Design Statement | ID 349
Project Title: Containing COVID-19

The Studio Objective

We are in the midst of the greatest public health crisis in a generation. Designers are grappling with ways that they can join the fight against COVID-19 through architectural and product solutions. This studio asked designers to consider how architecture can provide quick solutions in emergency situations that drive the response experience for professionals, patients, and the community. The goal is to create an active response center that can be built quickly and deployed within a community experiencing a contagion or other public health crisis.

Problems Present

A testing center must respond rapidly. However, these facilities require specific equipment and appliances that increase time of construction on site. Essential healthcare workers are taking the brunt of the cognitive load from this pandemic, leading to increased levels of stress. The testing center must be designed with their needs in mind in order to support long hours of work in high pressure situations.

Design Strategy

"Containing COVID-19" is an adaptable and rapid response that minimizes time between on-site construction and implementation. The project is comprised of 20' shipping container modules which arrive on site fully fabricated. The modules arrive in phases depending on the site's needs, therefore, allowing for incremental investment.

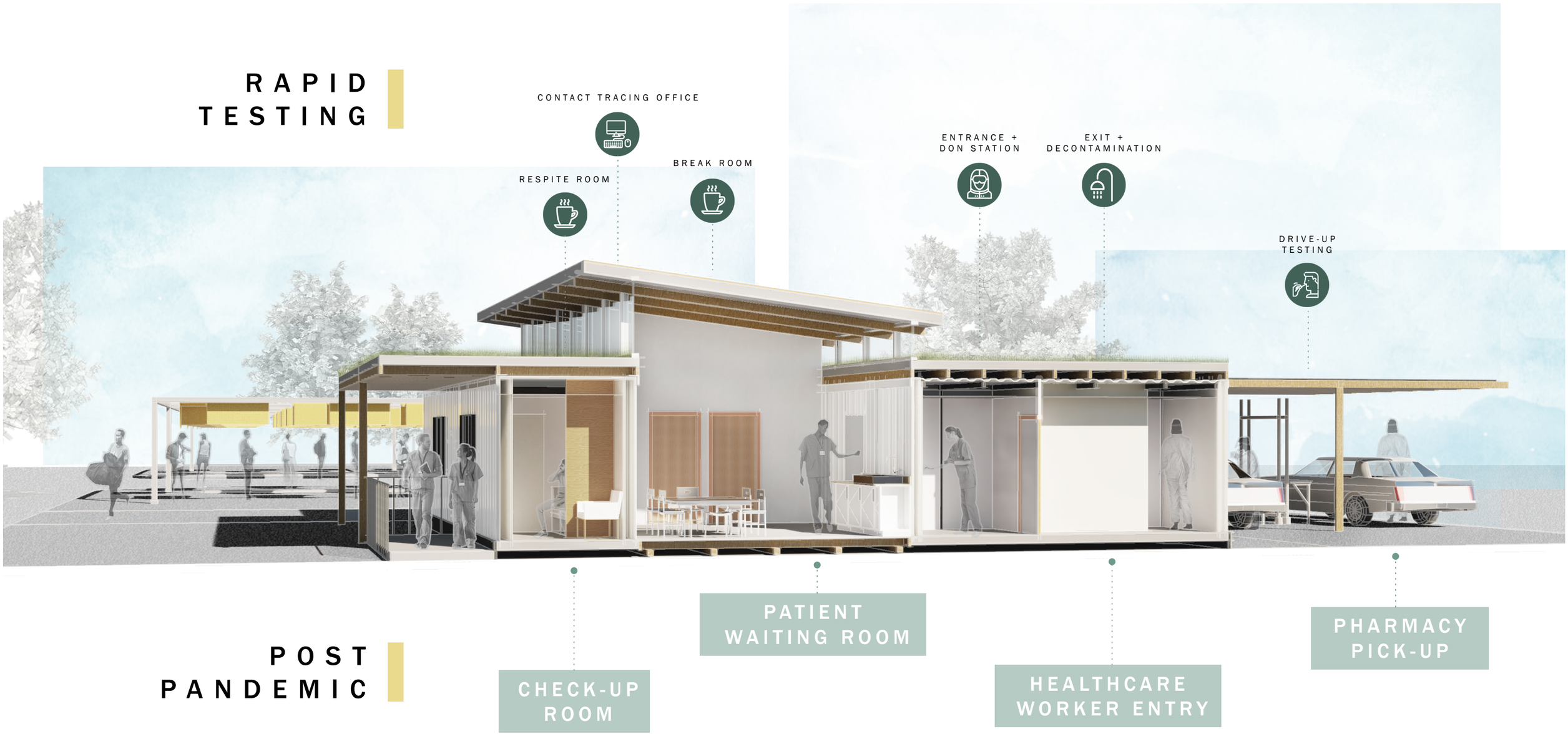
Phase 1 is one 20' long shipping container and is used for walkup testing. There are two testing booths with enough space for packing samples, cold storage, and biohazard waste. Phase 1 is the most rapid response, yet still prioritizes worker safety with the enclosed container acting as an additional safety barrier. Phase 2 adds two additional containers with a covered drive-up testing lane and two more testing booths. It also provides additional storage space to keep up with testing capacity and a dedicated restroom for workers as well.

Phase 3 is meant for sites with a high rate of contamination. Adding two more containers creates a dedicated DON/DOFF cycle. Phases 1 and 2 don't have this program attached because they are only temporary solutions. When a site foresees a prolonged testing use and increasing positivity rates, this phase will be important to help prioritize worker safety and establish a solid presence.

Phase 4 will be implemented for sites that predict a long-term use of the facility such as for vaccine distribution or even conversion to a healthcare facility, especially for socially vulnerable communities that already lack access to healthcare. This phase comprises of two more 20' shipping containers and a wall panel system with wood frame construction that uses the containers on site for additional structural support. Construction for this phase can occur while the rest of the building is still in use. This phase will add staff support spaces like a break room and respite room as well as contact tracing offices and meeting room space.

The project is designed with way-finding tactics in order to prioritize worker wellbeing. These tactics aim to decrease cognitive load during shifts by making a simple flow of circulation and clearly separated zones between contaminated and clean spaces.

RAPID TESTING



POST PANDEMIC

CONTAINING COVID-19

The situation with COVID-19 is constantly changing. Spikes in cases can occur within days and the need for testing is critical. A testing center must respond rapidly, yet these facilities require specific equipment and appliances that increase time of construction on site. “Containing COVID-19” is a solution that is adaptable and a rapid response that minimizes time between on-site construction and implementation. The project is comprised of 20’ shipping container modules which arrive on site fully fabricated. The modules arrive in phases depending on the site’s needs, therefore, allowing for incremental investment.

The project is designed with way-finding tactics in order to prioritize worker wellbeing. These tactics aim to decrease cognitive load during shifts by making a simple flow of circulation and clearly separated zones between contaminated and clean spaces. “Containing COVID-19” differs from current solutions because of its intentionality in worker safety and wellbeing yet with an emphasis on efficiency, practicality, and flexibility.

EASING COGNITIVE LOAD WITH DESIGN PSYCHOLOGY

Healthcare Professionals can rarely control the amount of information that comes to them: in both manner and speed at which it is delivered. They are required to process information quickly and to determine if it is useful, urgent, or of consequence. This creates an enormous amount of cognitive load which can lead to mistakes at work.

Cognitive load is the amount of information a person holds and processes within working memory. Working memory is the ability to remember and use relevant information while in the middle of an activity. The consequences of cognitive load are detrimental in the healthcare space. 250,000 to 440,000 people die each year from medical errors in the United States. 75% of medical errors result from distraction and are caused by cognitive load. The high cognitive load on workers can be mitigated through intentional design. This is crucial in healthcare spaces when decisions at work are high-stake and the well-being of healthcare workers should not be ignored.

INTRINSIC COGNITIVE LOAD
WHAT YOU BRING

COGNITIVE LOAD FROM THE PHYSICAL ENVIRONMENT CAN BE MITIGATED THROUGH WAYFINDING DESIGN

EXTRINSIC COGNITIVE LOAD
WHAT THE ENVIRONMENT DELIVERS

GERMANE COGNITIVE LOAD
HOW YOU MAKE SENSE OF IT ALL

PRINCIPLES OF IMAGEABILITY

HOW THE MIND UNDERSTANDS SPACE

Imageability Elements by Kevin Lynch

DISTRICTS
Groupings of space
Common identifying character

PATHS
Channels people travel through

NODES
A point to anchor and reorient

EDGES
Boundaries
(Real or Perceived)

LANDMARKS
Points of reference
Clues of identification

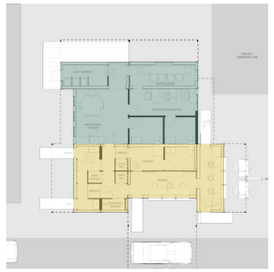
Imageability Elements Adapted to COVID-19 Testing Centers

APPLIED WAYFINDING

DISTRICTS

CLEAN DISTRICT
No PPE needed

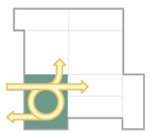
Spaces include:
Break Room
Respite Room
Contact Tracing Offices
Meeting Room

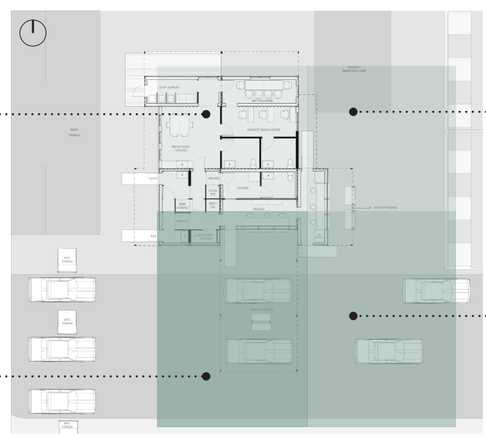


HOT DISTRICT
PPE Mandatory

Spaces include;
Don/Doff Cycle
Laboratory
Cold Storage
Testing Stations

NODES





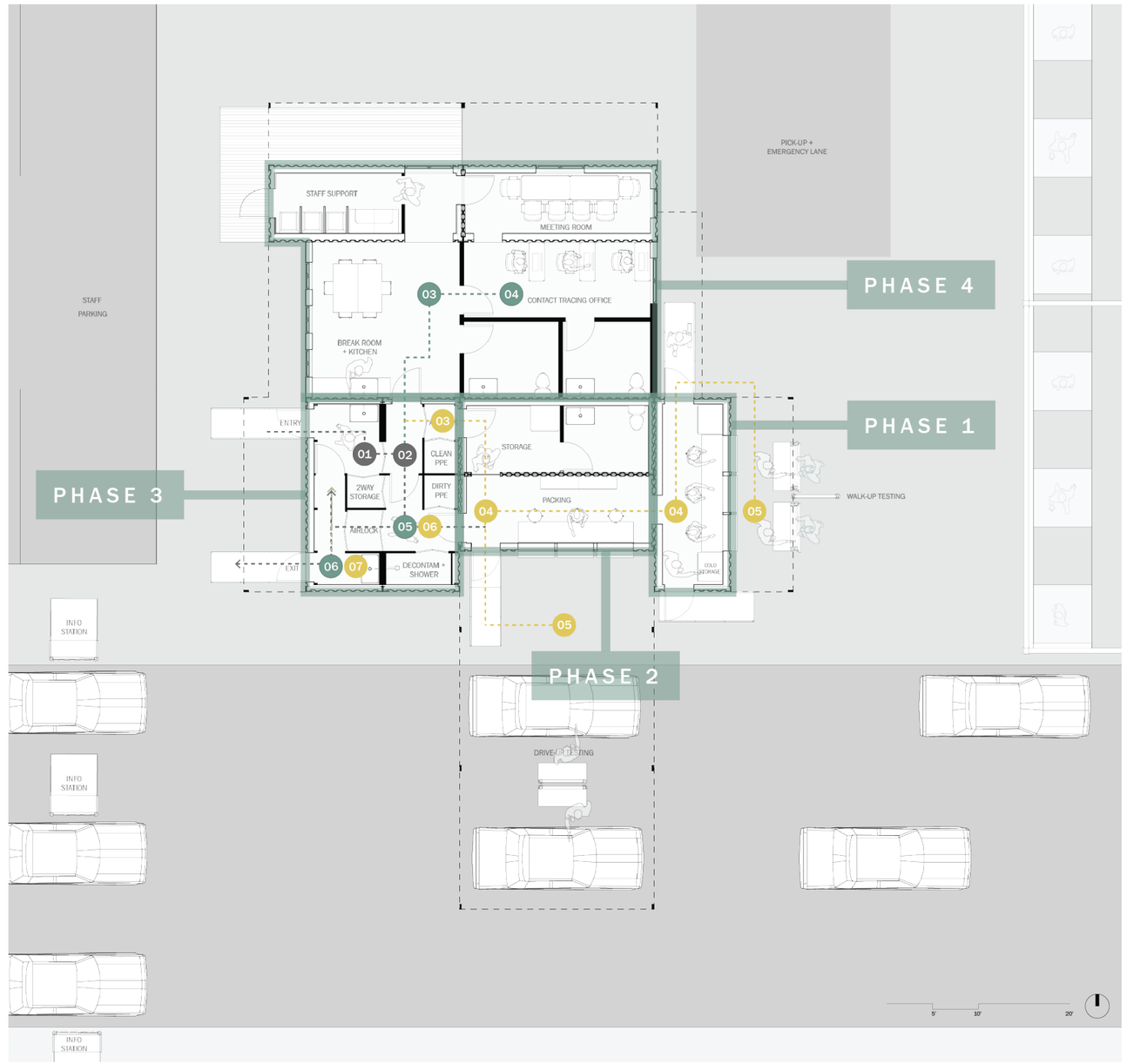
PRE DON

ENTRY OR DON

DOFF

EXIT OR RE-ENTRY

PATHS



WORKER PROCEDURE
CLEAN ZONES

01 REMOVE STREET CLOTHES + SANITIZE
02 ENTER TRANSITION ROOM
03 ENTER CLEAN ZONE
04 ENTER OFFICE/MEETING ROOMS
05 RETRIEVE STREET CLOTHES AND DECONTAMINATE
06 EXIT

WORKER PROCEDURE
HOT ZONES

01 REMOVE STREET CLOTHES + SANITIZE
02 ENTER TRANSITION ROOM
03 ENTER AIRLOCK AND DON PPE
04 LAB WORKERS ENTER PACKING AREA
05 TESTERS EXIT BUILDING TO DRIVE-UP OR WALK-UP TESTING STATIONS
06 RETRIEVE STREET CLOTHES AND DECONTAMINATE
07 TO RE-ENTER CLEAN ZONE, BEGIN CYCLE AGAIN OR EXIT

TESTING RATE
Information Collection
Approx. 3 min

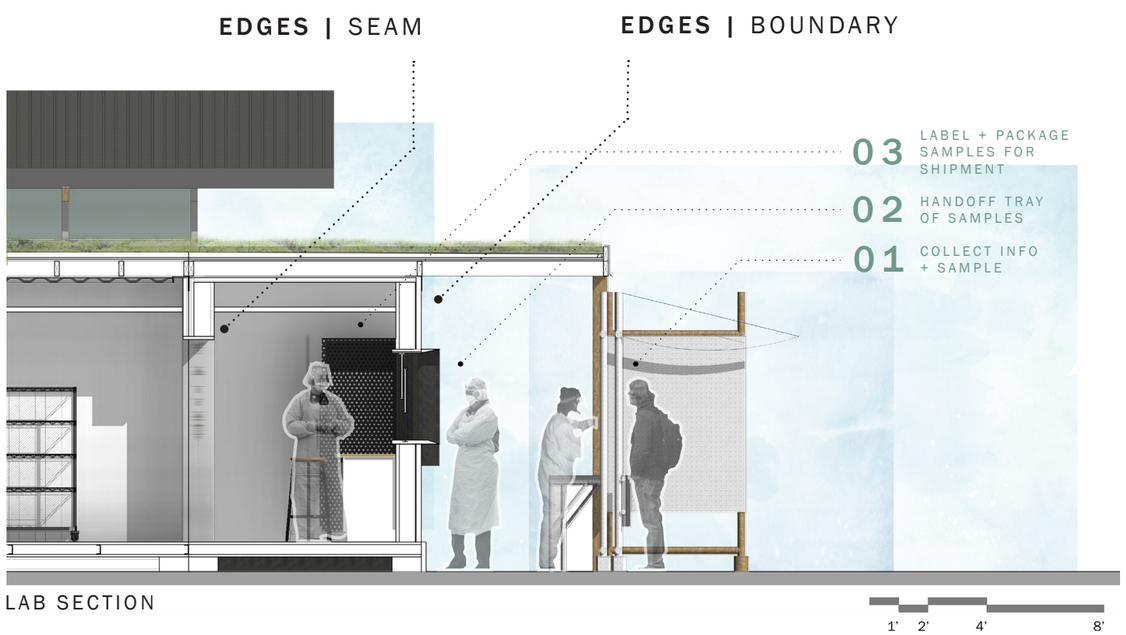
Nasal Swab
Approx. 1 min

STATIONS
Information Collection
3 stations

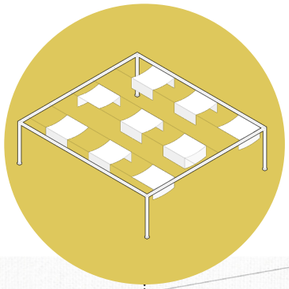
Nasal Swab
2 stations

TESTING CAPACITY
60 cars / hour

EDGES

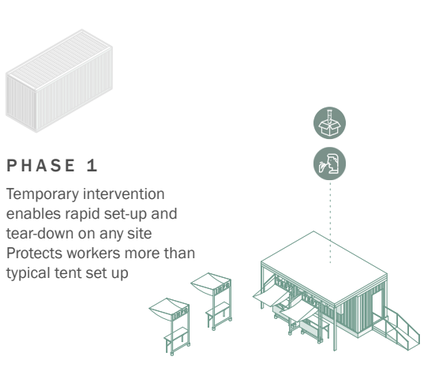


LANDMARKS



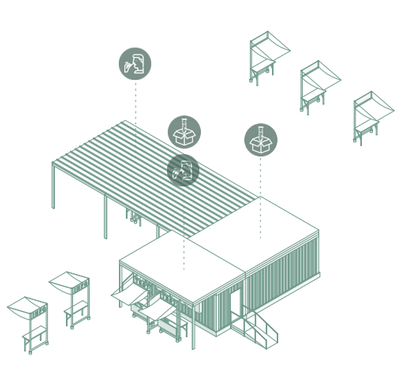
The module consists of a wood frame structure with cables spaced six feet apart. 6x6 canvas sheets are hung also spaced six feet apart, creating a grid with social distancing in mind. Similar to the stickers used at grocery stores, the canvas sheets are meant to guide patients along the line as they wait and to encourage patients to maintain proper distance. This design goes beyond stickers because it is designed for intuitive social distancing. Many times the stickers go unnoticed, but these canvas sheets are visual cues as well as a shade for patients waiting in the sun. The name is derived from the German term biergarten, or beer garden, as it creates a similar calming ambiance.

PHASED MODULES



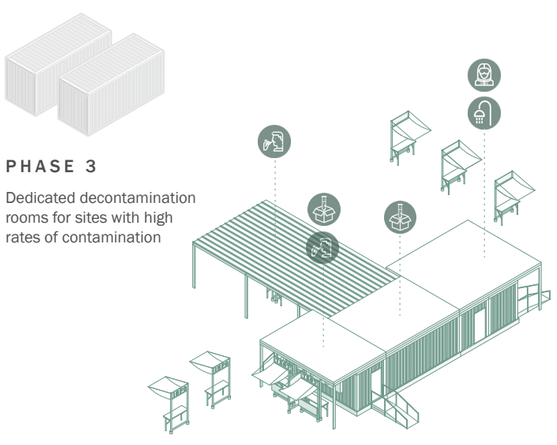
PHASE 1

Temporary intervention enables rapid set-up and tear-down on any site
Protects workers more than typical tent set up



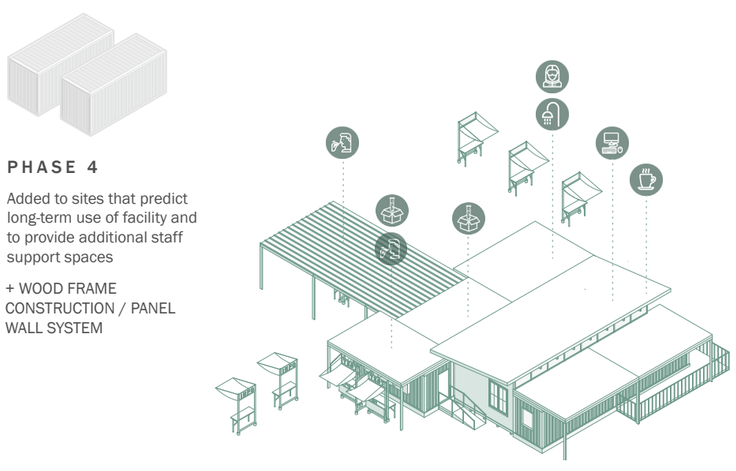
PHASE 2

Temporary intervention adds to testing capacity with drive-up lanes



PHASE 3

Dedicated decontamination rooms for sites with high rates of contamination



PHASE 4

Added to sites that predict long-term use of facility and to provide additional staff support spaces

+ WOOD FRAME CONSTRUCTION / PANEL WALL SYSTEM