce, creating moments for deliberate social engagement.

The winning project, Landscape of Co-existence by Angela Xu and Georgia Reader, questions current relationships between human and non-human inhabitants in the built environment. The scheme focuses on affordable housing and social connectivity, but at its core studies the impact of decentralising the human experience. In turn, the proposal pursues a better pathway for urban development – one that seeks to benefit all living things.

The built environment directly impacts the health and wellbeing of Country and communities, and this relationship is becoming better understood by the architecture industry, as demonstrated in this year's submissions. Collectively, the schemes are persuasive on how conceptual design can be used as a tool to test and explore outcomes that think differently about repair and connection. Whether it is through material documentation, spaces for cultural reflection or the reuse of existing building stock, it's clear that we are pursuing architecture that gives more than it takes.

Congratulations to the awarded schemes for 2025.

— Georgia Birks is associate editor of *Architecture Australia*, a curator for Design Speaks, a graduate of architecture and a proud descendant of the Birpai, Dunghutti and Kamilaroi people.

For a gallery of the shortlisted projects, go to: architectureau.com/articles/aa-prize-for-unbuilt-work-2025-shortlist-revealed/

Shortlist


(13)


(14)


(15)


(16)


(17)


(18)


(19)


(20)


(21)


(22)

(13) Gestura by Jasmine O'Loughlin
(14) Intertwining by Agnes Leonardi
(15) Landscape of Co-existence by Angela Xu and Georgia Reader
(16) Ngurra: The National Aboriginal and Torres Strait Islander Cultural Precinct, Canberra, Australia by Djinjama with COLA Studio, Hassell and Edition Office in collaboration
(17) Perpetual Obsolescence by Danica Cruz and Lillian He
(18) Planter House by Infra-Architecture Lab
(19) Productive Edge by Phorm Architecture and Design with Silvia Micheli and Antony Moulis
(20) Super Floater by Supermanoeuvre
(21) The Lay of the Land by Henrick Michael
(22) The Mill by Ariani Anwar

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PORTFOLIO

PEER REVIEW
AA Prize for Unbuilt Work 2025
IMPACT

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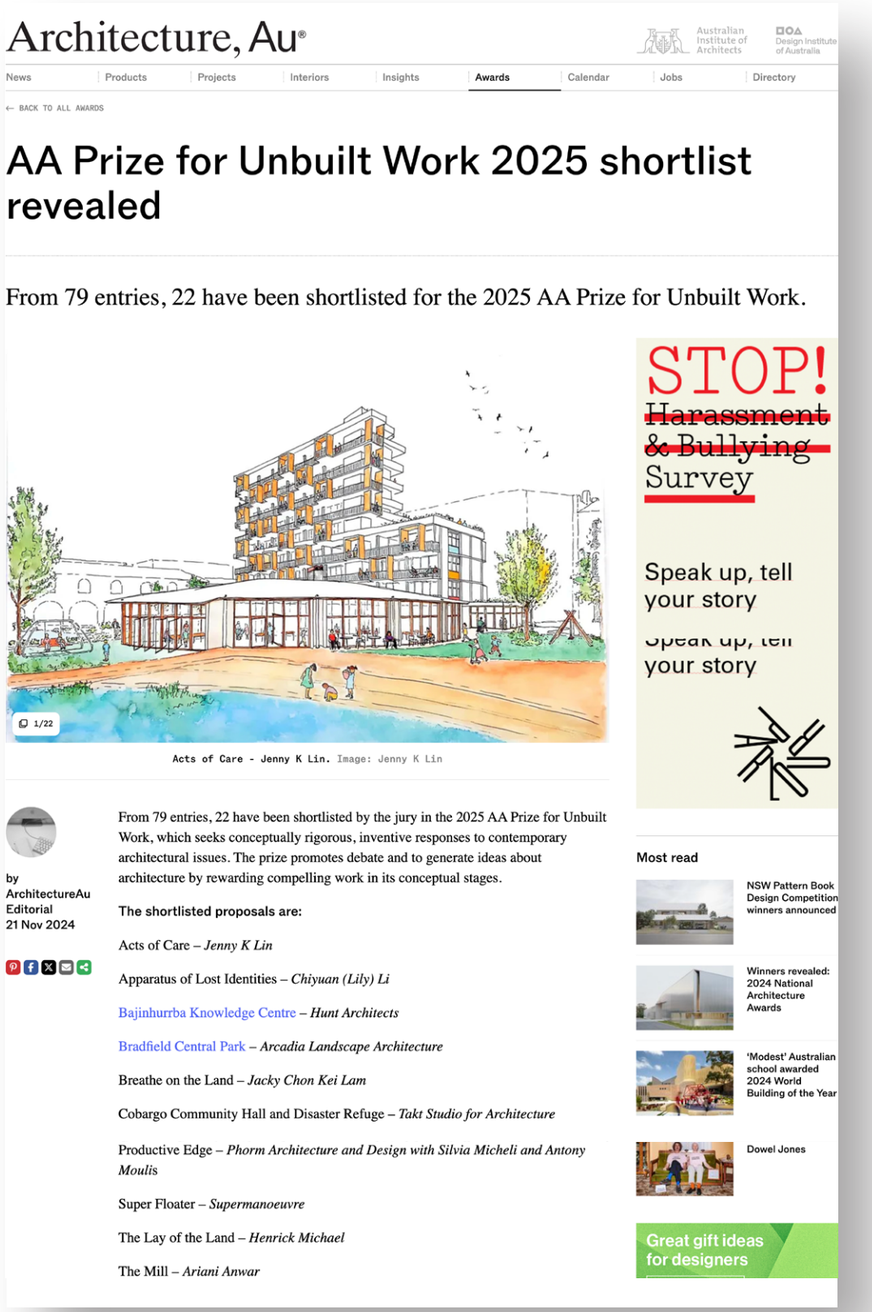
AUTHORS

Super Floater
Offshore Floating Wind Turbine Platform
PROJECT TITLE

AA PRIZE FOR UNBUILT WORK [NATIONAL]

ARCHITECTURE AUSTRALIA

NATIONAL SHORTLIST



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AA Prize for Unbuilt Work 2025 shortlist revealed

From 79 entries, 22 have been shortlisted for the 2025 AA Prize for Unbuilt Work.

Acts of Care - Jenny K Lin. Image: Jenny K Lin

by ArchitectureAu Editorial
21 Nov 2024

From 79 entries, 22 have been shortlisted by the jury in the 2025 AA Prize for Unbuilt Work, which seeks conceptually rigorous, inventive responses to contemporary architectural issues. The prize promotes debate and to generate ideas about architecture by rewarding compelling work in its conceptual stages.

The shortlisted proposals are:

Acts of Care – *Jenny K Lin*

Apparatus of Lost Identities – *Chiyuan (Lily) Li*

Bajinhurrba Knowledge Centre – *Hunt Architects*

Bradfield Central Park – *Arcadia Landscape Architecture*

Breathe on the Land – *Jacky Chon Kei Lam*

Cobargo Community Hall and Disaster Refuge – *Takt Studio for Architecture*

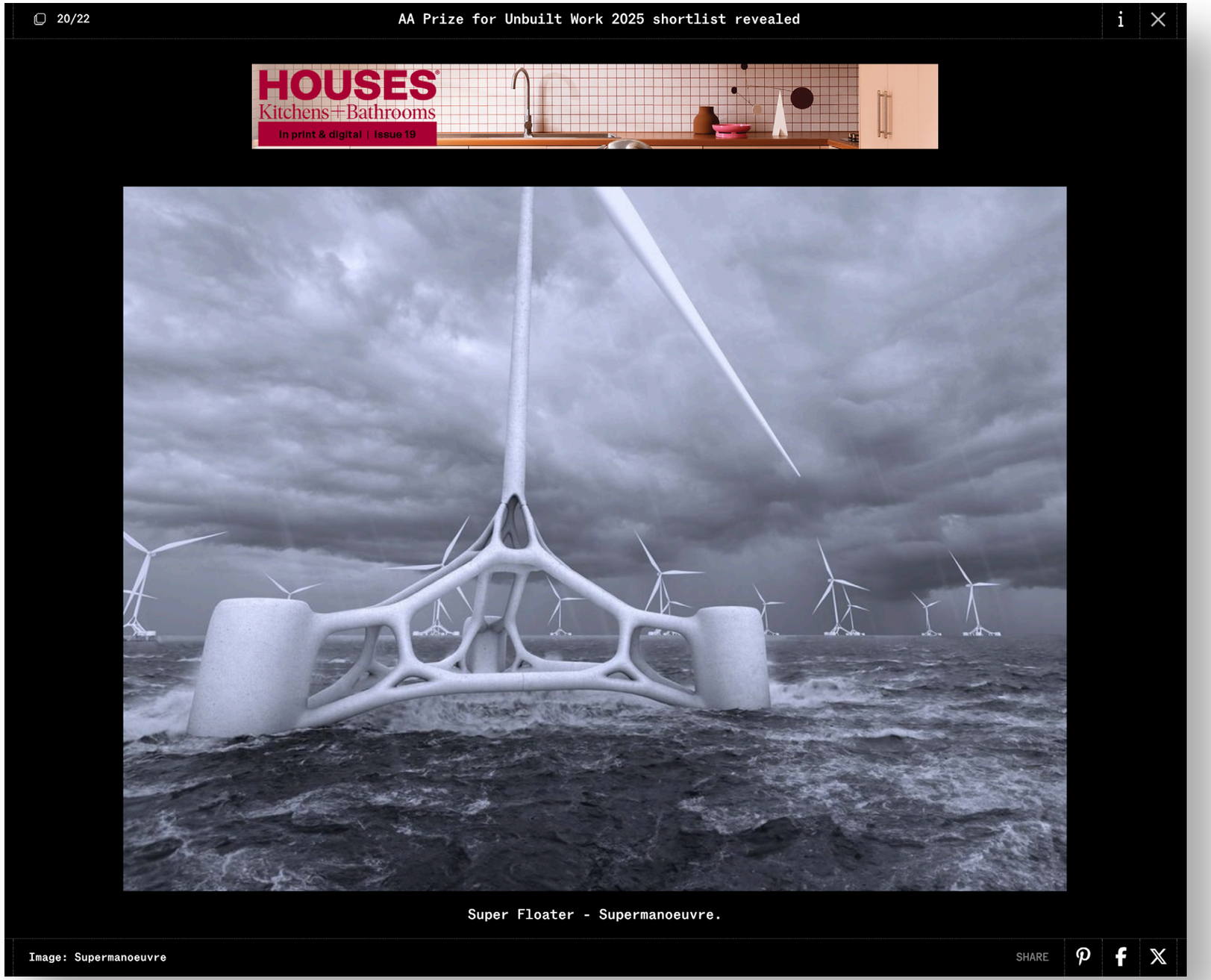
Productive Edge – *Phorm Architecture and Design with Silvia Micheli and Antony Moulis*

Super Floater – *Supermanoeuvre*

The Lay of the Land – *Henrick Michael*

The Mill – *Ariani Anwar*

Most read



Super Floater - Supermanoeuvre.

Image: Supermanoeuvre

SHARE

Dave Pigram
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PORTFOLIO

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AA Prize for Unbuilt Work 2025
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TYPE

Dave Pigram, University of Technology, Sydney
Iain Maxwell, University of Canberra
AUTHORS

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Offshore Floating Wind Turbine Platform
PROJECT TITLE

US011999451B2

(12) **United States Patent**
Buttles et al.

(10) **Patent No.: US 11,999,451 B2**
(45) **Date of Patent: Jun. 4, 2024**

(54) **ADVANCED CEMENTITIOUS COMPOSITE FLOATING PLATFORMS AND METHOD OF MANUFACTURE**

(71) Applicant: **Texas Wind Tower Co.**

(72) Inventors: **John Buttles**, Los Angeles, CA (US); **David Pigram**, Sydney (AU); **Jordan Michael Powell**, Tyler, TX (US)

(73) Assignee: **Texas Wind Tower, Co.**, Dallas, TX (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **18/482,170**

(22) Filed: **Oct. 6, 2023**

(65) **Prior Publication Data**

US 2024/0025521 A1 Jan. 25, 2024

Related U.S. Application Data

(63) Continuation of application No. 18/181,384, filed on Mar. 9, 2023, now Pat. No. 11,807,346.
(Continued)

(51) **Int. Cl.**
B63B 73/50 (2020.01)
B63B 5/14 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***B63B 73/50*** (2020.01); ***B63B 5/14*** (2013.01); ***B63B 35/44*** (2013.01); ***B63B 73/40*** (2020.01); *B63B 2035/446* (2013.01)

(58) **Field of Classification Search**
CPC B63B 73/50; B63B 35/44; B63B 5/14; B63B 73/40; B63B 2035/446
See application file for complete search history.

(56) **References Cited**

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(Continued)

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KR 20170118709 A 10/2017
(Continued)

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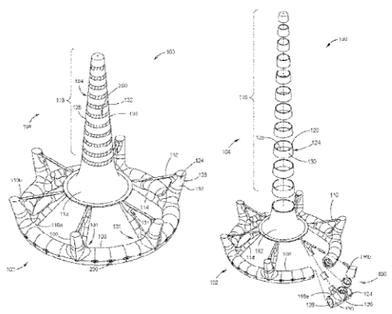
Primary Examiner — S. Joseph Morano
Assistant Examiner — Jovon E Hayes
(74) *Attorney, Agent, or Firm* — Patterson + Sheridan, LLP

(57) **ABSTRACT**

Semi-submersible wind turbine platforms capable of floating on a body of water and supporting wind turbines, and a method of manufacturing the semi-submersible wind turbine platforms from advanced cementitious composite material are provided. The method includes determining at a first iteration topological outputs of the wind turbine platform including a plurality of modular sections consisting of an advanced cementitious composite (ACC) material, obtaining a second iteration from the topological outputs, the second iteration including a second model platform and a second model tower of the wind turbine platform, and obtaining addition iterations via simulation to attain a final model platform and a final model tower, the final model platform and the final model tower including a layout of the plurality of modular sections and connections for a platform and a tower of the wind turbine platform.

19 Claims, 7 Drawing Sheets



(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 392 668 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
14.01.2026 Bulletin 2026/03

(21) Application number: **23767482.5**

(22) Date of filing: **09.03.2023**

(51) International Patent Classification (IPC):
F03D 13/25 *(2016.01)* ***B63B 35/44*** *(2006.01)*
F03D 13/10 *(2016.01)* ***F03D 13/20*** *(2016.01)*
B63B 5/14 *(2006.01)* ***B63B 73/40*** *(2020.01)*
B63B 73/50 *(2020.01)*

(52) Cooperative Patent Classification (CPC):
B63B 73/50; B63B 5/14; B63B 35/44; B63B 73/40; F03D 13/10; F03D 13/20; B63B 2035/446; Y02E 10/72; Y02P 70/50

(86) International application number:
PCT/US2023/014914

(87) International publication number:
WO 2023/172691 (14.09.2023 Gazette 2023/37)

(54) **ADVANCED CEMENTITIOUS COMPOSITE FLOATING PLATFORMS AND METHOD OF MANUFACTURE**

ERWEITERTE SCHWIMMENDE PLATTFORMEN AUS ZEMENTARTIGEM VERBUNDSTOFF UND VERFAHREN ZUR HERSTELLUNG

PLATES-FORMES FLOTTANTES COMPOSITES CIMENTAIRES AVANCÉES ET PROCÉDÉ DE FABRICATION

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **09.03.2022 US 202263269070 P**

(43) Date of publication of application:
03.07.2024 Bulletin 2024/27

(73) Proprietor: **Texas Wind Tower Co.**
Dallas, TX 75209 (US)

(72) Inventors:
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- **POWELL, Jordan Michael**
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- **PIGRAM, David**
  Dallas, TX 75209 (US)

(74) Representative: **Appleyard Lees IP LLP**
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(56) References cited:
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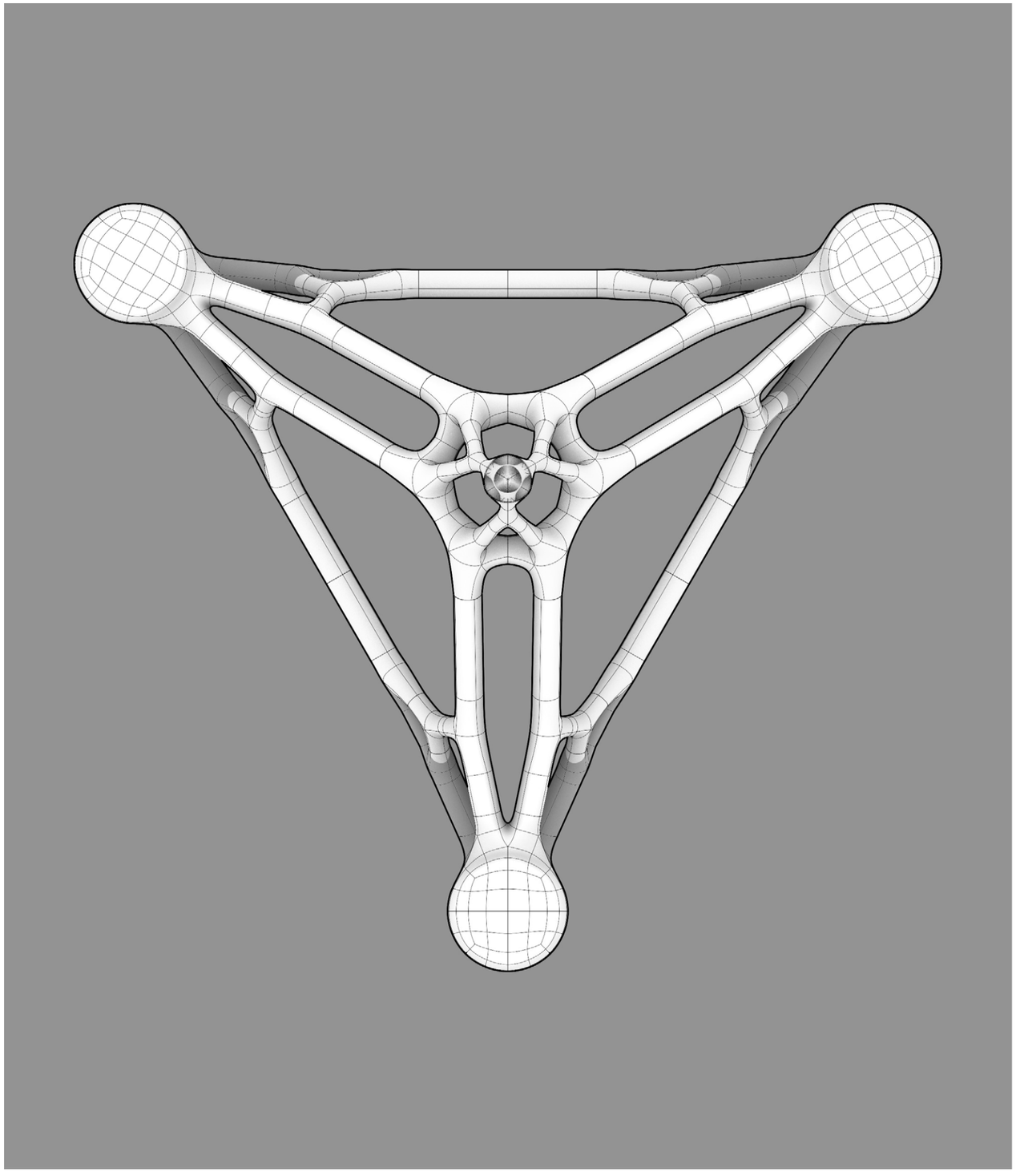
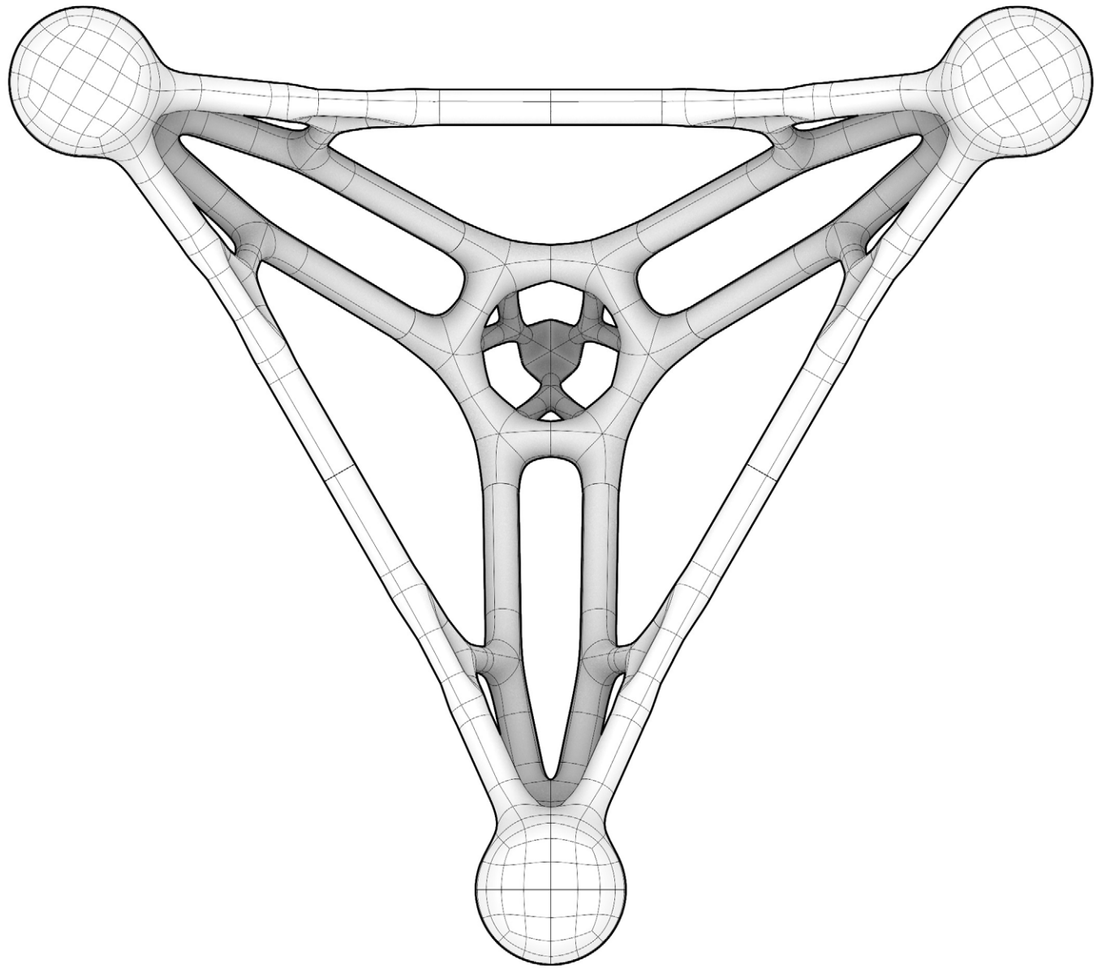
CN-A- 102 015 435
CN-A- 112 922 018
KR-A- 20170 118 709
US-A1- 2014 248 091
US-A1- 2022 002 961
US-B2- 9 964 097

- **JIN QINGXU ET AL: "Structural and durability assessment of ECC/concrete dual-layer system for tall wind turbine towers", ENGINEERING STRUCTURES, ELSEVIER, AMSTERDAM, NL, vol. 196, 28 June 2019 (2019-06-28), XP085759885, ISSN: 0141-0296, [retrieved on 20190628], DOI: 10.1016/J.ENGSTRUCT.2019.109338**

EP 4 392 668 B1

DESIGN ARTEFACTS
PLAN, REFLECTED PLAN





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DESIGN ARTEFACTS
Plan & Reflected Plan
IMAGE

Original Creative Work
Architectural Project
TYPE

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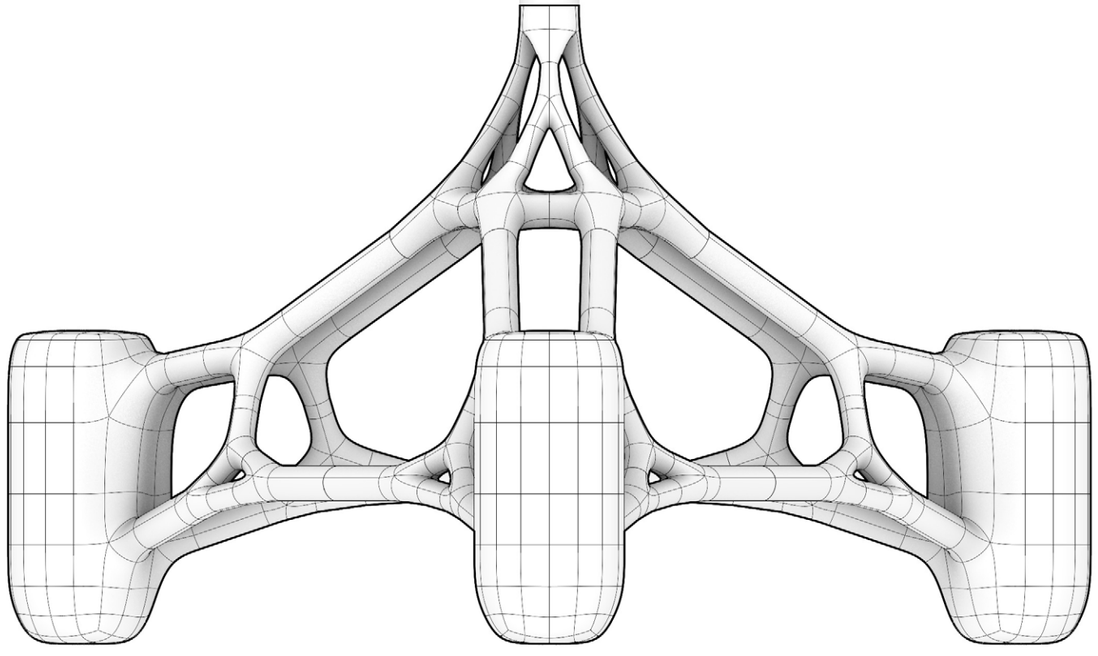
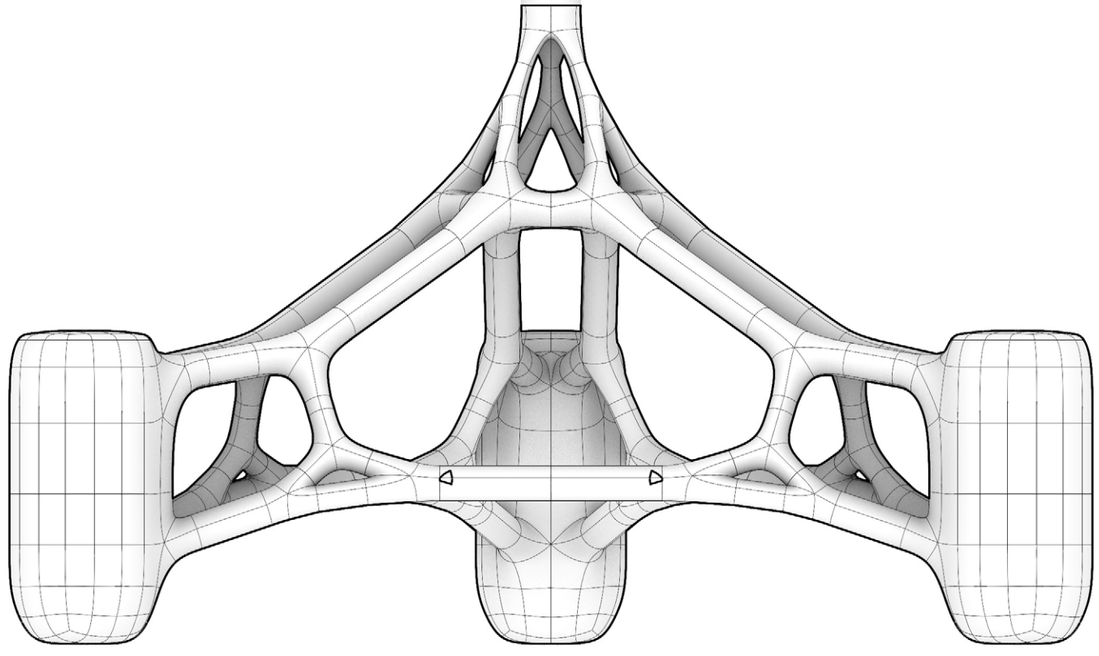
Iain Maxwell, University of Canberra
AUTHORS

Super Floater
Offshore Floating Wind Turbine Platform
PROJECT TITLE

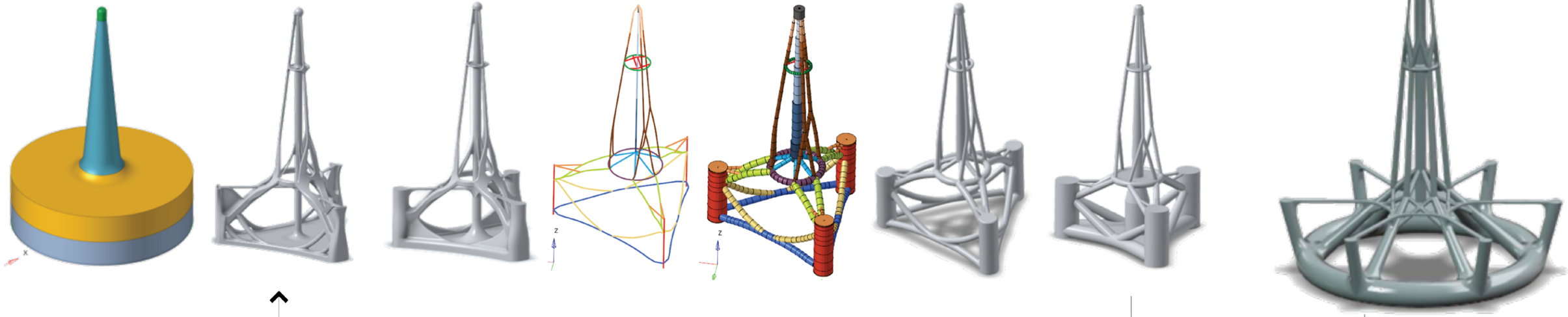
DESIGN ARTEFACTS
ELEVATIONS

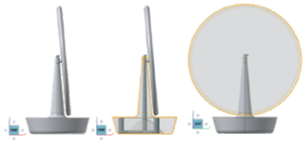




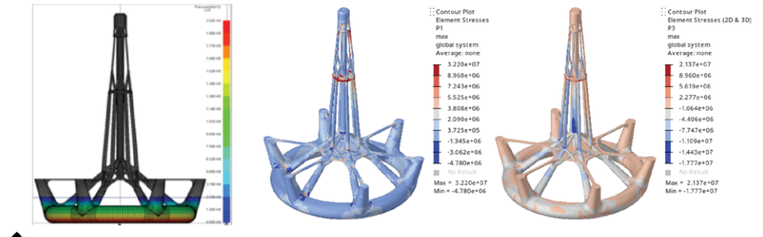
DESIGN ARTEFACTS
MULTI-STAGE DIGITALLY-AUGMENTED DESIGN PROCESS

01 02 03 04 05 06 07 08





GEOMETRIC CONSTRAINTS +
BOUNDARY CONDITIONS



PERFORMANCE ANALYSIS - STRUCTURAL, MARITIME ETC.

Multi-Stage Digitally-Augmented Design Process

The process of generating floating platform designs involves multiple steps, and tight feedback loops combining structural and maritime performance simulations with fabrication-aware formfinding processes.

01
Input permitted design envelope, load cases, boundary conditions and non-design regions.

02
Structural topological optimization resolves constraints into a minimal material distribution; the process is enacted in Altair OptiStruct.

03
Add buoyancy components and adjust for stability.

04
Extract medial-axes as centerlines.

05
Interpret results from P3 into a manufacturable structure reflecting conditions of the proposed fabrication approach.

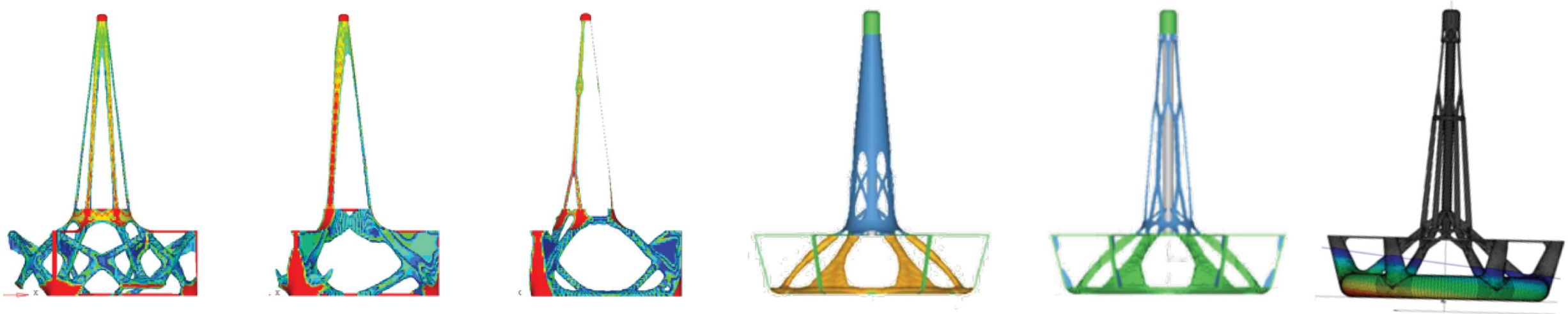
06
Determine Centre of Gravity [COG] and desired waterline. Use naval analysis MAESTRO to recheck COG and waterline – adjust size, thickness and ballast to achieve stability.

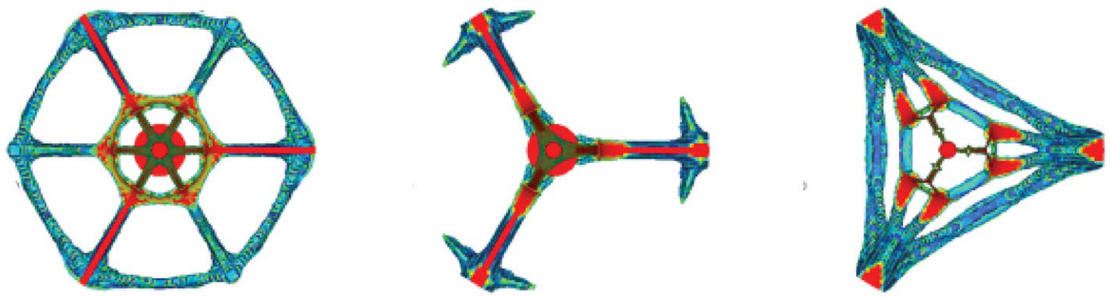
07
Extract hydrostatic loading from MAESTRO to isolate non-design within new boundary condition and repeat as P1.

08
Conclude with an optimized FOWP design resulting from the completed computationally augmented process.

DESIGN ARTEFACTS

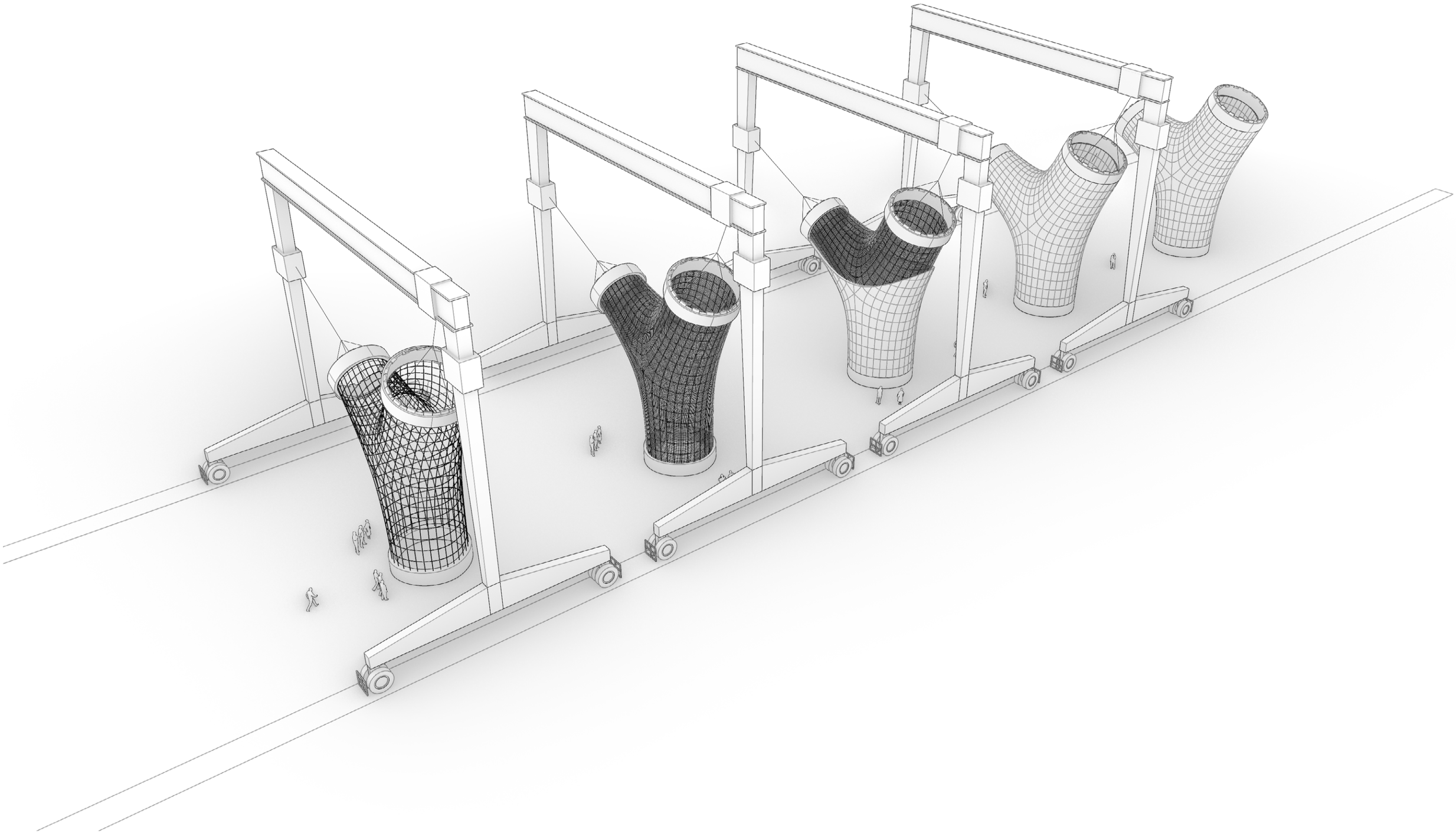
TOPOLOGICAL OPTIMISATION — DESIGN VARIATIONS





DESIGN ARTEFACTS

ULTRA-HIGH-PERFORMANCE CONCRETE [UHPC] NODE FABRICATION PROCESS



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DESIGN ARTEFACTS
Fabrication Process Illustration
IMAGE

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