

NUOFAN  
XU

Architectural  
Works

■ 2022 - 2023

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2022 Fall

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**NUOFAN XU**

nuofanxu@outlook.com  
(203) 444 - 0270



# SHELF

**Program** Residential + Social Infrastructure  
**Location** New York, NY  
**Instructor** Wonne Ickx  
**Team** Nuofan Xu, Xi Jin  
**Year** GSAPP Fall 2022

When John Warnecke designed 33 Thomas Street some 50 years ago, he envisioned a building for machines that could survive a nuclear attack. That design intent resulted in a skyscraper with no windows and small bays.

This studio design task is built on a hypothesis: that ATT would decide to turn this windowless skyscraper into a combination of 75% of affordable housing and 25% of social infrastructure. The first challenge everyone in this studio faces is how to fit the required large column-free social infrastructure spaces such as the swimming pool, sports facilities and auditorium into the small structural grids.



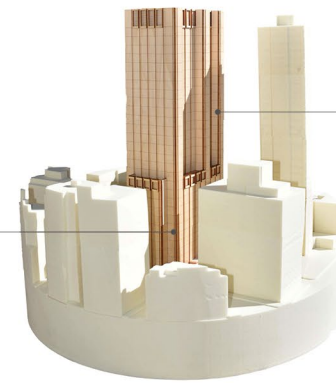




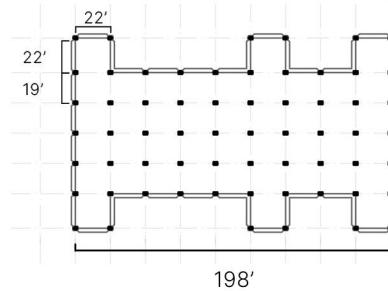
[ ORIGINAL ]  
Dense Structural Grid

VS

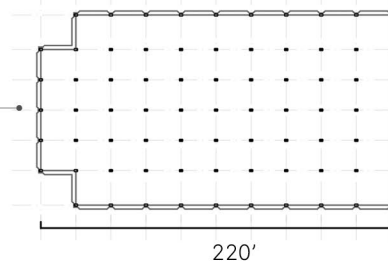
[ NEW ]  
Large Column-less Space



typical floor plan of upper levels



typical floor plan of lower levels



**25% SOCIAL INFRASTRUCTURE**

**SWIMMING BLOCK:**

Swimming pool (pool + deck): 1500 m<sup>2</sup>  
Locker rooms + showers: 500 m<sup>2</sup>

**SPORTS BLOCK:**

Dancing: 1000 m<sup>2</sup>  
Sports: 1000 m<sup>2</sup>

**HEALTH CARE:**

Waiting room+medical cubicles: 1000 m<sup>2</sup>

**CULTURAL BLOCK:**

Art studios: 1000 m<sup>2</sup>  
Exhibition: 1000 m<sup>2</sup>  
Library: 1000 m<sup>2</sup>  
Theater: 1000 m<sup>2</sup>

**COLLECTIVE:**

Cafe / living: 1000 m<sup>2</sup>  
Gallery: 1000 m<sup>2</sup>  
Offices: 500 m<sup>2</sup>  
Restaurant: 500 m<sup>2</sup>

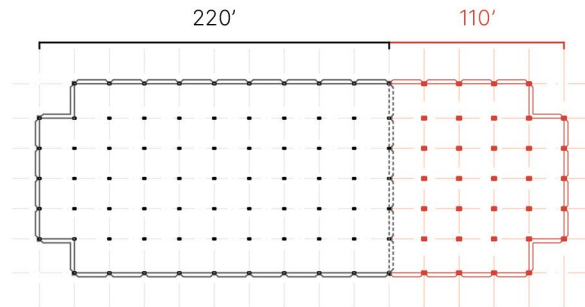


**75% AFFORDABLE HOUSING**

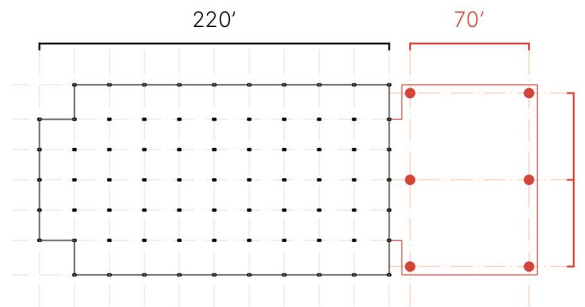




typical floor plan of lower levels  
with the unbuilt 2nd phase



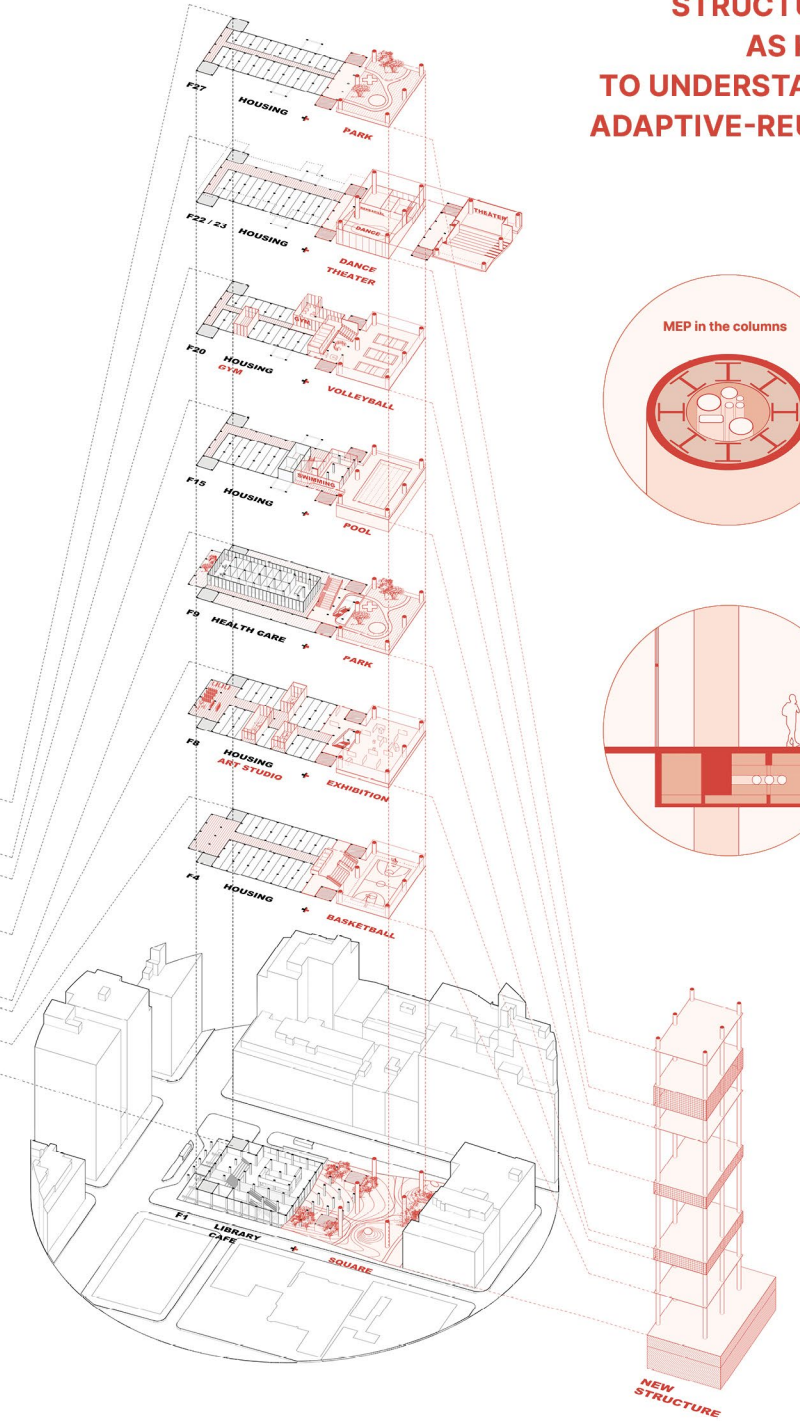
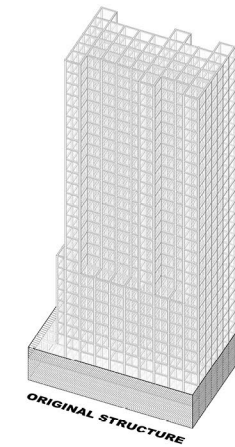
typical floor plan of lower levels  
with the proposed new structure



The original AT&T Long Lines Building had two construction phases, it was meant to be symmetrical. The image on the top left shows a model photo of the original design from the John Warneck Archive. However, the second phase of the building was never constructed.

The never-built second phase is on the southeast side of the building, on the drawing it's a 5-bay, 100-foot wide lot, currently a fenced garden, not open to public.

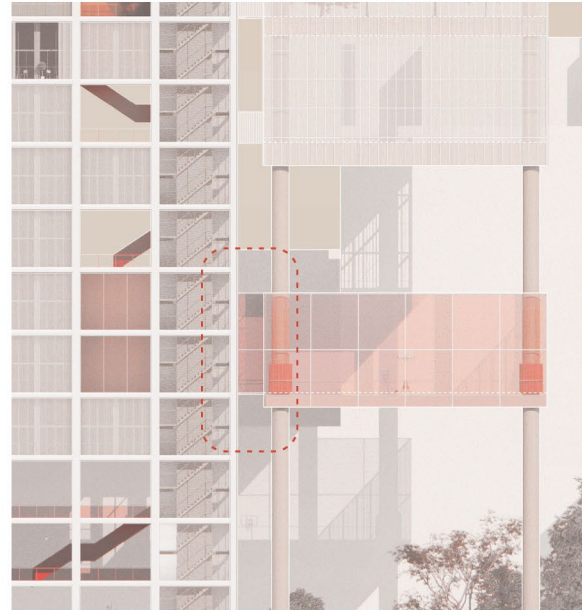
We believe this private garden has tremendous potential. Our massing strategy is essentially a freestanding shelf structure on this space reserved for the never-built second phase. The shelf would house various types of large spaces that could be essential to public life, while providing accessibility for the occupants of this building. The added new structure, from axis to axis, is a 70-foot wide, 112-foot deep platform supported by 6 huge columns. The added new structure, from axis to axis, is a 70-foot wide, 112-foot deep platform supported by 6 huge columns.



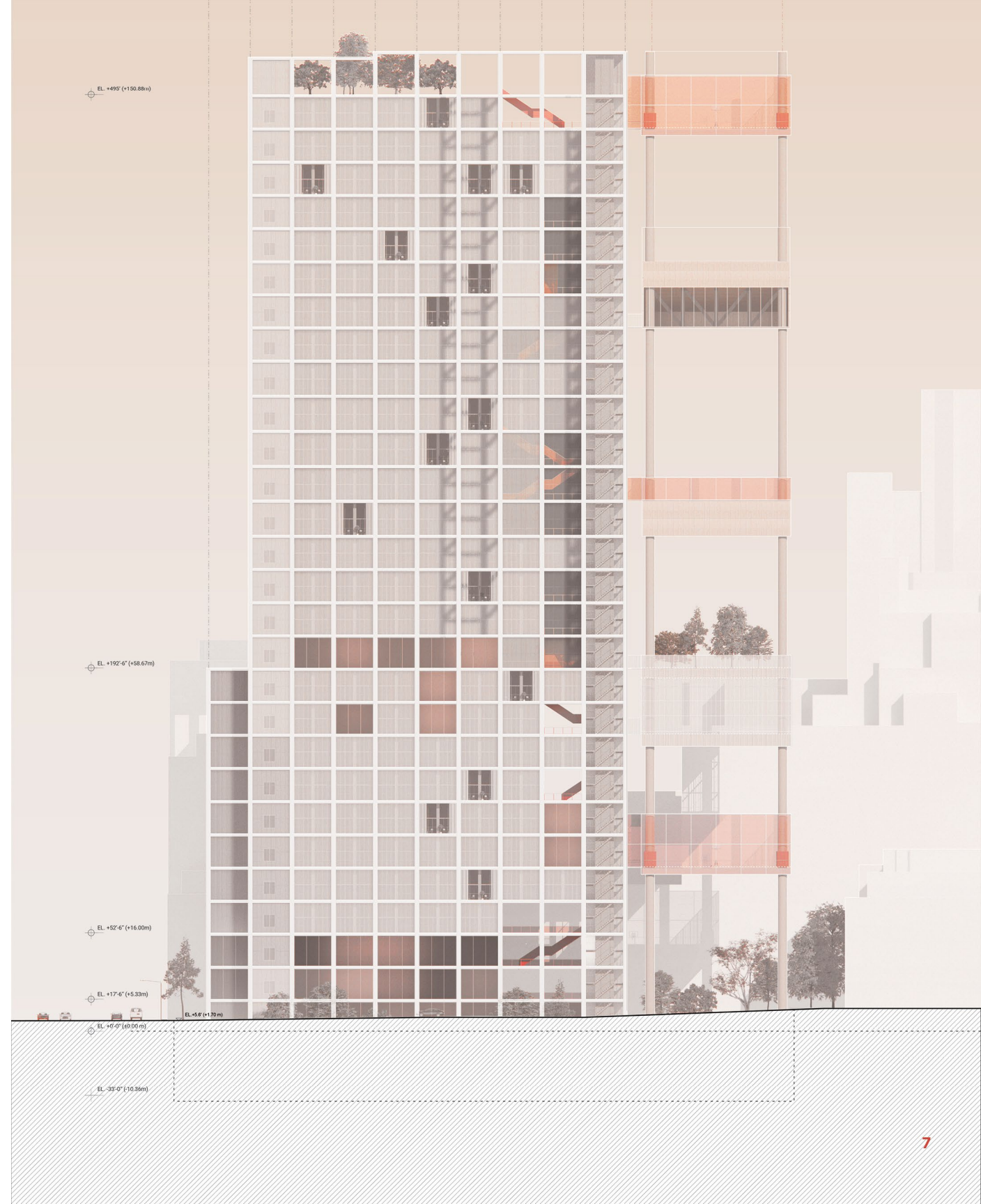
**STRUCTURE  
AS KEY  
TO UNDERSTAND  
ADAPTIVE-REUSE**

The size is the result of a study of the standard dimensions of various sports facilities, such as basketball courts.

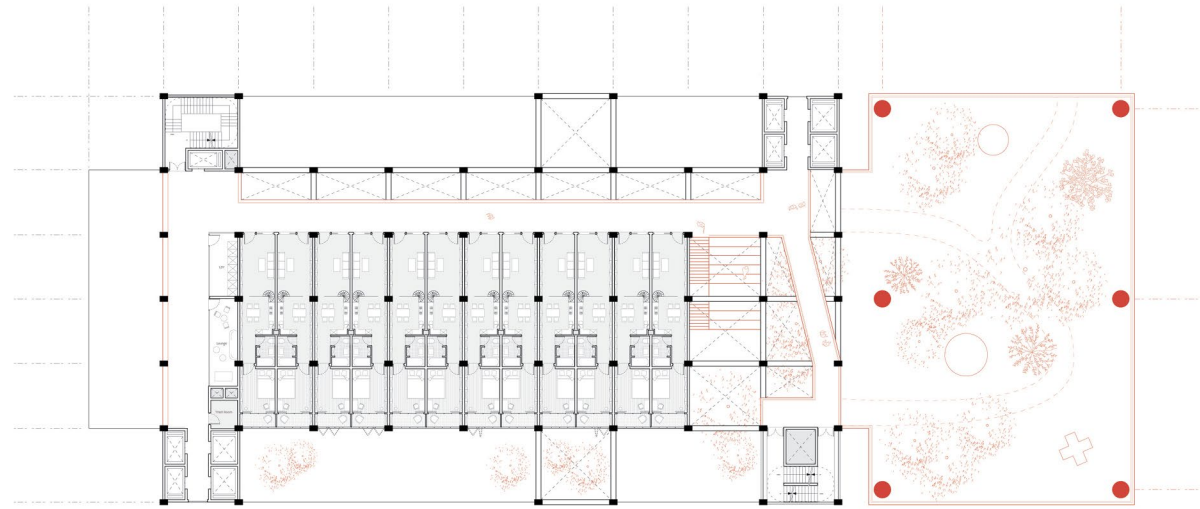




The interface between the original structure and the added shelf could also be used for informal gatherings as a transition from public to private living spaces. Here on the left is a view from the gap between the new structure and the old. The gap is 8 feet wide, and standing here you can see the strong contrast between the new, huggable mega-structure and the original dense forest of columns.

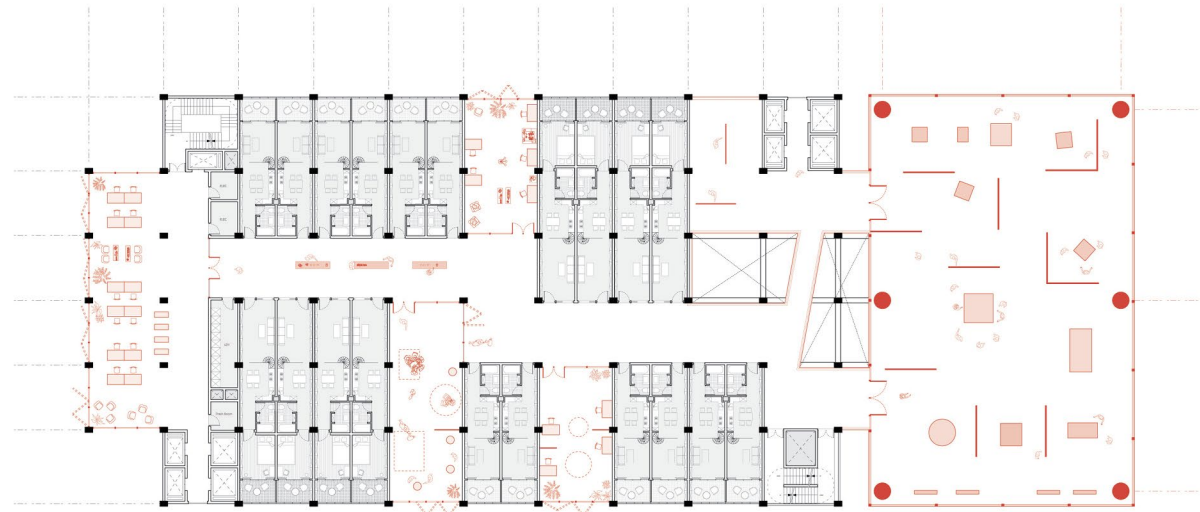






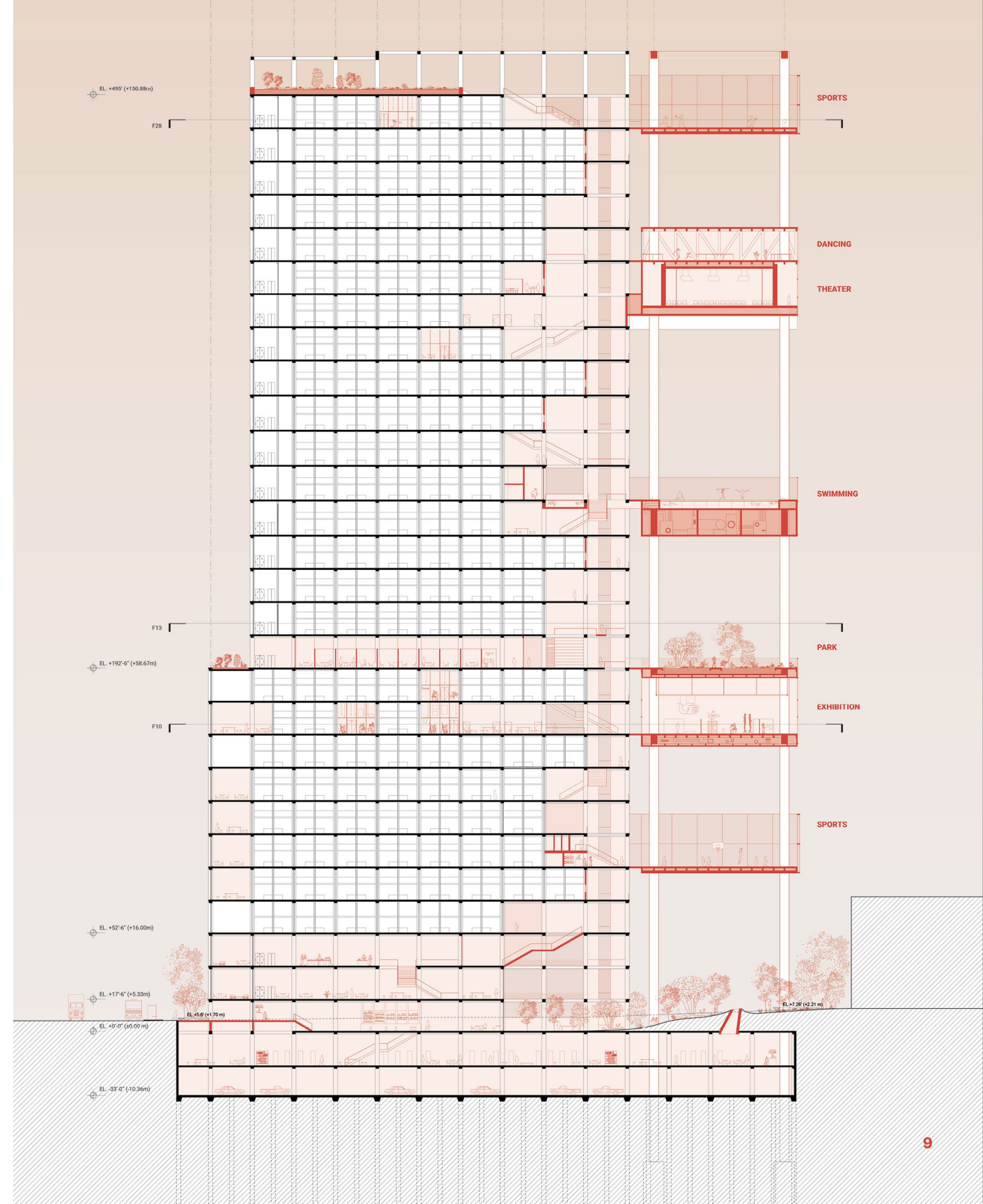
**F10 FLOOR PLAN**  
typical upper floor housing

0 ft 10 30 50



**F8 FLOOR PLAN**  
exhibition & artist studio / workshop

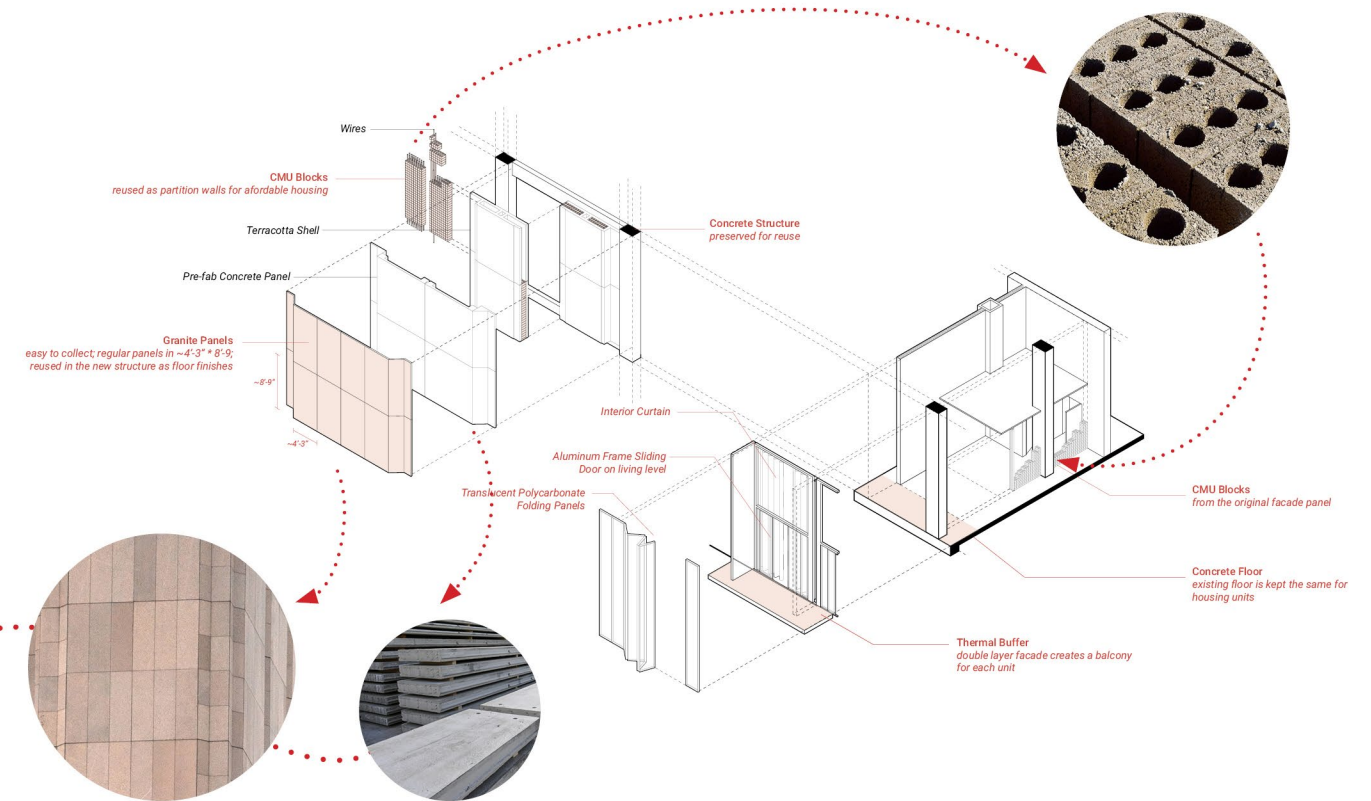
0 ft 10 30 50





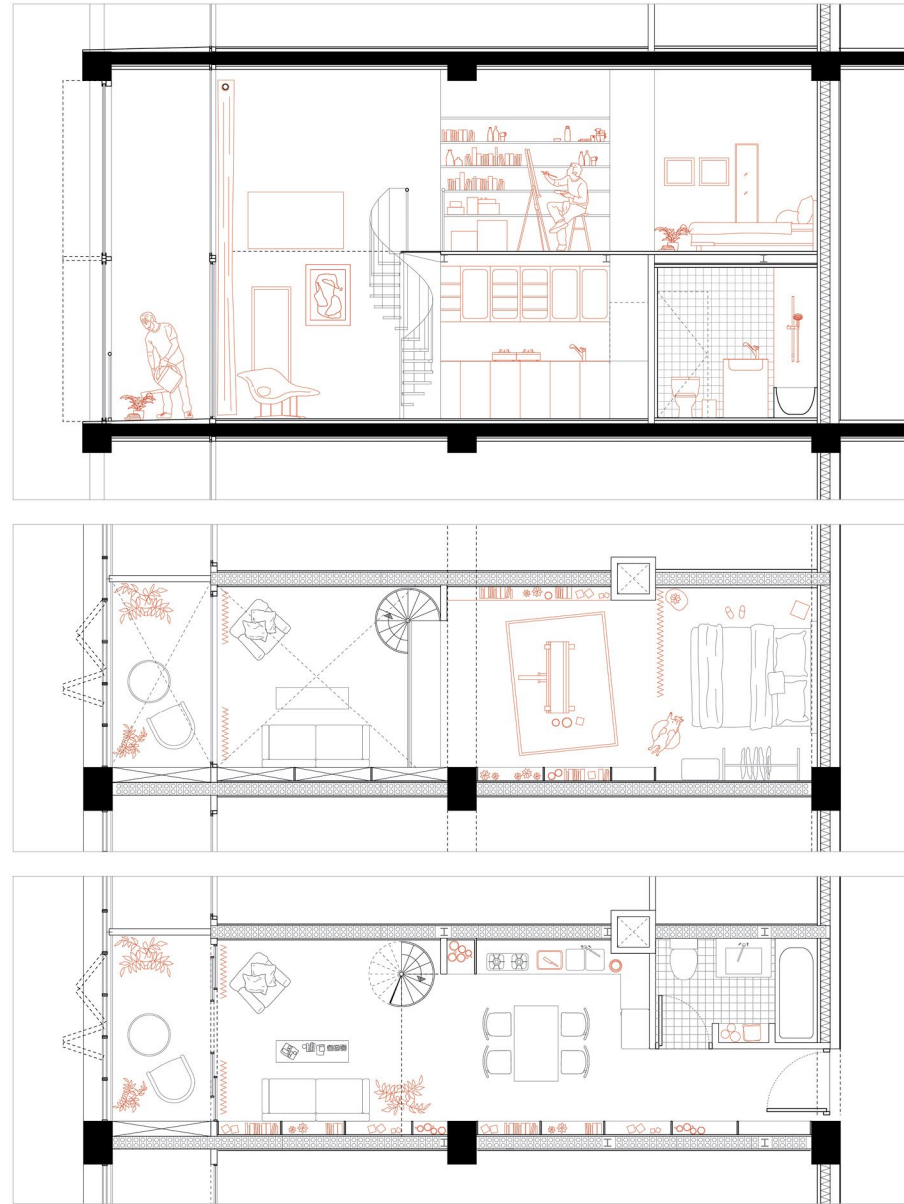


In terms of materiality, we want to reuse the precast concrete panels with granite finishes as the main tone for the platform areas. The thick concrete panels were designed to protect a building for machinery, so we want to keep it that way. Here we are using the panels for both floor finishes and false ceiling panels.



Another huge portion of the original facade is the CMU blocks behind the granite panels. In this case, the CMU blocks are collected and reused as the partition walls for the affordable housing sector.







# WASTESCAPE

**Program** Social Infrastructure  
**Location** New York, NY  
**Instructor** David Moon  
**Team** Nuofan Xu, Que Zhang  
**Year** GSAPP Summer 2022

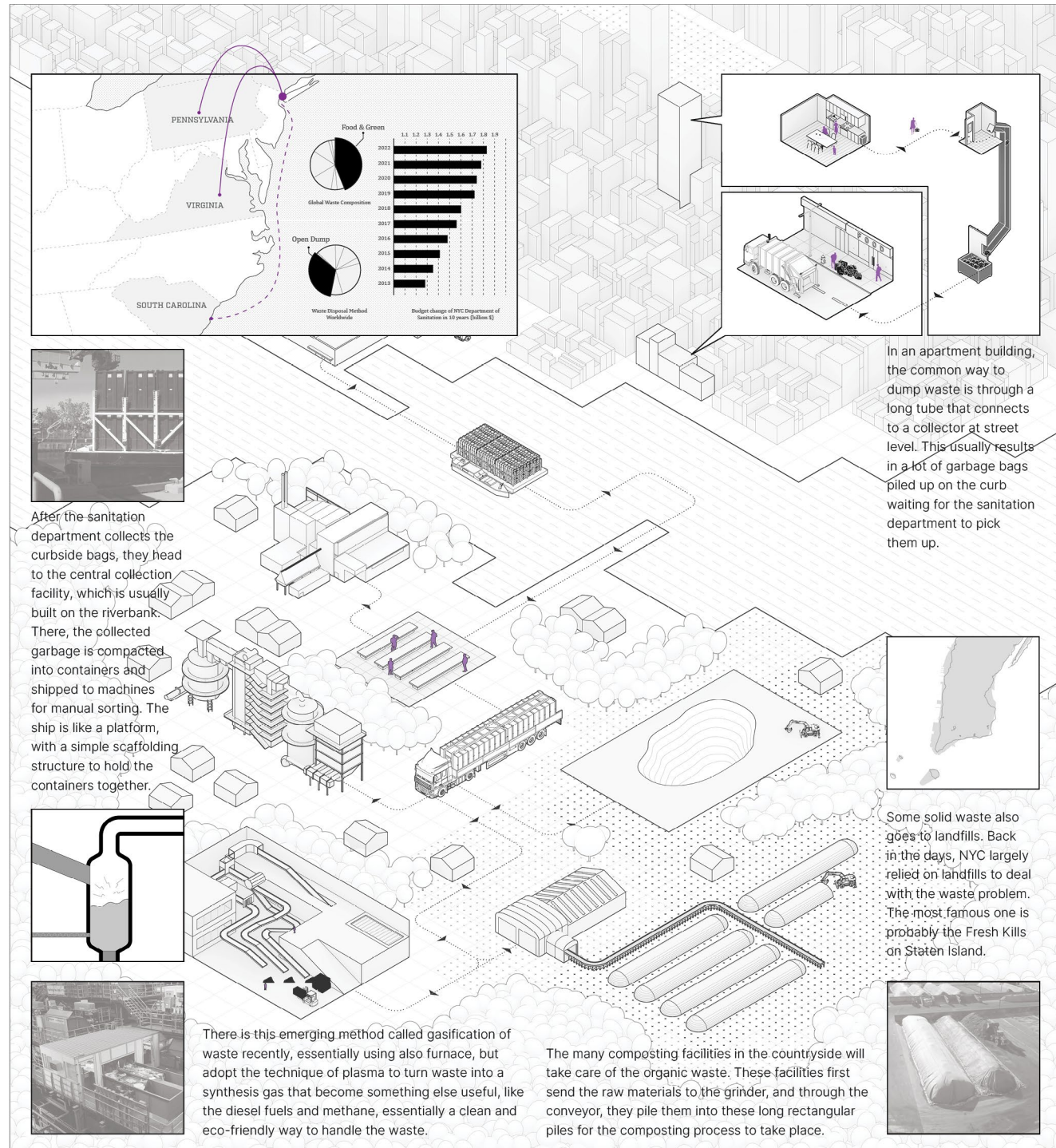
Waste has been and will continue to be a global crisis. Waste treatment facilities can cause serious environmental damage. However, large cities such as New York continue to outsource their waste to surrounding rural areas. For example, despite a few sorting and transfer centers, New York City has no waste treatment facilities.

Waste-scape, is a series of speculative urban interventions designed to raise public awareness of the waste crisis and provide insights into how our built environment can better engage with waste treatment facilities. The project seeks to approach the waste treatment facility as an opportunity and a resource, rather than simply a burden on our city.



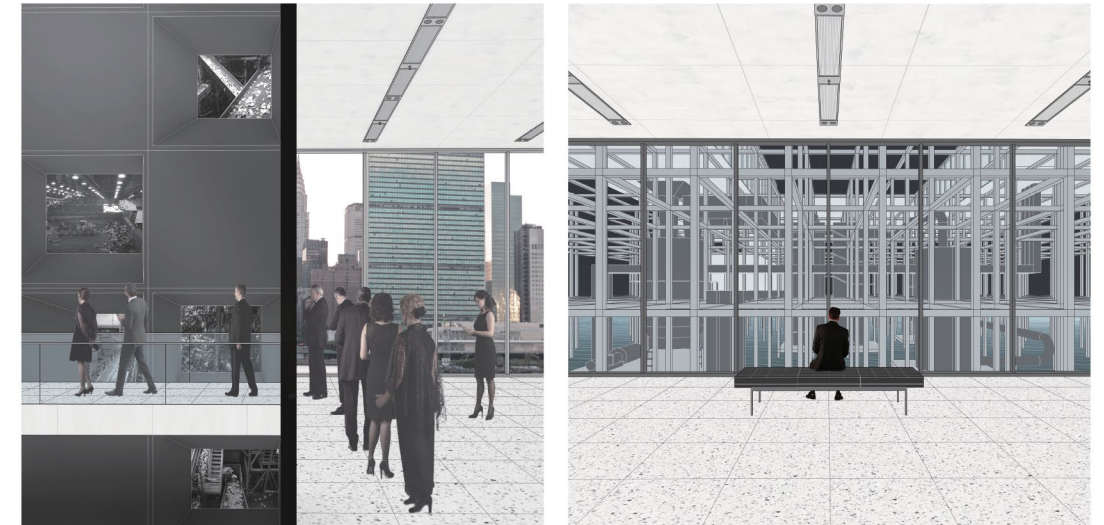
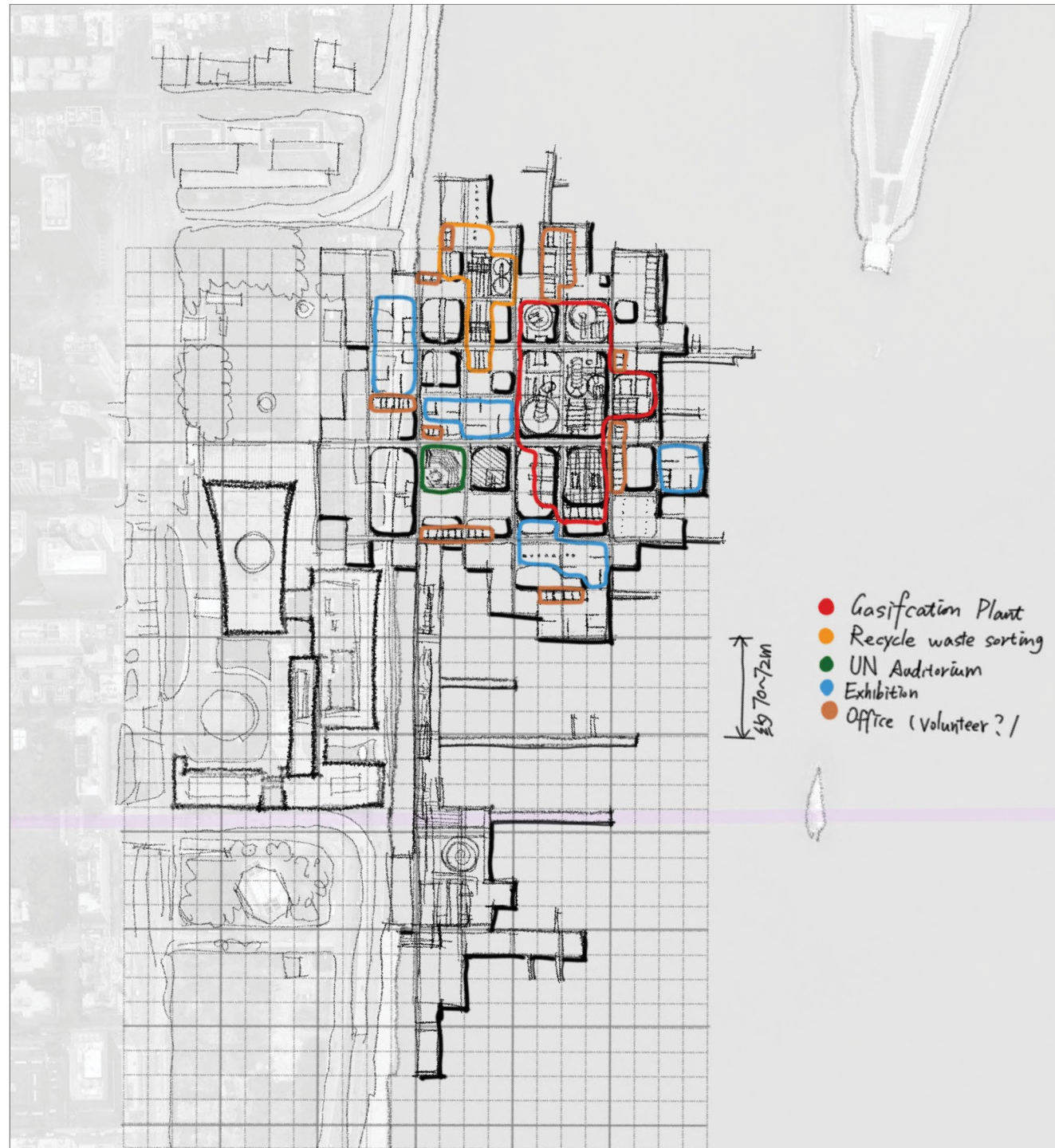


# THE LONG VOYAGE of NYC's UNWANTED WASTE



Metropolitan areas, such as New York City, often do not handle the waste they produce. They have and continue to outsource their own burdens to surrounding rural areas.





What if we approached waste facilities not as burdens on our built environment, but as opportunities and potential resources?





The site choice is an attempt to imagine the marriage between the once outsourced waste facilities and the heart of a metropolitan city. The project involves a spectrum of different programs, including culture, leisure, educational a UN related facilities. Despite creating an interesting dialogue among

different user groups, the goal of the project is contributing to the acknowledgment of the waste crisis to the general public and how our urban environment can better engage with the inevitable facilities that we once outsourced to the rural areas.

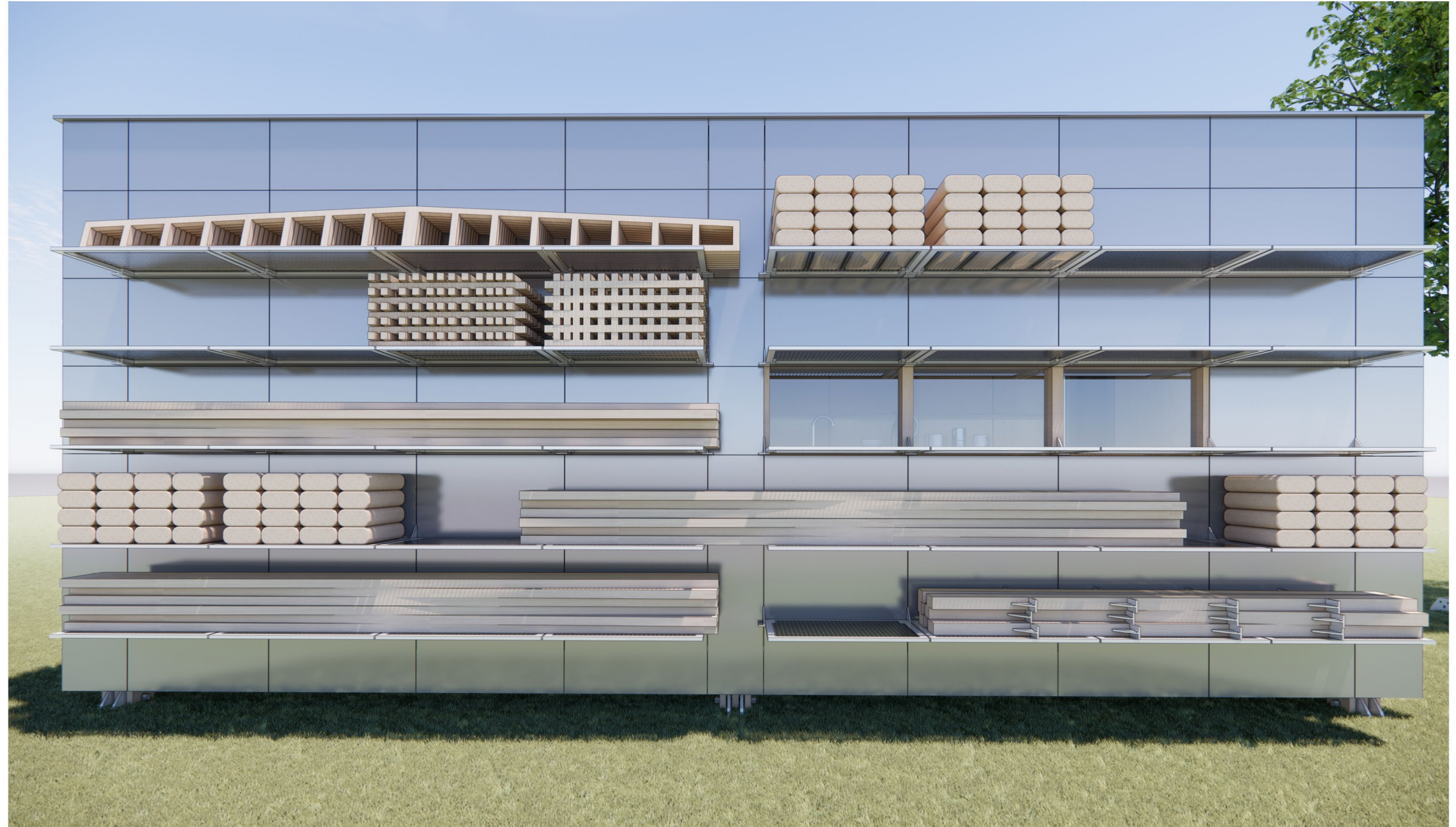


# INCREMENTAL TIME

**Program** Residential Community  
**Location** Hida, Gifu, Japan  
**Instructor** David Benjamin  
**Team** Nuofan Xu  
**Year** GSAPP Spring 2023

We are facing a world of impossible numbers: on the one hand, we need to cut carbon emissions in half by 2030, but on the other, the built environment is expected to double in size over the next 30 years. How do we reconcile the dilemma of building more but emitting less?

This project believes that we can make our construction industry more environmentally friendly by promoting the reuse of building materials through the use of more standardized building components. More standardized and uniform building components will empower the general public to customize their environment by themselves, encourage the exchange of parts, and ultimately lead to a building culture from the bottom up.





## OBJECT

# A reform of how we understand, design and construct buildings might be the answer.

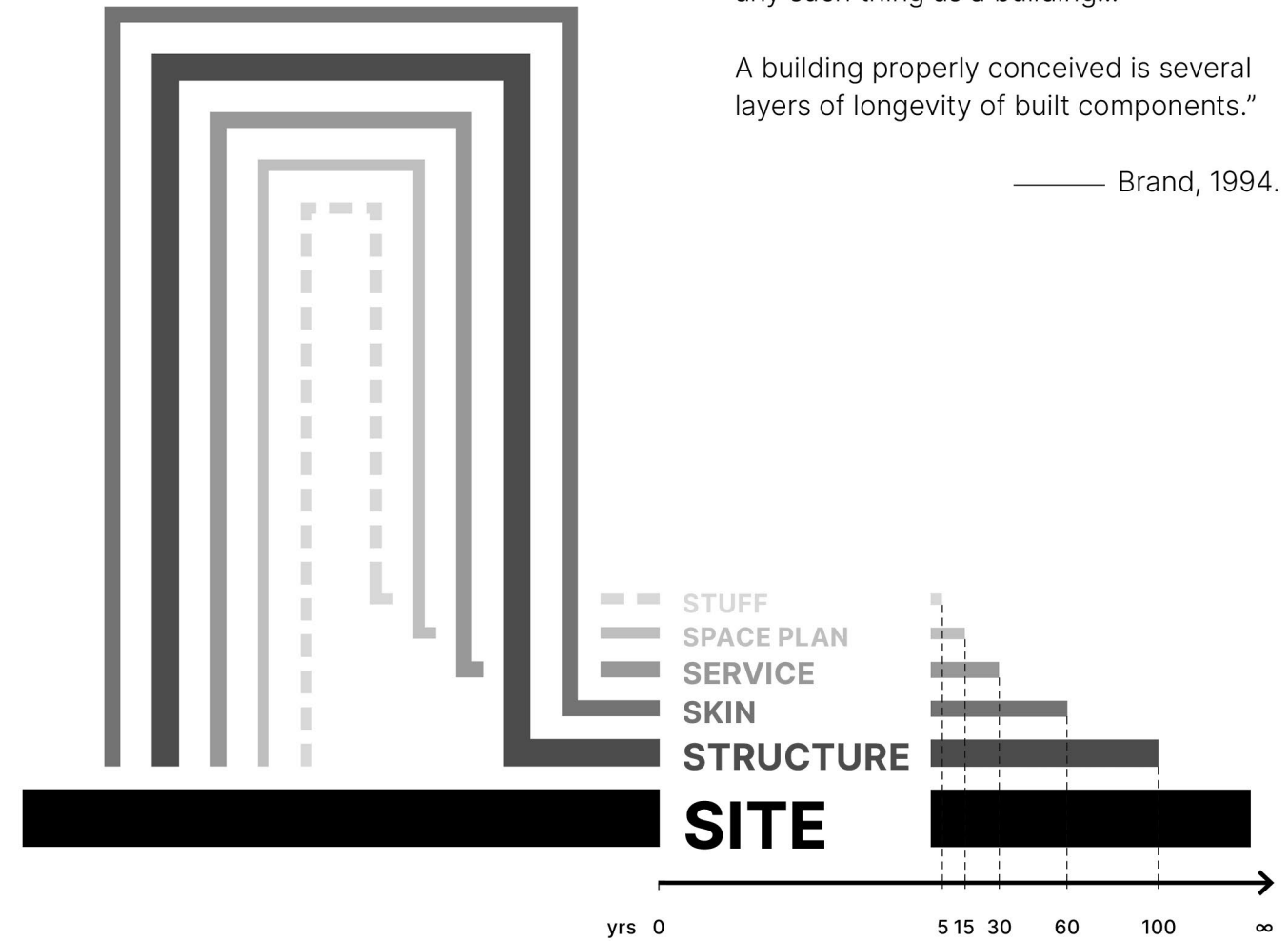
Usually, we see one building as an object. Steward Brand, however, raised this understanding of a building: that besides being a configuration of spatial relationships, a building can be seen as a bank of materials and assembled components.

## SHEARING LAYERS OF CHANGE

“ Our basic argument is that there isn’t any such thing as a building...”

A building properly conceived is several layers of longevity of built components.”

—— Brand, 1994.



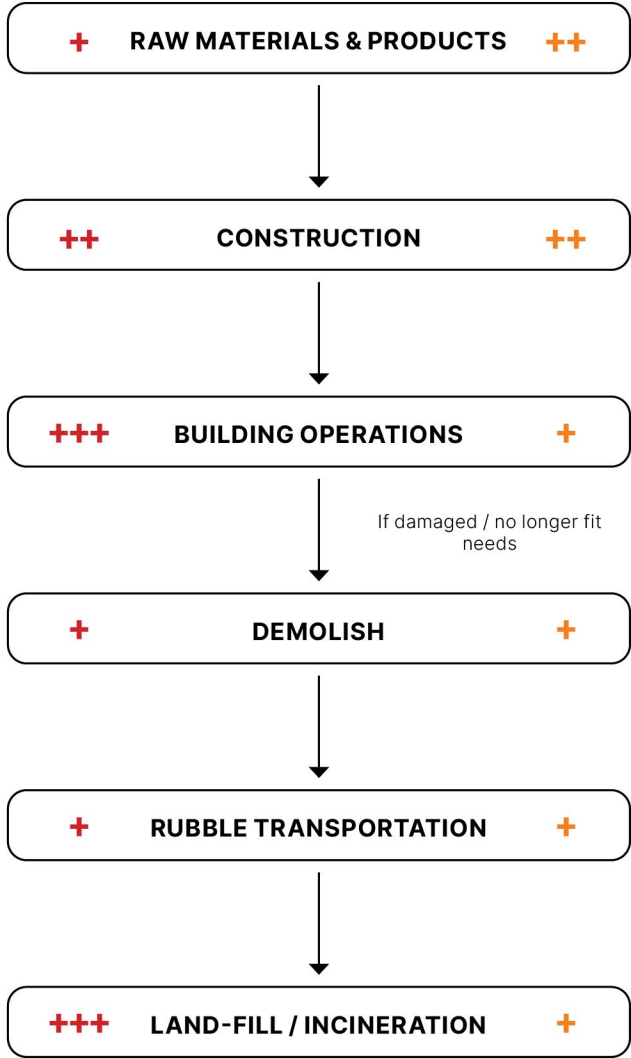


# DEMOLISH ?



Fundamentally, buildings decay, and building components decay at different rates. Eventually, if a certain layer of a building breaks down and if that layer is deeply embedded in the other layer, then there is a need for adaptations. The worst treatment of a decayed building is, of course, "demolish": it is both environmentally and financially costly yet demolishing is not uncommon nowadays

If we are developers who want to build ...  
demolish is both **environmentally** & **financially** costly

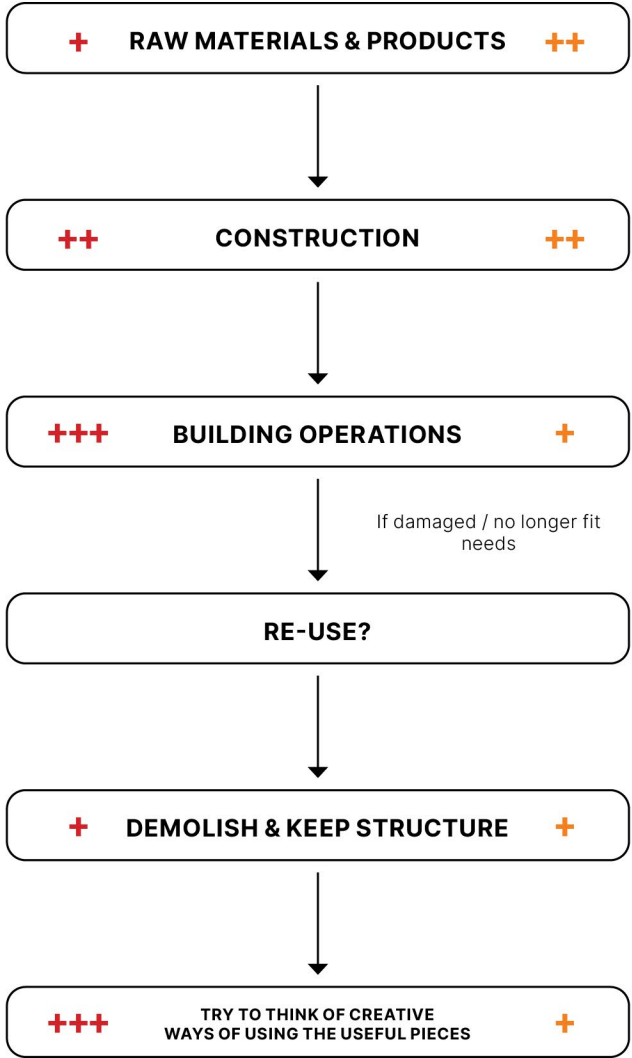


# RE-USE ?



A slightly better but not sufficient practice is adaptive-reuse projects. Most reuse practices are in fact, not so different from new construction. Demolishing everything but the structure, or, preserving part of the original structure and adding a new piece, are probably the most common practices. I believe, Ultimately, the reason for this insufficient reuse is because of the lack of standardization in the components. The logic of the reuse of a space does not usually extend to all the layers, and thus these layers end up becoming rubble.

re-use is a better practice but not sufficient enough

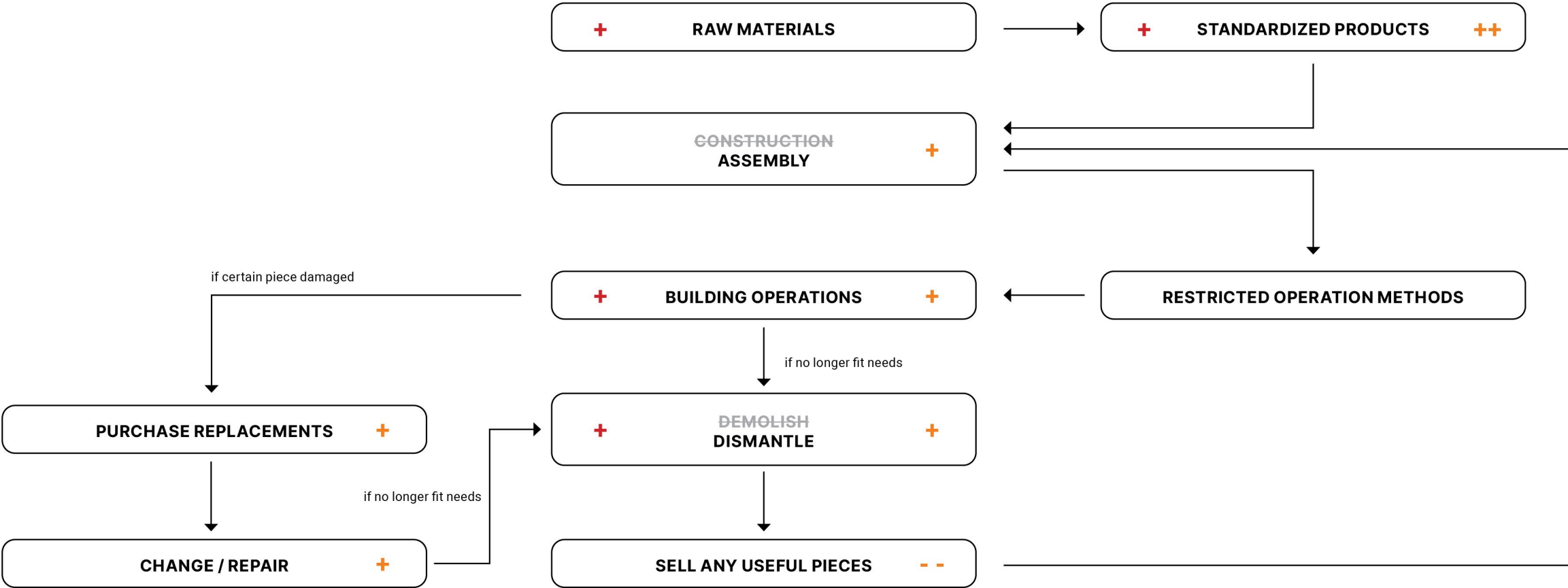




# ~~DEMOLISH? RE-USE?~~ DISAMBLE & REPAIR

Thus, consider if we can fully embrace standardization: that all architectural components are standardized and capable of swapping, that all components can be reused for different purposes as long as the conditions are good enough, what our construction industry would look like?

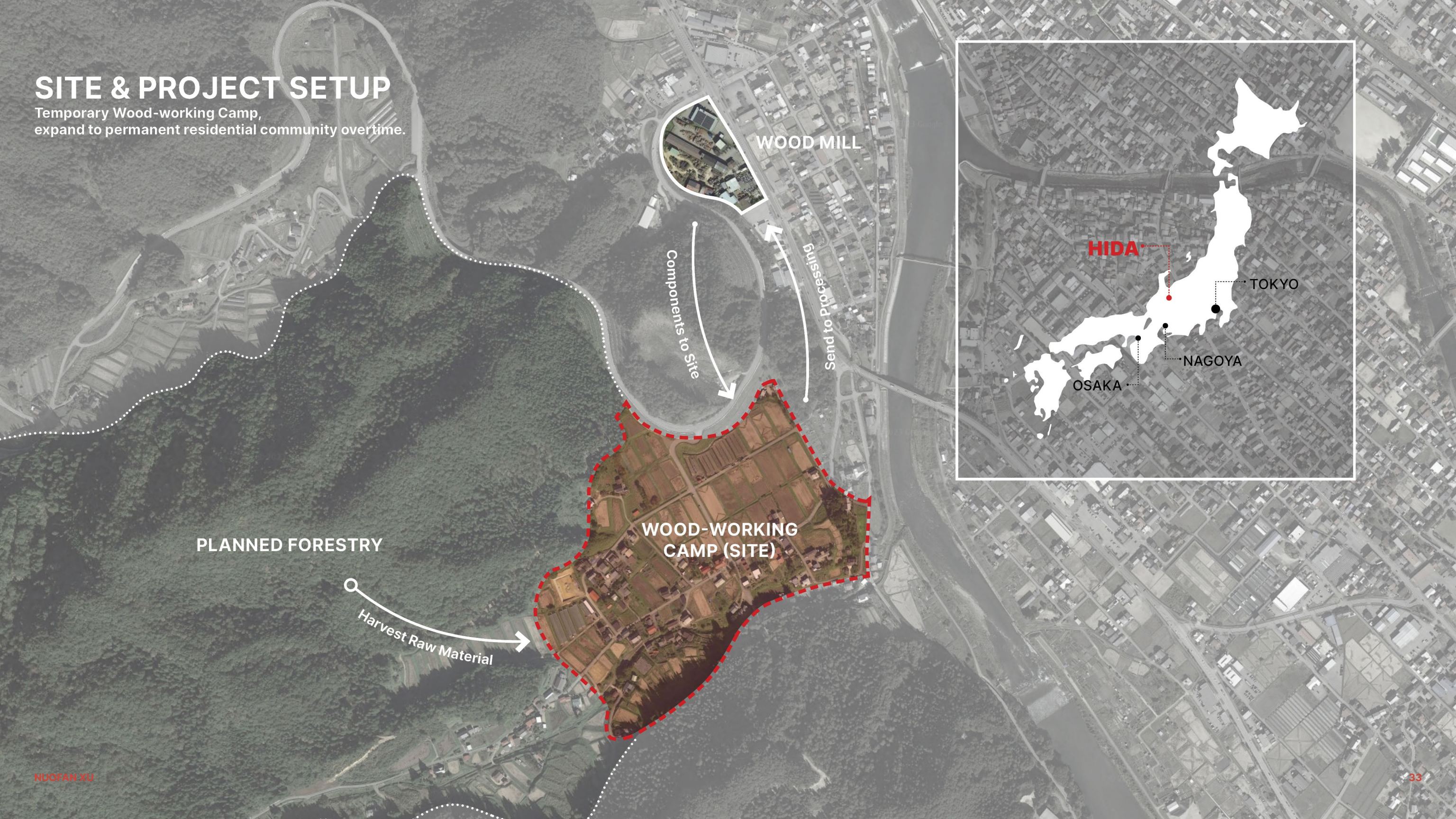
If that's the case, perhaps the vision for our future construction industry is that buildings are no longer constructed, but assembled. They are not demolished or reused when they are damaged or no longer fit for purpose; instead, they are repaired, dismantled and reassembled; demolishing a building is probably not financially costly but potentially profitable because all parts can be sold and reused.





# SITE & PROJECT SETUP

Temporary Wood-working Camp, expand to permanent residential community overtime.



WOOD MILL

Components to Site

Send to Production

WOOD-WORKING CAMP (SITE)

PLANNED FORESTRY

Harvest Raw Material



HIDA

TOKYO

NAGOYA

OSAKA



# UNIT DESIGN

## Wood-working cabin prototype

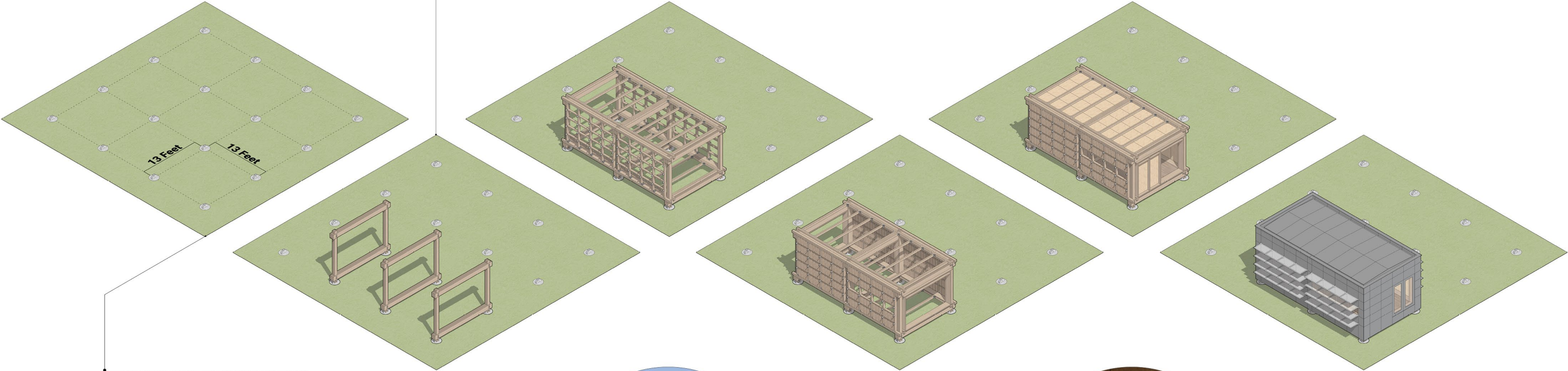
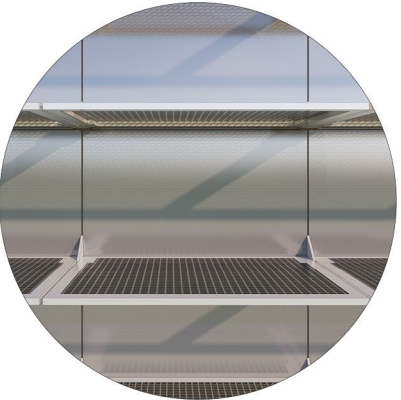
2. Components are bolted together, no spray or glue is used, so all parts are potentially reusable.



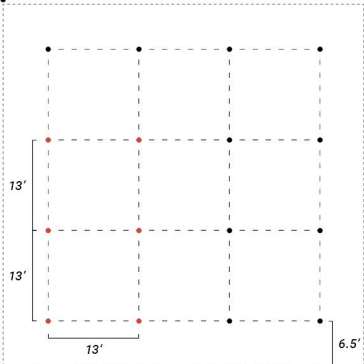
4. Insulation in the prototype is made from bags of wood chips from wood processing. No chemical coatings are involved for better reuse.



6. The substructures of the wall panels include a grid of connectors for shelves on the facade. The shelves are intended for the storage of materials: there is no need to build warehouses for the exchange of components.



1. Each unit occupies two structural bays of 13 feet by 13 feet. With the intent to expand the buildings, the site would have the foundation columns for planned future expansion following the grid.



3. The structure system is wood frames, a variant of vertical baloon framing to be specific. Each floor would rest on the beams instead of the walls below compared to typical wood frames.



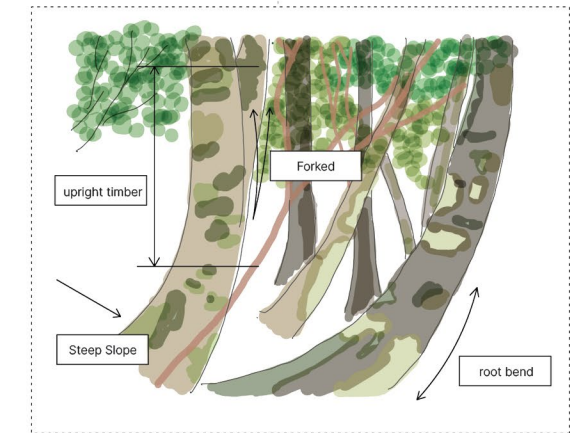
5. Similarly to the insulation layer, the interior finishes and partitions are wooden OSB panels, also from the wood processing progress.





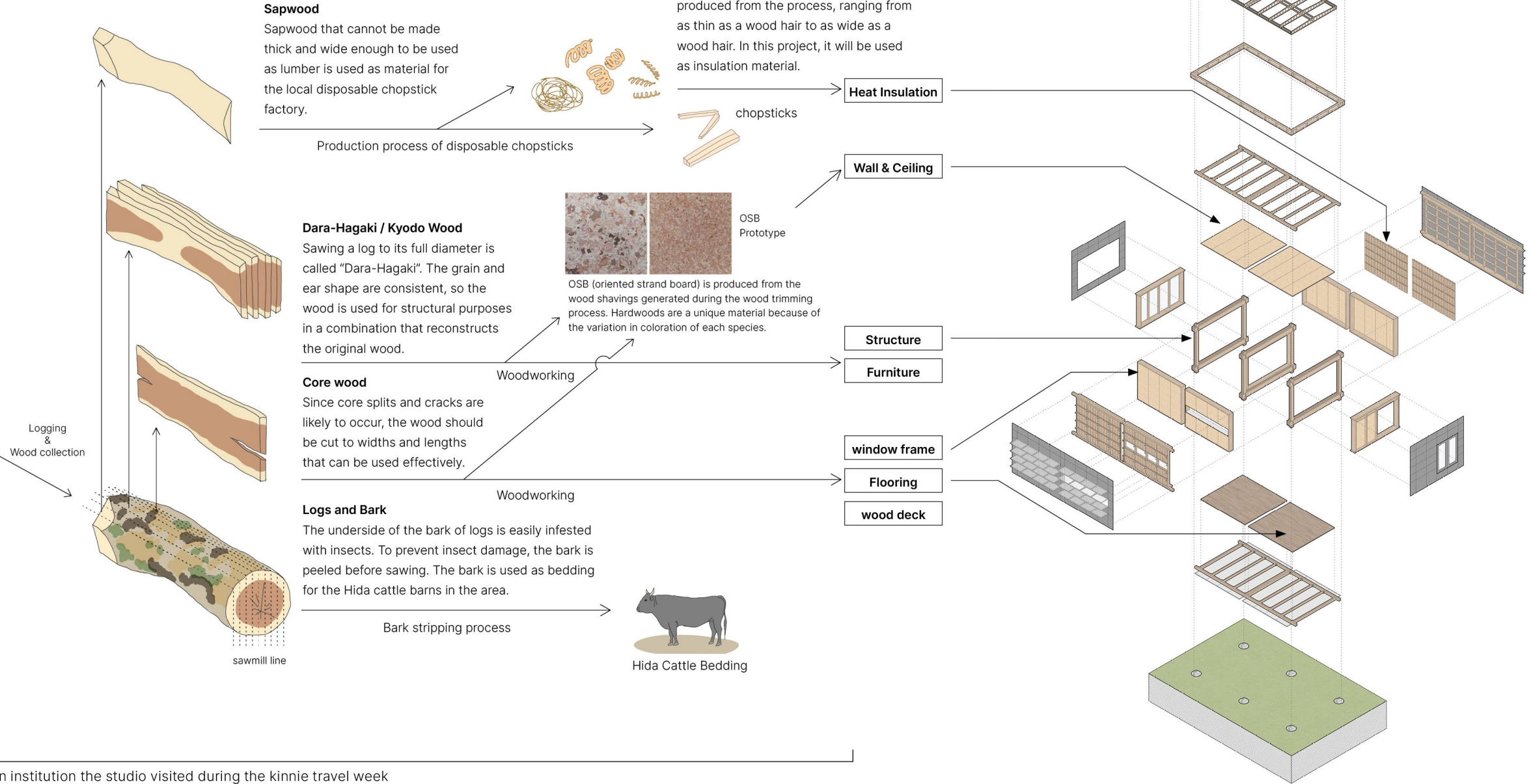
# UNIT DESIGN

## Material Diagram



### Hardwood Forests

Broadleaf forests are natural forests that sprout and renew from stumps after logging. In the Hida region, steep slopes and snow cover in the forests tend to cause root bending. Since the area that can be harvested as straight timber is limited, the first step was to establish the necessary structural width (200 mm) and select species so that the bent trees can be used as they are.



\* This Portion of Material Diagram is from **HIDAKUMA**, an institution the studio visited during the kinnie travel week



# THE INCREMENTAL TIME

A possible scenario in plan: the start condition.



Occupant



Pillar



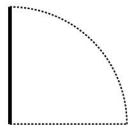
Panelling



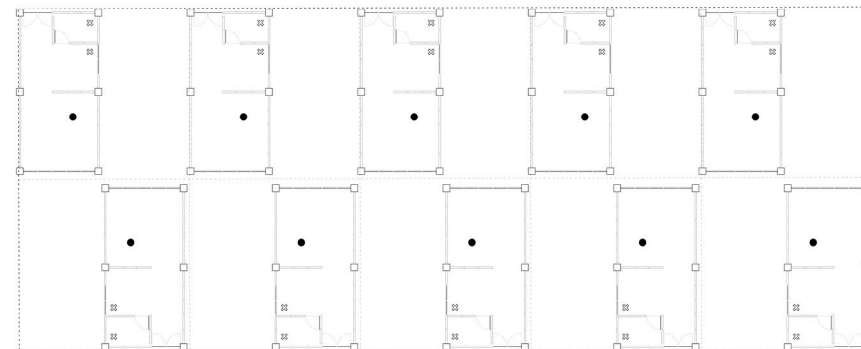
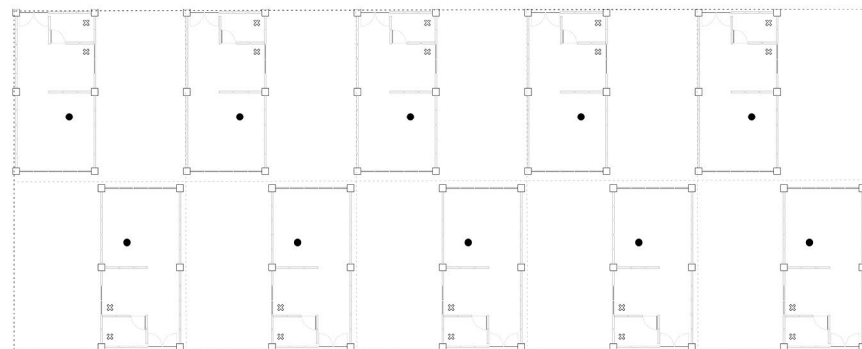
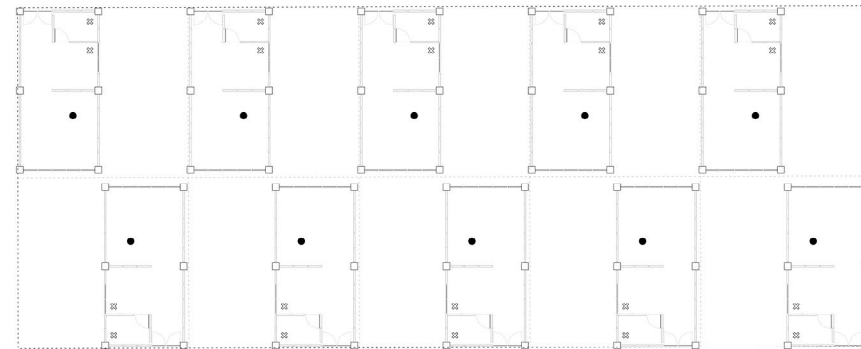
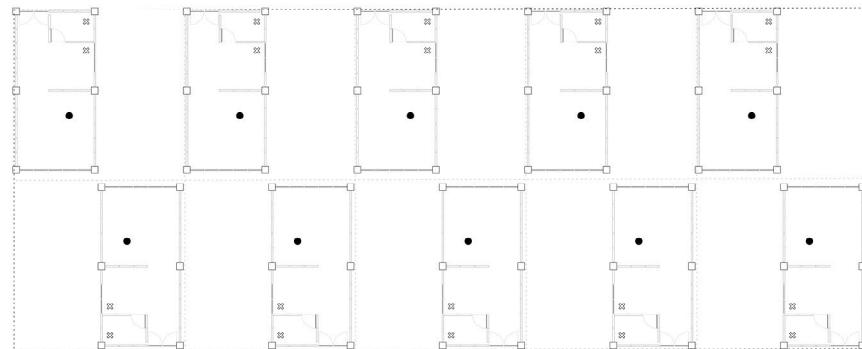
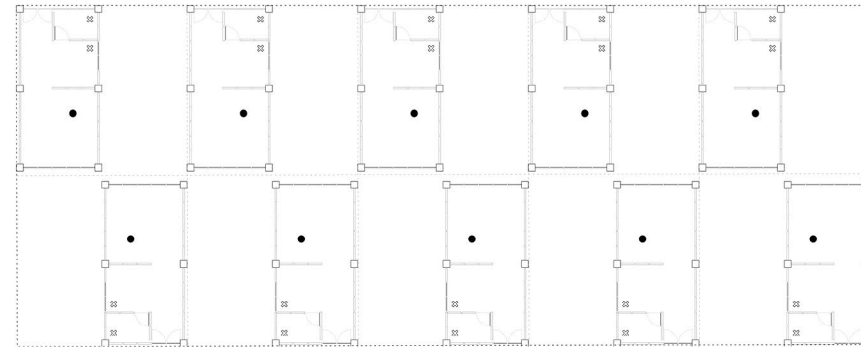
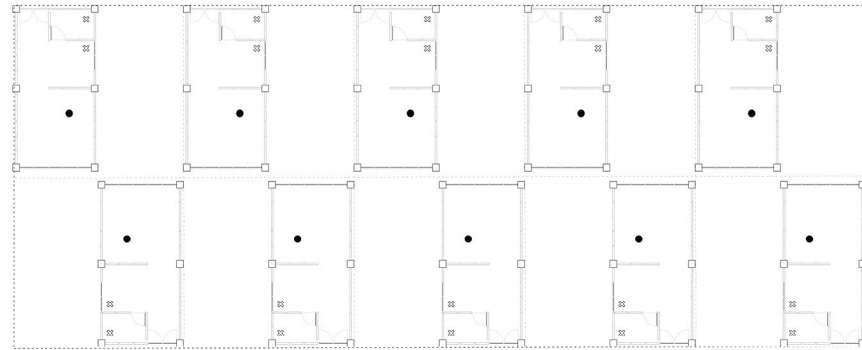
Panelling  
(translucent)



Pipe



Access





# THE INCREMENTAL TIME

A possible scenario in plan: the intermediate state.



Occupant



Pillar



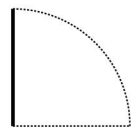
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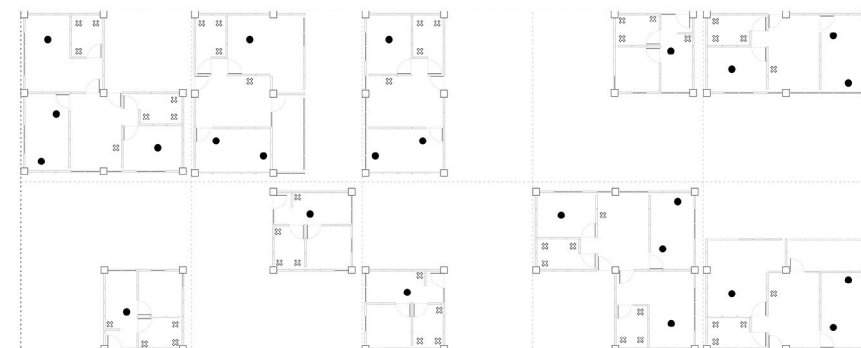
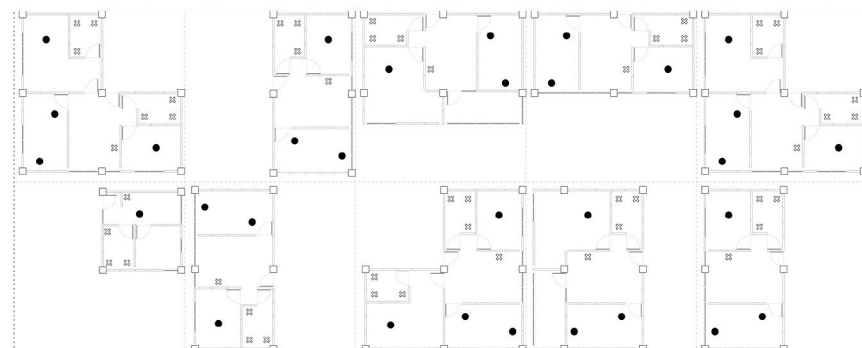
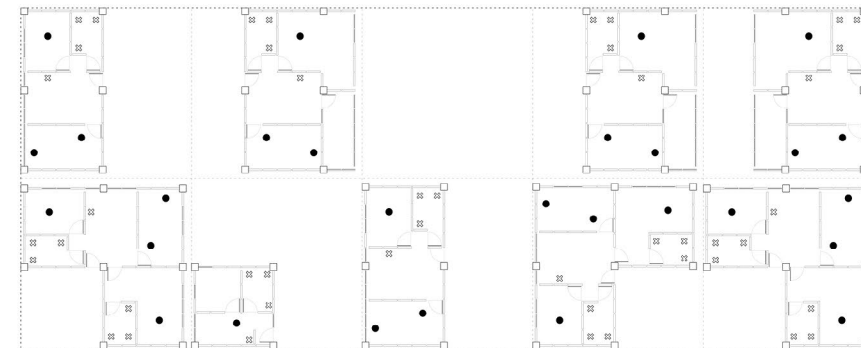
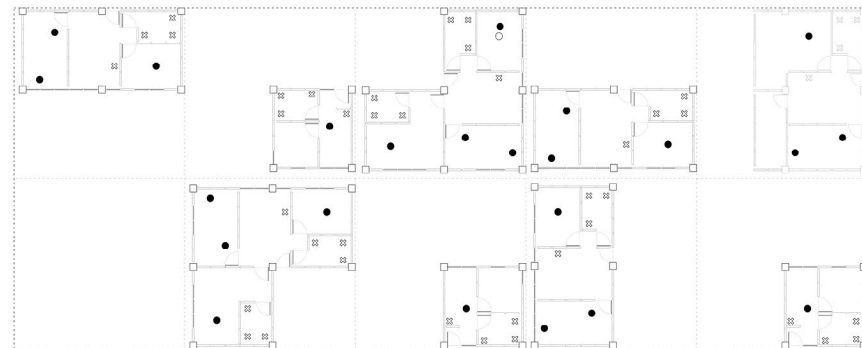
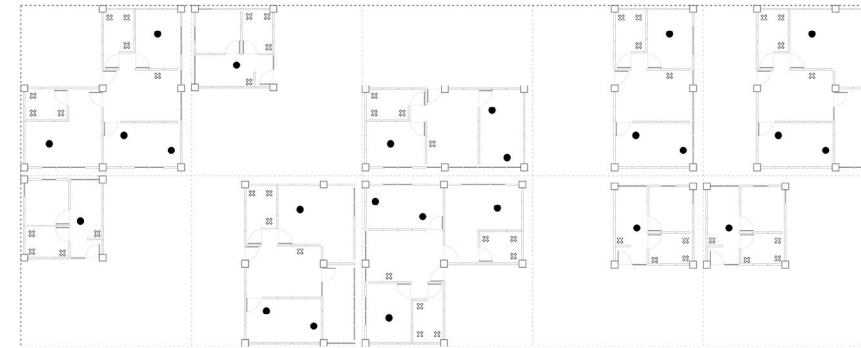
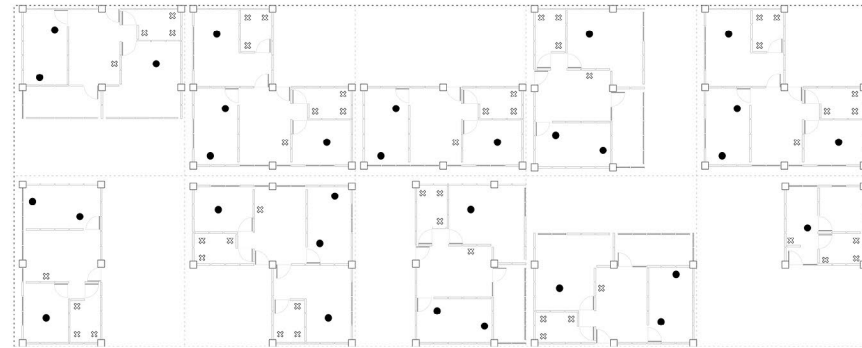
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Pipe



Access





# THE INCREMENTAL TIME

A possible scenario in plan: one potential end state.



Occupant



Pillar



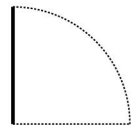
Panelling



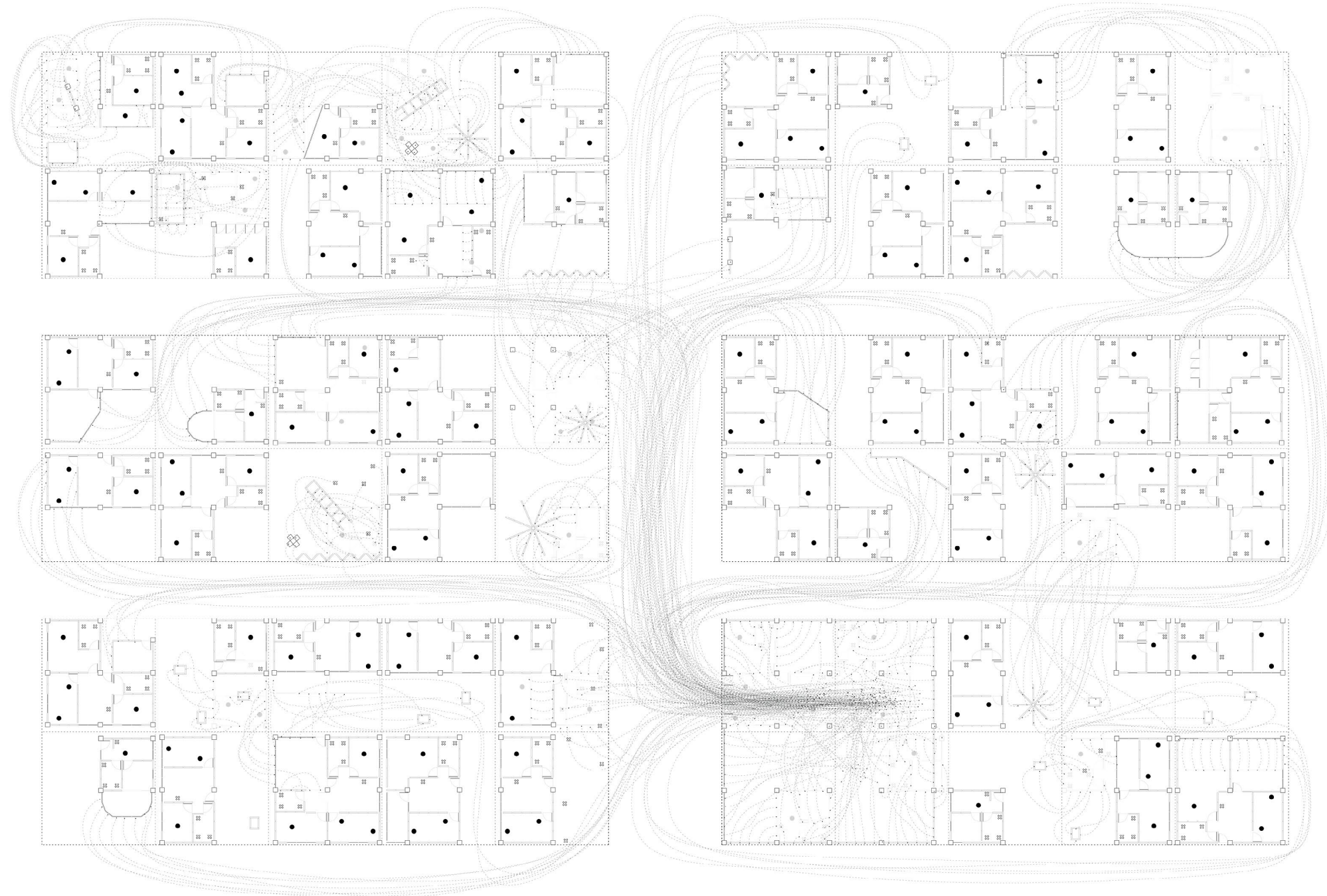
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(translucent)



Pipe



Access



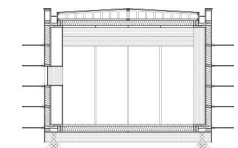
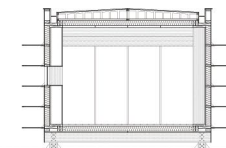
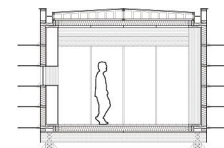
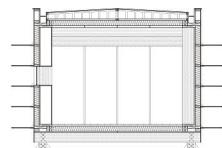
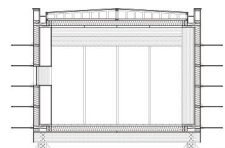
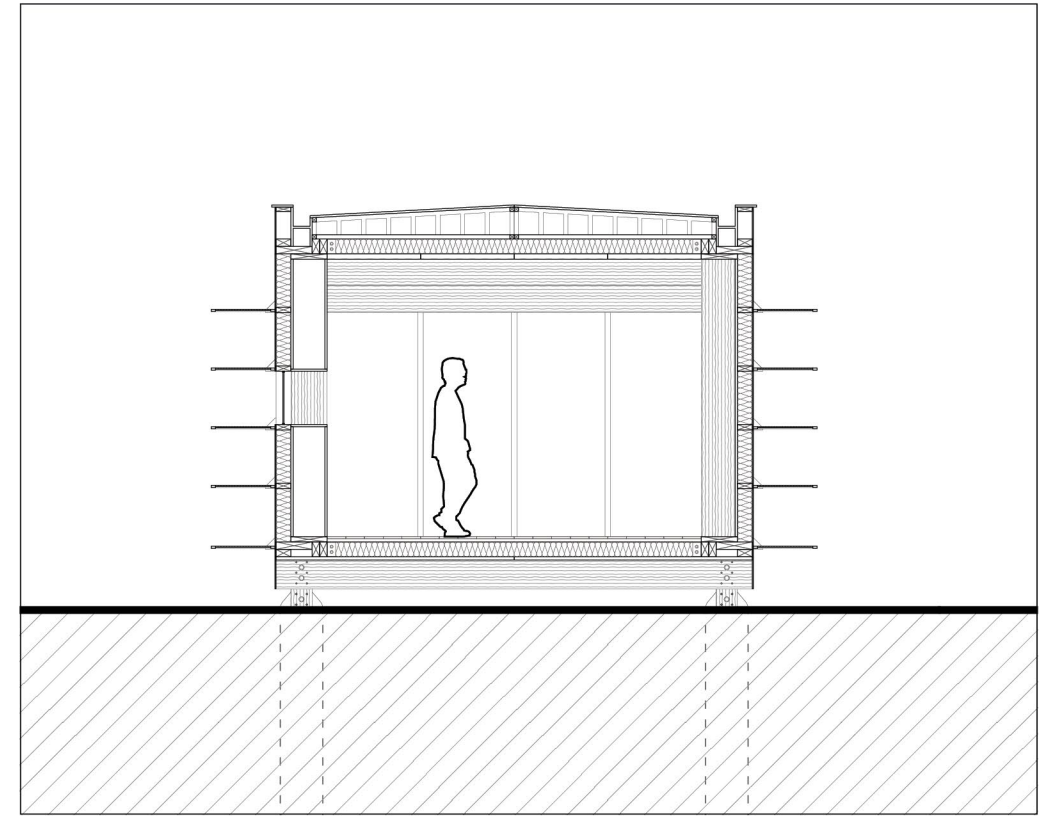


# THE INCREMENTAL TIME

A possible scenario in section: The start condition.

Essentially, Both the plan and the section drawings are meant to picture **a possible scenario of exchange of components in a local circular economy**, and what the components might assemble if the autonomy of building is granted to the end-users.

In that case, the design priority might change as well: a large portion of feasibility studies in pre-design may be the evaluation of second hand pieces available currently in the market; a significant piece of SD and DD may become assembly strategy, what pieces to use and creative ways of utilizing the standardized pieces in ways other than their intended uses.

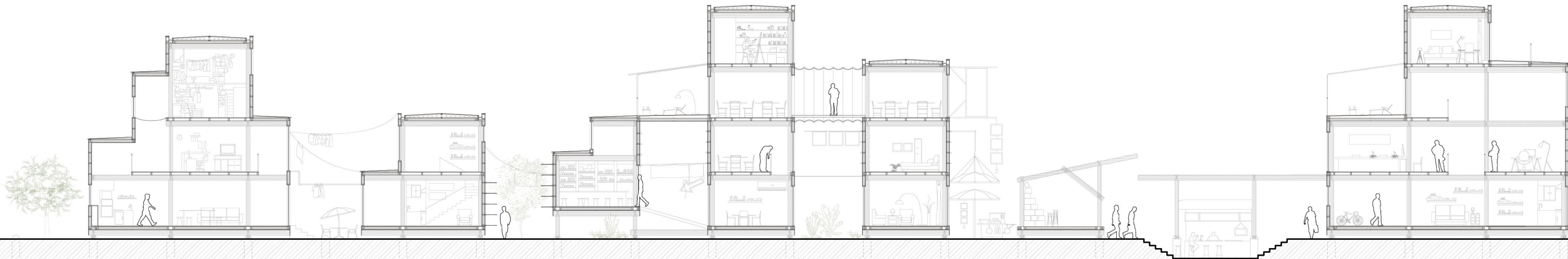
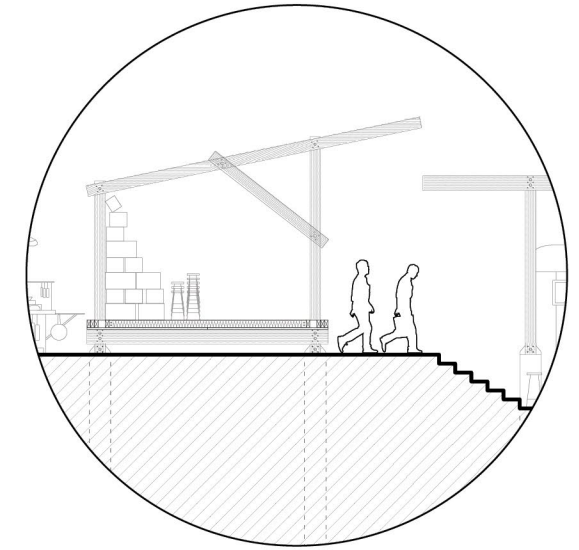
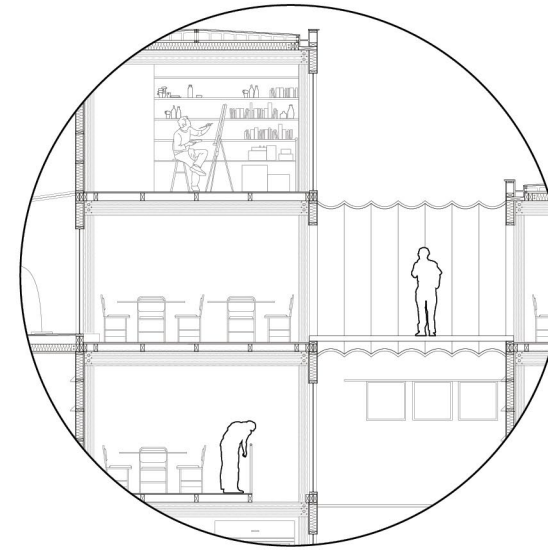
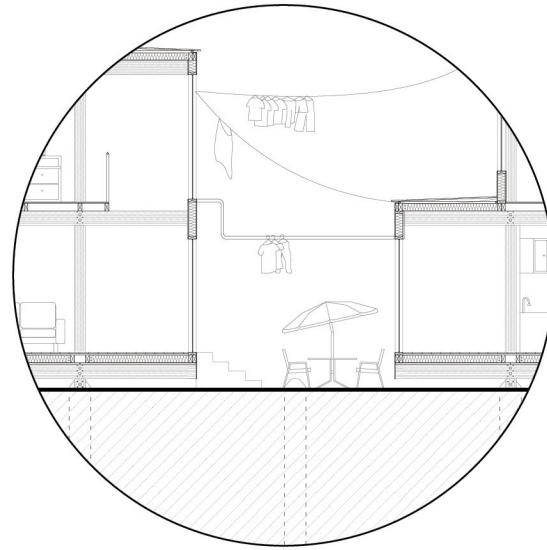




# THE INCREMENTAL TIME

A possible scenario in plan: one potential end state.

Ultimately, the project is not about designing a universal model for modular construction, but about speculating on how such a construction system might change our long-established notions of building, a notion of building that no longer fits the world we live in today, given the challenging environmental conditions. I hope the project will contribute to the discussion on prefabricated systems, standardization of architectural components and circular economy.





**NUOFAN XU**

nuofanxu@outlook.com

(203) 444 - 0270