

2024 SECOND PRIZE

Lijin Zhao

UNIVERSITY OF HAWAII AT MANOA

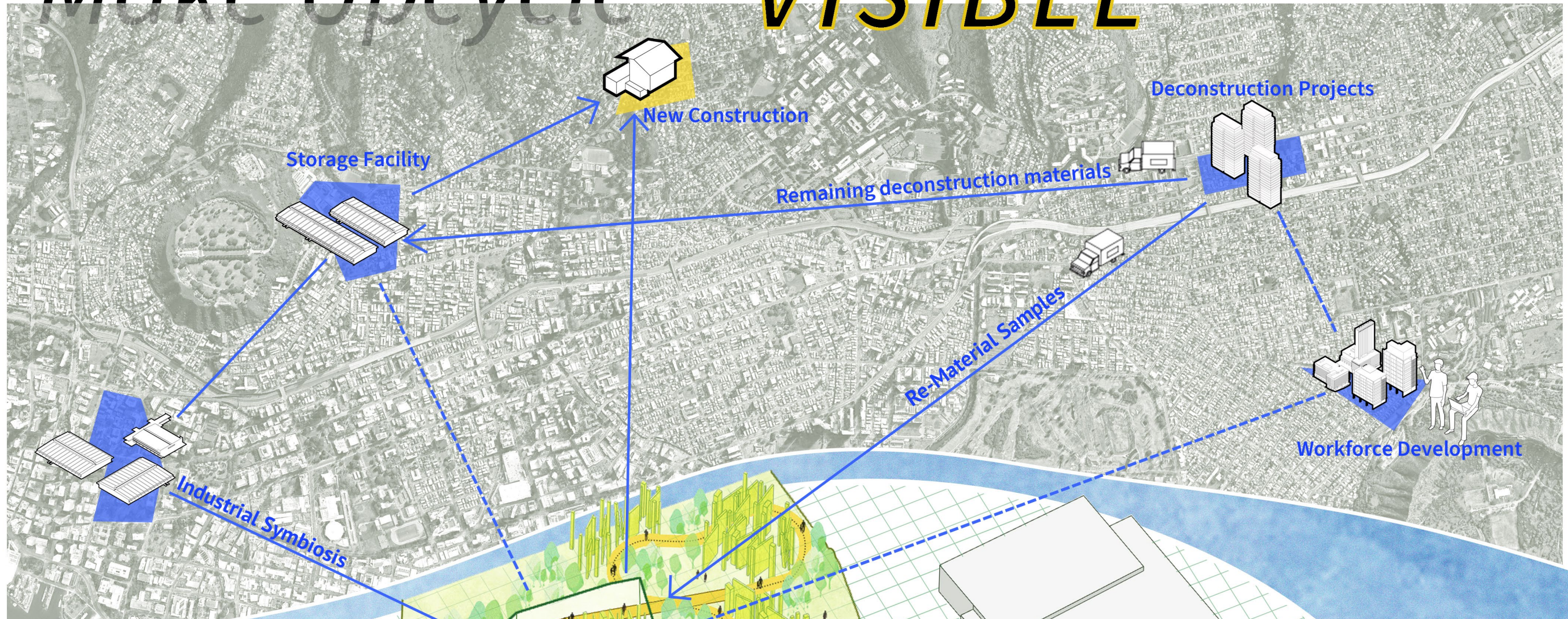
FACULTY ADVISOR – CLARK E. LLEWELLYN

LYCEUM

A traveling fellowship in Architecture

Make Upcycle “**VISIBLE**”

LF-12101



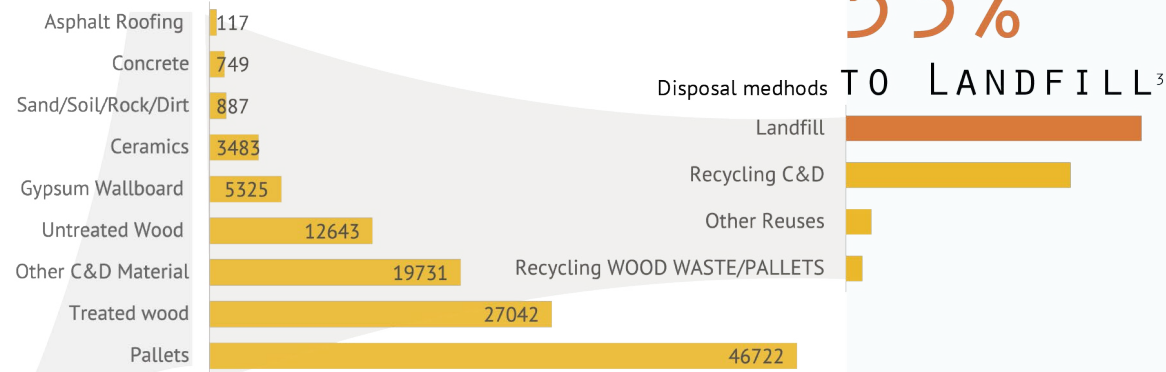
Nearly all construction materials in the Island are imported.

Despite limited land, continuous construction and demolition generate excessive waste annually, with 53% ending up in landfills. How can we maximize the reuse of demolition materials?

Research indicates that the lack of a transparent information network severely restricts the circulation and sales of recycled materials. **This proposal introduces a new model for a scenario-based Material Hub. The hub's core will feature samples of various recycled materials, linking them with public participation.** This transforms the previously invisible professional processes of material recycling, processing, and reuse into a visible and accessible resource, effectively reorganizing the emerging market for recycled materials.

BEFORE,

END OF LIFE

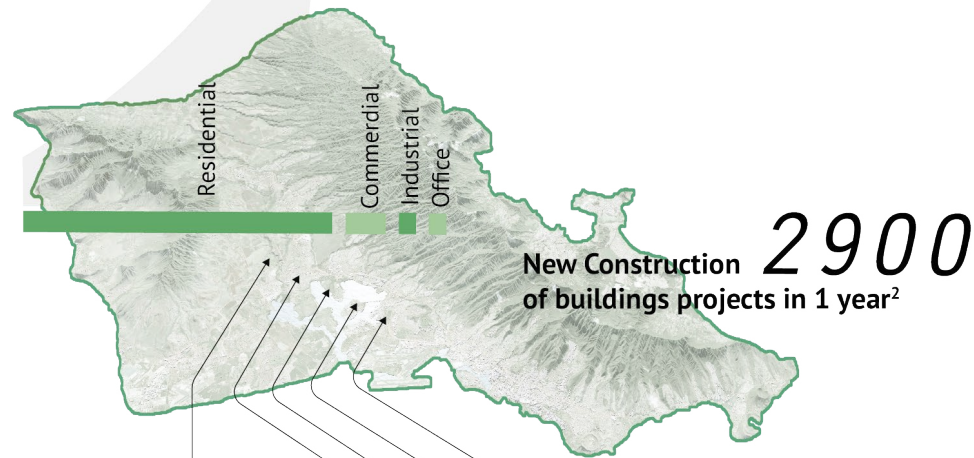


53%

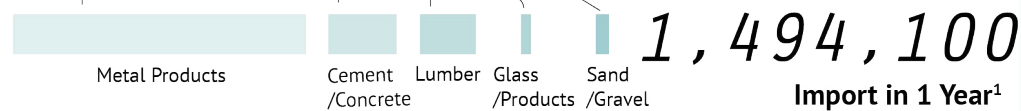
TO LANDFILL³

116,690 TONS
Overall Construction Waste in 1 Year³

USE PHASE



100% IMPORTED



BUILDING MATERIALFLOW OF LIFE CYCLE IN HAWAII

1.State of Hawaii Data Book s 2021 State of Hawaii Individual Tables s Section 21 - Construction and Housing, 2018
Table 2 :Meleah Houseknecht, Choony Kim, Austin Whitman, Material Flows on the Island of Hawaii, May 2006
3.City and County of Honolulu, 2017 Waste Composition Study Final Report, June 2018

WHY?



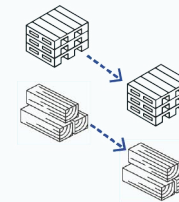
THE BLACK BOX

on the recycled construction market



4.UNAWARE PUBLIC

The **public** is unaware of the uses for recycled materials.



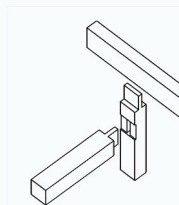
1.UNIFORMITY

Most single-stream recycled materials have only one method of reuse.



2.COSTLINESS OF PROCESS

Due to high sorting costs, most construction waste companies opt for incineration for energy or land-filling, leading to the wastage of mixed recyclable materials.

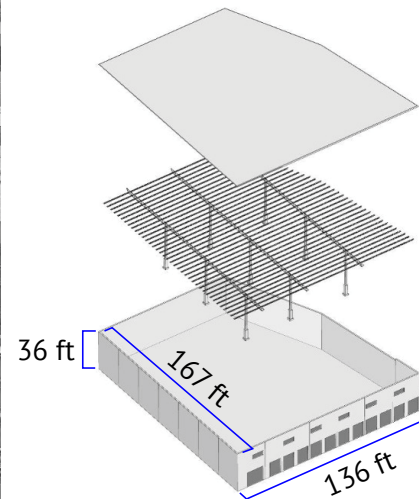
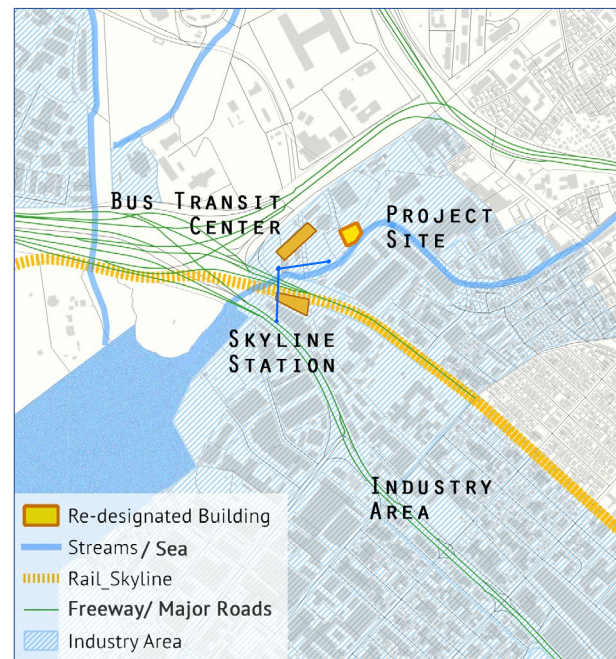
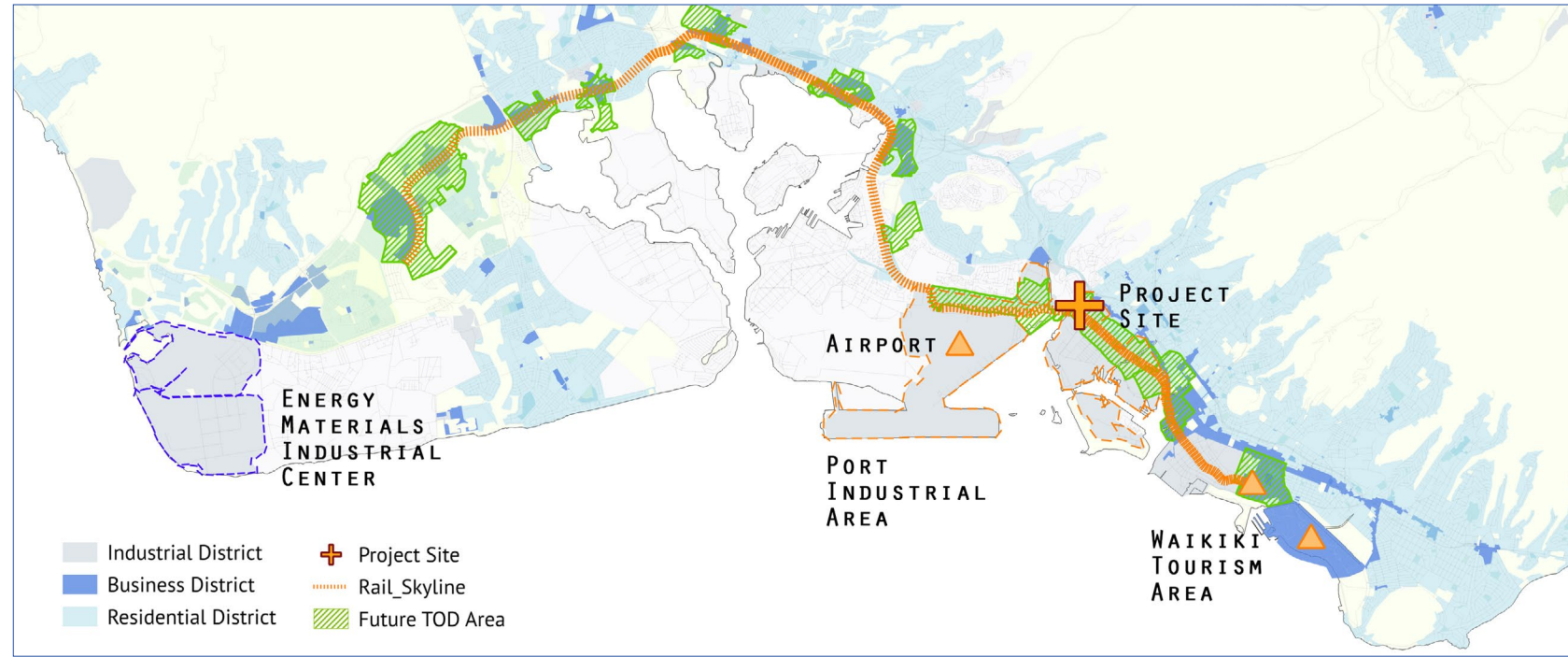


3.DECONSTRUCTION REQUIREMENT

Existing reuse retail products have technical requirements for deconstruction.

EXISTING CONDITIONS

I select an idle tilt-up concrete factory located in the port industrial area of Honolulu, Hawaii. This site is situated next to a river and within a TOD (Transit-Oriented Development) planning area, adjacent to a bus transit center and the new Skyline station, providing ample public accessibility.



Tilt-up Concrete

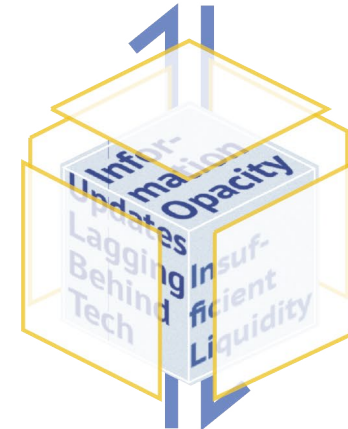
HOW?

UNVEIL THE BLACK BOX

BY LEVERAGING PUBLIC ENGAGEMENT,
REBUILDING THE ISLAND
SALVAGE BUILDING MATERIAL NETWORK



PUBLIC PARTICIPATION



1

Information-sharing medium

2

Coordinate, combine, and redistribute from a central node.

3

Replace the sales-focused wholesale store with an experiential, interactive, and multifunctional public space.

Industrial Symbiosis

Campbell Industrial Park

New Construction

Digital Information Sharing

● Physical Material Exchange
 ● Remote Information Exchange

Comprehensive Processing Facility

All Deconstruction materials

Materials Samples

Deconstruction Projects

Sorting on site

Timber Salvage Warehouse

Marukai Wholesale Mart

Comprehensive Salvage Warehouse

Formulate Demolition Plan

Visitors/
Potential Consumers

Products
Sale

Bus Transit Center

Kahauiki Skyline Station

University Collaboration

Downtown



AFTER

EXCHANGE HALL

Source of Recycle:
Facade Panels from Wholesale Mart
Uses: Interior and Exterior Building Decoration
Price: \$9.60/sf

A-6
RECYCLED ALUMINUM ALLOY PANELS

Size: 50-100"L x 20-50"W x 1.5-2"T
Uses: Furniture
Price: \$18-24/sf
W-320 TREE SLAB

Per linear foot
Uses: Furniture
Price: 2 sides paint \$3.75
1 or more sides clear \$5.25
L-239 REDWOOD T&G

Recycled from A Middle School Gymnasium Roof Structure



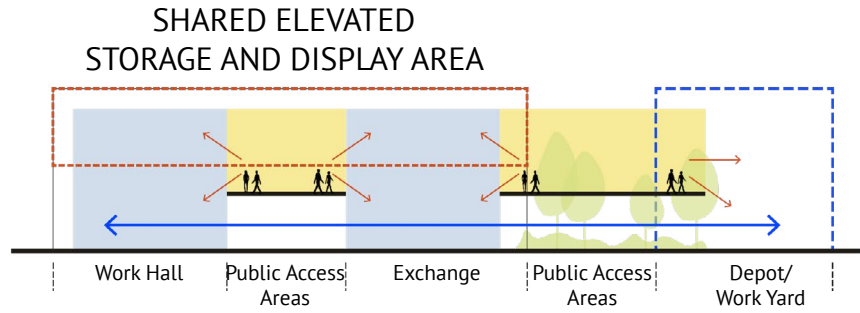
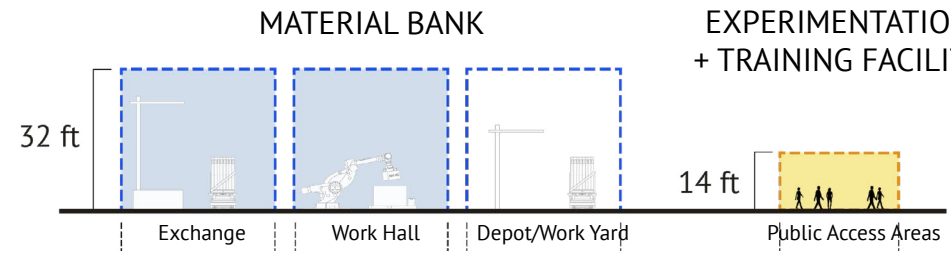
Facade Panels from SWANZY Beach Park Toilet

Recycled from a Residential Demolition

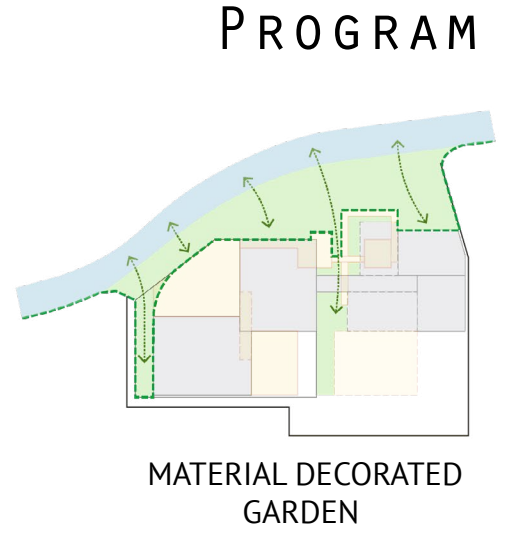
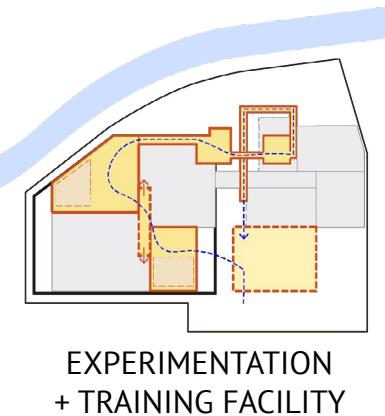
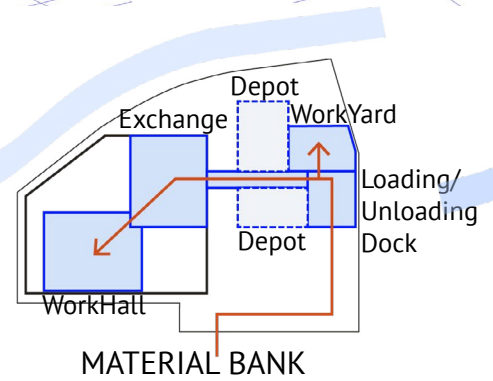
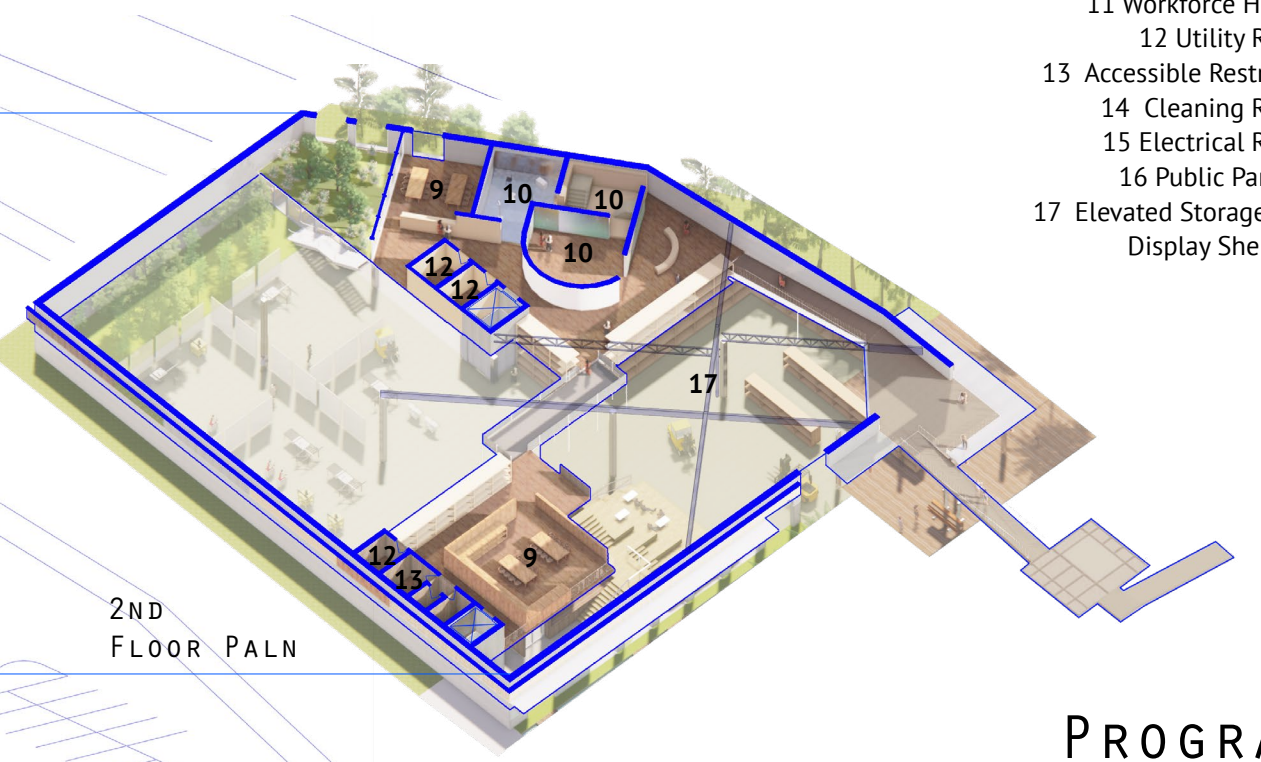
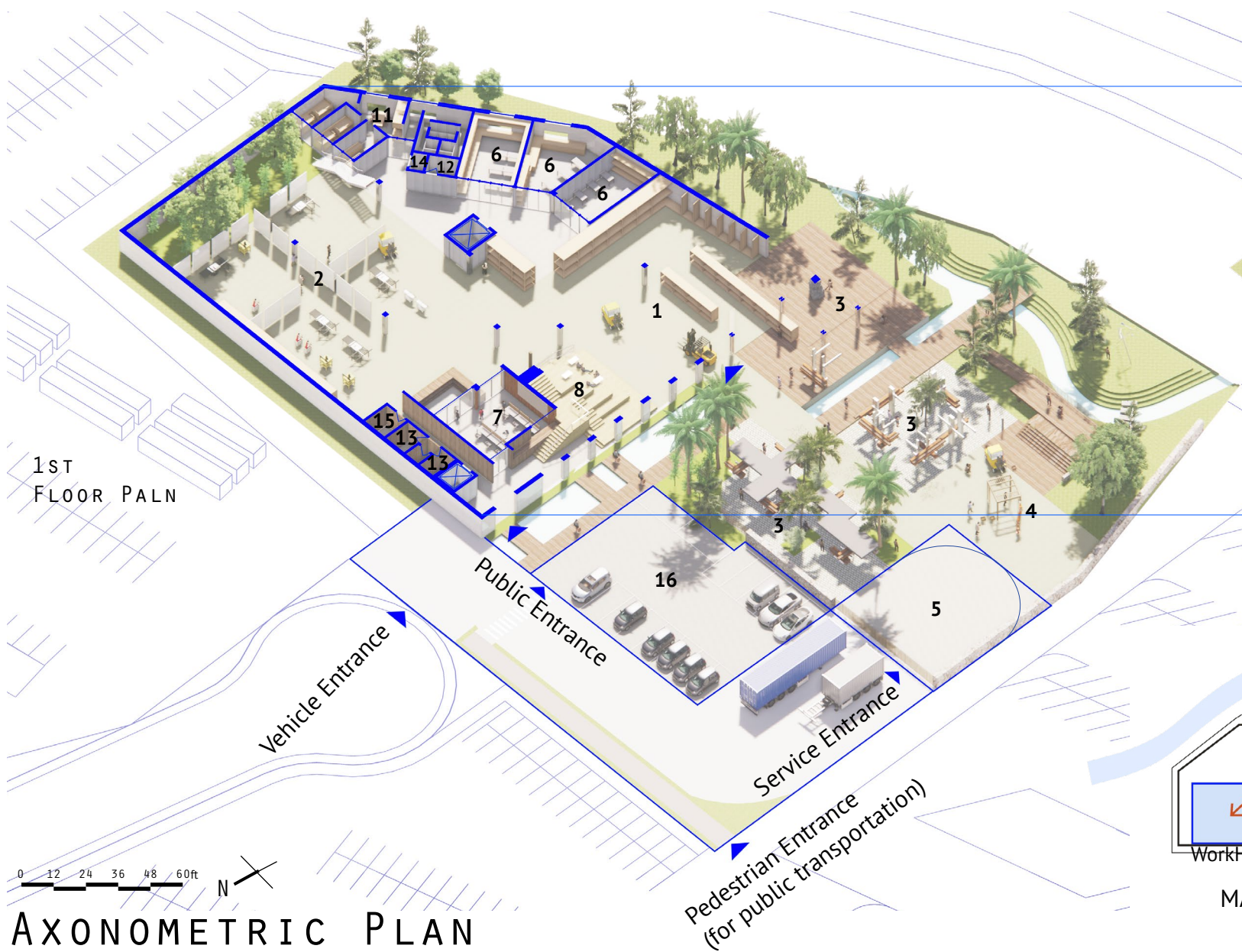
TODAY'S HIGHLIGHT
CRAFTING A DOOR FROM RECLAIMED WOOD

Upcycle Hub seamlessly blends digital information with the physical experience of materials.

DESIGN STRATEGY

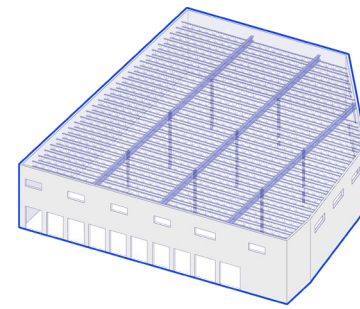
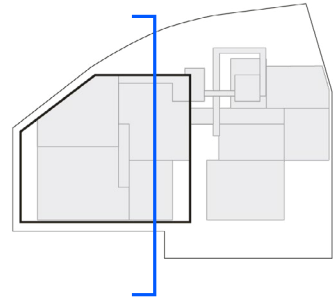


- 1 Exchange
- 2 Work Hall
- 3 Depot
- 4 Work Yard
- 5 Loading/Unloading Dock
- 6 Lab
- 7 Material Scheduling/Ordering Office
- 8 Interactive Material Stage
- 9 Workshop/Classroom
- 10 Contextual Experience Exhibition Hall
- 11 Workforce Hostel
- 12 Utility Room
- 13 Accessible Restroom
- 14 Cleaning Room
- 15 Electrical Room
- 16 Public Parking
- 17 Elevated Storage and Display Shelving

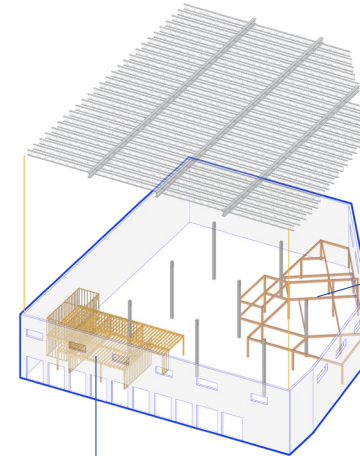


PROGRAM

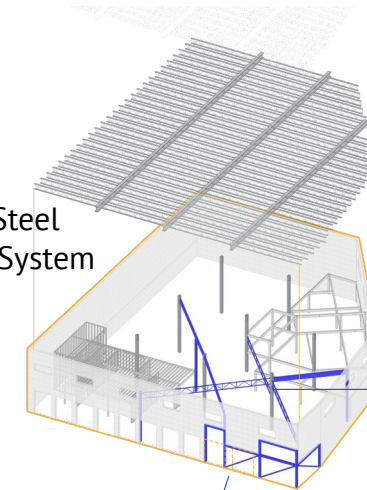
STRUCTURE



Original Structure
Tilt-up Concrete



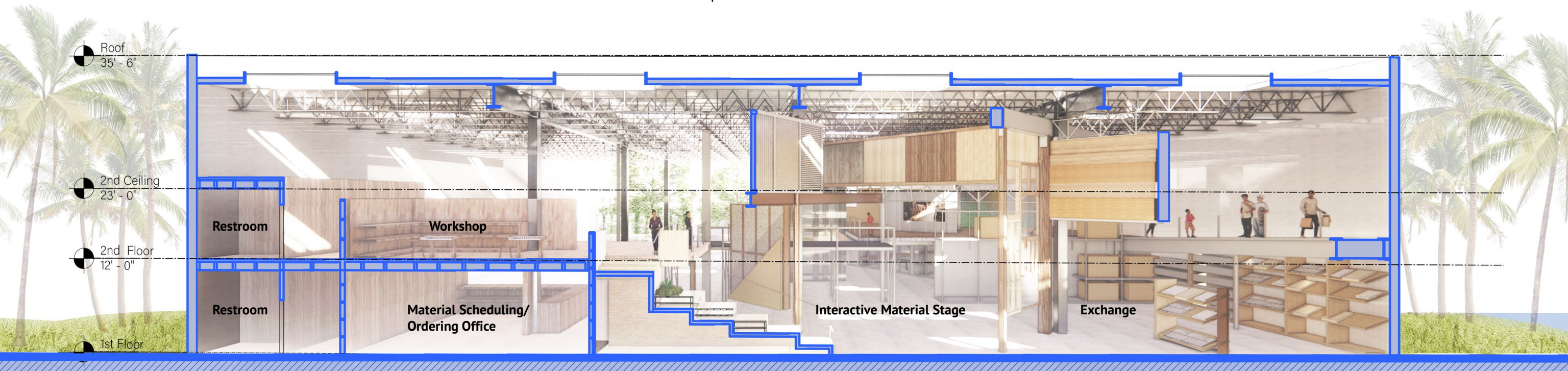
Inserted Recycled Timber
Frame Structure System



Recycled Steel
Structure System

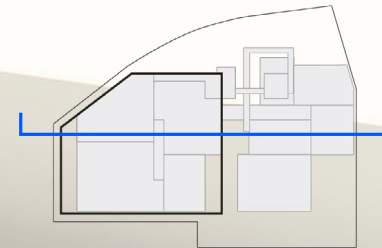
Construct Elevated
Storage Shelving
Using Recycled
Steel Trusses

Opening Cut/I-Beam Frame
Reinforcement



SECTION 2-2

0 6 12 18 24 30ft



Roof
35' - 6"

2nd Floor
12' - 0"

1st Floor

Workforce
Hostel

Classroom

Utility Room

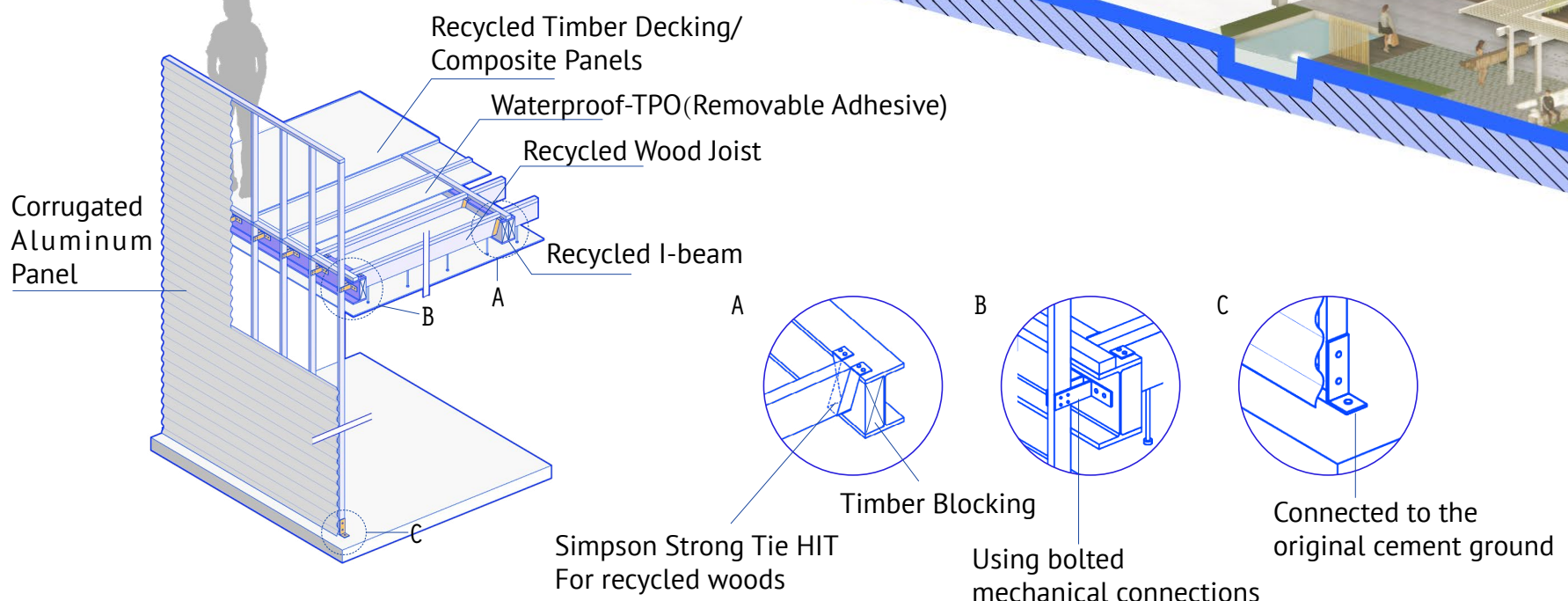
Freight
Elevator

Movable
Link Bridge

Exchange

Depot

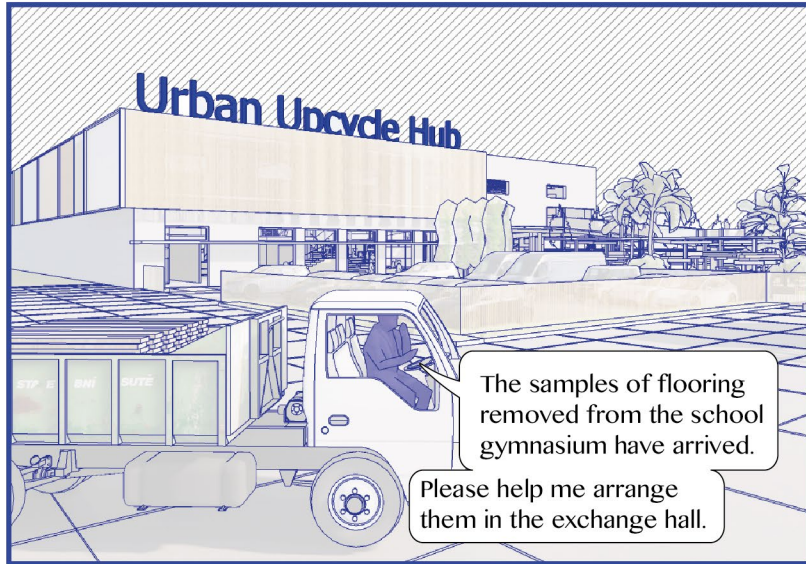
Loading/Unloading
Dock



- Constructed using recycled steel, wood, and other materials, the system is flexible and can **accommodate components of various sizes**.
- Designed for deconstruction**, allowing for components to be reused after dismantling.
- Details are visualized**, making the construction system itself an example of upcycling.

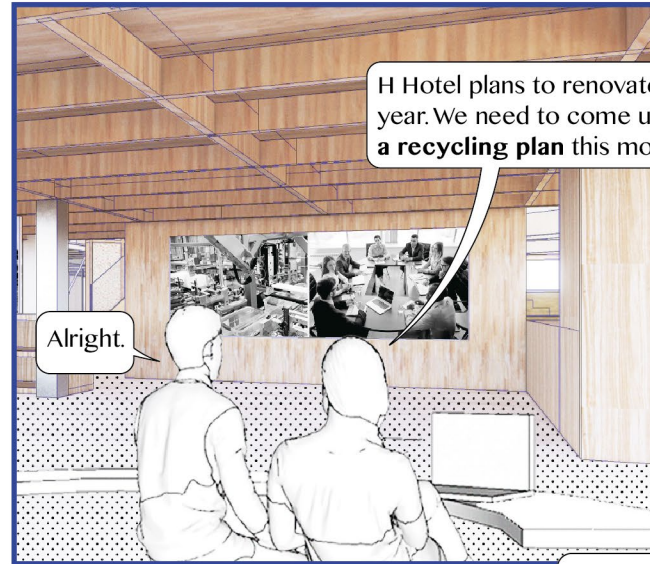
CONSTRUCTION SYSTEM

SCENES SERIES: THE JOURNEY OF UPCYCLE HUB



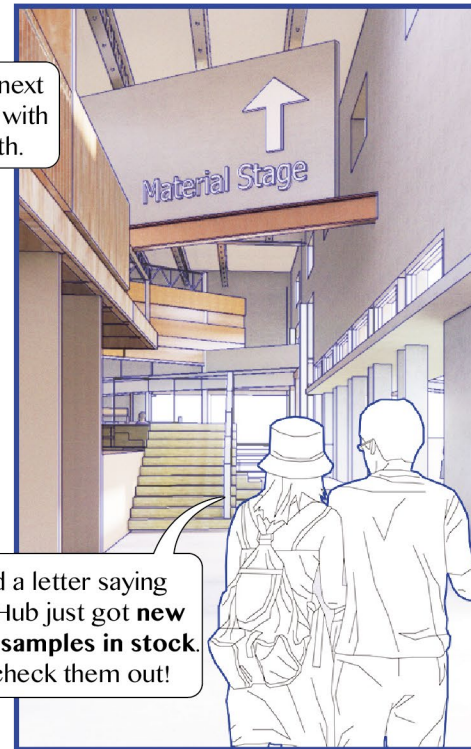
The samples of flooring removed from the school gymnasium have arrived.

Please help me arrange them in the exchange hall.



Alright.

H Hotel plans to renovate next year. We need to come up with a recycling plan this month.



I received a letter saying Upcycle Hub just got new material samples in stock. Let's go check them out!



Great idea!

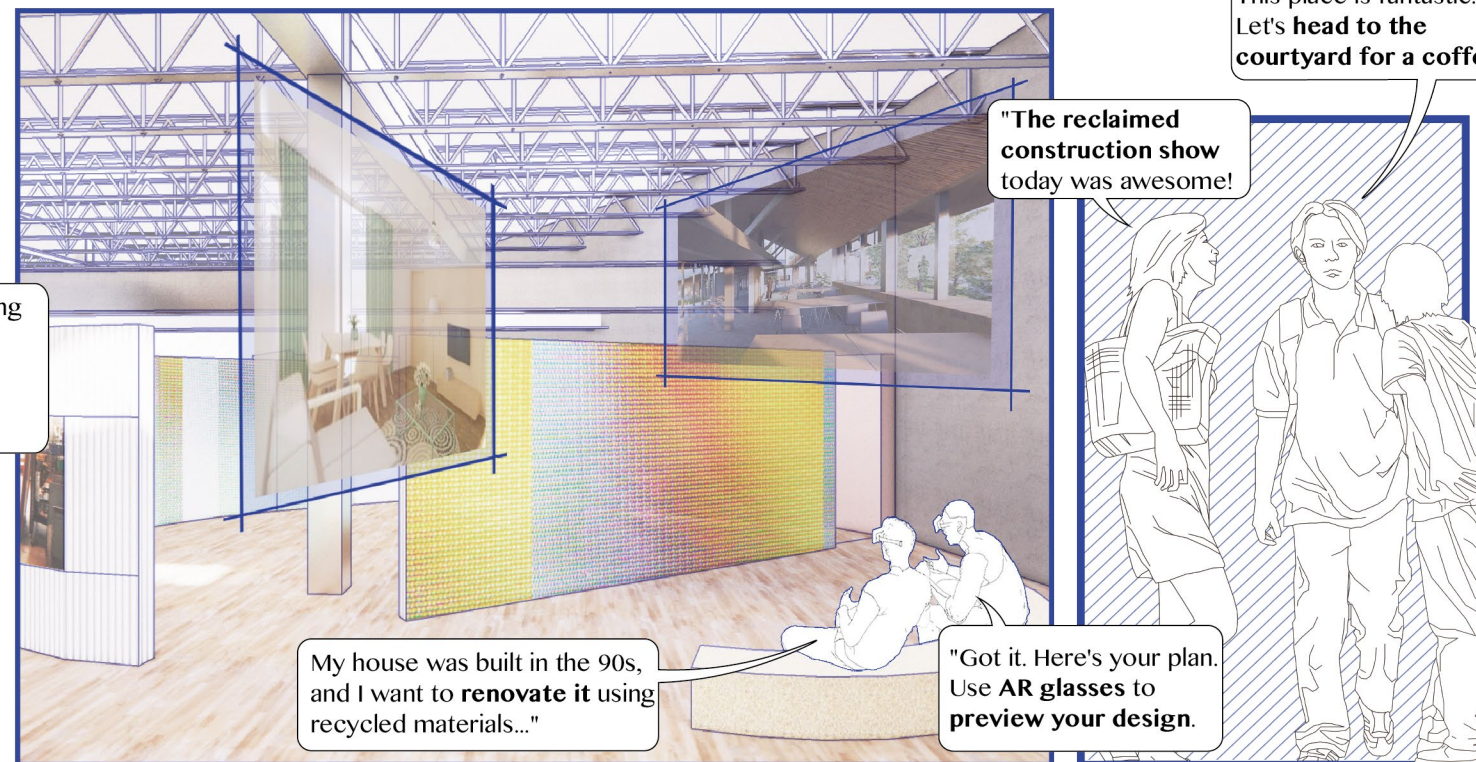
I'll book an appointment with a materials expert...

Wow, I had no idea recycled materials could be used this way! We could use them for our home renovation too!



This time, we are collaborating with X University to test the structural integrity of reclaimed wood from a demolished house.

Amazing!!!



My house was built in the 90s, and I want to renovate it using recycled materials...

"Got it. Here's your plan. Use AR glasses to preview your design."

"The reclaimed construction show today was awesome!"

This place is fantastic. Let's head to the courtyard for a coffee!

DEPOT GARDEN/MAIN ELEVATION

