

Doomsday Rehearsal

Architecture for Pre-Disaster Learning &
2020 Tokyo Olympics the Year of Disaster Prevention Global Classroom

Master Dissertation (Master of Architecture)

- Environmental challenge & Research Map
- Feasibility and research structure alignment
- Idea implementation (architectural in demonstration)
- Reflection & Question



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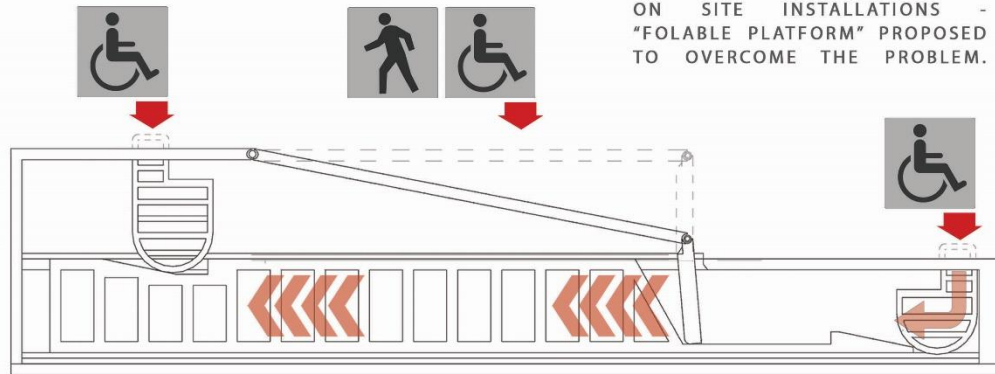


LEVEL FREE FOLDABLE PLATFORM

THE TASK IS TO OVERCOME THE PROBLEMS OF INCONVENIENTLY USED OF THE DISABLE GROUPS IN ACCESSING FROM ONE TO ANOTHERS DIFFERENT GROUND LEVELS INDEPENDANTLY. WHERE CREATING A UNIVERSAL ACCESSING FACILITIES WOULD COST ALOT OR THE SPACE MIGHT NOT ALLOWED.

PROPOSED DESIGN

A DUAL USED TOOLS WITH SIMPLE ON SITE INSTALLATIONS - "FOLABLE PLATFORM" PROPOSED TO OVERCOME THE PROBLEM.



APPLY IN PRIVATE.



INSTALL IN FRONT OF THE DOOR, SOMETIMES AS PLATFORM TO RESIST RAIN, SOMETIMES AS A RAMP FOR DISABLE PERSONS ACCESS EASILY.

APPLY IN PUBLIC



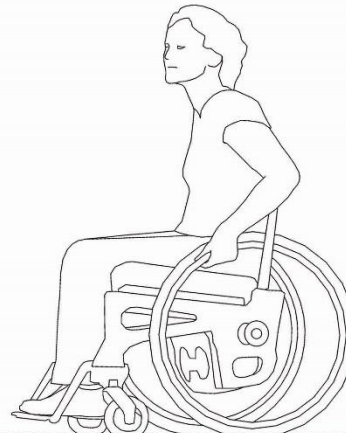
IT ALSO ABLE TO USE AS PUBLIC FACILITIES, TO INSTALL IN BETWEEN A DIFFERENT GROUND LEVEL, SIMPLY BEING AS A PART OF THE PATHWAY.



IT SERVE AS A RAMP WHEN A WHEELCHAIR "STEP" ON IT, AND THE DISABLE PERSONS COULD ACCESS A DIFFERENT GROUND LEVEL INDEPENDANTLY.

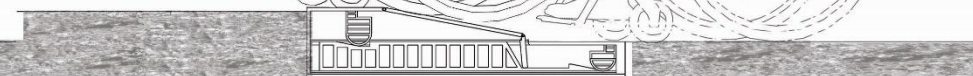
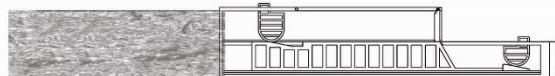
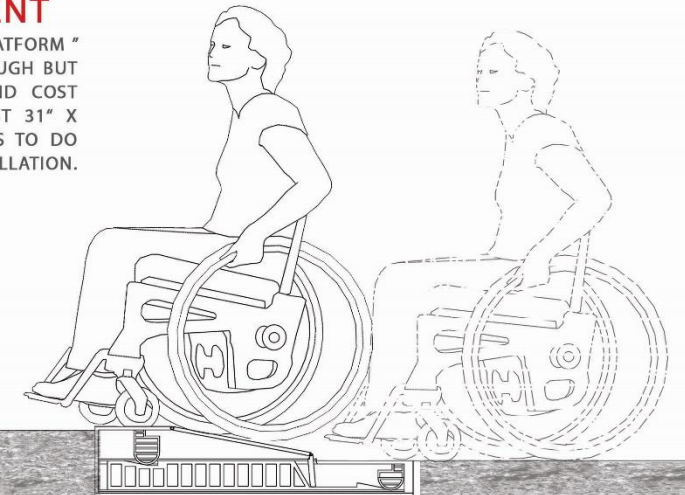
HOW ITS WORKS ?

A MOVING WHEEL CHAIR COME CLOSE TO THE ENTRANCE WITH THE PROPOSED FOLDABLE PLATFORM INSTALL AT THE FRONT OF THE DOOR. AND FIRSTLY, THE BABY WHEEL OF THE WHEELCHAIR WILL HAVING FIRST CONTACT WITH THE FOLDABLE PLATFORM WHICH MEANS A FORCE EQUALLY APPLY ON THE BAR ON THE FLOOR AND THE PLATFORM STEP WILL TURN INTO A RAMP SO THAT THE WHEELCHAIR WOULD BE ABLE TO PROCEED TO THE INDOOR PLACE AS CONVENIENT AS THEY CAN DO IT WITHOUT ANY ASSISTS.



EFFICIENT

"FOLDABLE PLATFORM " IS SMALL ENOUGH BUT PRACTICAL AND COST EFFECTIVE, JUST 31" X 36" OF SPACES TO DO THE INSTALLATION.





DOOMSDAY + REHEARSAL

REAL TIME TRAINING IN HAZARDOUS SIMULATION

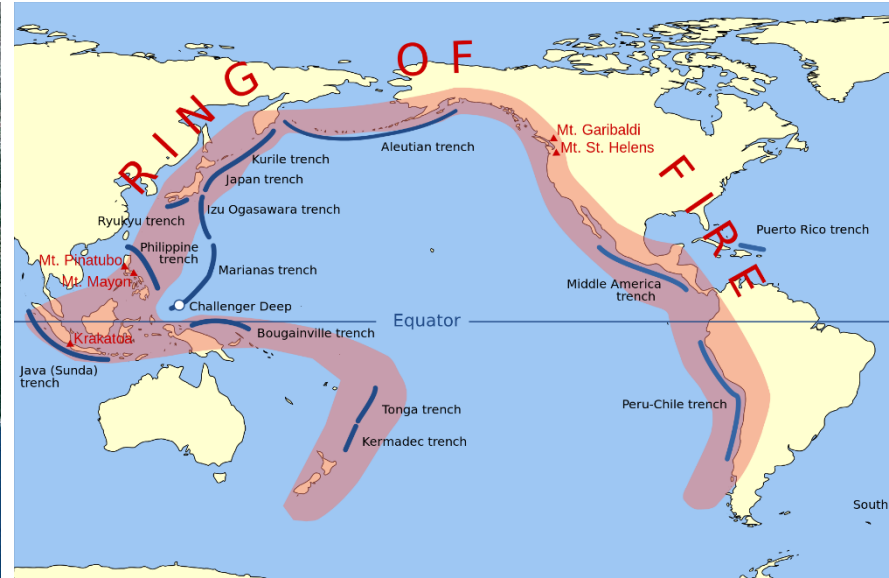
- an early practice towards hazardous simulations in a safe and controlled environment.



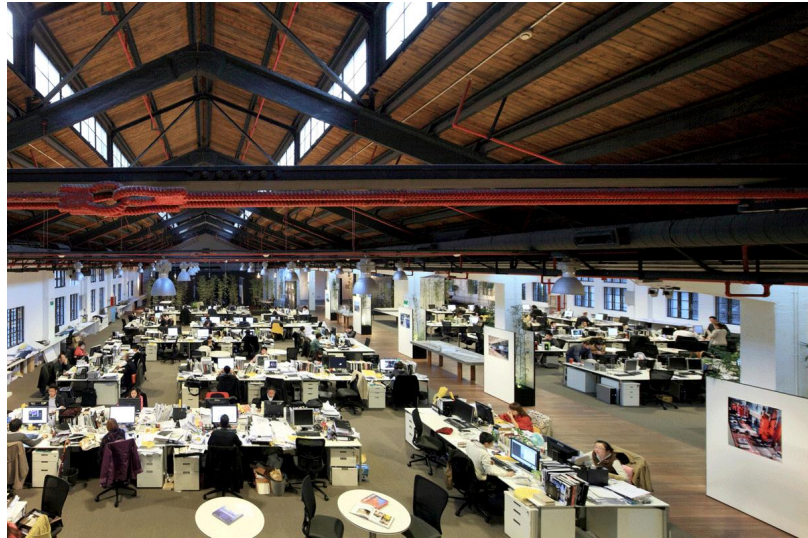
Today's takeaways

- Address problems that leads opportunities to author's research intention
- Aware of opportunities and realization
 - *seeking exposure & opportunity for multi-disciplinary collaborations*
- Looking at 2020 Tokyo Olympic and disaster prevention , then address available strategies to enable architecture to intervention within this research field.
 - *provocative, positive, celebrate & benchmark*

JAPAN, TOKYO



2020 TOKYO OLYMPIC



**USER EXPERIENCE
PRACTICALITY
AESTHETICS**

A man and a woman are shown in a close embrace on a rocky shore. The man is wearing a light-colored shirt and a grey vest, while the woman is wearing a red top. They are looking at each other with expressions of concern or relief. The background is a turbulent, blue sea with white-capped waves crashing against the shore. In the distance, other people can be seen on the rocks, suggesting a group of survivors or a community in a state of emergency.

life are vulnerable when threatened by the devastating nature.

Environmental Challenge

- hazards are mostly unpredictable.
- science and technology have the limitation, there is no perfect solution to combat devastation.
- disaster prevention learning is difficult to penetrate into the 'geographic safe zone'
- not everyone developed a good sense of disaster surviving skills, citizens always have high expectation on disaster aid. (Physically and mentally not ready)



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Failing in Respond

- lack of sense of basic aid will worsen the degree of injury due to help.
- shortage of aid support and higher demand on relief expenditure.
- the vulnerable groups that completely exposed and left unprotected.
- high chance of post-disaster mental illness.



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DEVASTATION

EVACUATE



ISOLATE



PRE-DISASTER & DURING DISASTER >>



Currently marketed survival capsule and pre-cast evacuation tower.

RESEARCH



METHOD



Ancient China Architecture used sticky rice mixture in their construction to build building that is seismic proof.



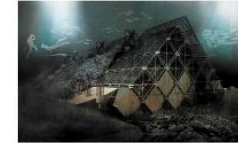
DURING DISASTER >>



Studies will create a guide for the architecture to solve environmental problem more explicitly during disaster occur.



RESPONSE



RESILIENT



DURING DISASTER & POST DISASTER >>



These building is like a series of testing ideas to adapt the idea of resilient with small individual and scale.

EVOLVE



ADAPT



from individual to urban scale; future adaptation getting stable and growth rapidly



POST DISASTER >>



architecture evolve and take shaped from and adapt into nature, therefore softening the collision between man-made and nature.

Architectural Placement in Disaster Response

The Serial Progression of Architectural Reaction

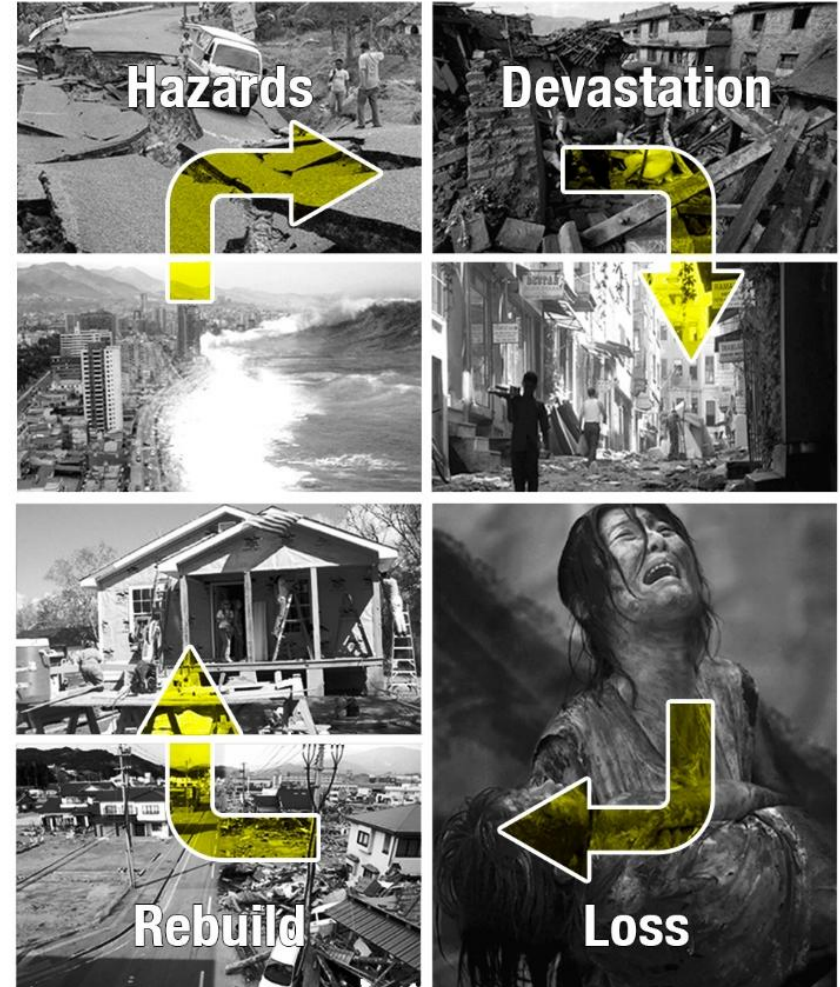
This cluster of pictures interpreting the intimate actions between mother nature and architecture. Different architectural attribute constantly involve to facilitates the ever-changing environment, to bridge surviving of mankind from the stages of pre-disaster preparedness to the moment disaster struck, and then post-disaster rebuild and re-adapt.

Image 004-013 Credit : refer to page ??



The Cycle of Problem

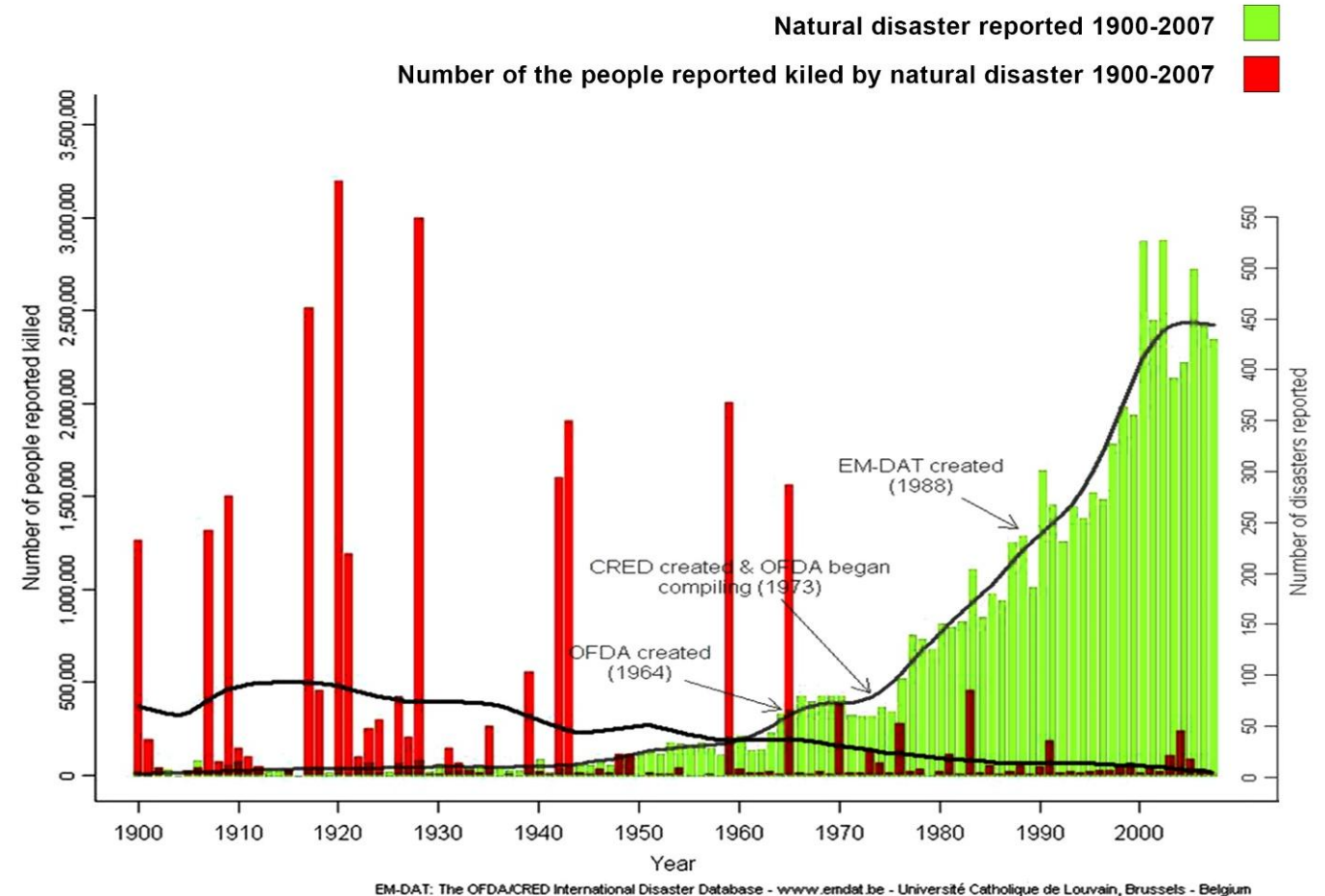
- the power of the mother nature is not allowed to be challenged. It's uncertain level of threat to our homeland causing our loss and constantly rebuilt. When we're recovering and there might be always another waves of devastation are reaching us soon. This is the 'Cycle' and we can only accept the truth.
- This research established from there to express my concerned of this helplessness matter.





“if you have major disaster involving hundreds of thousands or in this case million of peoples , whether it be a natural disaster or an act of terrorism, the first 72 hours are going to be totally chaotic no matter what you plan to do.”
(Warren Rudman, 2014)

Capacity to handle hazards has increase: technology **education and international awareness** improved which means countries are more able and set up to cope. (Geog.W, 2015)



Source: OFDA/CRED, EM-DAT (2015) **Centre for Research on the Epidemiology of Disasters (CRED)**_Emergency Events Database_ Université catholique de Louvain,



Precedent 1

Tokyo Rinkai Disaster Prevention Park



Source: Rinkai Disaster Prevention Park

https://blogs.yahoo.co.jp/whfsc363/GALLERY/show_image.html?id=65107321&no=14

Precedent 2

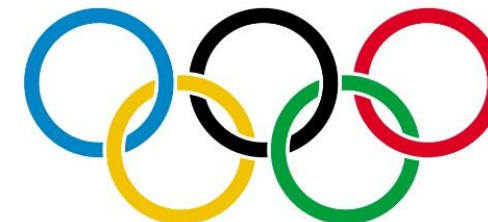
Guardian Centers of Georgia Perry



Source: GC Guardian Centre

<https://guardiancenters.com/>

Feasibility & Research structure alignment



Tokyo Metropolitan Risk Management's Disaster Prevention Guideline, Tokyo Bousai

BOUSAI, 'BOU' means prevent; 'SAI' means 'Disaster'. Adopting this disaster prevention guideline, which has been introduced to the nation on the 1 JAN of 2015, is a very complete teaching disaster prevention skill and information maps. This handbook basically covers every critical information and emergency knowledges.

-The 5 Major Topics of Bousai Teaching set a strong framework to assist public in dealing with 3 complete stages of disaster preparedness, the 'PRE' 'DURING' & 'POST' disaster teaching:

- Topic 1: Simulation of Major Earthquake
- Topic 2: Let's get prepared
- Topic 3: Other Disasters and Countermeasures
- Topic 4: Survival Tips
- Topic 5: Disaster Facts and Information you should know

Tokyo 2020 Olympic Games Organizing Committee

Adopting the 2020 Tokyo Olympic as a design strategy, a disaster proof candidate city. Pursuing a whole new perception of architecture of disaster prevention. Take this chance of mass amount of international arrivals to push forward the Japanese way of disaster prevention learning.

-Tokyo 2020 Olympic & Paralympic Games High-level Sustainable Plan, Jan 2016 :

Line 2.1: sustainable; Line 2.2 bid slogan Discover Tomorrow; Line 2.3 Sustainability Approach for Tokyo 2020; Line 3.0 Thematic Topic of Sustainable plan (more detail refer back to Tokyo 2020 Sustainable Guideline to be provided)

-Tokyo 2020 Olympic & Paralympic Games Fundamental Principles for the Sustainable Sourcing Code, (more detail refer back to Tokyo 2020 Sustainable Guideline to be provided)

-Tokyo 2020 Olympic Games-Infrastructure briefing [Swiss Business Hub Japan, Oct 2014] ii. Action programme for Tokyo Vision 2020:

1. Achieve a sophisticated disaster resistance city (TDDD master planning);
2. Create a low carbon society with high efficient, independent & distributed energy system (connect Olympic village);
3. Restore Tokyo surrounded by water and Green (Garden of Tomorrow);
4. Connect land, air and sea [highly efficient transportation network (connected existing infra & Tokyo Bay River Cruise with rich content basin area)];
5. Tokyo on new track of raising industrial power [foster core industries & create best business hub increase foreigner visitor] (synchronize with Olympic 2020 less investment risk);
7. Raise globally competent individuals (pioneer in disaster research & global collaboration hub);
8. Sport society (emergency training)



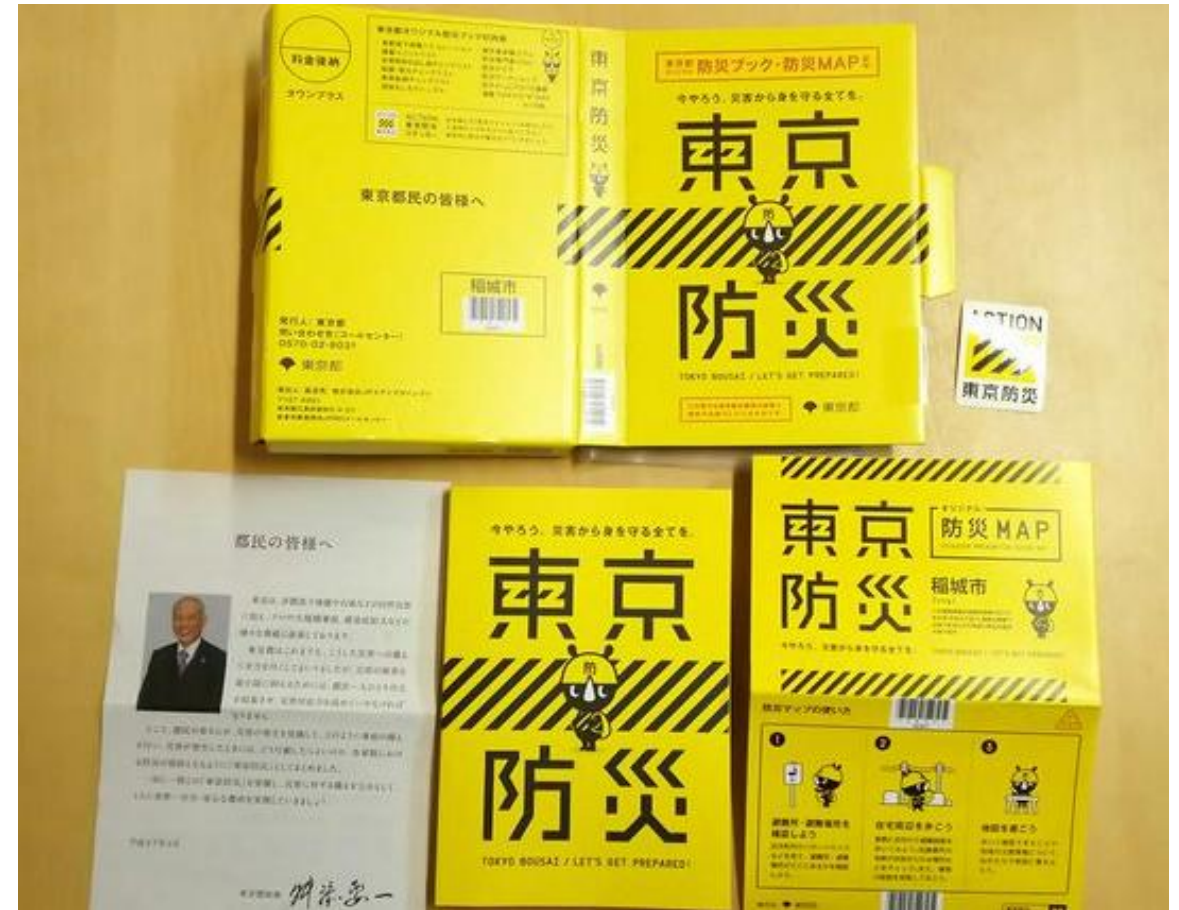
Tokyo Disaster Prevention Plan

-Becoming the World's Safest, Most Secure City-

Risk management is the year 2020 as one end point, this plan (Tokyo Disaster Prevention Plan) woth the practice of envisioning the worst case scenario, then ensuring everything possible is done to prepare. Taking risk backwards from there to lay out a clear road map for need to be done. (Yoichi Masuzoe-Governor of Tokyo, 2014)

Feasibility & Research tructure alignment

- implement emergency preparedness education as a compulsory school learning and living knowledge.
- designated platform to widely spread an appropriate disaster prevention education.
- once in a right time to advocate disaster awareness and prevention.



Source:Tokyo Metropolitan Government (2015) Disaster Preparedness Tokyo /Tokyo Bousai-<http://www.metro.tokyo.jp/ENGLISH/GUIDE/BOSAI/>

Awareness

1st September Disaster Prevention Day (防災の日 *bousai no hi*).

proactive learning in action, familiarity in hazardous condition to minimize the possible of cause danger from our daily surrounding



Rehearsal (practice in action)

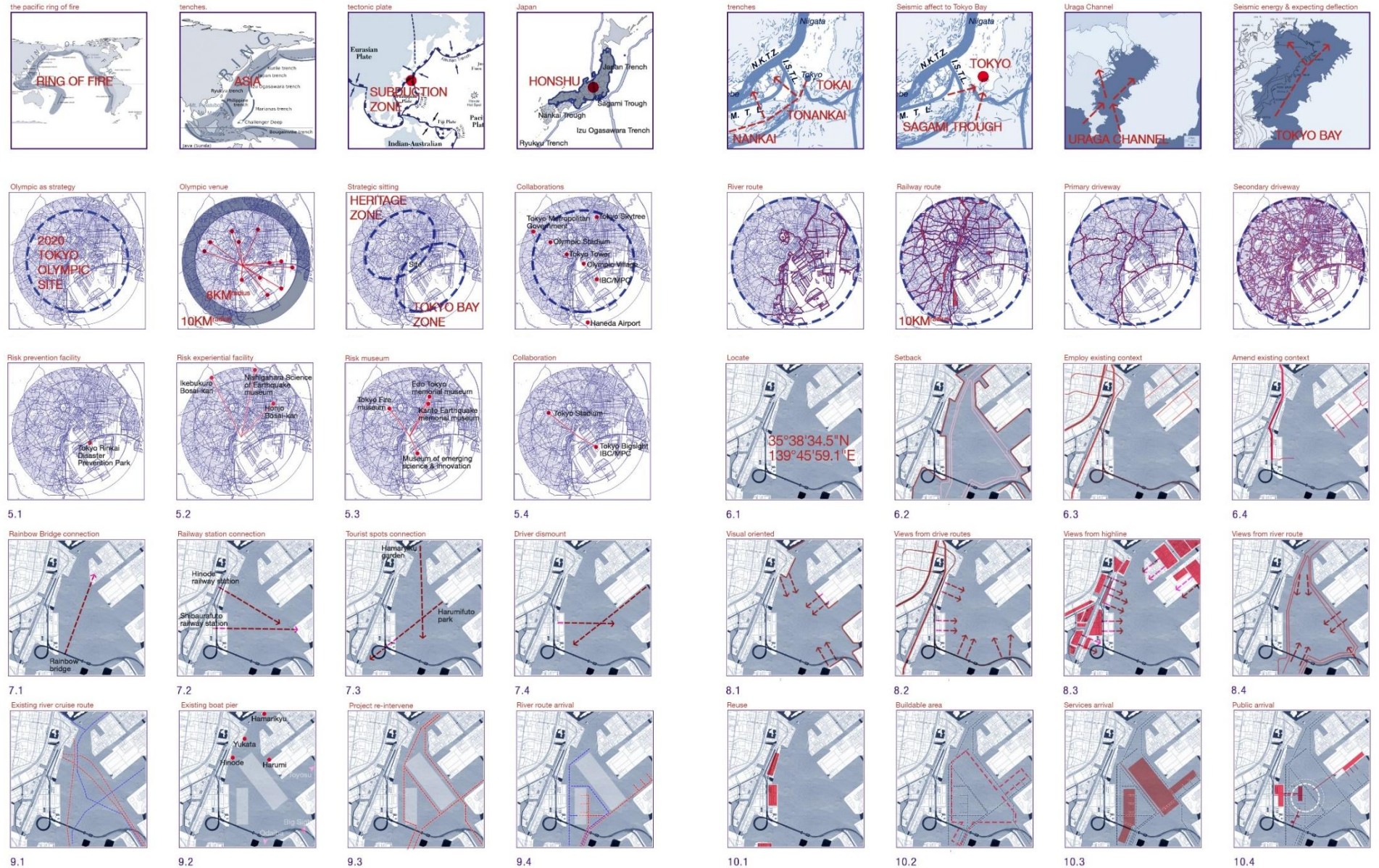
designated platform to develop common safety knowledge & interact and understand the role of aid practice make perfect.

Doomsday Rehearsal

Outcome(Phase 1)

Bousai

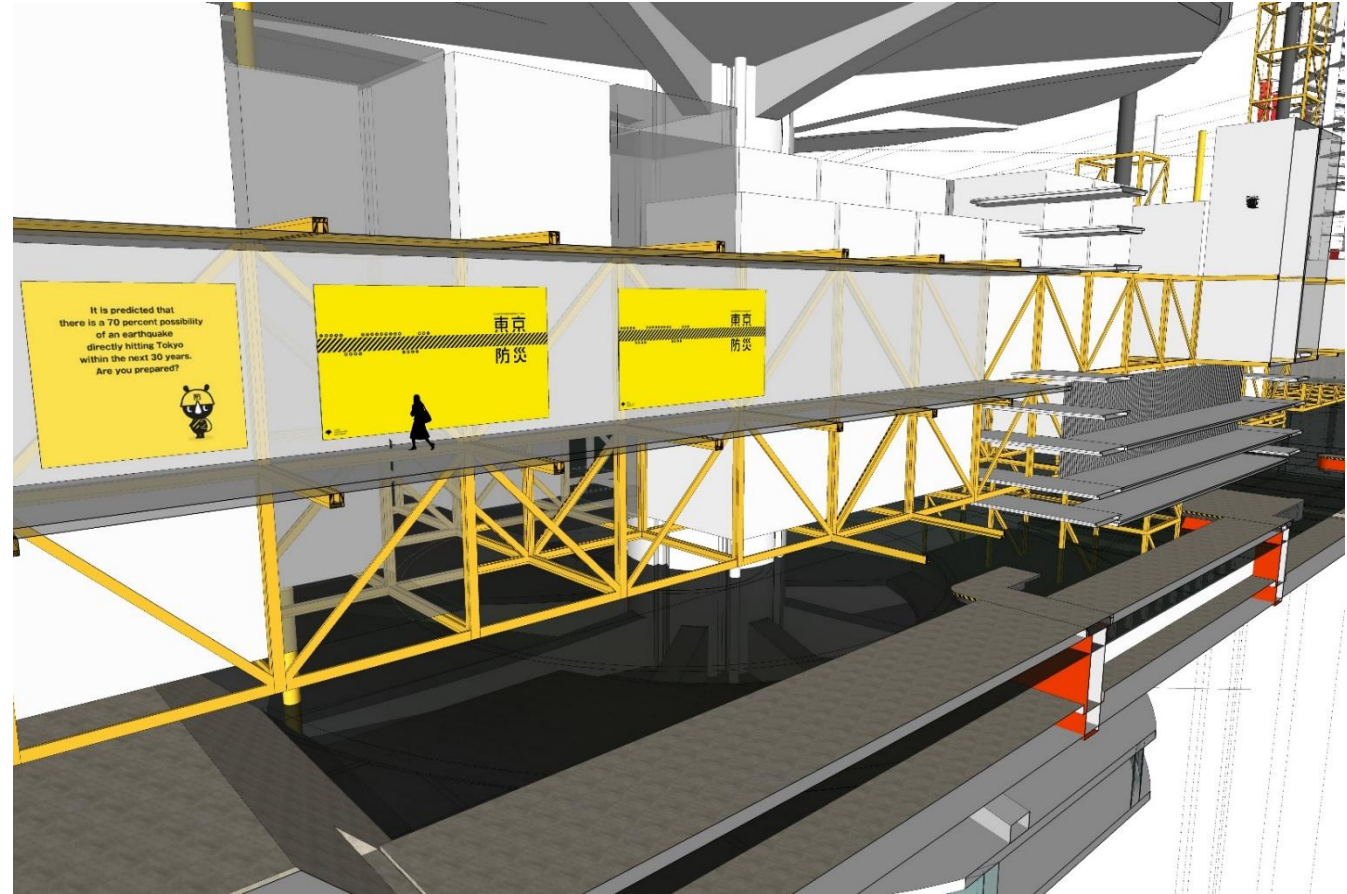
Re-introduction





Hypothesis

- peoples design 'safe architecture' then architecture design 'safe people'. (vise versa)
- architecture are capable to **bring disaster prevention education, research, and disaster prevention training together.**
- architect create immersive experience and enable great knowledge penetration.
- gather and catalyze knowledge transition and allowed research expression.



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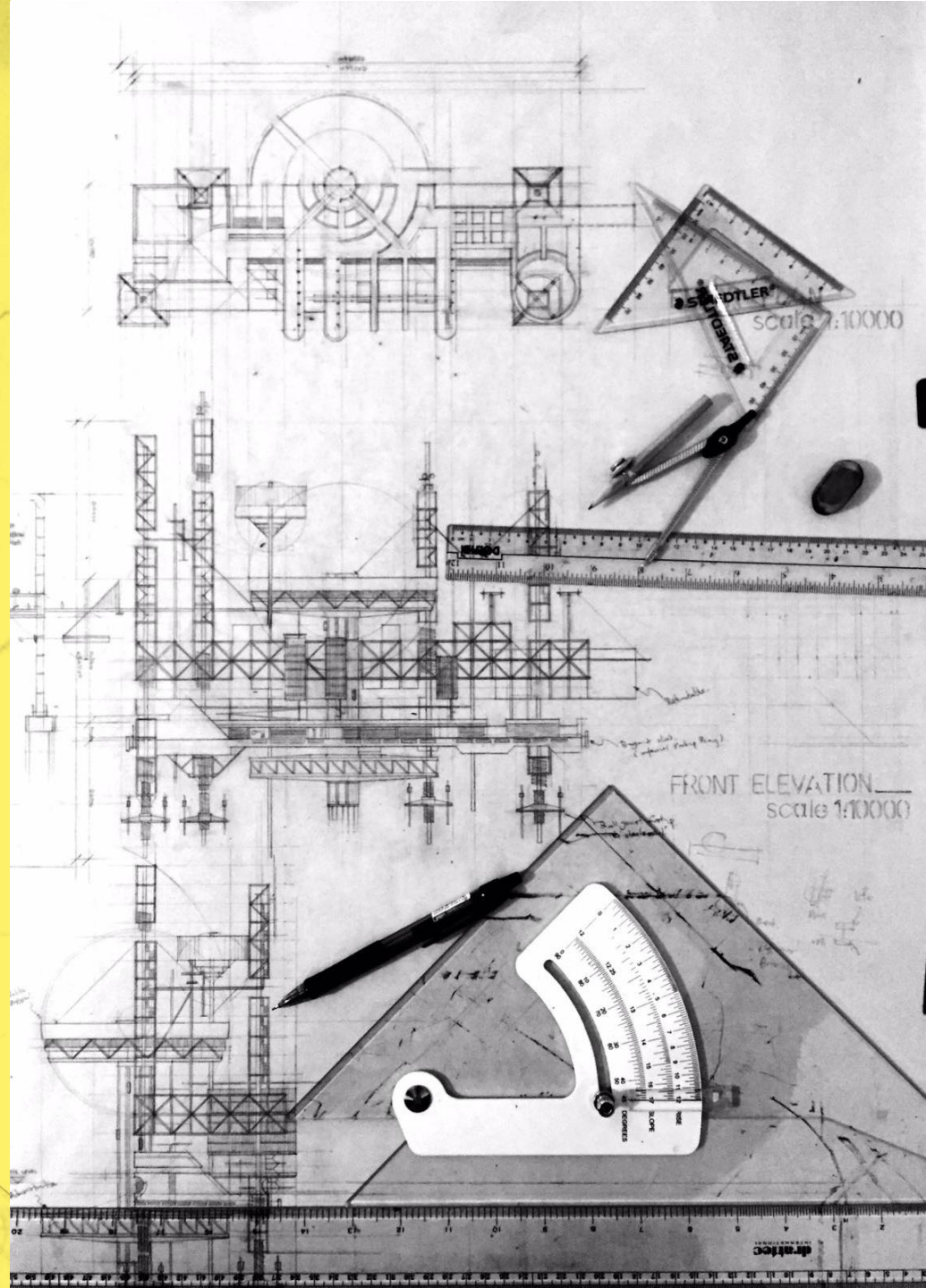
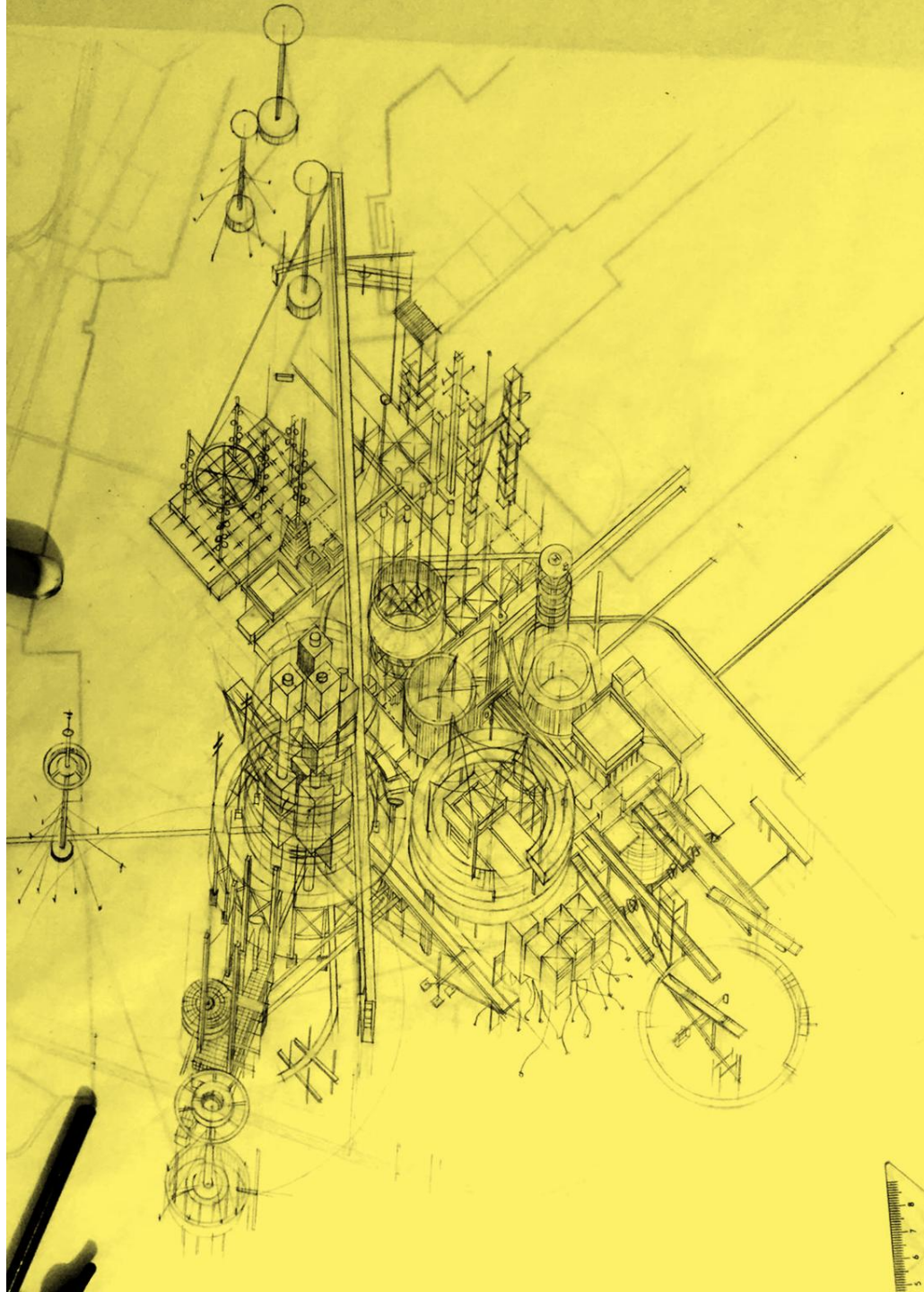
Hypothesis

- 2020 Tokyo Olympics as the Year of Disaster Prevention Global Classroom.
- unique and effective disaster prevention learning experience & information exchange.
- celebrate 2020 Tokyo Olympic in another level high up and thematically significant.
- **“A Disaster Proof Candidate City” & “Discover tomorrow”**



Doomsday Rehearsal

Methodology
Design expression



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Doomsday Rehearsal

Outcome(Phase 1) Bousai Re-introduction



Bousai Strategy

Facilitate Bousai; this TOKYO BOUSAI is a walk-through experience to respond to Tokyo Metropolitan Disaster prevention handbook, well informed natural environmental problem and advocate interactive disaster prevention.



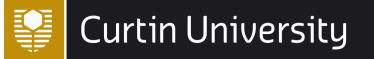
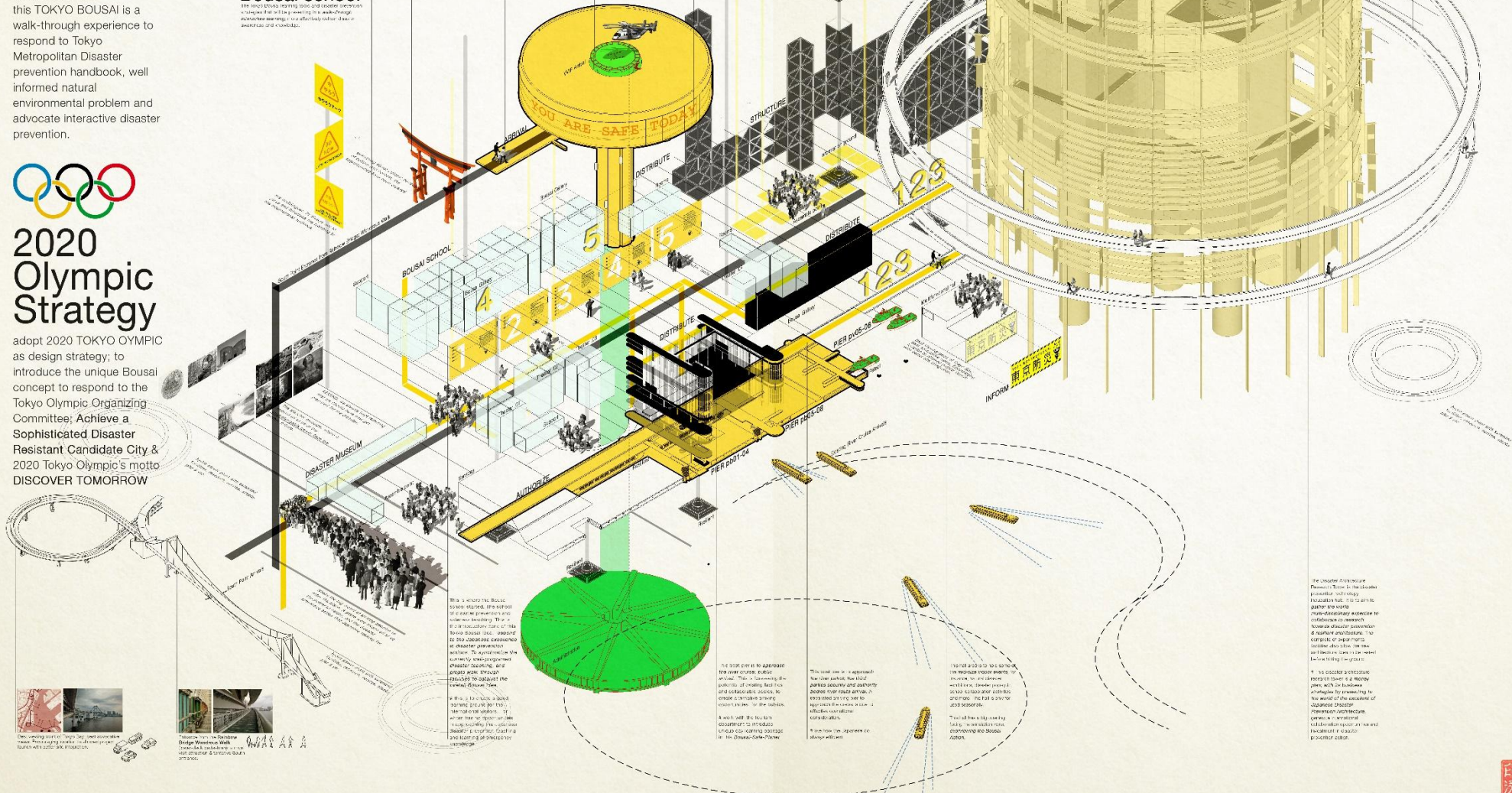
2020 Olympic Strategy

adopt 2020 TOKYO OLYMPIC as design strategy; to introduce the unique Bousai concept to respond to the Tokyo Olympic Organizing Committee; Achieve a Sophisticated Disaster Resistant Candidate City & 2020 Tokyo Olympic's motto DISCOVER TOMORROW

- 01 Simulation of a Major Earthquake 014
- 02 Let's Get Prepared! Disaster Preparedness Action 030
- 03 Other Disasters and Countermeasures 142
- 04 Survival Plan 170
- 05 Disaster Points and Information 216

Bousai school

The Bousai school is a walk-through experience to respond to Tokyo Metropolitan Disaster prevention handbook, well informed natural environmental problem and advocate interactive disaster prevention.



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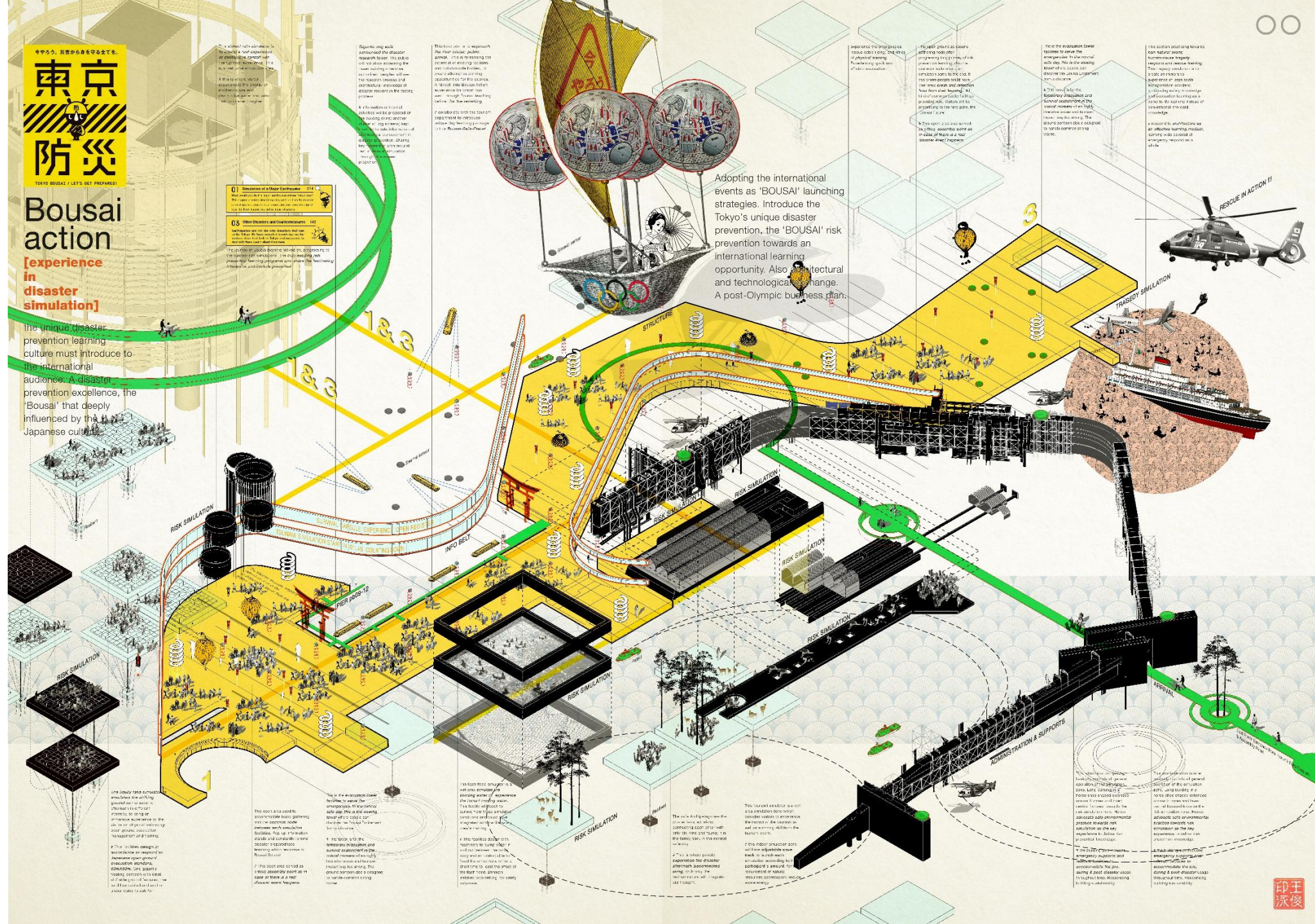
Doomsday Rehearsal

Outcome(Phase 2) Bousai Experience



Bousai action [experience in disaster simulation]

The unique disaster prevention learning culture must introduce to the international audience. A disaster prevention experience, the 'Bousai' that deeply influenced by the Japanese culture.



- 01 Simulation of a Major Earthquake 214
- 02 Other Disasters and Countermeasures 142

Adopting the international events as 'BOUSAI' launching strategies. Introduce the Tokyo's unique disaster prevention, the 'BOUSAI' risk prevention towards an international learning opportunity. Also architectural and technological change. A post-Olympic business plan.



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Outcome(Phase 3)
Bousai
Safety Training



Bousai action

[experience in safety evacuation]

the unique disaster prevention learning culture must introduce to the international audience. A disaster prevention excellence, the "Bousai" that deeply influenced by the Japanese culture.



2020 Olympic Strategy

adopt 2020 TOKYO OLYMPIC as design strategy; to introduce the unique Bousai concept to respond to the Tokyo Olympic Organizing Committee; Achieve a Sophisticated Disaster Resistant Candidate City & 2020 Tokyo Olympic's motto DISCOVER TOMORROW

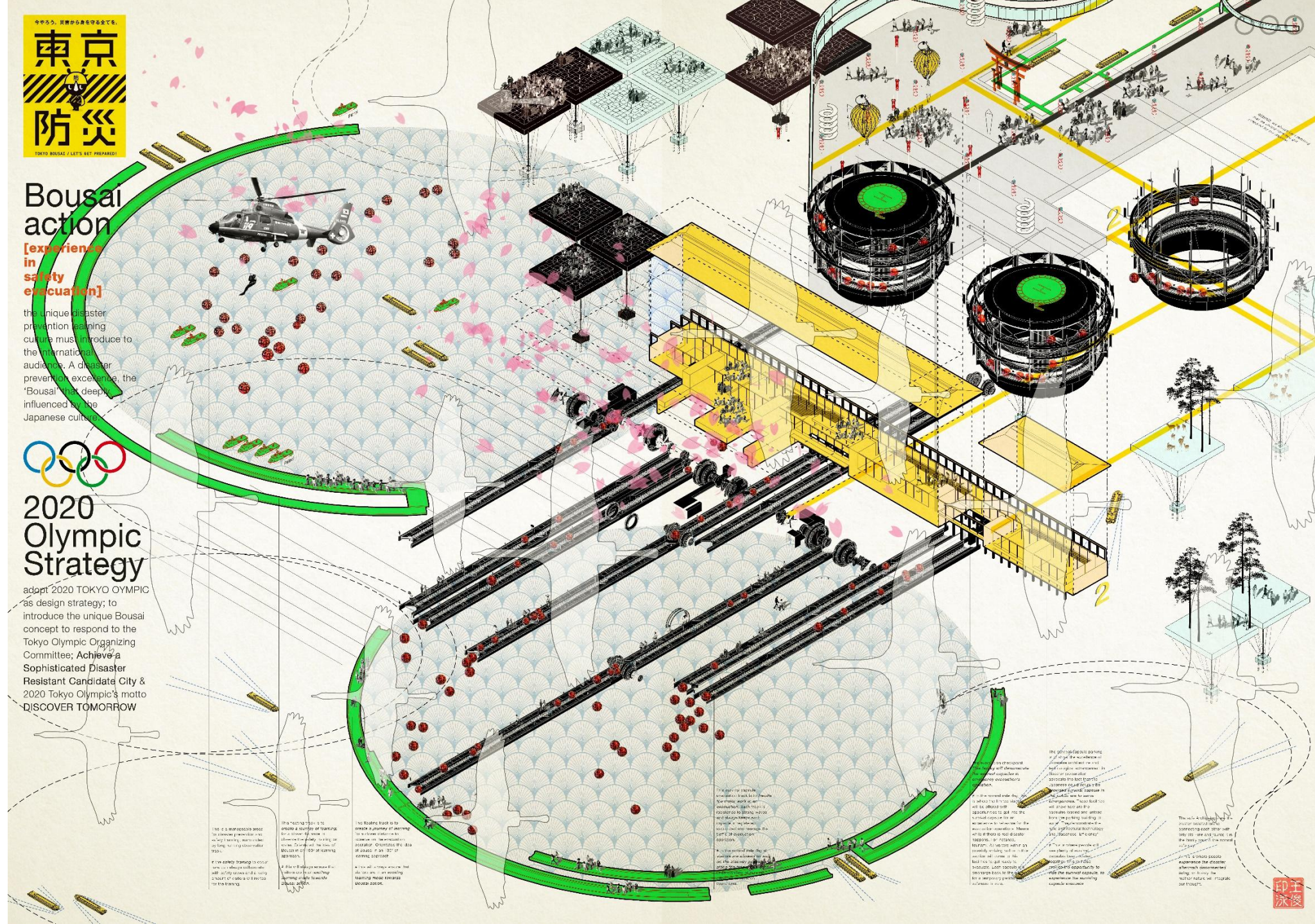


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The site is a rehearsal space for disaster prevention and safety training. It is designed to be a multi-functional space that can be used for various purposes, including disaster prevention training, safety training, and public events.

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Outcome(Phase 4)
Bousai
Safety Training

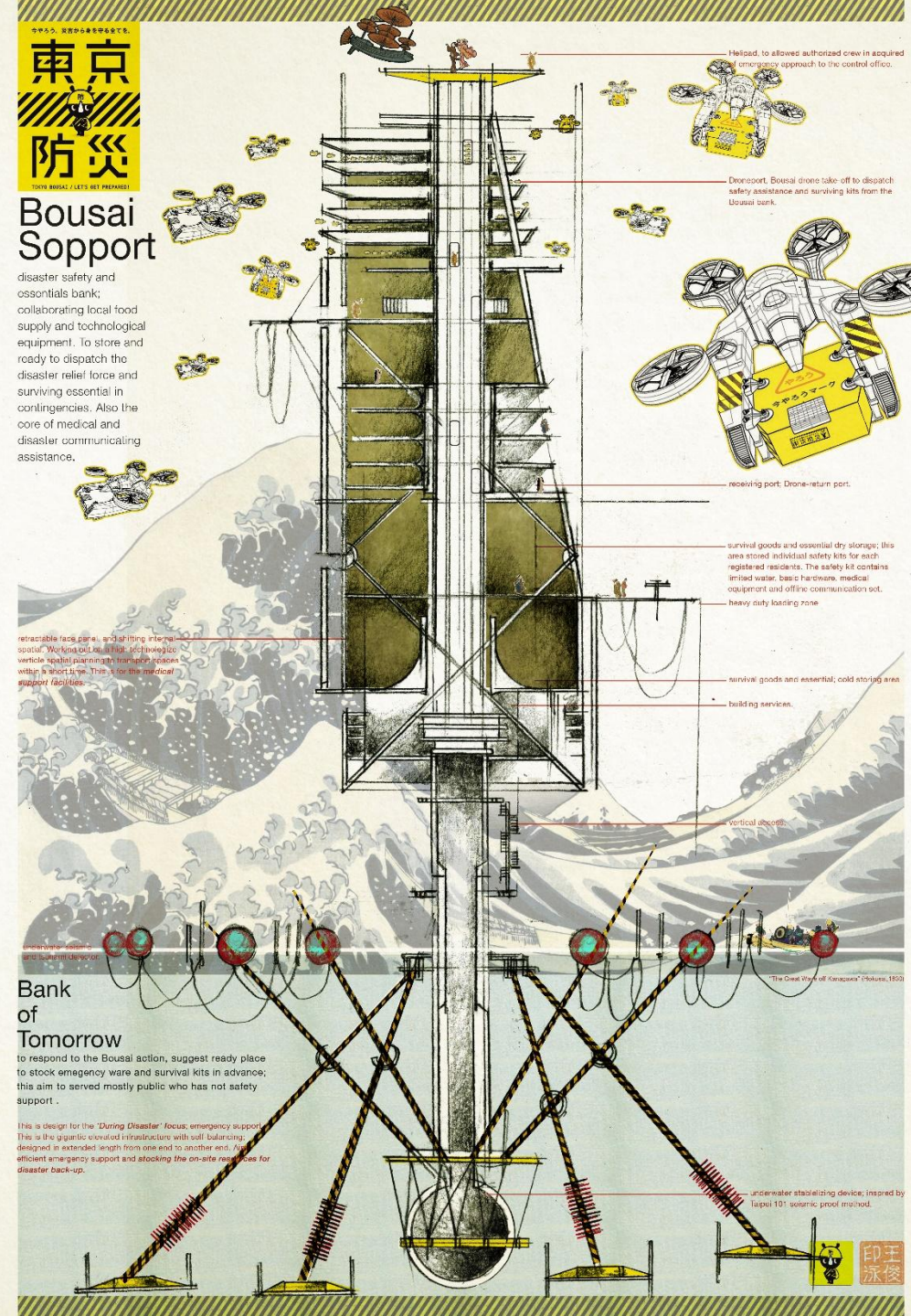
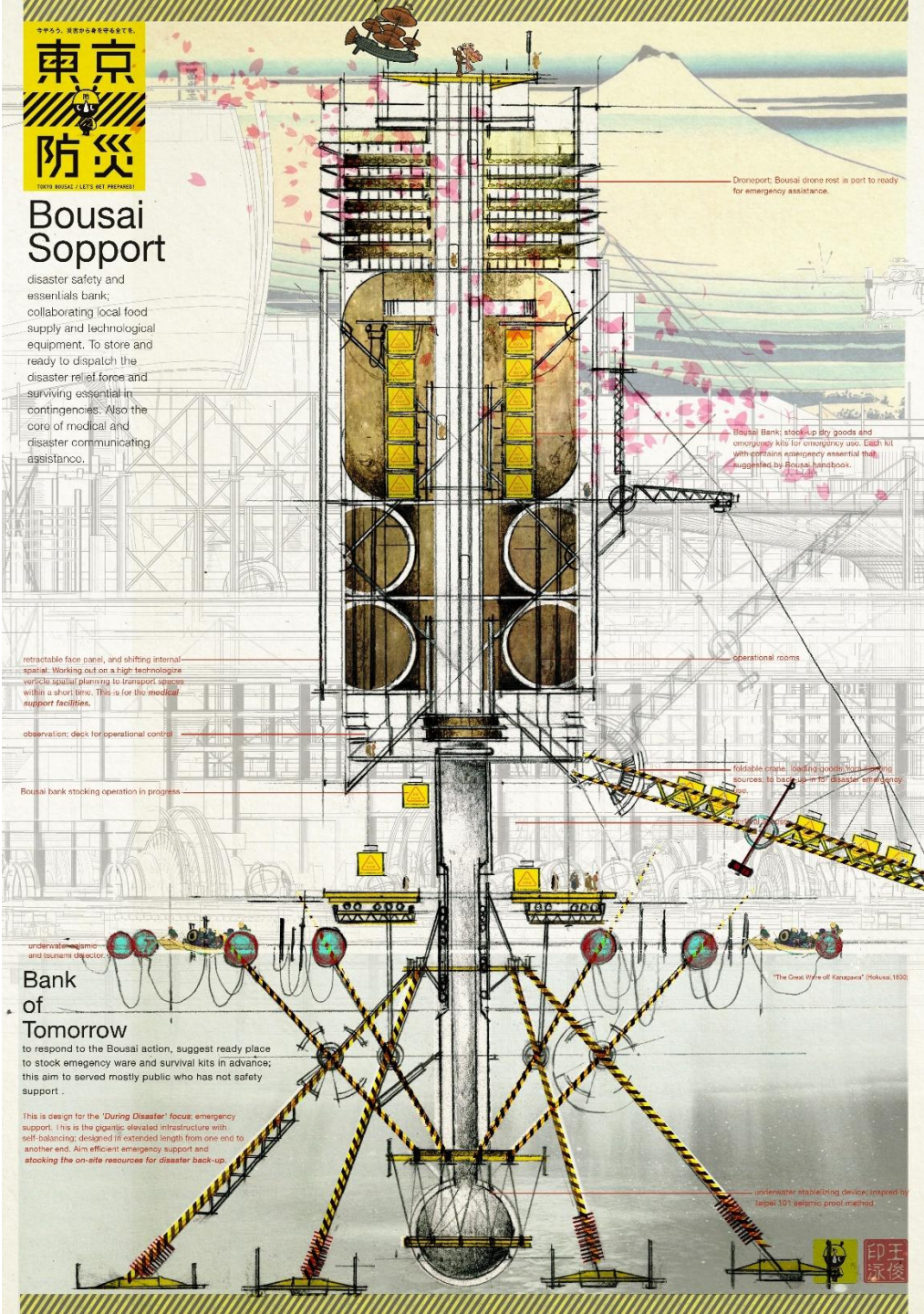
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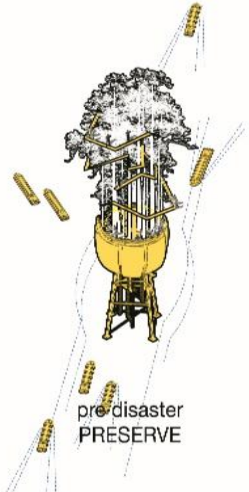
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Doomsday Rehearsal

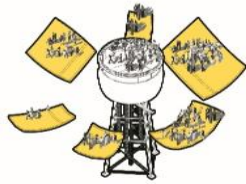
Outcome(Phase 5)
Bousai
Safety Training



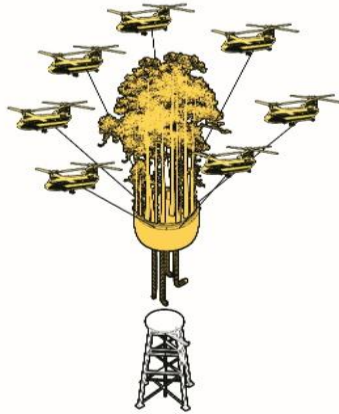
pre-disaster
PRESERVE



during disaster
ESCAPE



during disaster
ISOLATE



post-disaster
RESTORE



post-disaster
REGROWTH



Miracle Pine

Only surviving tree out of 70,000 after tsunami that struck Japan in 2011. 'Miracle pine', the monument to ~9,000 disaster victims.



Bousai Future

Foresee the future of Japan with Bousai; the excellent risk surviving strategy.



2020 Olympic Strategy

2020 Tokyo Olympic's motto: DISCOVER TOMORROW



Bousai Future

Foresee the future of Japan with Bousai; the excellent risk surviving strategy.

to pay respect to the 'Miracle Pine', this nature preservation area is the artificial land to preserve nature, evident of architectural advancement. This is to pay respect and show appreciation to nature; an architectural behavior on 'back to nature'

this elevated deck is for the visitors sighting experience and also for the Bousai crew to service the preserved wood.

this disaster essential bank is the place where store dry goods, and for ward to disaster back up use; it also support temporary needs for 100,000 citizens.

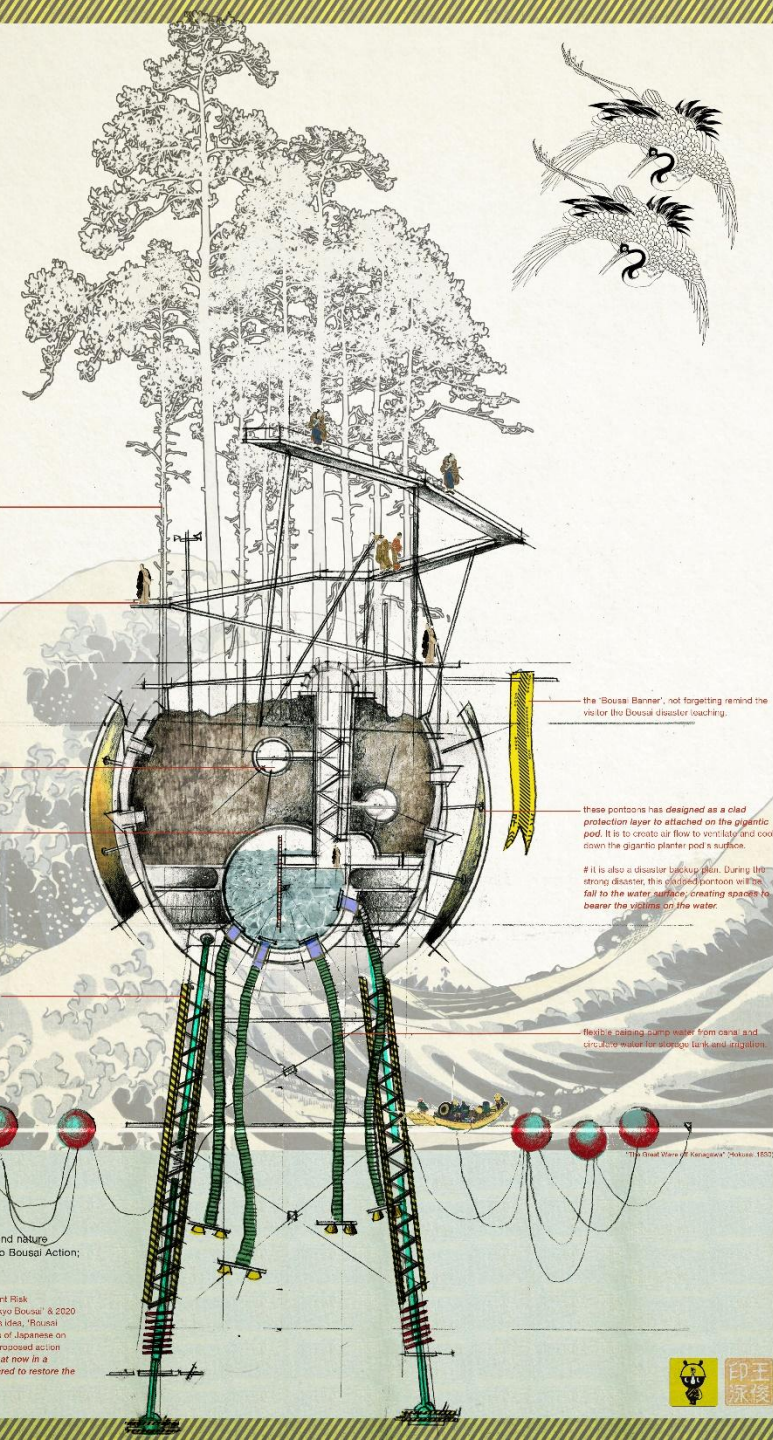
this disaster collection zone is to collect and catch freshwater and drainage water to back up for during disaster use; or those that evaporated and contributed to this pool.

disaster proof supporting structure, ball joints foundation deep penetrated into the ground to kept the planter pods stood firmly above water.

Garden of Tomorrow

'The Wood of God' is a artificial safe-land nature reserved garden designed to response to Bousai Action; advocating 'Bousai Future'

adopt the disaster Tokyo Metropolitan Government Risk Management's disaster prevention guideline 'Tokyo Bousai' & 2020 Tokyo Olympic's motto 'Discover Tomorrow'. This idea, 'Bousai Future' advocated the imaginable successfulness of Japanese on handling Nature Disaster. 'Bousai Future' is the proposed action towards natural preservation, preserving nature at now in a designated artificial safe land and being prepared to restore the nature from the possible future disaster.



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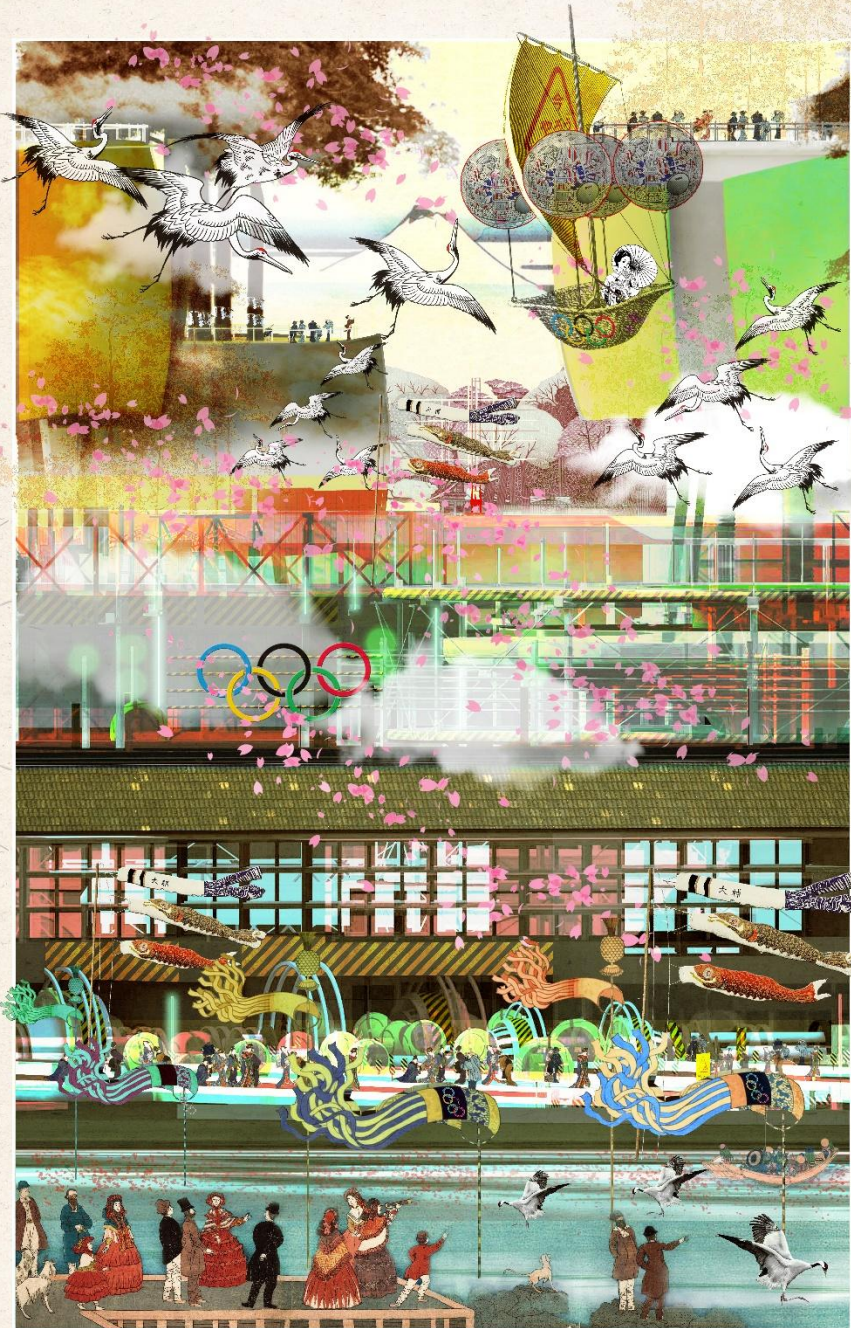


There is no harm in hoping for the best as long as you're prepared for the worst

(Stephen King, 1982)

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Outcome



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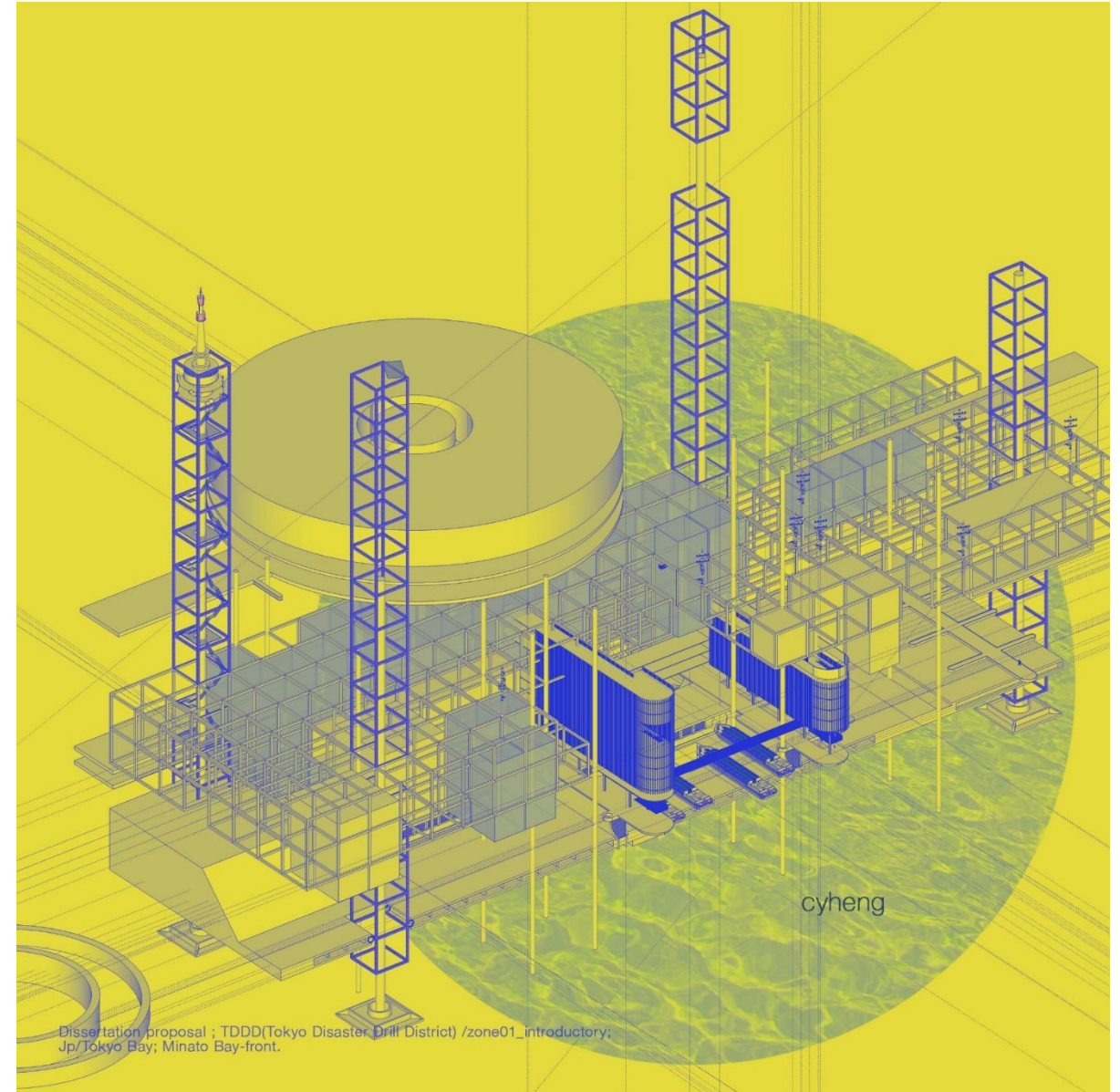
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WHAT do we looking forwards?

- familiarity in reacting contingencies (scalable reaction)
 - **contingency decision (from individual to the crowd)**
 - **everyone have the ability on giving basic aid and helps**
- pre-disaster education to expect a significant result in reducing disaster casualties.
- global synchronization of disaster awareness, in regardless of geographical context.



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Tokyo Disaster Prevention Plan (Dec 2014)

*In the midst of these efforts, Tokyo was selected to host the 2020 Olympic and Paralympic Games, While the success of the games is of course important, it is also important that Tokyo take advantages of this opportunity to achieve its goal of becoming the greatest city in the world. **Disaster preparedness measures are one of the foundation on which a city's safety and security are built. (TMG, 2014)***



Reference

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- <https://guardiancenters.com>