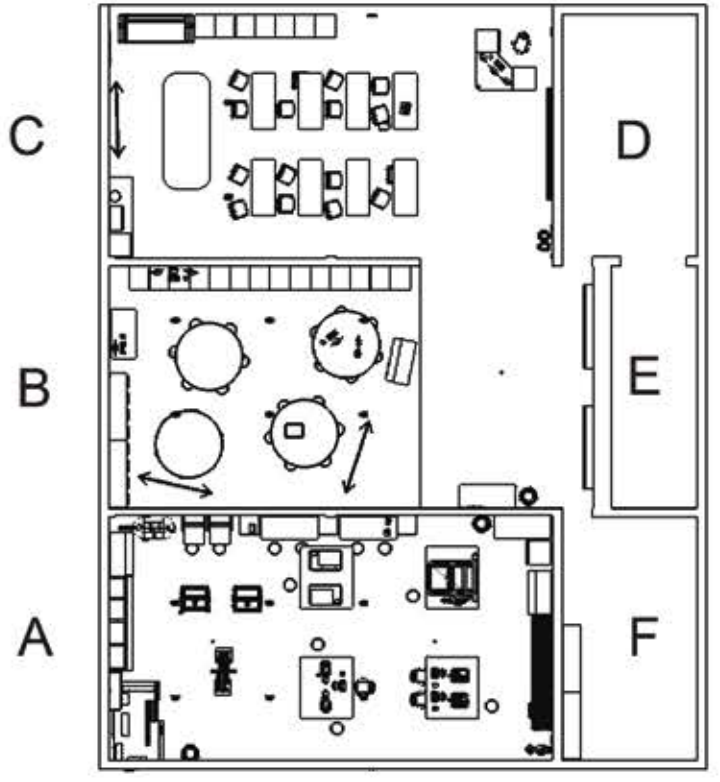




Shown: A



**A** Makerspace Floor

A closed off prototyping facility, with all the necessary equipment to introduce students to design and engineering.

**DEF** Storage

In order to properly supply the Makerspace Floor (A) and the Assembly Cleanroom (B), the three Auxiliary rooms (DEF) will be used for scrap storage, extra hardware, tools, and student projects.







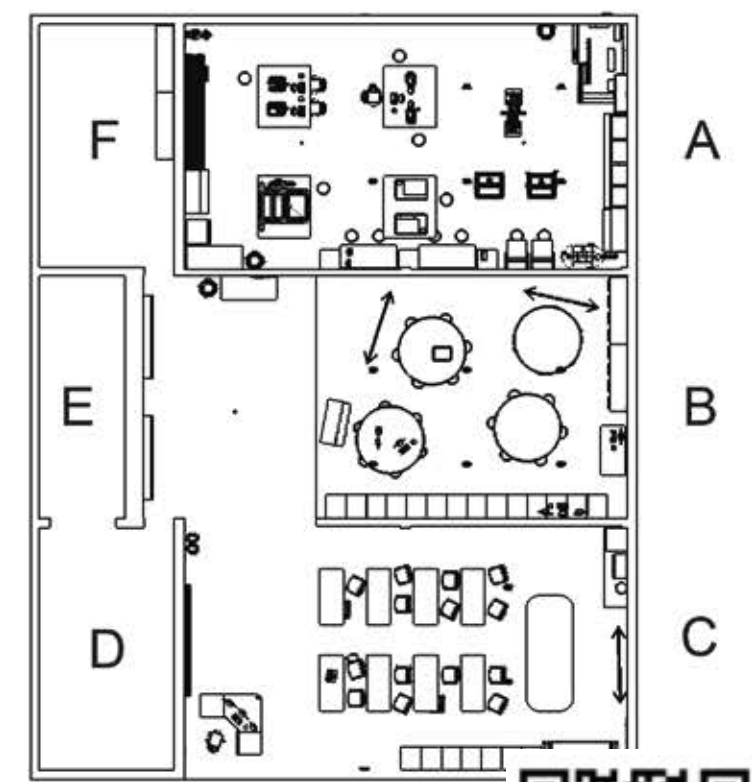
Shown: BC

**B** Assembly Cleanroom

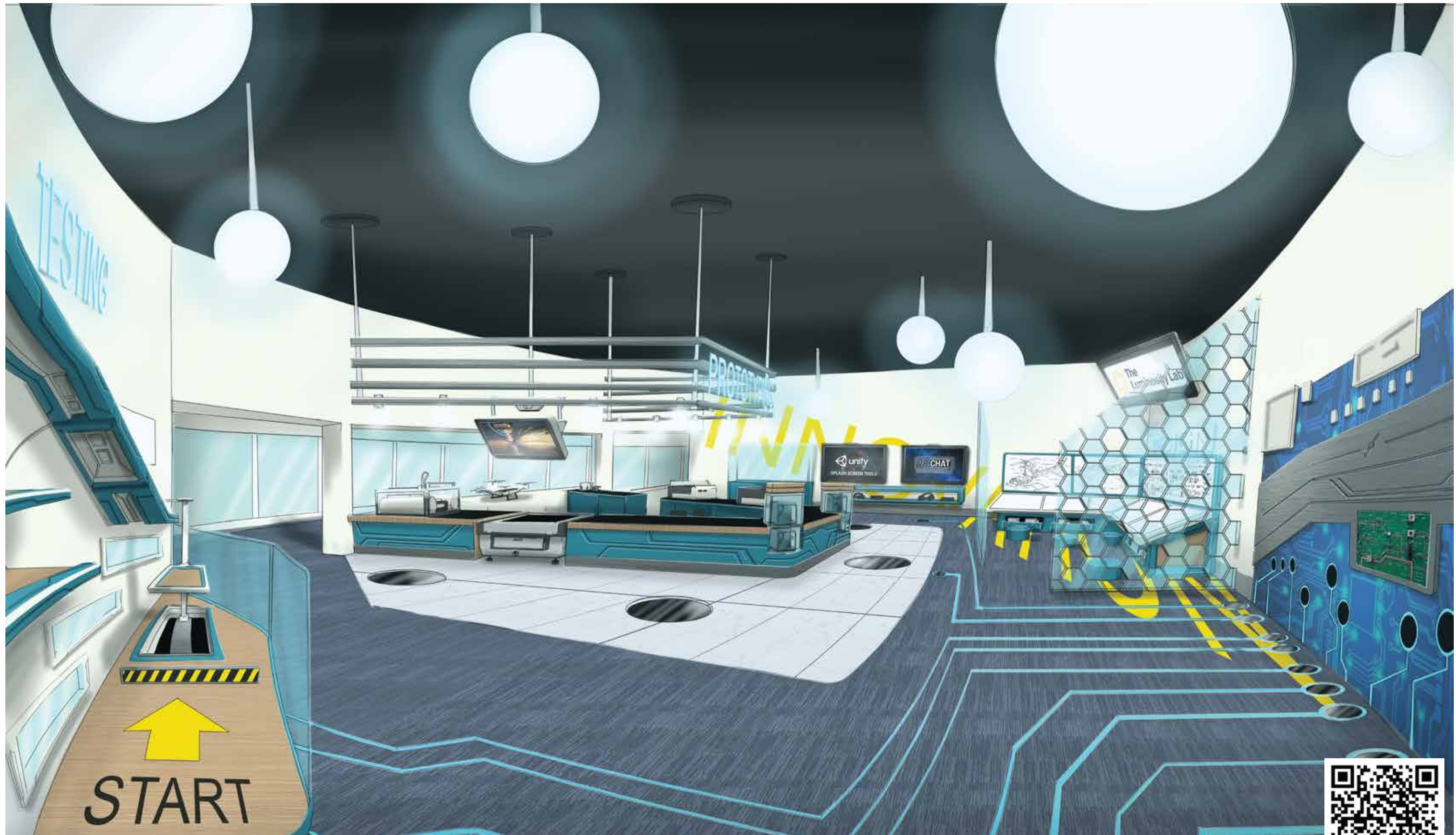
A space for students to assemble the parts they have created on the Makerspace Floor (A). Includes; storage, tools, CAD stations, assembly tables and whiteboards for ideation.

**C** Classroom

A space for students to learn the skills they need to become better creators. This space is an open area with viewing to all other spaces in the facility, for teacher monitoring.











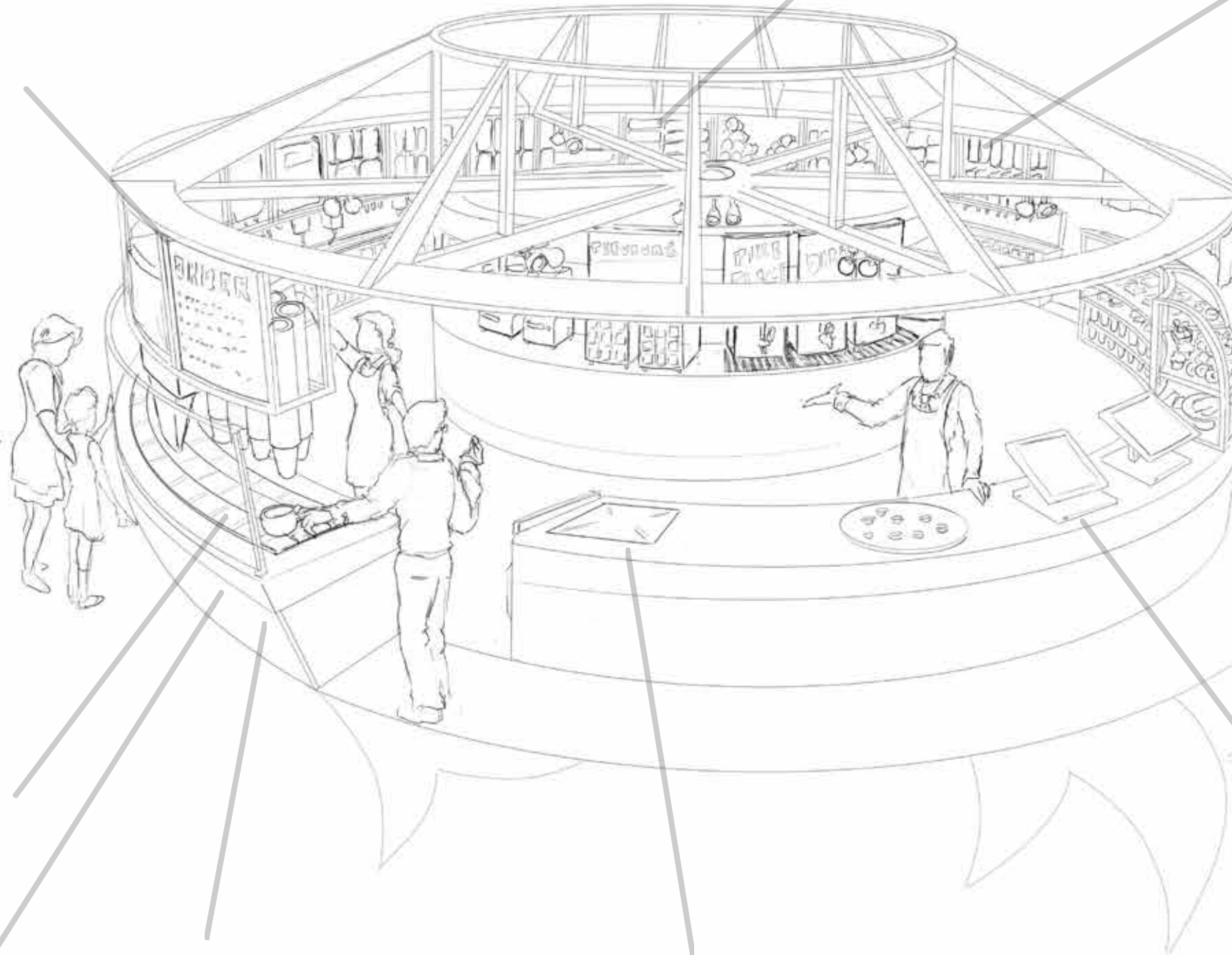
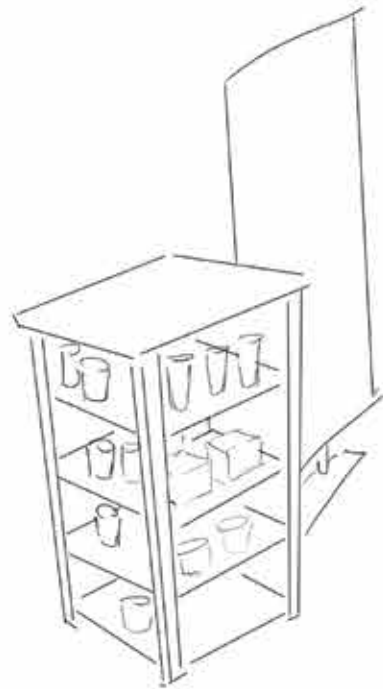
**SUMMARY:** A CONCEPT KIOSK FEATURING AN ASSEMBLY LINE, SUSPENDED ABOVE A COUNTERTOP WITH CONVEYER BELTS FOR AUTOMATIC DRINK PRODUCTION CAPABILITES, STREAMLINING THE TASKS OF THE EMPLOYEES FOR MAINTINENCE AND CUSTOMER ENGAGEMENT

CORE OF KIOSK FOR CLEANING AND MAINTINENCE

ALL SUPPLIES ARE STOCKED ON THE FLOOR

DIGITALLY DISPLAYED QUE FOR DRINK CREATION ORDER

LIGHTENED WORKLOAD FREES EMPLOYEES TO ENGAGE AS HOSTS



BRANCHING CONVEYER BELT COUNTER TOP

GLASS WINDOW TO OBSERVE ENTIRE STAND

AUTOMATIC OR MANUAL DRINK CREATION CAPABILITES

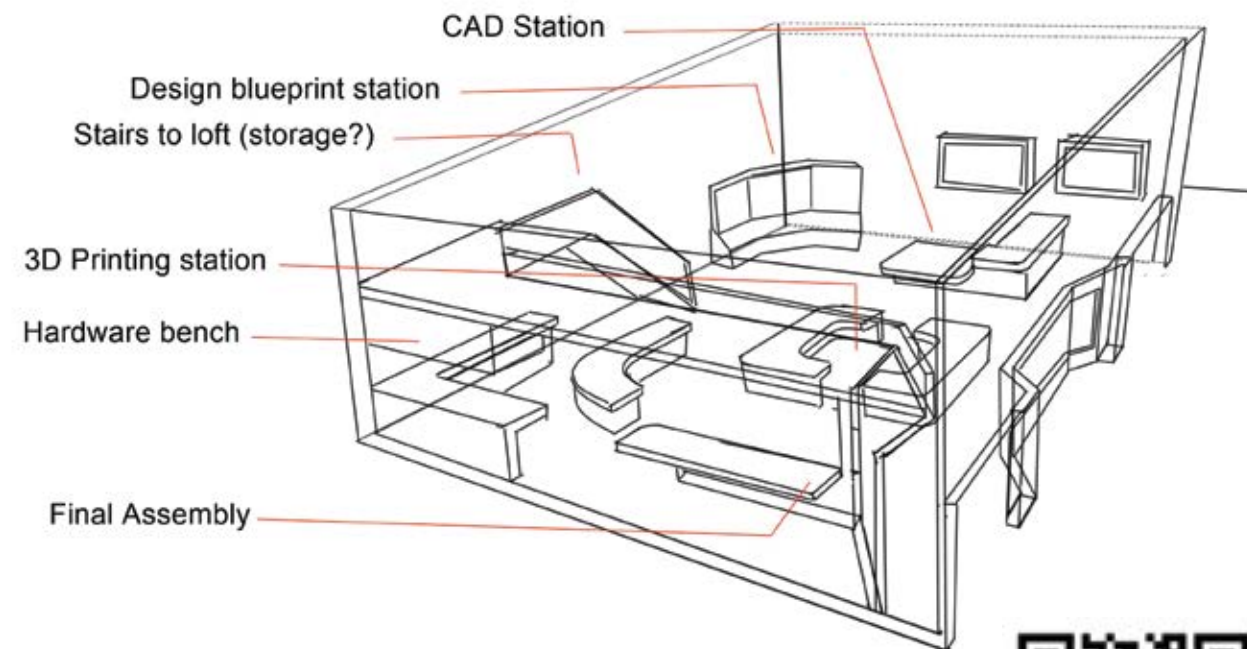
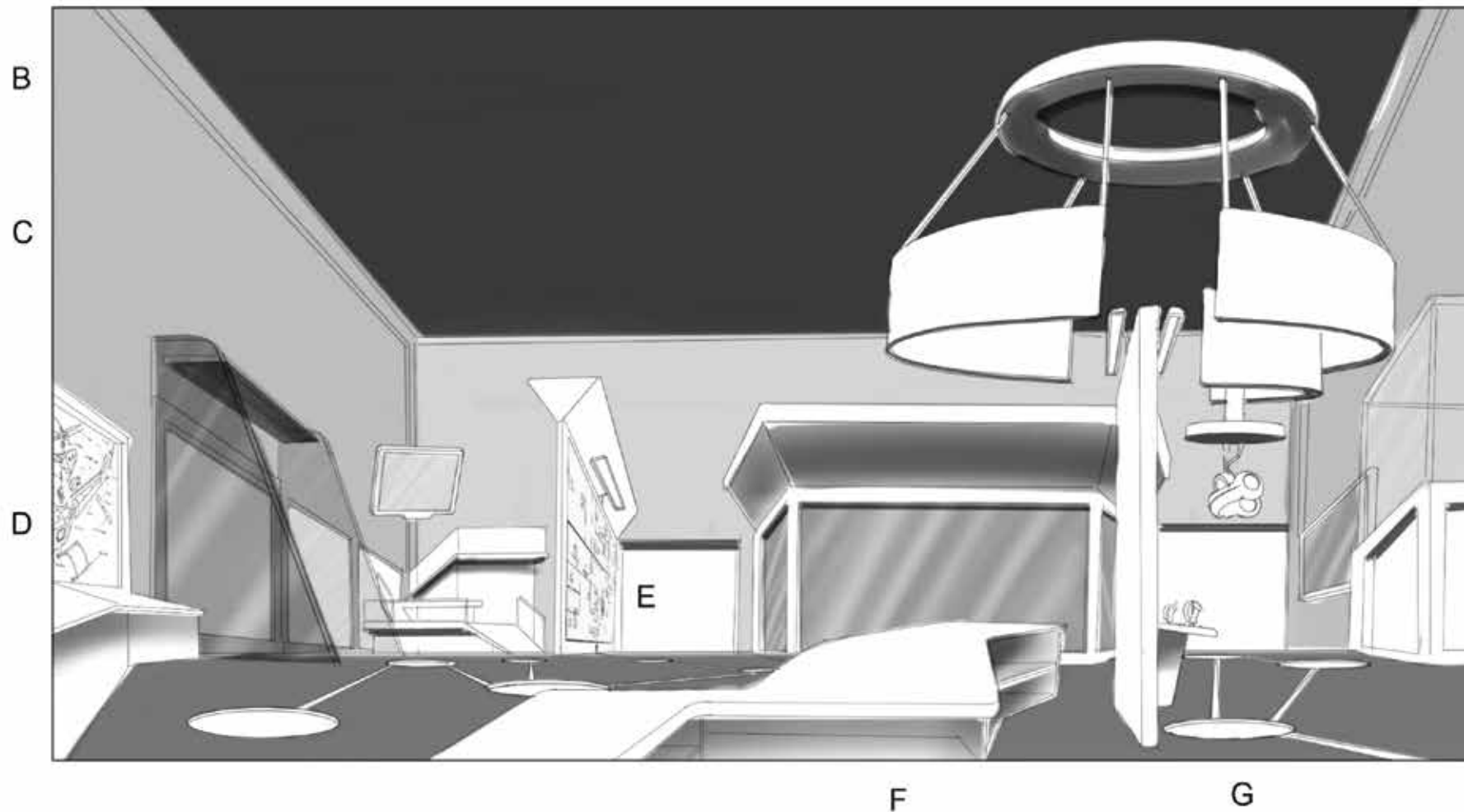
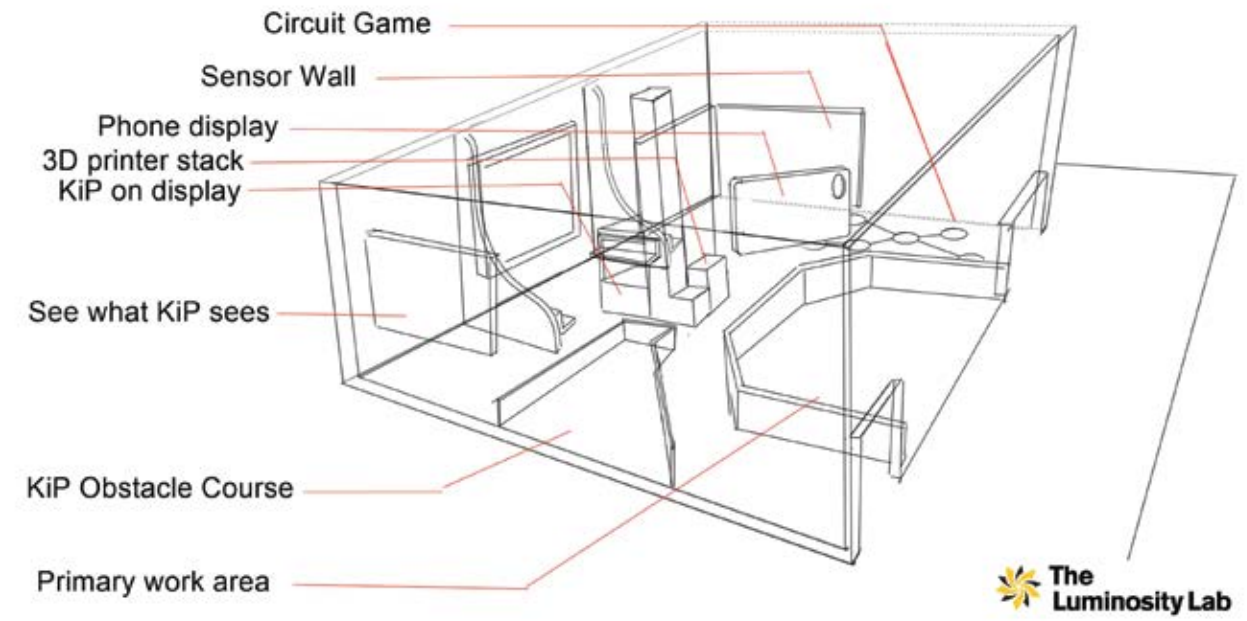
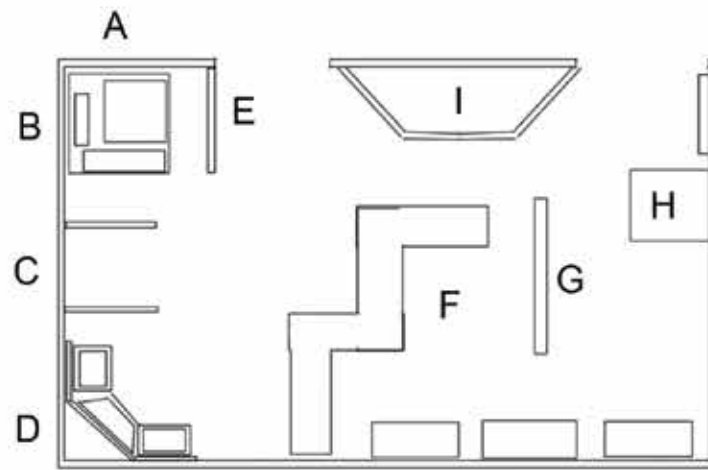
ALL INVENTORY TRACKED BY RF-ID

ORDER BY SELF SERVE SCREEN OR APP

DESIGN TEAM: JOSH CHANG, RAKSHITH SUBRAMANYAM, CHELSEA BORDER, SHAY RAVACCIOLI, MICAH EL SAXON, HUNTER MIDDLETON

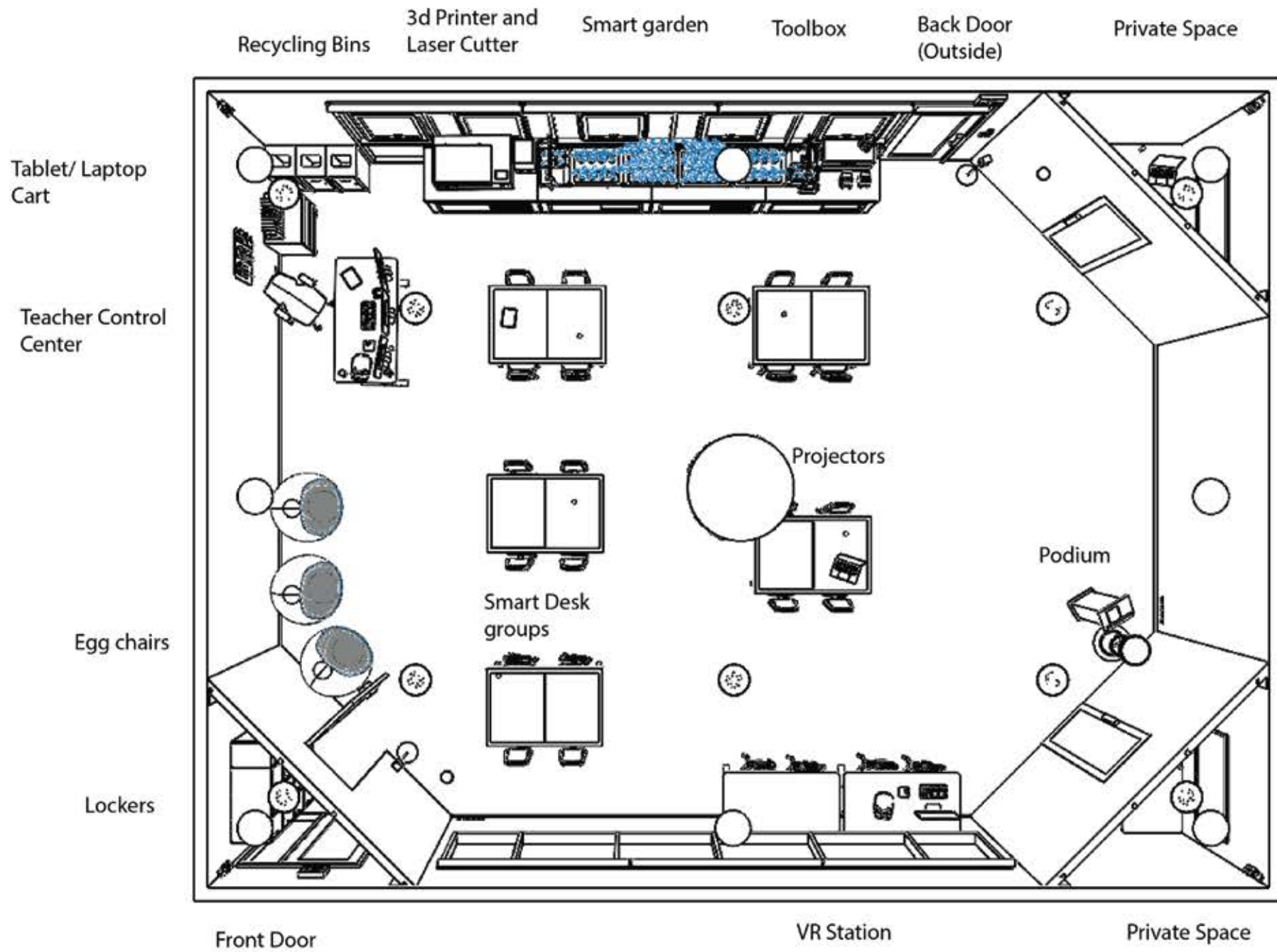


- A: KiP Obstacle course tower
- B: Windows to course from Stairs
- C: See what the robot sees. Machine Vision
- D: Ideation Station
- E: Sensor Wall
- F: Main Assembly Station
- G: VR Simulator
- H: Model Exhibition Case
- I: Viewing bay from Hall OR Quiet room

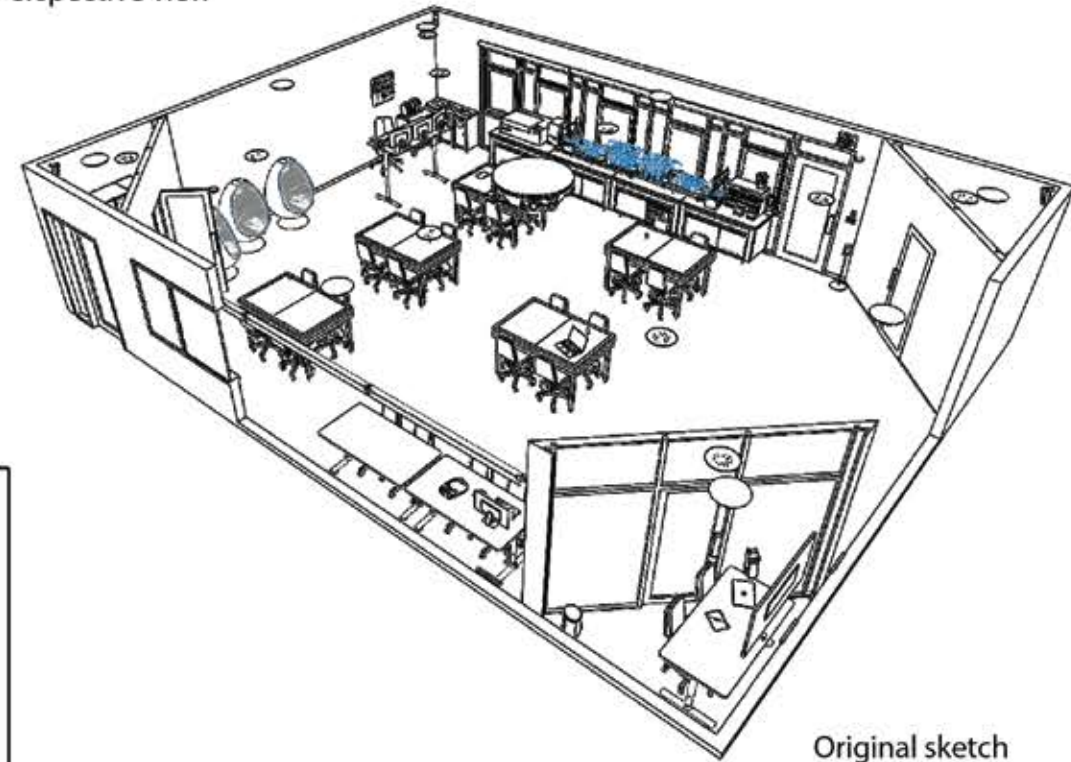




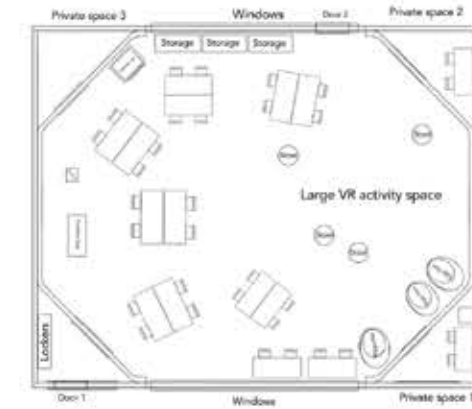
# CLASSROOM OF THE FUTURE CAD DEMO ASSEMBLY 2.0



Perspective view



Original sketch

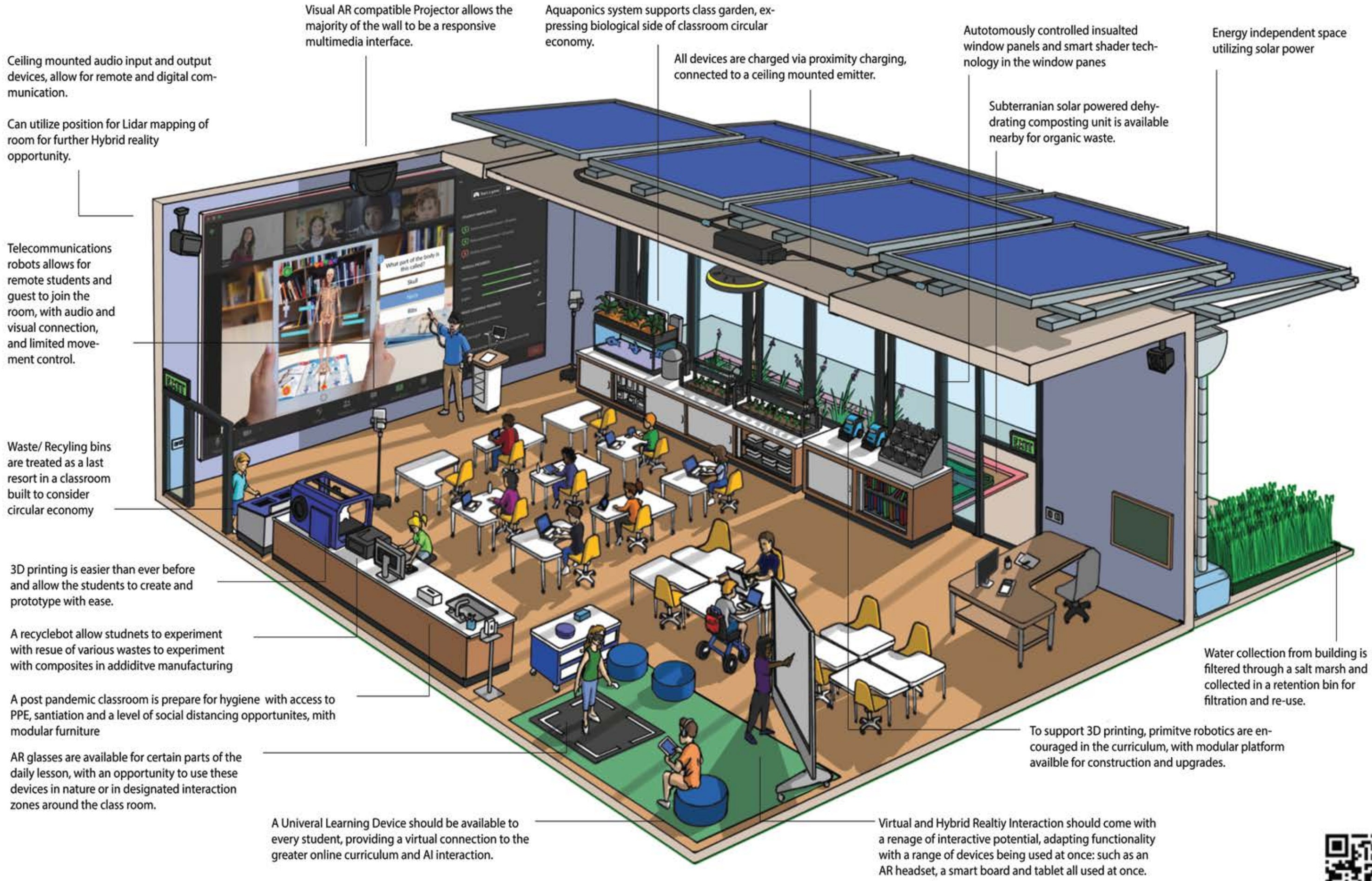


Large Interaction Zone

Speakers and Dome lights distributed across ceiling







Ceiling mounted audio input and output devices, allow for remote and digital communication.

Can utilize position for Lidar mapping of room for further Hybrid reality opportunity.

Telecommunications robots allows for remote students and guest to join the room, with audio and visual connection, and limited movement control.

Waste/ Recycling bins are treated as a last resort in a classroom built to consider circular economy

3D printing is easier than ever before and allow the students to create and prototype with ease.

A recyclebot allow studnets to experiment with resue of various wastes to experiment with composites in additve manufacturing

A post pandemic classroom is prepare for hygiene with access to PPE, santiation and a level of social distancing opportunites, mith modular furniture

AR glasses are available for certain parts of the daily lesson, with an opportunity to use these devices in nature or in designated interaction zones around the class room.

A Univeral Learning Device should be available to every student, providing a virtual connection to the greater online curriculum and AI interaction.

Visual AR compatible Projector allows the majority of the wall to be a responsive multimedia interface.

Aquaponics system supports class garden, expressing biological side of classroom circular economy.

All devices are charged via proximity charging, connected to a ceiling mounted emitter.

Autotomously controlled insulated window panels and smart shader technology in the window panes

Energy independent space utilizing solar power

Subterranean solar powered dehydrating composting unit is available nearby for organic waste.

Water collection from building is filtered through a salt marsh and collected in a retention bin for filtration and re-use.

To support 3D printing, primitve robotics are encouraged in the curriculum, with modular platform available for construction and upgrades.

Virtual and Hybrid Realtiy Interaction should come with a renage of interactive potential, adapting functionality with a range of devices being used at once: such as an AR headset, a smart board and tablet all used at once.







"Big Taipei" by Bjarke Ingels



Arcosanti, Yavapai county

## Background

Biophilic design means creating spaces for people to experience a sense of holistic well being. Biophilic spaces should be inspirational, innovative, restorative, and integrate functionality with the ecosystem that the design belongs in. Biophilia nurtures a love of place - for us, that place is Arizona.

We were inspired by the painted rocks of Sedona, the cave domes in Papago park that evoke a great sense of refuge, and the overall vibrancy of life the Sonoran desert landscape. Architecturally, we drew inspiration from Arcosanti in Yavapai county, an experimental town with ecological architecture, whose forms emerge like exo-skeletal cacti. Visually, we also echo Danish architect Bjarke Ingels, who develops structures that appear to blend Papago caves and Arcosanti together.



Papago Park, taken by Lily Luo

*"Above all, biophilic design must nurture a love of place".  
-Terrapin Bright Green*

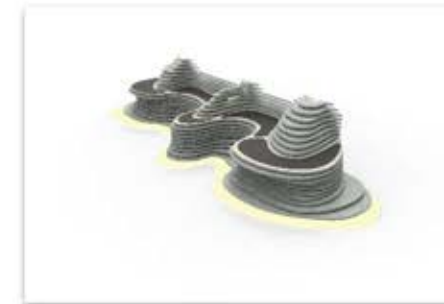


Our original solution evoked the visual sense of nature by connecting the first floor of the Memorial Union (MU) with the basement using a biodiverse stair set. We wanted to provide an interesting and engaging stair climbing/descending experience. With a thought provoking form, the staircase would support traffic flow and enrich all passersby with knowledge about the Sonoran desert.

Unfortunately, our original design could not be implemented, as Studio Ma has already redesigned the upper and lower level of the Memorial Union where our staircase would be. Thus, we reinterpreted the geological, exo-skeletal feeling of the staircase into modularized furniture pieces.

## Final Design

All of our units can be disassembled and collapsed. Benches interlock with end pieces along the wall and can be deployed in many configurations, creating a continuous structure. Units will be made from lightweight recycled material or pine wood from Flagstaff. Together, these pieces create a non-uniform and aesthetically mysterious space, the kind of place that we dream about when desiring an escape to nature.



Winding Canyon Bench

View at:  
[https://www.youtube.com/watch?v=EfegXBwB\\_EU](https://www.youtube.com/watch?v=EfegXBwB_EU)

- LED wrapped bases for floor lighting
- Easy to integrate with other LED strip lights
- Each layer can be taken out individually



Monument to the Master Cave Builder

View at:  
<https://www.youtube.com/watch?v=HrK13DgjnXM>

- The bench can be flipped around – mirrored
- Leaving a gap between the mirrored benches for hydroponic system
- Water is the original master – trickling streams create cave systems



Hydroponic System

- Closed loop (only need to plug in to power pump)
- Modular
- Secondary to design intent, but shows structural adaptability of design
- Useful for Kratky based hydroponics or metamorphic rock medium



View of Entire Room  
<https://www.youtube.com/watch?v=xu6HzuT2>







BIOPHILIC INTERIOR DESIGN SKETCH

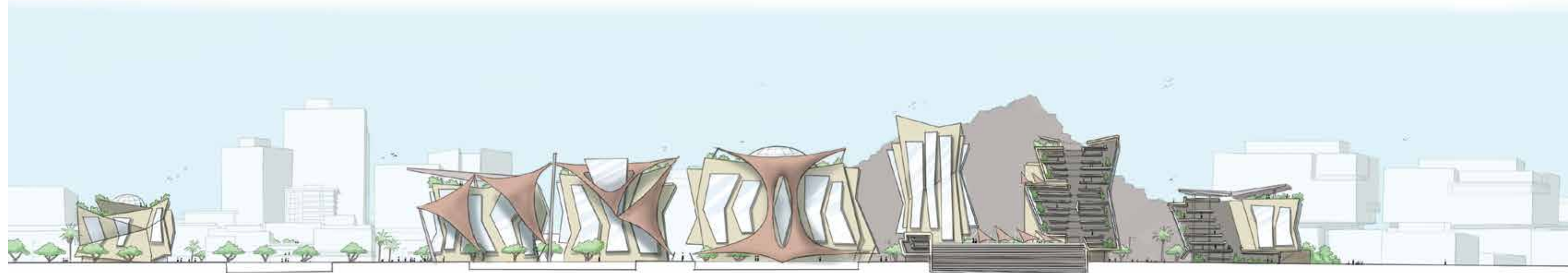
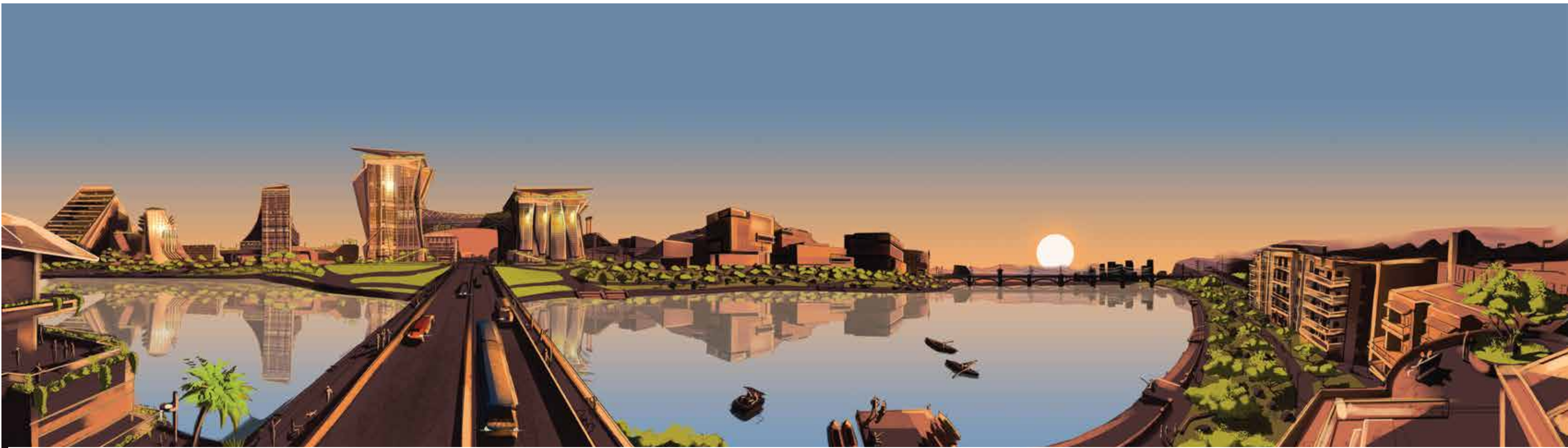
COMPLETE PROJECT →









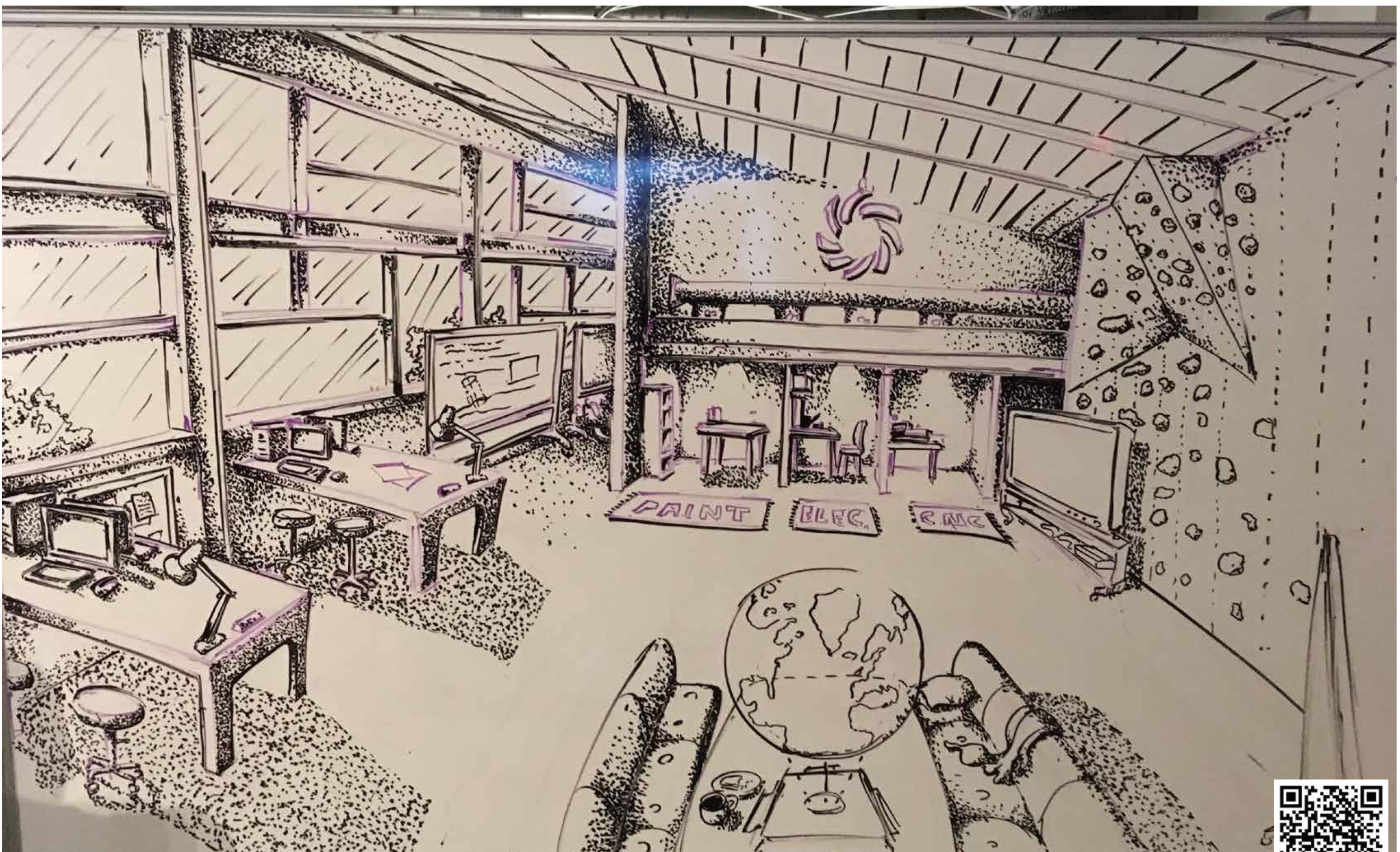


SKYLINE CONCEPT SKETCHPAGE AND SECTION DRAWING

FOR COMPLETE PROJECT →







FACILITY SPACE CONCEPT ON WHITEBOARD

MORE ON ORGANIZATION →







# 4401 E Baseline Facility Shop floor Map and placement tool

1:12 Scale

41' 0" wall length

### DIMENSIONS TABLE

- DM Furnace: D: 34" x H: 65" x L: 60"
- DM Oven: D: 45" x H: 65" x L: 45"
- DM Printer: D: 45" x H: 80" x L: 80"
- DM Finisher: D: 35" x H: 80" x L: 50"
- DM: Blender D" 20" x H: 41" x L: 32"
- DM Vacuum: D: 40" x H: 56" x L: 22"
- Cutting System D: 24" x L: 35"
- Massivit 1800: D: 44" x H: 77" x L: 57"
- SandBlaster: D: 38" x H: 66" x L: 60"
- MJP 5200: D: 50" x L: 71" x L: 87"
- Mimaki: D: 60" x H: 61" x L: 87"
- 1325 CNC: D: 32" x L: 120"
- Carbon L1: D: 32" x L: 24" x H: 54"
- KP800-V1000: D: 60" x H: 93" x L: 98"
- KP800-V3000: D: 60" x H: 93" x L: 98"
- Vacuum Former: D 60" x H: 65" x L: 120"
- Curing Station: D: 43" x L: 60"
- Shop Air Compressor: TBD

### POWER REQUIREMENTS

#### First priority Phase 1

- 240V Transformer and Panel
- DM Oven: 240 V 1ph 12.7A (Sp. Exhaust) -w/ Fused Disconnect
- DM Furnace: 220V 3ph 24A
- DM Finisher: Installed
- DM Printer: Installed (Sp. Drainage)
- DM: Blender: Installed
- DM Vacuum: Installed

#### Phase 2

- BSX-1224 Vacuum Former: 220 V 3ph 63A
- Cutting System: 110V 1ph
- Shop Air Compressor: 41500 SandBlaster: 110 V 1ph 8.5A
- KP800 V1000: 220 V 16A

#### Phase 3

- 1325 CNC: 220 V 3ph 109A -w/ Fused Disconnect
- KP800 V3000: 220 V 16 A
- Curing Station: 120 V 1ph 3A
- MJP 5200: 220V 3ph 80A
- Massivit 1800: 240V 1ph 20A
- Mimaki 3DUJ-553: 240 V 6.8A
- Carbon L1: 240 V 1ph 18A







- A. NASA 1
- B. ROTATING PART DISPLAY 1
- C. ROTATING PART DISPLAY 2
- D. ELECTROSTATIC CLEANER
- E. WAITING AREA
- F. NEW FRONT DESK LOCATION
- G. EDUCATION ROOM
- H. TOPOGRAPHIC MAP
- I. KODIAK VACUUM
- J. ARCHITECTURE MODELS
- K. CITY OF PHOENIX
- L. PUEBLO GRANDE
- M. PROSTHETICS
- N. SCUPLTURED MODELS

