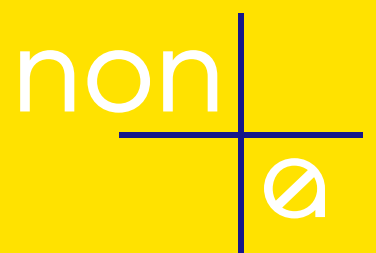# POST-NUCLEAR POWER PLANT

01/11/2022

non+a

NON ARCHITECTURE

We can consider "architecture" everything that has already been designed and/or built. That would define a realm of conventional solutions, often repeated in a self-referential system. We imagined a counterpart, a "non architecture". A world of unexplored designs and countless possibilities, that if found, could enlarge and change permanently the boundaries of architecture. A universe of chances and opportunities never challenged by architects before. A limitless field of investigation that includes everything that is not architecture, yet.

Non Architecture Competitions aims to find unconventional and unexplored design solutions in the field of architecture. The second phase of competitions is structured in 9+2 themes: a Research Ecosystem with the purpose of exploring each theme from different perspectives. All competitions have their focus on tackling the big issues of tomorrow, by seeking nontraditional approaches in the architect's work.

Post-Nuclear Power Plant is one of the Non Architecture "Energy" competitions.

INTRODUCTION

Participants of this competition are asked to come up with creative proposals for the decommissioned Fukushima Daiichi Nuclear Power Plant in Japan. The goal is to give a new purpose and reimagine this existing and underutilized nuclear power plant into a beautiful piece of architecture that positively impacts the community. Proposals can be pavilions, buildings, landscape design, urban plans, strategic visions or any other creative form of spatial design.

Many cities like Fukushima await this opportunity, where large-scale infrastructures lie empty, waiting for a visionary project. This is more than remodelling and swapping out paint colours, the aim is to transform this abandoned nuclear power plant from a liability into an asset, and give it a second chance at life through your design.

From 2016, a total of 150 nuclear reactors were shut off, and since 2017, most nuclear plants operating were designed for a life of about 30 - 40 years. Many power plants are coming to the end of their life, meaning they must go through a decontamination and decommissioning process, and be left empty.

What does the future hold for these empty nuclear facilities? What role can we play as designers in reimagining a new use for these places?

Post-Nuclear Power Plant aims to answer those questions with a particular focus on Energy in a post-nuclear cycle.

COMPETITION
BRIEF

→

RE-DESIGN A NUCLEAR PAST

No energy source comes without any environmental impact. Whether it's coal, gas, nuclear or renewables, every energy source takes up land; uses water; and needs some natural resources for fuel or manufacturing.

Nuclear energy is the most land-efficient source: per unit of electricity it needs 50-times less land compared to coal; and 18 to 27-times less than on-ground solar photovoltaic. It is the only large-scale, carbon-free electricity source that a country can widely expand to produce large amounts of electricity. Nuclear power plants are thermal plants. They use heat produced by nuclear fission to convert water into high-pressure steam. The steam drives a turbine generator to make electricity. This energy source prevents the release of significant quantities of emissions that would be created by burning fossil fuels to generate the same amount of electricity.

Nuclear energy isn't all good news, though. The Fukushima Nuclear Disaster is the latest testament to that. This disaster was a consequence of the combination of a tsunami and a powerful earthquake in March 2011. Radioactive material was subsequently released along with several chemical explosions, which were initiated by the immense heat released by the nuclear reactions.

The Fukushima Daiichi Nuclear Power Plant is today a disabled nuclear power plant located on a 3.5-square-kilometre site in the towns of Ōkuma and Futaba in Fukushima Prefecture, Japan. The plant suffered major

damage from the magnitude 9.0 earthquake and tsunami that hit Japan on March 11, 2011. The chain of events caused radiation leaks and permanently damaged several of its American-designed reactors, making them impossible to restart. By political decision, the remaining reactors were not restarted.

First commissioned in 1971, the plant consists of six boiling water reactors. These light water reactors drove electrical generators with a combined power of 4.7 GWe, making Fukushima Daiichi one of the 15 largest nuclear power stations in the world.

A year after the nuclear meltdowns at the Fukushima Daiichi plant, tens of thousands of people from the area still cannot return to their homes. Many will not be able to do so during their lifetimes. Only two of Japan's 54 reactors are operating, and there is uncertainty over whether the others will return to service.

Why is radioactive material dangerous? To start with, to be radioactive refers to the fact that this material is actively emitting radiation. Electromagnetic radiation emitted as a result of nuclear fission, has 100,000 times more energy than visible light. Radioactive material can also emit highly energetic electrons. This concentrated energy causes the molecules in our body to react in ways that can be extremely damaging, sometimes giving rise to cancer.

Radioactivity isn't just a characteristic of the material being used in the nuclear reactor. Even in the absence of a nuclear accident, nuclear power inevitably produces dangerous materials. This waste, stays radioactive for extremely long periods, too, presenting a major problem in regards to storage.

Following the 2011 Fukushima nuclear disaster in Japan, the most severe nuclear accident since Chernobyl, many nations reiterated their intent to wean off the energy source. Despite a dip in total capacity and active reactors, nuclear energy now provides about 10% of the world's electricity from about 440 power reactors.

When a power company decides to close a nuclear power plant permanently, the facility must be decommissioned by safely removing it from service and reducing residual radioactivity to a level that permits release of the property and termination of the operating license.

This also means that a great number of large-scale infrastructures previously used for nuclear energy production are left abandoned and with no use. What would you do with an old and empty nuclear power plant? Would you tear it down, leave it abandoned, or could you transform it into something new? Cities all around the world are wrestling with this very challenge. The question then becomes, what can architecture do about it? What could it become? How can we as designers make it an active piece of the city?

Unlike other nuclear infrastructures that are in the middle of nowhere, the Fukushima Daiichi Nuclear Power Plant is right next to the cities of Ōkuma and Futaba. This is a site with a privileged location and unique sensitive environmental settings. Considering that the reactors will take 30–40 years to be decommissioned, what does the future hold for this site, after that?

With absolute freedom in the program, participants are asked to make it an active piece of the city. Proposals can be pavilions, buildings, landscape design, urban plans, strategic visions or any other creative form of spatial design. The scale of the projects can range from furniture design up to masterplanning.

POST-NUCLEAR POWER PLANT

Non Architecture and all the supporting organizations collaborated in identifying a range of 30 design issues related to the research theme of Energy. Within our longlist, we highlighted a few that could be relevant to this competition.

In relation to the Energy Production and Management:
1. Fossil fuels, Gas & Oil,
2. Geothermal,
3. Wind power,
4. Solar Power,
5. Hydropower,
6. Biomass and natural gas,
7. Cinetic energy harvesting,
8. Hydrogen,
9. Nuclear Energy,
10. Alternative energy sources,
11. Batteries and energy storage,
12. Energy infrastructure and distribution,
13. Smart Grids,
14. Energy efficiency.

In relation to Society & Culture:
15. Energy saving behaviours & Responsible Consumption,

16. Visual Impacts of energy infrastructure,
17. Space occupation of energy infrastructure,
18. Energy Commons.

In relation to Architectural Design:
19. Energy saving for building construction,
20. Energy saving for buildings operations,
21. Integrated energy production systems,
22. Upgrade and innovation of energy systems.

In relation to Urban Development:
23. Urban energy network (cables, switching stations, shafts),
24. High voltage network,
25. Heat networks and district heating,
26. Urban Mobility,
27. Public transport,
28. Recharging / Refuelling stations,
29. Street lighting,
30. Internet of things and Blockchain.

These are only a few of the critical aspects to address around the theme of Energy. Projects should take into consideration one or more of these themes. They can also come up with new ones, as long as they are relevant to the topic of the competition.

We ask participants to select a maximum of 5 keywords to explain their design. Keywords can be picked from our list or they can be proposed by the design team. See the submission requirements for further reference.

If you want to receive more insights on these topics you can subscribe to our newsletter or visit our online journal. You will get articles, essays and references from our editorial team.

COMPETITION
SITE

→

SITE

The Fukushima Daiichi Nuclear Power Station is an out of commission nuclear plant located in the towns of Futaba and Ohkuma, 250km north of Tokyo city in Japan.

The first unit of the nuclear station was commissioned in 1971. In total, the station has six boiling water reactors which together have a power generation capacity of 4.69GW.

The site is divided into two reactor groups, the leftmost group – when viewing from the ocean – contains units 4, 3, 2 and 1 going from left to right. The rightmost group – when viewing from the ocean – contains the newer units 5 and 6, respectively, the positions from left to right. A set of seawalls protrude into the ocean, with the water intake in the middle and water discharge outlets on either side.

Fukushima Daiichi
Nuclear Power Station

Tokyo
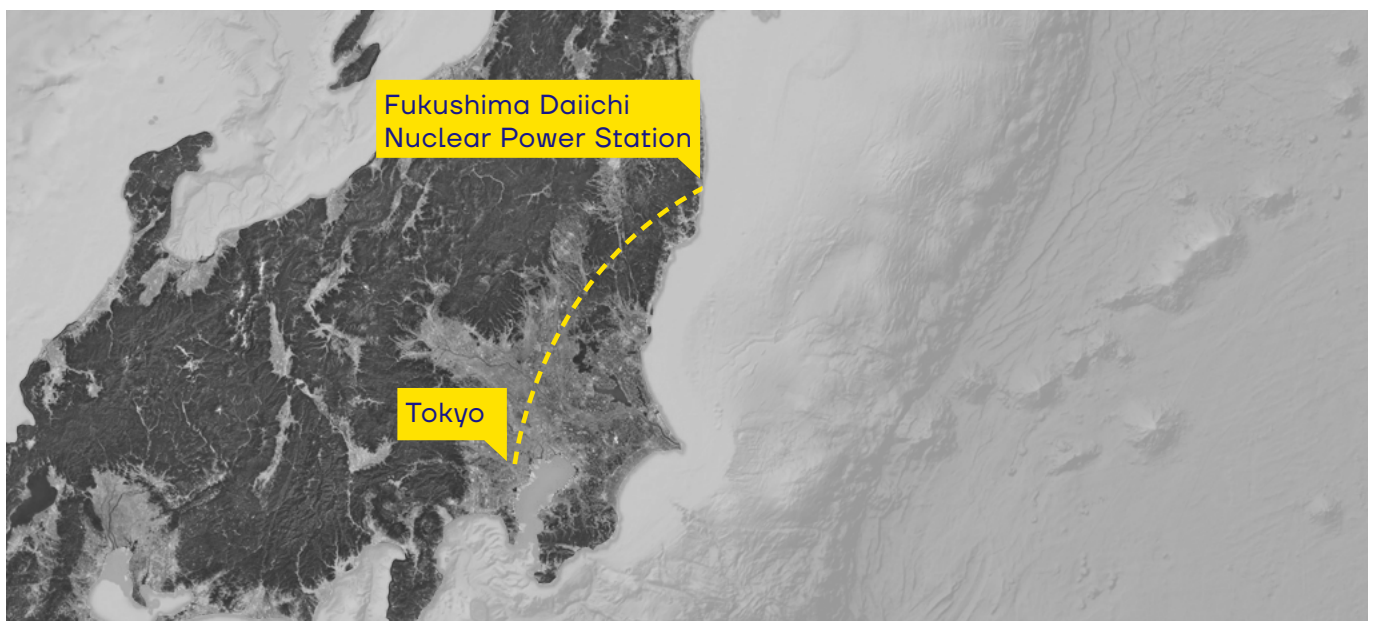
LOCATION

Site plan and photos are available for download **HERE**.


Competition Site
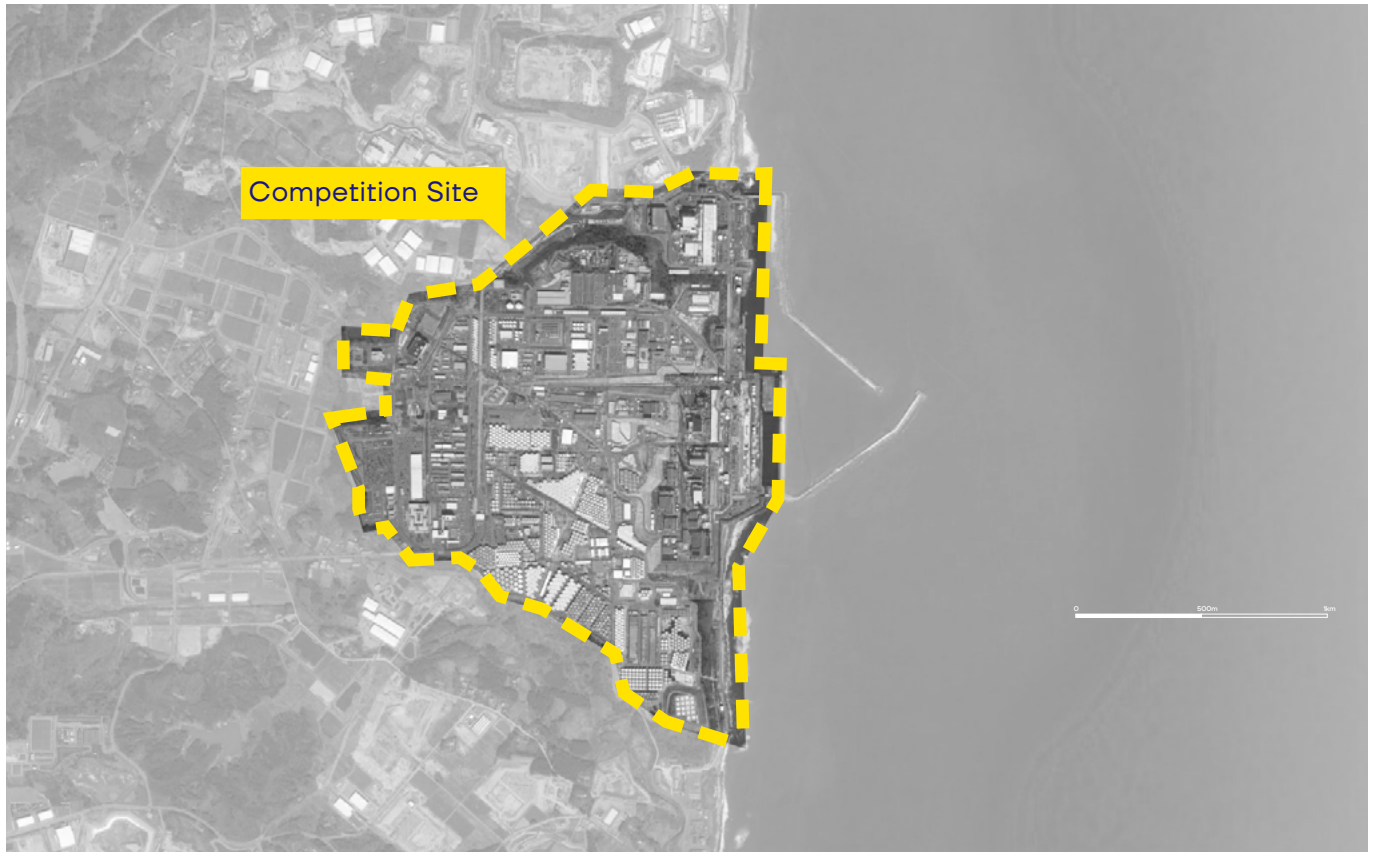
AERIAL VIEW OF THE SITE

PLANT LAYOUT AND STRUCTURES

Units 1 through 4 are located in the town of Okuma, which is in the county of Futaba, Fukushima Prefecture. Units 5 and 6 are located in the town of Futaba in the same county.

Facilities for each reactor unit comprise several buildings including the reactor building, turbine building, control building, service building, radioactive waste treatment building and others. Some of these buildings are shared between adjoining reactor units.
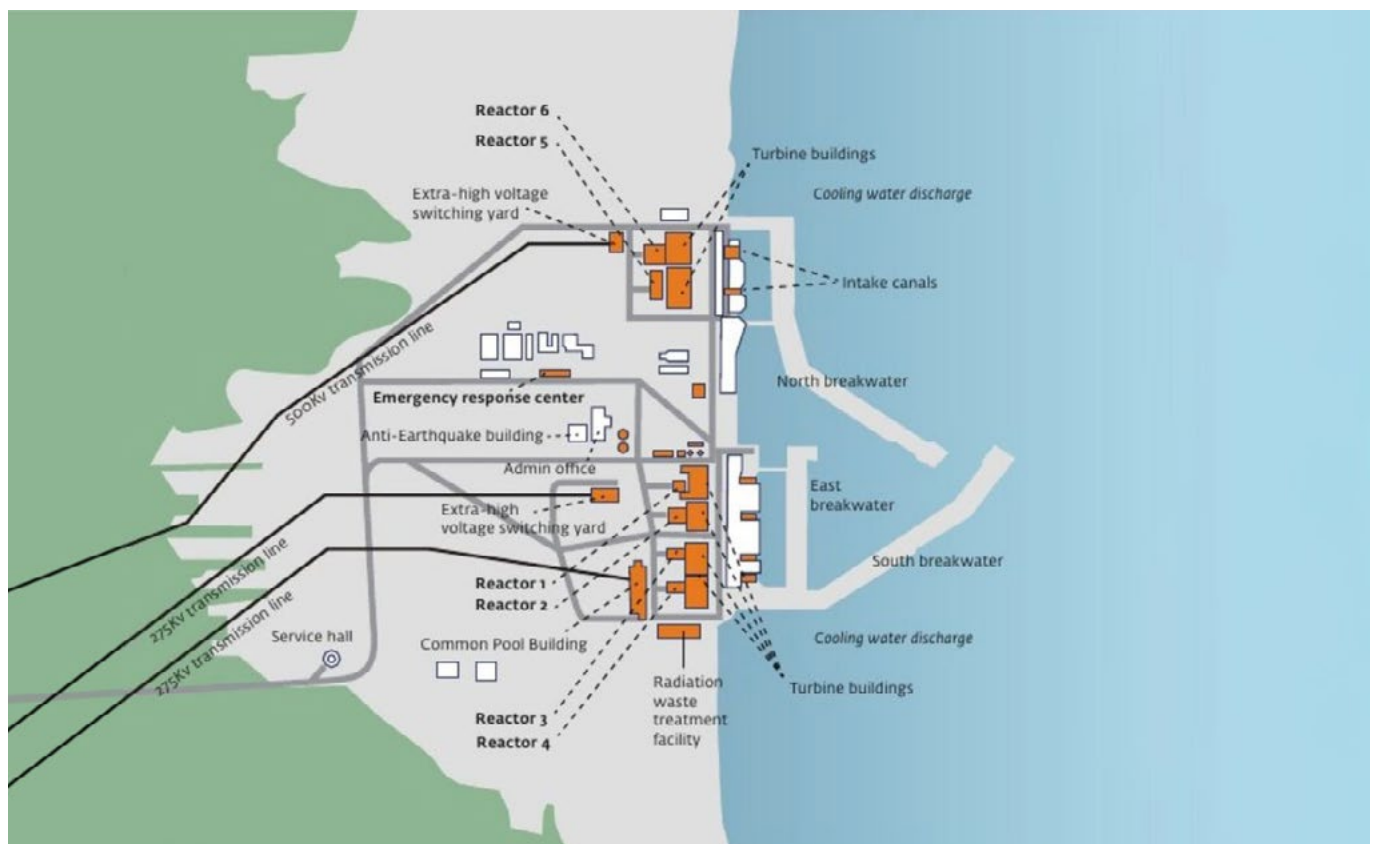
THE FUKUSHIMA DISASTER

A Magnitude 9.0 earthquake occurred at 2:46 p.m. on March 11, 2011, with an epicenter on the ocean floor off the coast of Sanriku.

The Fukushima Daiichi Nuclear Power Station was among those hit by strong shaking. However, Units 1,2, and 3 - operating at the same time of the earthquake - all made emergency trips. Additionally, their emergency diesel generators started up and cooling of their reactor cores began. The earthquake caused damage to some routine equipment, such as power transmission and receiving facilities, but no damage to key safety facilities.

However, the nuclear power station took a direct hit from an enormous tsunami about 50 minutes after the earthquake happened. Pumps and other outdoor equipment installed on the seaside for releasing heat from the reactor to the sea were damaged, and almost the entire site on which the reactors were built was flooded as a result of the tsunami. Also, water flooded into the turbine building and other structures and power-supply facilities became unusable. As

SITE VIEW

THE DISABLED FUKUSHIMA DAIICHI NUCLEAR POWER PLANT

a result, various key safety functions, such as the injection of coolant into reactors and the ability to monitor status, were lost.

In the days after the accident, radiation released into the atmosphere forced the government to declare an ever-larger evacuation zone around the plant, culminating in an evacuation zone with a 20 km radius. All told, some 110,000 residents evacuated from the communities surrounding the plant due to the rising off-site levels of ambient ionizing radiation caused by airborne radioactive contamination from the damaged reactors.

Large amounts of water contaminated with radioactive isotopes were released into the Pacific Ocean during and after the disaster. The plant's operator has since built new walls along the coast and has created a 1.5 km long "ice wall" of frozen earth to stop the flow of contaminated water.

UNIT 4

RUBBLE OUTSIDE UNIT 4

UNITS 1 AND 2 TOWER

WORKERS AT FUKUSHIMA DAIICHI NUCLEAR POWER STATION WORK AMONG UNDERGROUND WATER STORAGE POOLS

SITE PHOTOS

THE FUKUSHIMA NO.1 REACTOR CONTROL ROOM IN 1999

AERIAL VIEW

EXPERTS AT UNIT 4, 2013

PRIME MINISTER YOSHIHIDE SUGA INSPECTED THE DAIICHI NUCLEAR POWER PLANT ON SEPTEMBER 26. 2020

WATER TANKS

RADIOACTIVE CONTAMINATED SOIL COLLECTED (FUKUSHIMA EXCLUSION ZONE)

THE TOWN OF NAMIE (POPULATION 21.000) WAS EVACUATED AS A RESULT OF THE DISASTER

ABANDONED SHOPPING STREET SEEN AT FUKUSHIMA EXCLUSION ZONE

RULES

→

PRESENTATION REQUIREMENTS

PRESENTATION BOARD

.JPEG
A2 LANDSCAPE
594 x 420 mm
300 DPI (7016 x 4961 px)
MAX. 7 MB

CODE_Title of the
project_Board

TEXT
DOCUMENT

.DOC
Title + subtitle
5 keywords
200-word
description
↓ TEMPLATE

CODE_Title of the
project_Text

TEAM
DOCUMENT

.DOC
Team member
info

↓ TEMPLATE

CODE_Title of the
project_Team

Folder: CODE_Title

This competition is an opportunity to address critical issues of tomorrow by creating innovative and unconventional ideas today. Designers are asked to answer the questions posed by the brief with absolute creative freedom.

Non Architecture is also unconventional in its submission requirements. The participants are asked to submit 1 folder, named with the registration code and the title of the project (CODE_Title), containing:

01. Presentation Board (.JPEG) with sketches, renderings, plans, sections, elevations, diagrams, and/or other presentation tools to explain your proposal. File name: "CODE_Title of the project_Board".

02. A text document in Word (.DOC), that clearly states
/ the title and subtitle of the project (maximum of 10 words)
/ 5 keywords, at least 1 from the given list (page 6-7), that better explain your project,
/ a short project description (maximum of 200 words, must be written in English).
File name: "CODE_Title of the project_Text"
USE THIS TEMPLATE

03. A team document in Word (.DOC) with the team's info in the following format:
/ Name + Surname of each team member (separated clearly),
/ Nationality (multiple options can be added),
/ Institution/company (company or university attended, to be included just in case you want it to be visible once your project is published).
There is no need to create a team name.
One team should consist of 1-4 people.
File name: "CODE_Title of the project_Team"
USE THIS TEMPLATE

The CODE refers to the 5-digit number you receive during the registration process (same as the order munber, in a format of #12345), it is going to serve as your registration code for the competition.

An example of naming the files correctly:
CODE: #56789
Title of the project: Nuclear
01. Presentation Board: 56789_Nuclear_Board
02. Text Document: 56789_Nuclear_Text
03. Team Dosument: 56789_Nuclear_Team
Folder: 56789_Nuclear
Please, do not use the # in the file names.
/ You need to come up with your own project title and replace "Nuclear" in the example.

THE EVALUATION OF THE PROJECTS IS ANONYMOUS, so do not include your name, your registration code, or any other reference to you in the images. After being evaluated by the jury, the projects will be reconnected to their authors through the submission code. Additional details on the team members and on the projects will be required during the submission procedure.

IMAGE REQUIREMENTS:

/ A2 Landscape 594 x 420 mm, 300 dpi (7016 x 4961 px),
/ High Quality (for example, in Photoshop JPEG output quality: 8, or 80-85 in Gimp is recommended),
/ 7 MB maximum file size.
If the submitted images don't respect these criteria, may lead to the disqualification of the team.

FORMATTING REQUIREMENTS:

/ The Presentation board can contain sketches, renderings, plans, sections, elevations, diagrams, and/or other presentation tools to explain your proposal.

/ Presentation board must not indicate any information related to an individual's/team's identity.

/ The images in the board do not demand for any kind of specific technique of representation, as long as they respect the given guidelines. They can be technical drawings, diagrams, collages, pictures, renders, models, paintings, hand drawings, etc. Be creative!

/ We highly recommend you to not add text to the images, please use the Text Document for further explanation. The projects should be explanatory enough through the graphic material.

/ It is compulsory to use the provided Word templates to create your Text Document and Team Document.

/ In case the Text Document and Team Document are submitted in any other format than a Word file (.DOC), its content is might be excluded from publishing.

/ The language of the submission is ENGLISH, any text written in a different language will not be taken into account during the evaluation.

EVERY SUBMISSION THAT DOESN'T RESPECT THE PRESENTATION REQUIREMENTS, MIGHT GET DISQUALIFIED FROM THE COMPETITION.

ELIGIBILITY

Non Architecture Competitions are open to all human beings, from every age and cultural background, working in groups or individually.
Teams can be formed by a maximum number of 4 people.
The registration fee is paid per team, regardless of how many members form it. Personal information of all the team members can be uploaded during the submission procedure of the final drawing.

PRIZES

Non Architecture Competitions will award one winner, selected by the jury collectively, and 7 honourable mentions.

WINNER (1 PRIZE)
/ 1.000 euros*
/ publication in the Non Architecture Competitions books and website
/ reviews in digital magazines and several architecture blogs

HONOURABLE MENTIONS (7 PRIZES)
/ publication in the Non Architecture Competitions books and website
/ reviews in digital magazines and several architecture blogs

NON ARCHITECTURE EDITORIAL PICK (MINIMUM 6 PRIZES)
/ publication in the Non Architecture Competitions books and website

FINALISTS (UP TO 36 PRIZES)
/ publication in the Non Architecture Journal

SPECIAL PRIZE
The organization might establish additional special prizes and awards during the competition development and in the evaluation phase.

*Taxes will be deducted and retained by overall prize amount. The prize will be taxed as professional income or other sorts of income according to Italian law, with a range from 20 to 30% according to winners' country of residence.

Note: The appearance on external architectural platforms are subject to the agenda and availability of the external platforms.

CALENDAR AND PRICING

01 November 2022   Competition launch.

01 – 30 November   Special registration period (40€*).
01 – 31 December   Early registration period (55€*).
01 – 31 January   Regular registration period (70€*).
01 – 28 February   Last minute registration period (85€*).

15 February 2023   Submission opens.
28 Feb, 11:59 PM   Submission closes.
01 – 15 April 2023   Winner announcement.

* +22% VAT.

The timing always refers to Central European Time (CET). To avoid confusion, please check the countdown on the competition page.

REGISTRATION

The registration fee is per team, regardless of how many members are on the team.

If a team wants to submit more than one proposal to the competition they will have to register each proposal separately and pay an additional fee for each proposal they wish to submit.

For a project to be accepted the team must be properly registered to the competition. All registrations will be done through the Non Architecture website (nonarchitecture.eu), where you have to create an account, log in and choose your payment option.

All the payments will be organized through our Website, in order to provide the safest procedure to all the participants. Payments can only be operated via credit cards & debit card.

After completing the payment, you will receive an email from Non Architecture which confirms the transaction and registration code. THE REGISTRATION CODE WILL BE THE FIVE DIGITS CODE INDICATED AS "ORDER NUMBER", which will be sent to you once your payment is accepted.

You can olways find your order number in <u>My Account page</u>, under My Order.

After your Non Architecture confirmation is sent, you can't cancel your payment anymore and it is not possible to get a refund of the registration fee.

In case you have issues with payments, contact us at info@ nonarchitecture.eu

JURY

The jury will be composed by a pool of experts specialized in the theme addressed by the competition.

The jury members are the following:

Anouk Legendre
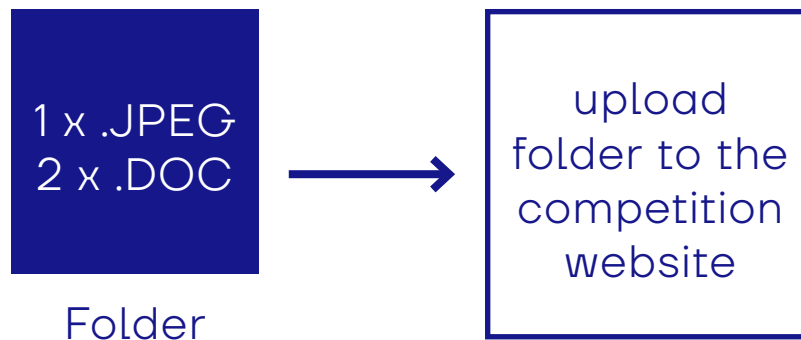Co-founder of XTUArchitects

Martin Ehn Hillberg
Landscape architect, Managing director in Stockholm of White Arkitektur

Arina Agieieva
Co-founder of ZA Architects

All jury members expressed their formal commitment in reviewing short-listed projects and selecting winners according to the awarding criteria expressed in the brief.

SUBMISSION

```
┌─────────────┐            ┌─────────────┐
│             │            │             │
│  1 x .JPEG  │            │   upload    │
│  2 x .DOC   │  ────────▶ │ folder to the│
│             │            │ competition │
│             │            │   website   │
└─────────────┘            └─────────────┘
    Folder
```

Submissions must be done through the Non Architecture website (nonarchitecture.eu), before the submission period ends, the deadline is indicated in the calendar.

The submission surface opens 2 weeks before the submission deadline. It is going to be placed on the Non Architecture website, on the corresponding competition page.

Simply follow the submission instructions and upload the project folder directly on the website.

By filling the form, your submission is finalized. You are going to receive one confirmation email when you finalize your submission on the website.

No submissions will be accepted by e-mail or any other medium.

The submission page will be automatically closed after the submission date and time are reached, not allowing any modifications.

We suggest uploading your project 24 hours in advance to make sure that everything works out correctly. This way you have time to solve any issues that might come up along the submission process.

EVALUATION

The core values of the competition are:
/ Innovation – In terms of program management, technology and originality of the formal solution proposed.
/ Communication – Clarity, appeal and experimentation in the presentation of the proposal.
/ Relevance – The degree to which the proposal is related or useful to the proposed theme.

These values will lead the selection of the finalists' projects and they will be used by the jury as a guideline in their decision.

Remember that this is a competition of ideas, an opportunity to experiment and explore the limits of architecture representation. The jury reserves the right to award any proposal that fails at any of the parameters mentioned in these rules, as long as it justifies the breach of the rule in favour of the value of the proposal.
The voting system to choose the winning projects is as follows:
1. The Non Architecture competitions team, following the main values of the competition, will make an initial selection of max 50 finalist projects in response to the

above mentioned criteria. The amount of pre-selected projects can slightly vary according to the judgment of the pre-selection team.

2. The members of the jury will study the pre-selected projects privately and give an evaluation for each one of them. Votes will be compared and revised to reach a common agreement on the selection of winners and honourable mentions.

In order to guarantee the authenticity of the awarding process, the prize's selection cannot be appealed.

INTELLECTUAL PROPERTY

All the materials submitted to the competition will become part of Non Architecture Competitions' files. Non Architecture will have full rights to publish and promote this material, always making proper mention of their authors.

The material might also be used for the platform's merchandising and exhibition purposes. For any other purpose, the authors of the projects will keep full rights over their design and will be asked to grant permission.

By submitting a proposal you are giving Non Architecture the right to use the received material in both printed and online publications.

Non Architecture Competitions will also have the right to slightly modify any of the mentioned materials in order to better adapt it to the different formats and layouts that different publications might have.

ADDITIONAL NOTES

1. Non Architecture reserves the right to make any changes to this document (dates, deadlines, requirements, etc.) as long as the changes benefit the majority of the competition participants. Any modifications will be announced on the Non Architecture Competitions Discord, Facebook page, Instagram account and weekly newsletter. It is the responsibility of each team to check the above mentioned sources on a regular basis to follow and incorporate if any changes are made.

2. The purpose of this competition is an intellectual exercise and will not be built. To produce a relevant collective research, a minimum amount of 30 registrations has to be submitted. If the registrations are less than 30 by the day of the deadline, Non Architecture reserves the right to proceed with the evaluation and publication, without awarding the monetary prize. In this eventuality, all the registration fees will be reimbursed to the participants.

3. No one has hired Non Architecture to organize this contest. The only purpose of this initiative is to raise questions that could lead to the progress of architecture practice and engage a community of enthusiastic and

creative designers in the creation of what could be a new way to represent architecture.

The idea and program of this competition have been fully developed by the Non Architecture Team to serve solely as an intellectual exercise.

4. Non Architecture Competitions is not held responsible for a breach of contract regarding the publications.

5. Participants are expected to submit original work. Copying somebody else's work or using copyrighted photos, images, architectural/art pieces is strictly prohibited and will result in recalling all prizes and removal from the website, social media and the publication.

6. This competition as well as all products and brand elements related to Non Architecture are sole property of Non Architecture s.r.l., VAT 16621271002, located in Via delle Coppelle 3, 00186, Rome, Italy.

CONTACTS

For additional info please check the FAQ on our website:
www.nonarchitecture.eu/faq

During the competition, all participants are permitted to ask questions which help them better understand the brief description and/or any other aspect of the competition.

Any questions that are not resolved in this document must be made via email at info@nonarchitecture.eu – if you didn't register yet – or through the Nonaverse, our server on Discord – if you already registered to the competition.

You will find there a dedicated channel for competition Q&A. Access to the Nonaverse can be found in your personal account page after registration to the competition.

This ensures that all participants have access to the same amount of information. Questions via any other social media channels will not be addressed.

THE NON
ARCHITECTURE
TEAM AND ALL
THE COMPETITION
PARTNERS WISH
YOU THE BEST LUCK,
CONFIDENT THAT YOU
WILL APPROACH THE
CONTEST
WITH ALL YOUR
CREATIVITY AND
INNOVATIVE MIND.

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ARCHIVOICE

ACT OF MAPPING

CAGE

toffu

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