

THOMAS S. EVANS

DESIGN PORTFOLIO: SNAPSHOT



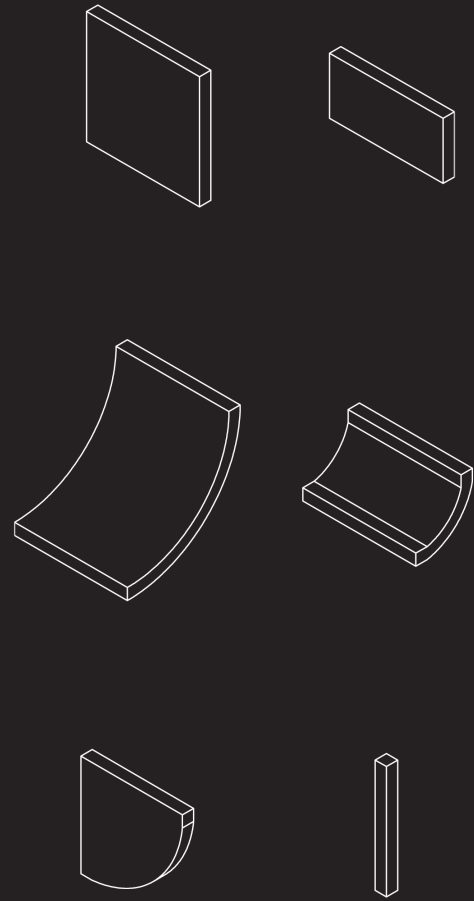
# multiwall

**mycetezoa-inspired modular construction**

multiwall emerged from an open-ended biomimicry design process that began with studying a biological phenomenon of interest and exploring some potential design applications inspired by the results of that research.

I was interested in slime molds in part because despite some brief attention, they remain a very mysterious group of organisms to scientists, let alone designers. I had no prior design solutions in mind when selecting them as my object of focus, but the process that followed yielded what may be my favorite project in this collection.

# multiwall

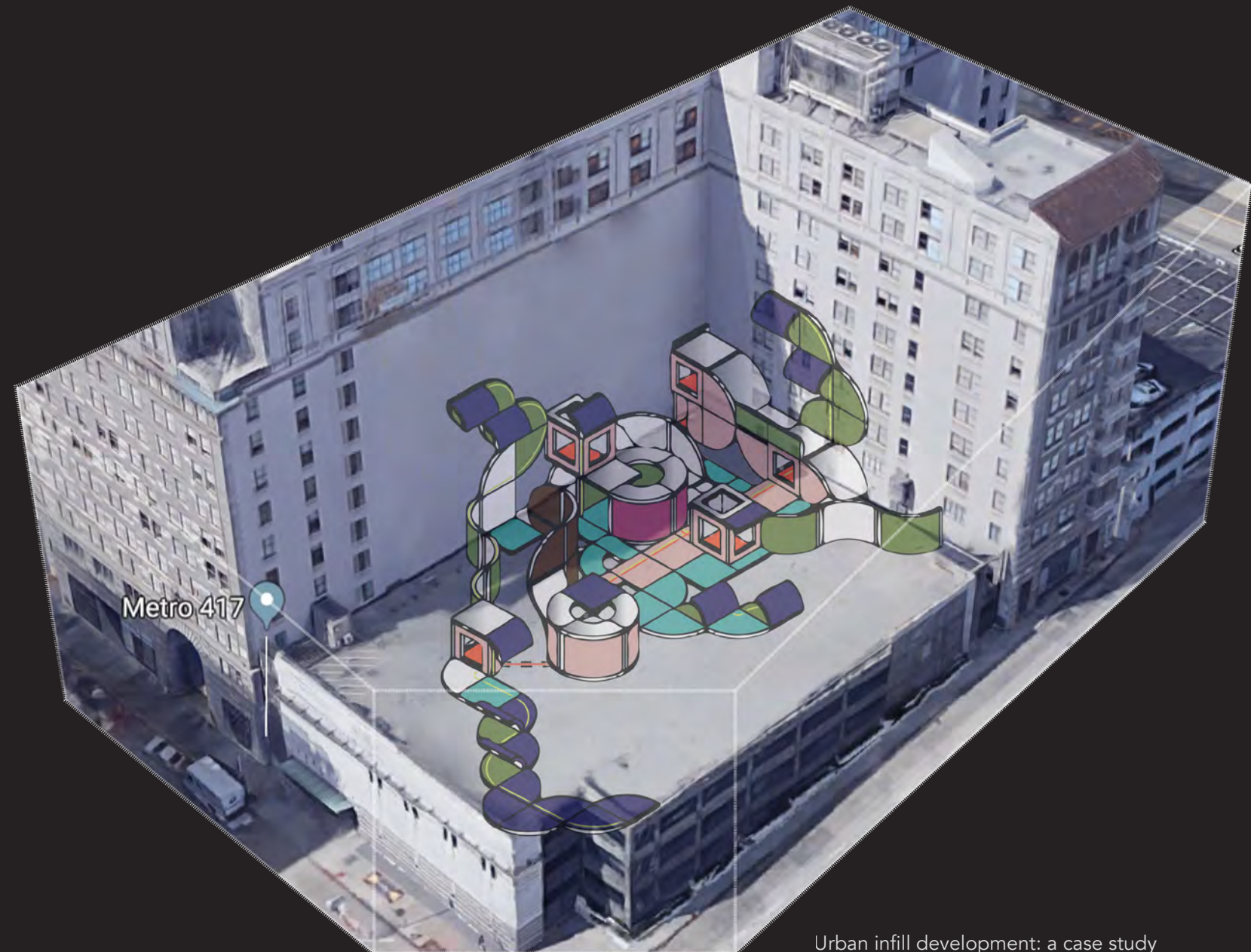


The six **multiwall** panels

MULTIWALL is an approach to modular construction informed and inspired by the Mycetozoa, aka "slime molds."

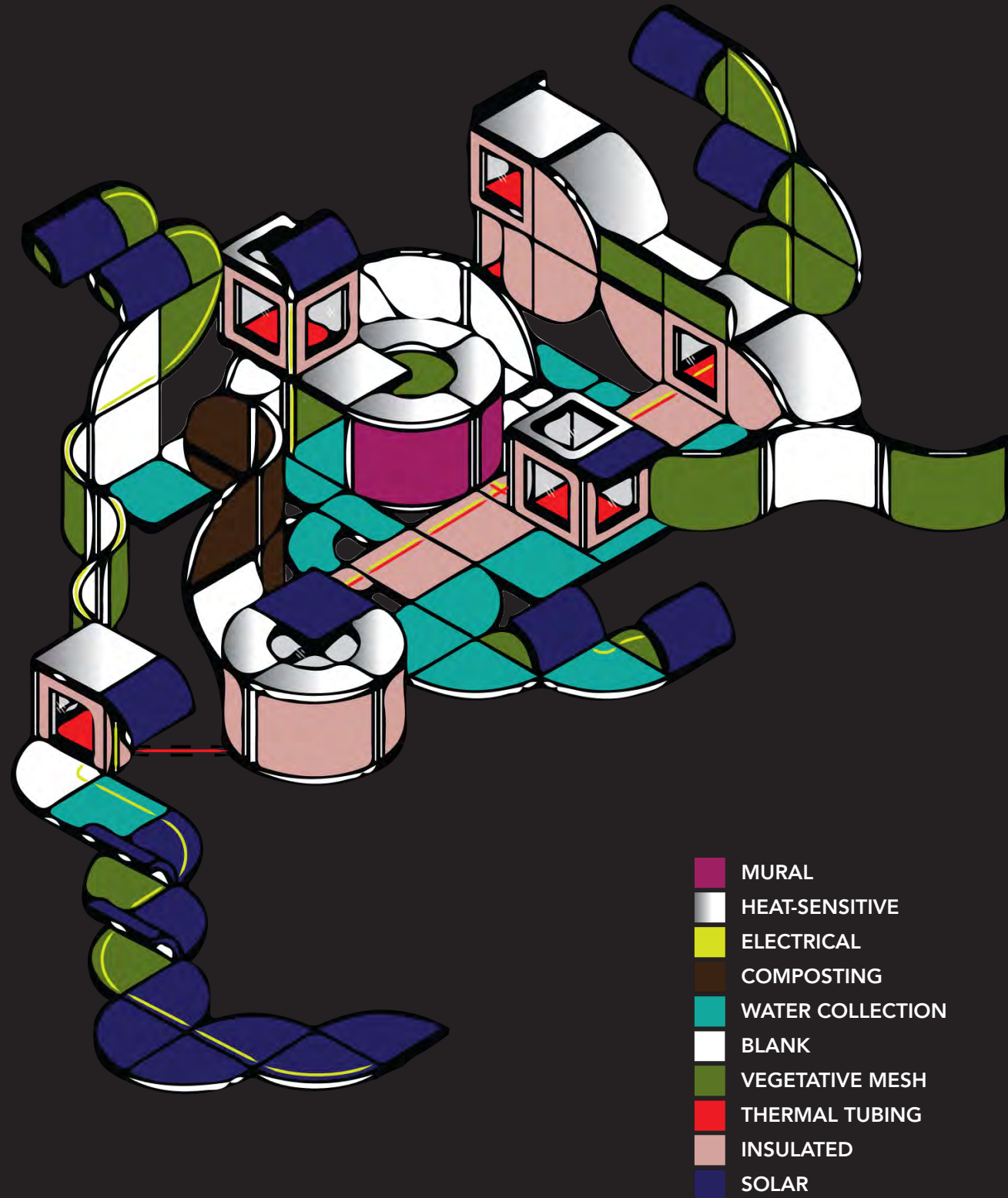
Like these molds, the panels can be combined into ambulating shapes that morph between private and public spaces, between interiors and exteriors.

The panels do not differentiate between use as ceiling, wall, or floor. Once installed, they can be equipped with claddings, fittings, fixtures, and internal fillings and pipings to establish their role in the building - but they are always ready to become something new.



Urban infill development: a case study

# adaptability



The panels can be modified with a variety of types of cladding or internal pipings and fillings. Attaching heat and pressure etc. sensors to the panels might enable real-time analysis of how efficiently certain rooms are heated, where air tends to accumulate etc.

This information could help guide adjustments to the infrastructure of the system, redirecting resources as necessary and identifying the most resource-efficient areas for expansion.

**frollicking egg** was developed in an effort to create a 3D puzzle that fits within a volume of 3 cubic inches, is composed of 4 interlocking pieces, and contains a hidden volume for storage of small objects.

What made this challenge interesting was finding a theme or implicit narrative to the product that “justifies” the geometry. There are plenty of puzzles of this kind that present themselves solely on the merits of the spatial challenge they offer - hopefully this attempt offers something somewhat new.



frollicking egg

May 2019



## frollicking egg



The puzzle consists of turning a hemisphere to produce sounds in a sequence that will enable the hemisphere to disengage. Rather than the tine approach considered in early ideations, this approach focuses on the possibilities of a “resonant bowl” for sound production.

An unofficial thematic goal emerged in the design process to seamlessly blend biological and technological cues - to make the object hover as much as possible between organic object and human artifice - in an attempt to create an otherworldly effect that is simultaneously accessible and pleasant, yet alien.

The biological formal influence can be seen in the stem plate (radiolaria/diatoms) and in the ribs of the upper part (mushroom gills). To push this a step further, the puzzle could potentially be made out of a type of chitin - the cellulose-like polysaccharide found in arthropod carapaces and mushroom stalks. Sustainable bioplastics made from this material are already under investigation.

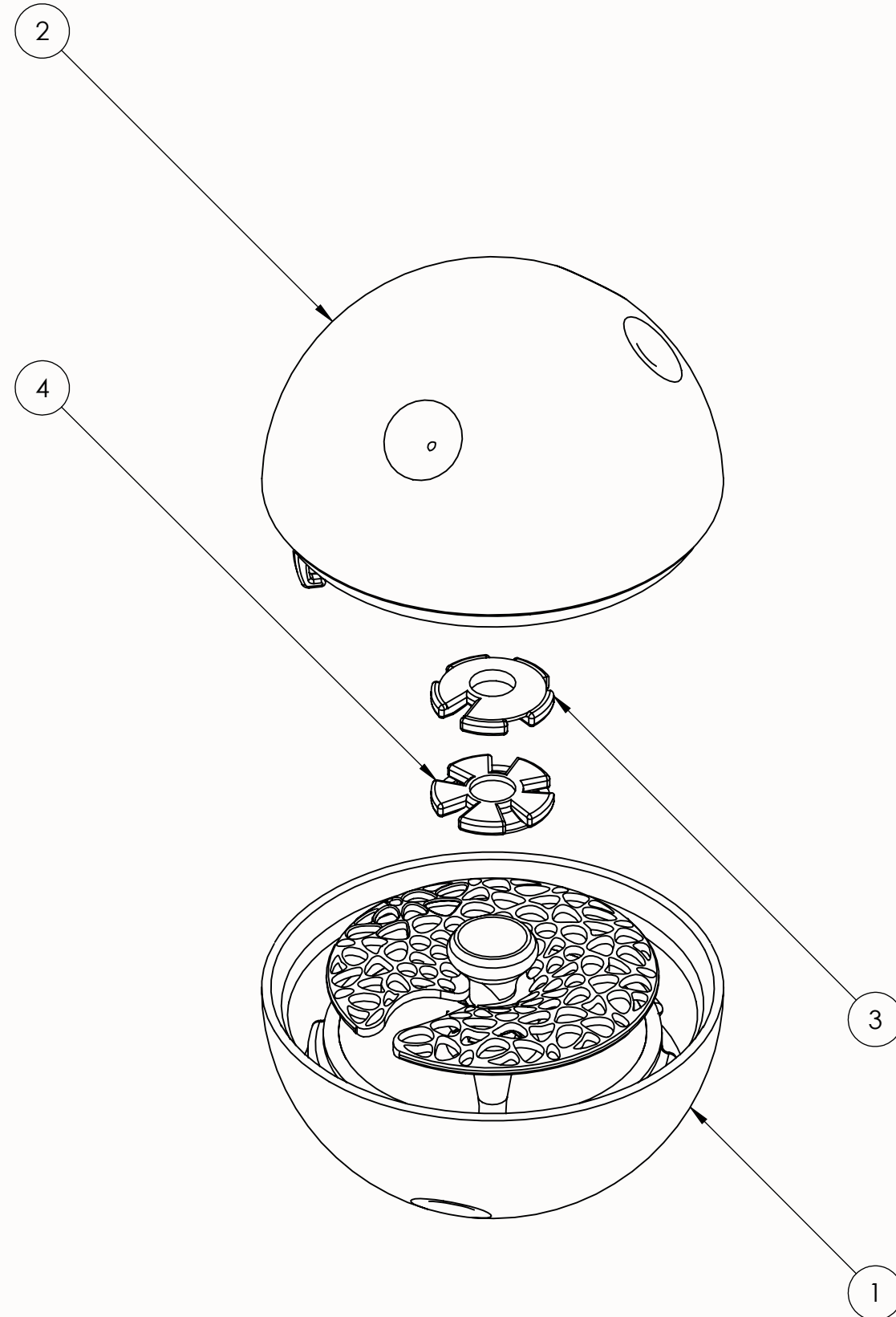
4

3

2

1

PART NO.	PART NAME	DESCRIPTION	QTY.
1	LOWER HEMISPHERE	CHITIN	1
2	UPPER HEMISPHERE	CHITIN	1
3	UPPER GEAR	CHITIN	1
4	LOWER GEAR	CHITIN	1
FEATURE		STATUS	
BASIC FORM		COMPLETE	
INTERLOCKING MECHANISMS		COMPLETE, POSSIBLE IMPROVEMENTS	
FORMAL ASPECTS		MOSTLY COMPLETE, NEEDS IMPROVEMENT	
SOUND PRODUCTION		BOWL, INTERFACE, SPEAKER HORNS ONLY	
EXTERNAL PATTERNING/CODING		INCOMPLETE	
RESET		DESIGNED BUT INCOMPLETE	
DETAILS			
MASS		0.244 lbs (as plastic analog)	
VOLUME		6.77 cubic inches	
CAVITY VOLUME		.065 cubic inches	
PIECE COUNT		4	



(SCALE: 1:2)

THOMAS S. EVANS

TITLE:

FROCKLING EGG ASSEMBLY

SIZE	DWG. NO.	REV
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<b>B</b>		
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SCALE: 1:1	WEIGHT:	SHEET 1 OF 1
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4

3

2

1

B

B

A

A

# ikikaza

Package-as-product decoration platform

January 2019

## **DESIGN PROCESS DOCUMENTATION**

The aim of this project was to develop a flat-packageable envelope for an arbitrary product. Consideration of how to approach the challenge led to an interest in flattening the distinction between the package and the product itself - an increasingly common theme in maximally dematerialized flat package designs.



# ikikaza

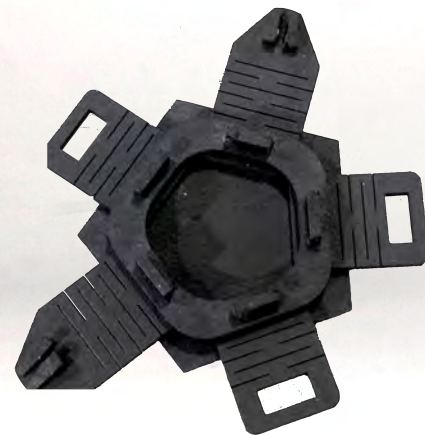
## PROTOTYPE 3: STRUCTURE



### PROCESS

This version uses two layers of mat board separated by spacers to create a .125" cavity between the inner and outer shell. This cavity provides a space through which mat board latches cut with a living hinge can pass.

Once reaching the aperture on the outer tiles, the latches spring back to catch on the edge of the tile. From the outside, they can be pressed to enable them to slide back out under the outer tile perimeter.



### DESIGN

Much of the design remains the same. The latches are of a similar shape to the previous connections; "permanent" connections between always-connected tiles have been simplified and made smaller. However, like the last version, all connecting elements are re-placeable.

### EFFECT

The open space and layers create a sense of discrete "islands" between each tile. The black on the inside might be better replaced with an off-white board or the tile on the outside with natural cardboard to break up the black, as it currently has too much of a "technical" feel.

### REMARKS

The two goals for this variant were to make the entire product 100% recyclable with no processing necessary on the part of the end user and to devise a more secure tabbing mechanism for constructing the sphere.

Due to the amount of dye used to make the black mat board, it may not be the most eco-friendly approach. Natural .0625" cardboard is a viable alternative.

The hinging latch mechanism works well to keep the sphere se-secure, but it can be a bit confusing to unlock it once assembled. An advantage of the prior iteration was that the sphere could essentially be pulled apart.

The space between the two layers and the flexibility of the hinges create a flimsy feeling. The nails have a tendency to slide out when assembled. Cardboard scraps from production could be used to make a simple glue to hold certain nails.

While this option is not fully recyclable, the cork tiles from the previous iteration are compatible with this version, so this de-sign could be "upgraded" with the cork for a deluxe edition.

### MATERIALS

0.0625" black mat board

### DIMENSIONS

OUTER HEX: 1" edge  
OUTER PENT: 1" edge  
SOLID: ~2.5" radius

### STRUCTURE

Some adjustments need to be made in order to fully realize this design. The interior tiles are a bit too large and the latches are a bit too long. Both of these issues prevent flush connections between the outside tiles - an easy fix.

Assembly is even more time-consuming than the previous version. Short of creating a novel production process, the design would likely need an overhaul for mass manufacture.



# ikikaza

PROTOTYPE 3: USE



Unfolded net

## VERSATILITY

Like prior iterations, the open **ikikaza** net can be used for decoration by placing tiles with various shapes into the spaces provided. It can also be hung up flat on the wall as a decoration in itself.

Different versions might be suited to different uses.

One version might have an empty space on both layers, so that when the net is folded into a sphere, it can be attached to a lightbulb to act as a lamp.

Another version might make use of the cavity between the two layers, to allow for planting small plants.



Half dome configuration with center pillar

## ASSEMBLY

This is the first design to actually produce and incorporate the central pillar. This pillar acts as an internal support for the sphere as well as acting as storage. It is hexagonal in shape with enough space to hold all of the cork tiles (if used) or game tiles within.

Extra cartridges (the smaller pillar pictured) might contain preferred objects or be used as additional space for holding accessories and tile packages. Up to 6 can fit onto the central pillar within the sphere.

These cartridges could be sold separately and mix-and-matched at initial purchase so users can decide what functionality they want for their **ikikaza**.

All kits would come with spare connector pieces and nails for user repair.

## STRATUM

player reference

### TURN SEQUENCE

**LAND:** Use the land ability of the tile you are on.

**MOVE:** Place one of your land tiles on a space. Land tiles can be placed on any space that has a type change.

**DRAW:** Take a tile from the main stock.



**VICTORY:** Collect all five rings and reach the center space.

### LAND TILES

- abyss**  
Ends Move phase (no ability).
- cave**  
Use the ability of any land tile.
- horizon**  
Use in any number of tiles.
- vista**  
Draw a land tile of any type.
- cloud**  
Move one space.
- volcano**  
Place or remove a tile.
- forest**  
Place a tile from your stock.
- gate**  
Move to space with gate of same shape (if present).

### AFFINITY (OPTIONAL)

- form**  
If on an Abyss, place a land tile of any type on any Abyss. This can be from your stock or the main stock.

## MATERIALS

0.0625" mat board,  
various colors

## DIMENSIONS

OUTER HEX: .75" edge  
OUTER PENT: .7" edge  
PIECE HEIGHT: .75"

## GAME

*Stratum* is a reference to the strata in rock formations used in biology and geology to piece together the history of Earth and the evolution of life.

Players seek to acquire one each of five rings located at the far end of each of the 5 arms of the **ikikaza** net. As they do so, they place tiles that represent different types of land that each have their own powers that players can draw upon.

Because the game board is blank, players can create their own tiles and invent their own games that take advantage of the uncommon board structure that the **ikikaza** net provides.



Stratum land tiles and player pieces

\*The following are excerpts from a presentation that covered development up through the most recent exposition to an audience.

Pasadena City College has few recycling bins, and trash bins are frequently filled with recyclable material. Furthermore, there was no comprehensive map of the location of recycling bins or trash cans, as individual workers learn their clean-up routes by area.

The goal of the research was to create such a map, sample can contents, gauge student satisfaction or lack thereof in recycling options, and use the results to identify ideal locations to install additional bins.

The project was carried out with the Sustainability Committee of Associated Students of Pasadena City College in Spring 2019.

# PCC RECYCLING

SPRING 2019

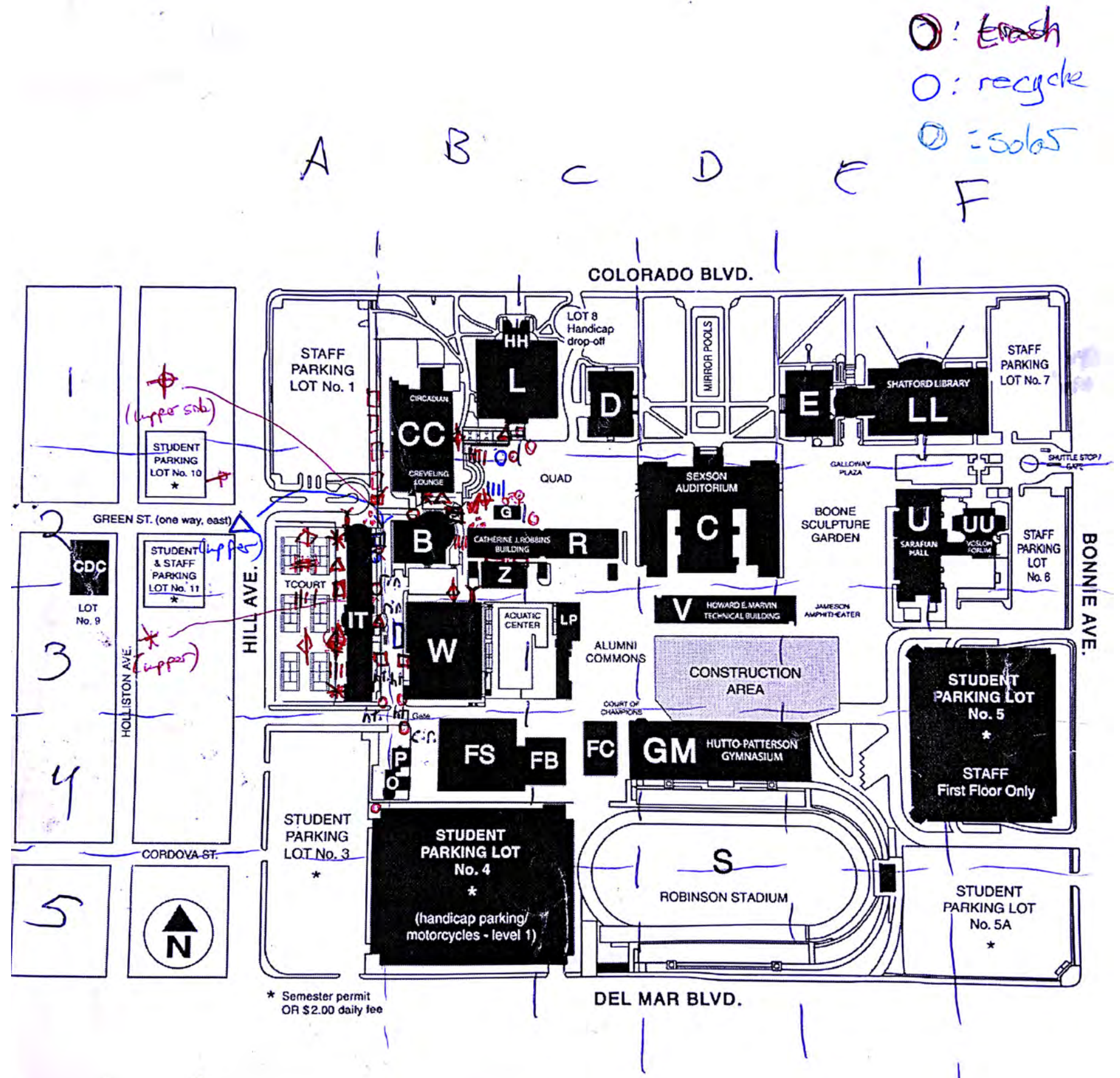
# ASSESS

SURVEY DATE: APRIL 1st, 2019

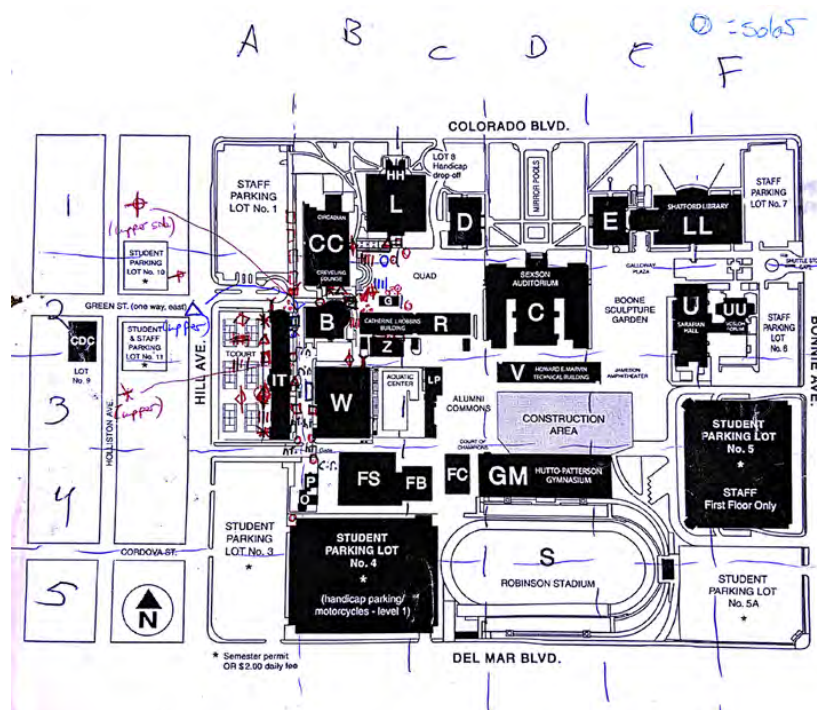
This preliminary sampling of PCC bins provided a firsthand look into the state of trash and recycling on campus.

An improvisational approach informed the cataloguing scheme, under the assumption that distilling a formalized categorization method from the data collected and symbols used would result in superior comprehension.

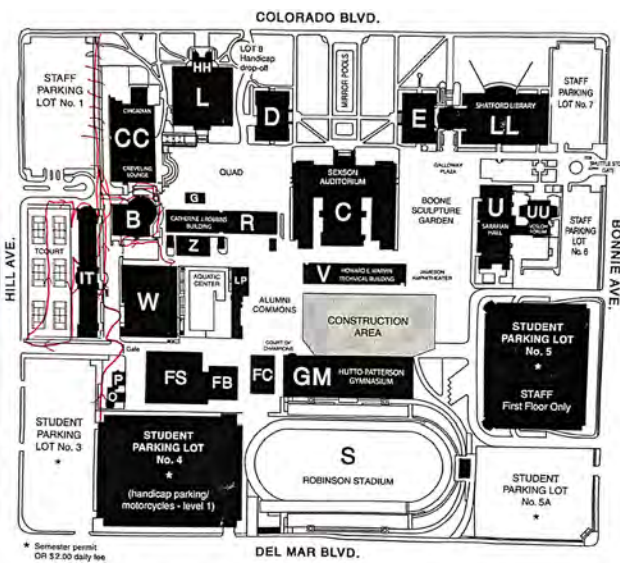
First survey map with ad hoc notation. The map used was outdated, preceding completion of the Center for the Arts building.



# FORMALIZE



The original grid was split according to major planning lines



TYPE	LEGEND	INSTANCE OF TYPE
dumpster	♠ : covered trash	○ 1 <sup>st</sup>
	♣ : chute-top	□ 2 <sup>nd</sup>
	○ : open-top	△ 3 <sup>rd</sup>
	∨ : bin	* 4 <sup>th</sup>
	⊞ : filled (bottle/can)	5 <sup>th</sup>
		⊕ 6 <sup>th</sup>
	○ : trash	
	○ : recycle	
	○ : solar	

*Handwritten notes on grid analysis:*

A2: ○/□ two recycling bins not obviously being used for recycling. In a "dump zone" / trees, bulk waste etc. Contain mainly paper waste & plastics. GI: glass FC: food container Bx: Box

F: full  
ME: mostly empty

A3: \* mostly empty (ME), PIB & PaC w/L (ca 1)

A2: □ ↑ PaBx, GIB, HB, PaFC

A3: ⊕ ME | PIB

A3: \* ↑ PaFC w/PIL, PIB, MC, PIC w/PIL, Pa<sup>S</sup>

A3: ⊕ PIB (29), PaFC, PaC

A2: ||| ○ ME | PIB, PIC w/PIL, MC

A2: ⊕ PIB (26)

A2: \* ↑ PIC (23), PaC w/PIL, PaFC (23) w/PIL (1)  
note proximity to food strip to North

A2: △ ↑ PaFC (22), PIC (22)

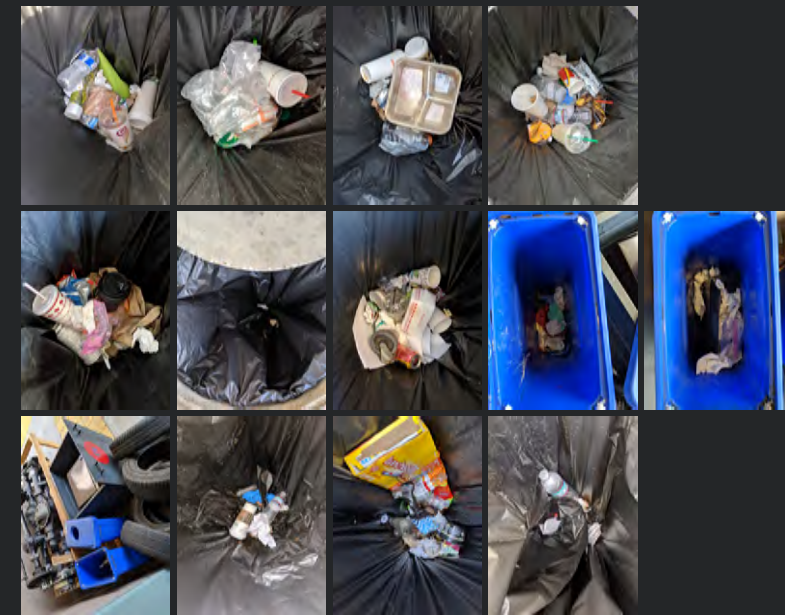
A2: ∨ ↑ MC, PIB, ~~PaFC~~ PaBx

A2: ∨ ↑ GIB, PaC w/PIL (22), PIC (22)

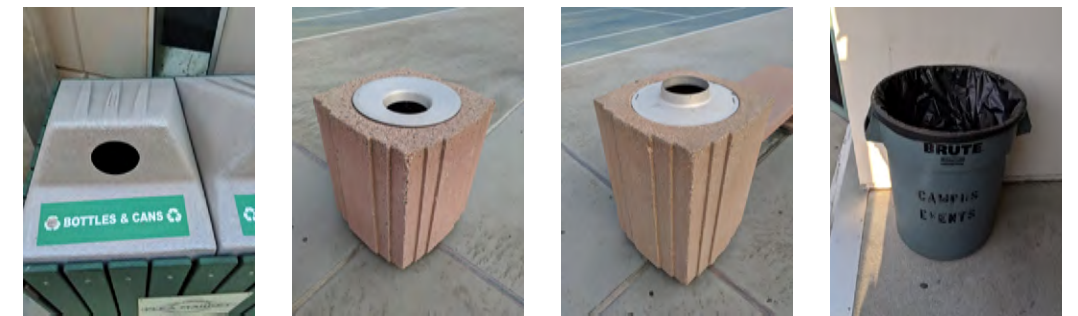
A2: △ FULL

A2: ⊕ ME | PaC

Record of bin contents, forms, grid locations



Bin sampling photos



Bin form code examples

<b>PI</b>	<b>Pa</b>	<b>M</b>	<b>O</b>
PLASTIC	PAPER	METAL	OTHER
<b>C</b>	<b>L</b>	<b>Bo</b>	<b>Bx</b>
CUP	LID	BOTTLE	BOX

Material and product type code examples

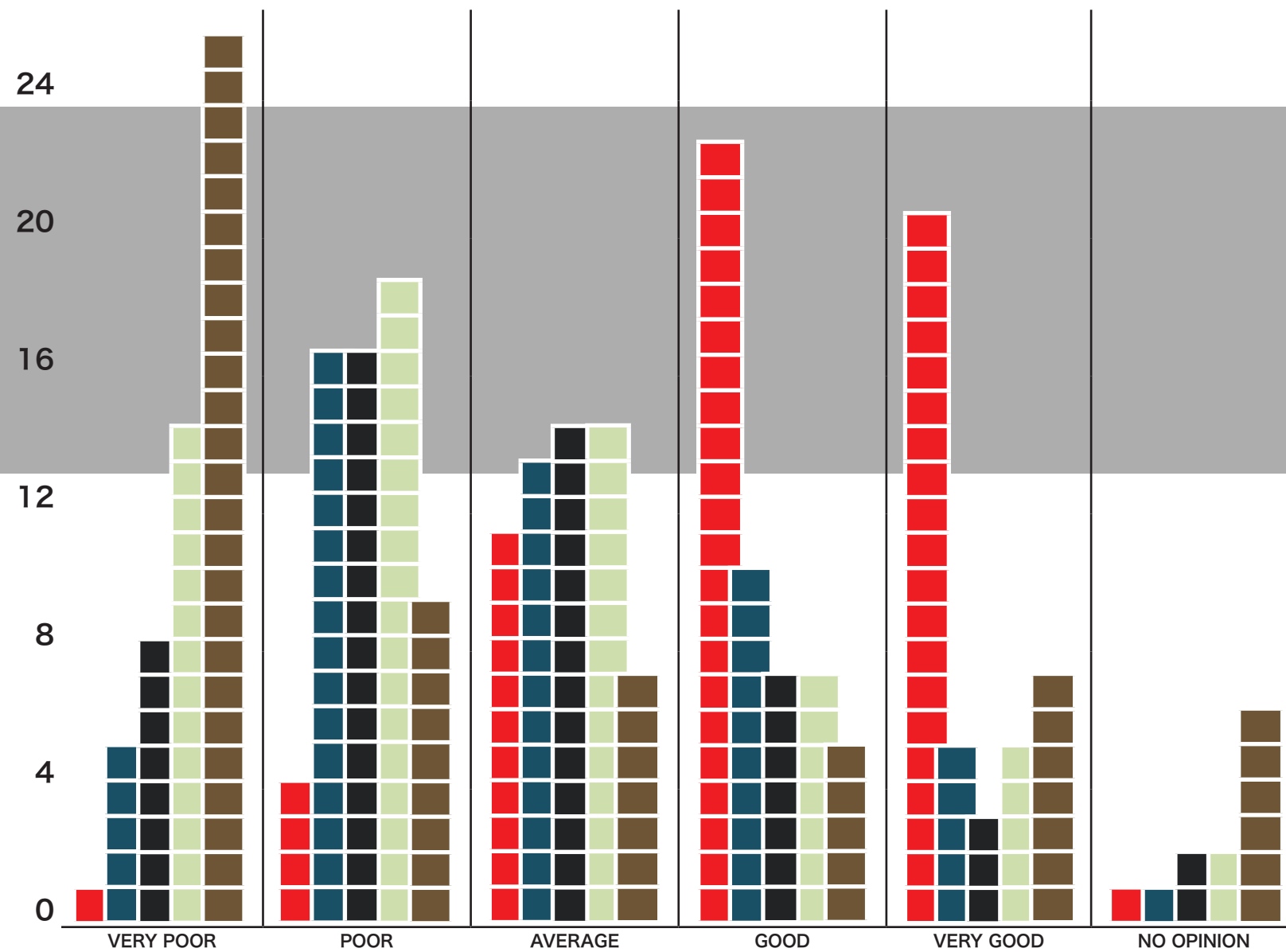
Development of the legend in an ad-hoc fashion based on what was found in real-time

# RESULTS

responses

ONLINE | 36  
PAPER | 21

p | 25000  
n | 57  
CI | 95%  
MoE | 12.9%



## CAMPUS BIN AVAILABILITY

highest satisfaction  
trash can availability  
**42 positive**

lowest satisfaction  
compost bin availability  
**34 negative**

### PCC SUSTAINABILITY

leader | 8  
good | 17  
**average | 20**  
poor | 6  
behind | 2  
don't know | 4

### IMPORTANCE TO YOU

**very important | 36**  
somewhat important | 16  
unsure | 5  
not very important | 0  
not at all important | 0

Additional surveys to be conducted on Thursday, 4.25.2019. Because the event is an environmental documentary screening, there may be a self-selection bias to those results.

THANK YOU