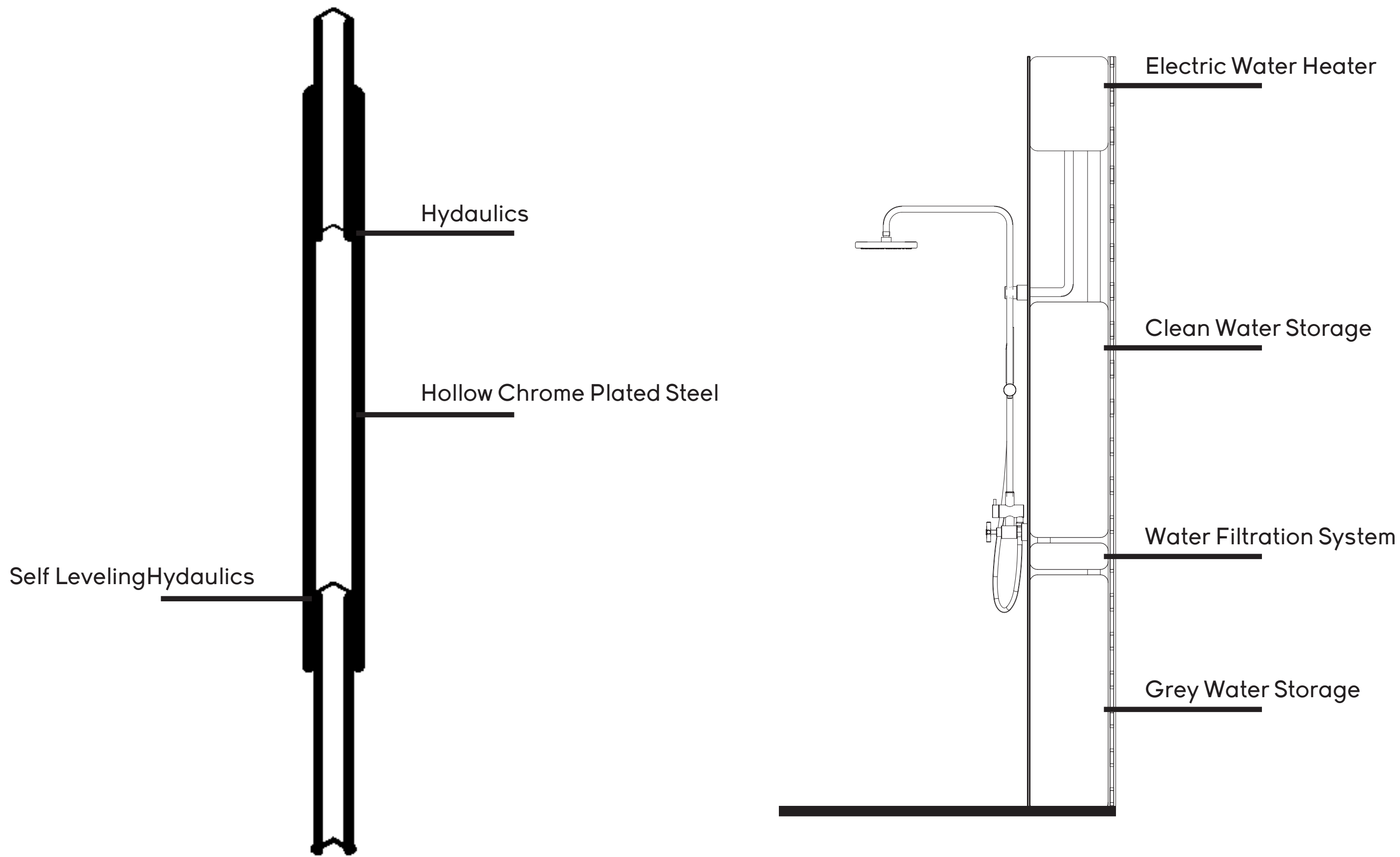
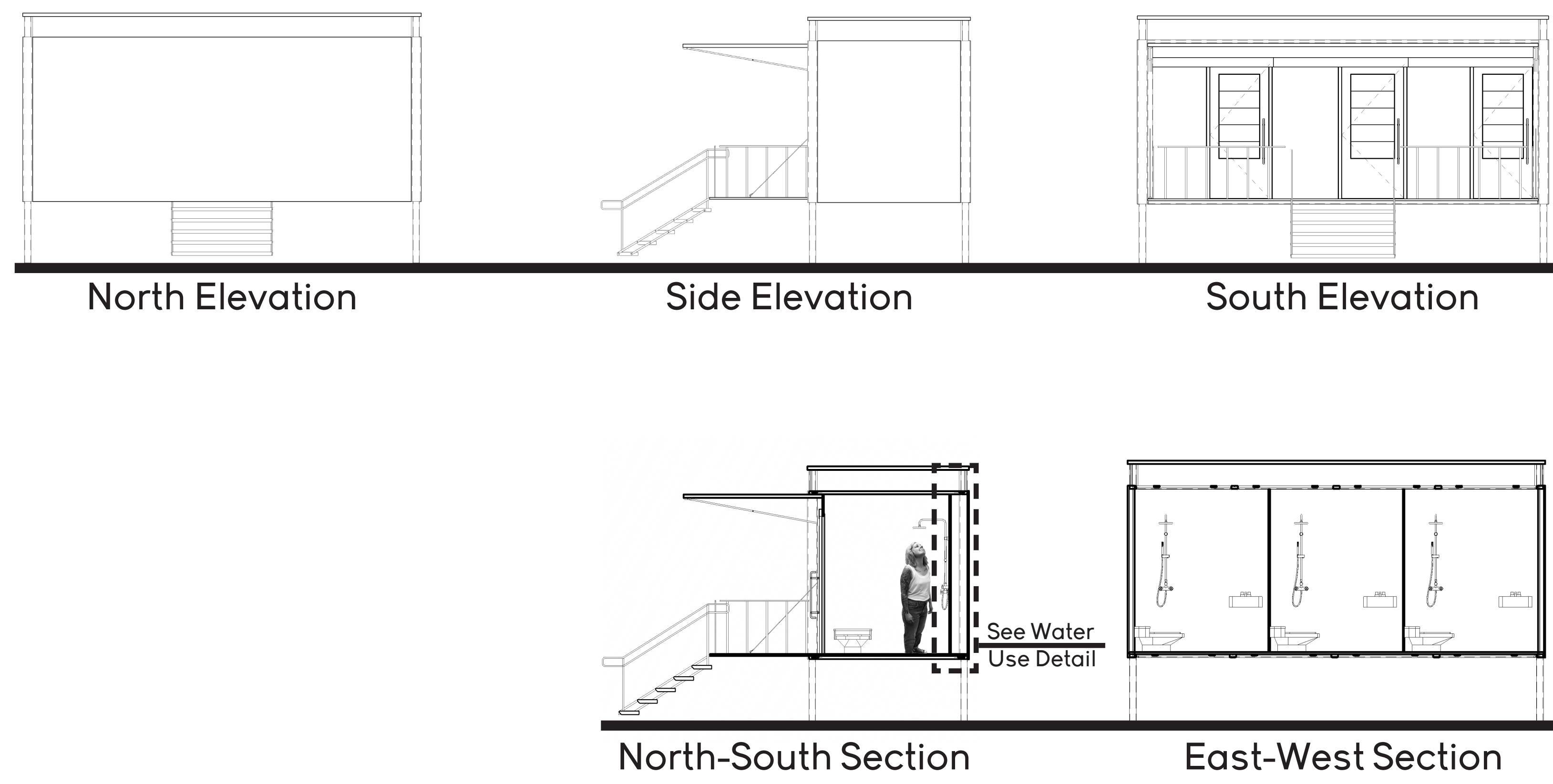
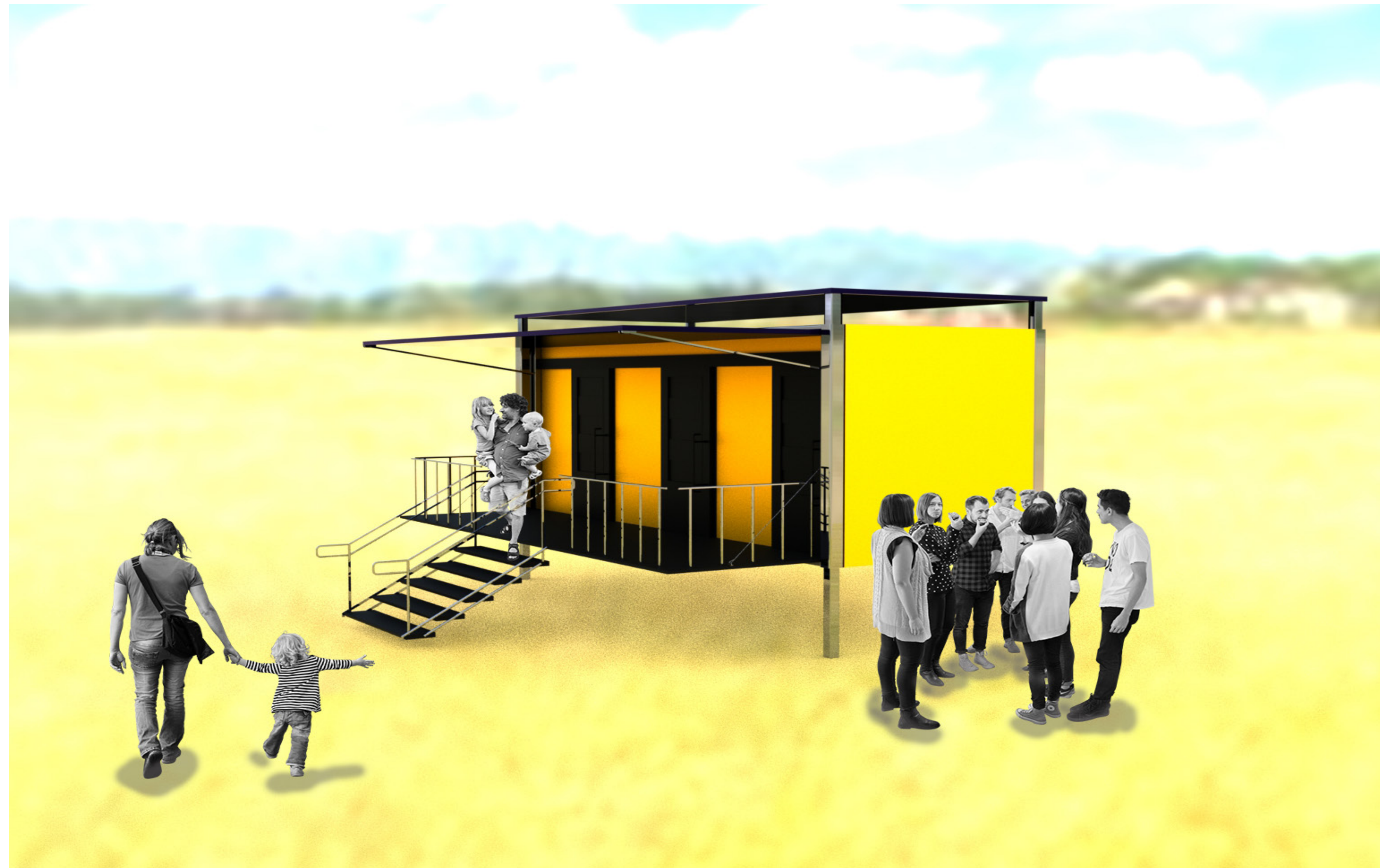


Refresh Unit



Hydraulic Detail

Water Use Detail



When Mother Nature Attacks

Response System Application

Looking throughout history and studying past disaster not only shows that every disaster is unique, but that each response is different. This research of the past helped develop questions for the response system application that can aid in calculating the required services for a disaster area.

The application is used to bring the entire response system together with the different types of units sent based on the level of need. This was designed with the users in mind. Those users include but are not limited to first responders, emergency managers, hospitals, and government officials.

This resource is currently unavailable before this point in time, and can be used to develop a uniformed response system for the entire United States that can be highly effective in providing aid.

Since nothing can produce data without asking questions the following questions were developed in the response system smartphone application that once collected can supply the design for the best response possible with the designed units.

What kind of disaster? This question refers to the main disaster that is the epic center of the event and the start of the following disasters that may be involved in a chain reaction. The selection of answers to the question are earthquake, flood, hurricane, landslide, tornado, tsunami, wildfire, and volcanic eruption. Only one can be selected since there is only one event to start the chain.

What other disasters are created? This question refers to the disasters that are created from the epic center disaster, the chain reaction. The selection of answers are floods, fires, landslides, tsunamis, and volcanic eruptions. Multiple secondary disasters can be selected since one event can cause many different disasters.

What is the location? This question is linked to google maps that are available at the bottom of the response system smartphone application. Each map is designed to search the given area for locations and phone numbers of hospitals and Air Force Bases in the immediate area. Users just need to input the City and State where they require aid to be provided.

What is the amount of the population affected? This question is the most difficult to answer since it is impossible to take a head count of the affected area. The number is based on city population since the amount of people in an area is always in flux. There is a total of about 326 million people in the United States, but as little as 100 could be affected by a single disaster. Population is visualized within the map and graphs above the screen.

How can architecture improve post disaster response?

"Emergency management is not just the responsibility of emergency managers."

A disaster is defined as the interaction of nature and people that results in the destruction of property

Nature is an ever-changing element in our world that we are unable to control or predict so all we can do is react. It has the ability to rip away our entire way of living without little to no warning. Life can change in the blink of an eye, but the most difficult part about disasters is that everyone responds differently. Each county within the United States have a different way of helping survivors after a disaster. Problems arise when disasters stretch over different jurisdictions and each area has different protocol of accepting outside aid.

The question to ask ourselves now is: How can we as designers supply a more uniform way of responding to disasters?

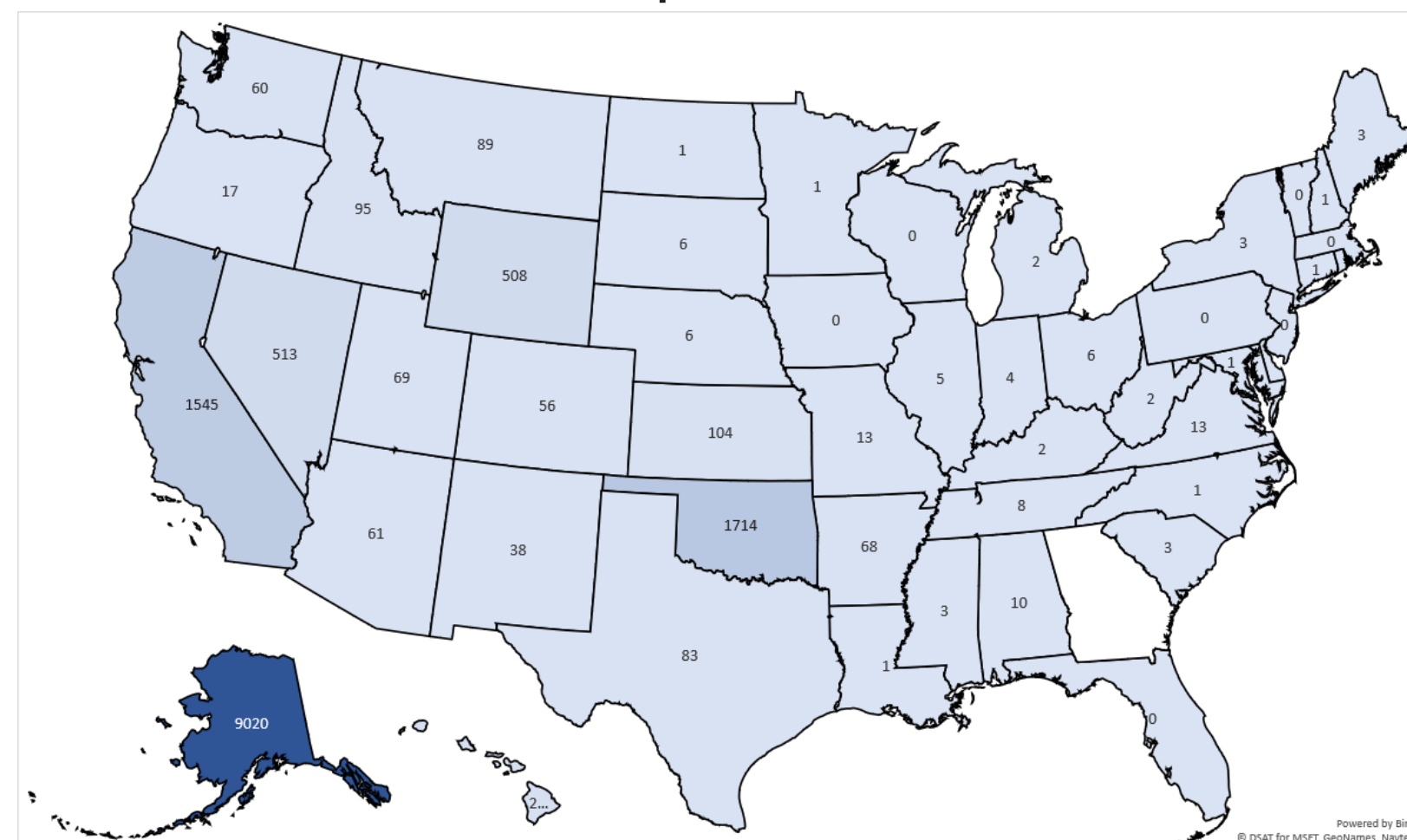
This project was developed to provide a uniformed response based on deployable units that can be sent to aid in response. Focusing on self sustaining systems, light weight materials, durability, and cost efficiency helped create the system of units shown.

Are the local hospitals still functional? This question is highly important since it will affect the amount of casualty collection units sent. Hospitals are prone to being destroyed or can be rendered unavailable due to power shortage during a disaster.

What are the travel conditions? This question is to decide the best way to transport the casualty collection units into the area. Sending them in by air or all-terrain military vehicles will allow for the units to show up quickly without having major obstacles to overcome in route. The selection of choices is set to debris blocking some routes, some routes destroyed, impassible roads, high winds, and restricted air space, only one option can be selected.

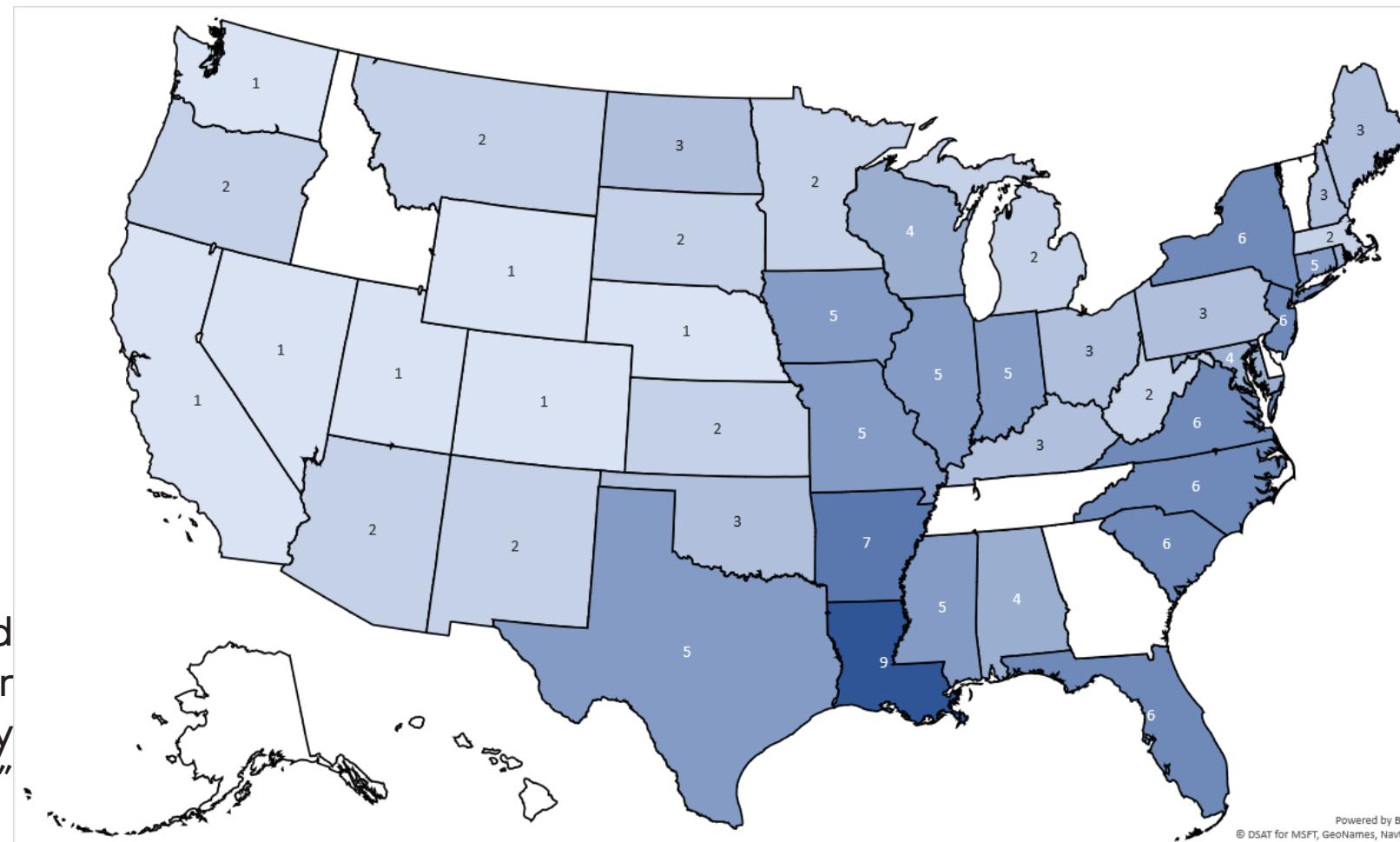
This is all the data that is required to create a generated response system to be sent. The output of application states what units will be sent and how many along with how it will be transported in.

Total Earthquakes 2010-2015



Earthquakes are "a shaking or trembling of the earth that is volcanic or tectonic in origin"

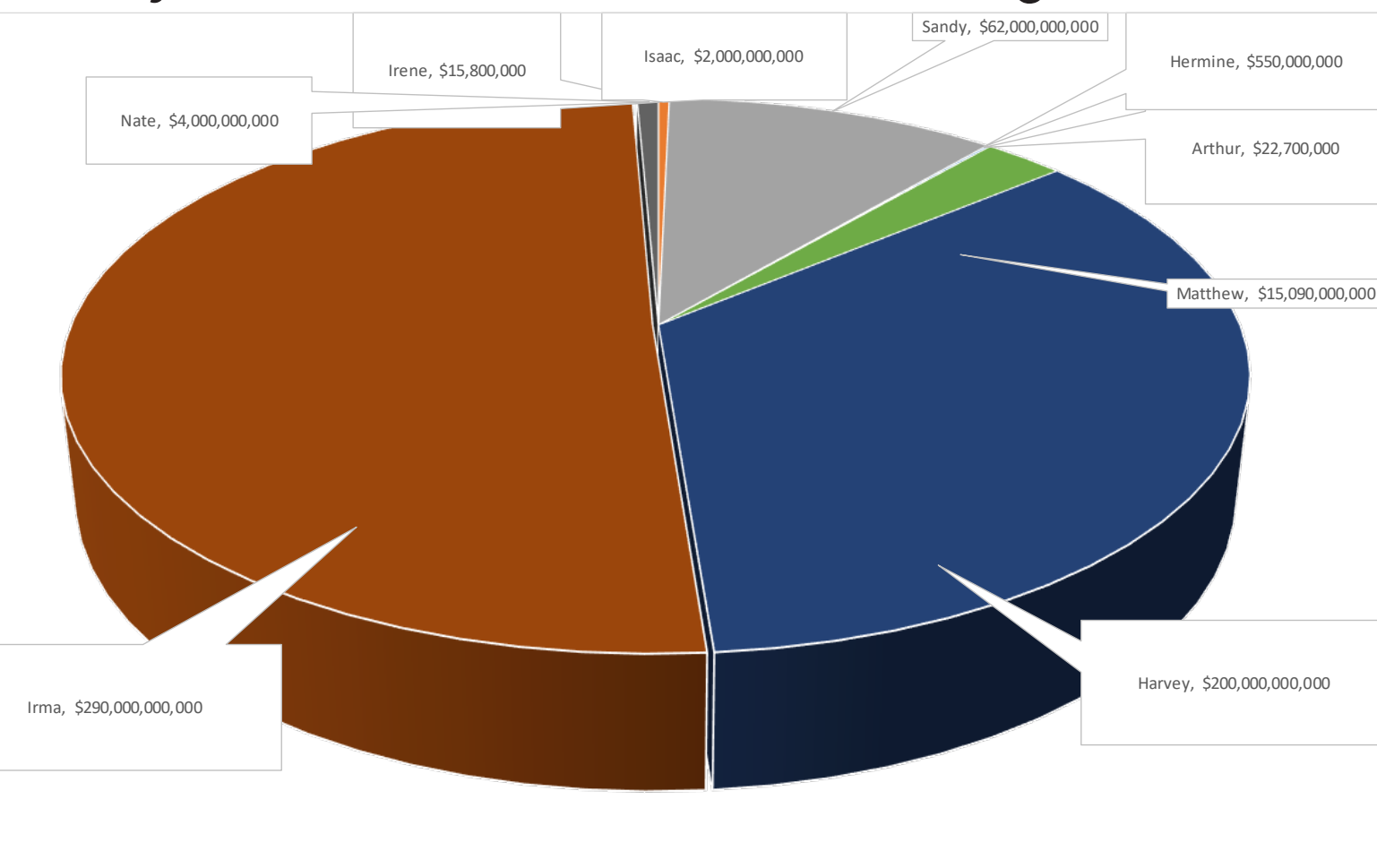
Major Floods 2011-2017



Floods are "a rising and overflowing of a body of water especially onto normally dry land"

Landslides are "the usually rapid downward movement of a mass of rock, earth, or artificial fill on a slope"

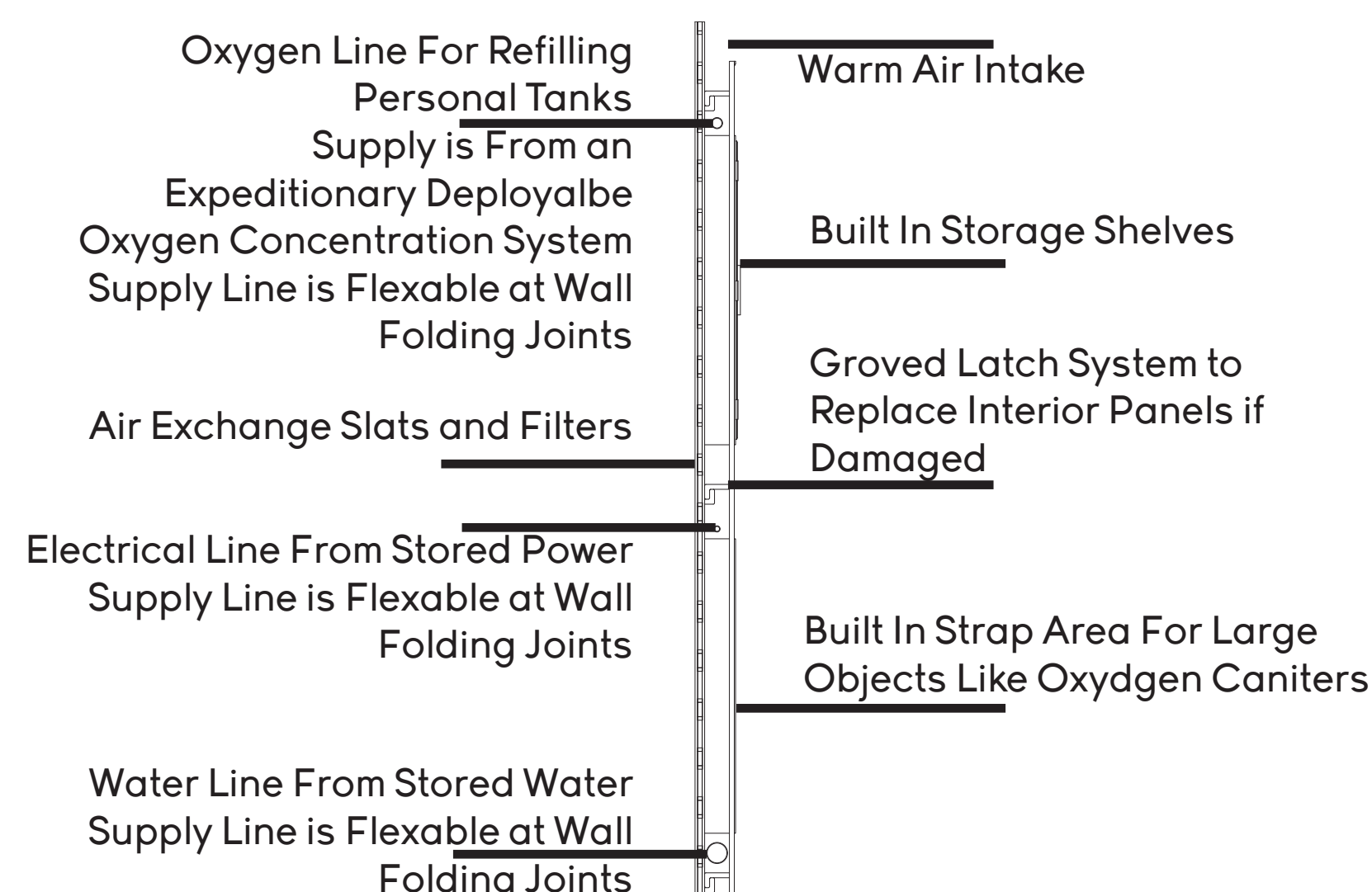
Major Hurricanes Total Damage Cost



Hurricanes are "a tropical cyclone with winds of 74 miles per hour or greater that occurs especially in western Atlantic, that is usually accompanied by rain, thunder, and lightning, and that sometimes moves into temperate latitudes"



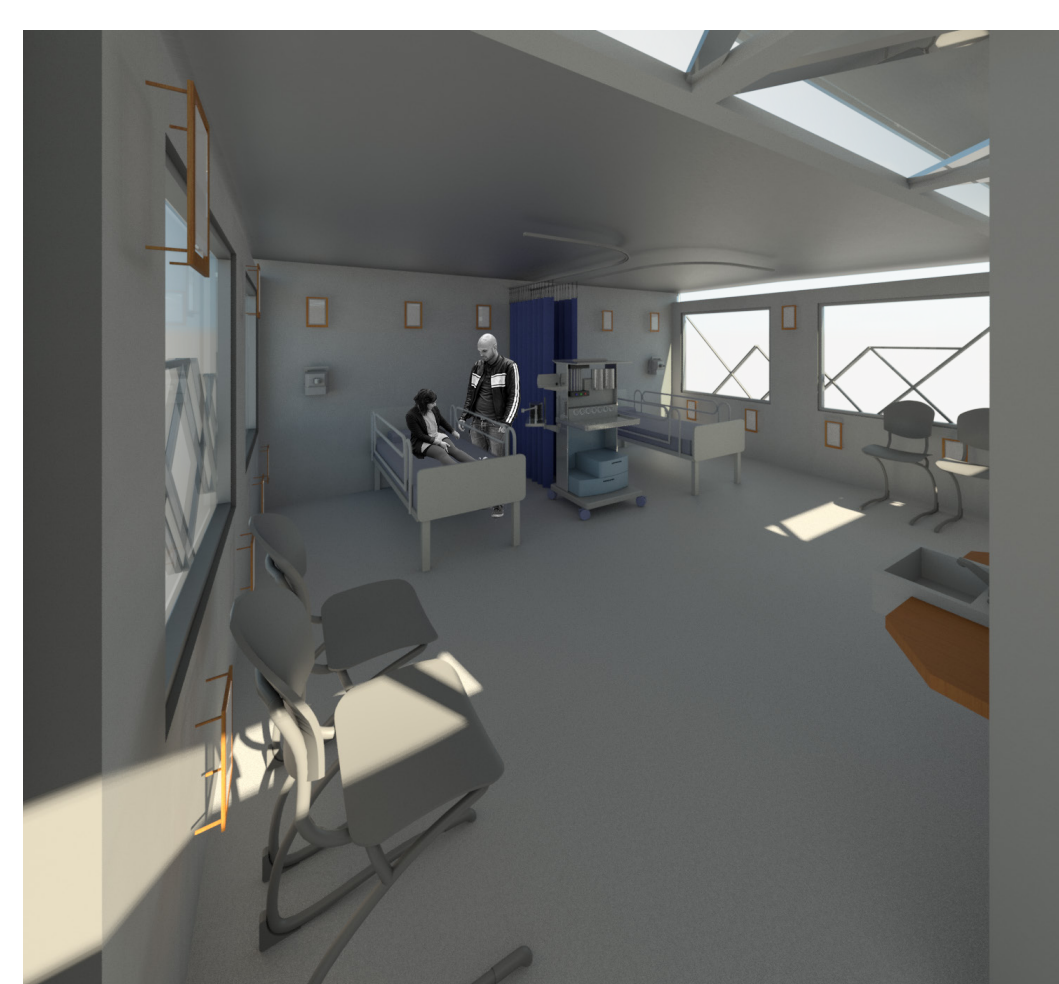
South Interior Perspective



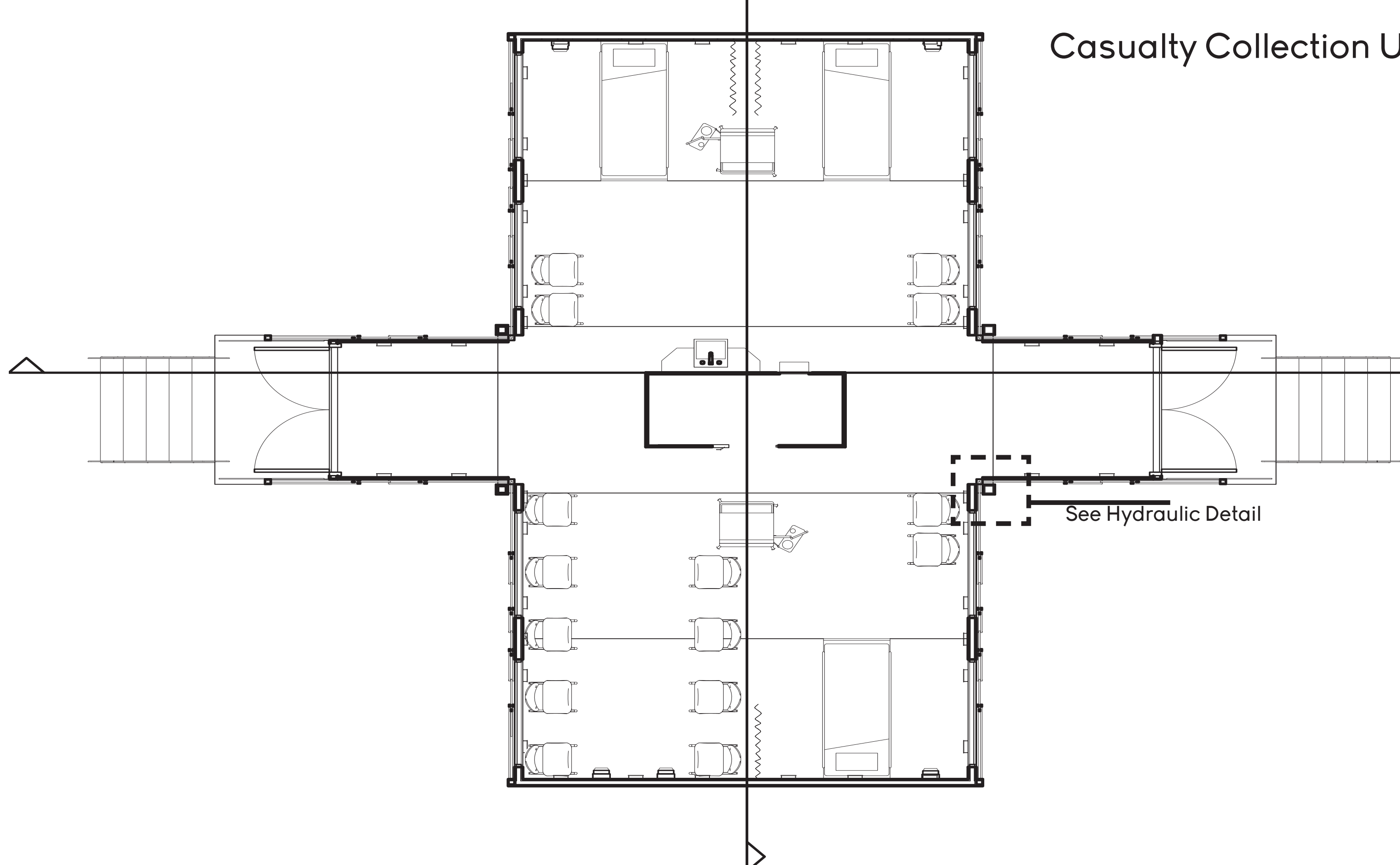
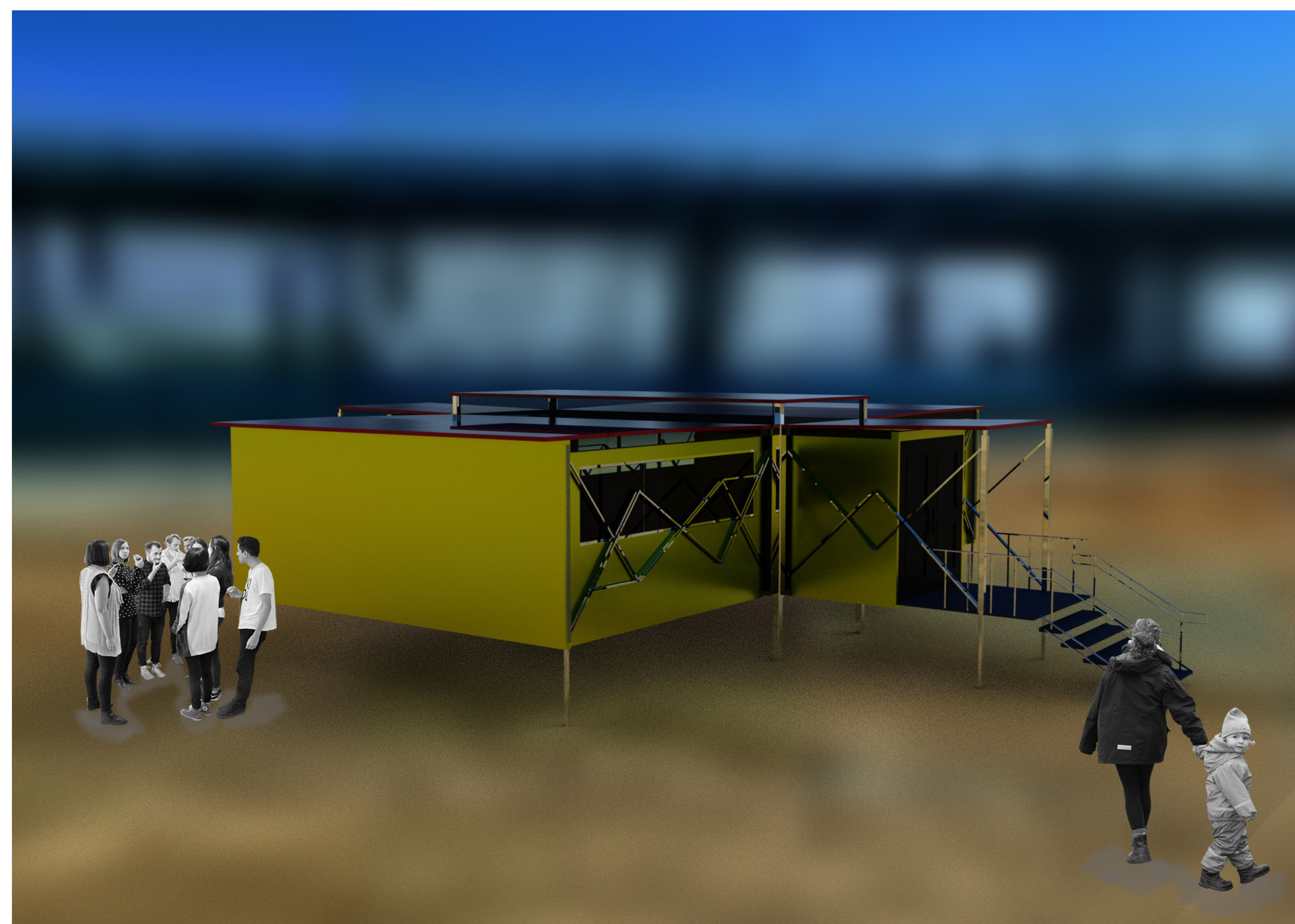
Air Flow Detail



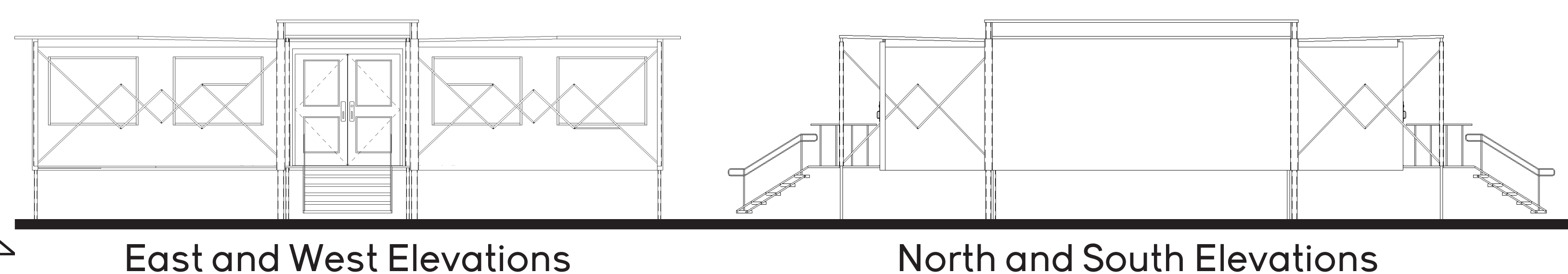
Entry Perspective



North Interior Perspective

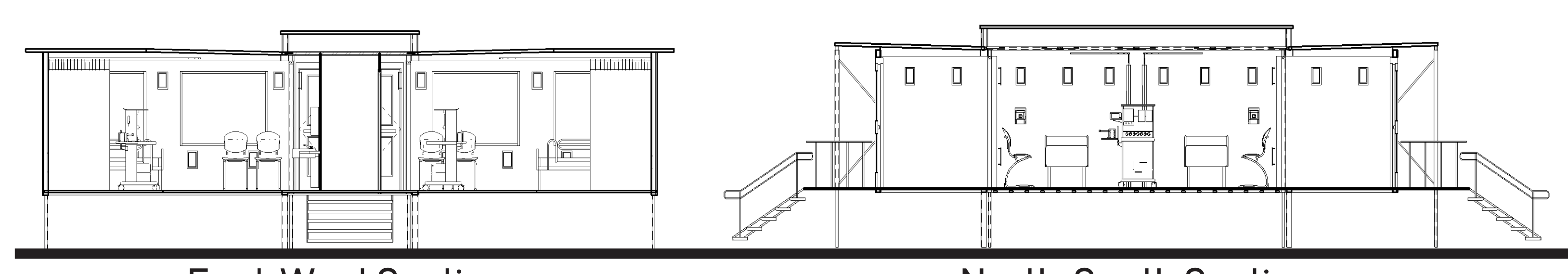


Casualty Collection Unit



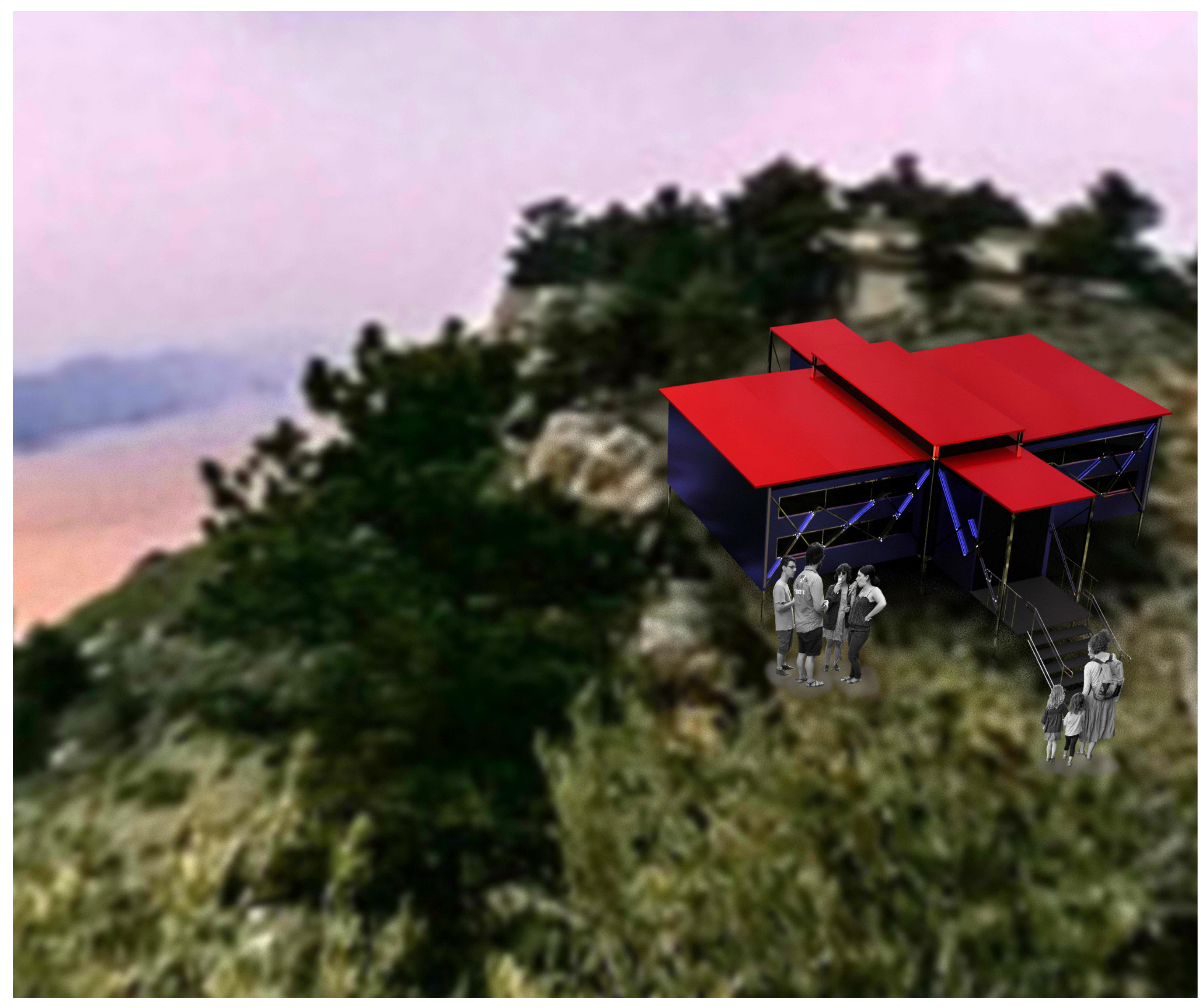
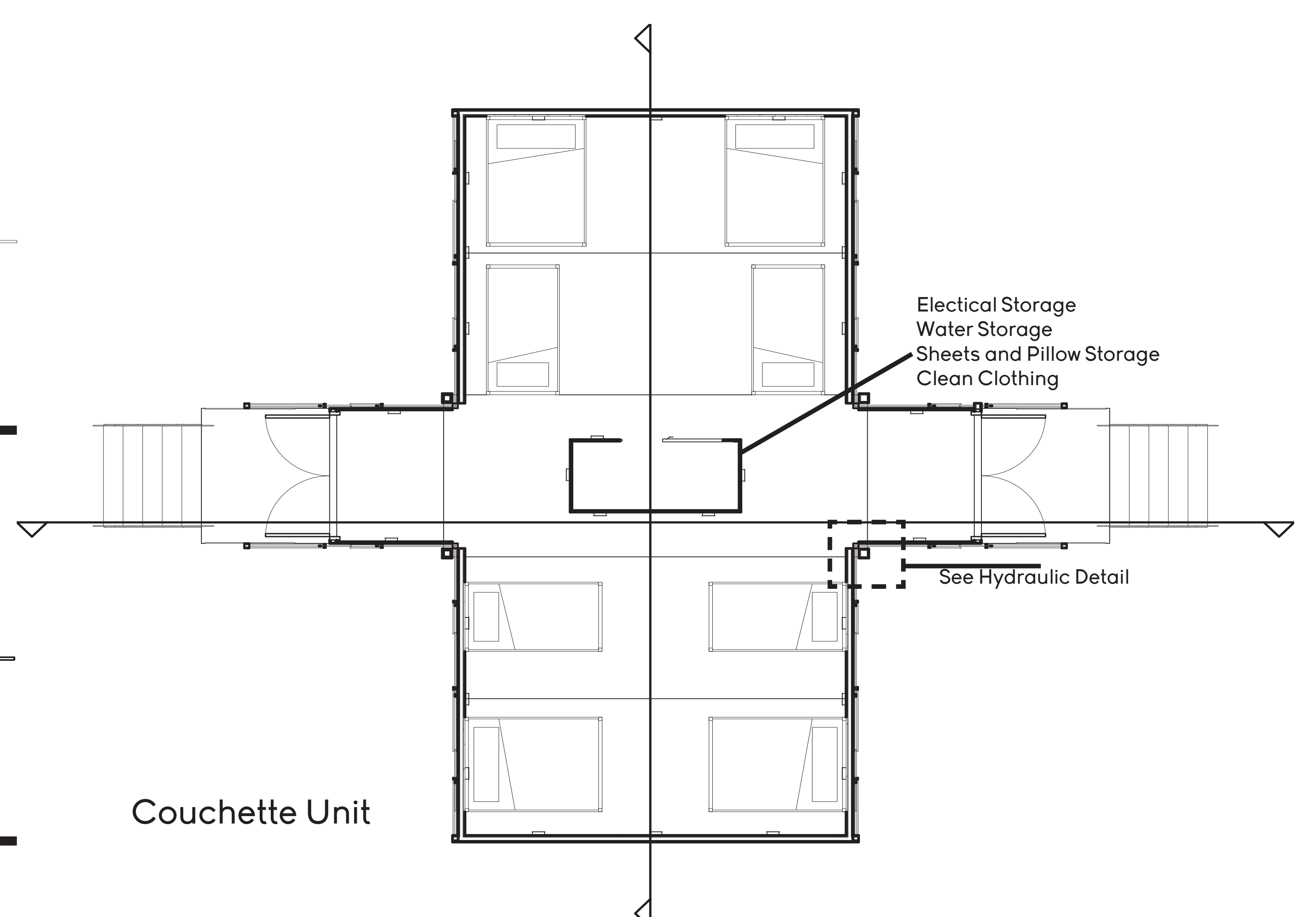
East and West Elevations

North and South Elevations

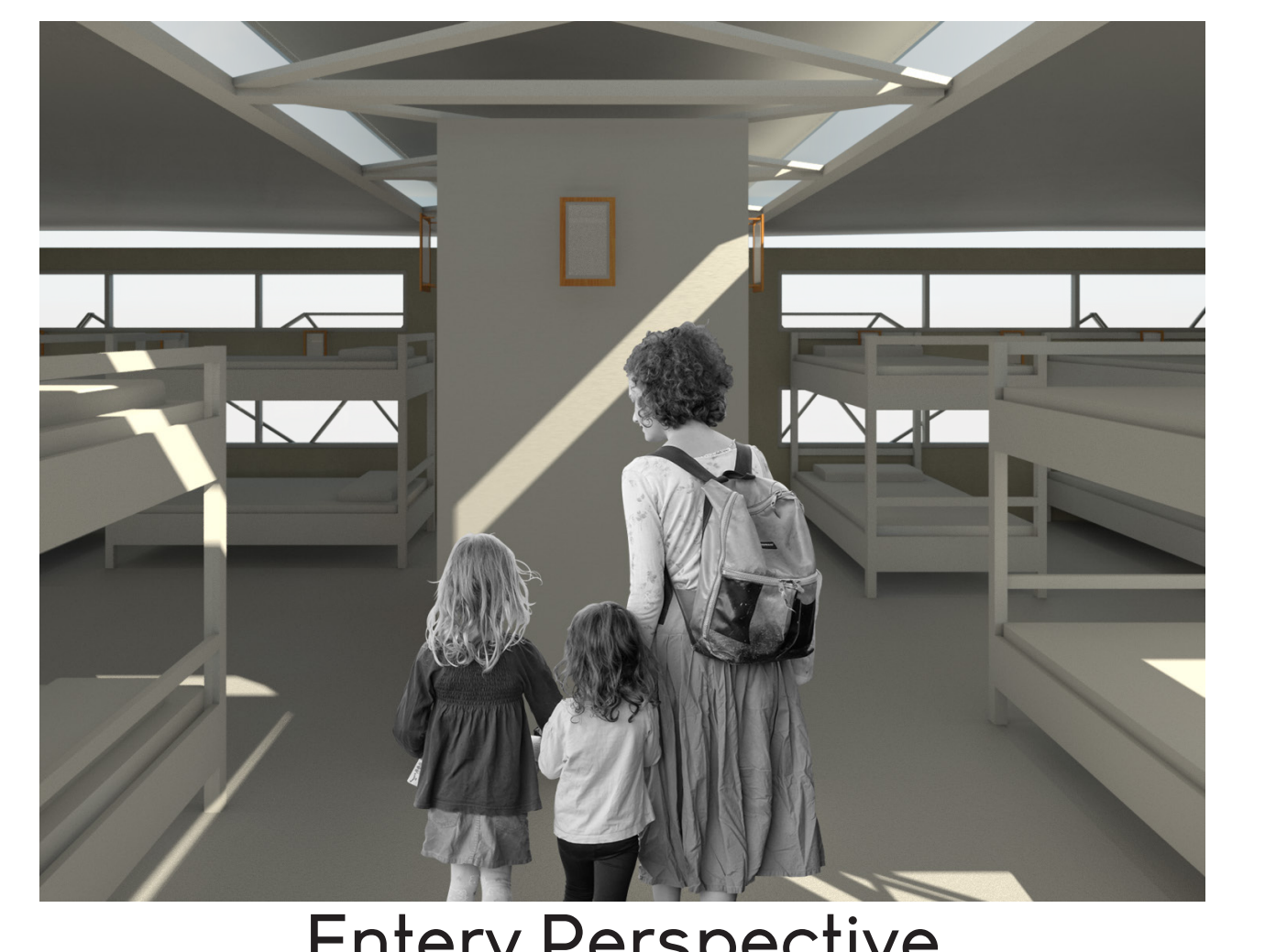


East-West Section

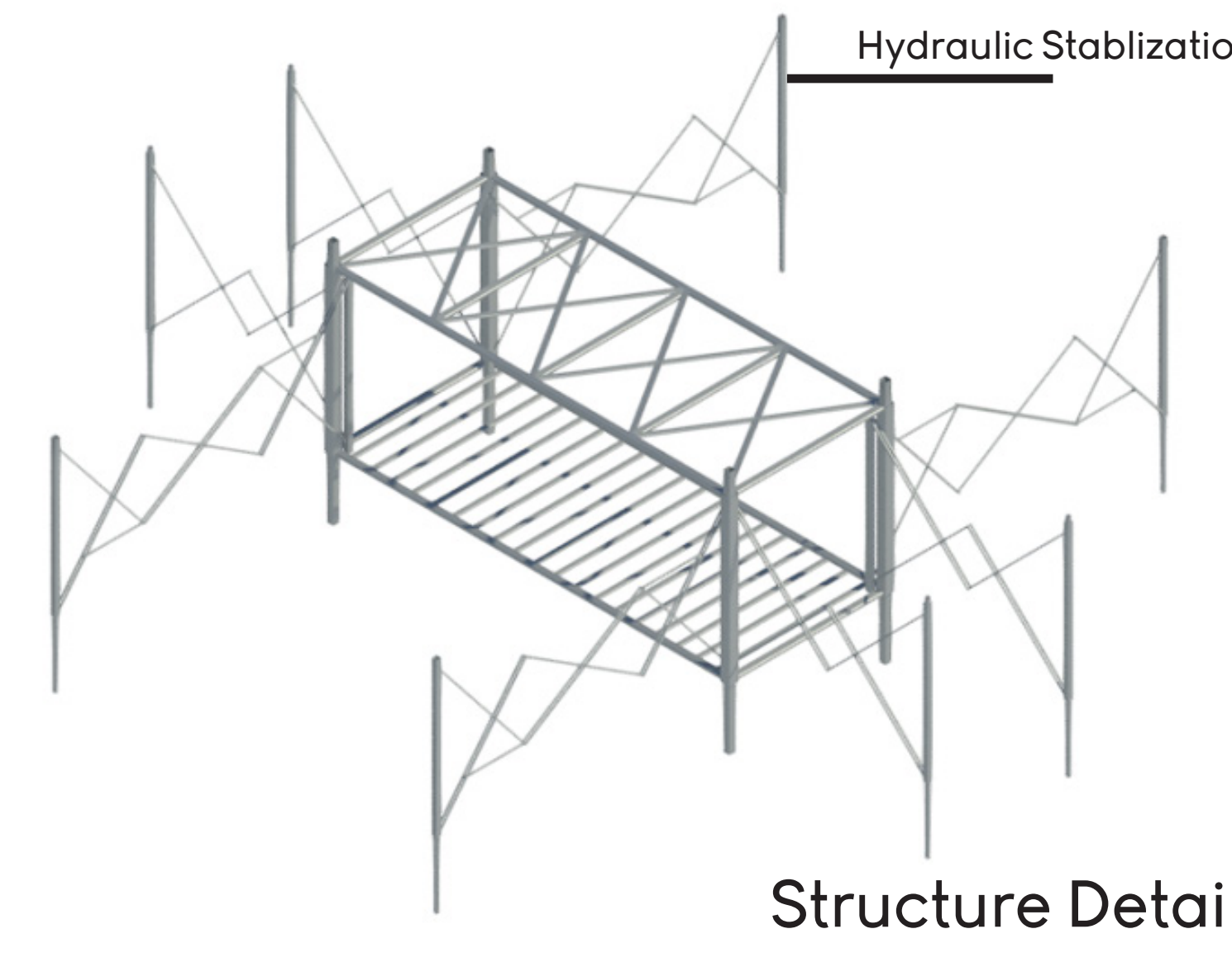
North-South Section



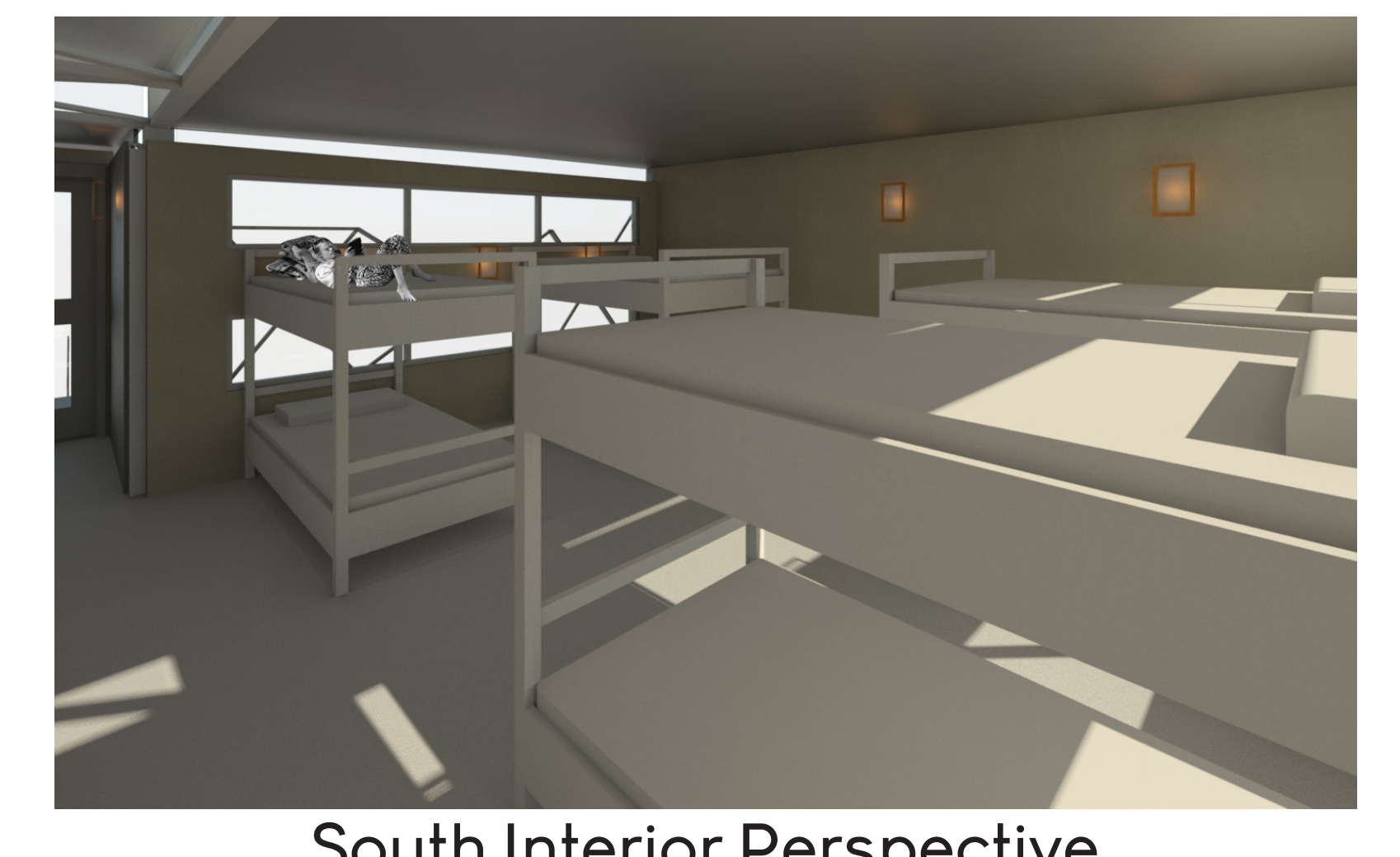
North Interior Perspective



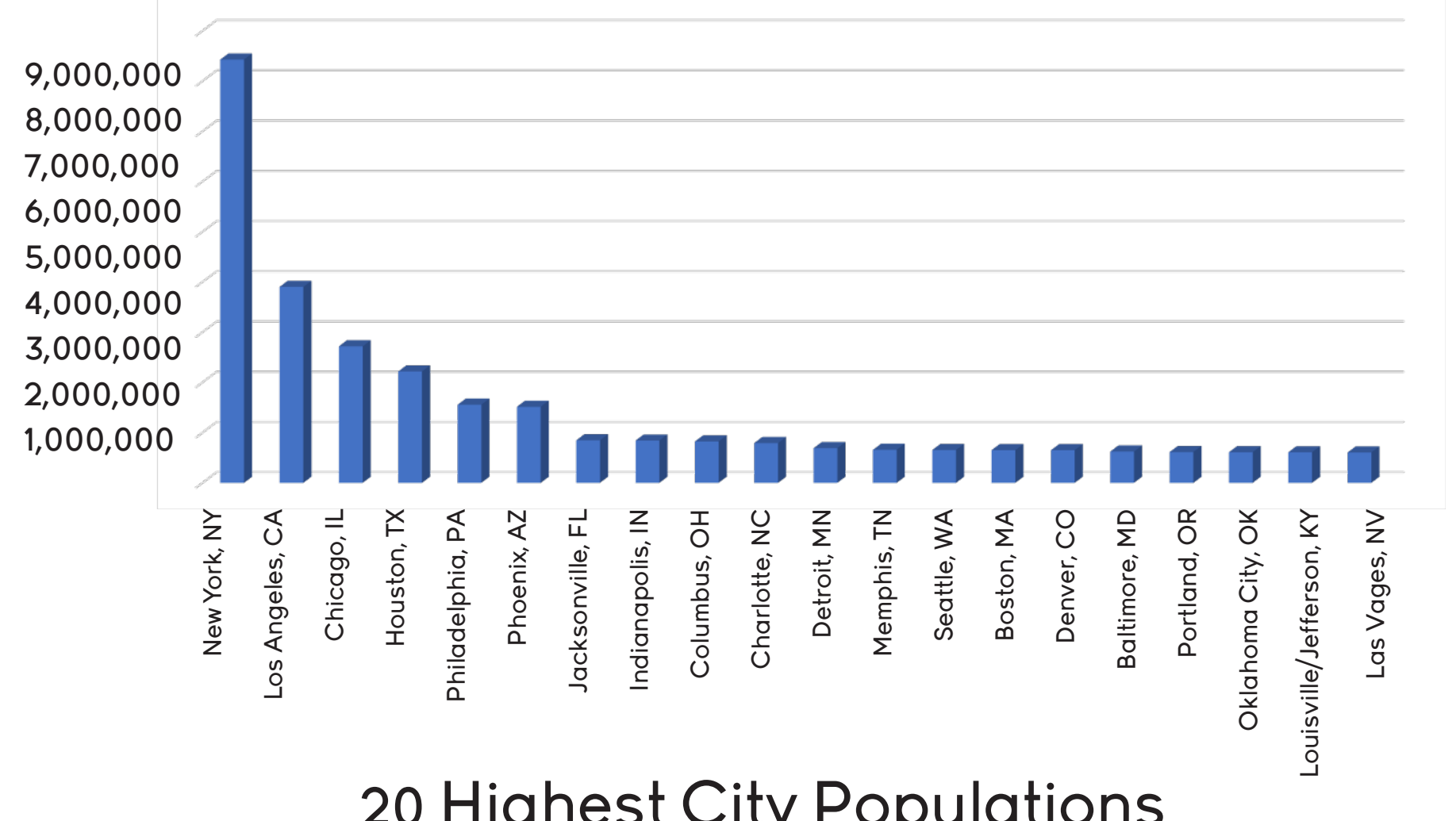
Entry Perspective



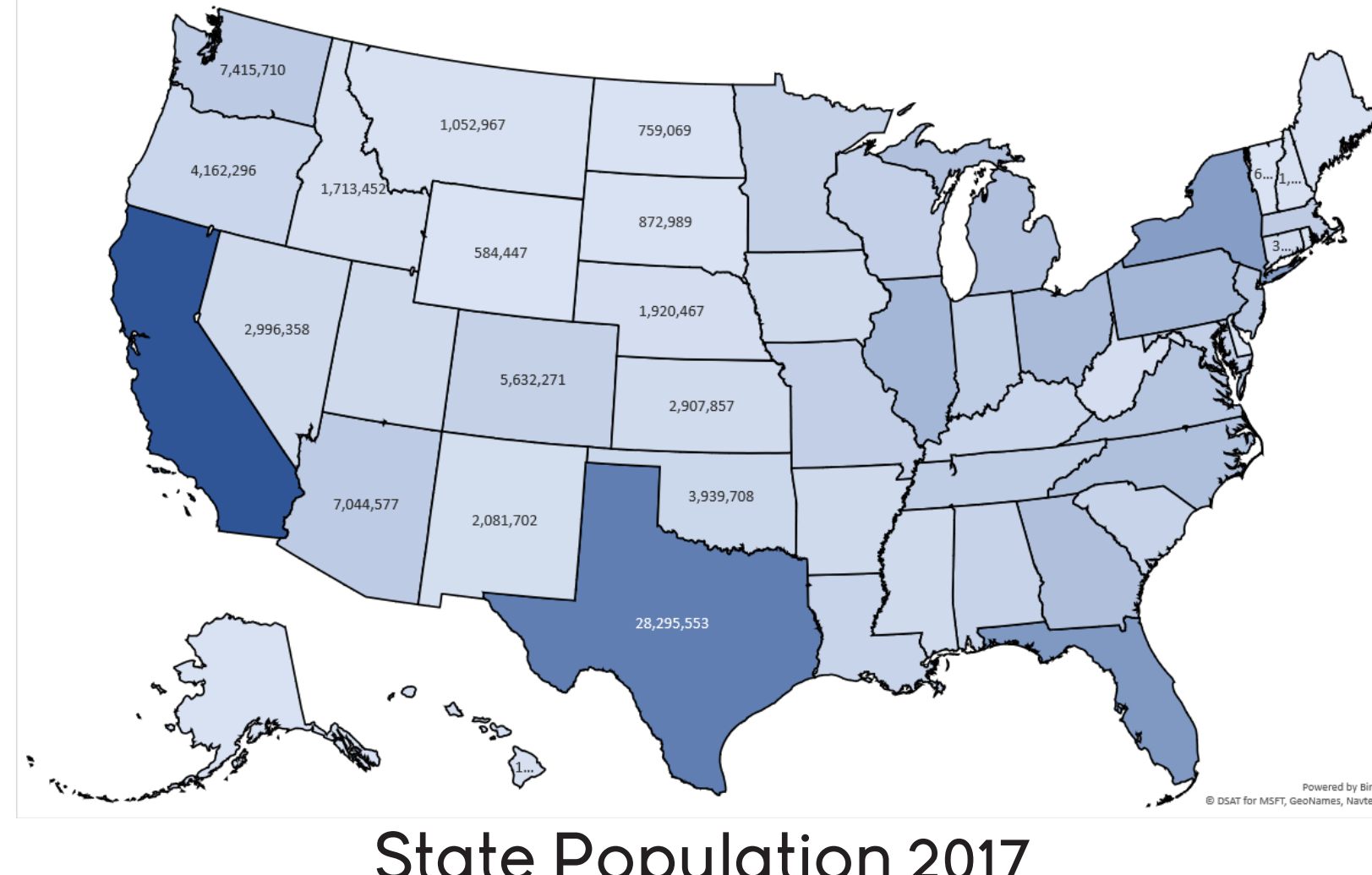
Structure Detail



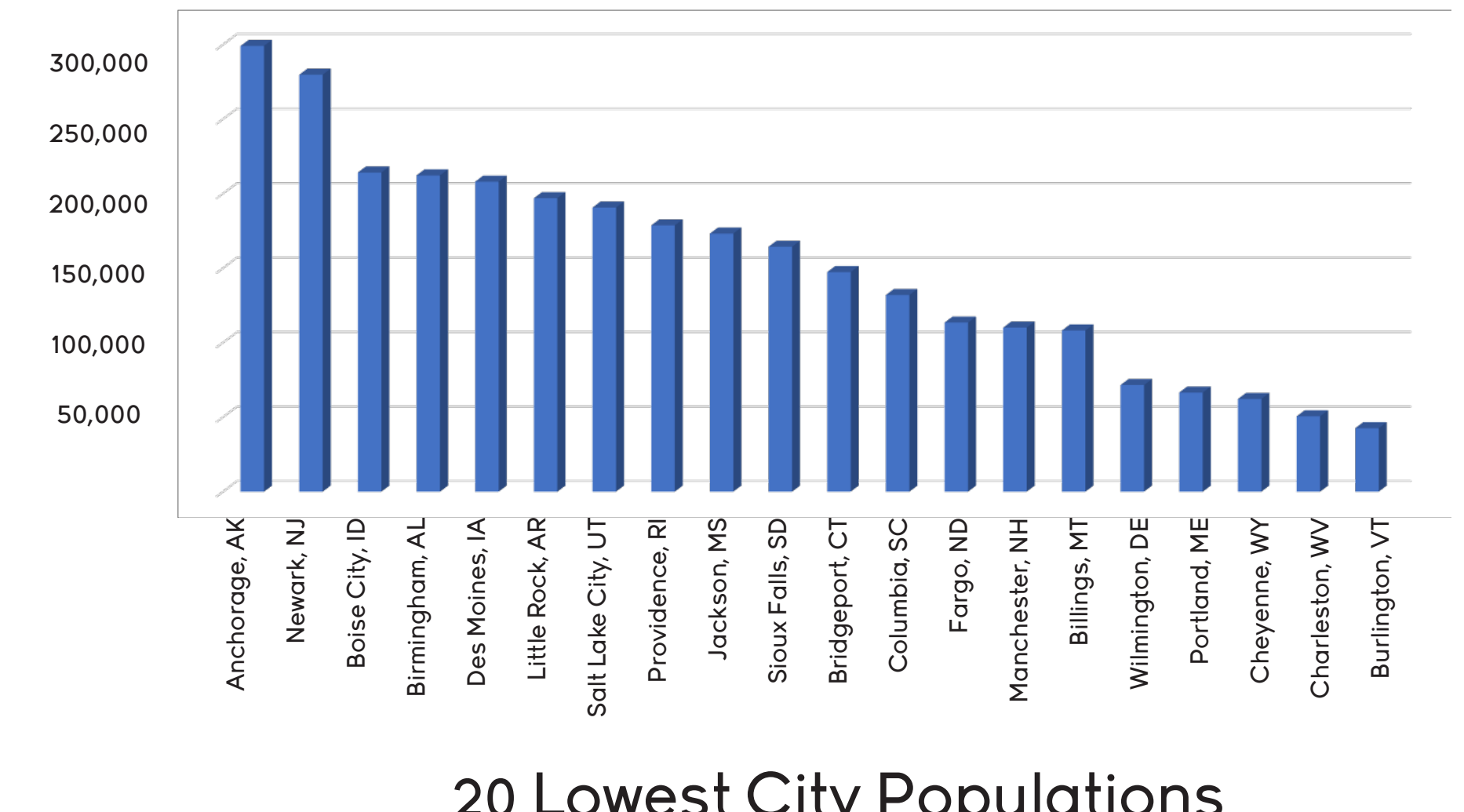
South Interior Perspective



20 Highest City Populations



State Population 2017

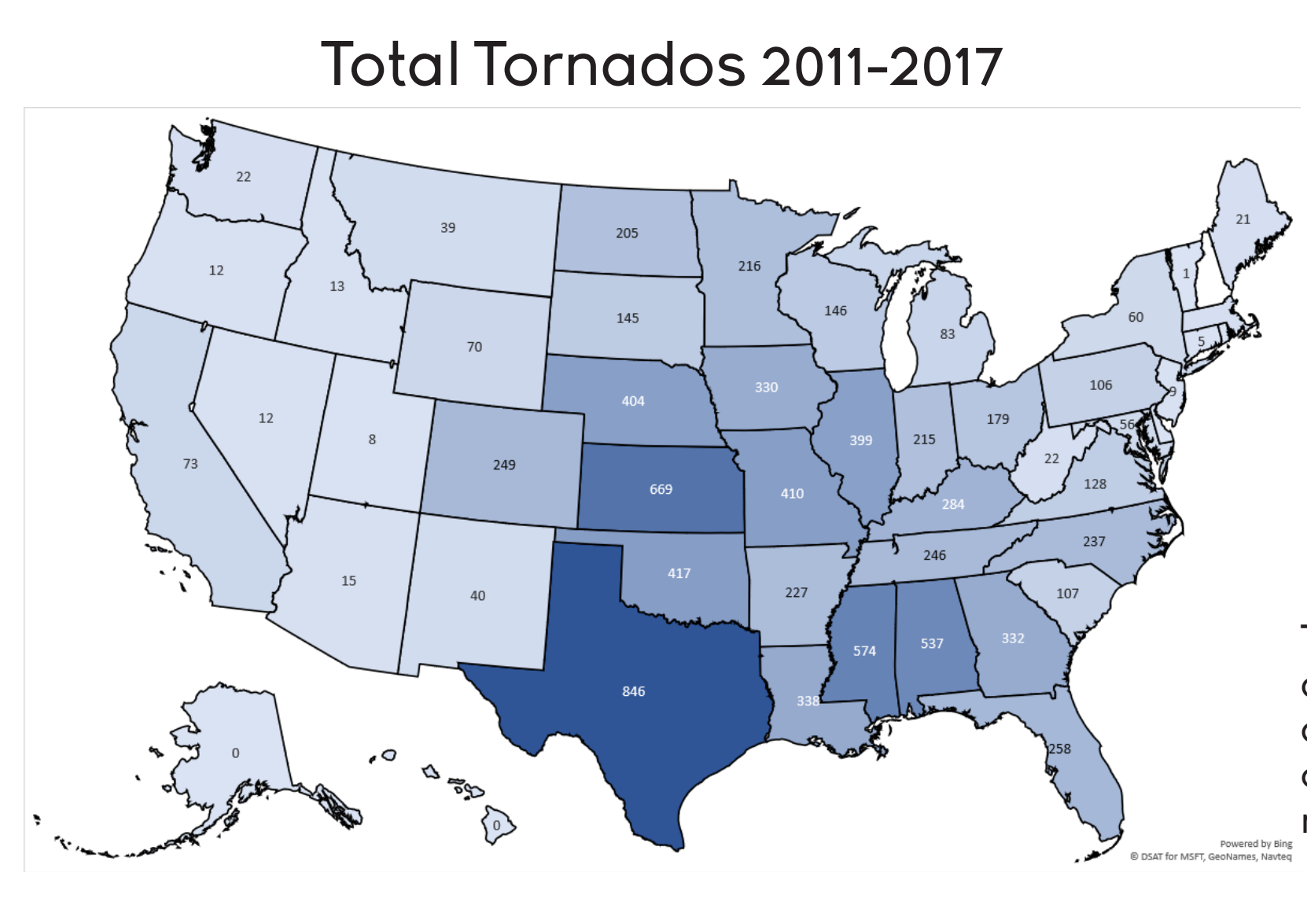


20 Lowest City Populations

Assembly Animation

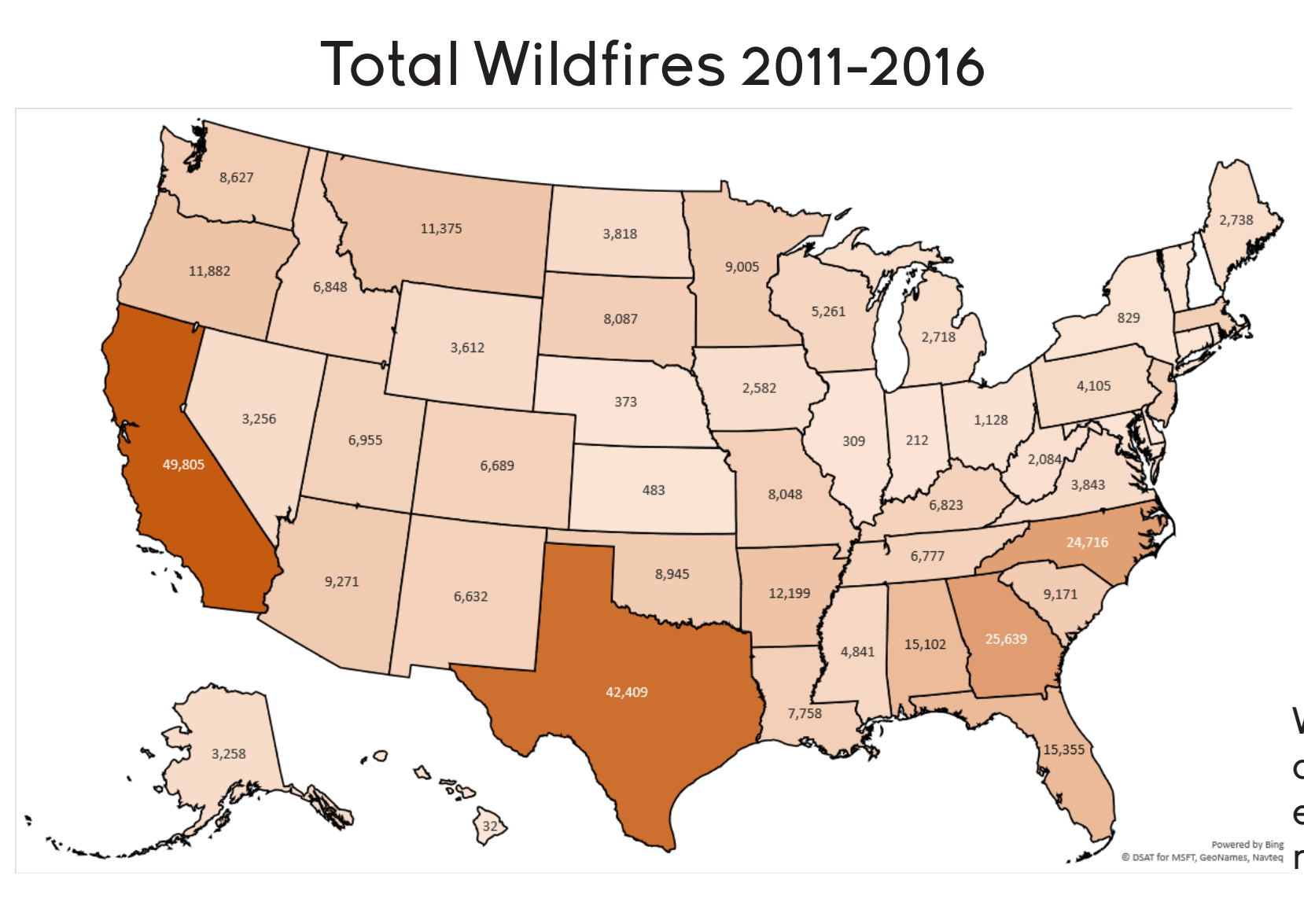
Featured on the monitor for your viewing pleasure is the unfolding of each type of unit. Each has self leveling hydraulics within the each of the twelve legs so they can be set on any type of terrain.

Elizabeth Rae
Arch 772: Design Thesis
Spring 2018
Instructor: Ganapathy Mahalingam
The Response System Application is currently available in the App Store



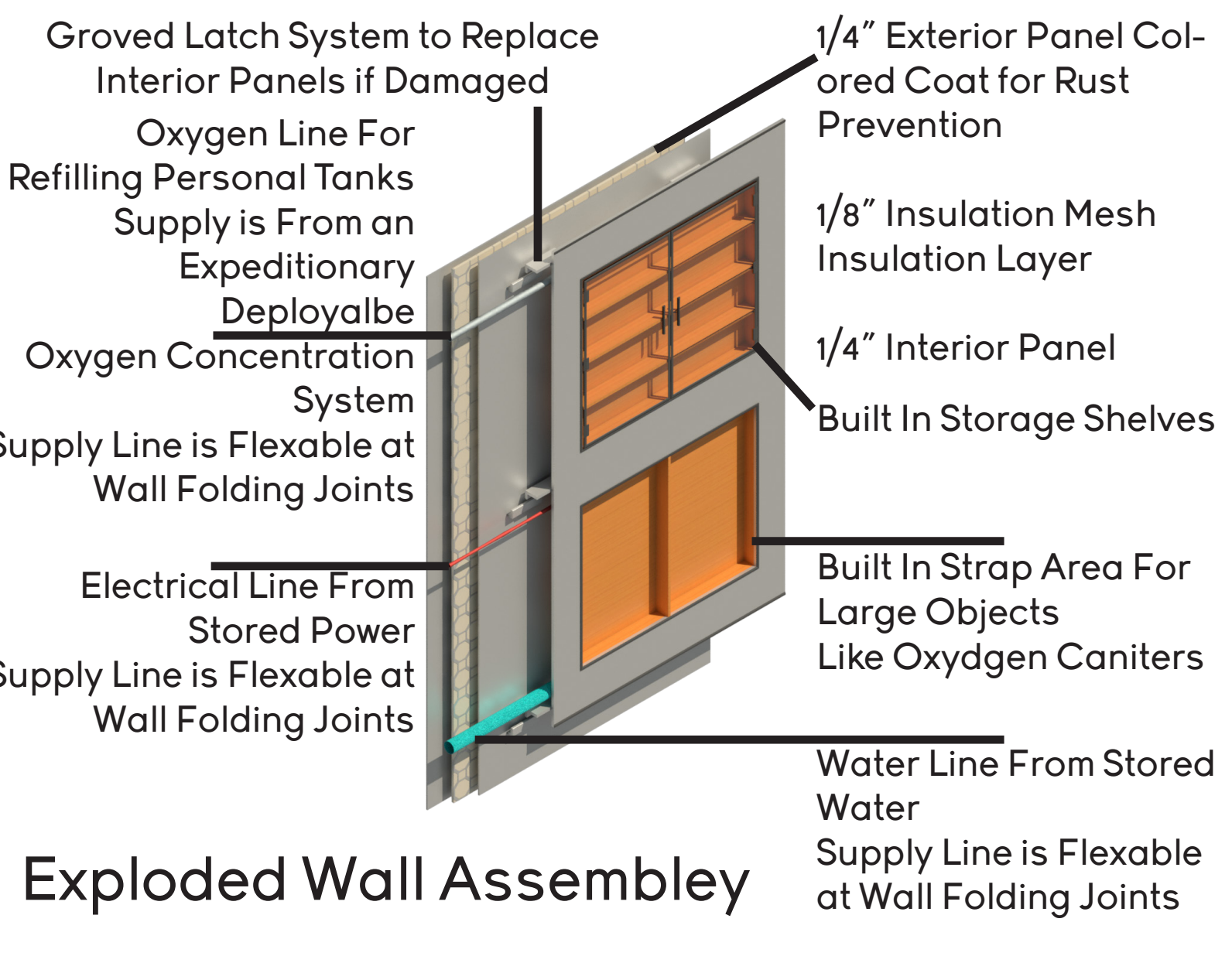
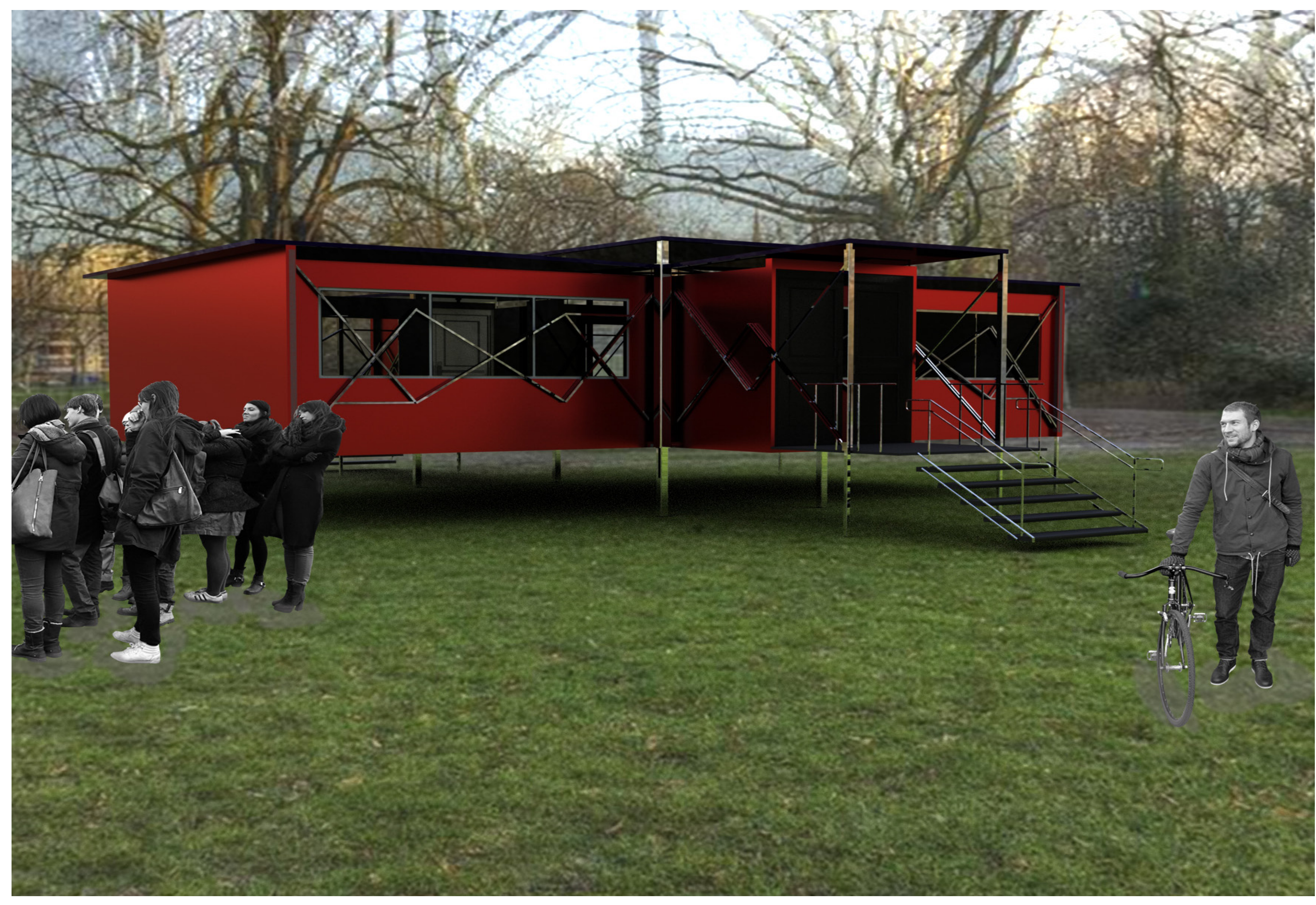
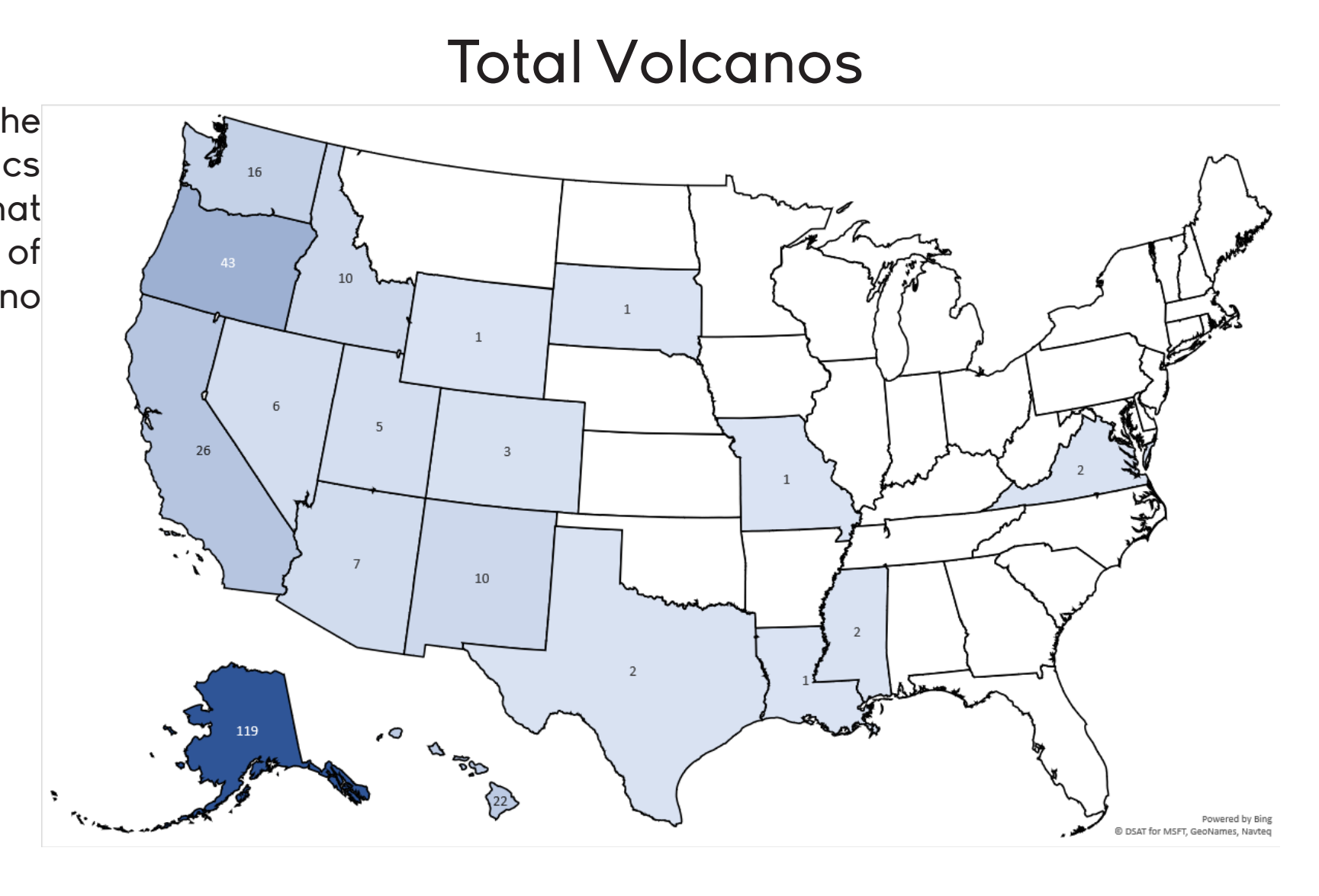
Tsunamis are "a great sea wave produced especially by submarine earth movement or volcanic eruption"

Tornadoes are "a violent destructive whirling wind accompanied by a funnel shaped cloud that progresses in a narrow path over the land"



Volcanic eruption is the combination of plate tectonics and pressure build up that escapes by expanding up out of a volcano

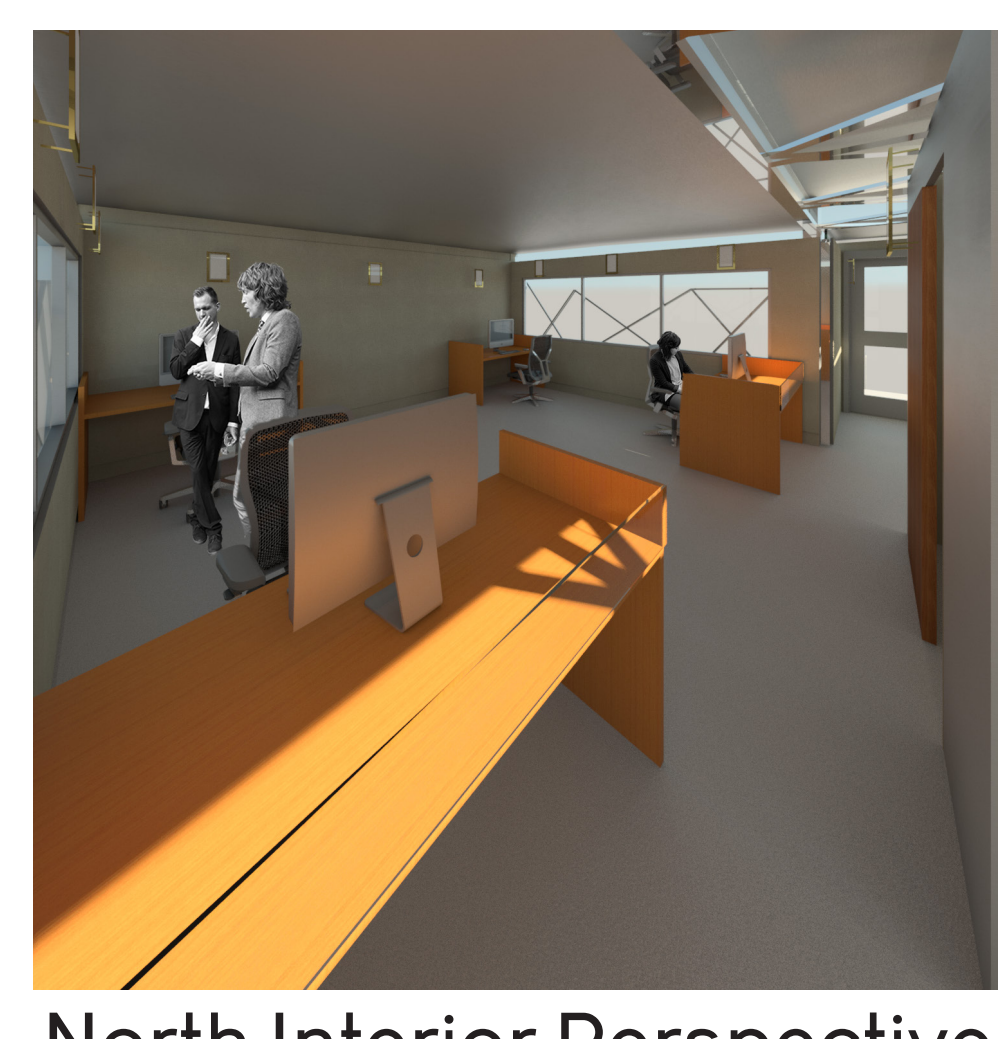
Wildfires are "a sweeping and destructive conflagration especially in a wilderness or a rural area"



Exploded Wall Assembly



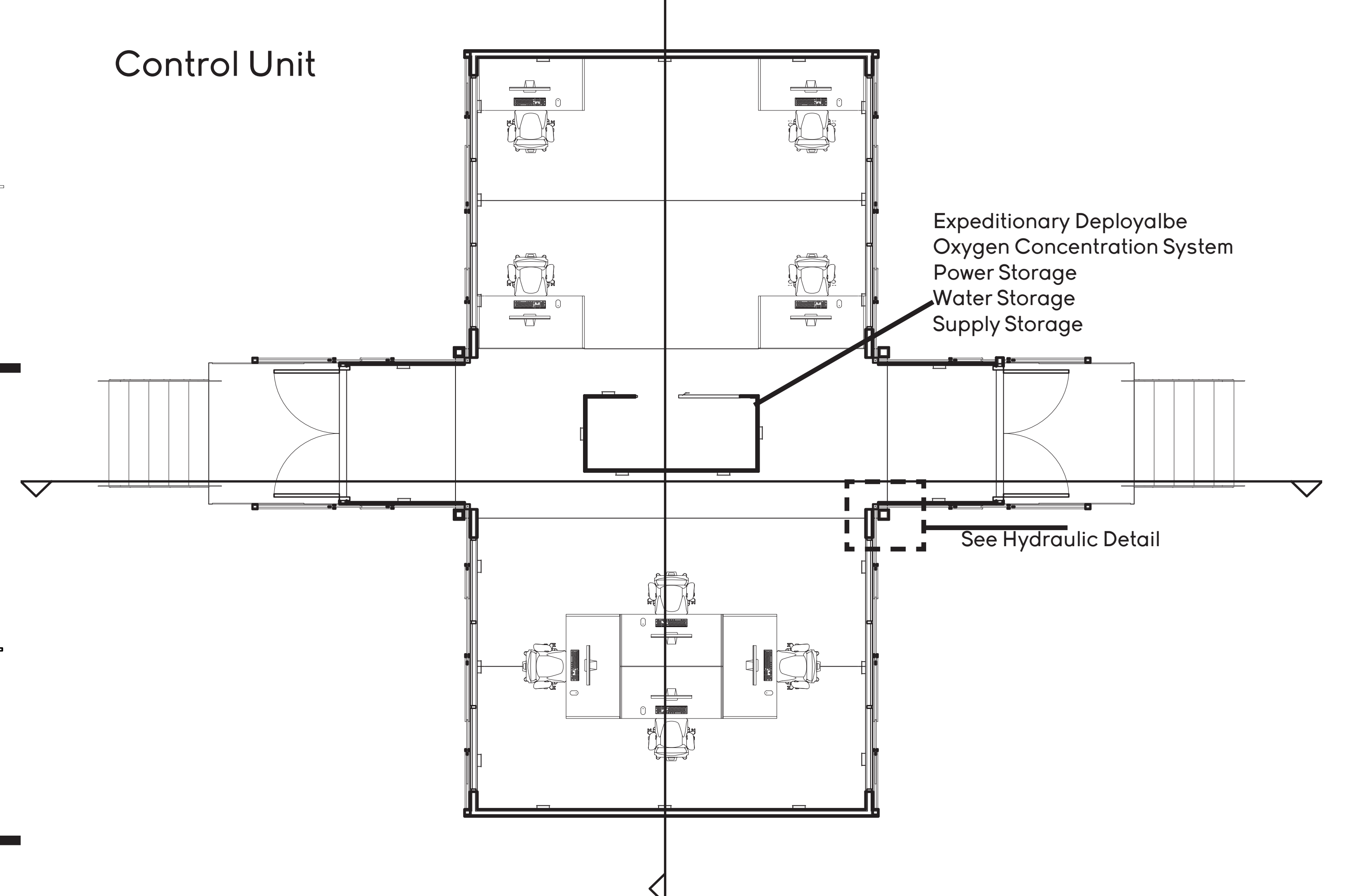
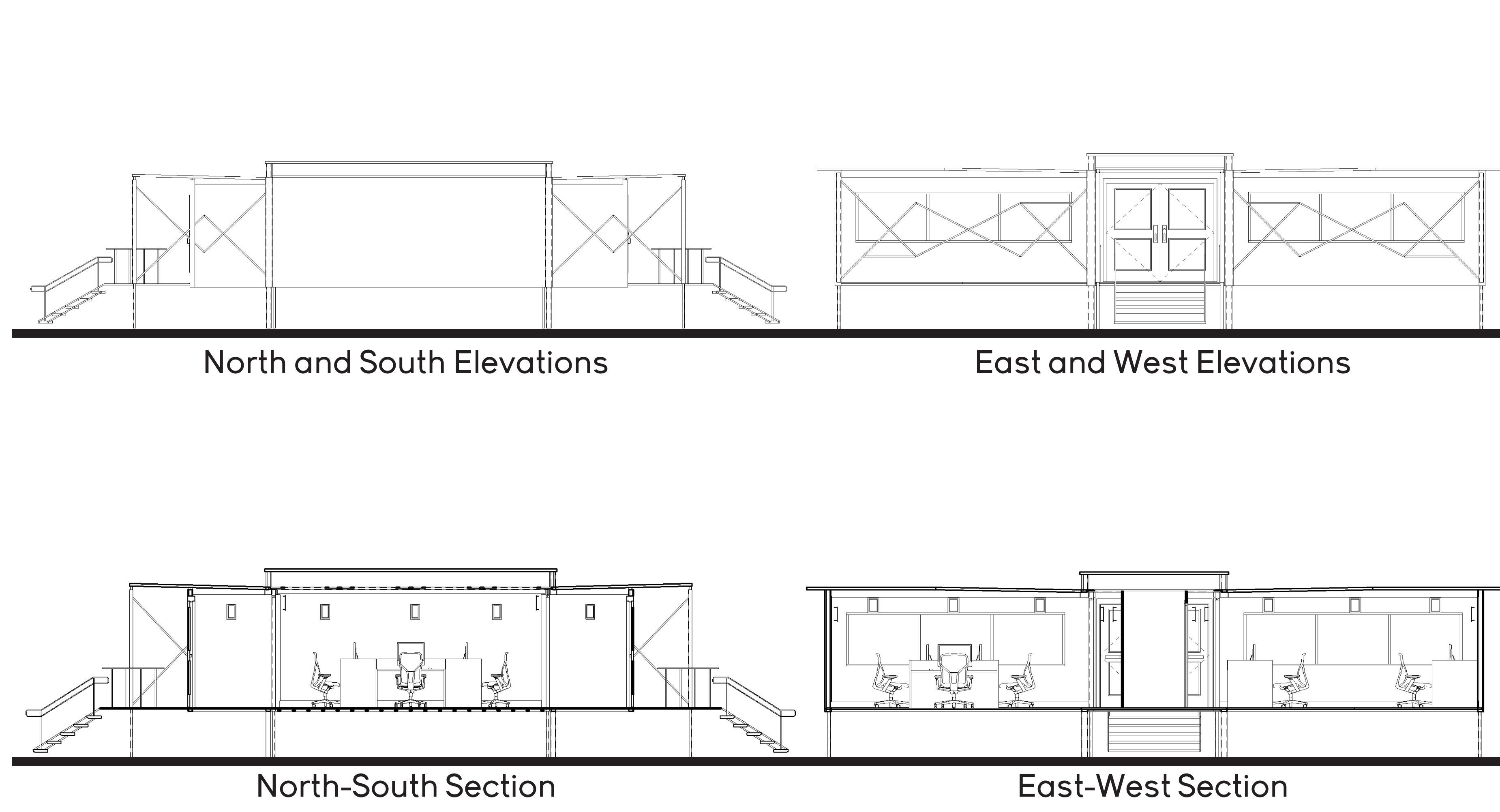
South Interior Perspective



North Interior Perspective



Entry Perspective



Control Unit