

How can technology be utilised to mitigate the climate crisis within the built environment?

Alex Man Chun Wong

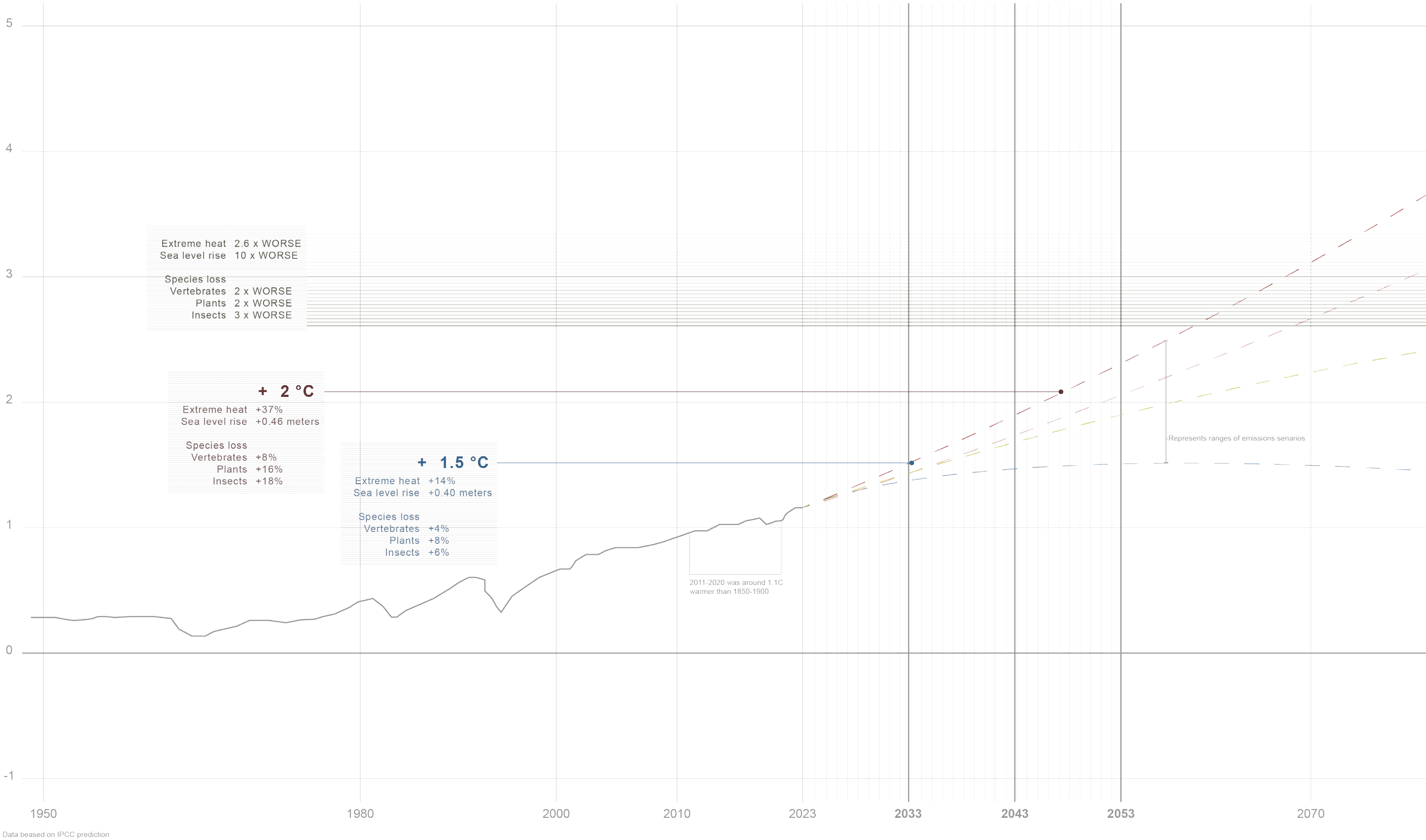
Climate crisis 2031 : What if climate change get worsens?

The Intergovernmental Panel on Climate Change (IPCC) presents a sobering vision of the world in 2030 if current trends in global warming continue unchecked. As we approach this critical decade, the planet is expected to experience profound changes with far-reaching impacts on natural systems and human societies.

By 2030, climate models predict a 1.5°C rise in global temperatures, triggering severe impacts. Sea levels may surge by 0.1 to 0.3 meters, endangering coastal areas. Extreme weather events will intensify, threatening infrastructure and agriculture. Melting ice sheets and glaciers will exacerbate sea level rise, while warming oceans will harm marine life. Terrestrial ecosystems face disruption, risking biodiversity loss.

Extreme weather events will become more frequent and intense, with heatwaves, heavy rainfall, and storms posing increased threats to infrastructure, agriculture, water supplies, and human health. The Greenland and Antarctic ice sheets, along with glaciers worldwide, will continue to lose mass, further contributing to sea level rise and disrupting local ecosystems. Oceans will warm and acidify, adversely affecting marine life, coral reefs, and fisheries. These changes will likely lead to shifts in species distributions and declines in marine biodiversity.

The predictions for 2030 underscore an urgent call to action. The choices we make today will shape the climate and the health of our planet for generations to come. It is imperative that we act decisively to mitigate the impacts of climate change and adapt to its inevitable consequences, ensuring a planet for all.



Data beased on IPCC prediction

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Climate crisis



New Zealand
Rightwing NZ government accused of 'war on nature' as it takes axe to climate policies



America's dirty divide
Heatwaves increase risk of early births and poorer health in babies, study finds



BBC Sign in

Global Warming Crisis: Scientists Warn Earth's Plants Face Extinction, Imperiling Future Life



| AI generated images of the scenarios

Laura Gozzi
BBC News

18 minutes ago

2.9K 17K 5.4K 3.8M

The Artist Formerly Known as Eric @breakingbaht · Nov 16
Okay.

Jewish communities have been pushing the exact kind of dialectical hatred

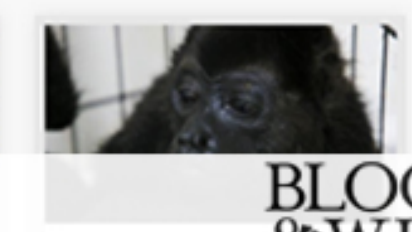
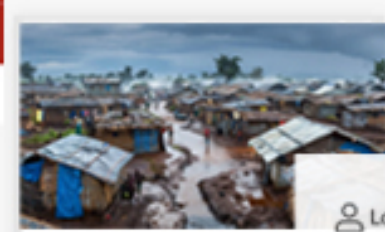
CLIMATE



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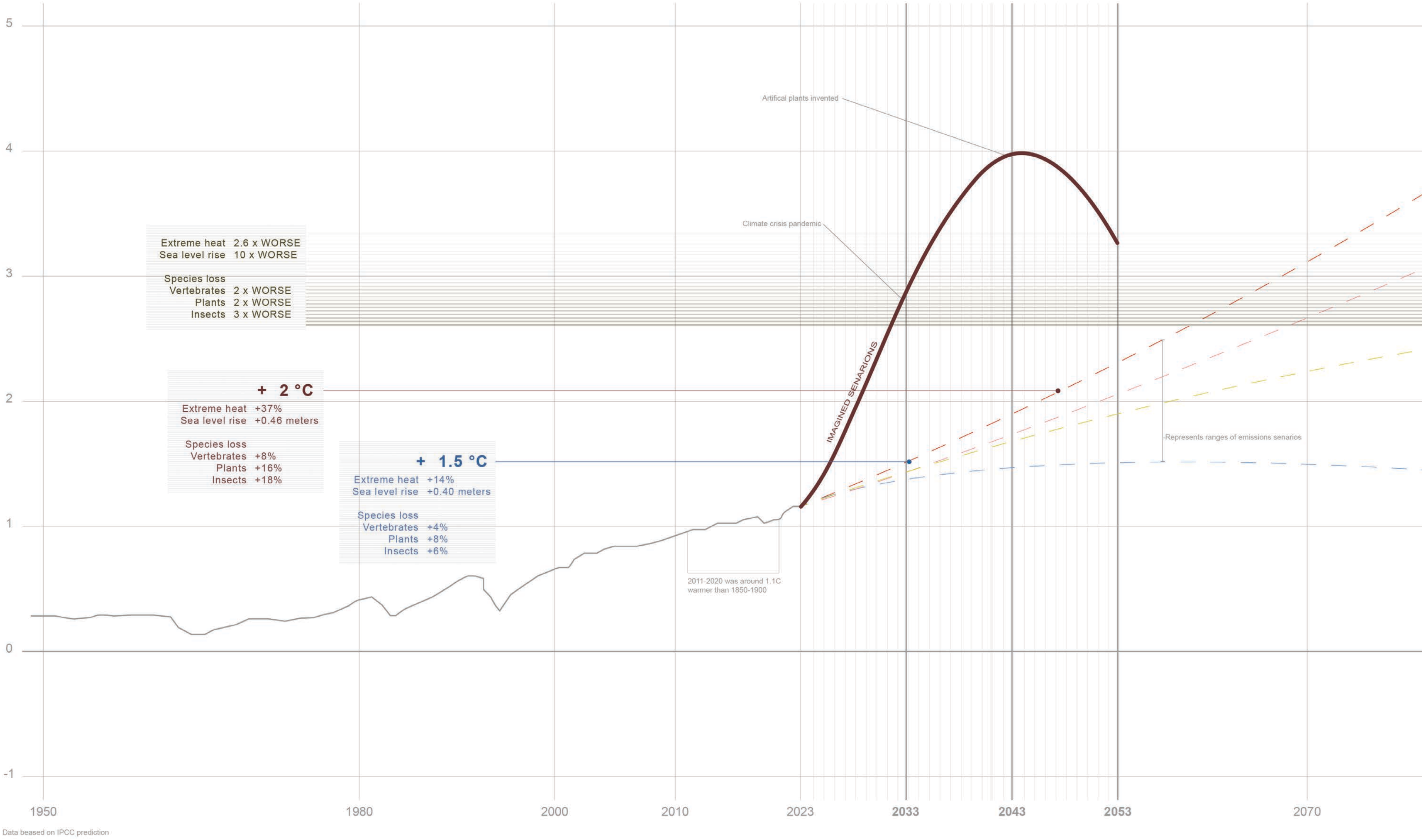


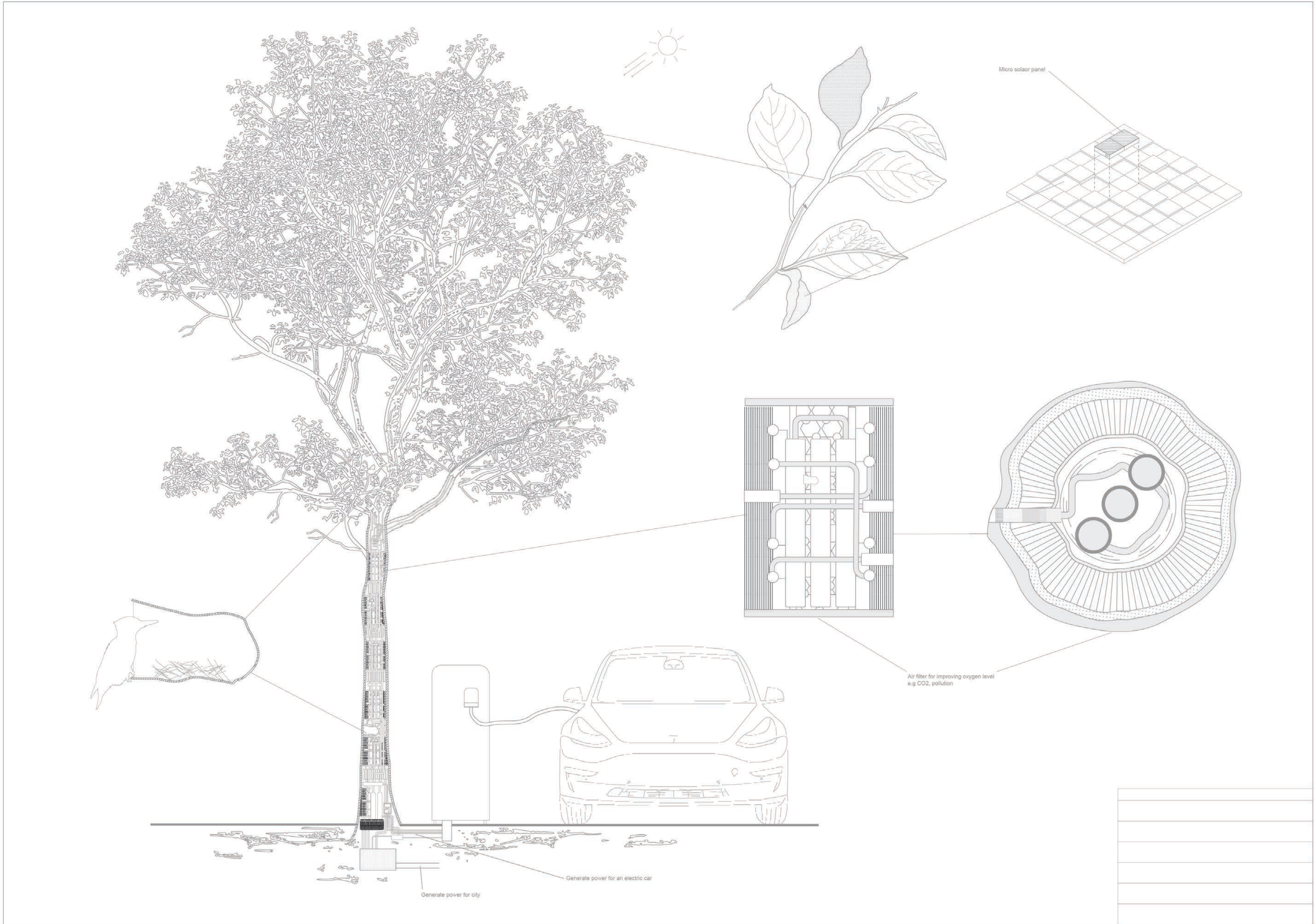
Left image show the impact of the climate change crisis on London, depicting the rising sea levels invade upon the cityscape
Right image show significant decrease in agricultural production, resulting in out of stock in local flower shop

Artificial plant: How can technology serve as a substitute for living organisms in maintaining and preserving climate ecosystems?

Climate Crisis 2031: What If Plants Couldn't Survive? Exploring the Implications and Solutions for Ecosystem Collapse

3°C rise in global temperatures by 2030 would be catastrophic for plants. Massive habitat loss would occur, with many species unable to adapt or migrate quickly enough. Severe drought stress would drastically reduce agricultural yields and natural plant growth. The spread of pests and diseases would accelerate, devastating crops and ecosystems. Phenological mismatches would disrupt flowering and fruiting times, impacting plant reproduction. Widespread forest dieback would occur, reducing carbon sequestration and further destabilising the climate. This extreme scenario underscores the urgent necessity for drastic climate action to protect plant life and maintain ecological balance.





The Artificial Plant proposal, take place in 2030, reimagines the climate crisis by addressing the most worrisome scenarios. With global average temperatures projected to rise by up to 3°C, nearly half of the planet has become unsuitable for plants to live, leading to ecosystems facing unprecedented challenges. In this scenarios, we question how can technology serve as a substitute for living organisms in maintaining and preserving climate ecosystems?

With the technology of Artificial plants designed to replica the living organisms functions. These technologically aim to improve the ecosystem, absorb carbon dioxide, release oxygenated provide electricity, therefore mitigate climate crisis.

To address this problem, a new profession "Plant Engineer" and "Plant Architect" has been created, their role is to design artificial plants. The artificial plant built throughout the city, each functions as an artificial air filter for improving oxygen production and solar panel leaves giving the city clean energy. The roots are used as electricity wires wrapped with carbon fibres designed to efficiently transmit energy from the solar leaves to power the city's systems.

Artificial plants could also be integrated into urban environments, transforming cities into greener spaces without the need for traditional gardening. Such technology can help create microclimates that support human health and well-being. In addition to their environmental benefits by providing habitats for insects and small animals, these synthetic structures can help maintain the delicate balance of ecosystems.



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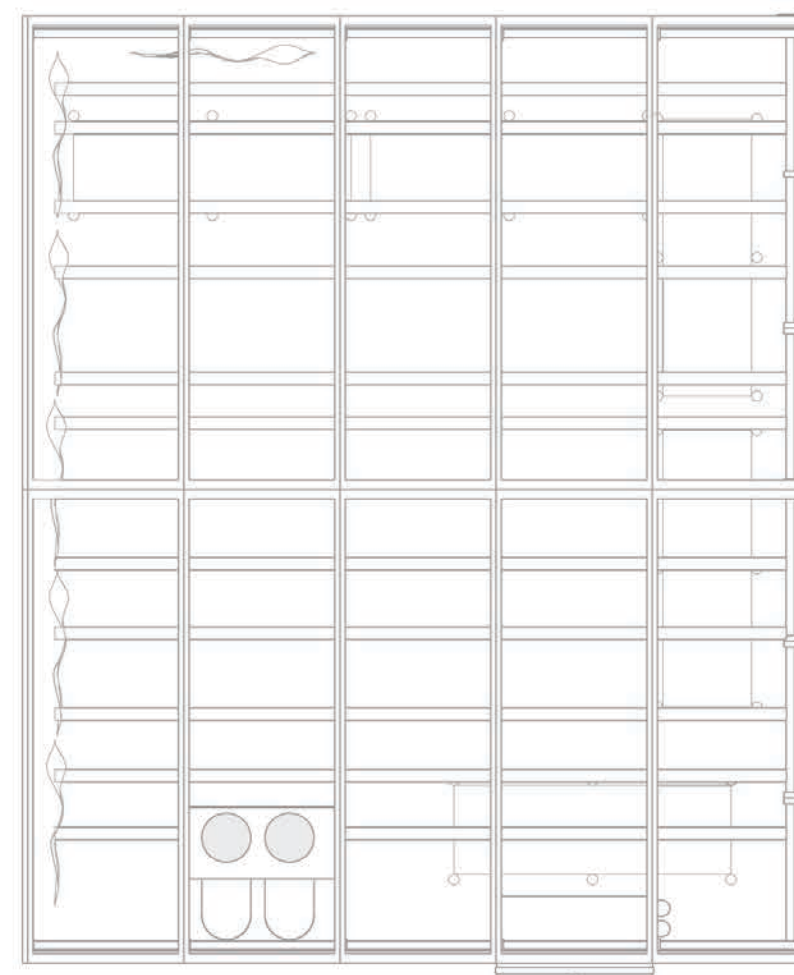
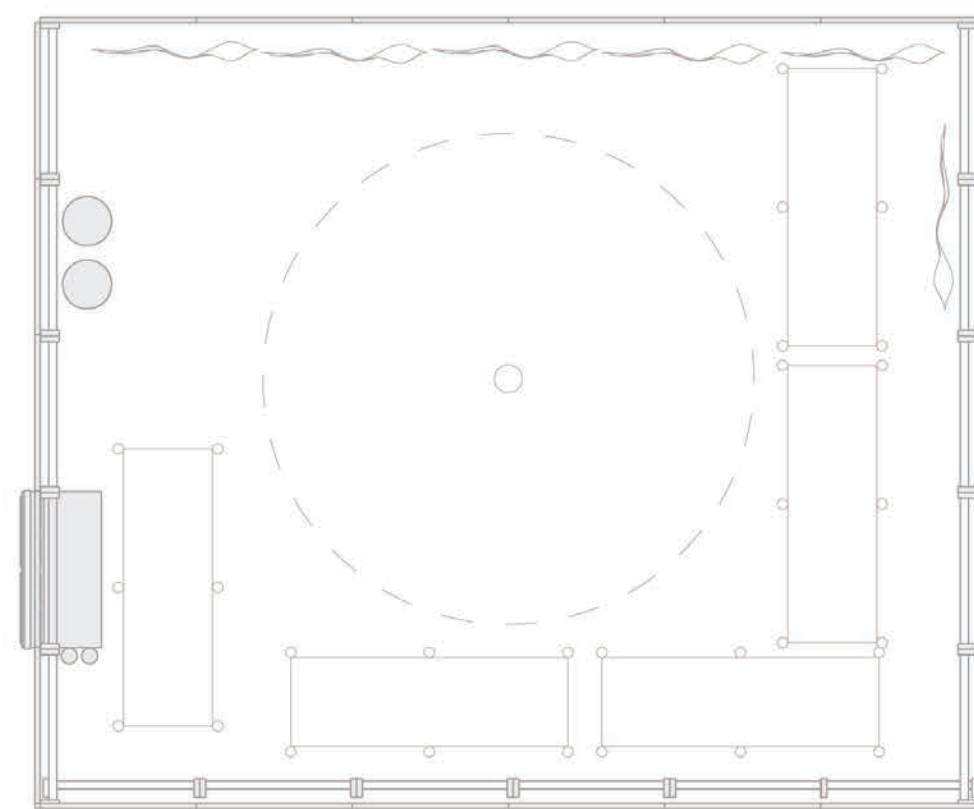
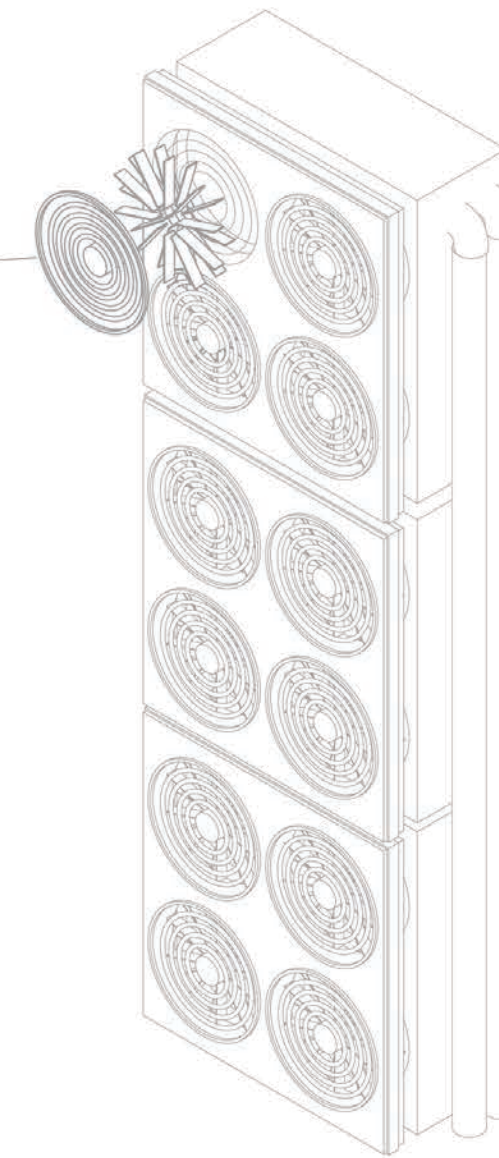
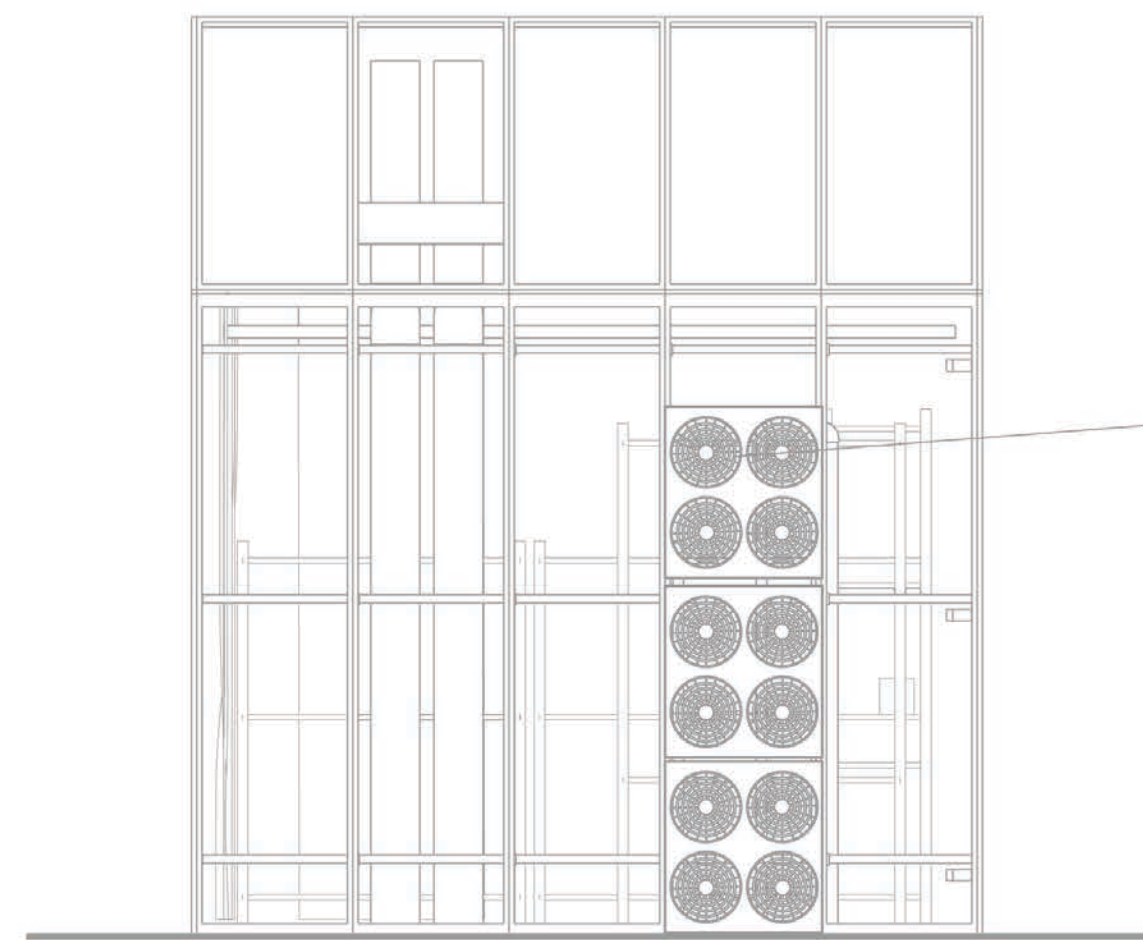
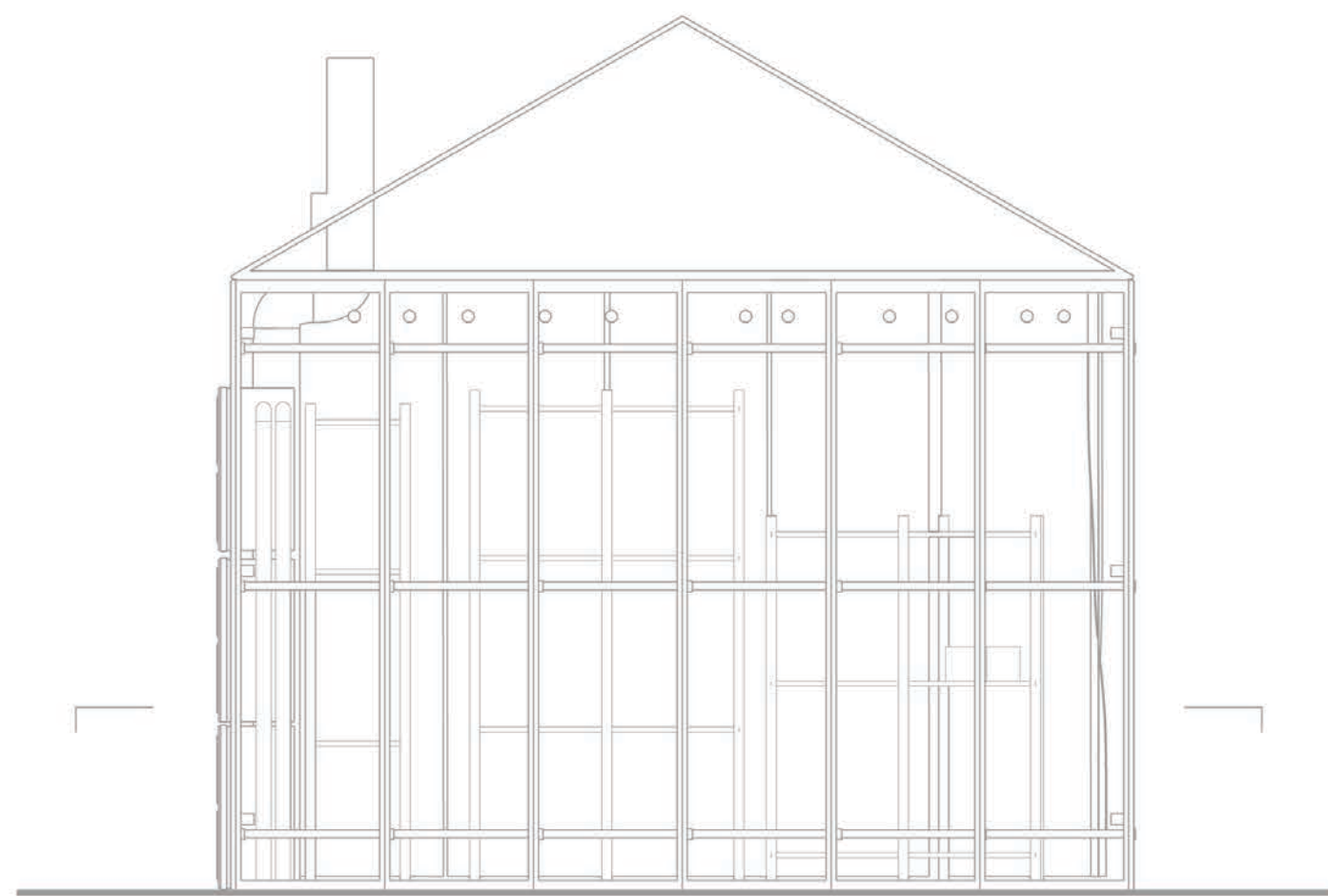
The film show how can the Artificial plant technology use in household



Image show The Artificial plant during construction in The Biodome



Left image show the nearing completion of the artificial plant installation
Right image show the exterior of the Biodome

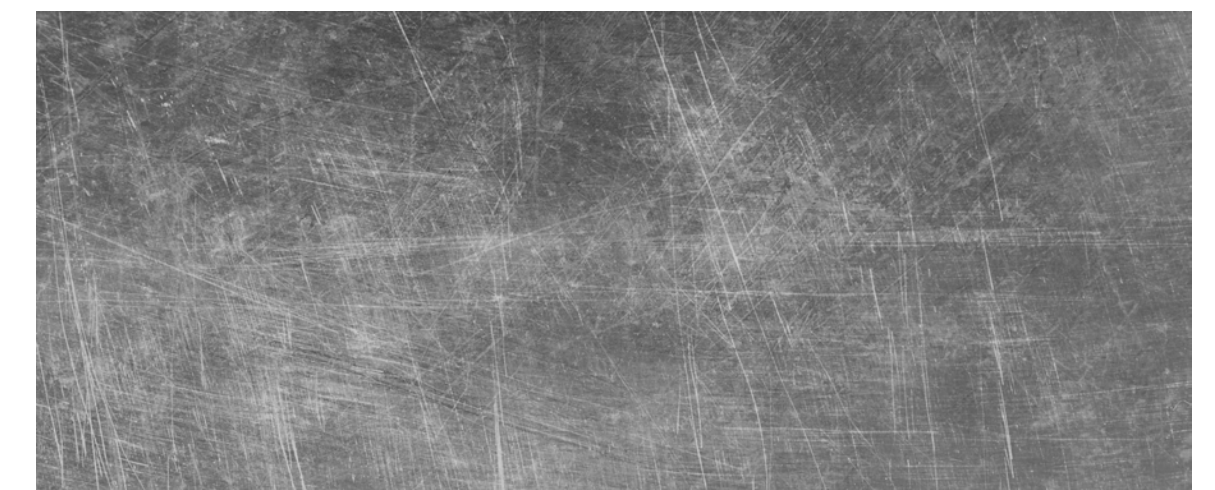


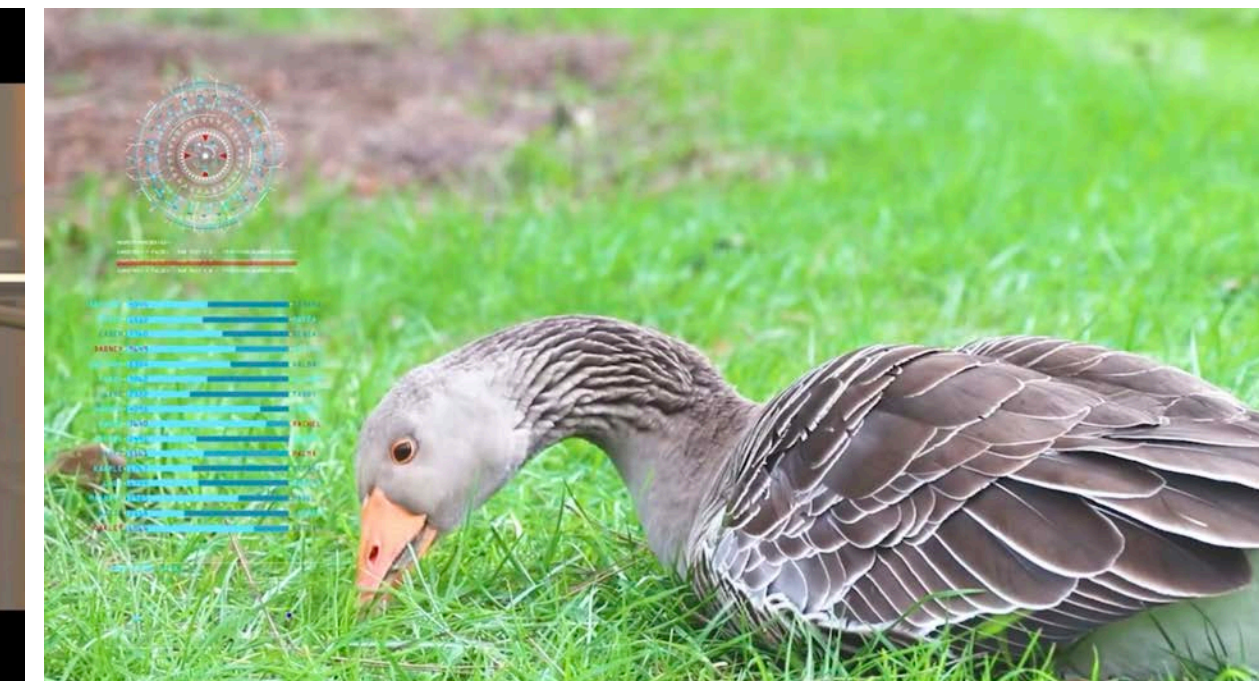
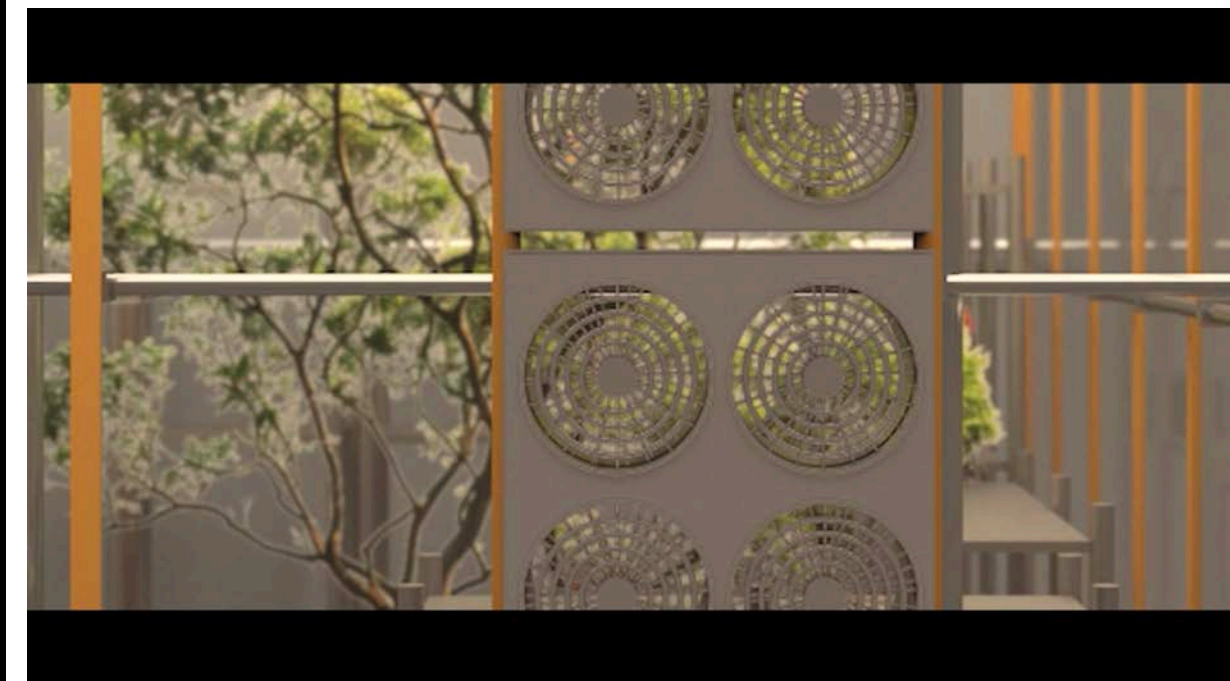
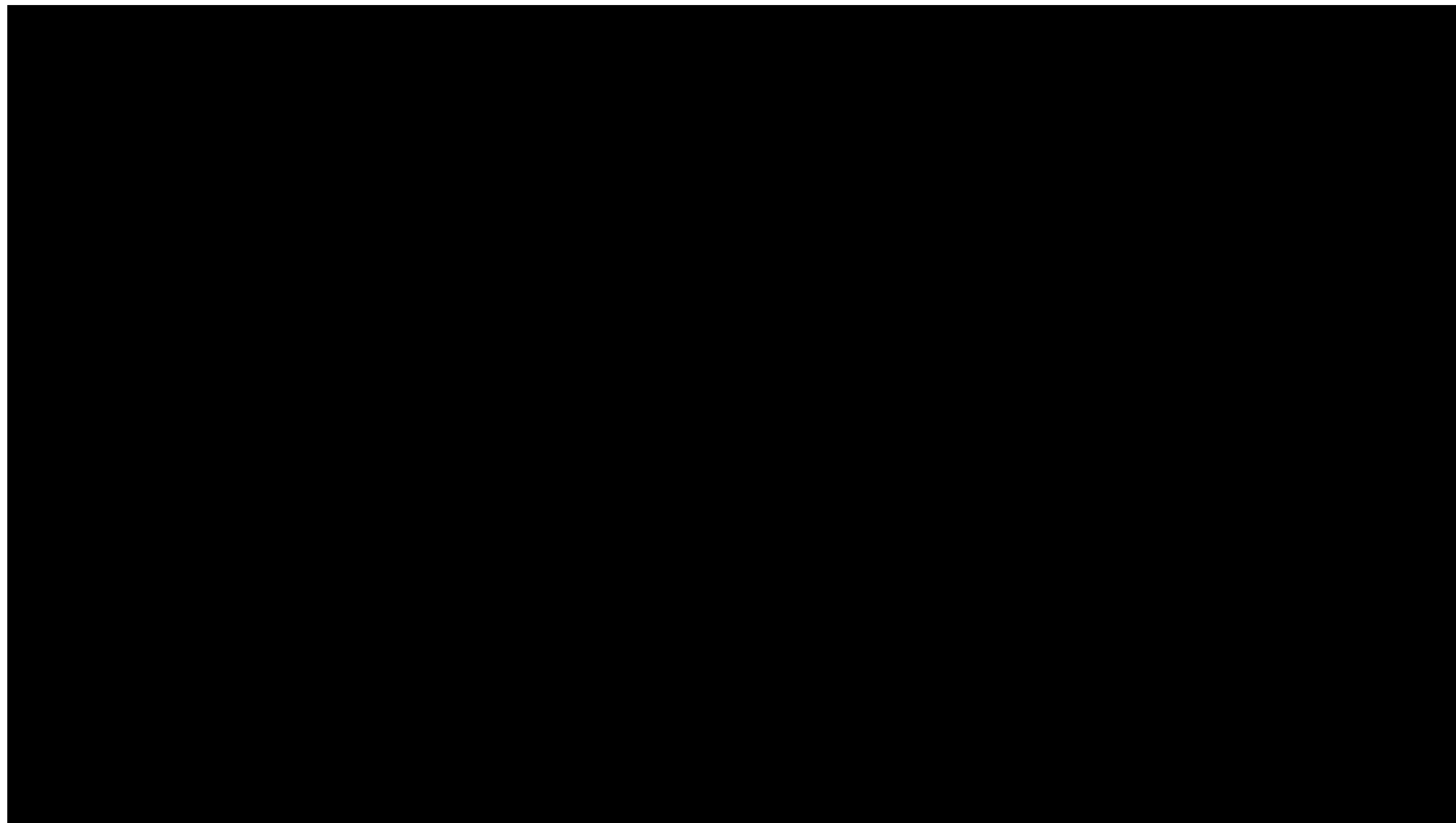
The Biodome technology designed to be use for scaffolding in building construction, offering protection against extreme weather conditions for occupants and builders.

Made from recycled steel, renowned for its ability to in the harshest of weather elements, the Biodome structure ensures durability and stability in both hot and cold climates. On the other hand, recycled steel stands out for its eco-friendly attributes, crafted from natural and recycled materials, thus contributing to a sustainable building approach. Its extended lifespan minimizes the need for frequent replacements, thereby reducing environmental impact.

Within the Biodome, polycarbonate is use for windows, offering exceptional strength that surpasses traditional glass by 200 times, while remaining lightweight for easy handling and installation. Resistant to impact, shattering, UV radiation, and extreme temperatures, polycarbonate maintains clarity and mechanical integrity even after prolonged exposure to harsh environmental conditions, ensuring long-term performance and safety.

Moreover, the Biodome's versatility extends beyond its initial use, as each unit can be repurposed for up to 10 cycles before being recycled for maintenance purposes, showcasing a commitment to sustainability and resource efficiency in construction practices.





The film show How can technology serve as a substitute for living organisms in maintaining and preserving climate ecosystems?

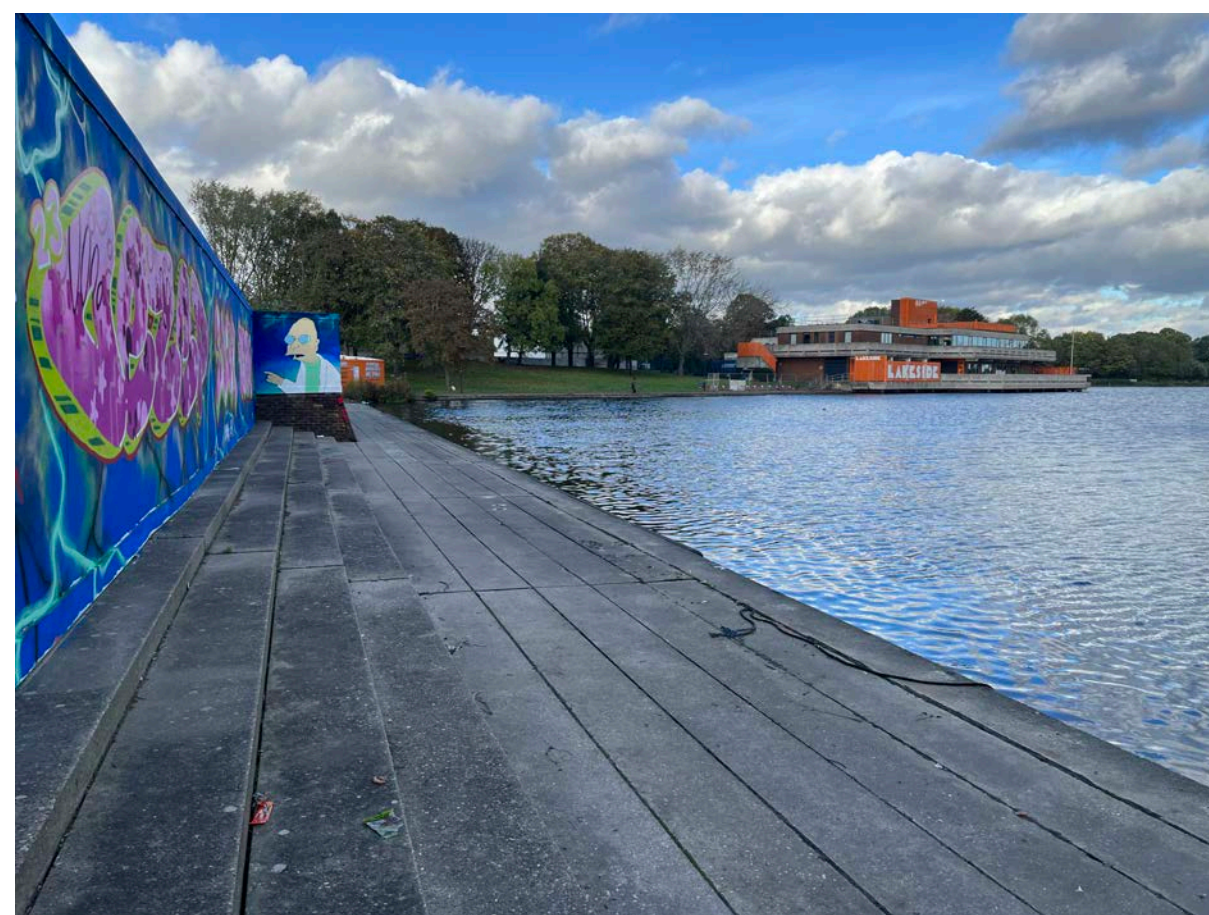
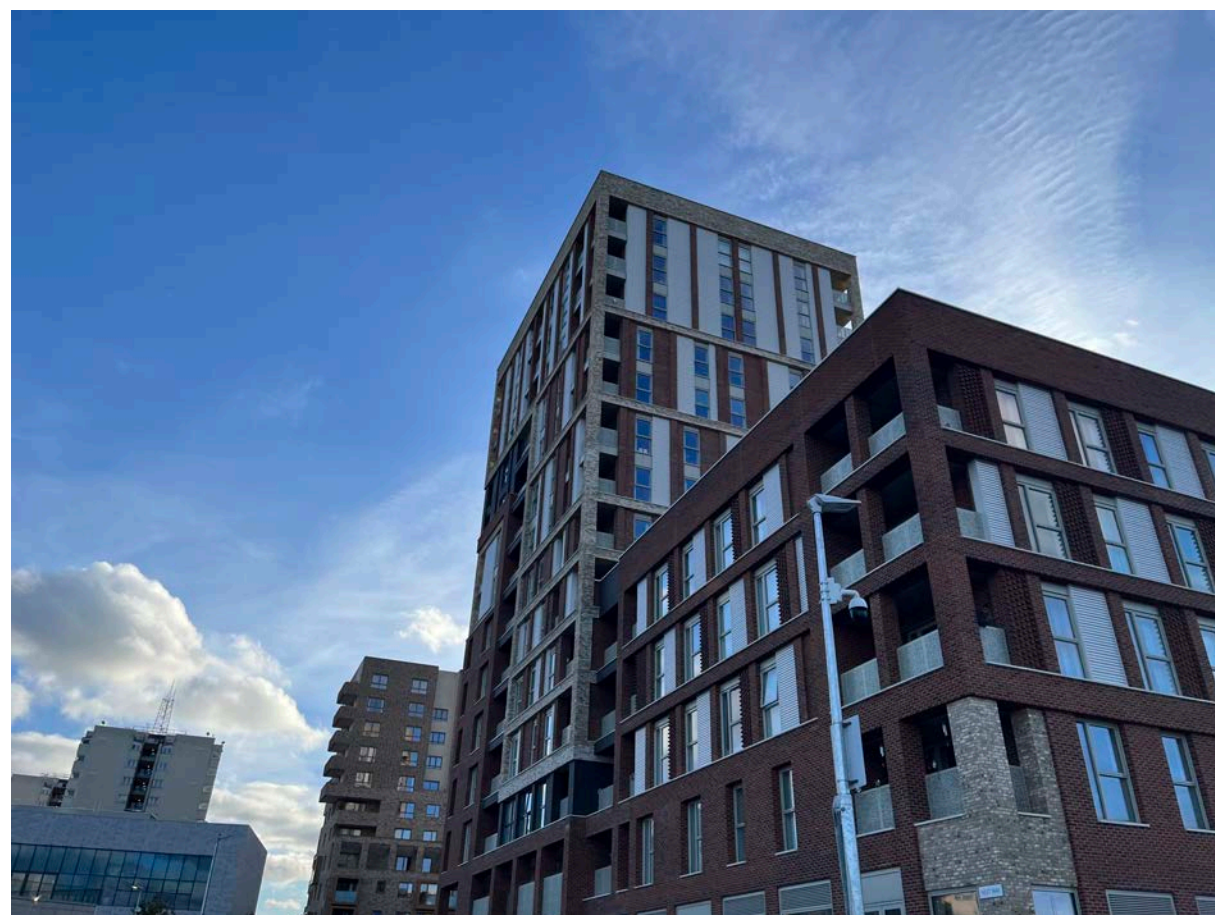
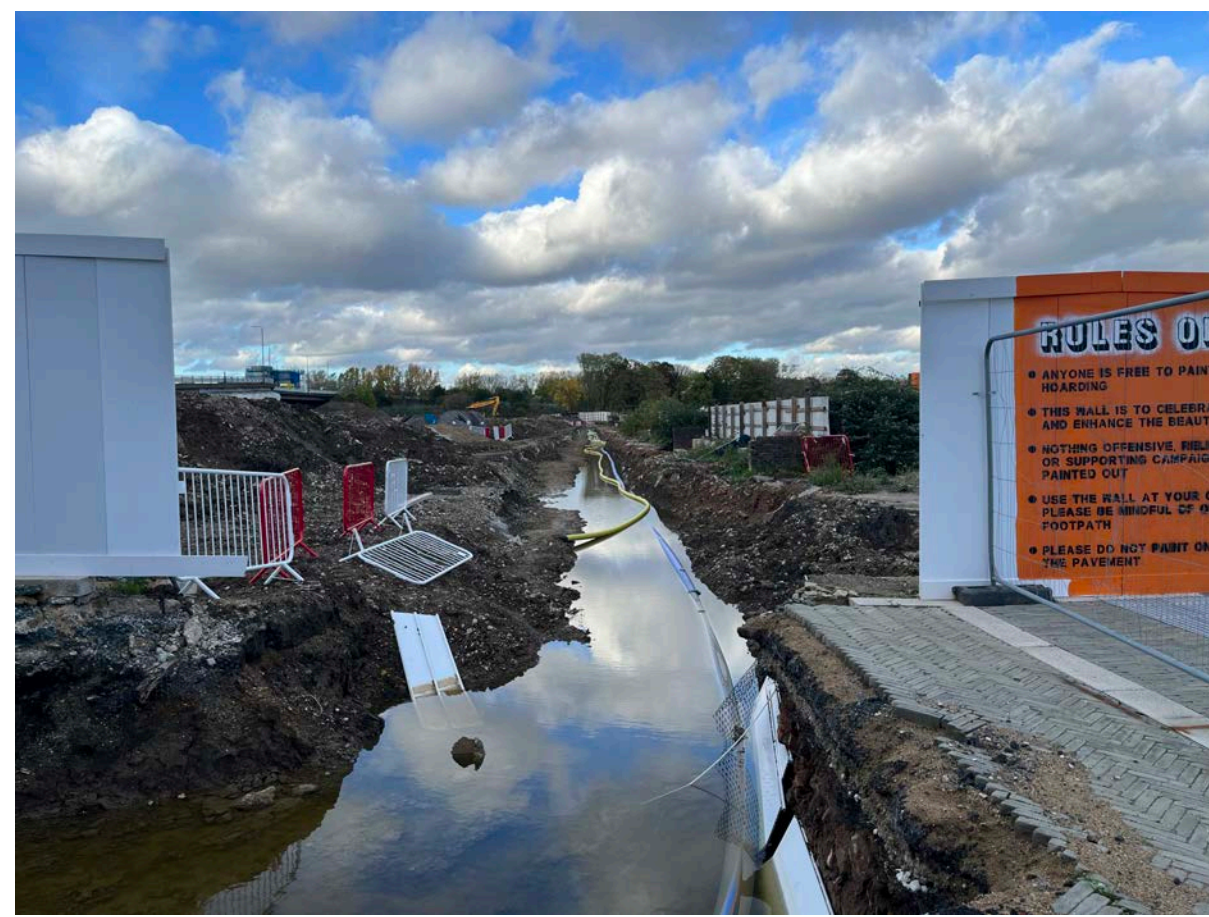
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Building Ecosystems: How can technology be utilised to mitigate the climate crisis within the built environment?



1960s

2023

2080s

Recent redevelopment plans, like Phase 2 completed in 2022, have introduced changes and improvements. New homes, better infrastructure, and community spaces aim to address the challenges that have plagued Thamesmead for decades.

The Town of Tomorrow
50 Years of Thamesmead

Thamesmead located in the of Southeast London, a once ambitious vision of modern living, known as "Town of Tomorrow". Built in the 1960s as a social housing development, initial promise of utopia crumbled over the years. Isolation, limited access, and a lack of essential facilities left this modernist dream struggling to meet the goals.

Can these plans truly transform Thamesmead into a sustainable community? Despite the progress, there's still a some lack of consistency, and the transformation of old brutalist-style buildings into modern commercial architecture remains a challenge.

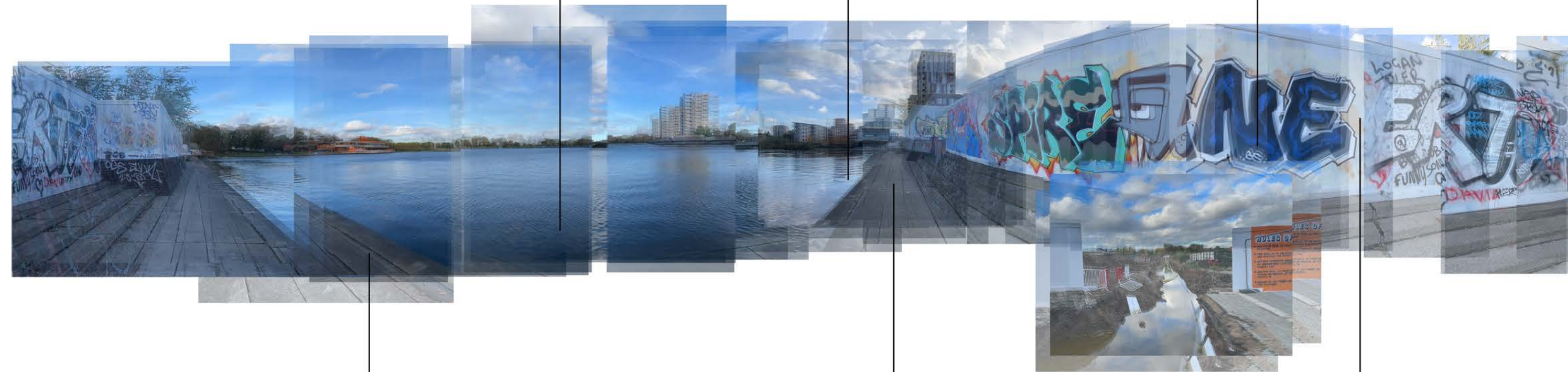
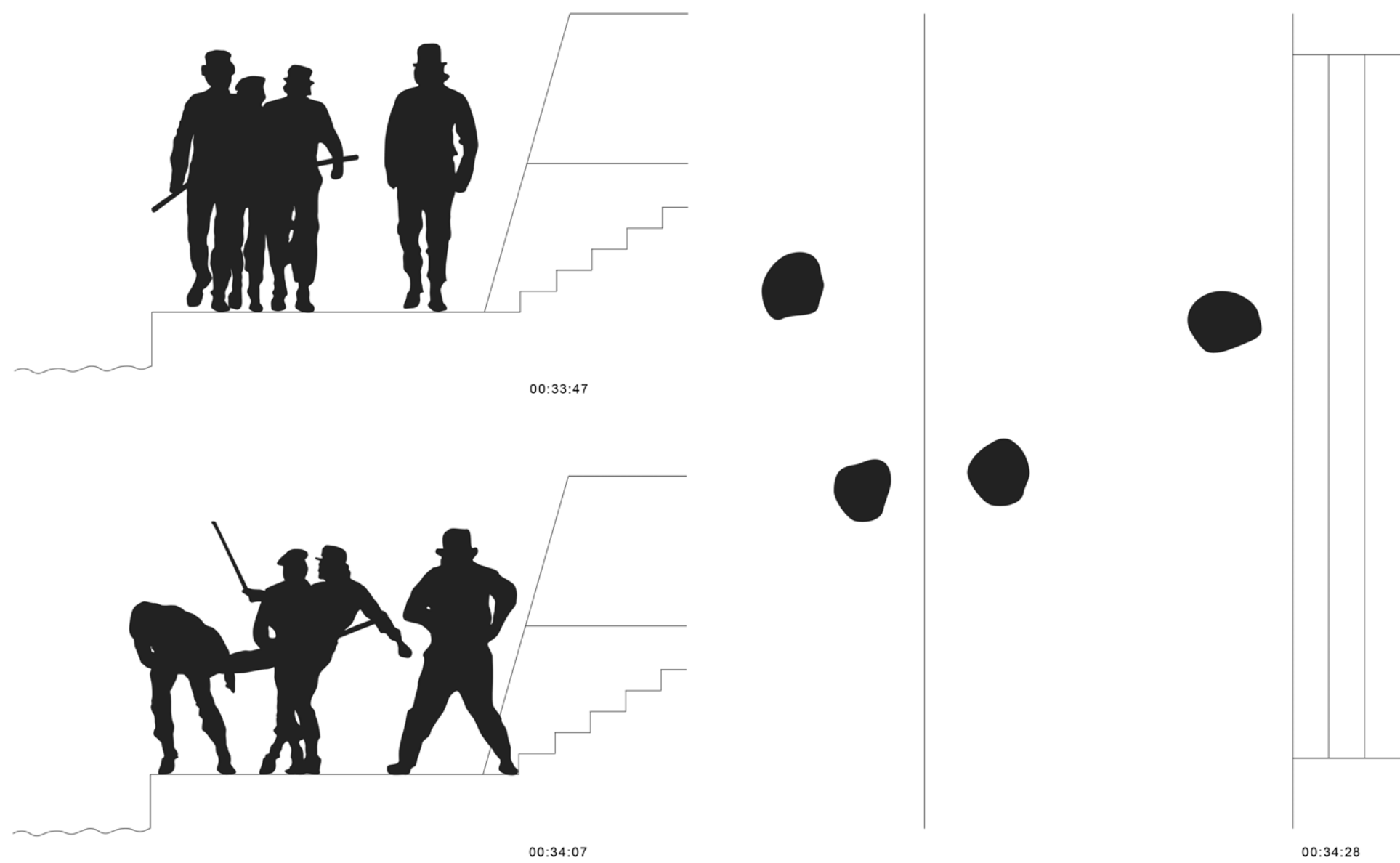
Stanley Kubrick described of Thamesmead in "A Clockwork Orange" using backdrop of a real-life housing development, designed with modernist and brutalist style, provides a visually violent behaviour and chaotic backdrop to the film's narrative.

Thamesmead built in the 1960s as a social housing development, was initially designed to be an utopian vision of modern living. Planning to be "A town of tomorrow". However, the area as faced various challenges and criticisms over the years, which has failed to meet the utopian goals. The area located in Southeast London situated between the Thames River and various waterways, limiting access and making it feel isolation from the rest of London. The lack of facilities has been one of the challenges faced, related to transportation, social services and retail spaces.



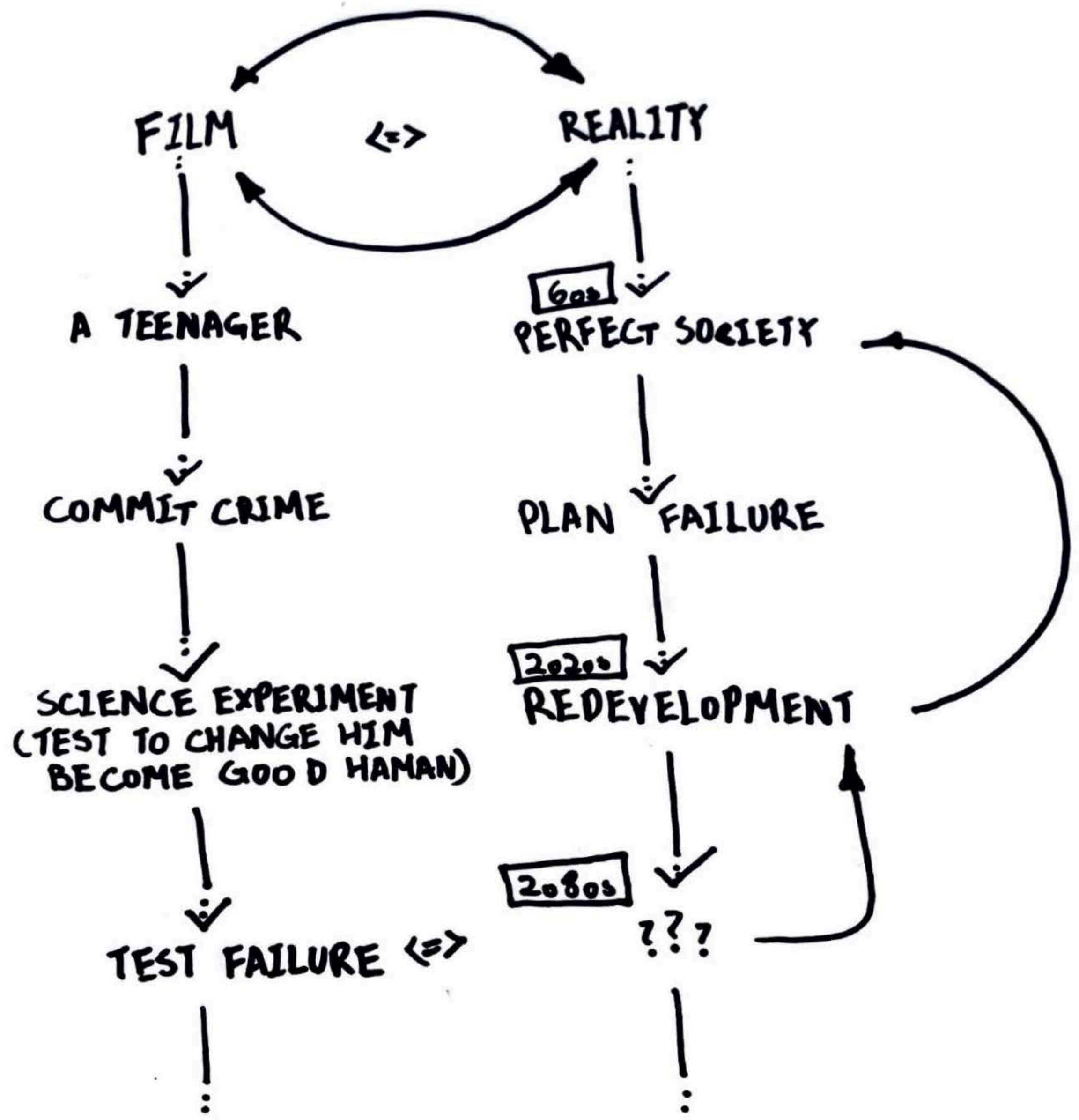
During my site visit, I recorded various sounds from wild animals and construction noise. I observed numerous natural elements, water features, ongoing developments and numerous vacant houses and apartments. Even during day there is many people around, it making feel the area scary and unsafe. Thought out the area I have found advertisement for new build housing and youth activity posting all over the place. I struggled to find lunch options, even the café at the central pond is closed, I have to take bus from Southmere to Thamesmead town centre.

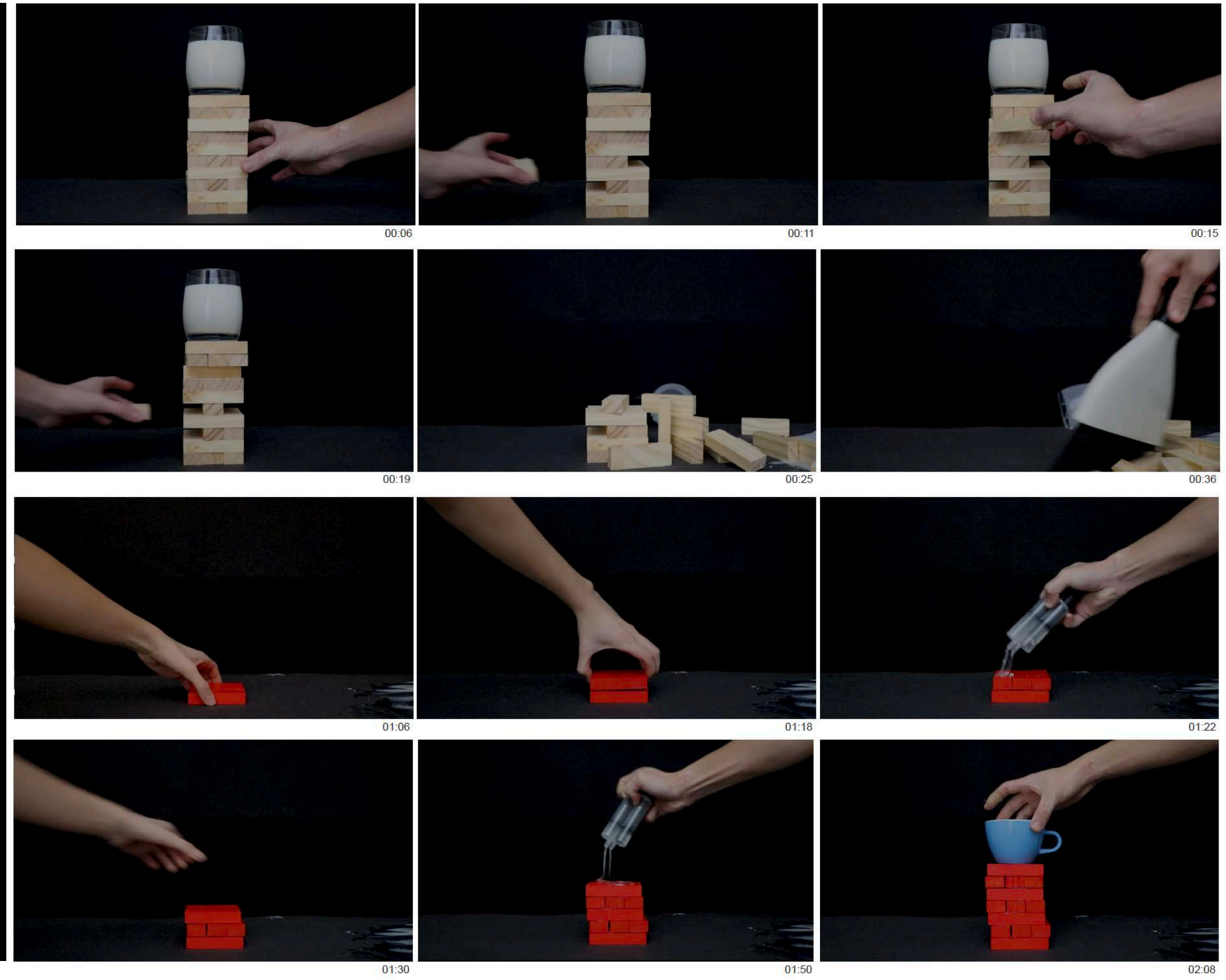
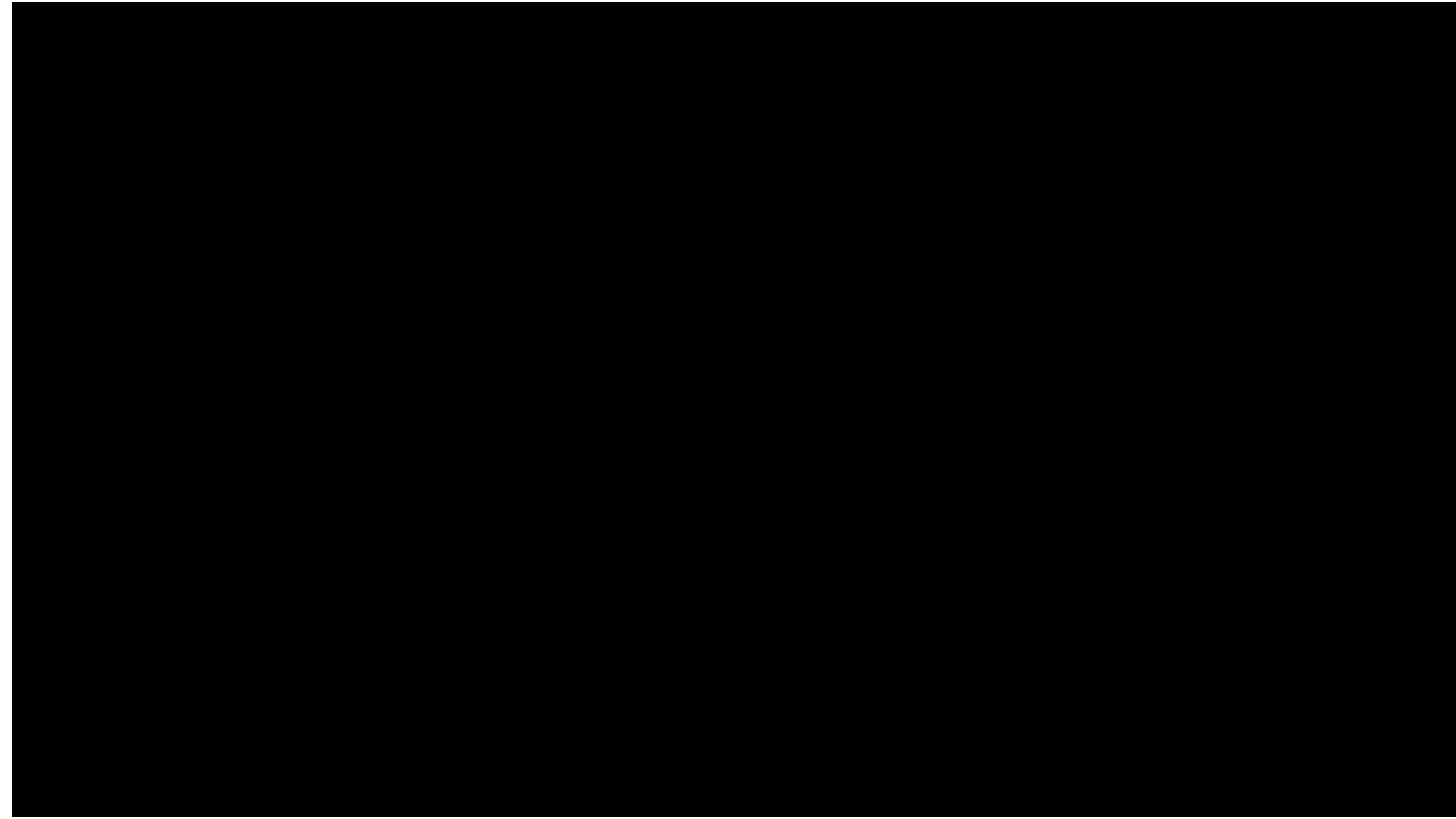
In recent years, redevelopment plans have been made to address some of these issues. Phase 2, completed in 2022, introduced new build 1-3 bedroom homes, improved infrastructure, and new community spaces and The Elizabeth Line at Abbey Wood. However, with all those redevelopment plan there is still lack consistent, transforming old brutalist-style buildings into modern commercial architecture. Comparing to the 1960s Thamesmead utopian vision , the critical question still remains despite these changes: Can these plans address the past issues and create a sustainable community?



"A Clockwork Orange" is a 1971 film directed by Stanley Kubrick, based on the 1962 novel by Anthony Burgess. The film is known for violence and sexually arousing content. In the scene that I chose is located in Thamesmead, Southmere Lake, a gang of four attacked by their leader Alex DeLarge and two of the member have fall down to the lake.

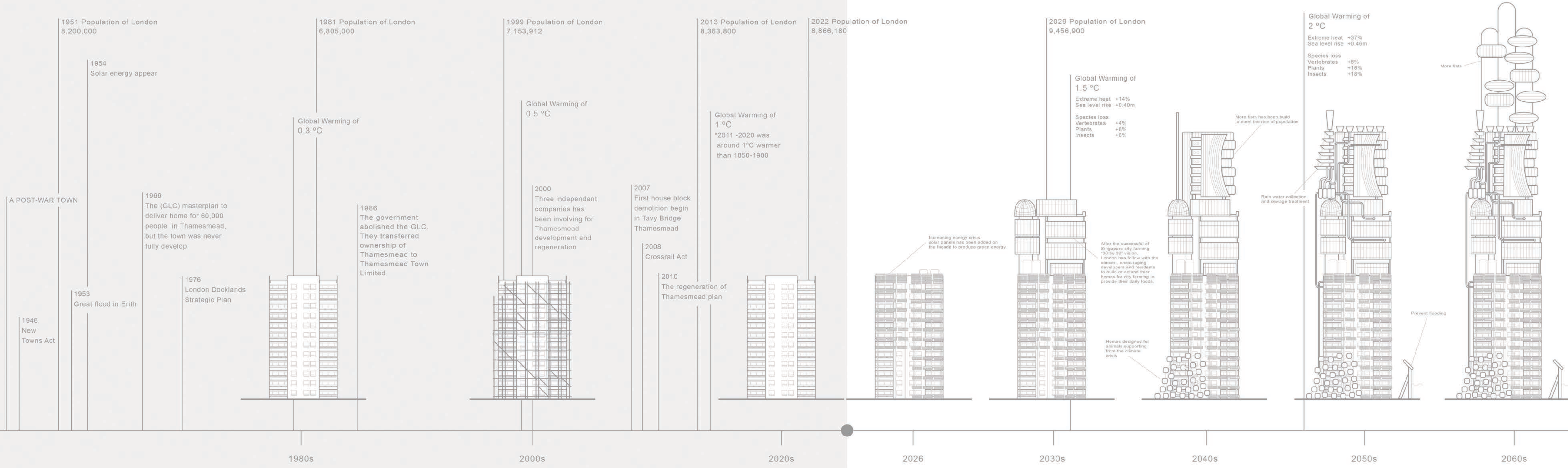
"Kubrick's choice of Thamesmead showed a very prescient instinct for how this architecture was deeply misguided and even hostile, doomed to fail as a model for living. As modernist as the buildings were, I believe he saw in them a dystopian reality." Stanley Kubrick descried of Thamesmead in "A Clockwork Orange" using backdrop of a real-life housing development, designed with modernist and brutalist style, provides a visually violent behaviour and chaotic backdrop to the film's narrative.





THAMESMEAD REGENERATION PROJECT

How can we use technology to mitigate climate change in buildings environment?



Renewable Energy Requirements

A

APPROVED DOCUMENT

- A1 Energy Efficiency
- A2 Structural Integration
- A3 Connection to Electrical System

For use in England*

Carbon Emission Limits

E

APPROVED DOCUMENT

- E1 Monitoring and Compliance
- E2 Allocating Emission Allowances
- E3 Review and Adjustment

For use in England*

Green Building Standards

H

APPROVED DOCUMENT

- H1 Building Research Establishment Environmental Method
- H2 Passive House

For use in England*

Water Efficiency Standards

L

APPROVED DOCUMENT

- L1 Water Efficiency Labelling and Standards
- L2 Local Water Efficiency Regulations
- L3 Water Efficiency Credits

For use in England*



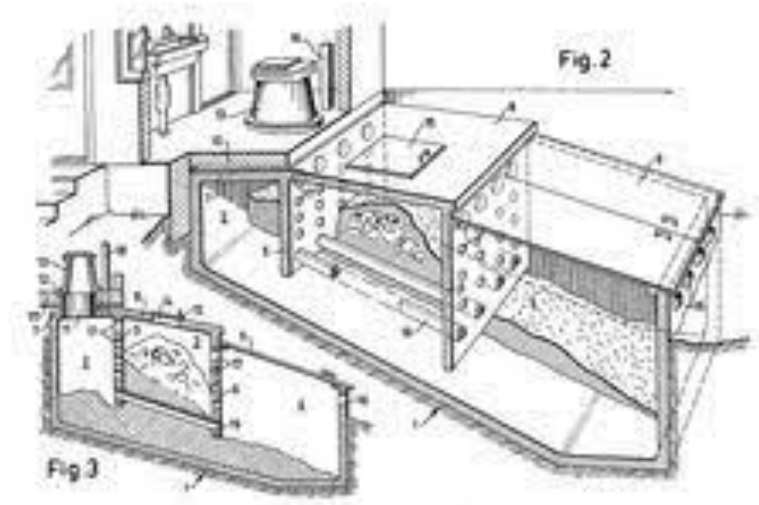
Climatron 1960

The Climatron was the first air-conditioned glasshouse that used a data centre to control, as an architectural marvel at the Missouri Botanical Garden. Designed by Thomas C. Howard, it's a geodesic dome greenhouse hosting a rich tapestry of tropical flora. Its revolutionary design provides a controlled microclimate for diverse plant species. This botanical haven allows for the study and conservation of exotic plants while offering visitors an immersive experience in lush, tropical environments. The Climatron remains a symbol of innovation in architecture and horticulture, blending science, aesthetics, and sustainability to create a captivating space for education, research, and appreciation of the natural world.



Clean Air Pod 1970

The Clean Air Pod was an innovative solution to combat urban air pollution. Designed by architect Buckminster Fuller, it was a small, mobile shelter equipped with air purification technology. These pods were intended to provide clean air for individuals in polluted urban environments. While not widely adopted, the concept sparked discussions about the need for clean air solutions and influenced future developments in environmental technology and urban planning.



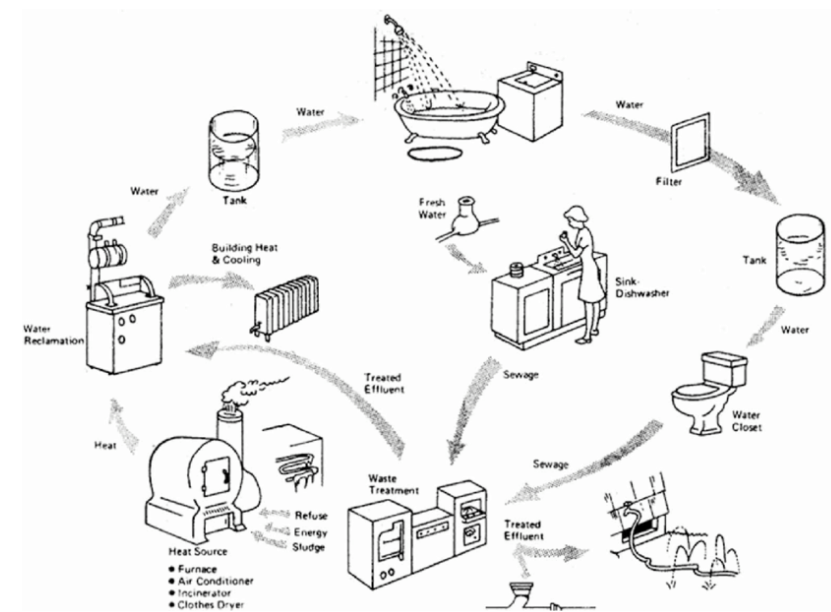
Clivus Multrum 1964

The Clivus Multrum, invented in 1964 by Swedish engineer Rikard Lindström, is a composting toilet system that utilizes natural biological processes to break down human waste into compost. It consists of a simple, waterless design that separates solid and liquid waste, promoting aerobic decomposition. This eco-friendly solution minimizes water usage, eliminates the need for sewage systems, and produces nutrient-rich compost for soil enrichment. The Clivus Multrum revolutionized sanitation practices, particularly in remote or environmentally sensitive areas, offering a sustainable alternative to traditional flush toilets.



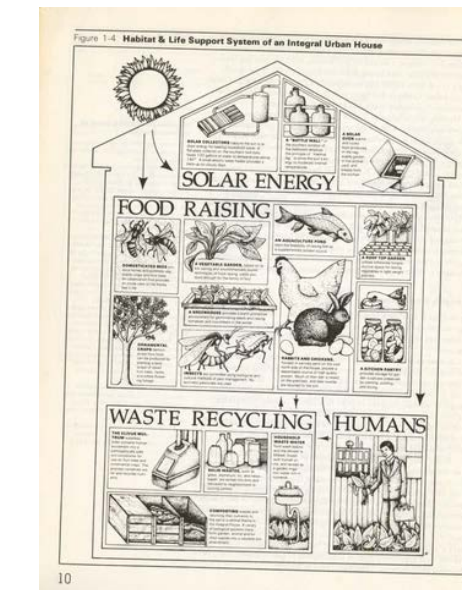
The Ark of cape cod 1974

The Ark of Cape Cod was an experimental community founded by architect David Sellers in East Falmouth, Massachusetts. It comprised geodesic domes and other alternative structures, aiming to promote sustainable living and ecological awareness. The community focused on self-sufficiency, renewable energy, and organic farming, embodying the countercultural values of the era. While the Ark faced challenges and eventually disbanded, it contributed to the dialogue on alternative lifestyles and sustainable communities.



Grumman integrated household 1969

The Grumman Integrated Household, proposed in 1969, was a visionary concept for future living spaces developed by the Grumman Aircraft Engineering Corporation. It envisioned modular, self-sufficient units that combined living, working, and recreational areas. These units would be mass-produced and easily transportable, promoting efficient land use and fostering community living. Although the GIH concept never materialized, it inspired discussions about sustainable urban planning and adaptable living environments, influencing subsequent architectural and urban design trends.



Integral urban house 1974

The Integral Urban House, established in 1974, was a pioneering experiment in sustainable living located in Berkeley, California. Designed by Sim Van der Ryn and Richard Thomas, it showcased eco-friendly practices such as solar energy, greywater recycling, organic gardening, and passive solar heating. This model home promoted self-sufficiency and environmental responsibility, influencing the development of sustainable architecture and urban planning. Though not widely replicated, it inspired the integration of ecological principles into residential design and sparked public interest in sustainable living practices.



Autonomous dome 1972

Buckminster Fuller proposed the "autonomous dome," an innovative concept for self-sufficient living spaces. These geodesic domes integrated advanced technology to harness renewable energy, manage waste, and maintain comfortable living conditions. Fuller's vision aimed for sustainable, off-grid habitats capable of supporting human life independently. While some experimental domes were built, widespread adoption of autonomous dome technology awaited further advancements in renewable energy and environmental design.



The Autonomous house 1993

"The Autonomous House," completed in 1993, was a groundbreaking project by architect Brenda and Robert Vale in Southwell, Nottinghamshire, England. This innovative home aimed to be entirely self-sufficient, generating its own energy, collecting rainwater, and processing waste on-site. It featured passive solar design, photovoltaic panels, and a composting toilet, showcasing sustainable living principles decades ahead of their time. The Autonomous House inspired a new wave of eco-friendly architecture and helped popularize the concept of zero-energy or off-grid homes.



Janicki Omni Processor 2014

The Janicki Omniprocessor transforms human waste into electricity, clean water, and ash. It dries sewage sludge, burns it to generate electricity, and purifies water through evaporation. The technology addresses sanitation challenges in developing regions, providing sustainable waste management solutions while producing valuable resources for communities.



The Crystal

This sustainable building serves as a hub for sustainable urban development, featuring a striking crystalline design and incorporating renewable energy, rainwater harvesting, and advanced energy management systems.



Plenty Vertical Farming 2023

Plenty Fram opened in Los Angeles is an innovative vertical farming facility utilizing advanced technology to grow fresh produce indoors. Through vertical stacking and controlled environments, Plenty maximizes crop yield while minimizing water and land use. This sustainable approach offers locally grown, pesticide-free vegetables to urban communities, promoting food security and environmental conservation.



Climeworks 2009

Carbon removal technology includes natural methods like afforestation and technological approaches such as direct air capture and bioenergy with carbon capture. These methods aim to reduce atmospheric carbon dioxide levels, mitigating climate change. Ongoing research seeks to improve efficiency, scalability, and environmental impact of these technologies.



Recycled steel is an environmentally friendly alternative to virgin steel, as it requires less energy and resources to produce. It's commonly used in structural elements such as beams, columns, and framing systems in commercial and industrial buildings.



Bamboo is a fast-growing, renewable grass that can be harvested sustainably and used as a building material. It's strong, lightweight, and flexible, making it ideal for a variety of applications, including flooring, wall cladding, and structural elements.



Solar city 2006

SolarCity, founded by Elon Musk's cousins Lyndon and Peter Rive, was a solar energy services company acquired by Tesla. It specialized in solar panel installation, leasing, and financing, aiming to make solar energy accessible to homeowners and businesses. The company's innovative approach helped drive the adoption of solar power across the United States.



Ferro-cement can be used for structural elements such as roofs, domes, and shells in building construction. Its thin, lightweight profile and high tensile strength make it suitable for creating complex shapes and structures.

