

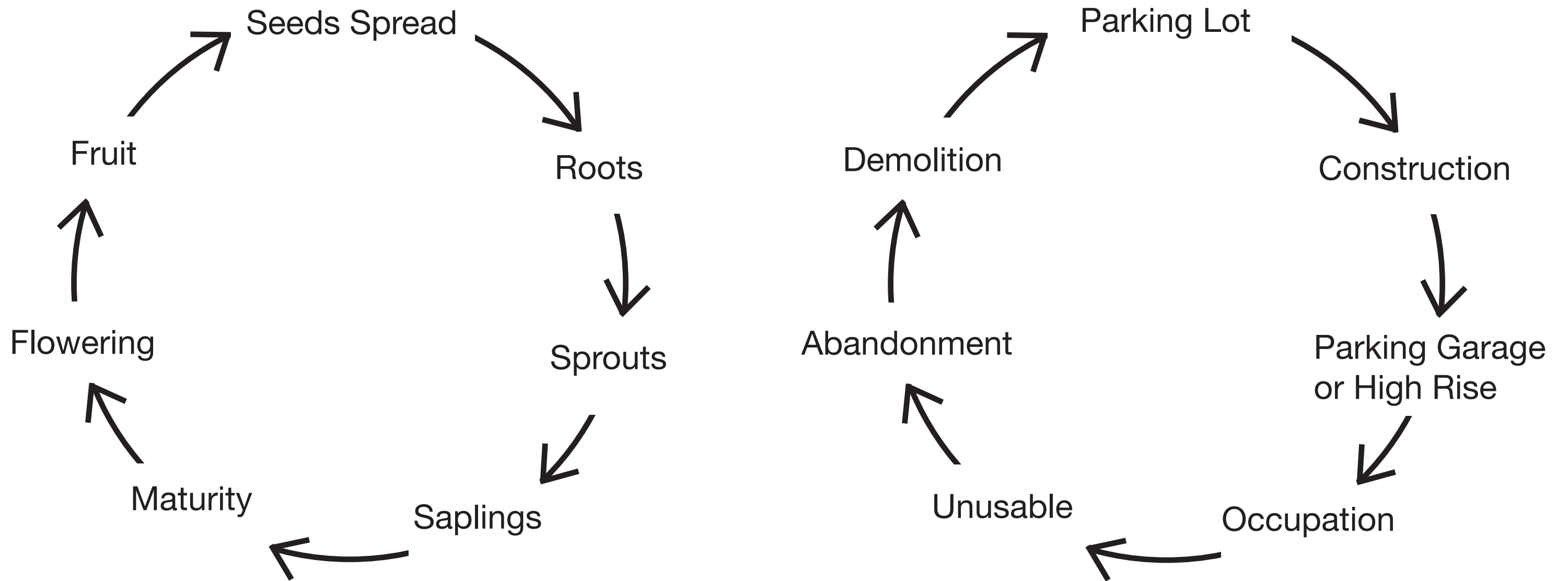
Terraced Garden

Location: Wichita, KS

Area: 26,380 ft²

Matthew Rule

Benjamin Moore: Future of Design Challenge



There are occasional trees and shrubs around the sidewalks, but the presence of asphalt concrete and cars far surpasses the presence of nature.



Larger open parking lots like this are plentiful. This is a parking lot just to the west of our site. There is a parking lot to the east of our site, and there is a parking garage directly to the South. And our site is currently a parking lot.



High rise buildings made of concrete, stone, and glass with Store fronts on the first floor that have boarded up windows and doors is a typical sight in downtown Wichita.



There are a few locations that have a pleasant walking experience, And most of these examples were in the eastern side of Wichita, which is the old town. This side of town that was developed more before the introduction of the car.



You can see that there are many parking lots on the western side of town represented by the red dots. But on the eastern side of town there are no large parking lots or parking garages. Our site represented by the blue rectangle is squarely within the parking lot jungle.



Parking Lots

The Earth has a number of self-sustaining functions. Typically these functions come in cycles. The warming and cooling of the planet is cyclical. All of the plants are born, reproduce, and die on a cycle. Animals follow the same cycle. From the grass that is eaten by a small animals all the way up to the largest apex predators, there are cycles of birth and death. Cycles of nature mean that there is a balance between all living and nonliving matter on Earth. The Earth has been perfecting these cycles for 4.5 billion years now. Humans have far less time to practice. Given that we have only been around for about 200,000 years as a species, and we have only had permanent settlements for about 12,000 years, so we have not figured out how to balance our wants and needs with the consequences of obtaining them.

Looking at a smaller scale, our cities are often constructed with short-term monetary gains in mind to the detriment all else. Real estate developers want to construct buildings as quickly as possible so that they can start making a return on their investment. The price for this expedience is less thought going into the design process, less care for the long-term care and maintenance of the building.

In regard to Wichita this process played out over and over, but even worse. Often when a building was demolished, a parking lot or parking garage was erected in its place. Downtown Wichita is now more parking than green space. Green space is nonexistent in the urban core. The lack of green space and ever-presence of concrete parking mean that urban heat island is exacerbated and the experience of walking around Wichita is rarely present. Parking lots are not what people enjoy visiting and seeing. People leave parking lots as soon as they no longer need to park there. The parking lots may become developed into a building. After the buildings and garages have earned the developer a positive ROI, they become unusable then abandoned.

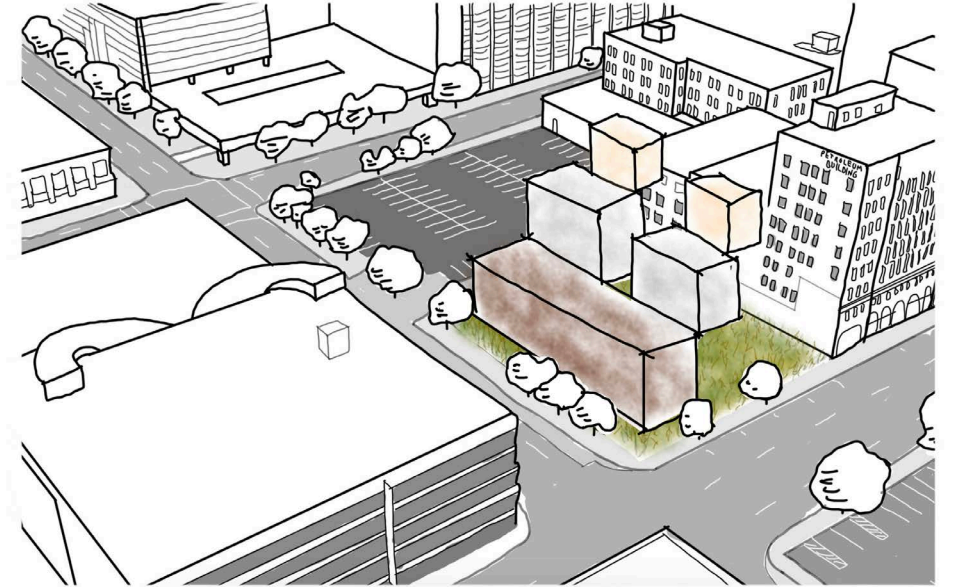
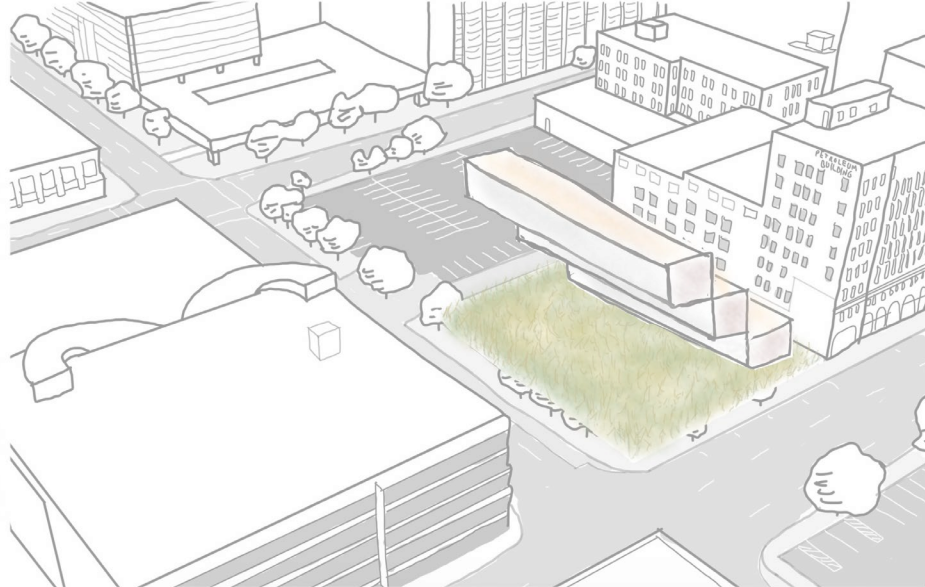
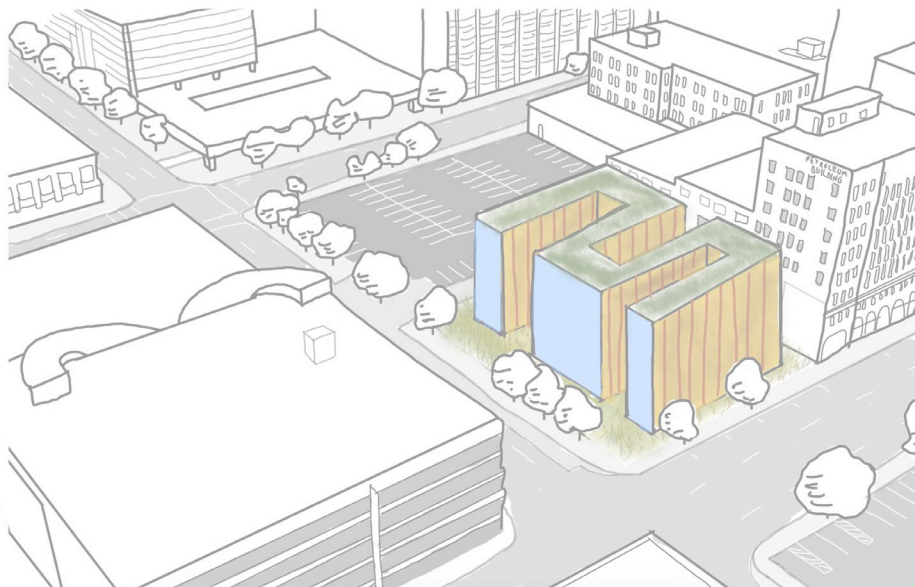
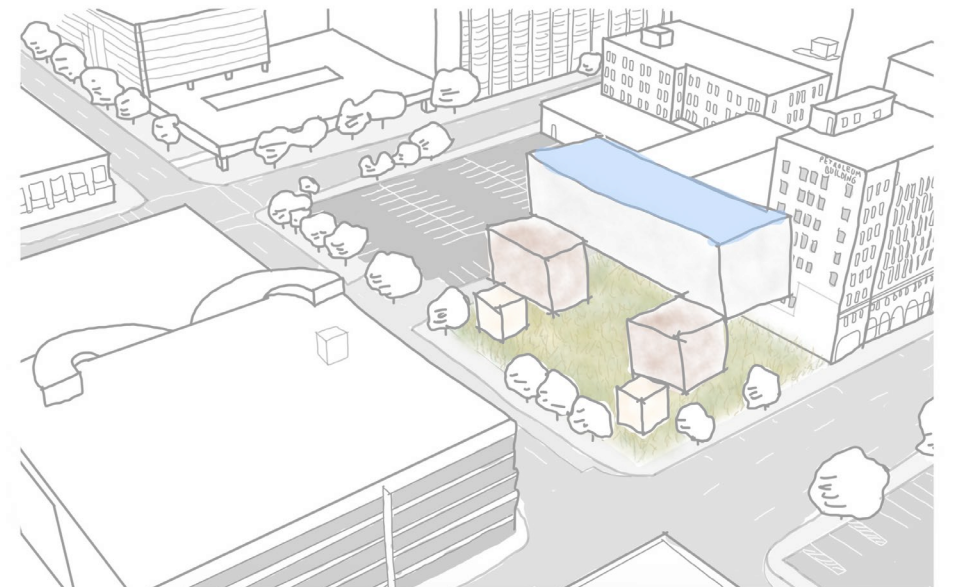
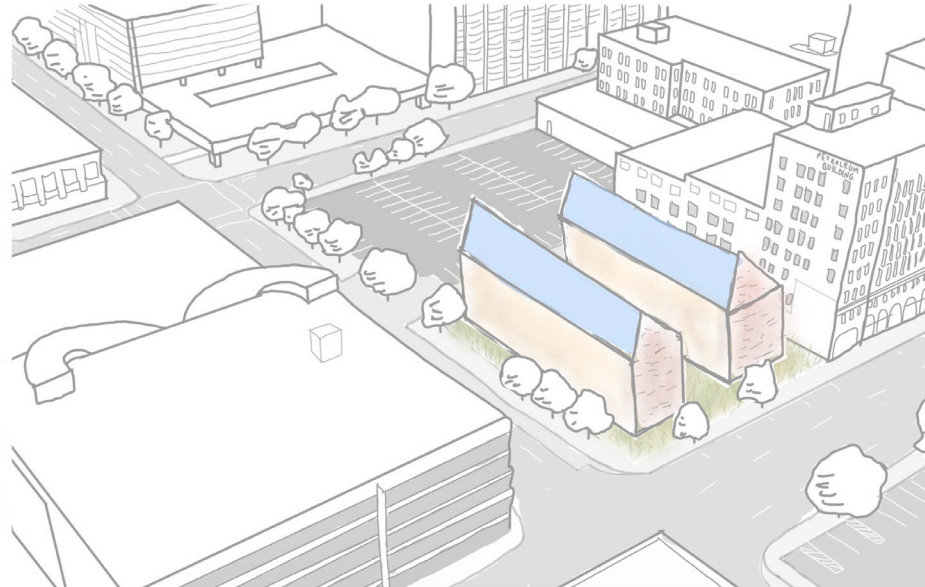
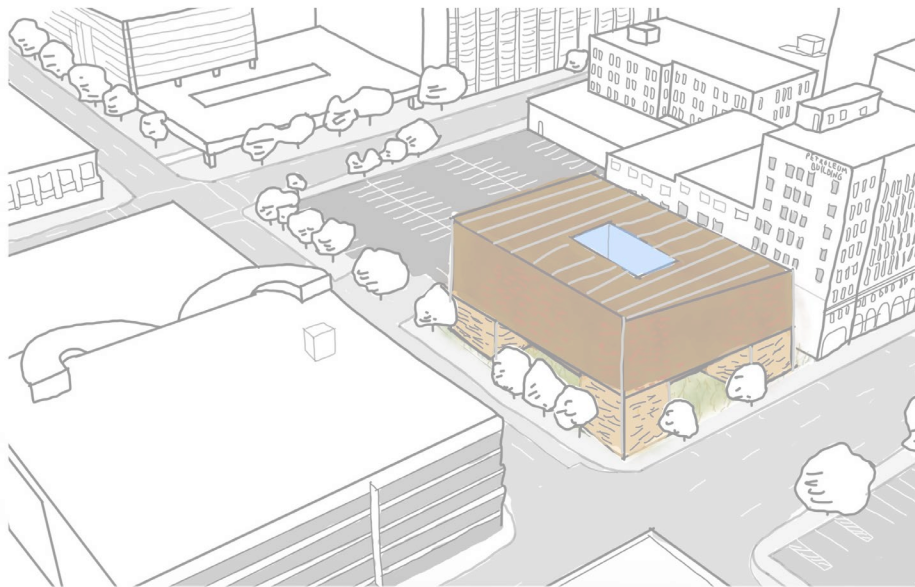
My goal with this site is to break the cycle of short-term growth then abandonment. Long-term maintenance is something that the United States has never been good but it needs to be a priority if we are to make better buildings and better cities. Long-term thinking about the experience of walking around the city. Too many developers decided to build a parking lot and now the experience of occupying the city is that of walking from concrete field to concrete field with high rise concrete obelisks in between.

Getting more specific into the building design, it will be permeable. Currently Wichita is comprised of rows of concrete buildings that are firmly interior buildings. Glass and metal doors that are always closed, that hold in the air conditioned micro-atmosphere. A building that can be permeable or closed is better than being permanently closed off. A building that is surrounded with vegetation and with flexible entries would be far more inviting than the standard office building entrance.

It should be fitting that a material bank is a collage of materials, a physical embodiment of the materials from which they are distributed outward. A building that represents its purpose without the need for obvious signage. A design of salvaged materials as to distinguish itself from the rest of the monotone buildings that inhabit Wichita.

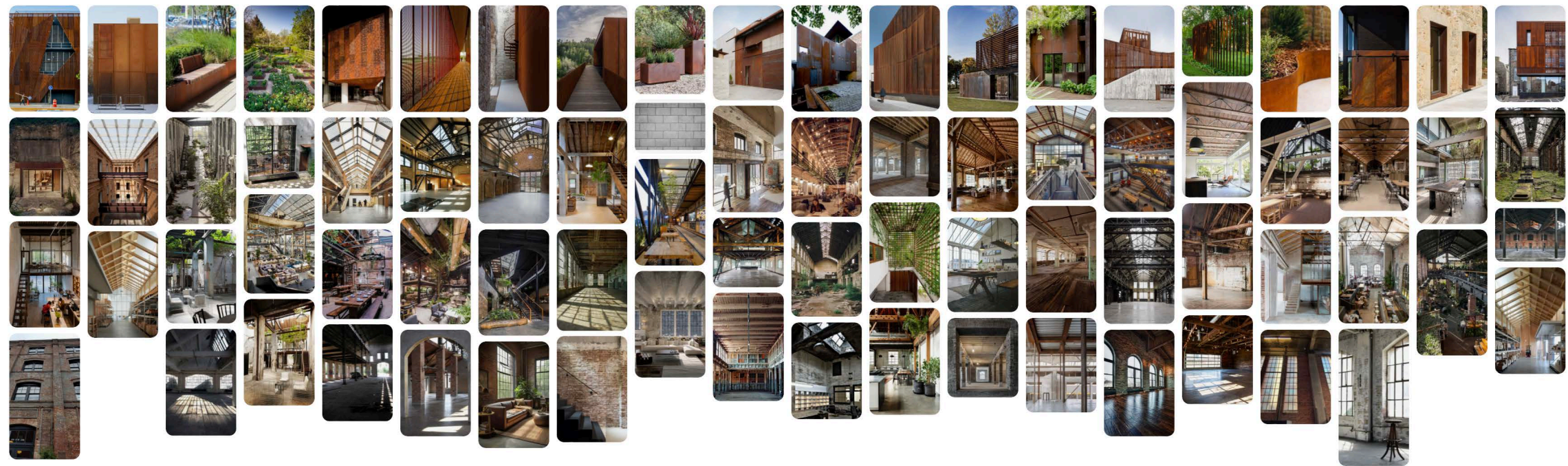
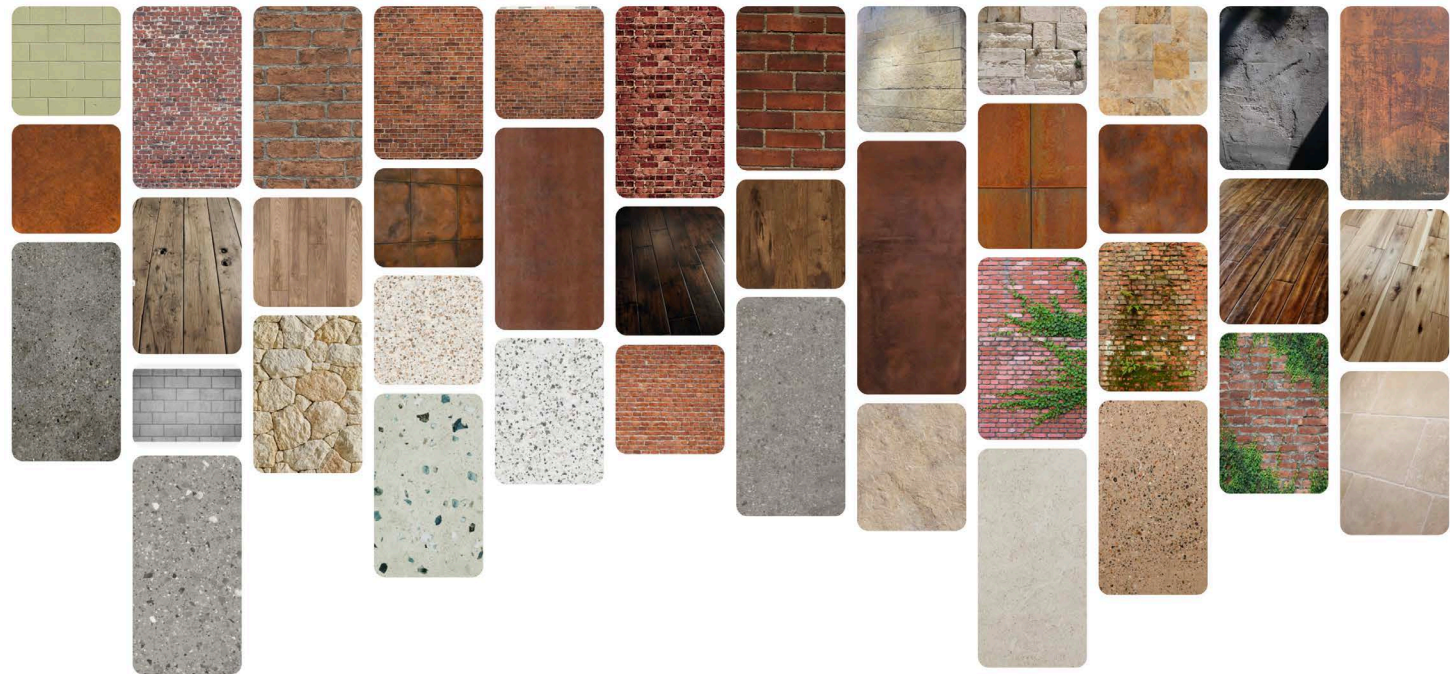
We occupy a world of finite resources. We must consider the entire life cycle of the products we make to insure that our resources are being utilized most effectively. The classic slogan of reduce, reuse, recycle is not just applicable to plastic water bottles. Our buildings should be in balance with the natural world, instead of being created in spite or without regard for nature. Our goal should be to achieve harmony with the cycles of the Earth.

Design Thesis



Sketches

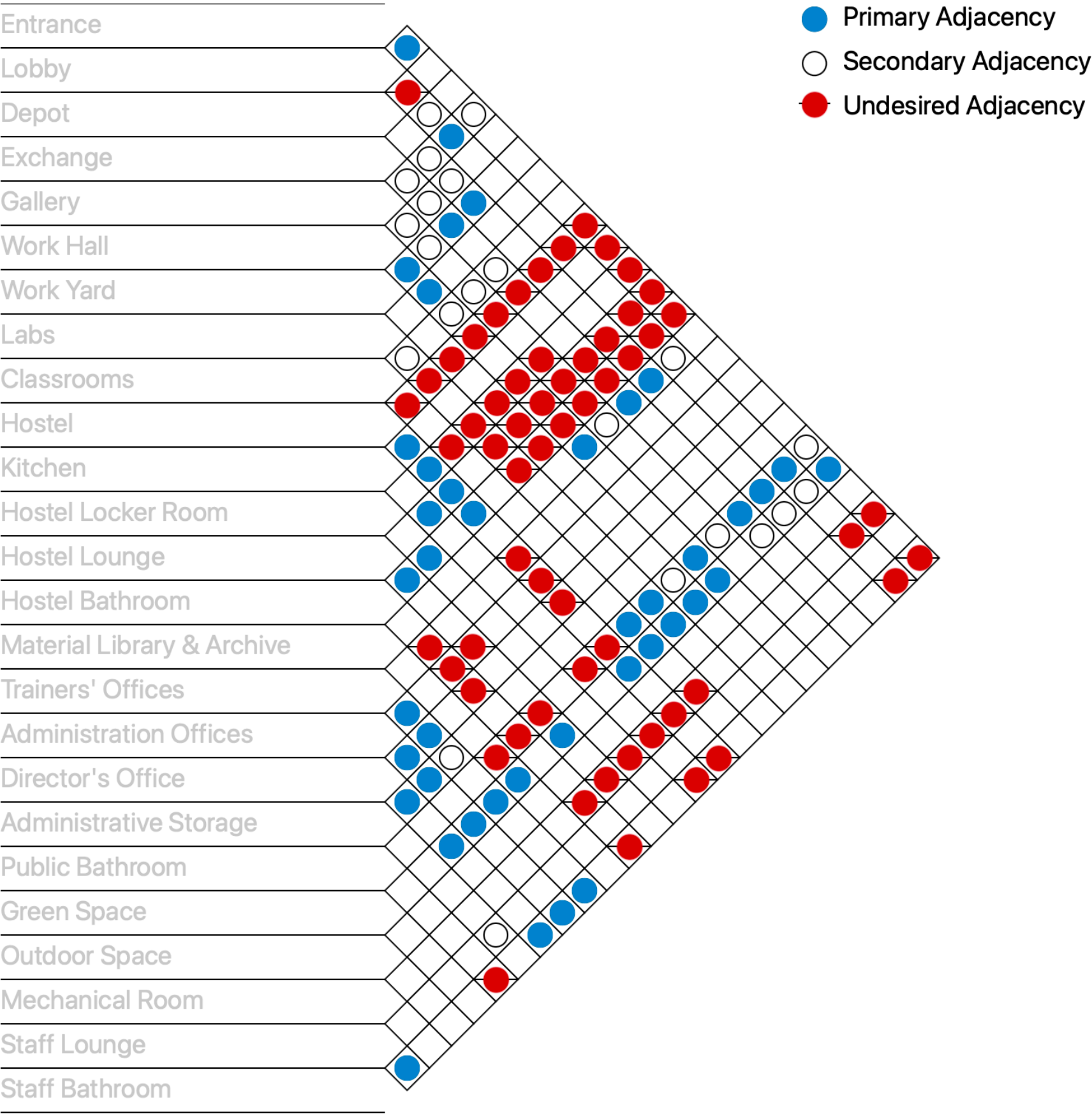
I will be using several materials in their natural form. Concrete, wood, steel, brick, and limestone. Corten steel instead of traditional stainless steel. I will use this variety of materials so as to not create a monotonous building that is one material of uniform texture. I want to create layers in both to form and material to visually distinguish this building from the typical Wichita tower. Having a industrial but warm feel to my building.



Material Palette

The adjacency diagram clarified that I do not want the hostel spaces near the commercial spaces. The hostels are almost residential while the work hall and work yard are almost industrial.

Adjacency Diagram



I moved onto a multi-level diagram which greatly helped me to decide on a three tiered design.

Level 3
Private

Hostel

Hostel

Level 2
Semi-Public

Offices

Storage

Material Library

Classrooms

Level 1
Public

Depot

Material Library

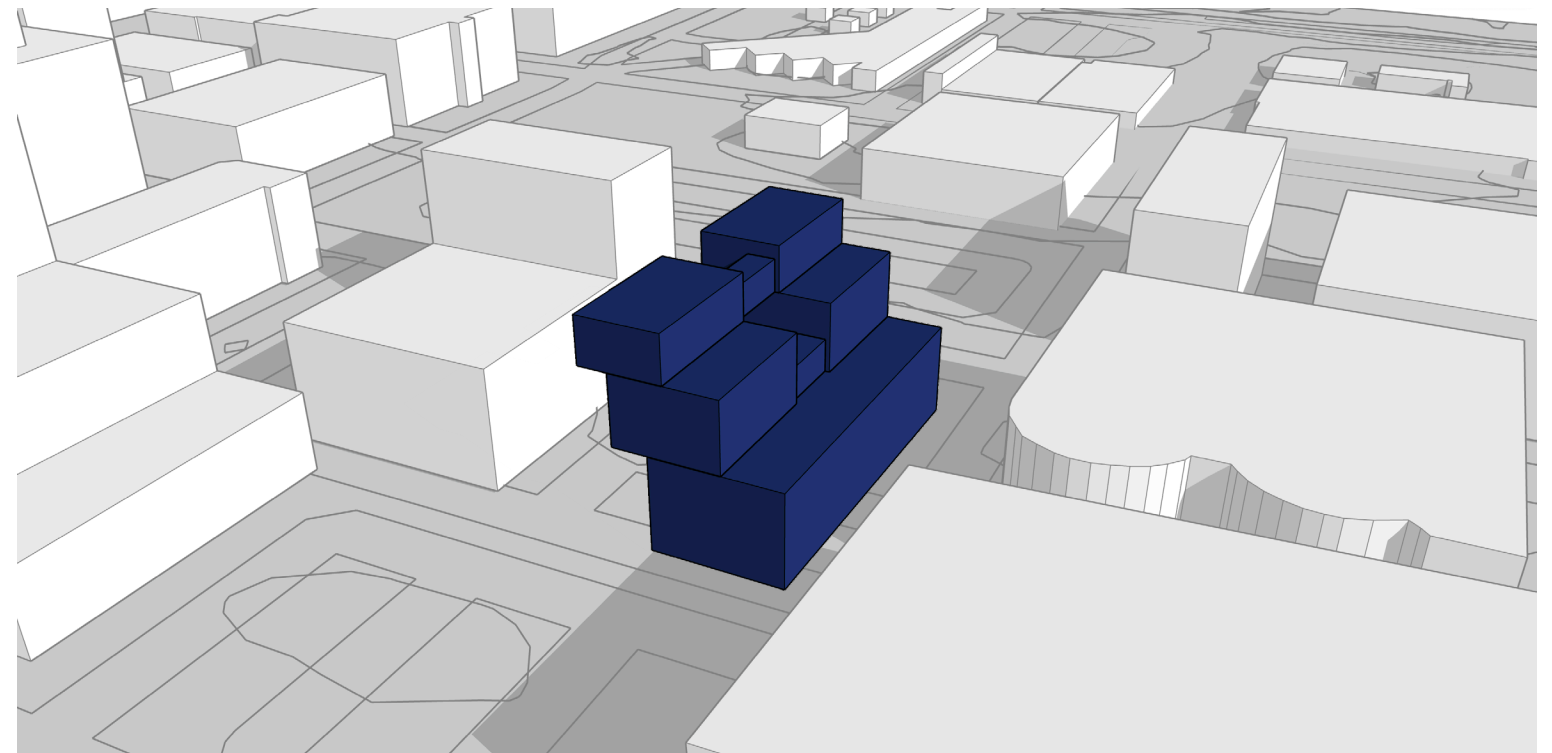
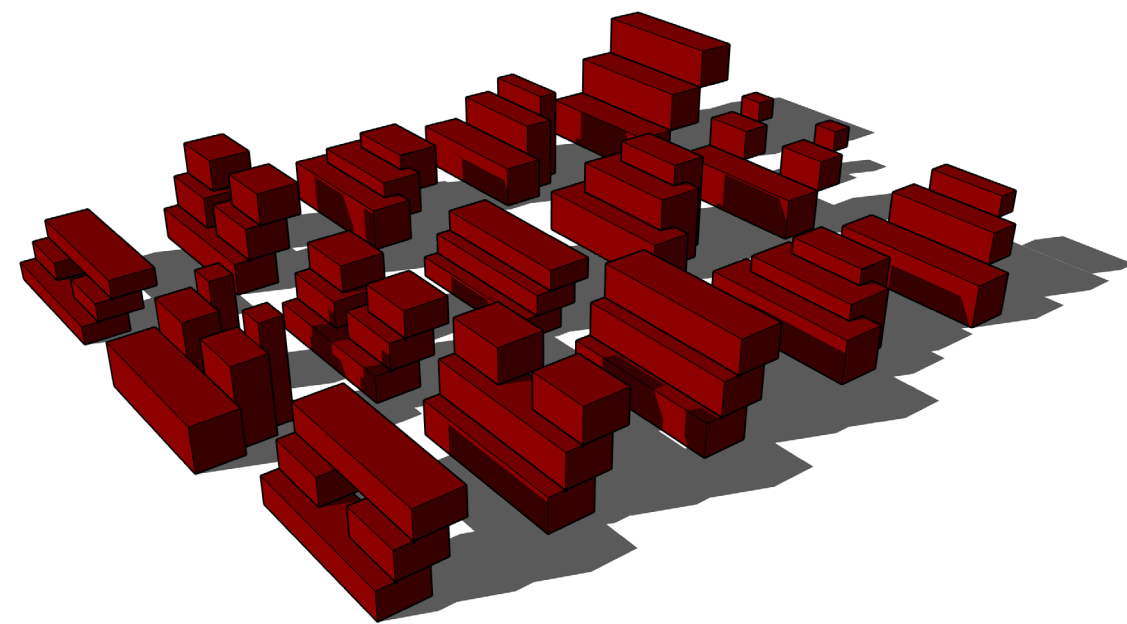
Labs

Work Hall

Lobby

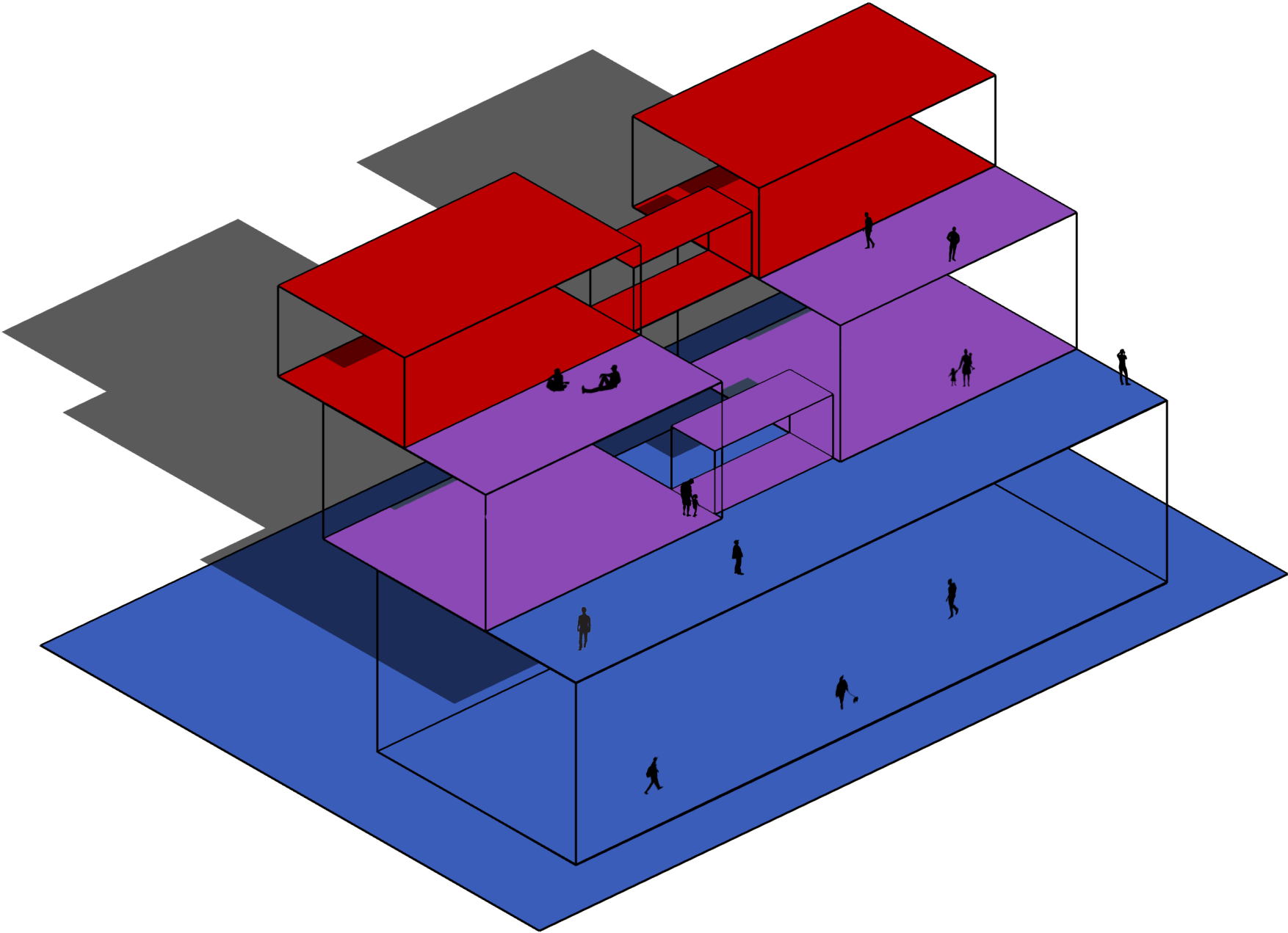
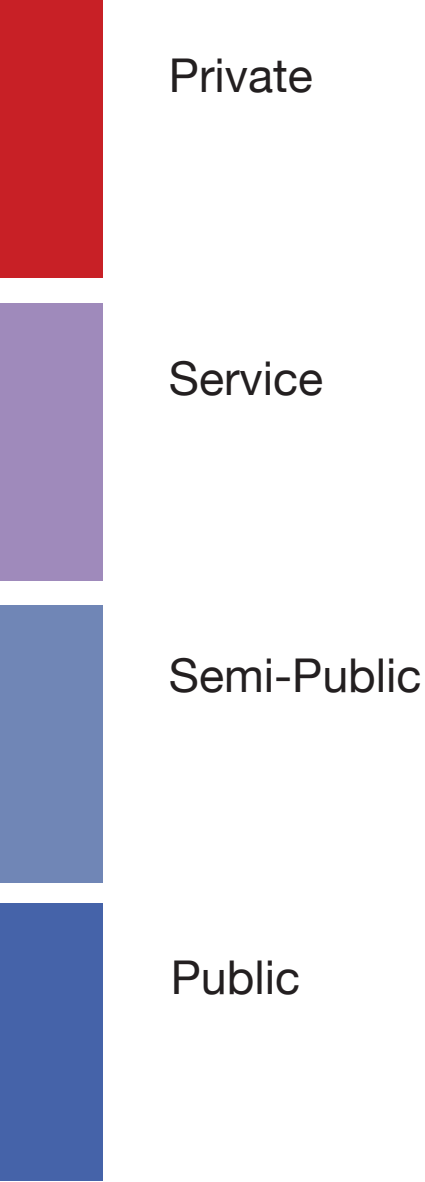
Exchange

Bubble Diagram

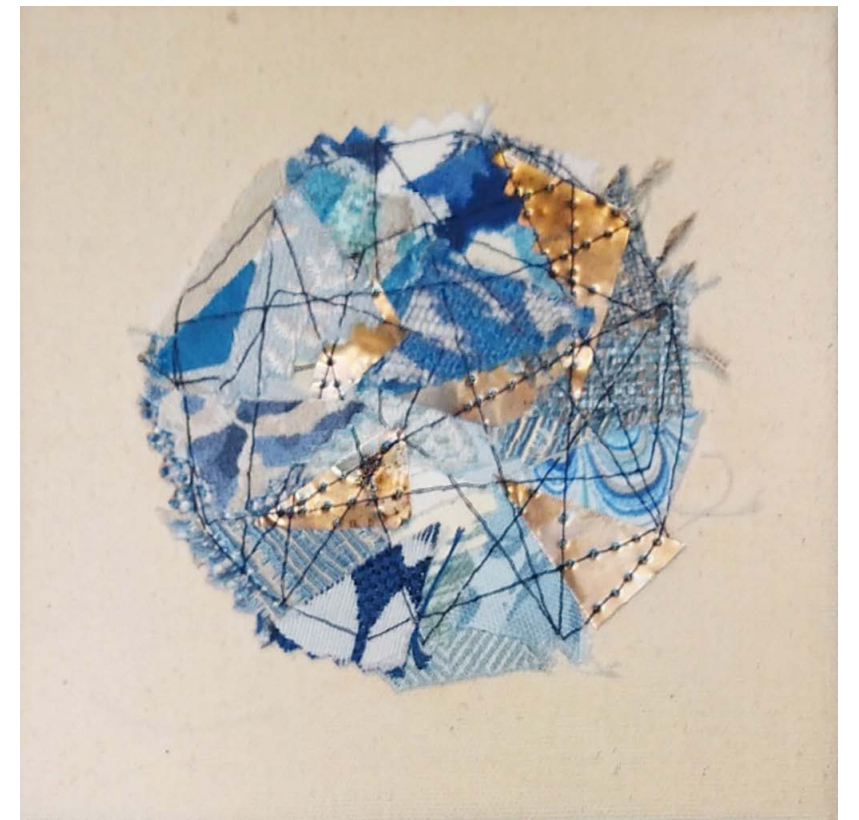


Massing Diagram

The three tiered design fit perfectly with my goal of seperating the hostel from the other spaces, with the first floor being the most public then increasing in privacy as you move up the building. Ending with the hostel at the top floor.



My specific programming is like a sewing group but more involved. My idea is that people will use the recycled and salvaged materials collected by us to create art. The Wichita Weavers uses metal, fabric, and thread to sew together. I want to build on this by having the visitors make the canvas as well as the art. Their whole piece is created by them from recycled materials, and they learn some rudimentary woodworking skills.

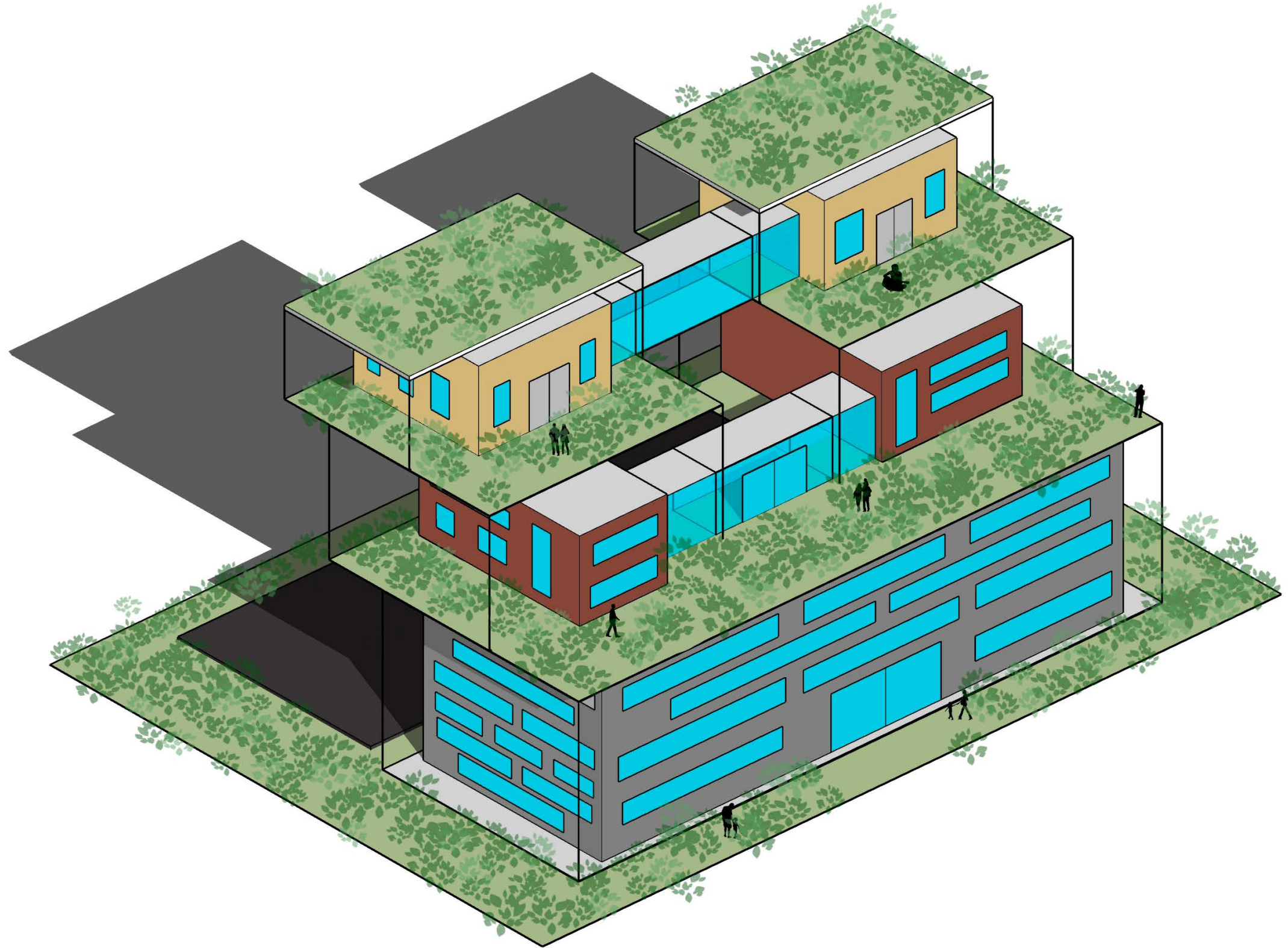


Programming

Occupancy Chart

						Block 1		Block 2	Block 3
Program Use	Occupancy	Occupancy Load Factor	Space Uses	Proposed Square ft.	Number of Exits for Room(s)	Assigned to 1st Floor Occupancy	Assigned to 2nd Floor Occupancy	Assigned to 3rd Floor Occupancy	Assigned to 4th Floor Occupancy
The Depot	M Storage, stock, shipping area	300 gross	An exterior material handling area accessible and maneuverable by flatbed or enclosed trailer trucks with functional clearances for the movement of loading equipment with temporary laydown space. The Yard may also include exterior material racks depending on the configuration of the Bank and its distribution of storages	5400	2	18			
The Exchange	S Warehouse	500 gross	A combination of interior handling, processing, storage and public display spaces that allow for optimum maneuverability of loading equipment and provide for storage systems and configurations for a range of material formats (linear elements such as beams, boards, piping or conduit, etc. of varying lengths, panels, slabs, blocks, aggregate, wire coils, as well as more anomalous small-scale elements that might be repetitively applied within building assemblies such as fasteners or hardware.	3600	2	8			
The Work Hall	E Vocational	50 net	A high bay with adjacent machine/equipment alcoves for different material-working processes and equipment (wood, glass, metal, ceramics, stone).	5850	2		117		
The Work Yard	M Storage, stock, shipping area	300 gross	Exterior workspace adjacent to the Work Hall.	1800	2	6			
The Labs	E Vocational	50 net	Workspaces tailorable to different requirements and adjacent to but closeable from the Work Hall where specialized equipment or processes might provide for material experiments or other forms of small-scale fabrication research.	1350	2			27	
The Classrooms	E Classroom	20 net	Flex spaces that can either be subdivided or conjoined for a range of uses such as class lectures, seminars or meetings, larger public lectures.	900	2			45	
The Hostel	R1 (Transient)	200 gross	Overnight sleeping quarters	500	1				12
	Locker Rooms	50 gross	Hostel Locker Room/Storage	50	1				12
	Library Reading Room	50 net	A "living room" for gathering/ recreation	300	1				12
	Kitchen (Commercial)	200 gross	Kitchen	300	1				12
Public Support	A Unconcentrated	15 net	Lobby / reception	300	1	20			
			Restrooms	400					
	A Exhibit Gallery and Museum	30 net	Flex-space for community meetings, special exhibitions, lectures	100	2	4			
Material Library & Archive	A Library Stack area	100 gross	For public use and reference	300	2	3	3		
Administration	M Mercantile	60 gross	Offices/workspace for up to 5 trainers, 5 administrative staff members, and the Center's director (distributed with appropriate adjacencies)	400	1			7	
	S2 Accessory Storage Space	300 gross	Storage for administrative equipment	50	1			1	
	Kitchen (Commercial)	200 gross	Kitchen/Café/Shared space for employees	200	2			1	
Building Support	Mechanical Equipment Room	300 gross	Mechanical rooms	50	1	1			
	Industrial Areas	100 gross	Electrical rooms	40	1	1			
	Industrial Areas	100 gross	Communication rooms	40	1	1			
	Industrial Areas	100 gross	Fire Riser room	40	1	1			
Circulation			20% of the total square ft	4394					
			Total without circulation	21970					
			Total with circulation	26364					
			Total occupancies per floor			63	120	81	48
			Building Occupancy	312					

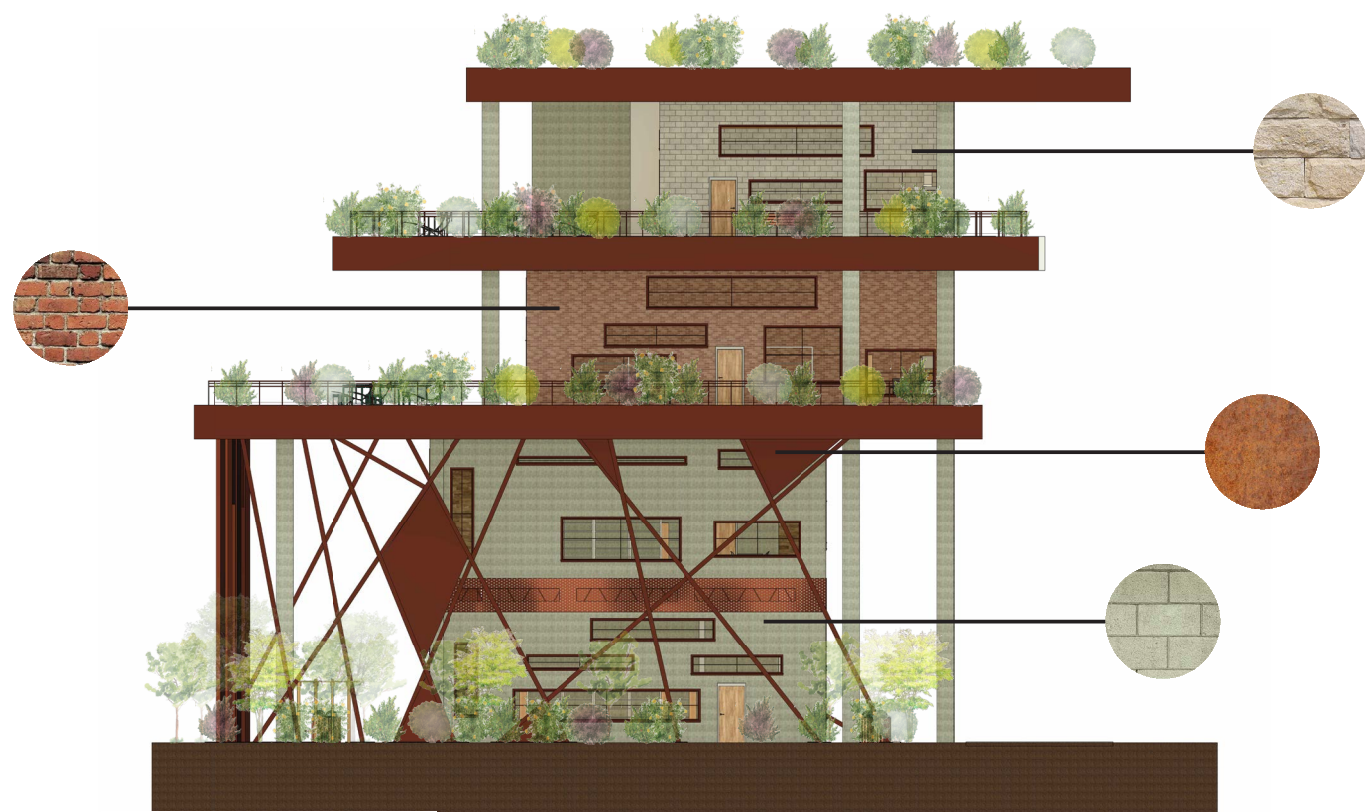
The orientation also means that the roofs are facing south which will be better for the plants on the green roofs. Green roofs allow for the maximization of green space on urban site. If I used a typical tower apartment or office building design, I would only have the perimeter on the ground floor available for green space. Cantilevering the spaces created roof space for vegetation and it provides outdoor space for more than just the ground floor.



Revised Massing Model

District Name	District Symbol	Description of District	Minimum Lot Size	Minimum Lot Width	Minimum Front Setback	Minimum Rear Setback	Minimum Interior-Side Setback	Minimum Street-Side Setback	Maximum Height
Commercial	GC	Commercial (warehousing, wholesaling services), retail, and office uses permitting outside display and/or storage	2,500 ft² 2,000 ft² 2-Family 580 ft² Multi-Family No Minimum Nonresidential	None	20 ft	10 ft	0.5 ft	10 ft	80 ft. + 2 ft. increase/1 ft. additional setback
Industrial Park-	IP-A	Accommodate research and development, industrial and manufacturing uses compatible with operation of airport and related facilities	None	None	50 ft	10 ft	15 ft	50 ft	60 ft
Industrial Park	IP	Limited commercial services, research and development, industrial and manufacturing uses which can meet high development and performance standards	None	None	50 ft	10 ft	15 ft	50 ft	60 ft
Central Business	CBD	Retail, commercial, office and industrial uses in a downtown setting	2,500 ft² 2,000 ft² 2-Family 250 ft² Multi-Family No Minimum Nonresidential	None	None	None	None	None	None
Limited Industrial	LI	Moderate intensity manufacturing, industrial, and commercial uses	None	None	20 ft	None	0.5 ft	None	80 ft. + 2 ft. increase/1 ft. add. setback
General Industrial	GI	Wide range of manufacturing, industrial, commercial, and complimentary uses	None	None	20 ft	None	0.5 ft	None	80 ft. + 2 ft. increase/ft. add. setback
Air Force Base	AFB	Accomodate the use of U.S. government-owned land for airforce base operation	None	None	None	None	None	None	None

Zoning



East Elevation

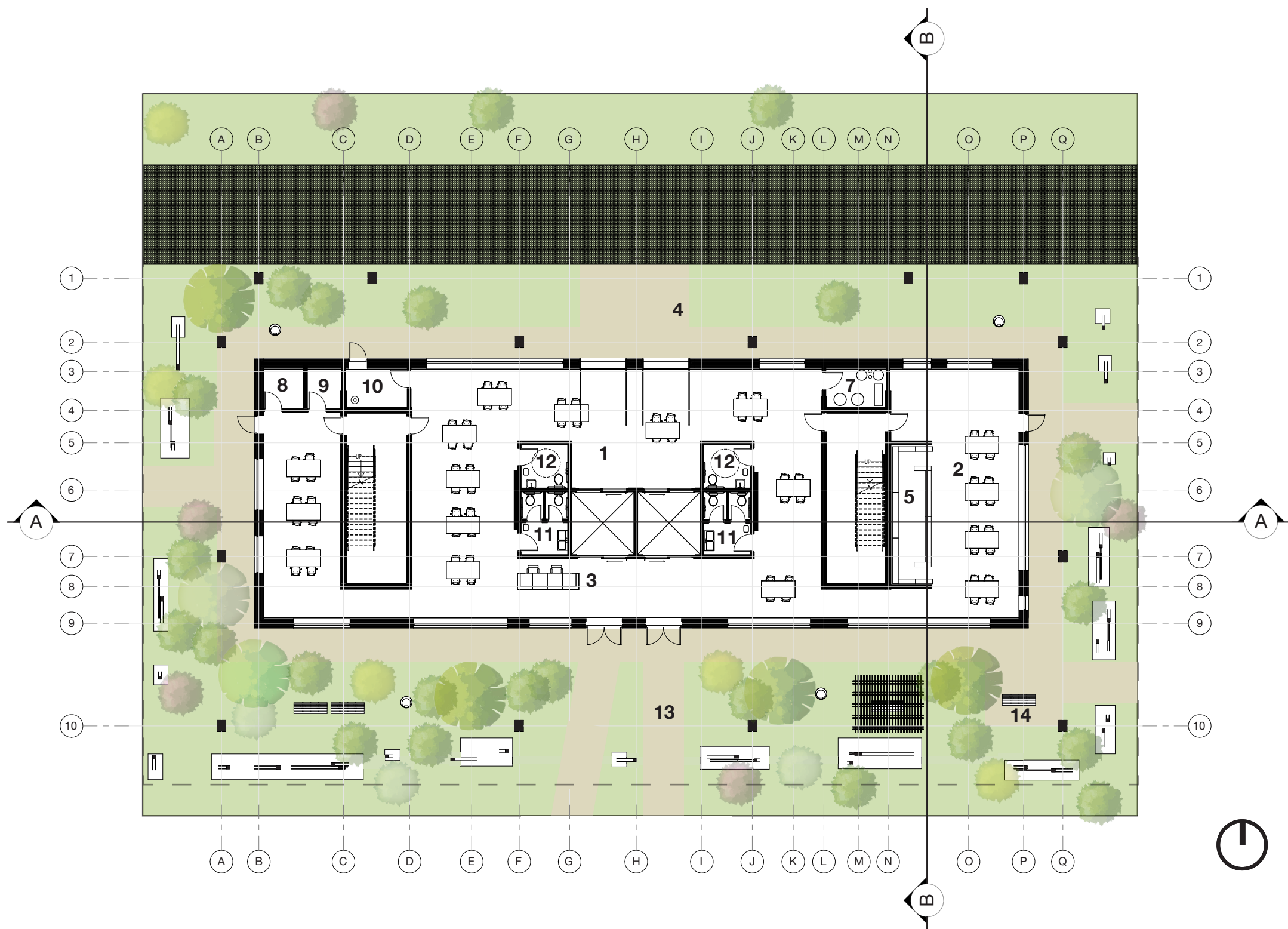


South Elevation

Elevations

1" = 22'-0"



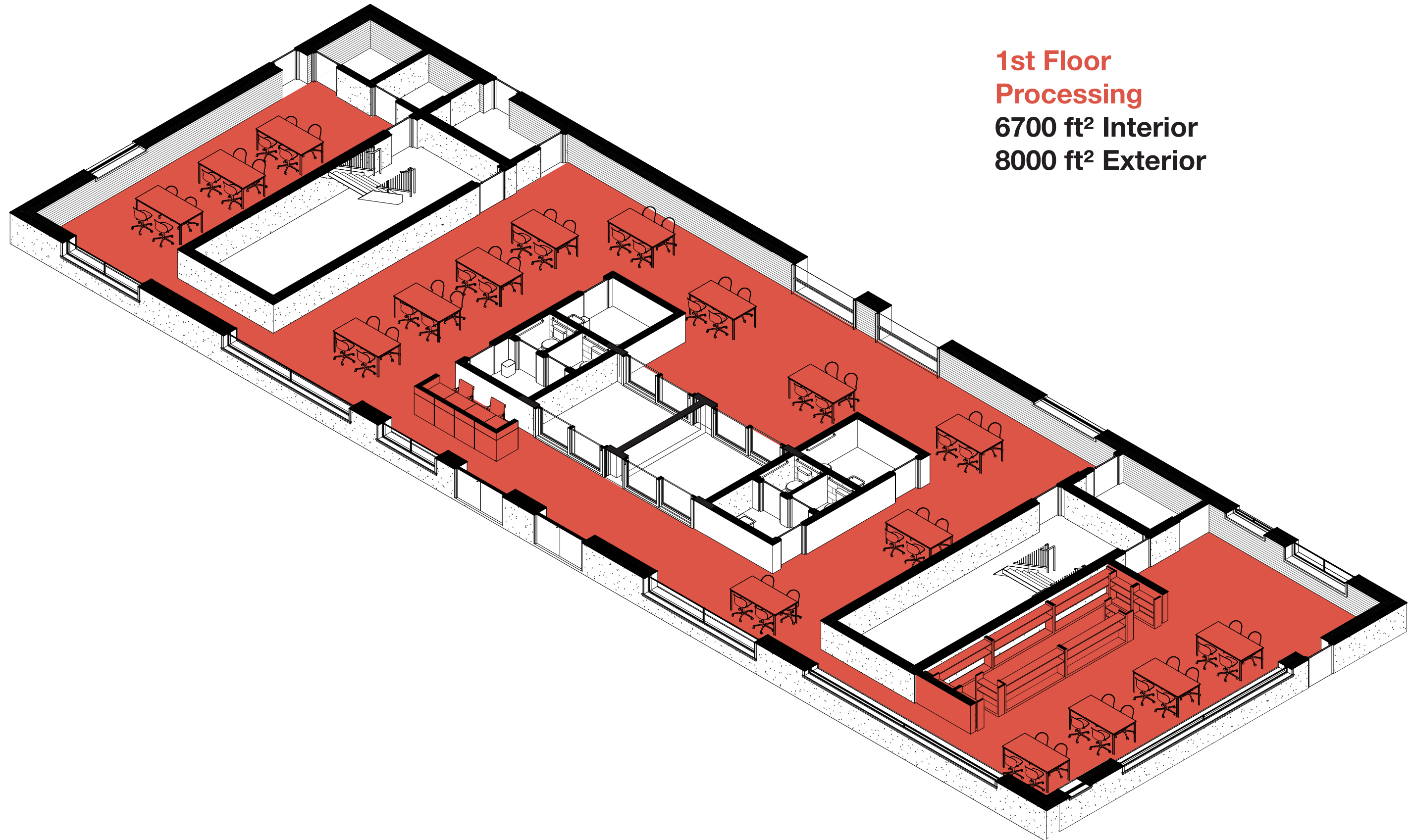


1st Floor

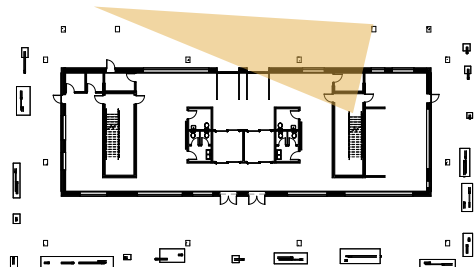
1. Sorting Area
2. Processing Area
3. Reception
4. Deliveries & Shipping Area
5. Material Library
6. Gallery
7. Mechanical Room
8. Electrical Room
9. Communication Room
10. Fire Riser Room
11. Restrooms
12. ADA Restroom
13. ADA Accessible Pathways
14. Accessible Public Transportation Stop

1/8" = 1'-0"





1st Floor
Processing
6700 ft² Interior
8000 ft² Exterior



Material Delivery
1st Floor

The day starts with the delivery of materials. Trucks can pull into the north side of the building along the permeable driveway. There are two garage doors that are six feet wide to allow for easy movement in and out.

After shipment is completed the truck can continue straight out to Broadway Ave or the west side alley without needing to reverse.

Material Delivery

Nature is a key aspect of my building, the element that makes it a *terraced garden*, so choosing the right plants is imperative. I researched trees, bushes, and shrubs that are native to southern Kansas. Native species so that they have the best chance of surviving and requiring the least amount of maintenance. The trees have to be small enough to fit within the space between the building and the steel screen, in both height and spread. The bushes needed to be small to medium as to fit the semi-intensive green roofs. And the spread of the root system needs to be small so that the roots aren't growing into the foundations

Site Design

Trees

- 1 Black Willow
Salix nigra
45 ft tall
- 2 Dwarf Chinquapin Oak
Quercus prinoides
30 ft tall
- 3 Downy Hawthorn
Crataegus mollis
30 ft tall
- 4 Dwarf Sumac
Rhus copallinum
10-32 ft tall
- 5 Flowering Dogwood
Cornus florida
32 ft tall
- 6 Nettleaf Hackberry
Celtis reticulata
25 ft tall
- 7 Peach-Leaf Willow
Salix amygdaloides
32 ft tall
- 8 Rough-Leaf Dogwood
Cornus drummondii
3-20 ft tall
- 9 Silk-Tree Albizia
Albizia julibrissin
20 ft tall
- 10 Redbud
Cercis canadensis
25 ft tall
- 11 Soapberry
Sapindus saponaria
40 ft tall
- 12 Wahoo
Euonymus atropurpureus
20-40 ft tall
- 13 Wild Plum
Prunus americana
10-25 ft tall
- 14 Chokecherry
Prunus Virginiana
3-20 ft tall
12 ft spread

Bushes and shrubs

- 1 Bailey's Rabbitbrush
Lorandersonia baileyi
10-28 in tall
- 2 Coralberry
Symphoricarpos orbiculatus
6 ft tall
- 3 Bessey's Sandcherry
Prunus pumila
28-40 in tall
- 4 Dichondra (Silver falls)
Dichondra argentea
2-4 in tall
3-4 ft spread

Sources

https://www.johnson.k-state.edu/docs/lawn-and-garden/in-house-publications/perennials/Perennial%20Vines_REV.pdf

https://kswildflower.org/tree_index.php

[https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=259475&is-profile=0&#:~:text=From%20a%20hanging%20basket%2C%20it,\(-to%201"%20across\).](https://www.missouribotanicalgarden.org/PlantFinder/PlantFinderDetails.aspx?taxonid=259475&is-profile=0&#:~:text=From%20a%20hanging%20basket%2C%20it,(-to%201)

https://www.wildflower.org/plants/result.php?id_plant=cofl2

https://www.wildflower.org/plants/result.php?id_plant=CHBA11

<https://www.gardenia.net/plant/cornus-drummondii>
<https://www.gardenia.net/plant/cornus-florida-appalachian-spring-flow-ering-dogwood>

<https://www.gardenia.net/plant/prunus-virginiana>

<https://www.gardenia.net/plant/prunus-americana>

<https://www.gardenia.net/plant/symphoricarpos-orbiculatus>

<https://www.gardenia.net/plant/dichondra-argentea-silver-falls>

<https://plants.ces.ncsu.edu/plants/cornus-florida/>



Appalachian Spring
(Flowering Dogwood)

Cornus florida
15-20 ft tall
15-20 ft spread



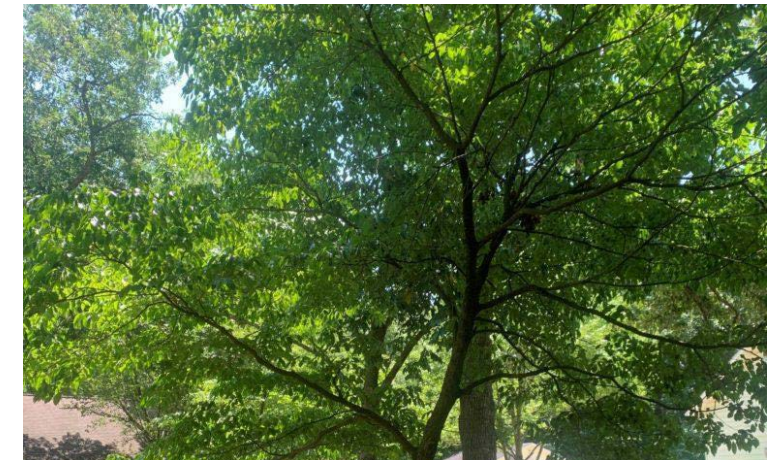
American Plum

Prunus americana
15-25 ft tall
15-25 ft spread



Chokecherry

Prunus virginiana
20-30 ft tall
15-20' spread



Roughleaf Dogwood

Cornus drummondii
6-15 ft tall
6-15 ft spread



Silver Falls

Dichondra micrantha
3-4 in tall
3-4 ft spread



Bailey's Rabbitbrush

Lorandersonia baileyi
10-28 in tall
3-4 ft spread



Coralberry

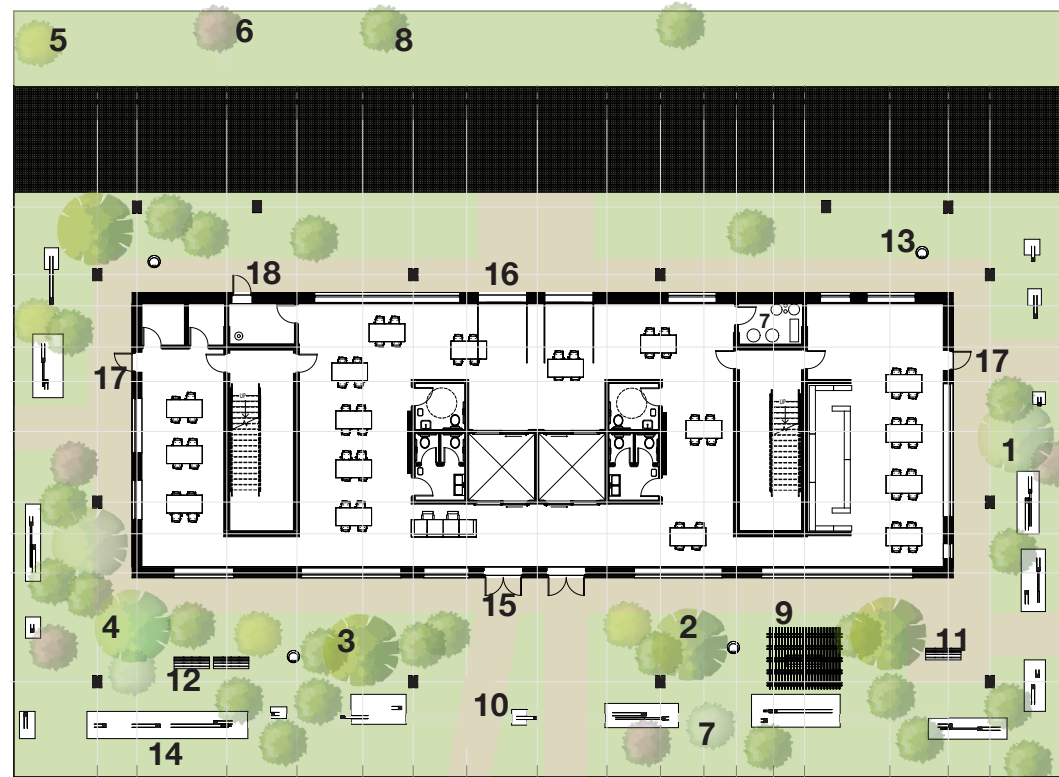
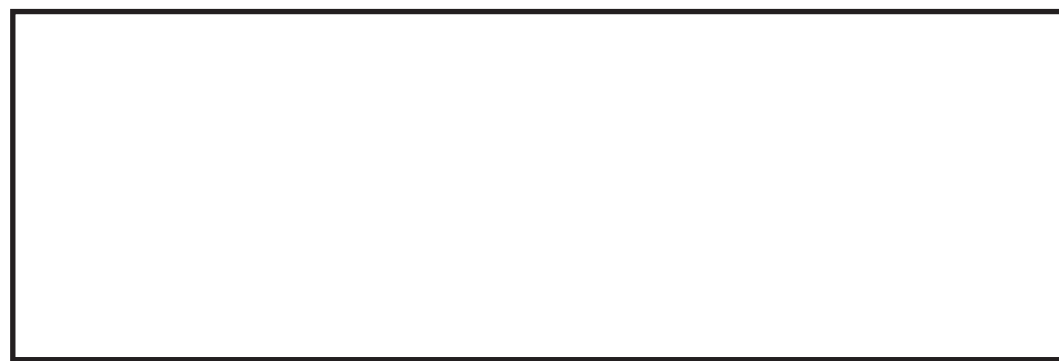
Symphoricarpos orbiculatus
2-5 ft tall
4-8 ft spread



Bessey's Sandcherry

Prunus pumila
28-40 in tall
3-5 ft spread

Site Design - Selected Plants



S Broadway Ave.

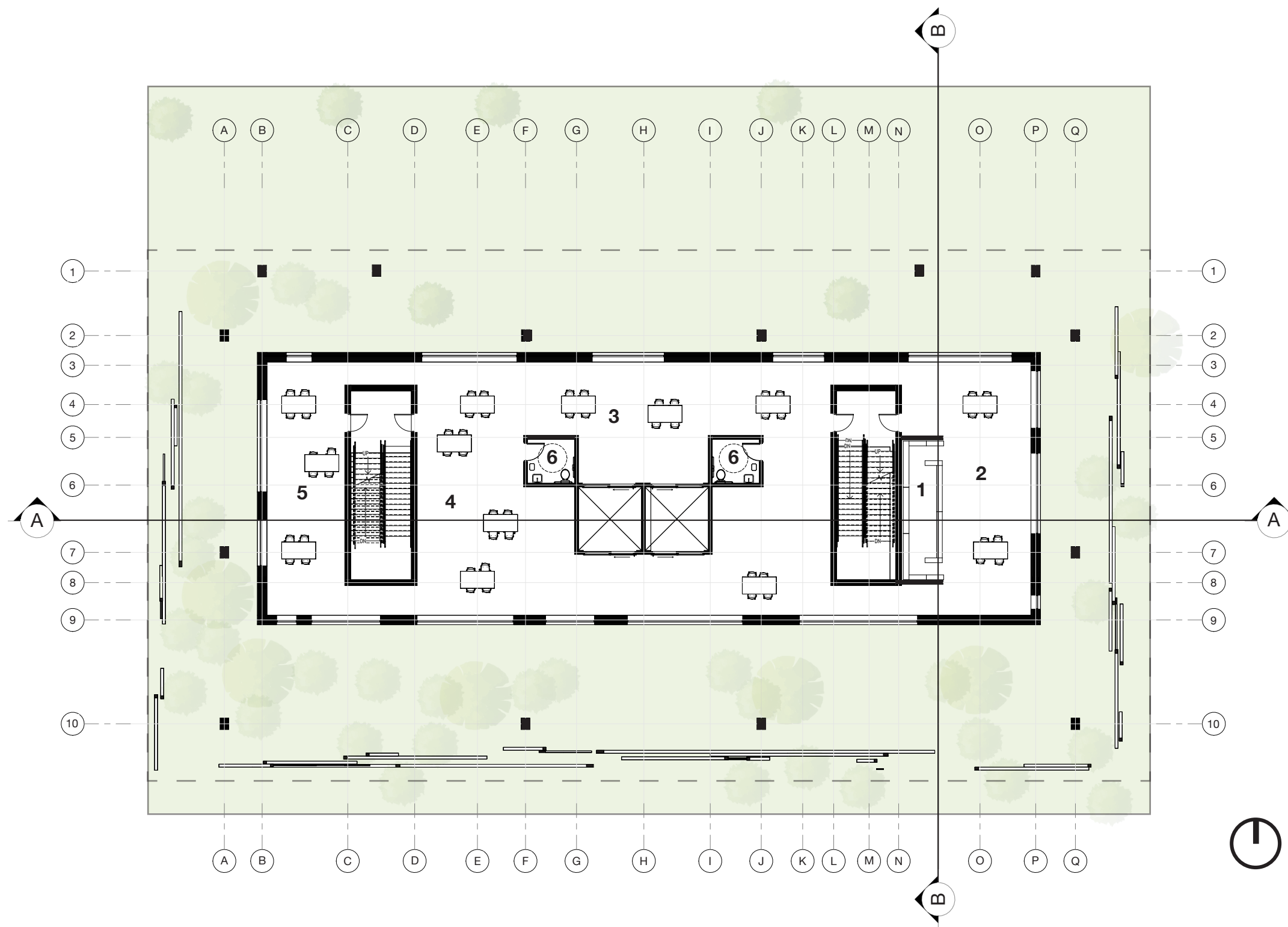
E English St.

Site Plan

1. Flowering Dogwood
2. American Plum
3. Chokecherry
4. Roughleaf Dogwood
5. Bailey's Rabbitbrush
6. Coralberry
7. Bessey's Sandcherry
8. Silver Falls
9. Pergola
10. ADA Accessible Pathways
11. Accessible Public Transportation Stop
12. Bench
13. Trash
14. Corten Steel Screen
15. Front entrance
16. Back entrance
17. Side entrance
18. Fire Riser Room entrance

1/32" = 1'-0"



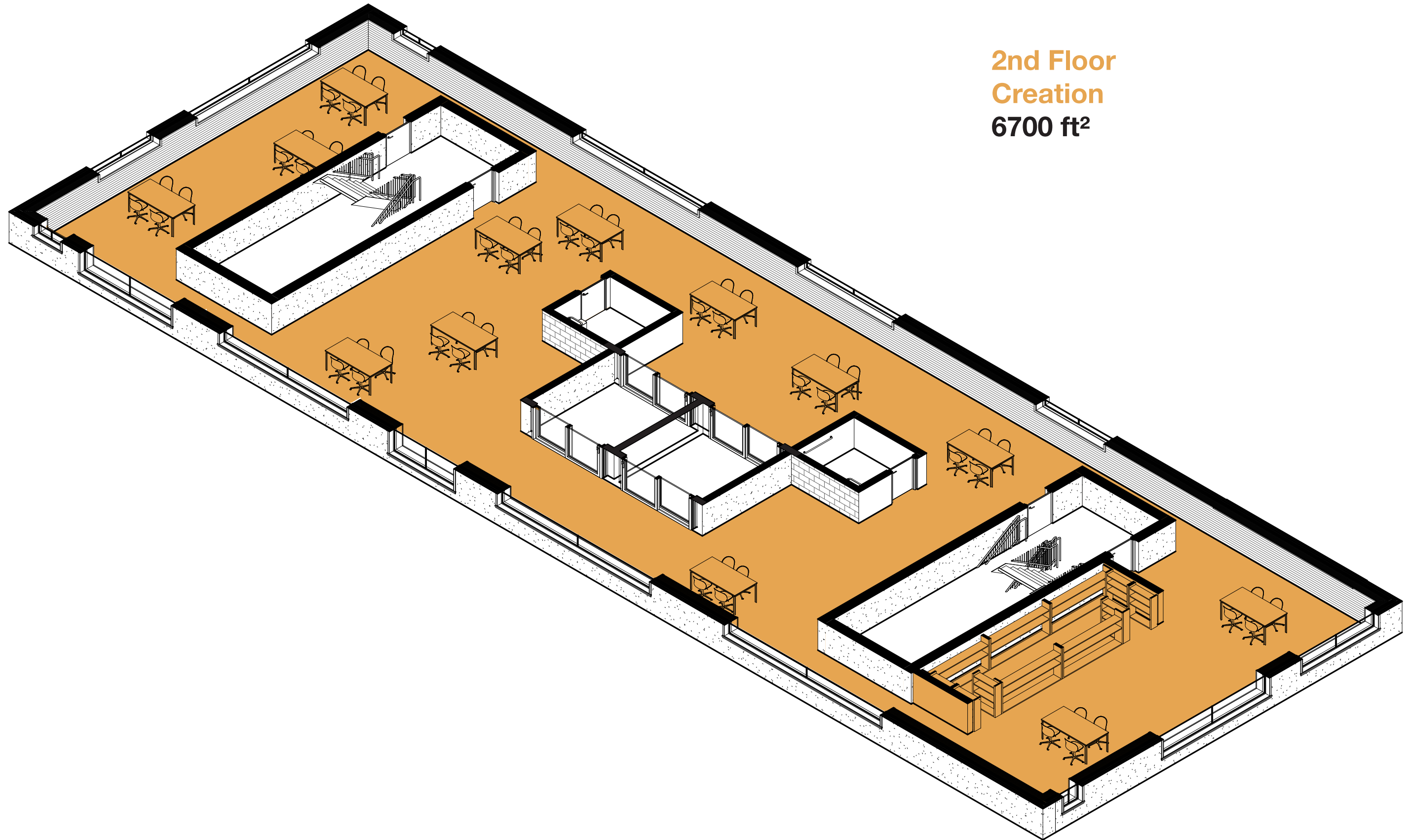


2nd Floor

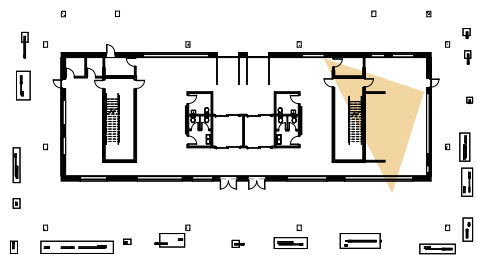
- 1. Material Library
- 2. Material Selection Area
- 3. Canvas Area
- 4. Sewing Area
- 5. Assembly Area
- 6. ADA Restroom

1/8" = 1'-0"





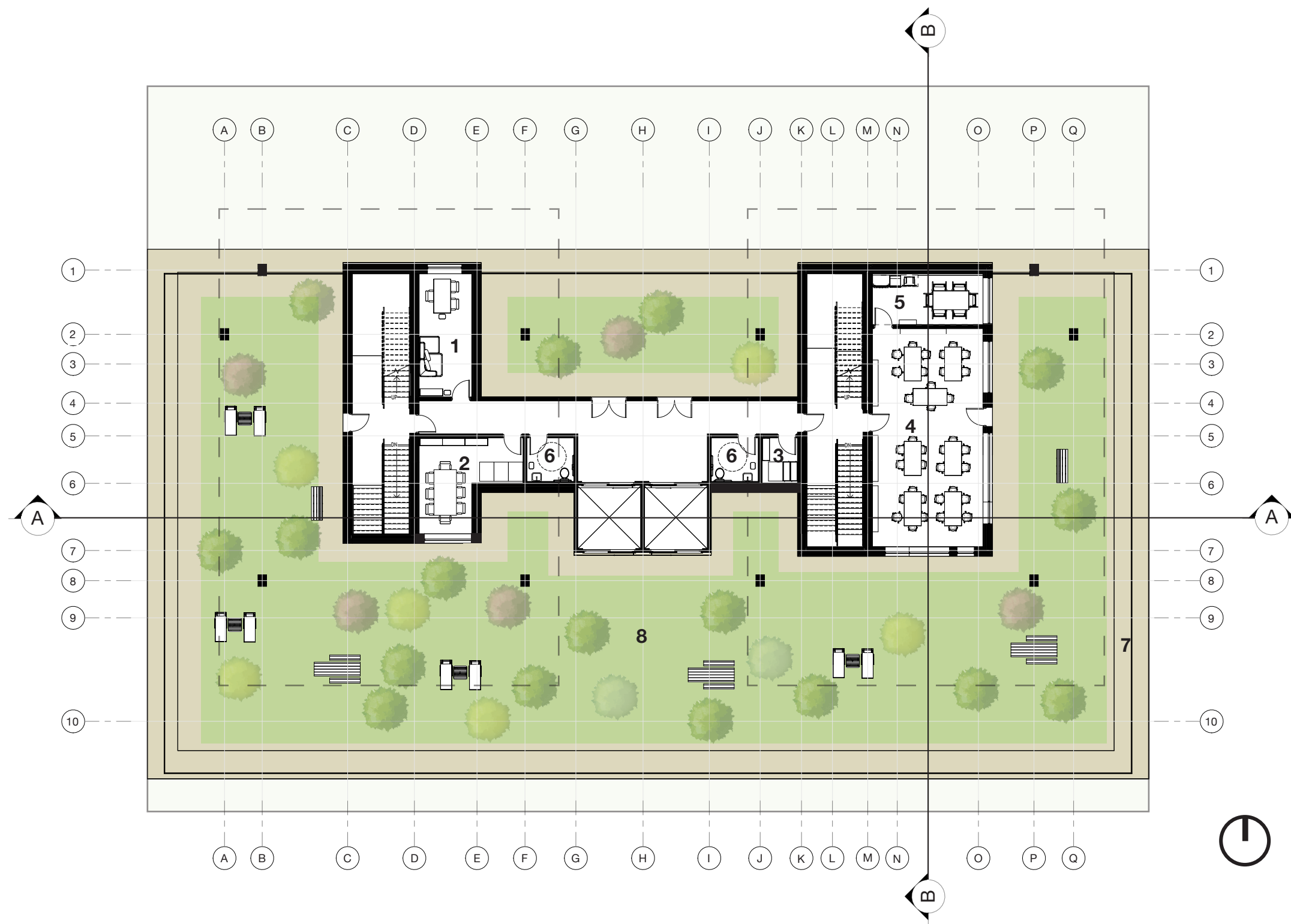
2nd Floor
Creation
6700 ft²



Material Sorting
1st Floor

Materials are dropped at the material library where they are then sorted by the staff to later be used by visitors. There is a material library on the first and second floors so a workshop can use materials on its floor without needing to go a different floor.

Material Sorting

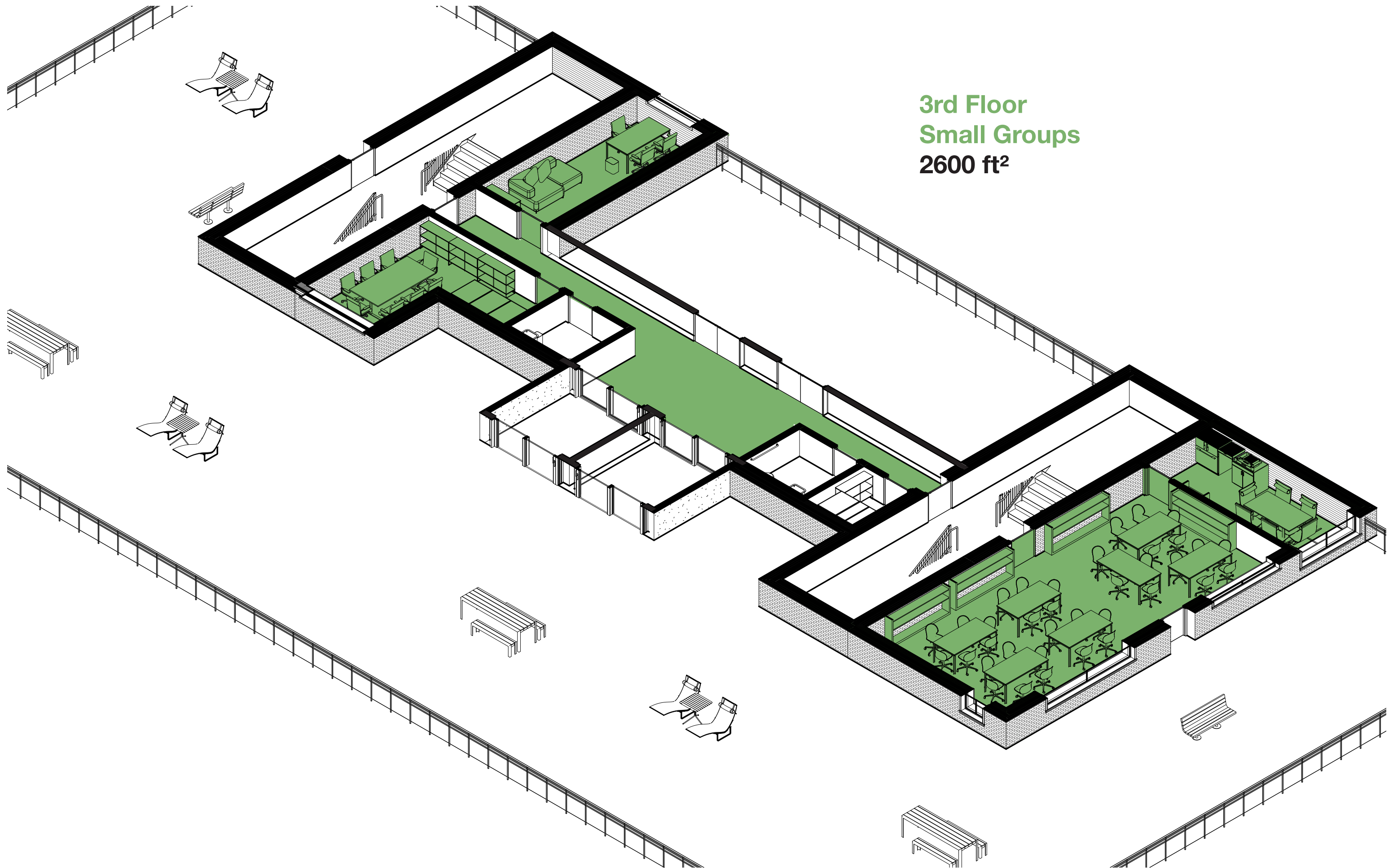


3rd Floor

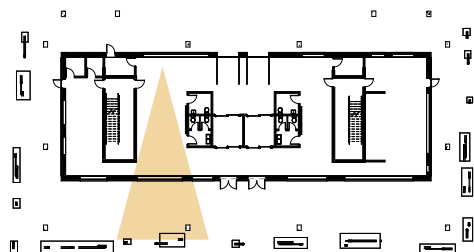
1. Office
2. Conference Room/Workspace
3. Storage
4. Classroom
5. Employee Kitchen
6. ADA Restroom
7. Fire Break
8. Green Roof

1/8" = 1'-0"





3rd Floor
Small Groups
2600 ft²

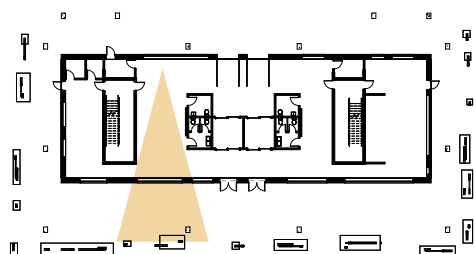


Classroom
1st Floor

Workshop

Workshop are held throughout the day to create the art using the recycled and salvaged materials. The visitors will create art using the fabric, wood, yarn, thread, metal, and canvas. People will work in small groups at tables like the ones shown above under supervision of employees that can direct them on sewing techniques or woodworking.

The first and second floors are more open spaces, but for a private class, there is a enclosed classroom on the third floor. That classroom could hold a invite-only class while the first and second floors could be walk-in style classes.

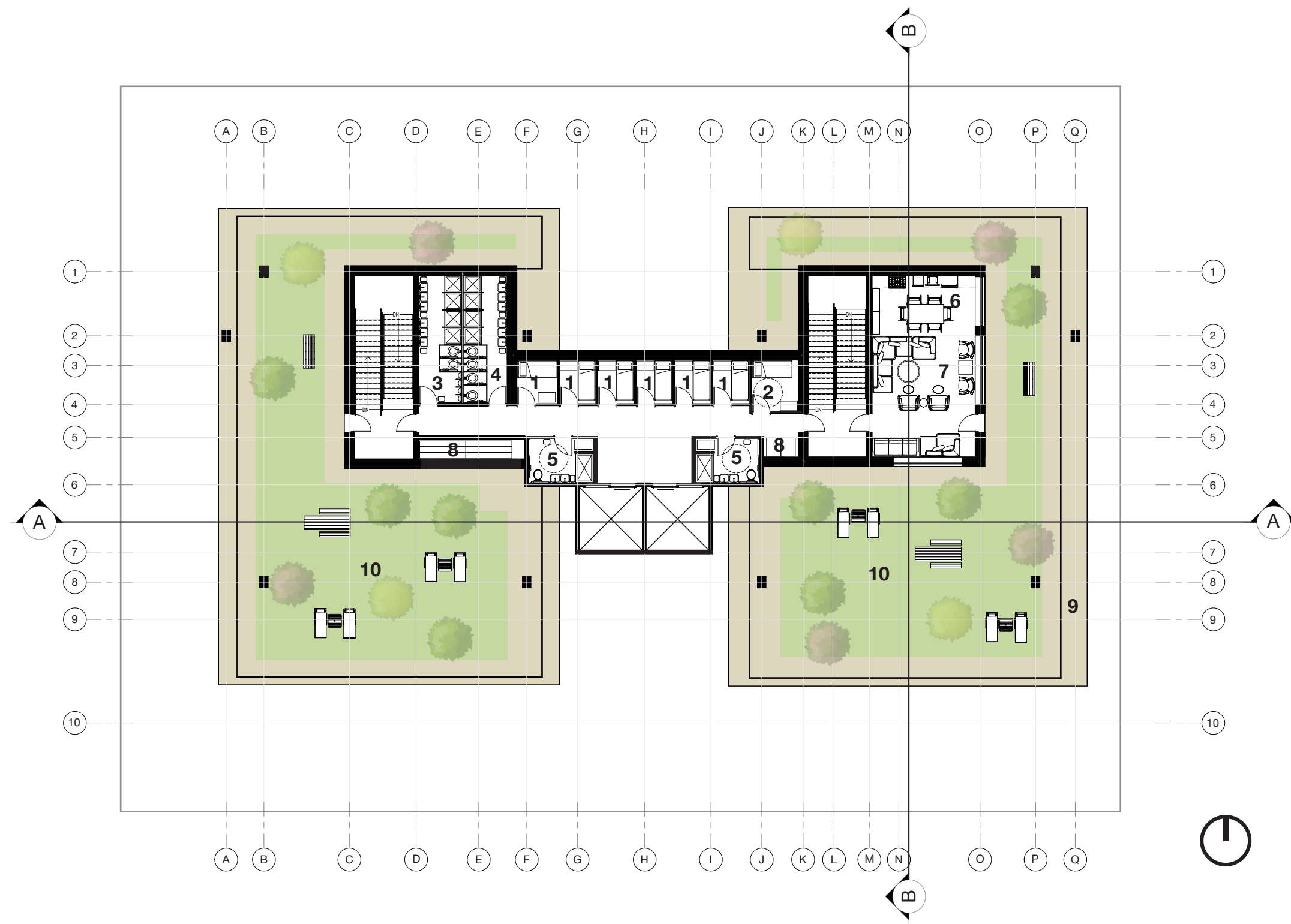


Gallery Space
1st Floor

Exhibition

These renders show the order of the operations of how a day at *terraced garden* could progress, but the design of the first two floors is open enough to allow for flexibility in the use of the space. The sorting, handling, workshops, and exhibition could happen entirely on one floor or have workshops happening on both floors.

Once the art is created, there could be an exhibition at night in the same space as the workshop class. The exhibition could be held on the first or second floors, or both simultaneously.

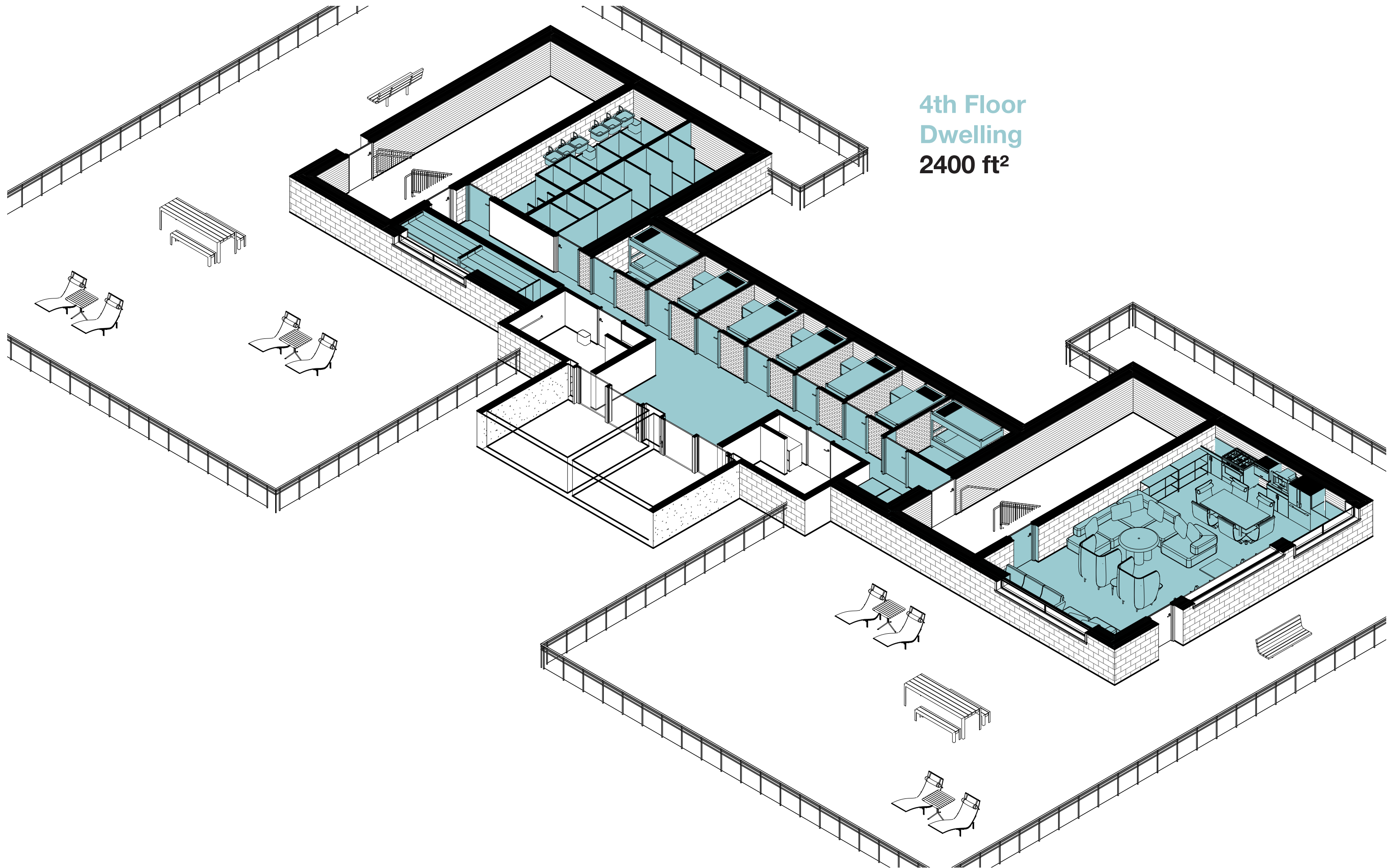


4th Floor

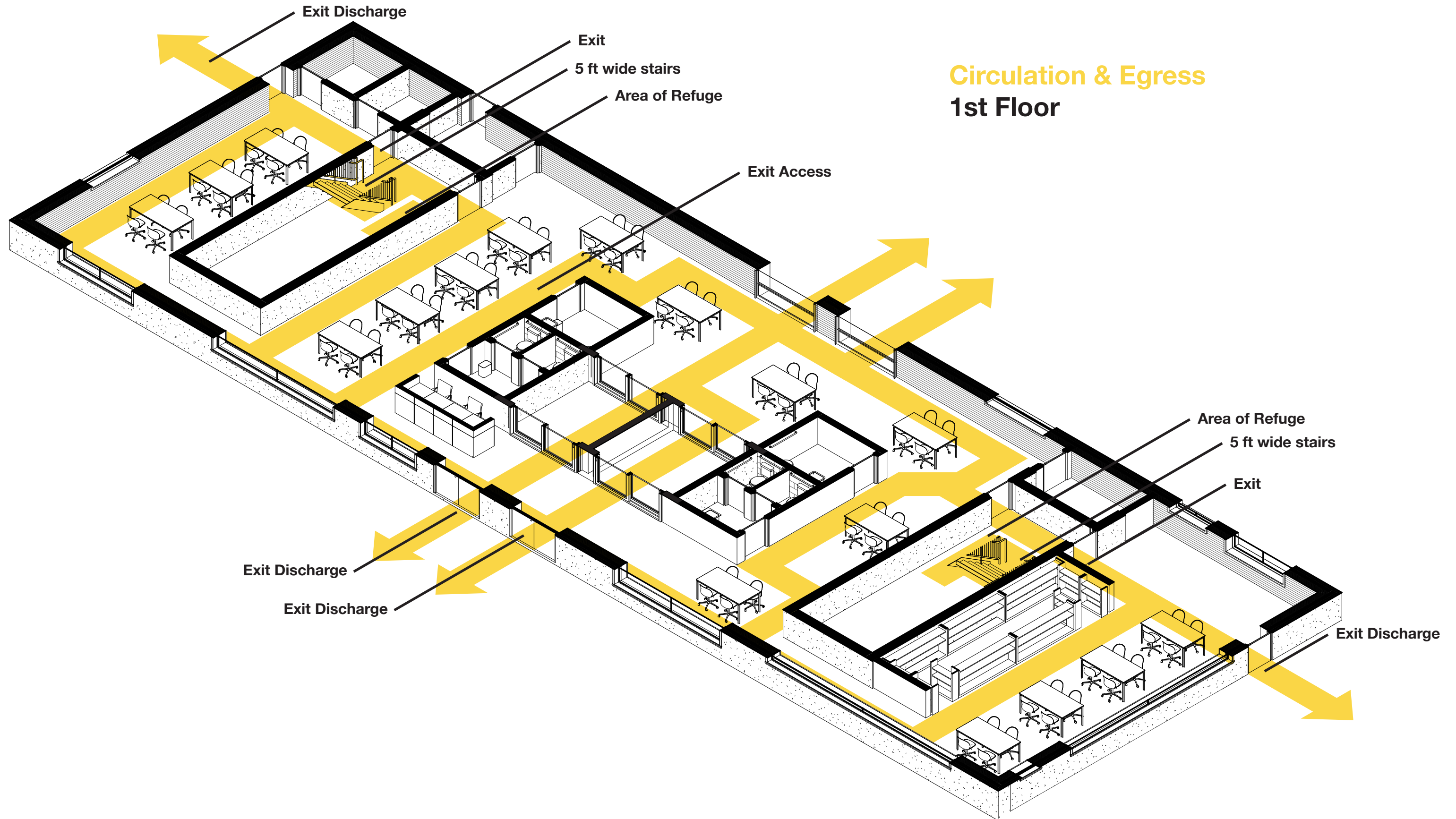
1. Hostel Room
2. ADA Hostel Room
3. Men's Restrooms
4. Women's Restrooms
5. ADA Restroom
6. Hostel Kitchen
7. Hostel Lounge
8. Storage
9. Fire Break
10. Green Roof

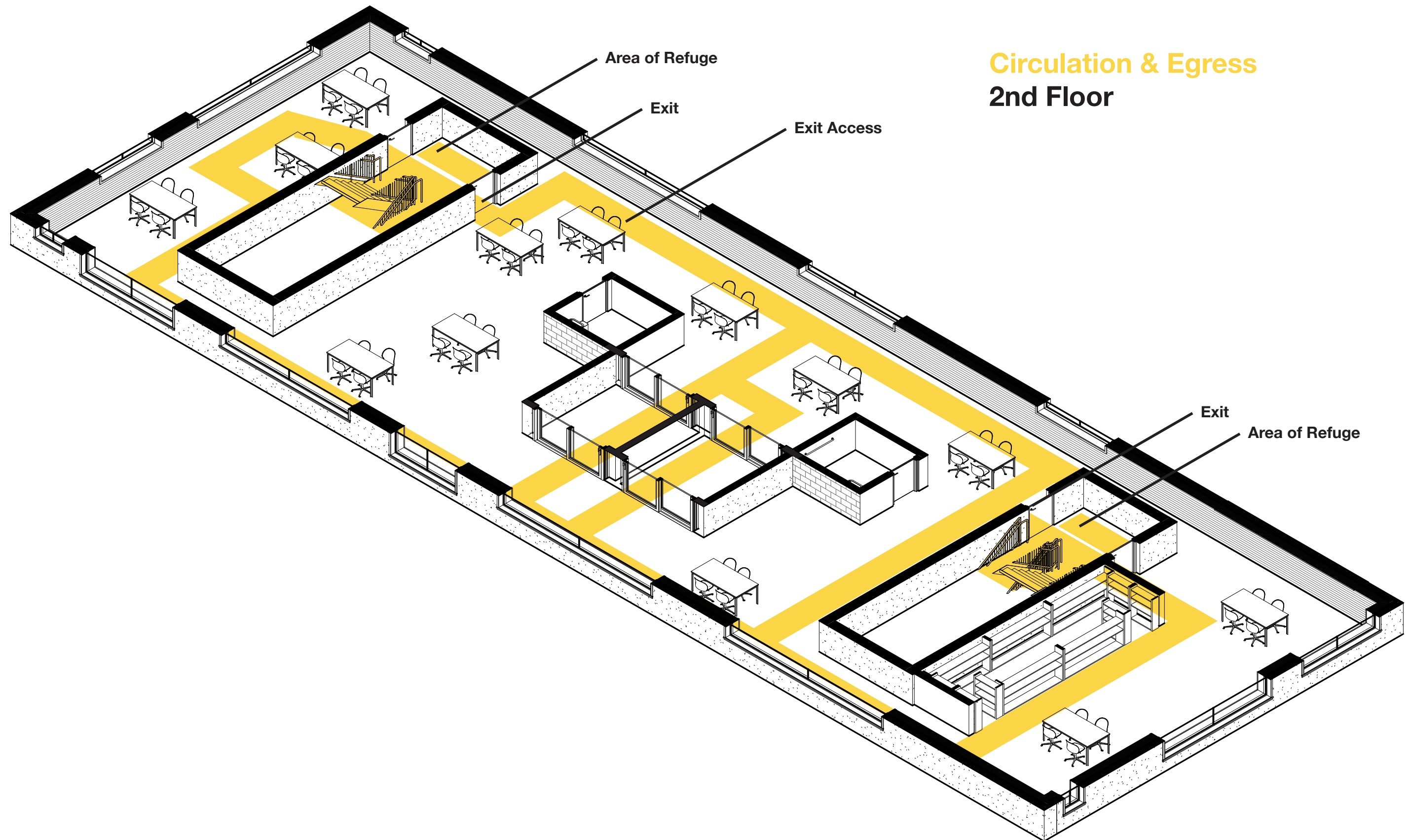
1/8" = 1'-0"



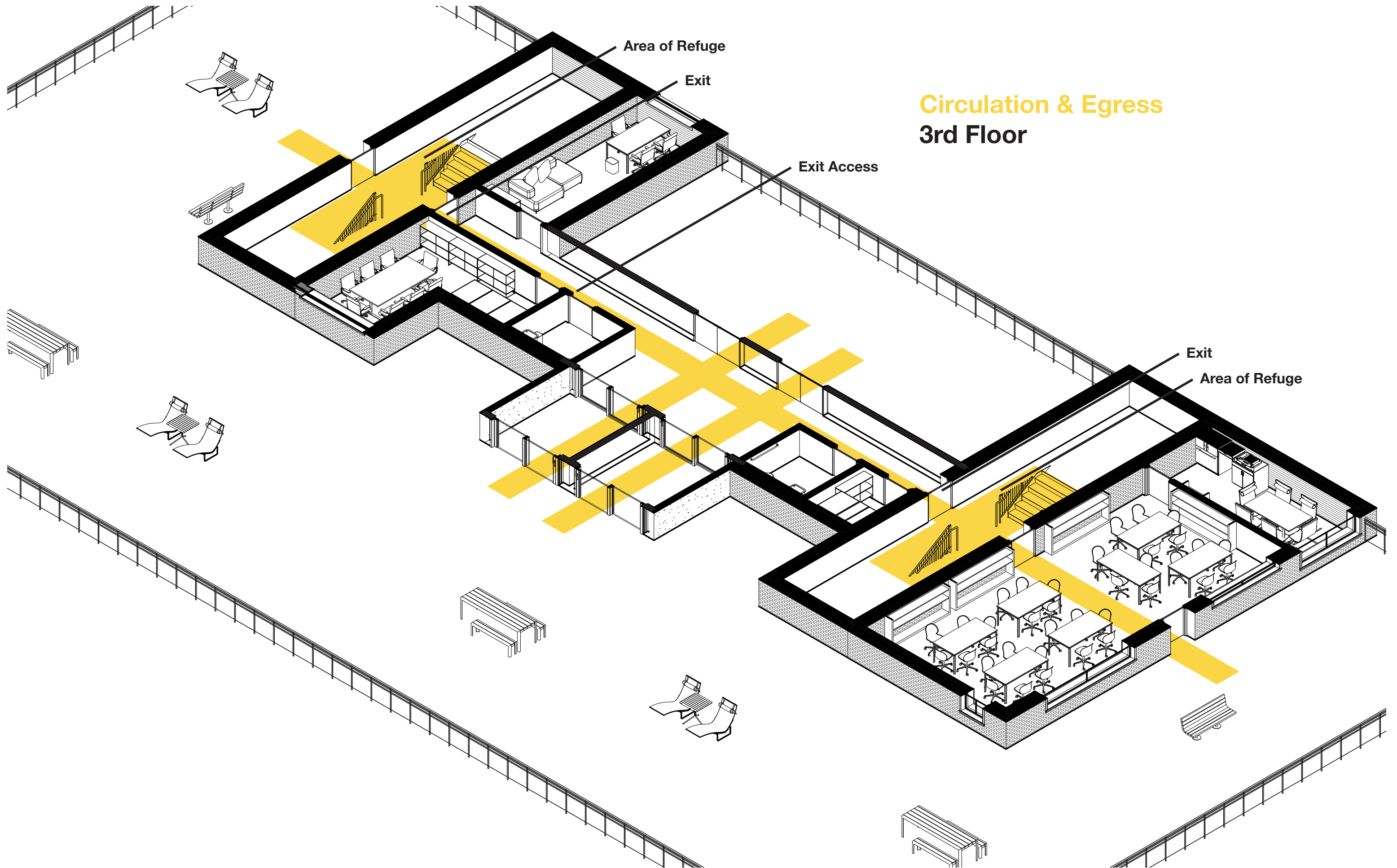


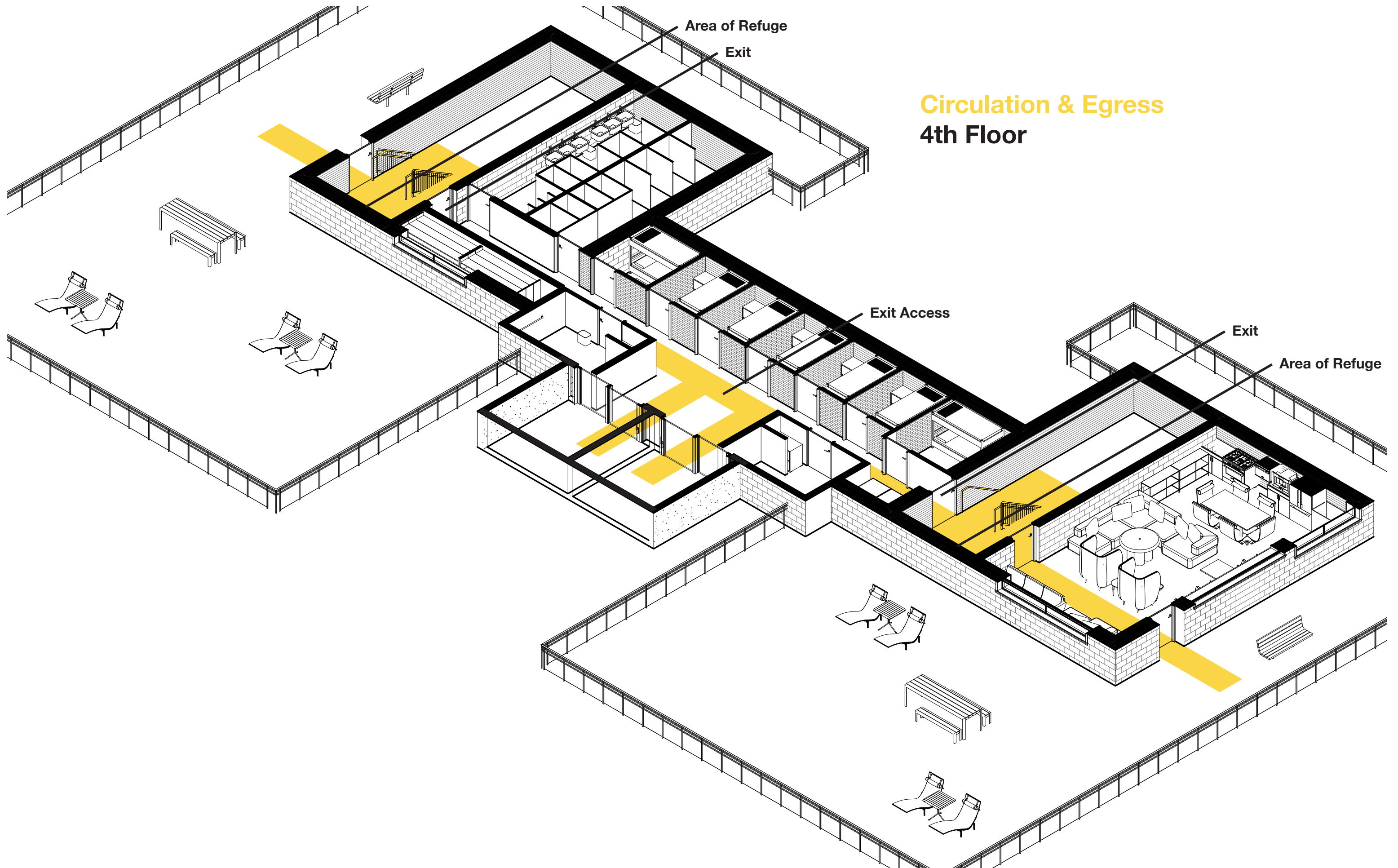
4th Floor
Dwelling
2400 ft²





Circulation & Egress 2nd Floor





Circulation & Egress
4th Floor

Area of Refuge

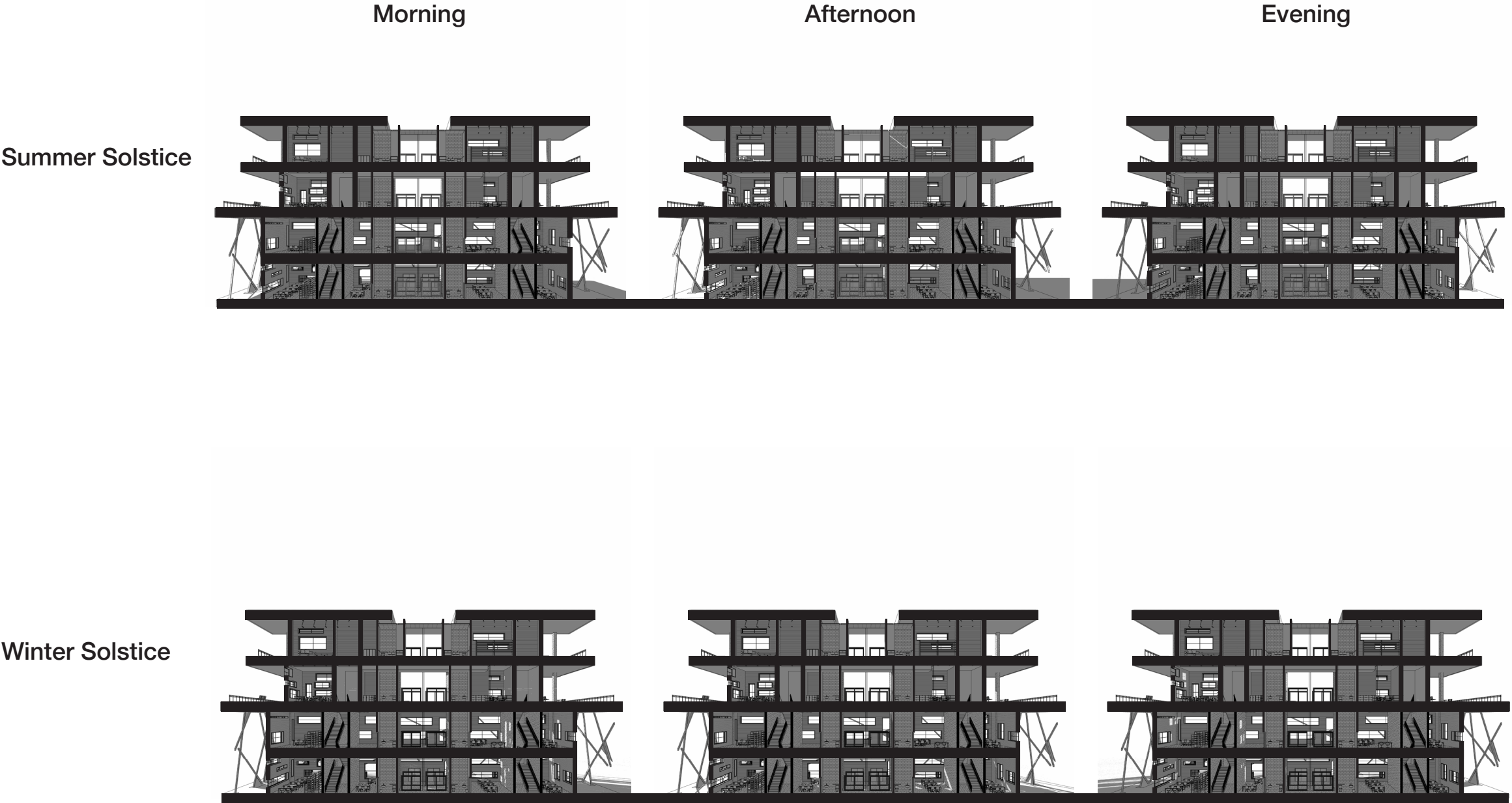
Exit

Exit Access

Exit

Area of Refuge

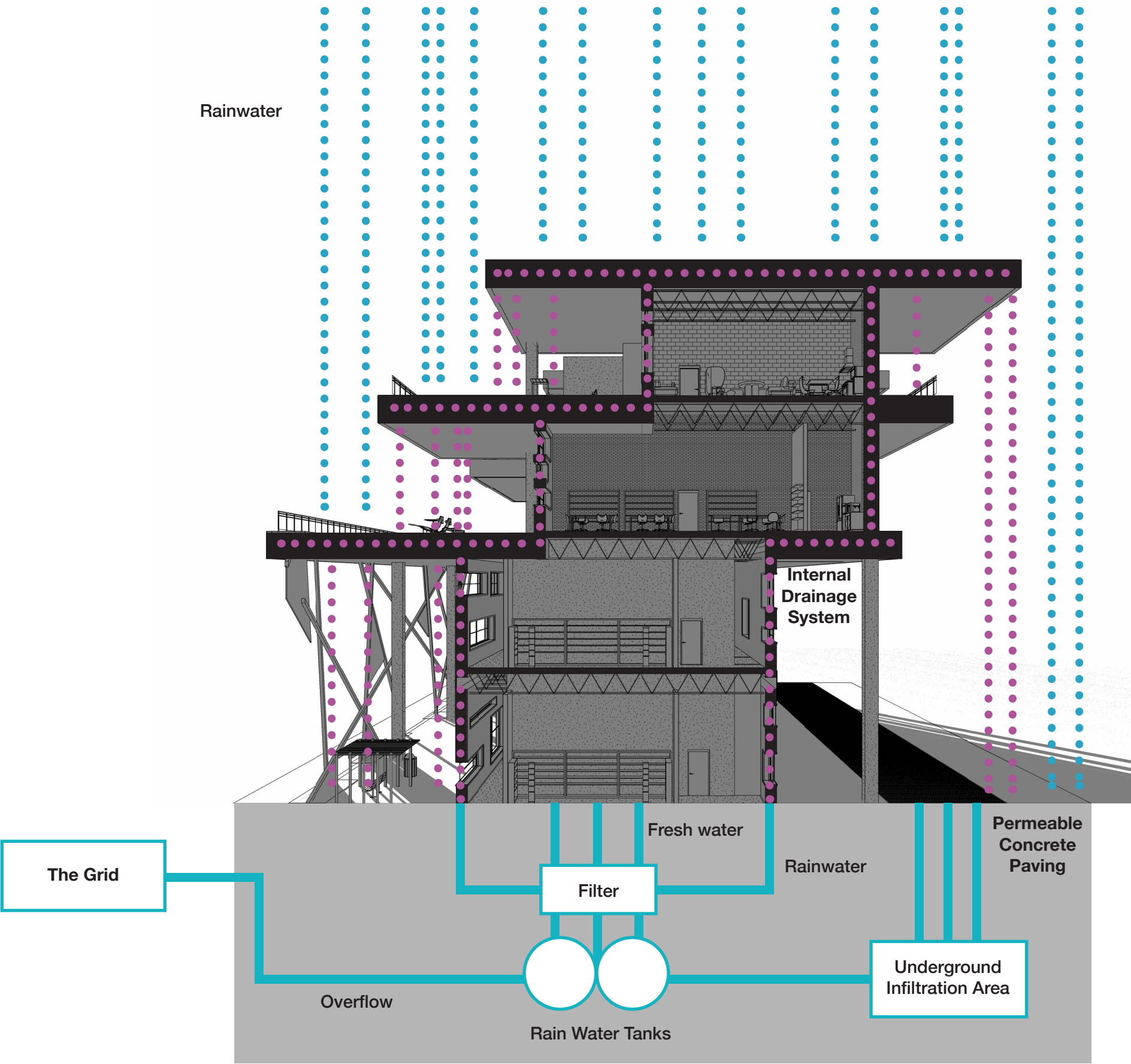
The green roof terraces have enough overhang that almost no direct sunlight reaches the interior of the building. Rather the sunlight is used by the plants to grow, and sun heat gain is minimized due to the plants absorption. Whether its the summer or winter, you will have nice diffused light throughout the building.

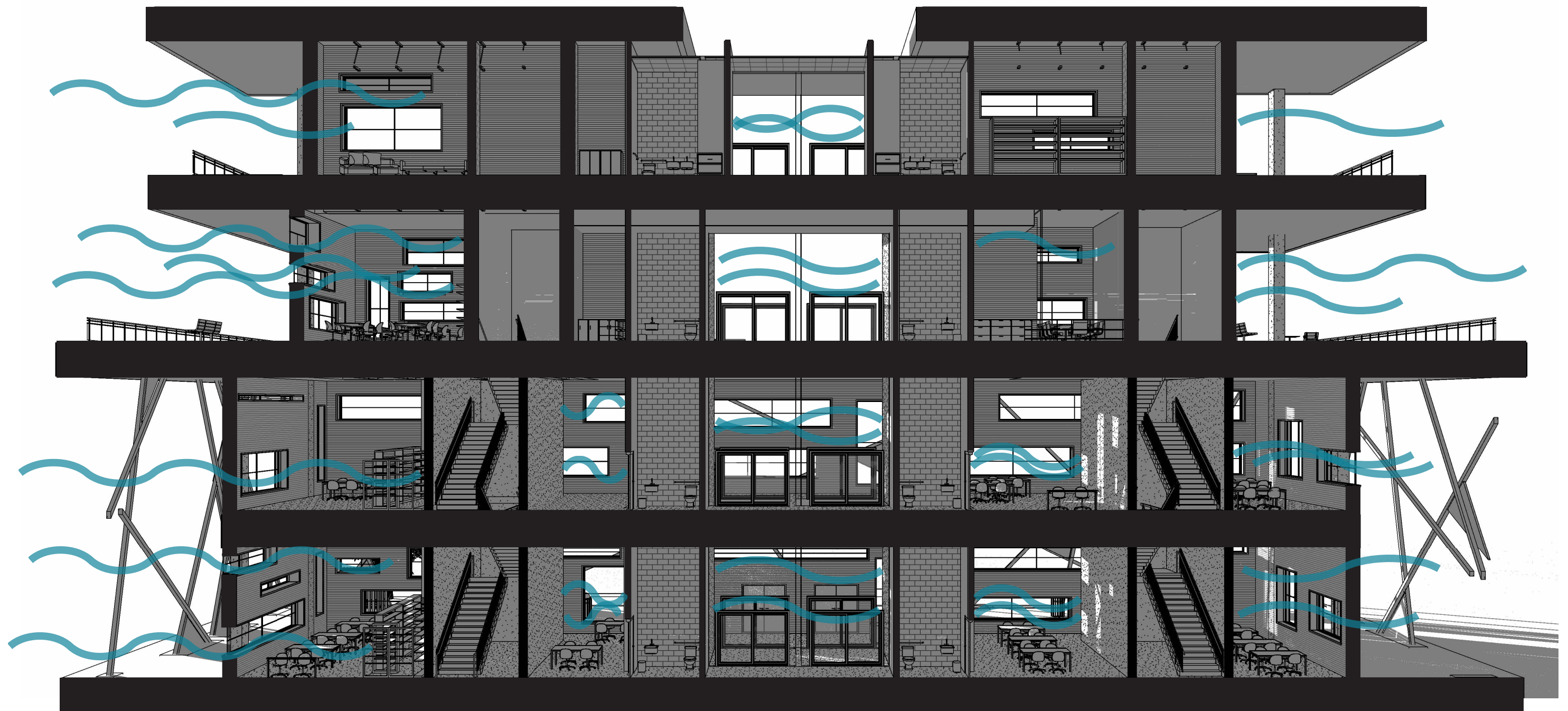


Daylighting

Water management is a large problem in urban environments. Cities, like Wichita, that cover everything in impermeable concrete paving will cause water runoff issues. Green roofs are part of my solution to collect and manage water that reached the site. Rainwater is absorbed and used by the plants on the ground and green roofs. The delivery driveway is permeable concrete paving to allow water to pass through to the soil instead of pooling on the surface.

Water Collection

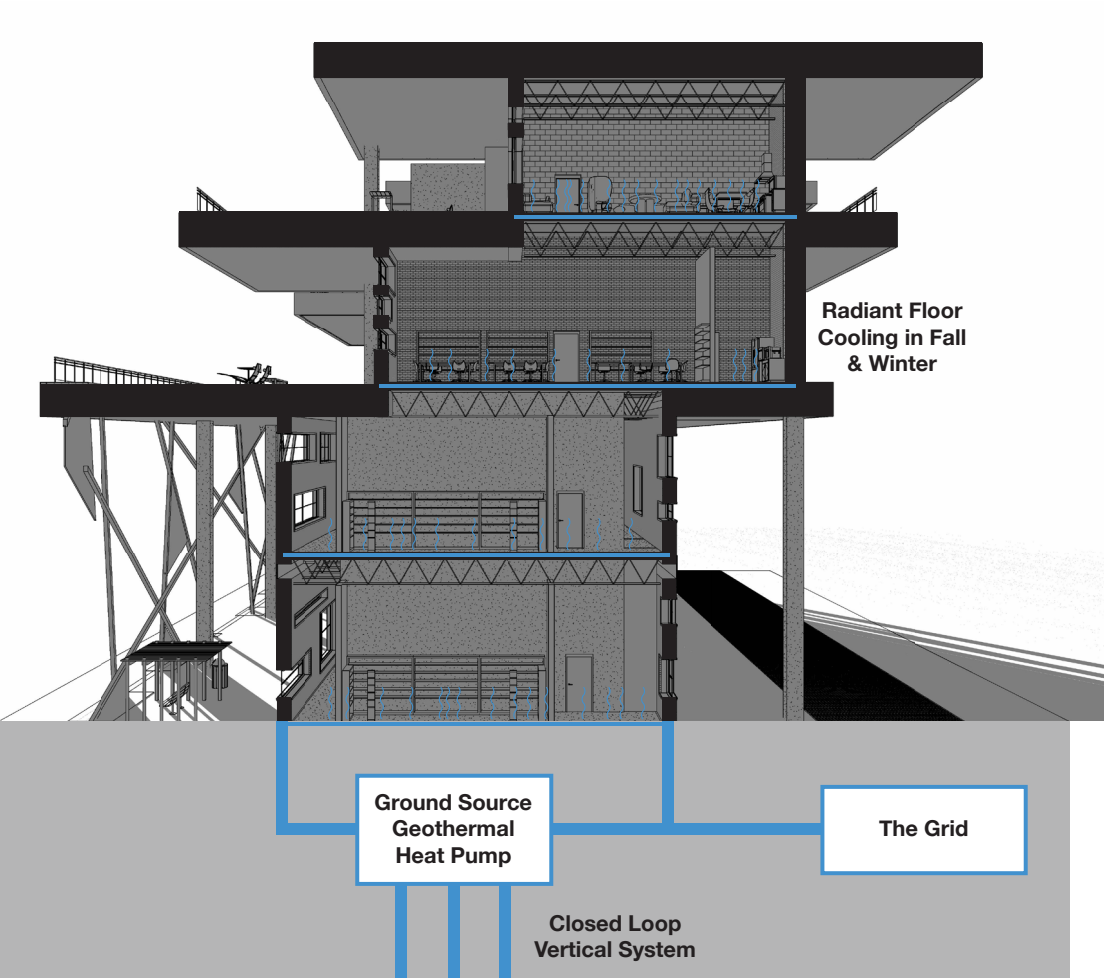
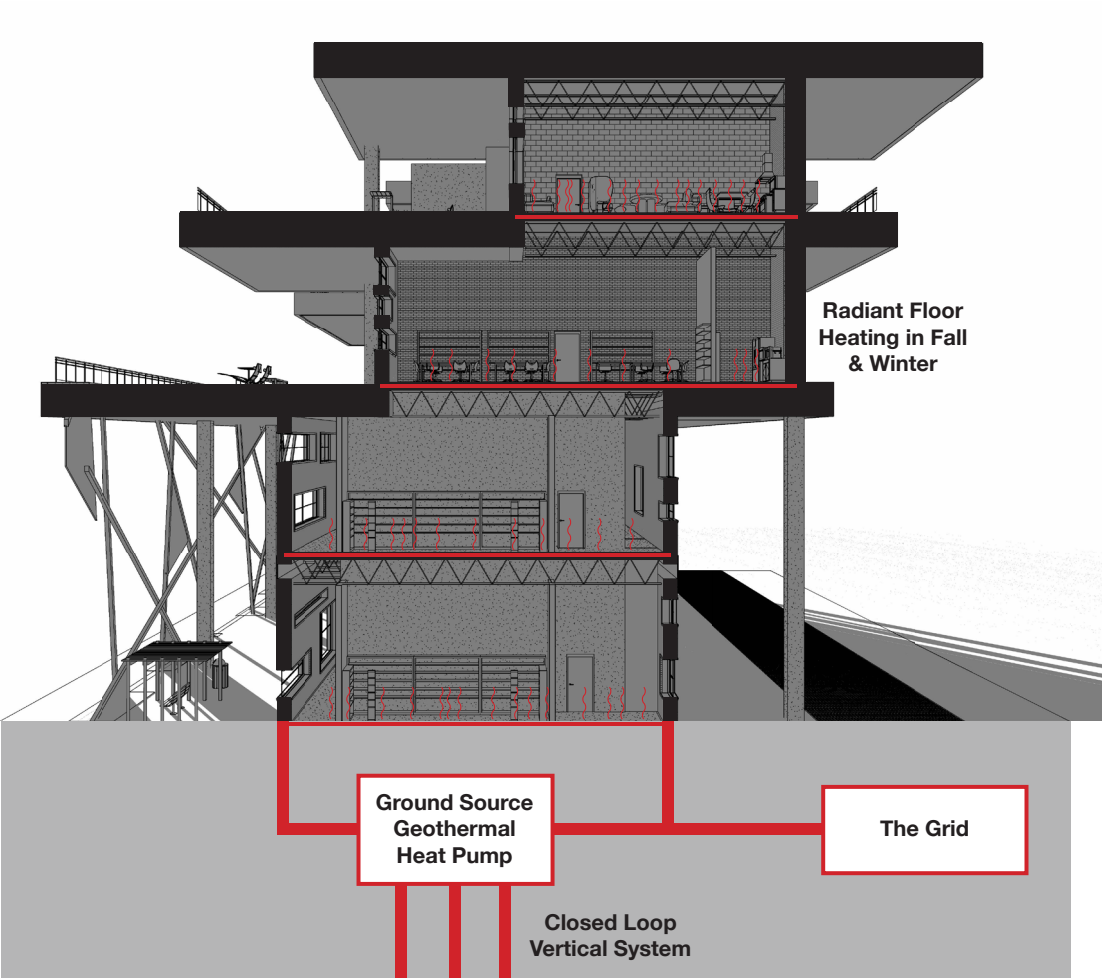




Ventilation

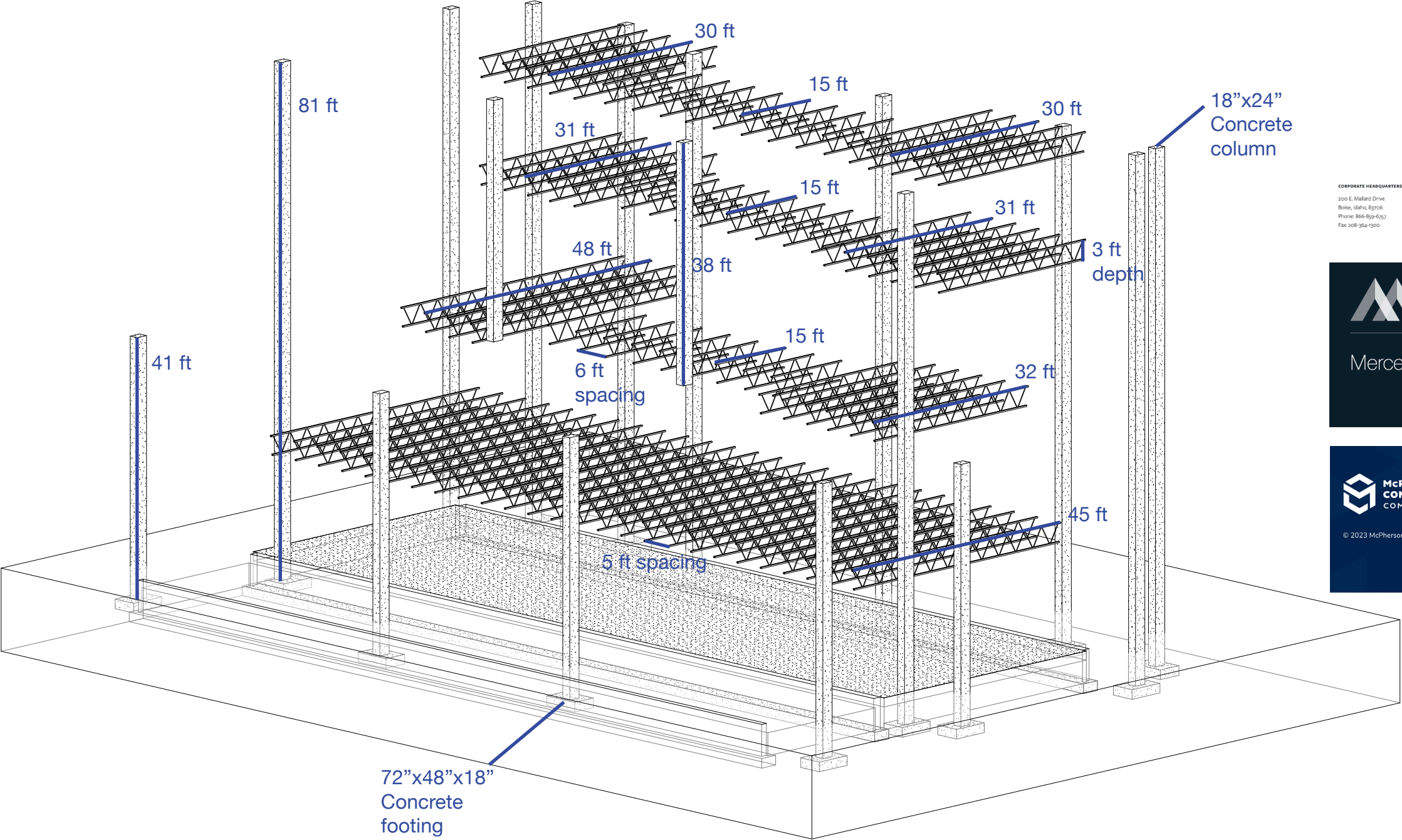
Although installing a geothermal heat pump system is more expensive than installing an air source system of the same heating and cooling capacity, you can recoup the additional costs in energy savings in 5 to 10 years. An average geothermal heat pump system costs about \$2,500 per ton of capacity. If a home requires a 3-ton unit, then it would cost about \$7,500 (plus installation and drilling costs). A comparable ASHP system with air conditioning would cost about \$4,000, but the energy costs could easily equate to the extra cost of installing a geothermal heat pump.

Geothermal heat pump systems have an average 20+ year life expectancy for the heat pump itself and 25 to 50 years for the underground infrastructure. Additionally, they move between three and five times the energy they consume between a building's interior space and the ground.*



Energy

*https://www.energy.gov/sites/prod/files/guide_to_geothermal_heat_pumps.pdf



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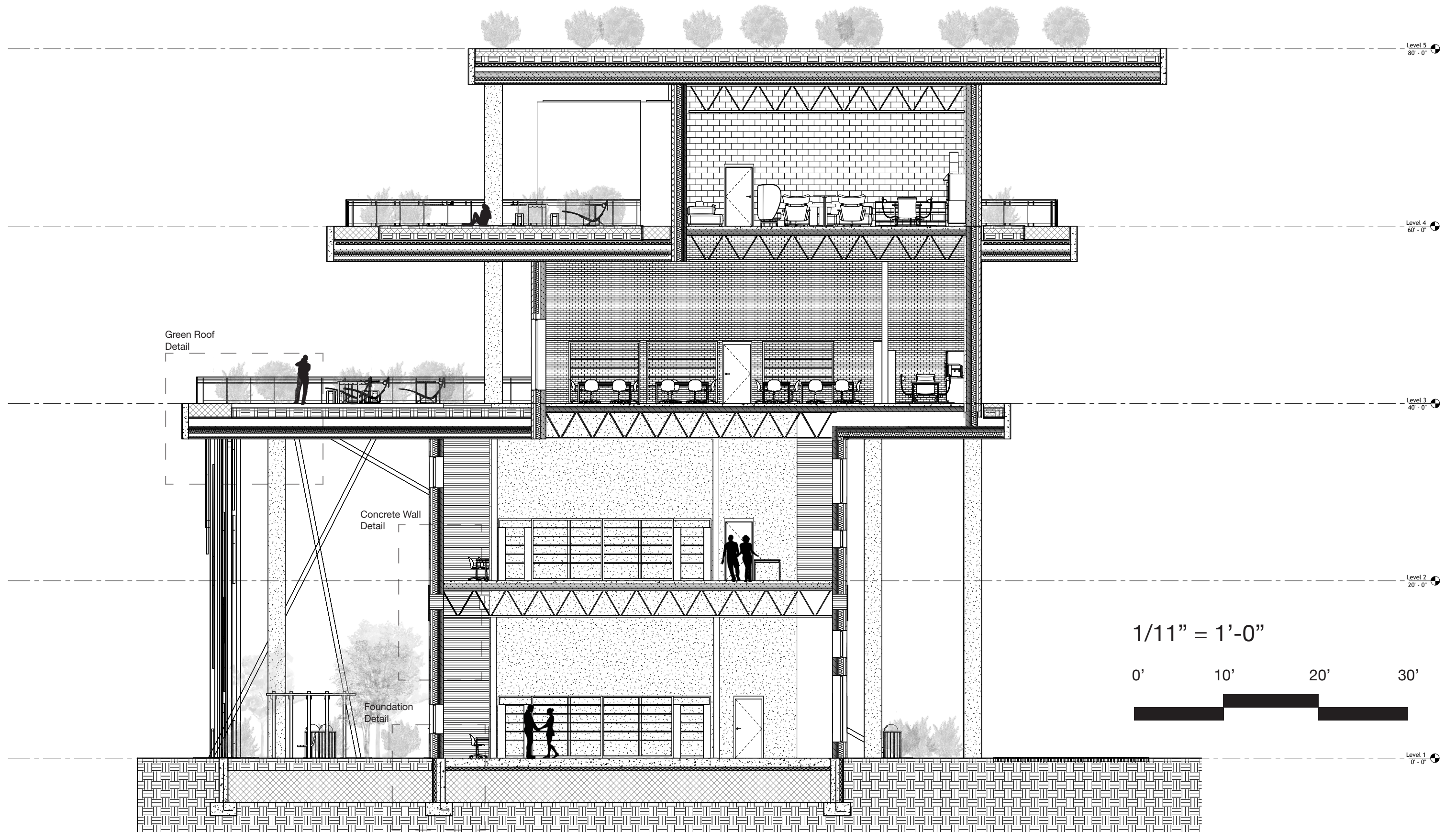
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**WICHITA CONCRETE
PIPE, INC.**

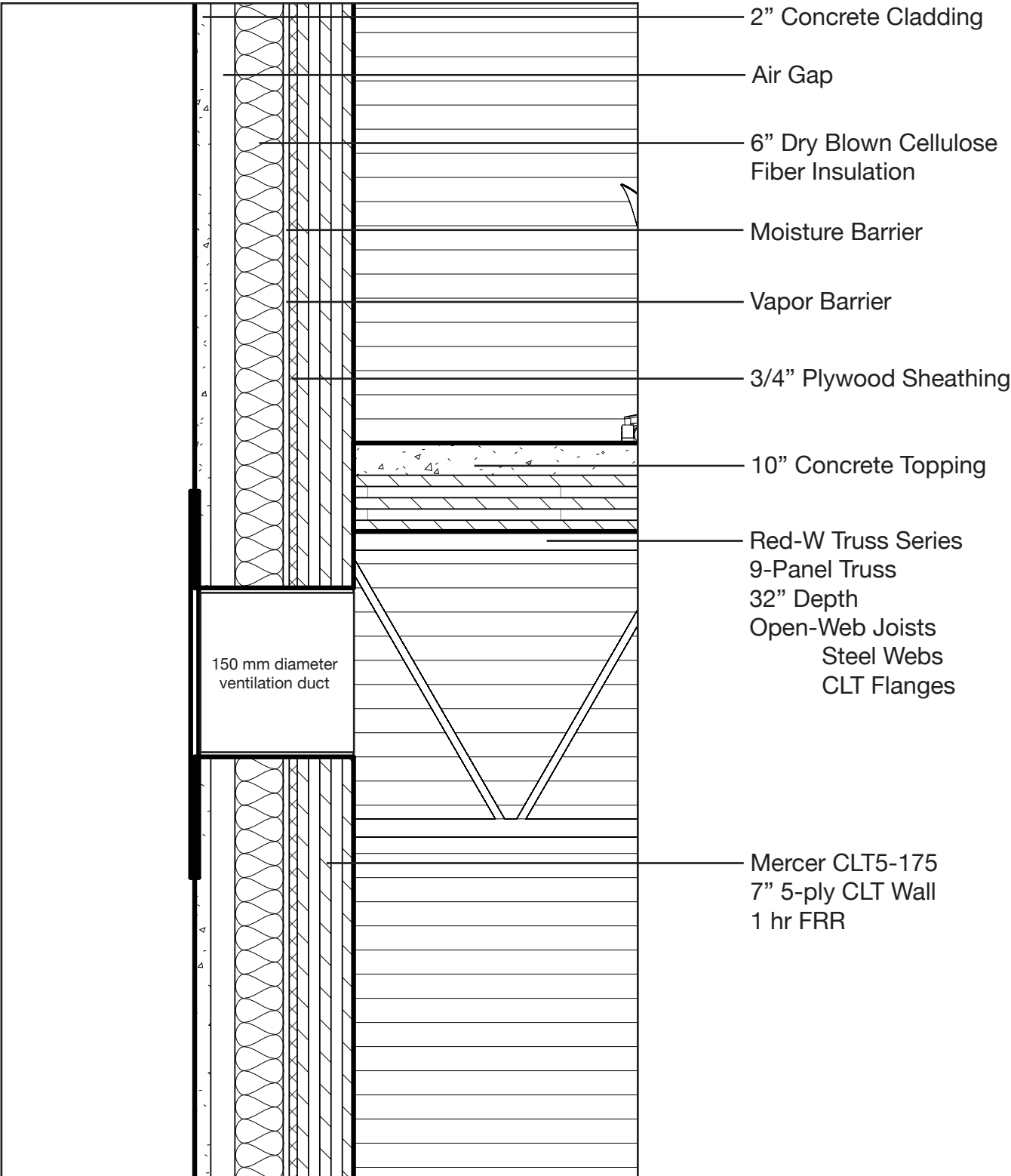
(316) 838-8651
221 West 37th Street North
Wichita, KS 67204



Structure

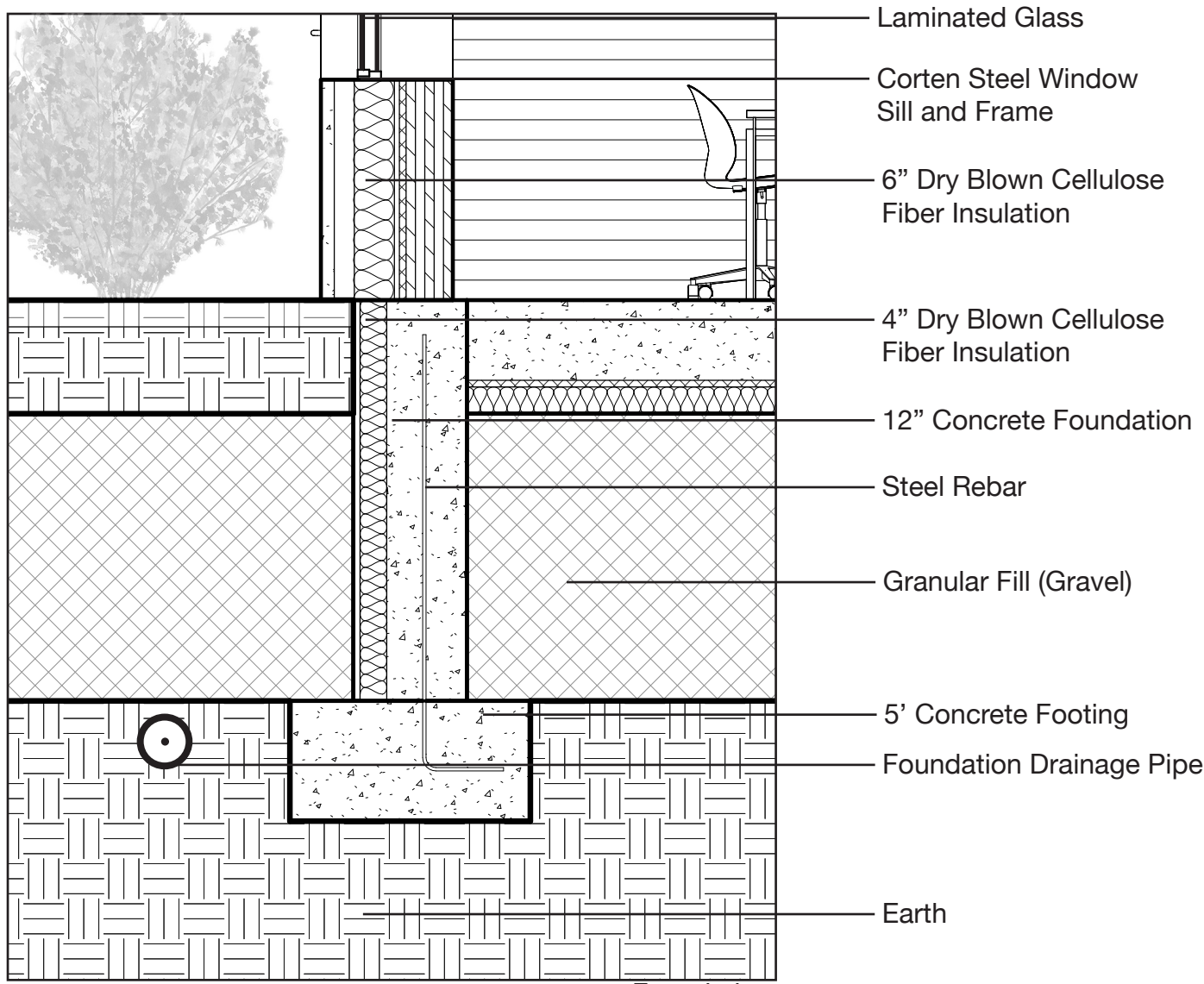


Wall Section



Concrete Wall Detail

Details

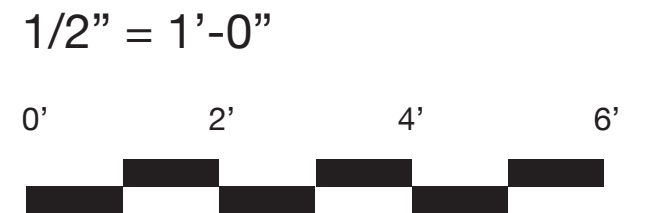
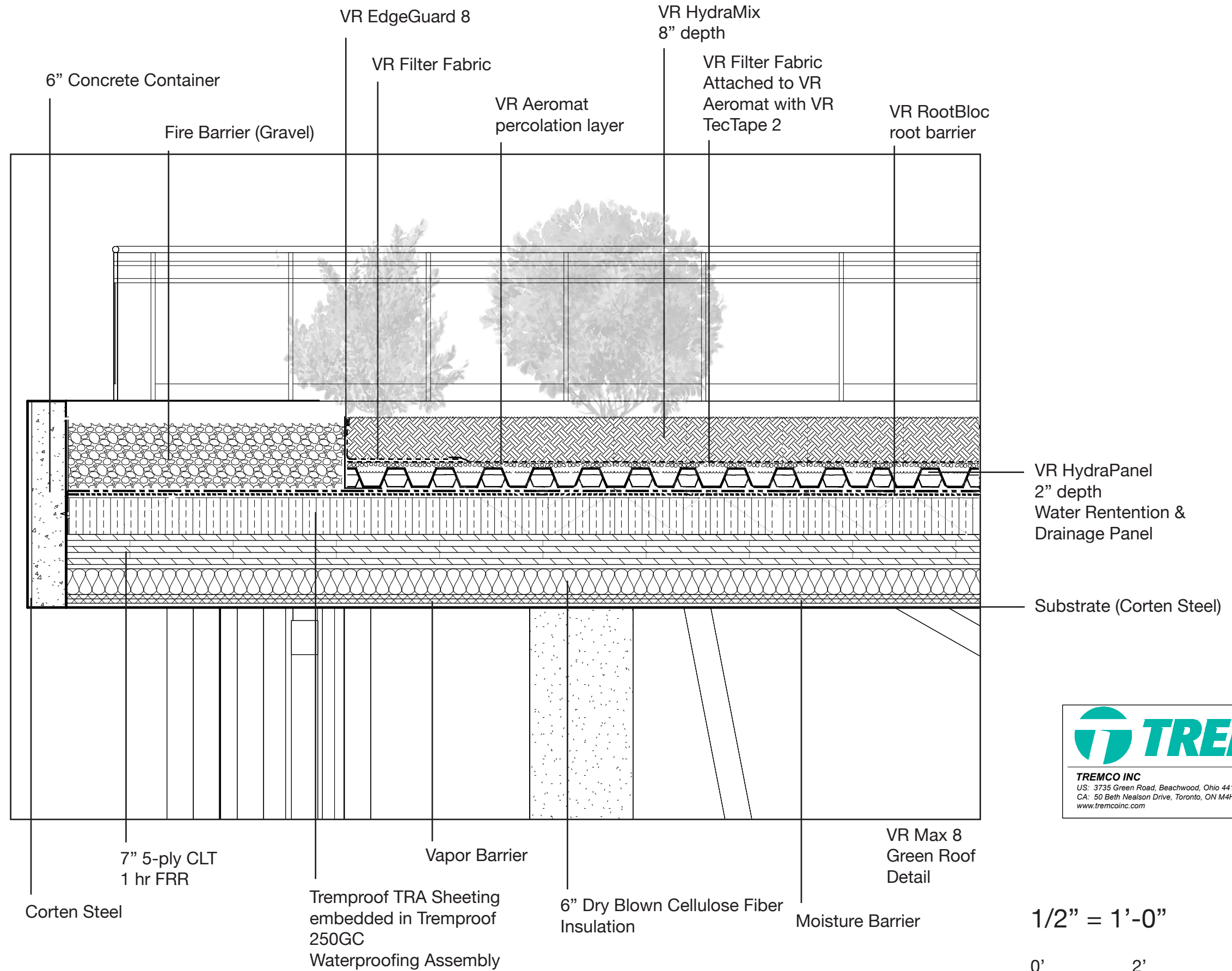





Foundation Detail

1/2" = 1'-0"



Details



Thumbnail	Manufacturer				Location	Room	Finish									Coverage Rates by Substrate (ft² per Gallon)			Certifications		
	Brand	Sub-brand	Name	Product Code			Type	Sheen	Cleanup	Resin Type	Use	MPI Rating	VOC Level (Grams/ Liter)	Dry Time @ 77°F (25 °C) @ 50% RH	Surface Temperature at Application	Concrete	Brick	Limestone	Certified asthma & allergy friendly®	Green Seal Certified®	Eligible for LEED® v4
	Benjamin Moore	Coronado® Masonry Coatings	Texcrete® Silicone Water Repellent	194	Exterior	All masonry walls	Sealer	Clear	Soap and water	Silicone	Exterior	117	20.9	2 Hours	50 °F - 100 °F	100-150	200-250	125-175	No	No	No
	Benjamin Moore	Eco Spec®	Eco Spec® Interior Latex Primer	372	Interior	All masonry walls	Primer	Clear	Soap and water	100% Acrylic Latex	Interior	50, 149	0.0	1/2 - 2 Hours	50 °F - 90 °F	400-500	400-500	400-500	Yes	Yes	Yes
	Benjamin Moore	Eco Spec®	Eco Spec® Interior Latex Flat	373	Interior	All masonry walls	Paint	Clear	Soap and water	100% Acrylic Latex	Interior	53, 53 X-Green, 142, 142 X-Green, 143, 143 X-Green	0.0	1/2 - 2 Hours	50 °F - 90 °F	400-500	400-500	400-500	Yes	Yes	Yes

Benjamin Moore is known for its paints but for my building I don’t paint. I am leaving the materials unadorned or decorated; visually in their raw form. The exterior walls are masonry cladding that will look untreated, but I will be using the Texcrete Silicone Water Repellent on the exterior. This is a clear sealer specifically made for masonry exteriors. On all of the exterior masonry walls I am using this sealer because it “prevents chlorine penetration and reduces cracking, dirt pickup, efflorescence, and damage from freezing/thawing cycles.” It works on vertical surfaces and is non-flammable.

On the interior, I am using the Eco Spec Latex Primer and Paint particularly for their environmental and health qualifications. Both are zero VOC rated, certified asthma and allergy friendly, and LEED eligible. Having no negative impact on the environment nor the people who the building is the goal, and zero VOC interior finishes is one step toward that goal. Take enough steps like this and you will have a much better building for people and the planet.

My building brings nature back to a downtown that is mostly devoid of it.

Finish Schedule



