FALLBACK PLAN

Dean Chang

PREFACE

The thesis is questioning the architectural response when facing disasters. Dealing with unexpected catastrophes, architectures usually respond passively after force majeure happens. In a city with dense populations, architectures though could not give in-time reactions like living creatures, a prepared threshold could be designed and it shall work as the first step for citizens to stay when emergency happens.

The thesis of Chia-Jui (Dean) Chang, titled FALLBACK PLAN is approved:

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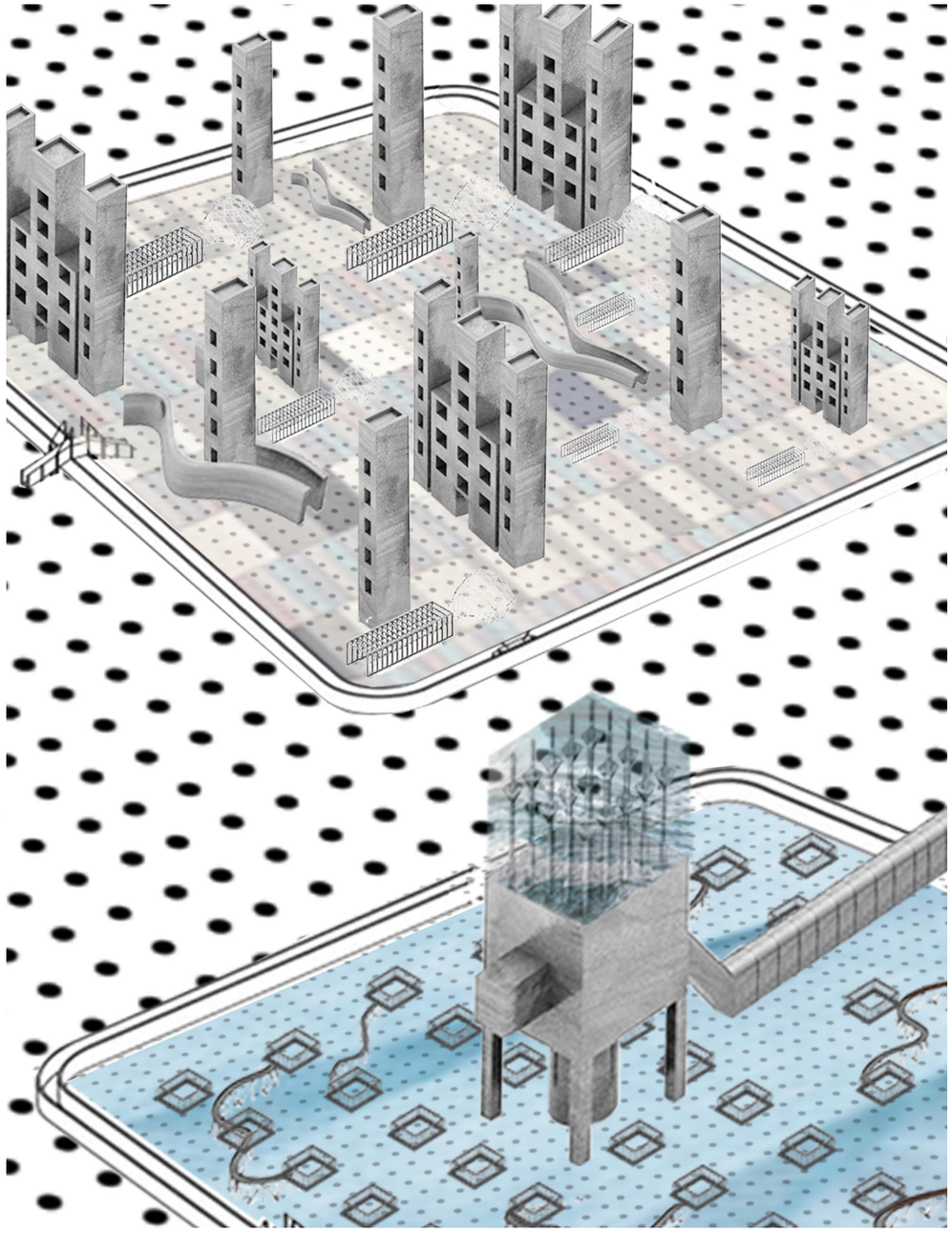
University of California, Berkeley

URBAN CRISIS

Cities are units for urban lives. An urban system is not responsive to the natural world especially when disaster happens. Earthquakes, typhoons, heat waves, flooding, pandemics are all giving severe impact to the modern urban society. The truth that none of a city is ready for natural disasters has been proved again and again from historical events to the global pandemic in recent days.



INFRASTRUCTURES

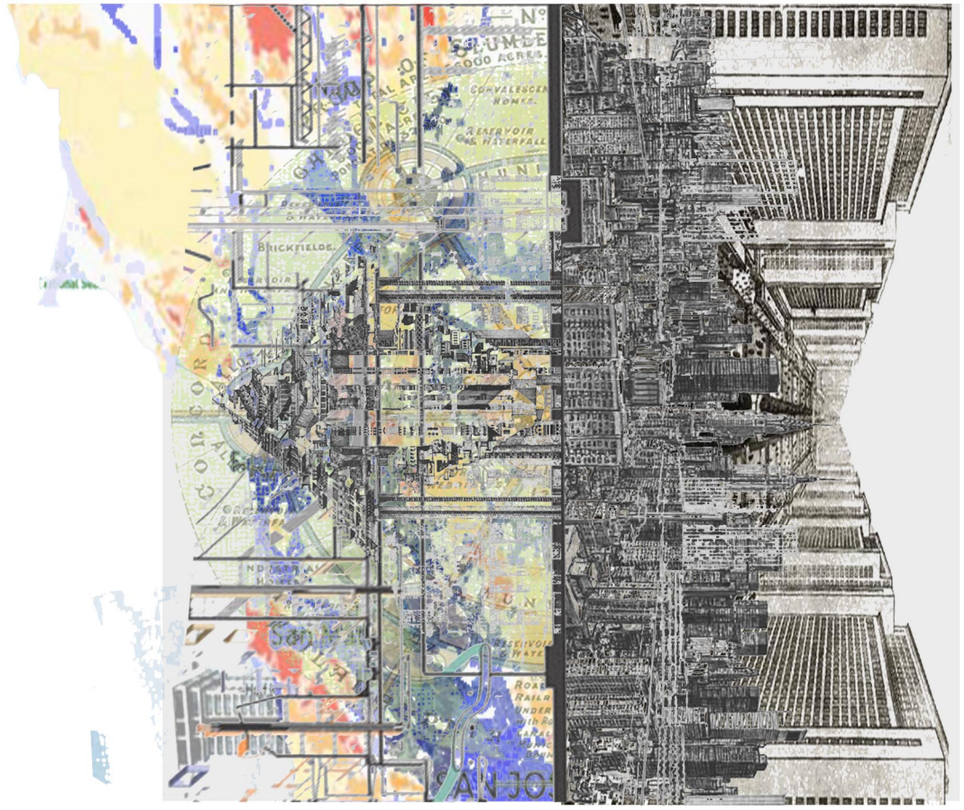
Problems in cities are usually solved by infrastructures. Crime is being dealt with police stations; Fire is the main subject for fire stations; death is the enemy of hospitals; evilness is being controlled by churches. Among all the infrastructures, none is specifically prepared for sudden environmental changes. Ironically, this type of crisis always lead to a huge amount of loss.

MONO-PURPOSE

Infrastructures are all single purpose spaces. In other words, the current strategy of human beings, dealing with city scale's problems, is far from flexible. Admit that there is no correct answer for a specific issue, then how come there is no corresponding treatments when facing potential severe disasters?

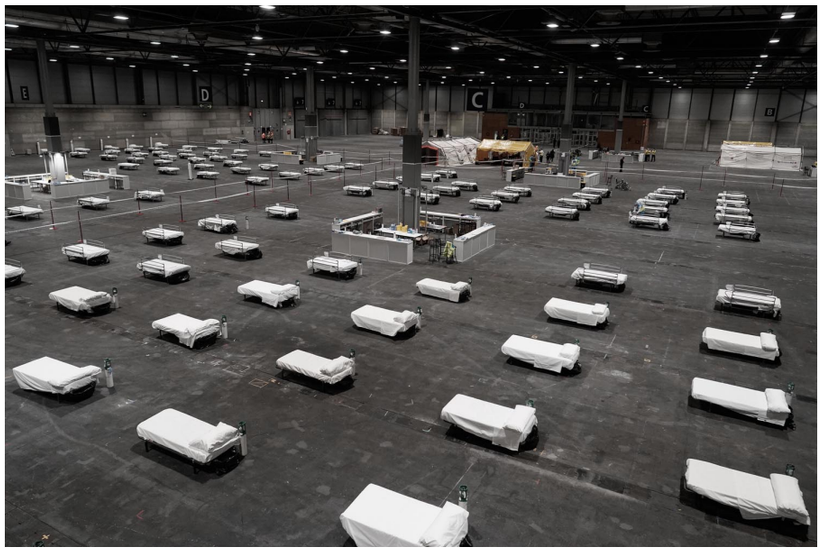
CONNECTION

The new infrastructure should also be in the city like all the others.
The interwoven relationship between the Fallback Plan and cities creates accessibility for citizens to recognize and raise their interests of the space. Comparing to the temporary shelters which are the main solution for disasters, a threshold that people are familiar with unconsciously implants the notion of a “safe place.” This gives senses of calm and provides time for citizen to get prepared facing the coming incidents.



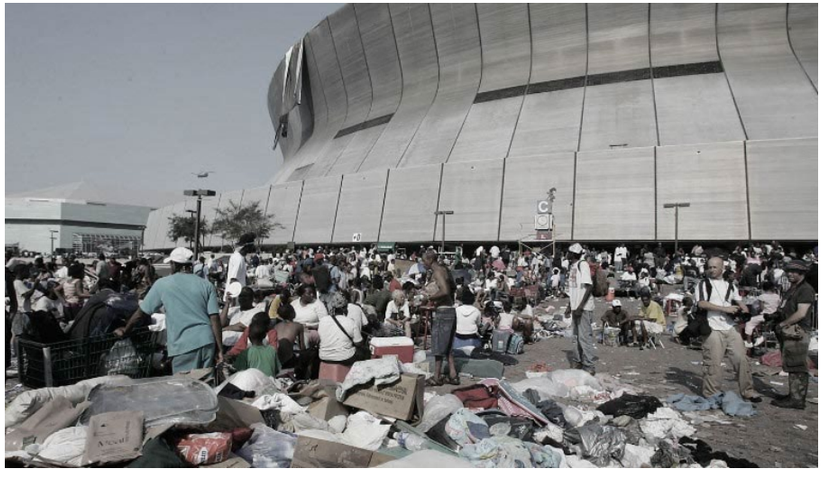
ALWAYS OPEN

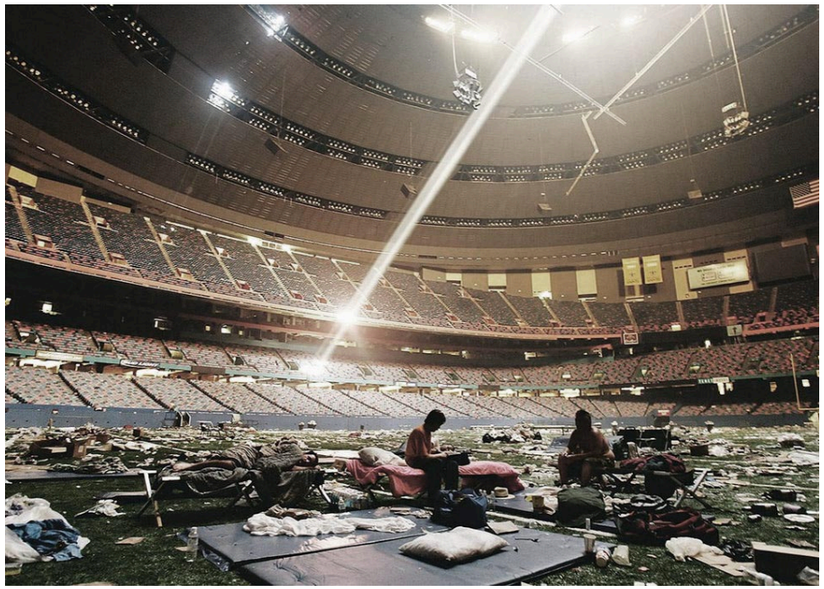
Imagine a upside down city looks exactly the same under the current city you lived in. People are welcome to get in the B city whenever they want. This interaction creates the sense of awareness that there is always a ready place for people to stay when the current world is malfunctioned.



RECENT INCIDENTS

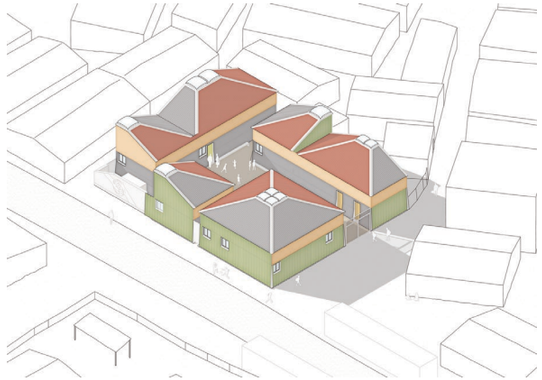
It shows the lack of solution and awareness of spaces when it comes to the pandemic started in 2020. Traditional infrastructures are not enough to deal with the sudden change of demand. Temporary containers and empty gyms are used to digest the increasing requests of medical spaces. Those spaces or not promising for medical use that might lead to further problems.

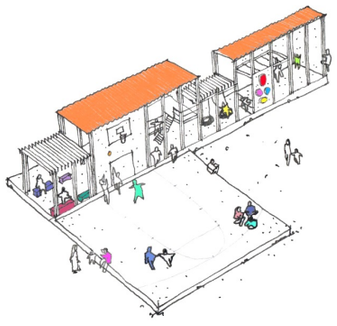




HISTORY INCIDENTS

From Hurricane Katrina to COVID, the 15-year evolution of spatial design seems not having a good improvement. People are using the spaces that are still available to use after disasters happen rather than planning a ready and safer space that could save more time when escaping.





NECESSATIES

In the refugee of Lebanon, the two projects designed by CatalyticAction reveals the multiple needs in a post-disaster situation. People need recreational and educational spaces even they are under a tough time in their lives. Not only does the fallback plan should work as a prepared space when catastrophe happens, it could also work as the starting point in post-disaster times.

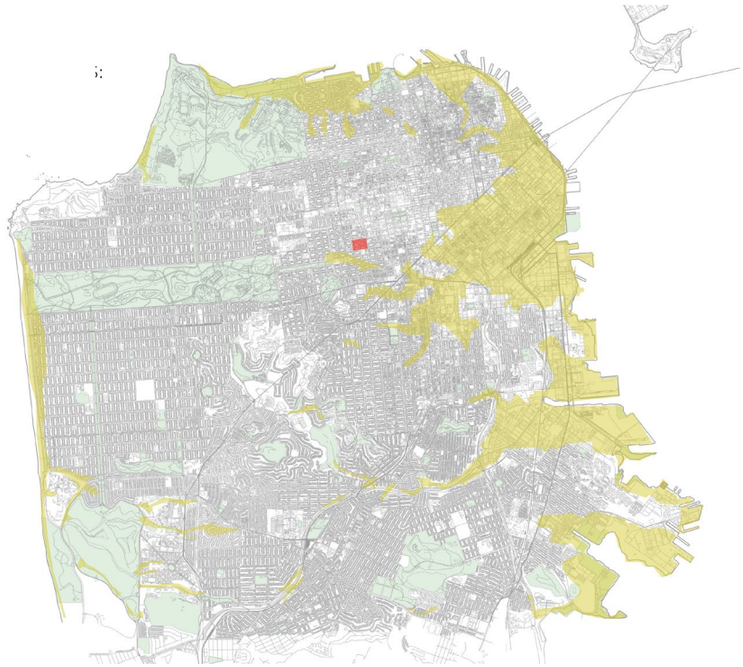
SAN FRANCISCO SPECIFIC RESOURCE MAPPING

CIVIC CENTER
SHELTER
HOSPITAL
CHURCH
RESILIENT PARK
JAIL
POLICE STA
FIRE STA

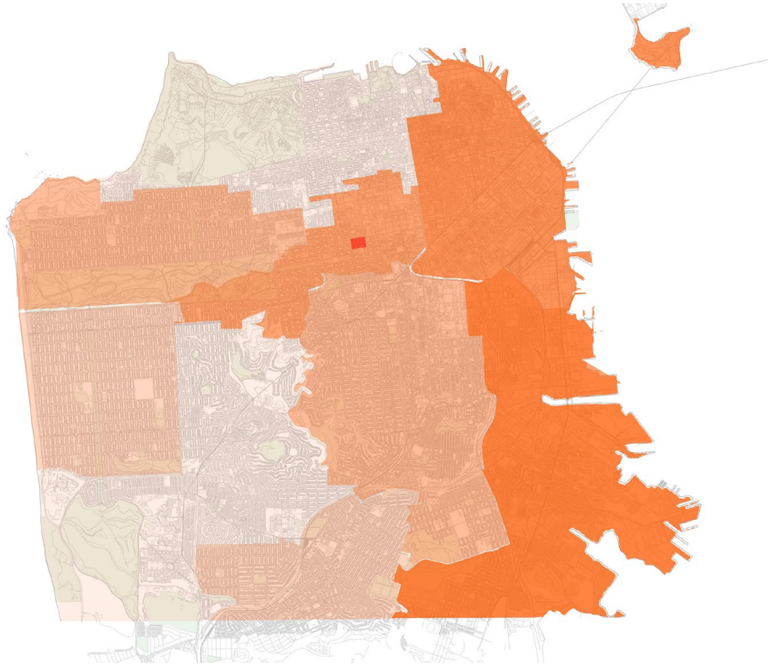
SITE

San Francisco, one of the most prosperous city throughout the world, is an example that is not ready for disasters. From the 1906 earthquake to the COVID, also the increasing social problems are the evidence that this city is having trouble dealing with the consisting problems.
The mapping shows the infrastructures in the city which is mainly located near the civic center.

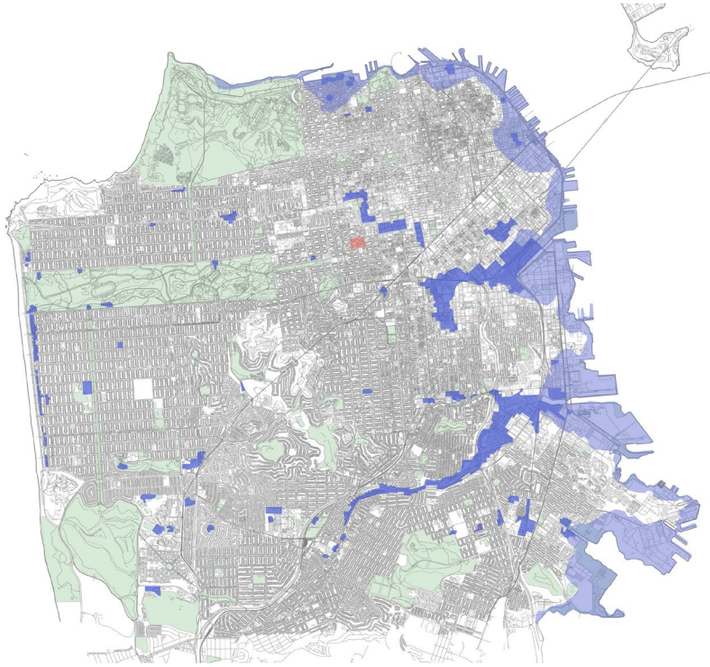
Seismic Hazard Zone: Liquefaction



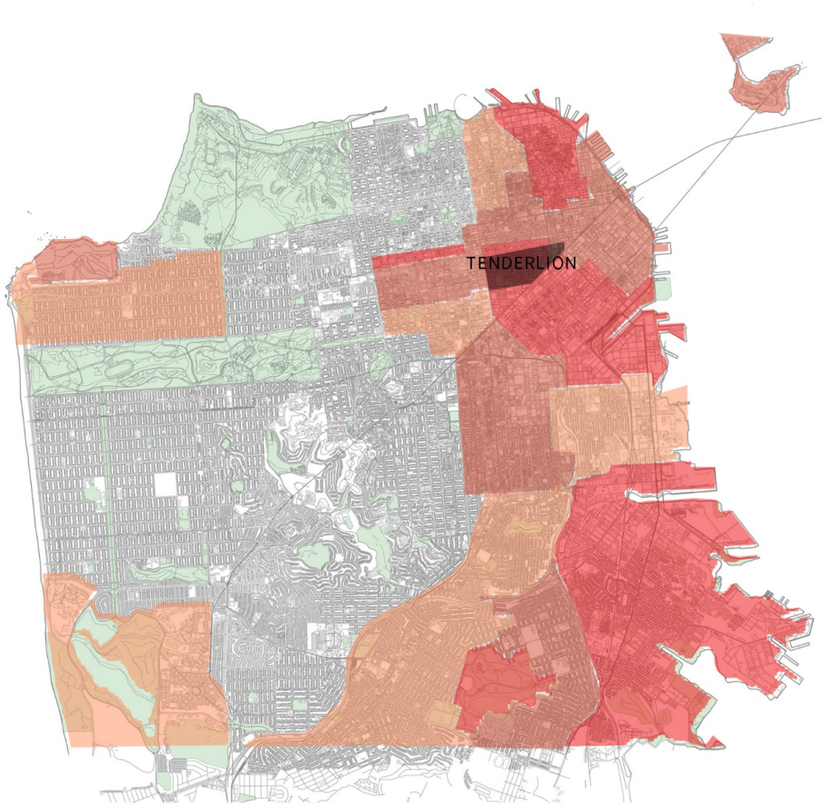
Homeless Population Density Map



100-YR Potential Flooding Map



SF VULNERABILITY MAP



VULNERABILITY

Based on the mapping of seismic hazard zone, homeless density, and 100-yr flooding map, the vulnerability of the city is established. There are more potential crisis on the southeast of the city.

EARTHQUAKES

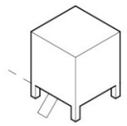
Smaller Massings

Tuned Damper

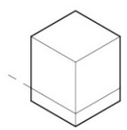
Foundation Damper

Framing

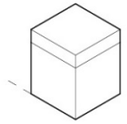
FLOODS



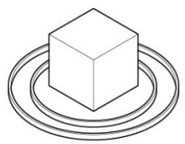
Wet Floodproofing



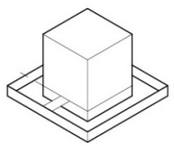
Dry Floodproofing



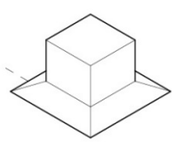
Equipments Higher



Cloaking



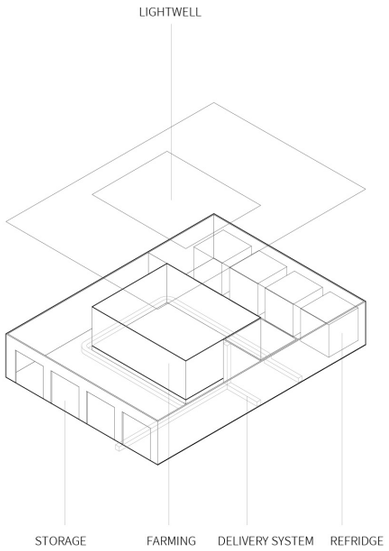
Floodway



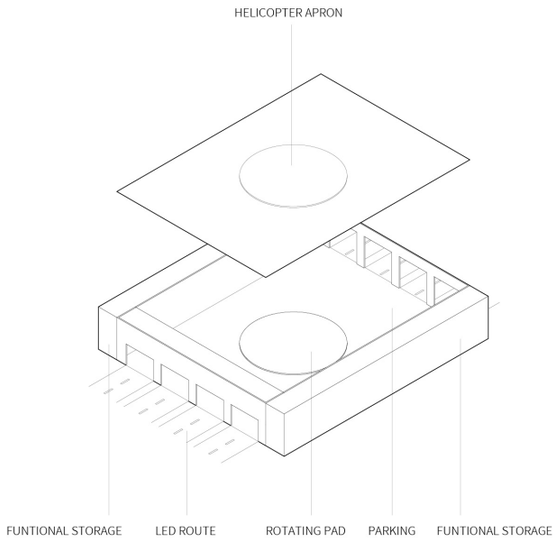
Topography

STRUCTURAL STRATEGIES

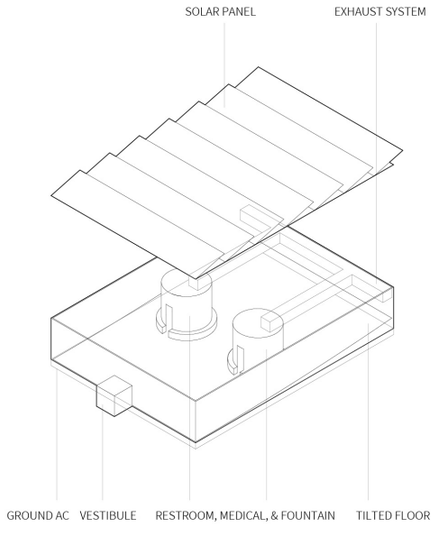
The disaster happens the most in San Francisco are earthquakes and flooding. To deal with the two catastrophe, some structural strategies could be applied in further designs.



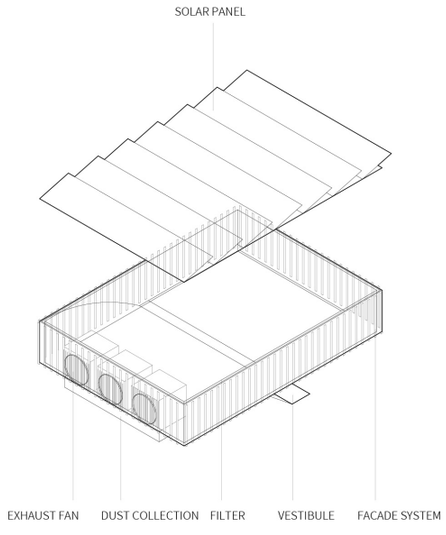
Food Supply Center



Connecting Center



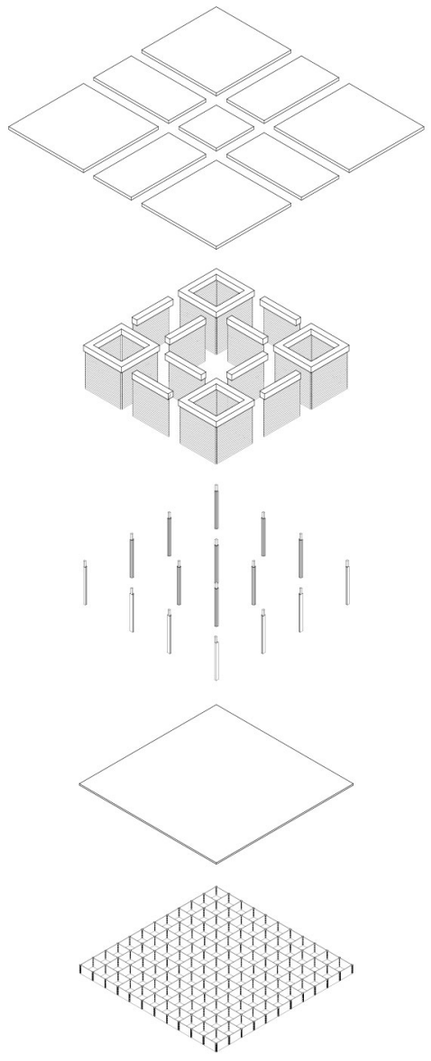
Cooling Center



Air Filtering Center

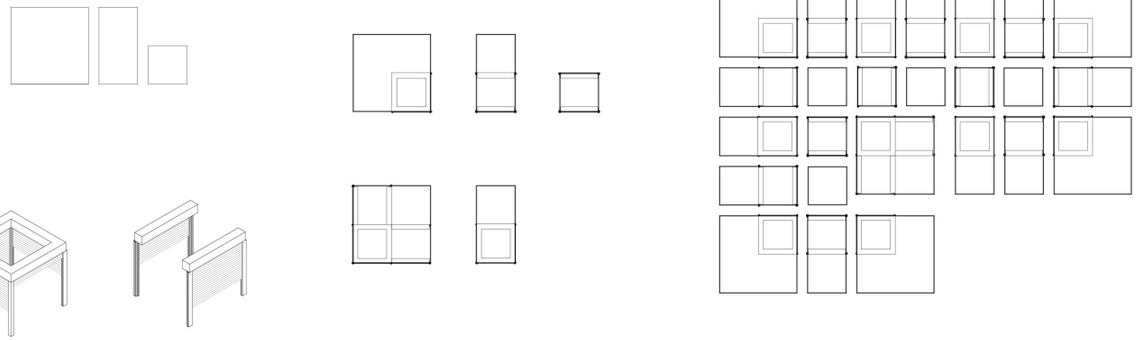
POTENTIAL PROGRAMS NEEDED

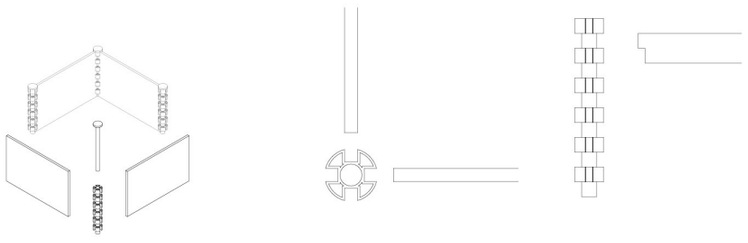
The thriving extreme climate changes are also a factor that will change future lifestyle in California. Considering under extreme situations, a food supply center and connecting center are necessary for the fallback plan. In daily lives, cooling and oxygen-bar are two thriving spaces in the states. Those programs could be seen as a way out when wildfires causes air pollution and global warming keeps increasing the average temperature.



ROLL-UP DOOR SYSTEM

With the consideration of making the programs adjustable, the roll-up door system is introduced to the design. With the basic modular systems. Roofs, the roll-up doors, and foundations can be combined and create different typologies of the Fallback Plan system.

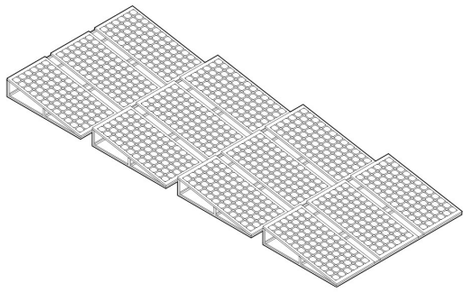


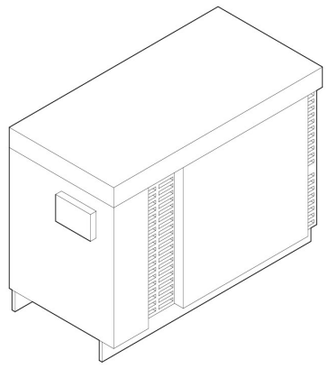


MODULAR ORDER

There are three sizes of roofs and two types of roll-up door units. With different combinations, the system make sure that the whole project could develop horizontally to adapt different sizes of sites.
The foundation system is a set of columns and panels. The shape of the column allows panels to be assembled in different directions simultaneously and it also creates the opportunity to combine themselves. The foundation system reassure the vertical accessibility of the project.

SOLAR PANEL & GENERATOR

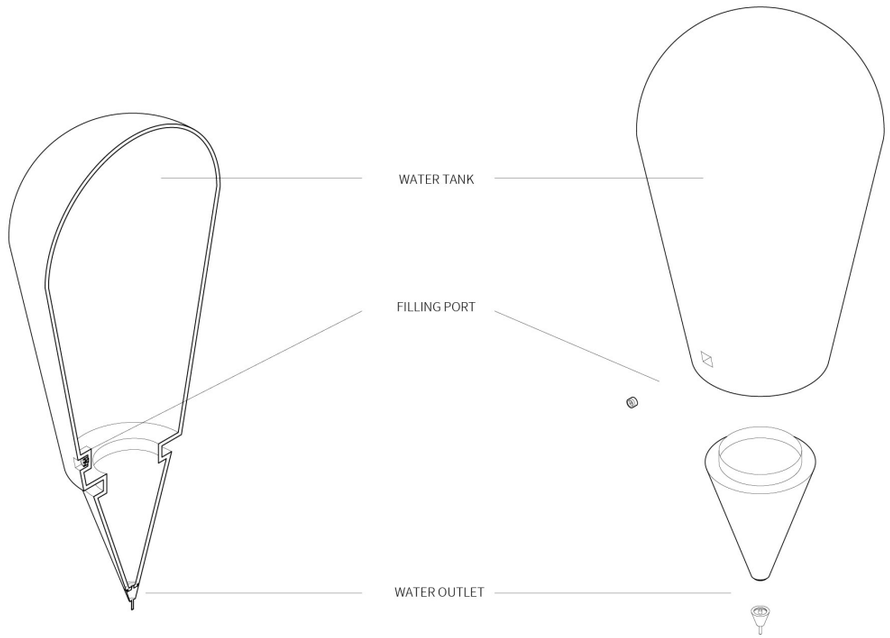




PROGRAM PLUG-INS

With the modular system that deals with the topologies. Programs of the project are considered as plug-ins that Fallback Plan in different locations could be customized based on the potential crisis and daily use.

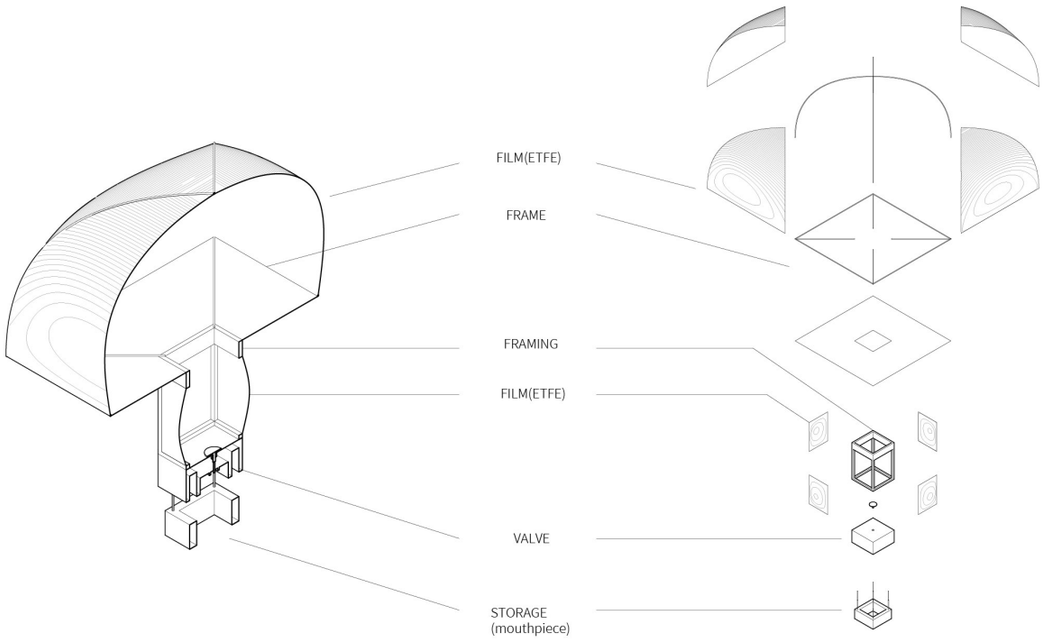
WATER TANK



WATER TANK

The fundamental and most important element that living creatures need is water. Disasters usually come with water pollution. Therefore, a water tank is necessary to apply in the project no matter where the site would be.

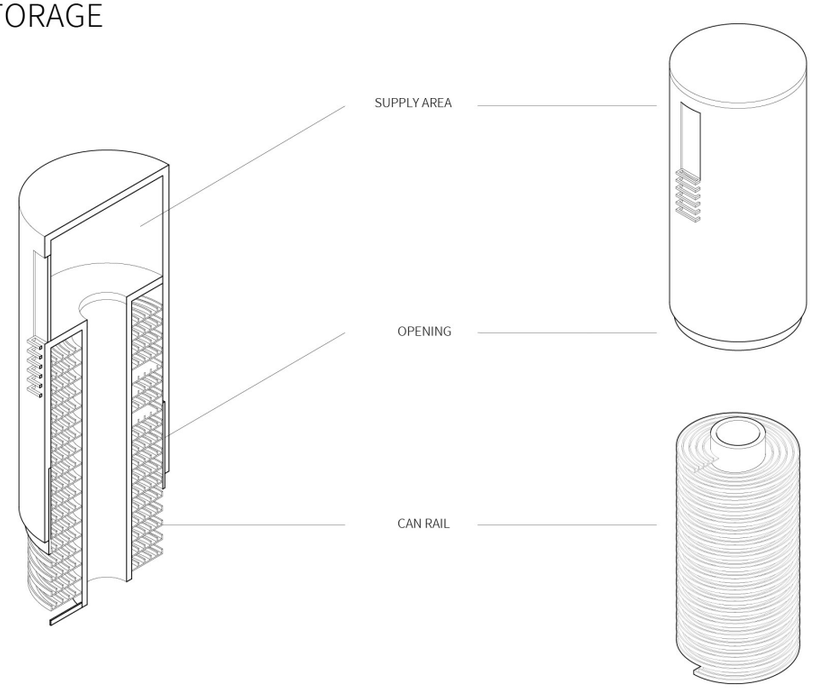
AIR TANK



AIR TANK

Considering the global warming and wildfire in California, an air tank is designed to provide clean air that awaken people under extreme circumstances. The elevated storage on the bottom is providing clean mouthpiece for people to use.

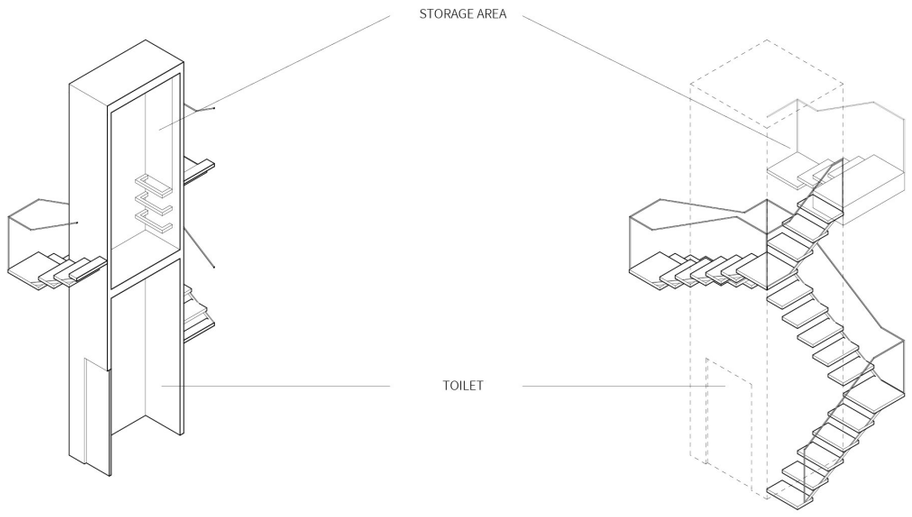
CAN STORAGE



CAN STORAGE

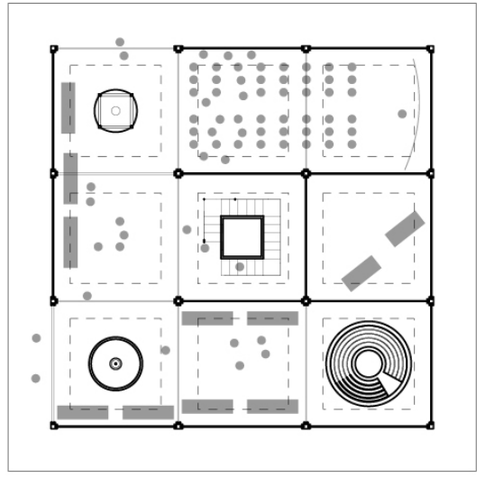
Under extreme condition, normal and fresh food are not helpful. Can food can be stored for longer times and the nutrition is more condensed. The spiral plate is designed that allows different sizes of cans to roll down from the top of the storage space. On the top is the supply area. There is also a roll-up door system that will be closed in daily situation.

TOILET & DRY STORAGE

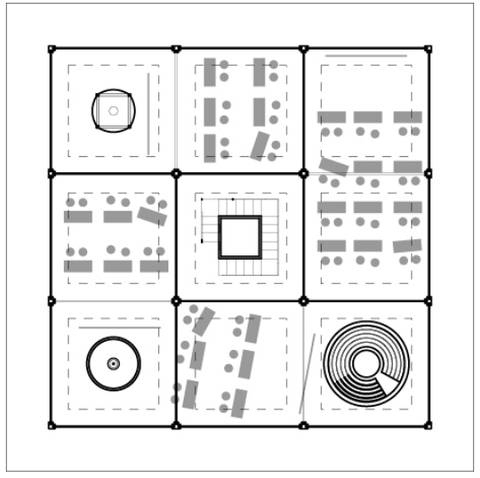


FIXED PROGRAMS

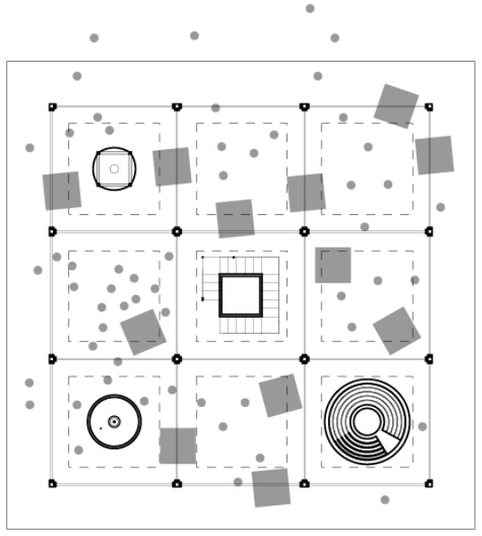
The fixed program is half of the structure of the main circulation. The stairs allow people to go to the roof to check whether the generators and solar panels are working. Also refilling the water tank and supply the can storage are the main activities happen on top.
The middle space are designed for toilet on the bottom and dry storage above with medical, first aid supplies, and any other small dry objects.



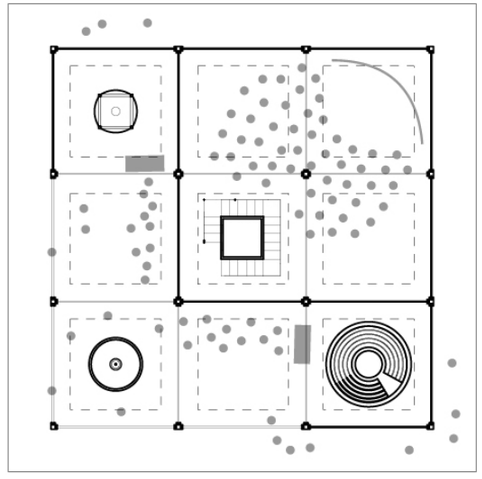
LECTURES



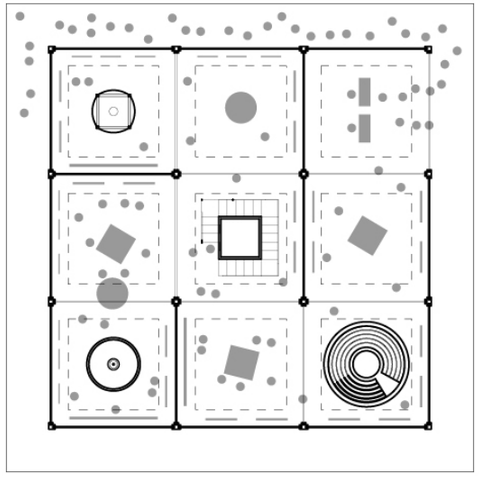
COMMUNITY COURSES



FLEA MARKET



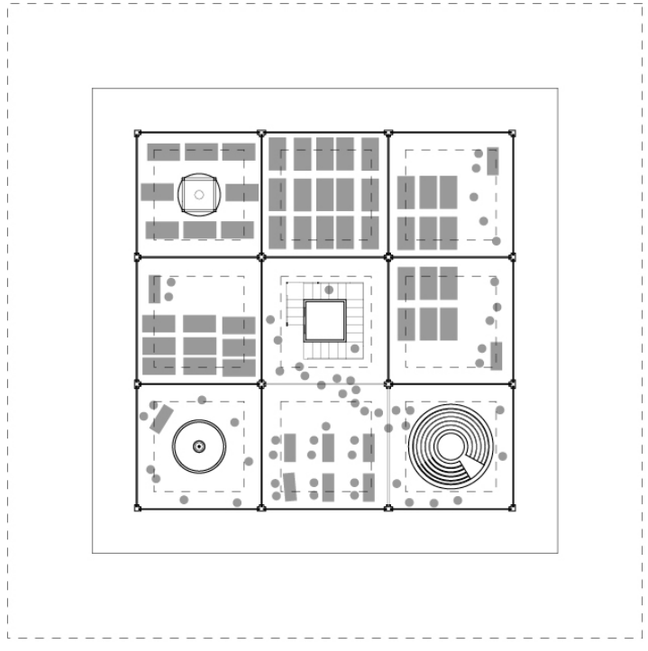
SEMI-OUTDOOR MOVIE THEATER



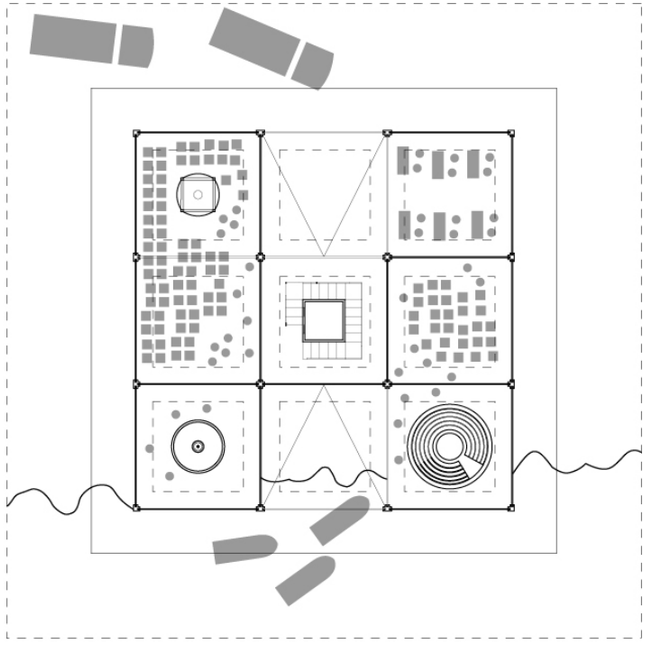
EXHIBITION HALL

STANDARD FORM

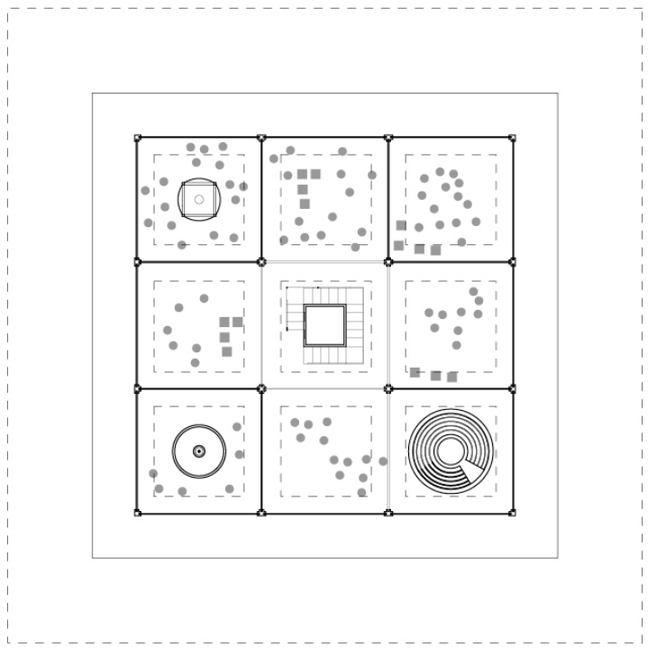
Applying one water tank, one air tank, one can storage, one set of solar panels, one generator, and one toilet/circulation set. This is the daily use diagram of the standard form.



MEDICAL CENTER



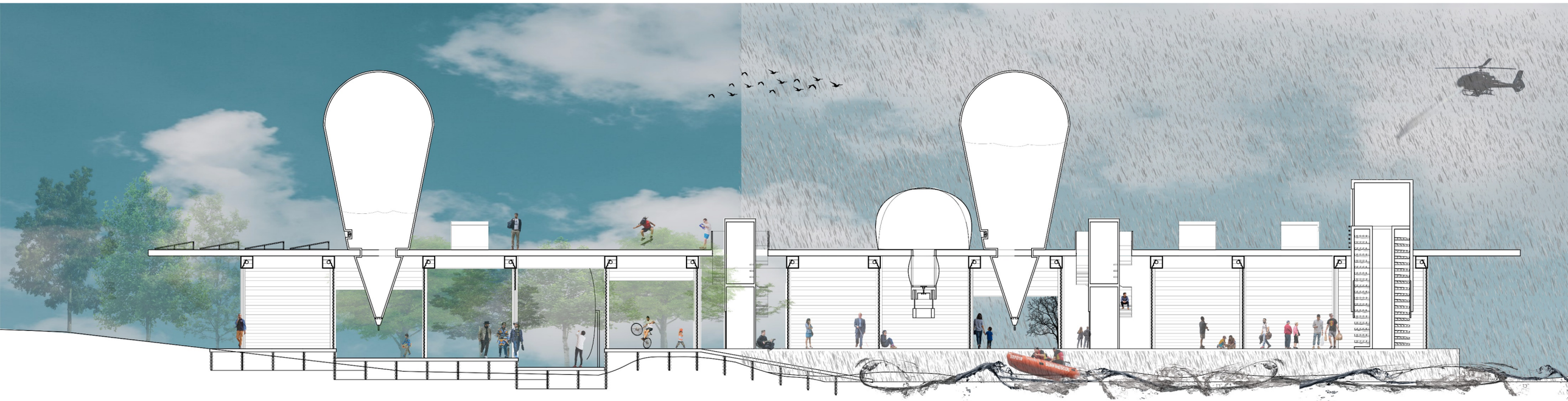
DISTRIBUTION CENTER



EMERGENCY SHELTER

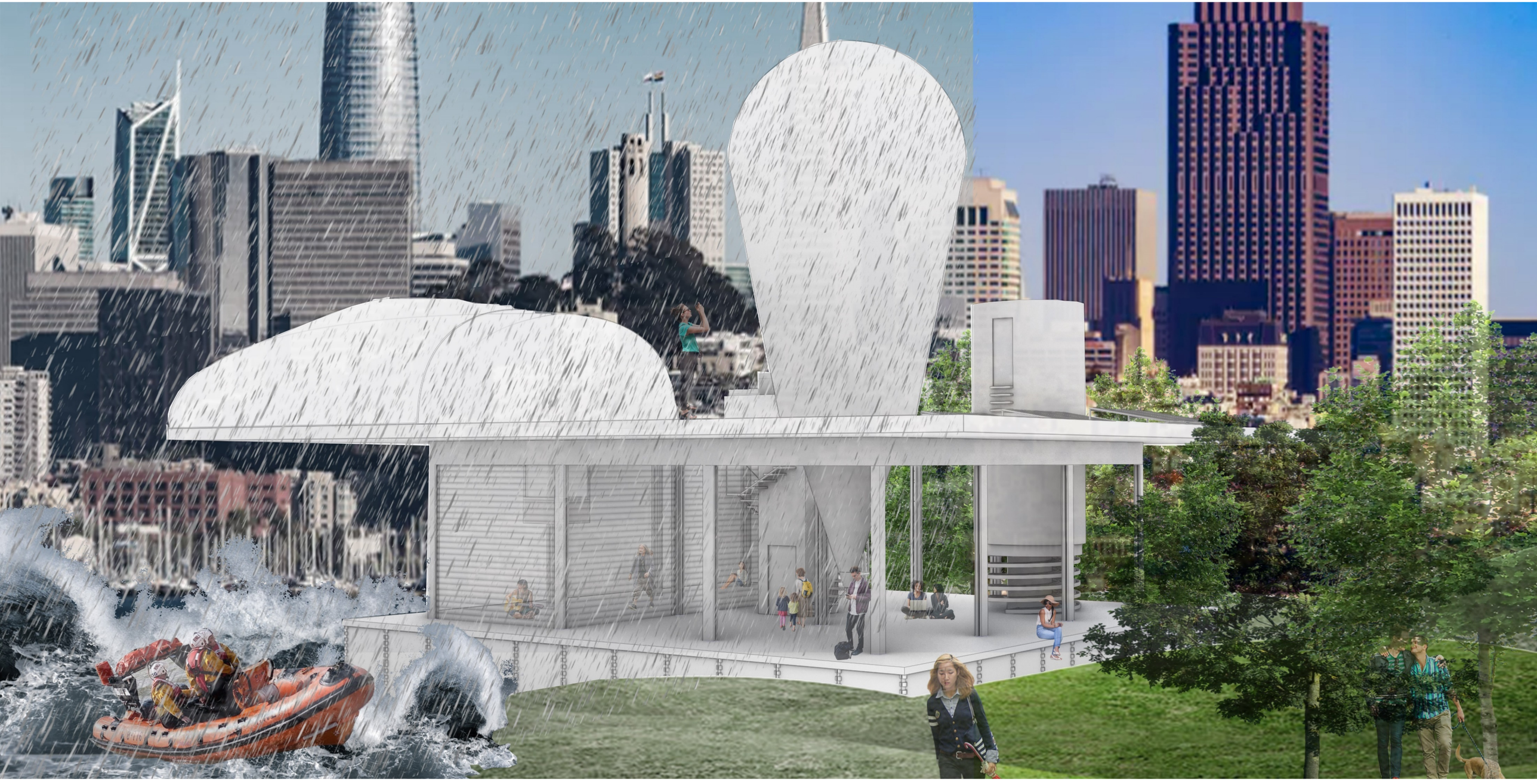
STANDARD FORM

Applying one water tank, one air tank, one can storage, one set of solar panels, one generator, and one toilet/circulation set. This is how the Fallback Plan works under extreme situations.



UNFOLDED SECTION

The section drawing shows the daily and urgent times.



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