

2022

PETER GRANT

PANDEMIC-RESISTANT ASSISTED LIVING

PANDEMIC-RESISTANT ASSISTED LIVING FACILITY

PETER GRANT - TEXAS A&M UNIVERSITY 2022
MASTER OF ARCHITECTURE FINAL STUDY PROJECT

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TABLE OF CONTENTS

COMMITTEE	1
ACKNOWLEDGEMENT	2
BIOGRAPHY & VISION	3
PROTECTION METHOD	4
SITE	7
DESIGN	9
PROGRESSION.....	10
SITE PLAN.....	12
FLOOR PLANS.....	14
UNITS.....	20
ELEVATION & SECTION.....	22
GARDEN	34
CITATION	42

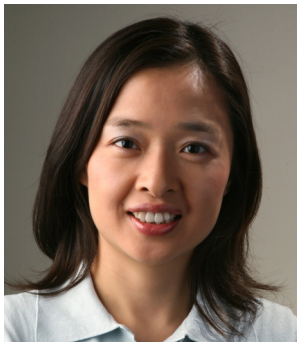
COMMITTEE



Committee Chair - **Kirk Hamilton, FAIA, FACHA,**

- Department of Architecture
- Center for Health Systems & Design

Signature X _____



Committee Member - **Xuemei Zhu, Ph.D.**

- Department of Architecture
- Center for Health Systems & Design

Signature X _____



Committee Member - **Chanam Lee, Ph.D.**

- Department of Architecture
- Center for Health Systems & Design
- Landscaping Architecture and Urban Planning

Signature X _____



Studio Professor - **Brian Gibbs, AIA, B.E.D.**

- Department of Architecture

Signature X _____

ACKNOWLEDGEMENT

Over my three years at Texas A&M University I have had many professors that have helped teach me the field of architecture. I would like to thank them now for all their aid coming up to this final project. Without them I would have never had made it this far. There were tough times when the stress almost got to me and I started to doubt myself and work, but thanks to them and my family, I was able to continue to the end. Whenever I needed help with a problem that I didn't understand or needed an opinion on a design idea for a project, all of them were there to assist. To my professors, committee members, Kirk Hamilton, Xuemei Zhu, Chanam Lee, Brian Gibbs, and my family, I say thank you. I wish you all a prosperous future and hope to see you all again someday.

BIOGRAPHY & VISION



Peter Grant
architecture

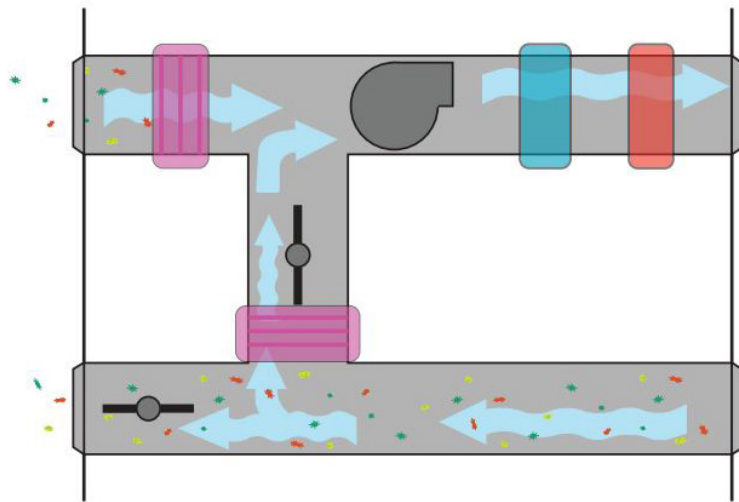
Peter Grant is a creative and determined team player who is a diligent worker. He has studied and received a Bachelors' Degree in Animation and modeling from Savannah College of Art and Design. After his graduation from SCAD, Peter went to work with his father in the field of architecture. Through his father and a family friend, Peter was told about the 'Change your Career' program at Texas A&M University in College Station, getting his master's degree in architecture. During his time at TAMU, he has taking up studying the finer field of Healthcare design, learning the important aspects of the system and flow.



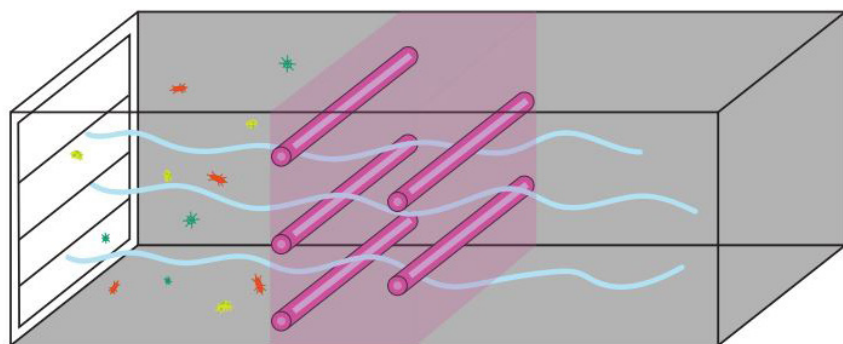
(Figure 1.)

The idea behind this project is to create an assisted living facility that can function during and after another pandemic, lowering the risk of spreading the virus. This Pandemic-Resistant Assisted Living facility will keep the residents safe and moral up during another lock down event. After the pandemic has passed the facility will slowly go back to normal function, allowing residents to enjoy the surrounding area.

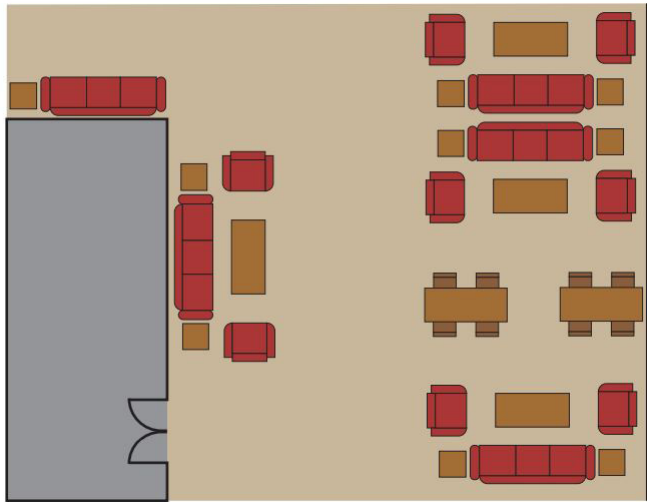
PROTECTION METHOD



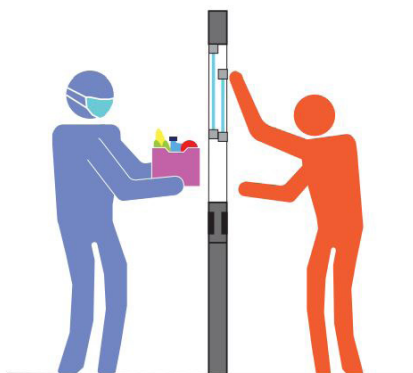
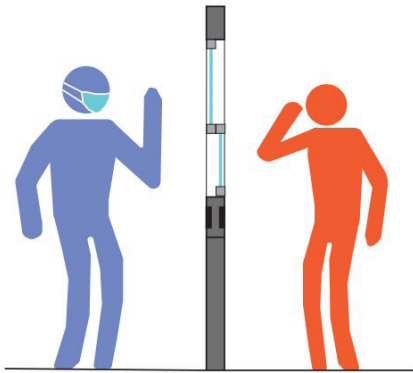
There are several ways that were used to improve the protection of the residents from the event of another Pandemic. The first of these was to keep the air circulating throughout the entire facility using both recycled air and natural air from outside. With the use of ceiling fans in each residential unit, the air will continue to move, thinning out the viral particles that could be in the air. It lowers the risk of the virus from gathering in one space and time for the main ventilation system to gather this air and filter it through the UV light filters built into the air duct system. The CDC, Centers for Disease Control and Prevention, states on their website that air circulation is one of the best ways to lower the risk of viral infection from viruses like COVID. The Butaro District Hospital, a specialized hospital in Rwanda, used many different forms of air circulation systems, including ordinary fans to lower the risk of spreading airborne viral pathogens. This hospital was studied to find systems to protect the residents of this facility from another pandemic event.



The second feature of the facility will be used with the conjoining of the first, adding ultraviolet lights within the vents of the building. These UV lights will act as a powerful filtration system for the air in the facility, killing off any harmful bacteria or virus that makes its way through from the outside or within. The UV lights will be placed in the vents both leading outside and in so that the natural air that vents through will be filtered and the recycled air shall also be sterilized.

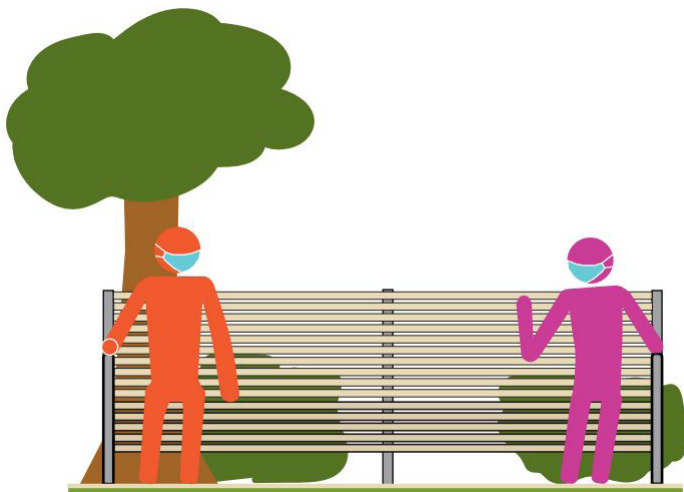
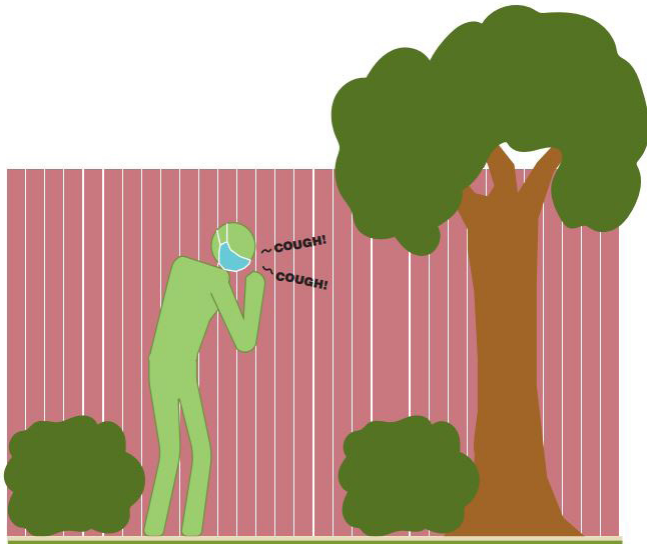
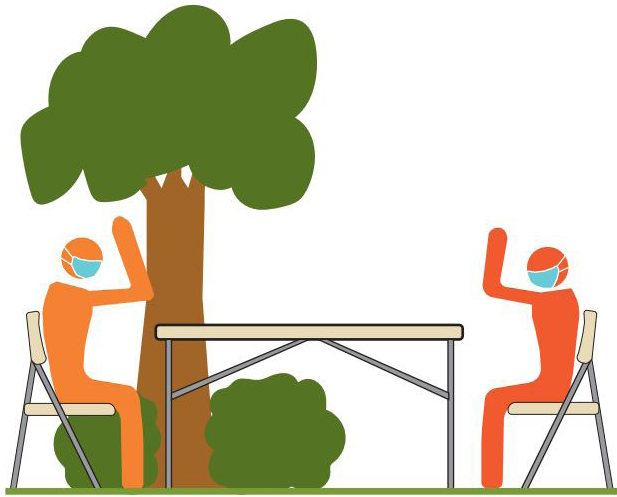


The third system that the facility has is a multiple layout plan and ample storage space for furniture in large gathering areas of the facility. The idea behind this is that during a pandemic social distancing will always be important during and after the event. With different planned layouts for these large public areas, the furniture can be moved or stored so that safe social distancing can be achieved. Excess furniture not used in these distancing layouts can be stored and be used again later once the viral crises is over.



The fourth systems is a hallway window that is installed in every resident's units in the kitchen area. These windows will have the ability to be opened from inside the unit and have a small slot underneath. The purpose of this window is twofold. The first function is to allow face to face conversation with staff and visitors during a pandemic without the fear of spreading the virus. This way residents can still see people without the disconnect of using only phones or monitors. The second function is the delivery of small and large goods to the residents. The staff can use the small slot underneath the window to deliver mail onto the kitchen counter of the resident while bigger packages can be quickly transferred to the residents but opening the window.

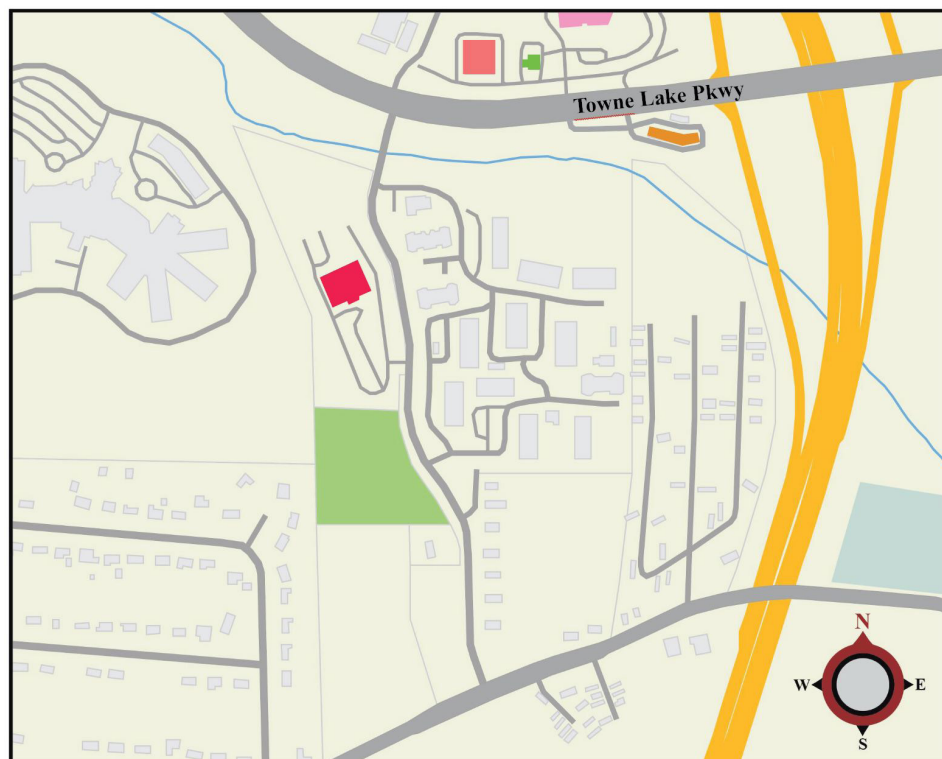
PROTECTION METHOD



Fifth is the different gardens and balconies for the residents of the facility. All three gardens are made to both lower the risk of spreading the virus and to keep up moral during another pandemic. They help relieve mental stress from another pandemic situation, helping with easing the mind for better physical health and sleep. Many studies in the past have shown that natural light, fresh air, and green spaces can improve life quality in all ages of people, improving moral, reducing stress, and building up physical exercise. The public garden, connected to the first floor, is designed for guests and residents to take leisurely walks around the outdoors, choosing different trails to take, improving the body, and offering benches for areas of rest. The private garden connected to the ground floor is more for relaxing than exercise. With a smaller area of space, the private garden, along with the second-floor patio, allows the residents to interact and take in the scenery using waist-high planters and more variation of plant life. With these waist-high planters the residents can have some outdoor activity planting their own flowers. The second-floor patio garden is the smallest out of the three, but still provides ample views and scenery for the residents of floor. With covered and socially-space safe seating, this garden acts much like the private garden, but with much larger planter areas for the residents to use.



(Figure 2.)

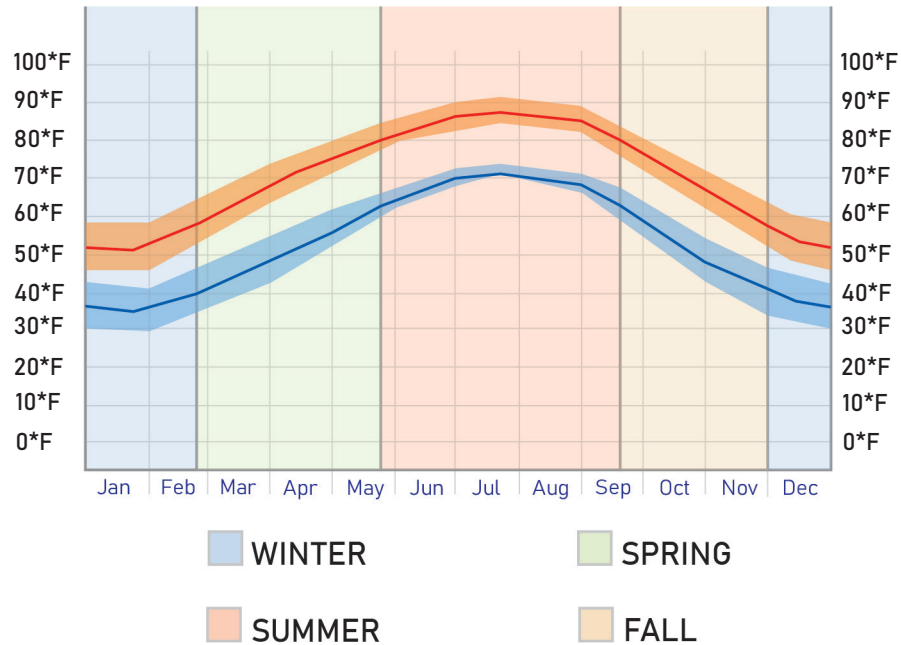


The state and area chosen for the assisted living facility is in the upper part of Georgia called Woodstock. Woodstock is a small city scape town with a somewhat large area of activity. The town is so far inland that the residents of the assisted living home will not have to worry about hazardous storms or flooding from the coastline area. Woodstock's hottest time is in July, where its daily average high temperature reach up to 88°F or its daily average lowest is at 71°F. During the winter, the coldest month of the year is in January, where near the end of the month the average daily temperature can be as well as 35°F degrees or at its daily average highest at 51°F.

The main site itself is a 233,747 sq.ft. wooded area with large trees and other plant life already taking up the location. The trees surrounded areas to the edges of the north, west, and south will be kept as a natural curtain for privacy and scenery for the residents. The site's location is optimal to the main street of Woodstock and any large medical centers. The closest hospital, WellStar Cherokee Health Park, is only 10 minutes away in case of any large emergency that the staff cannot handle. The downtown area is also a 10 minute drive for the residents to explore.

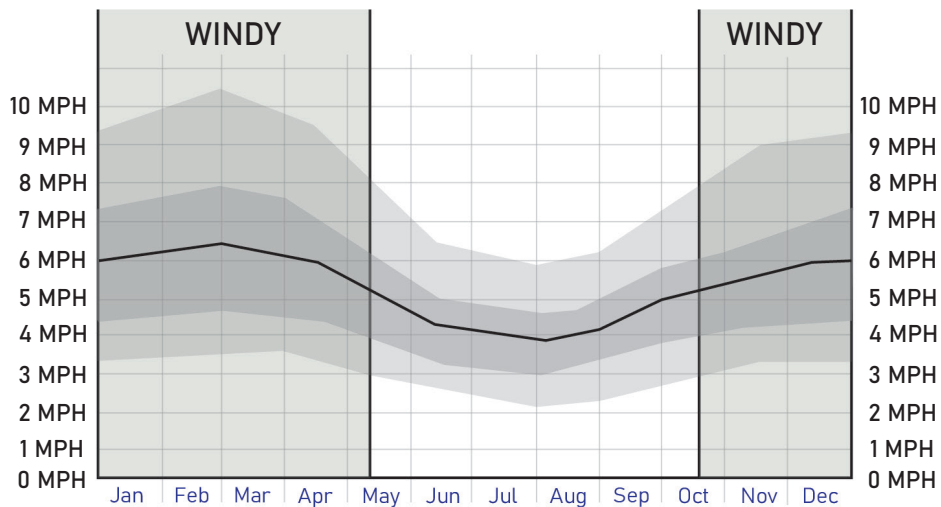
SITE

AVERAGE TEMPERATURE WOODSTOCK, GA



The weather in the area is mostly cloudy during the year especially during January. It isn't until the middle of July that the sky becomes clear. During around July 15th onwards near the end of November, the sky clears up. The clearest time during this period October is found to have the clearest sky of the year, seeing more blue than white. Rainfall varies throughout the year, hitting the most frequently in February. The months with the least amount of rain is in August and October, both shedding the least amount of water throughout the year. The wind will be hitting the site from the west for most of the year except during the fall season as it changes direction and comes from the east. The windiest times of the year start in the middle of October and end in the middle of May next year. During this windy period speed of the wind can reach from 4.5 to 5.8 mph. Sometimes in February or March the winds can get up to 6 mph. When summer starts though the wind speed slows down and reaches around half its speed in August at 3.7 mph.

AVERAGE WIND SPEED

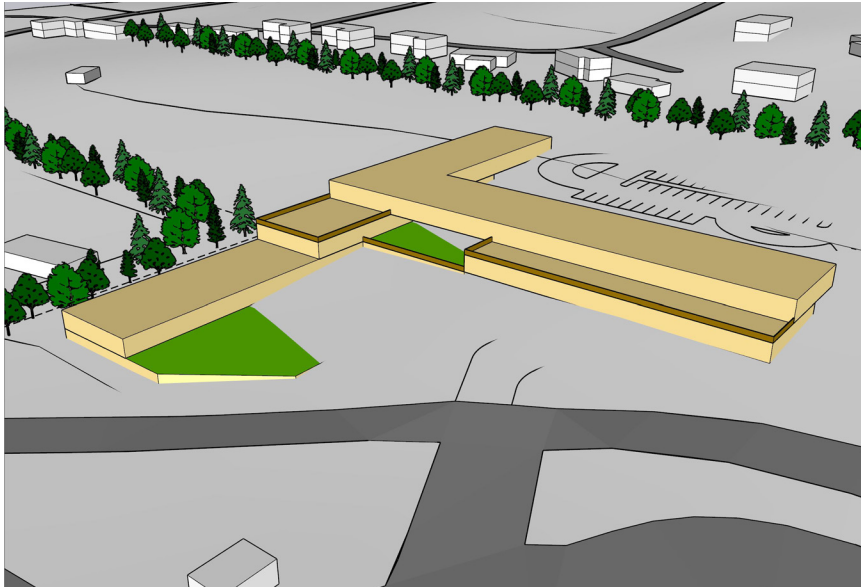


DESIGN

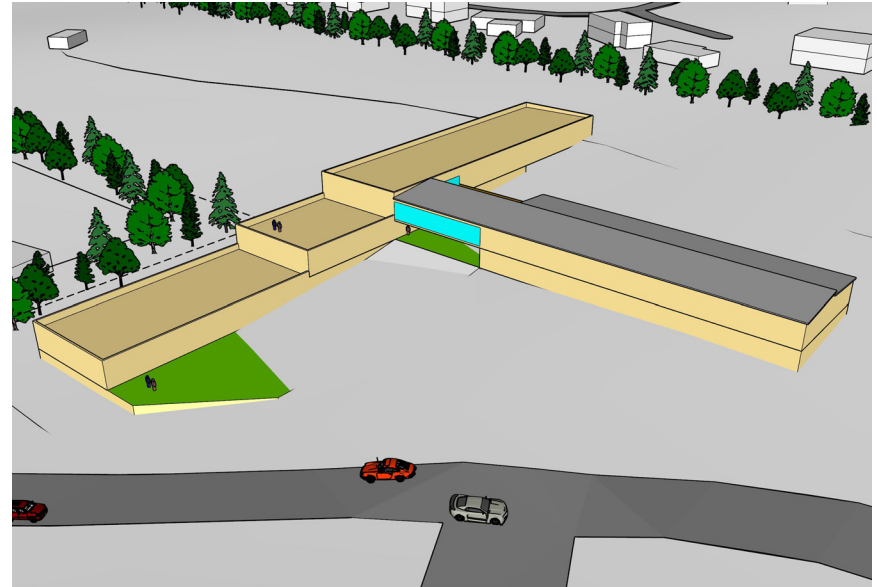


The building design and layout was done so it could fit with the topography of the site. The site itself is on an incline from the main road, Stone Bridge Pkwy, upwards to the west. Because of this, the building design was first looked at how the floors could benefit from this hill. The ground floor is partially buried under ground in the hill, the section buried though houses rooms that don't need natural light and benefit from the dark. The ground floor then acts as a stand for part of the top of the hill, which had to be flattened for the parking lot and first floor. The first floors act as the main circulation points for the drop off of residences, who could go either left or right to their units or to eat at the café or restaurant. The floors now each pushed back from the next on the south section, not completely overlapping one another and giving it a unique design.

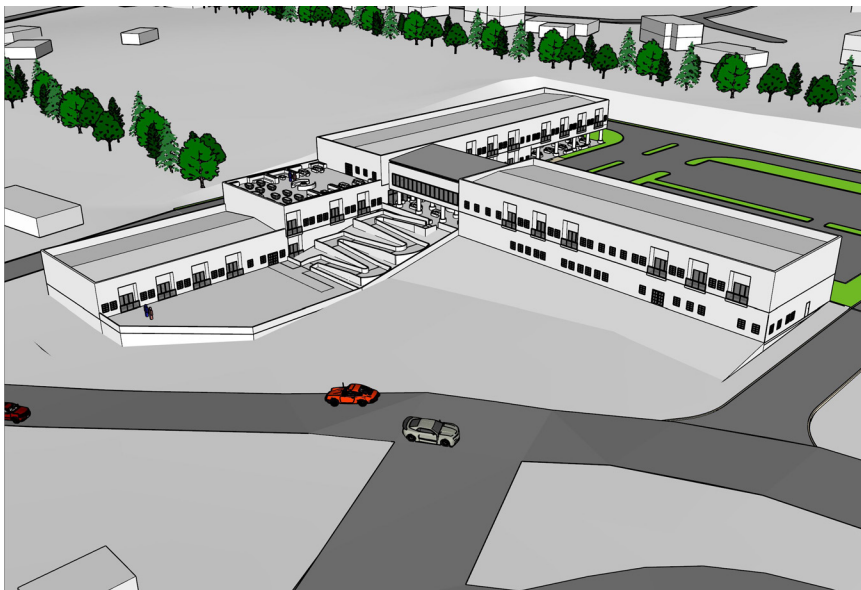
DESIGN - PROGRESSION



CONCEPT – Quick design layouts of building with site terrain. Several were made, but this is final choice.



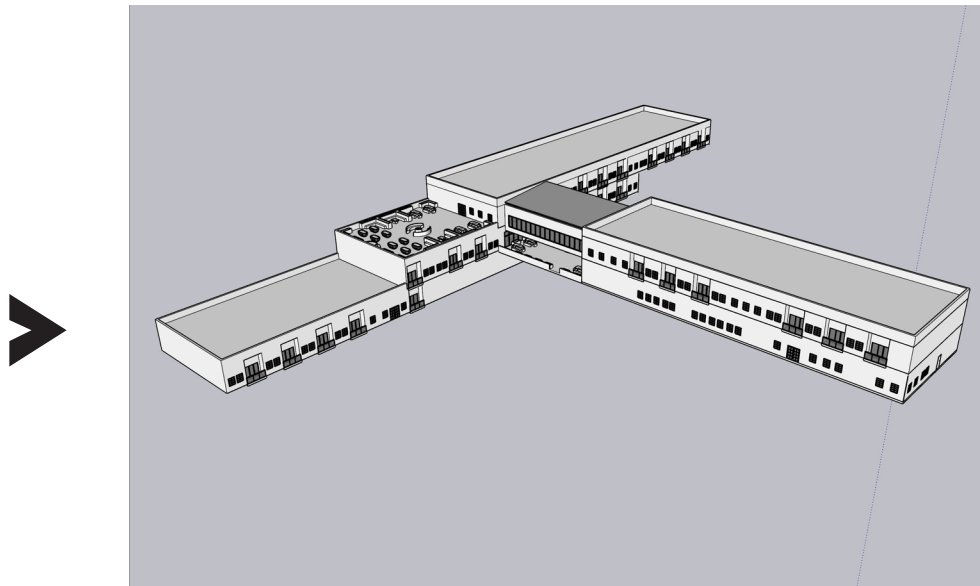
REFINEMENT – Taking the chosen concept design and refining it exterior. Placing main entrances and large scale windows.



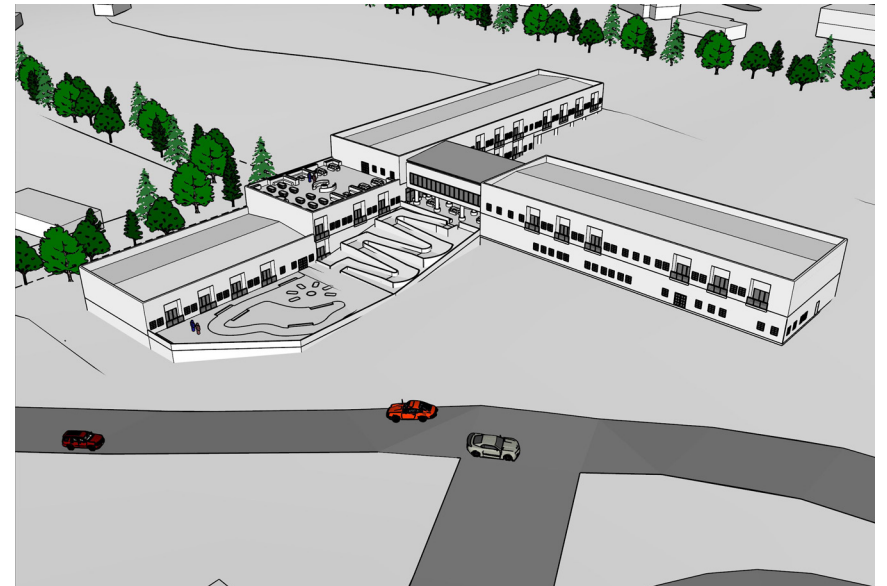
ROADS & PARKING – Flattening of terrain for parking lot and roads that connect to main street of the site.



TEXTURES – Adding texture detail to the exterior and interior of the building to show material makeup of structure.



DETAILS – Modeling doors, windows, balconies, outdoor furnituring. Creating the openings and interior spaces from floor plans.



RAMP & GARDEN – Design and layout of the ramp system that leads to private garden. Private garden area and pathway setup.

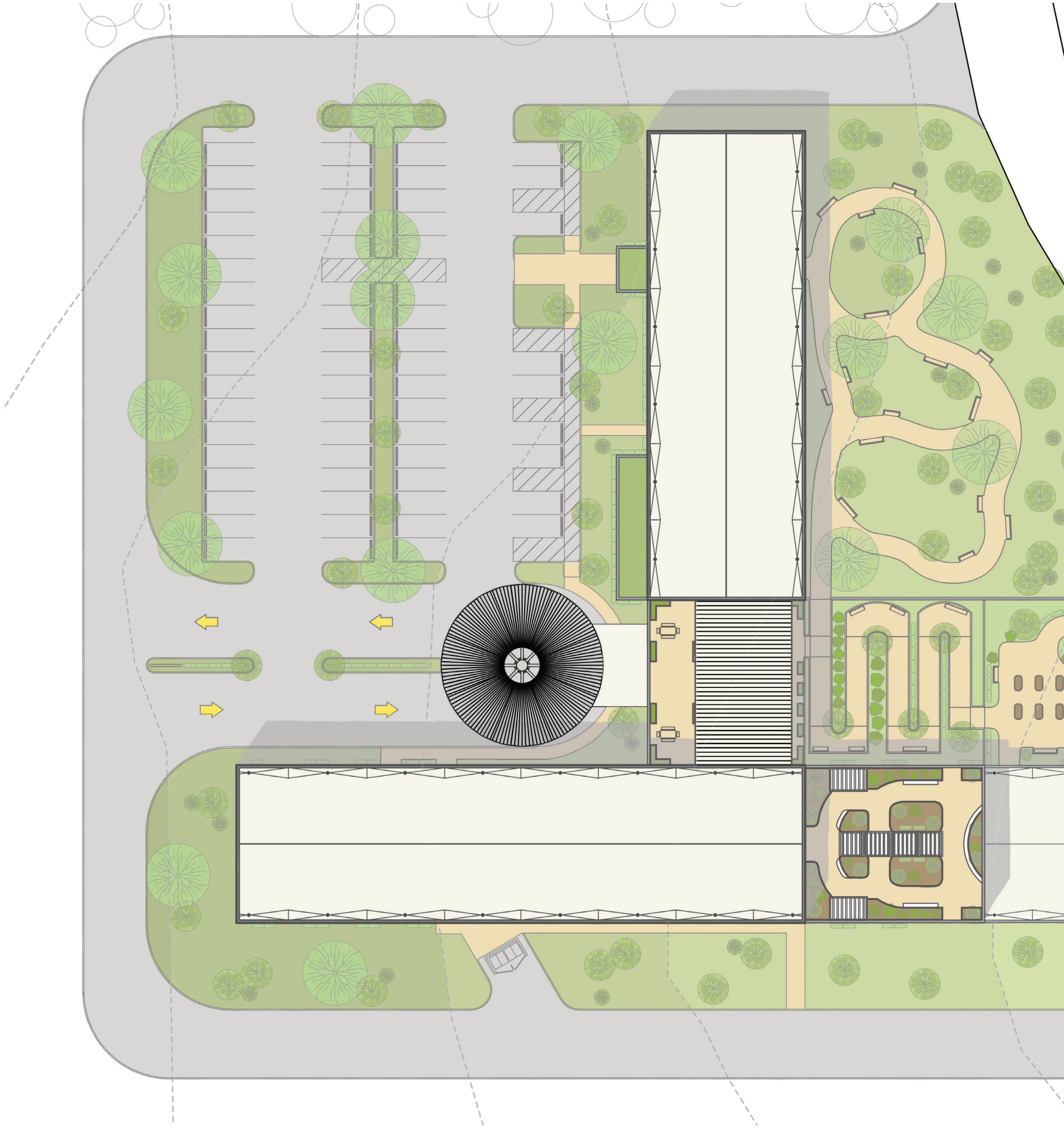


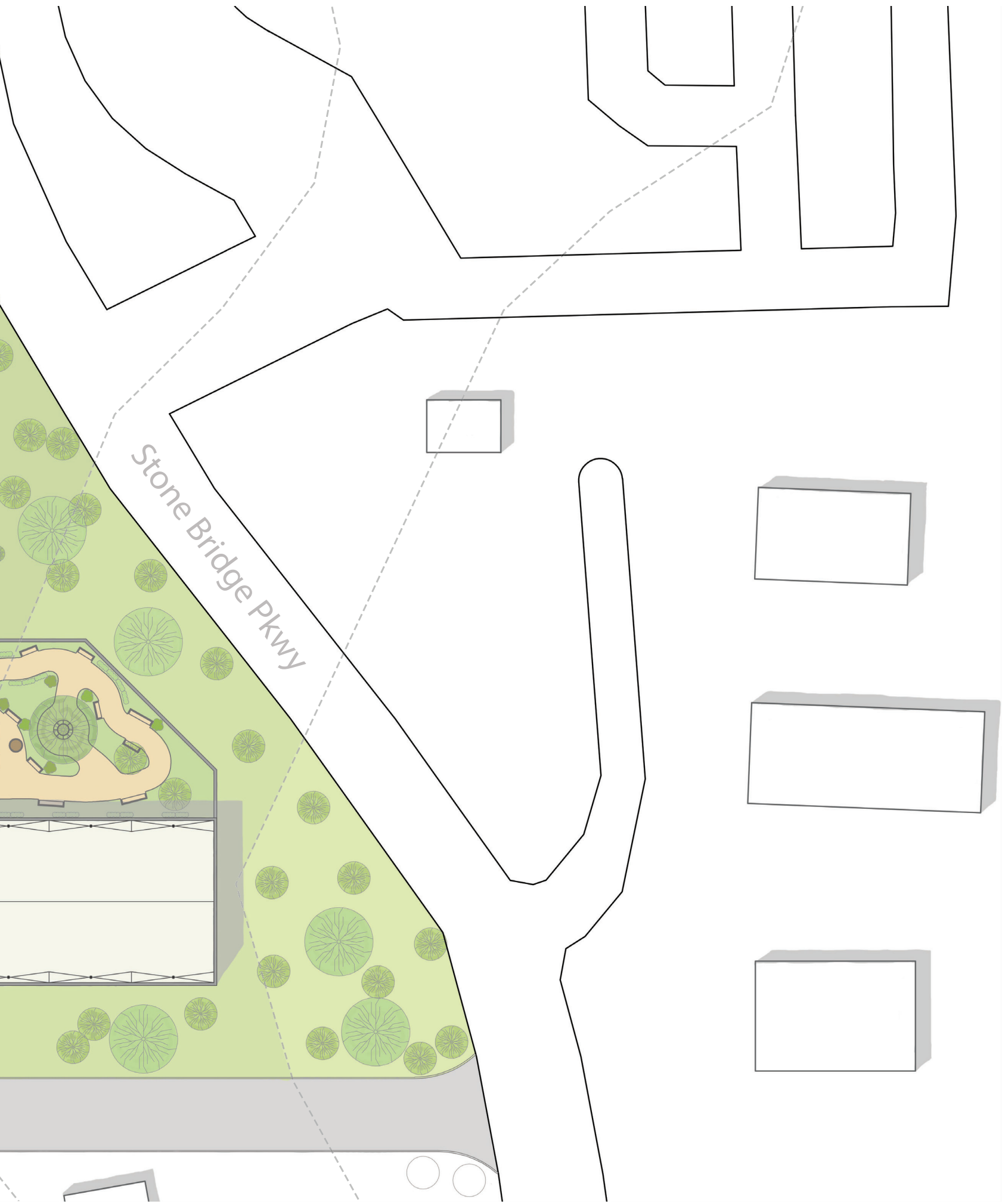
LANDSCAPING – Modeling the terrain for the public garden and for the ramp system.



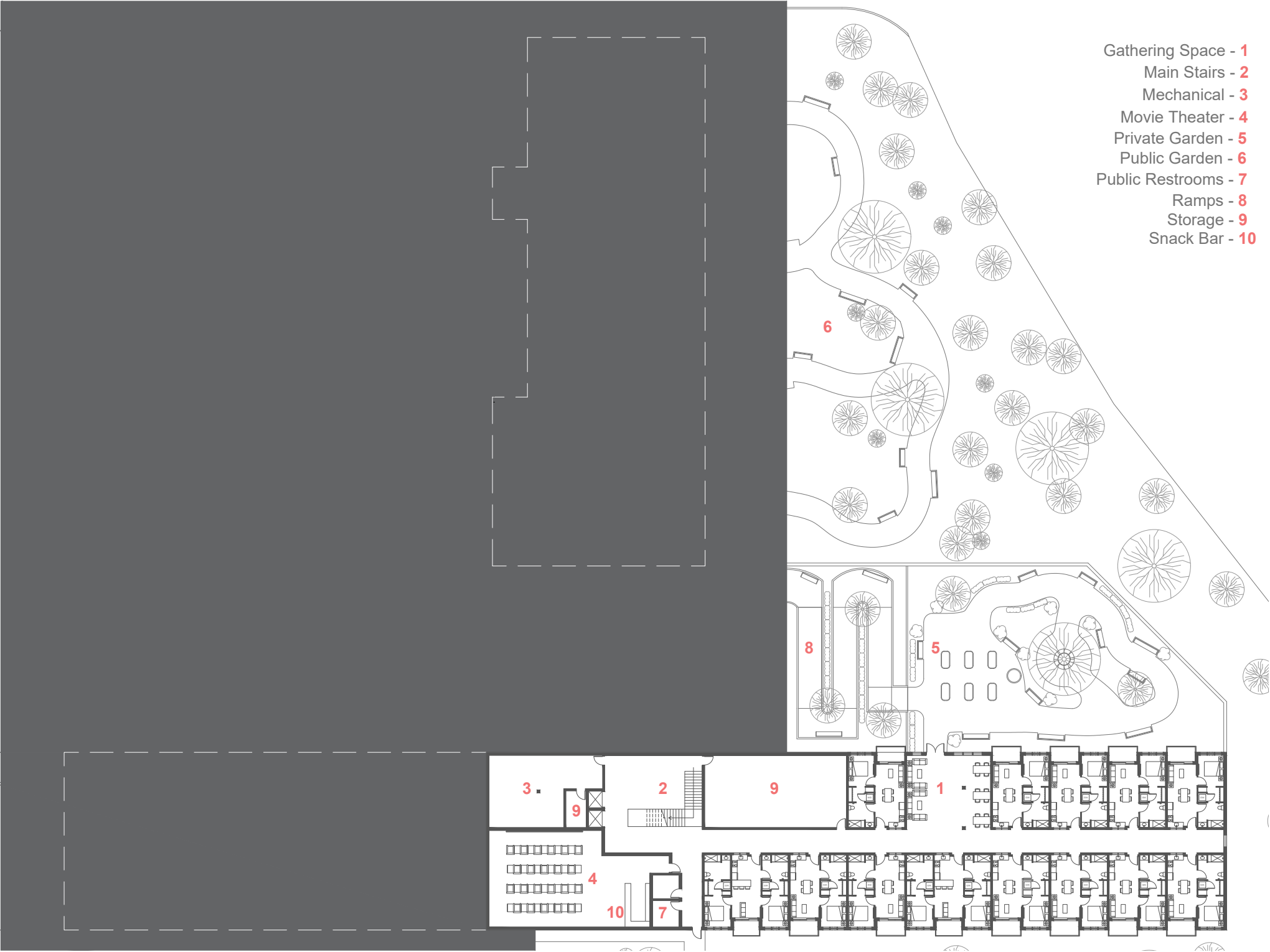
FINAL RENDER – Finished model transferred to Lumion where 3D plants and people were added to bring more life. Afterward, cameras were positioned and final rend shots taken.

DESIGN - SITE PLAN





DESIGN - GROUND FLOOR PLAN

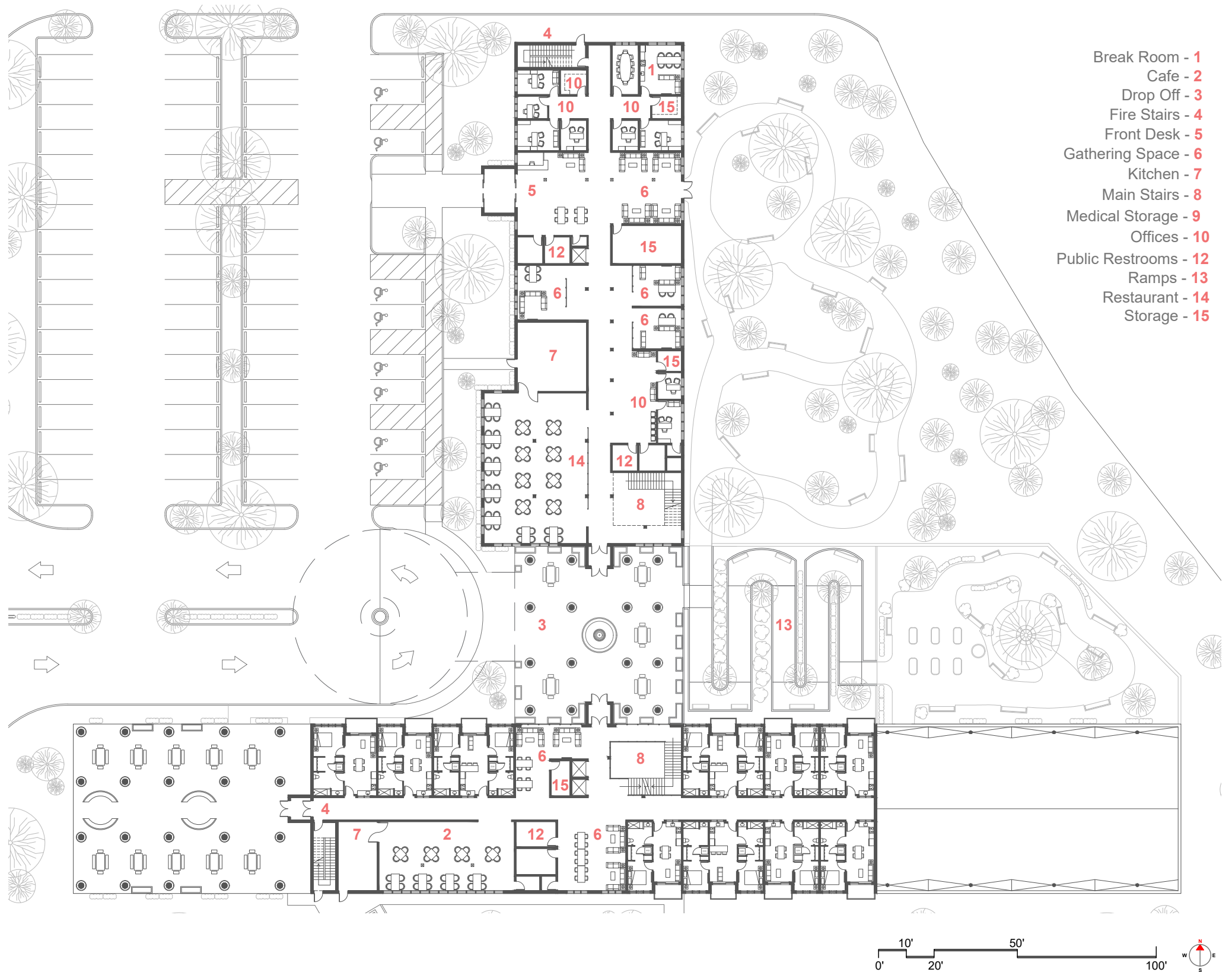


- Gathering Space - 1
- Main Stairs - 2
- Mechanical - 3
- Movie Theater - 4
- Private Garden - 5
- Public Garden - 6
- Public Restrooms - 7
- Ramps - 8
- Storage - 9
- Snack Bar - 10



The ground floor is accessible from the south end section of the facility as it runs along its length eastward. The level is unique as it is the only floor buried partly underground, the reasoning behind this is that the farther end of the ground floor is buried, housing the movie theater and the mechanical room, both which do not need any natural light. Inside the movie theater is a snack bar to the right of the entrance and up ahead of that is the seating with spacing between each seat for social spacing. Together there is 22 seats for residents to use and space for the handicap to watch the show. The rest of the ground floor is residential with one gathering area and a large storage space in the middle near the main stairs. Through this gathering area leads out into the private garden of the facility.

DESIGN - FIRST FLOOR PLAN



First floor of the facility is divided into two sections to the north and south with the middle being a covered drop off entry point. The north section in the back from the drop off point is mainly leasing offices and staff storage of medical supplies. There is also a conference room and breakroom next-door for the staff to relax. Closer towards the drop off is the front desk and gathering space for residents. Doors in the gathering space lead out into the public garden that has multiple interconnecting roads that allow the residents to choose the distance of walk they are willing to take from a quick walk around the circle or the full length of the trail. The final feature of the north section is the main restaurant of the facility which will serve a variety of meals. During the times of a lock down, the restaurant will make individual meals to be delivered to the residents without the fear of spreading the virus.

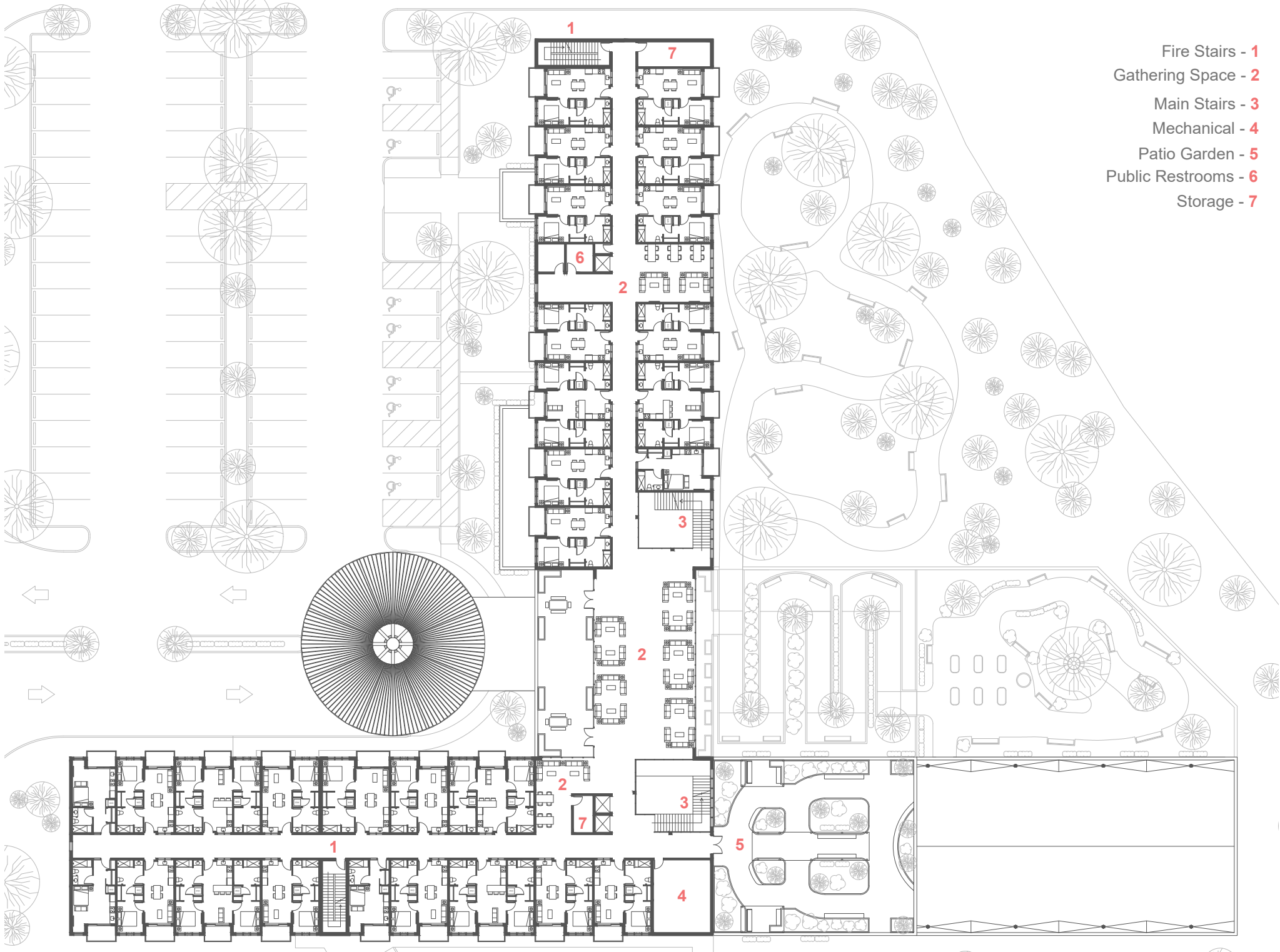
From the north section to the middle, the drop off point is covered by the bridge above, housing seating and tables for visitors and residents. In the center is a water fountain used to create ambience and white noise for the area. Behind that

to the east is the ramp system that leads to the private garden down the right or to the public gardens on the left. Because of its long trek down to the private gardens, each turn of the ramp has a resting point with seating for residents to rest and take in the scenery around them from the plant life.

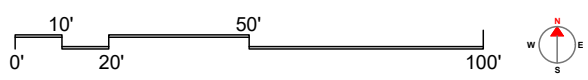
South first section is mainly residential units with a café near the entrance for residents to have more choice of food they want to eat for the day. Towards the west of this section come back outside to a seating area covered by a portion of the second floor. This area is used by both residents and visitors to meet outside and to host events.

The parking lot has 53 regular spaces and 8 handicap. With large trees all around for scenery, a path is cut through the north part of the parking lot to allow future residents to easily make their way to the north section of the first floor's second entrance to get to the leasing offices faster.

DESIGN - SECOND FLOOR PLAN



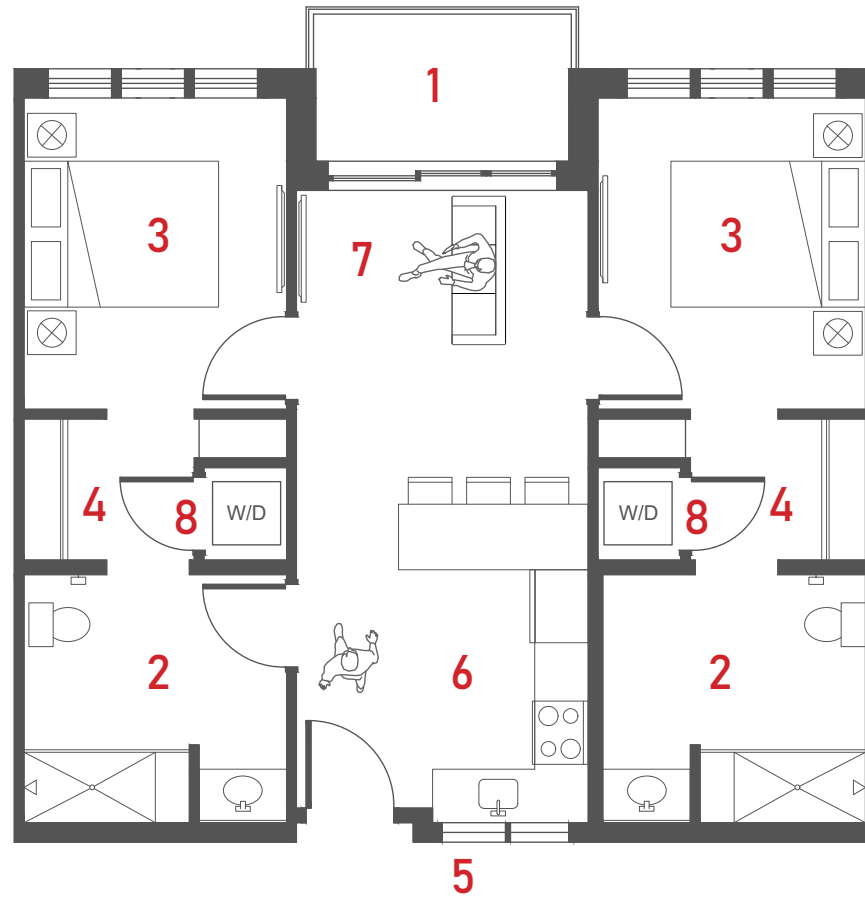
- Fire Stairs - 1
- Gathering Space - 2
- Main Stairs - 3
- Mechanical - 4
- Patio Garden - 5
- Public Restrooms - 6
- Storage - 7



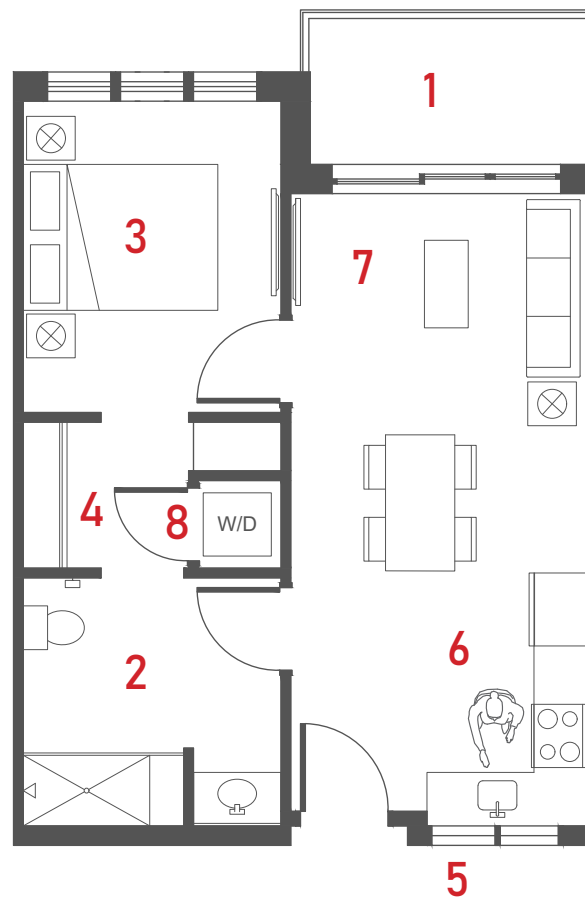
The Second-Floor houses most of the residential units in the building. The variety of units are one-to-two-bedroom units with a smaller studio unit that combines the living room and bedroom space together. The second story bridges is used as a main gathering area that has a connected balcony for residents to enjoy out to the west. On the end of the south section is the second-floor patio garden with covered seating and waist high planter beds for the residents to use. If residents on the second floor don't wish to take a long track to the private garden, then they can come to this second-floor patio instead. This patio will have small to medium sized plants, such as flower and bushes. The center planters will be used by the residents to plant any number of vegetation they wish.

DESIGN - RESIDENTIAL UNITS

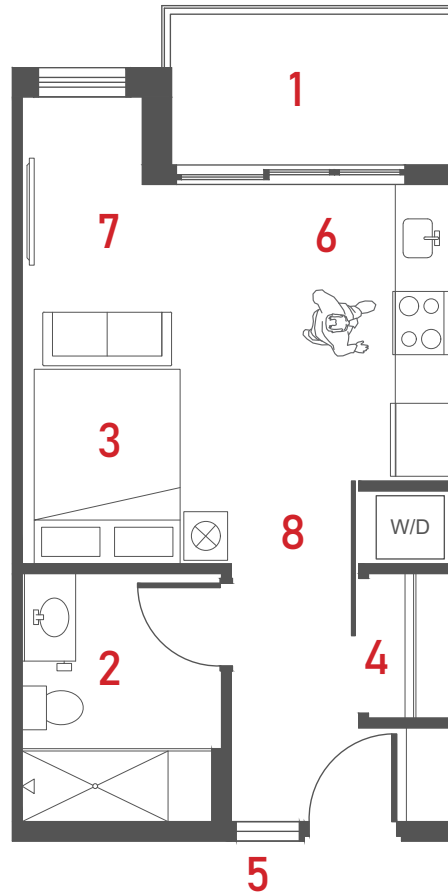
2 BEDROOM UNIT



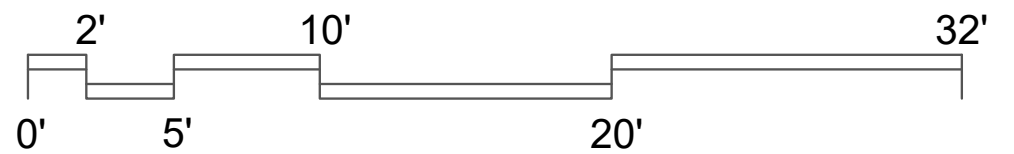
1 BEDROOM UNIT



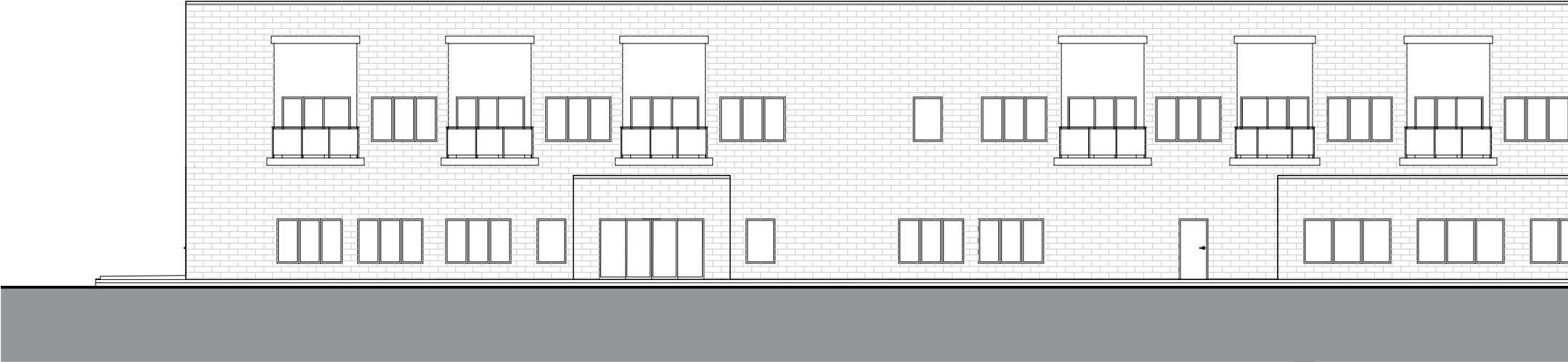
STUDIO UNIT

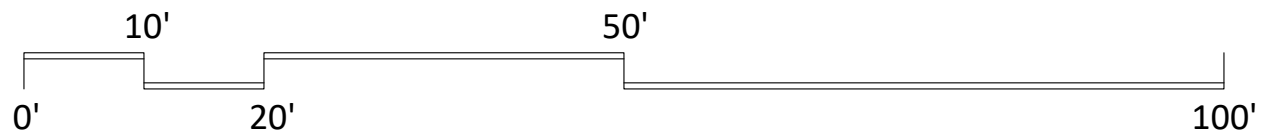
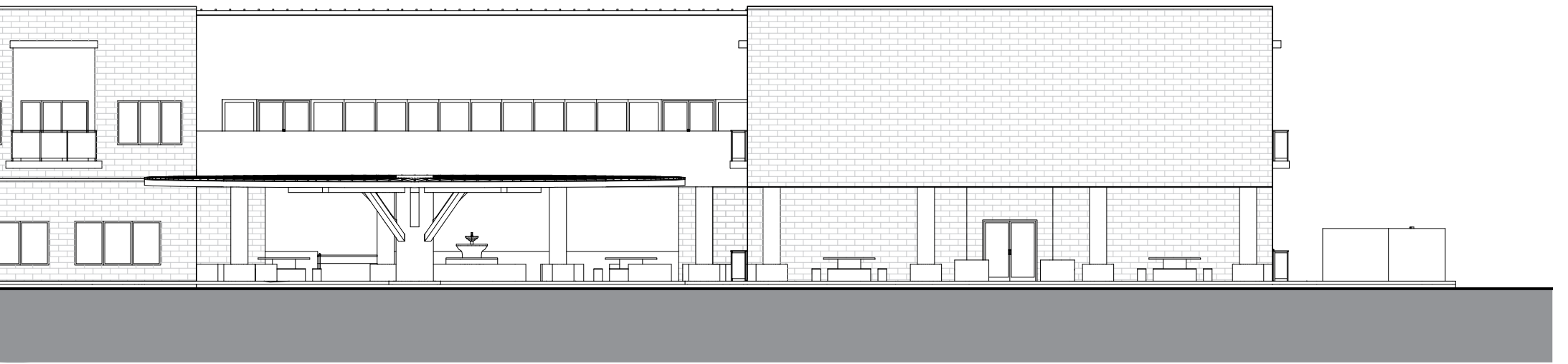


- 1 - Balcony
- 2 - Bathroom
- 3 - Bedroom
- 4 - Closet
- 5 - Hallway Window
- 6 - Kitchen
- 7 - Living Room
- 8 - Washer/Dryer



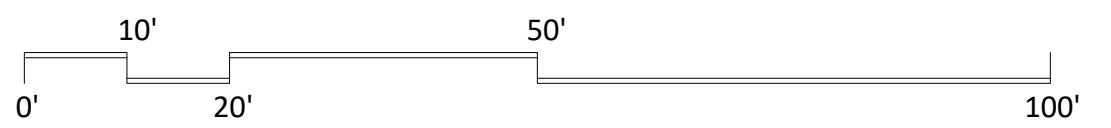
DESIGN - FRONT ELEVATION



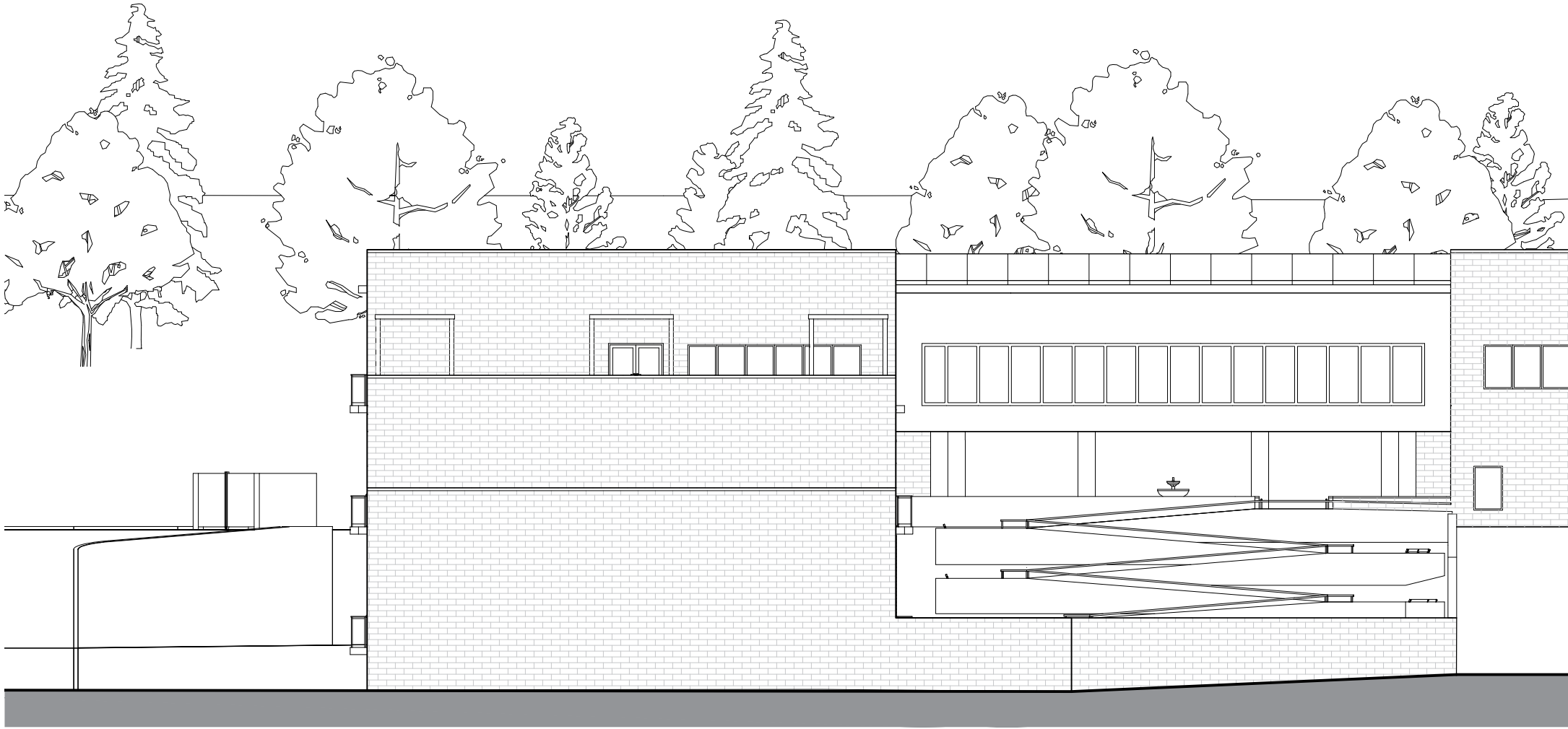


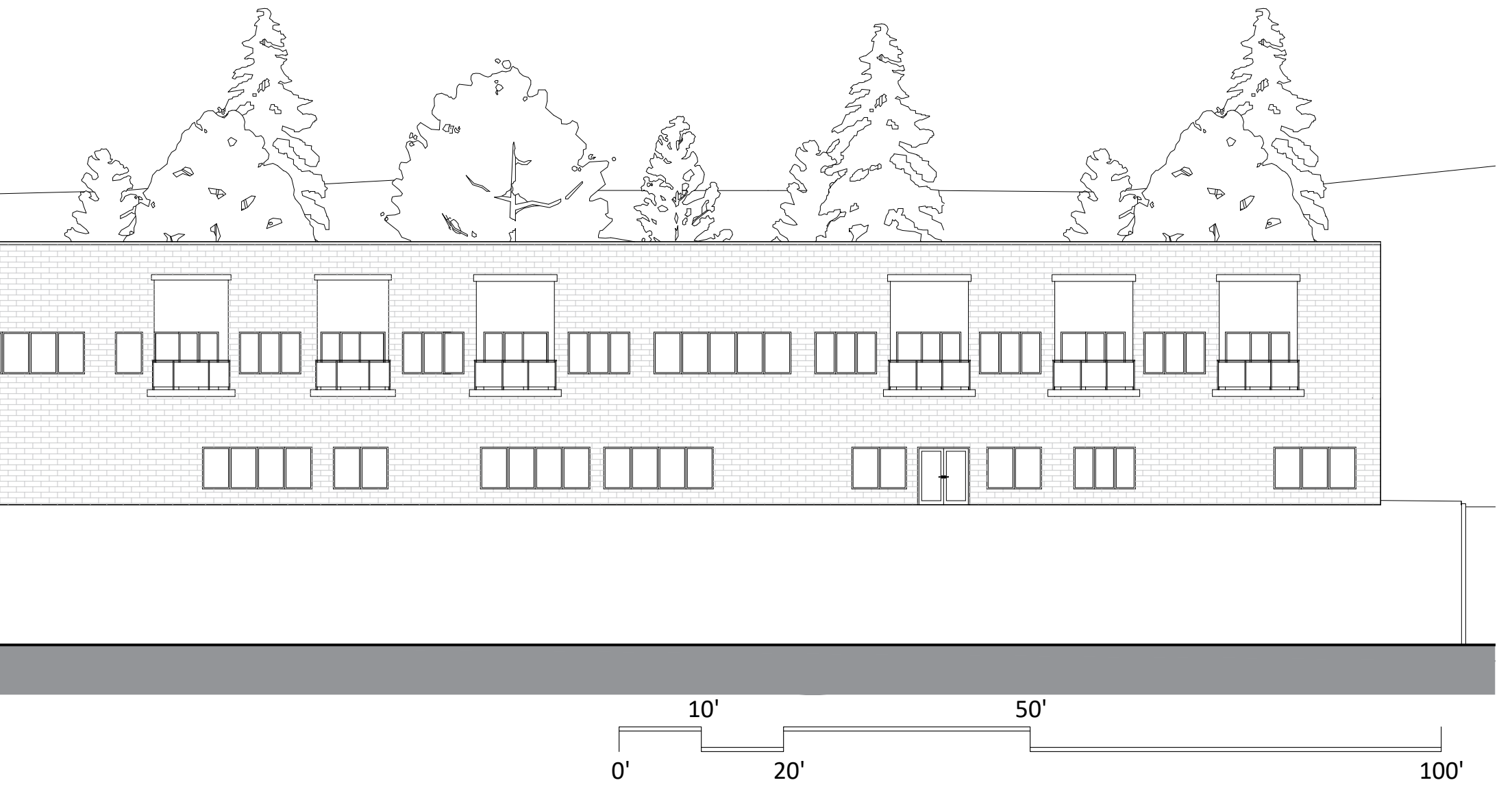
DESIGN - RIGHT ELEVATION





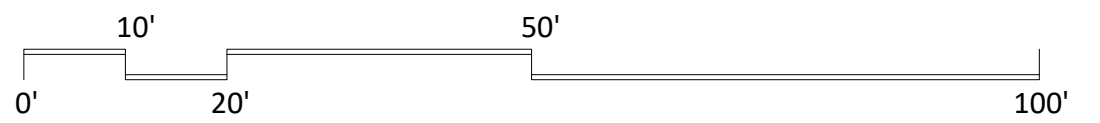
DESIGN - BACK ELEVATION



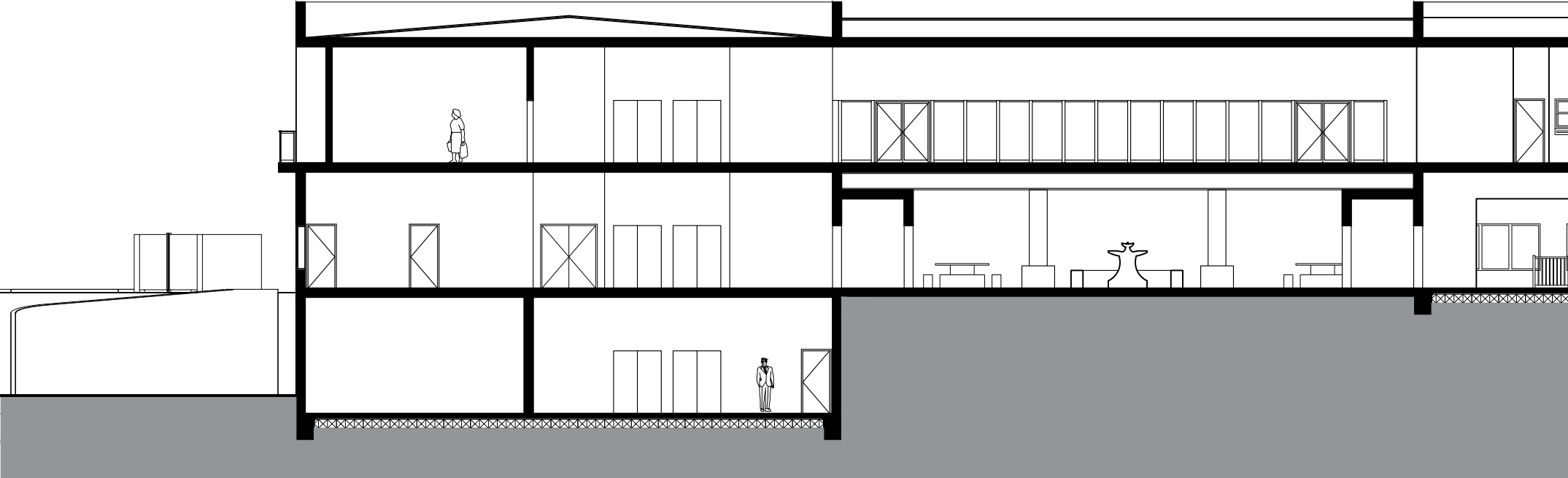


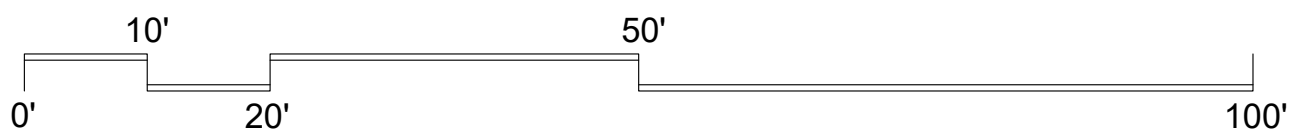
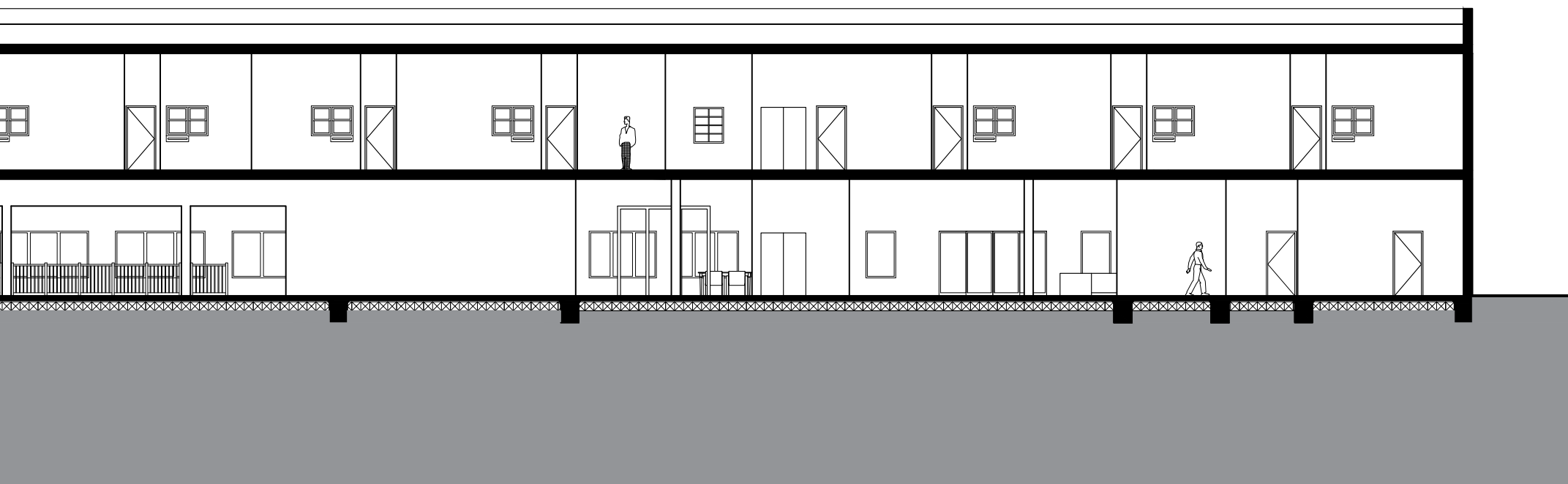
DESIGN - BRIDGE SECTION



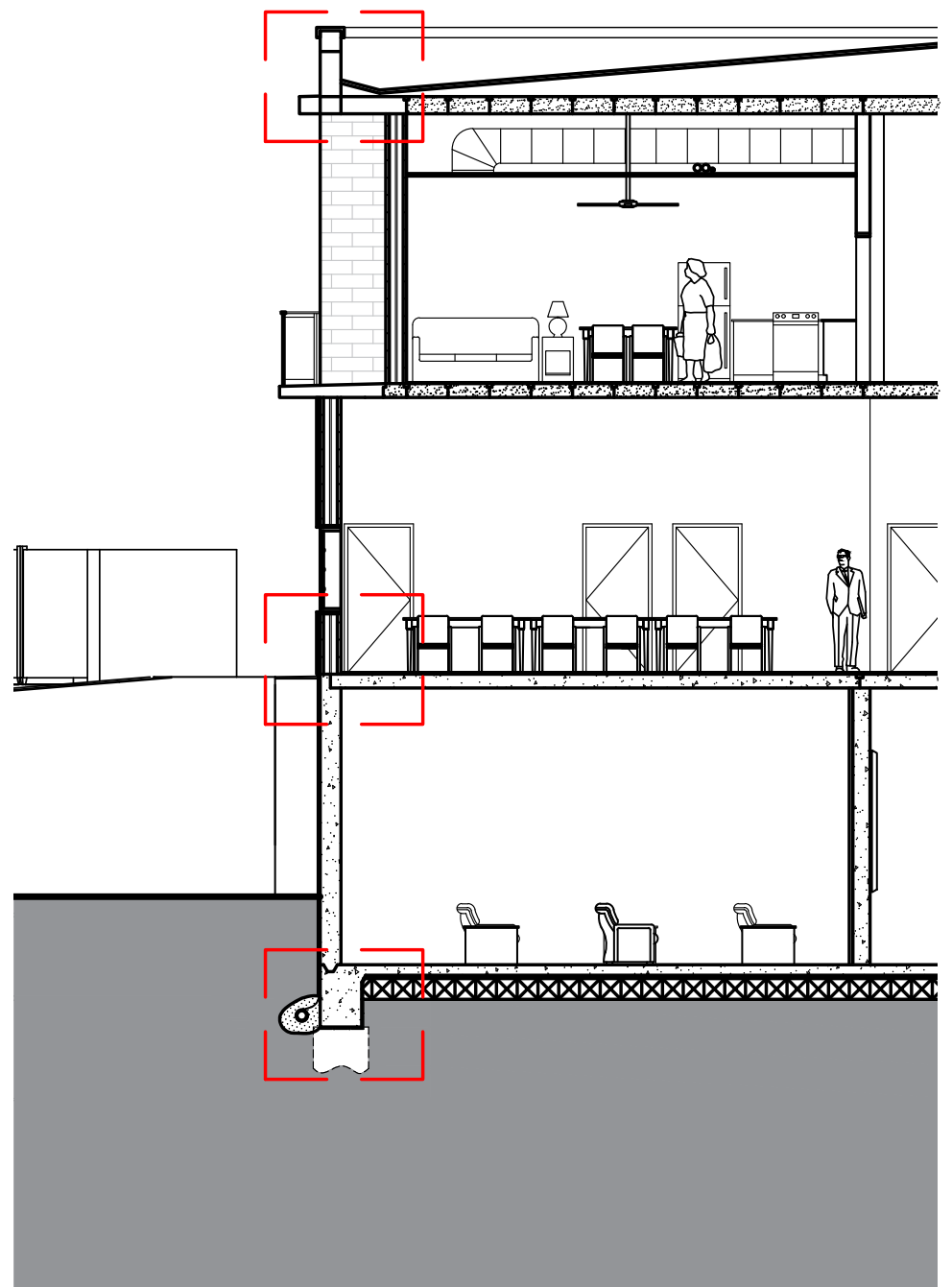
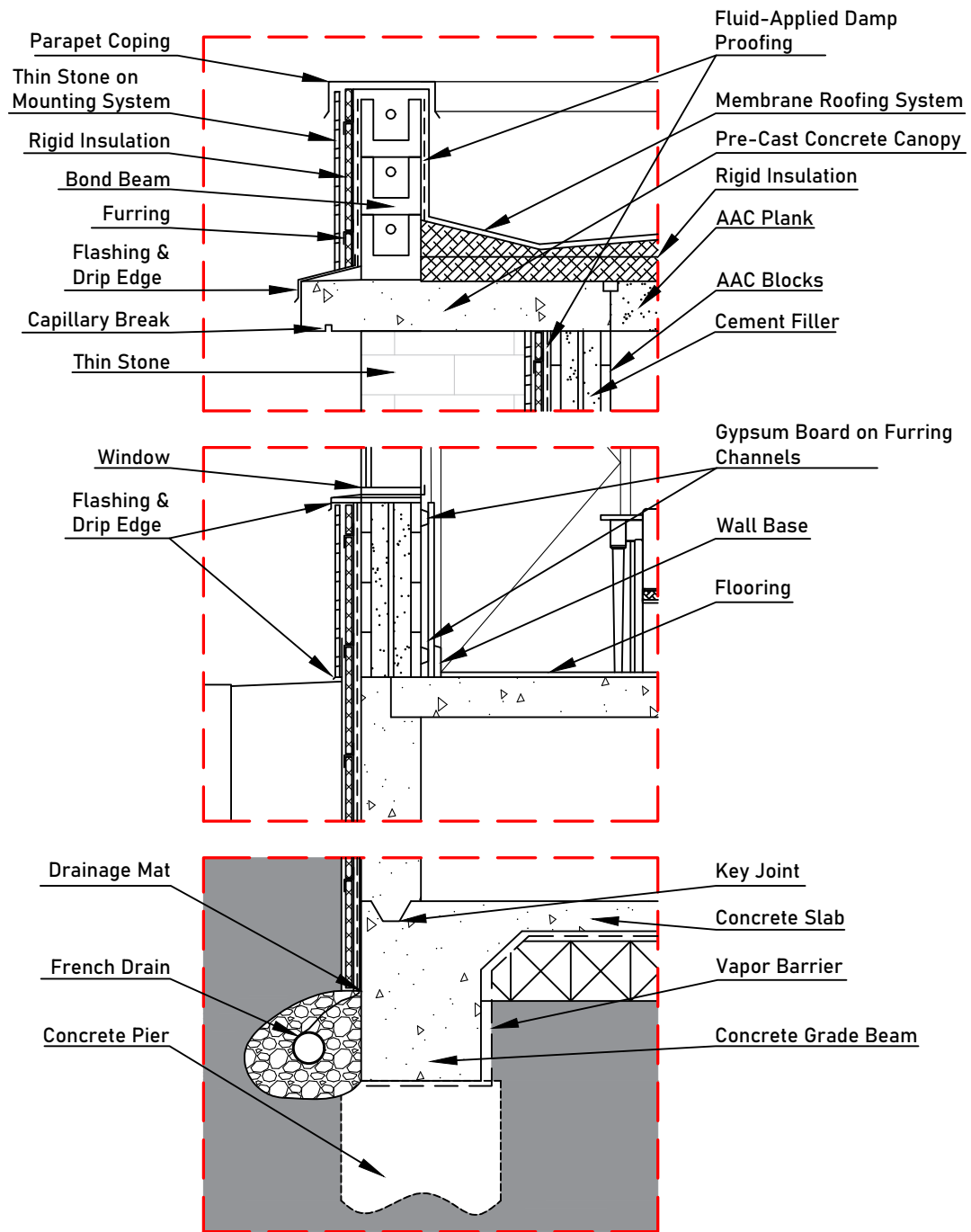


DESIGN - LONGITUDE SECTION



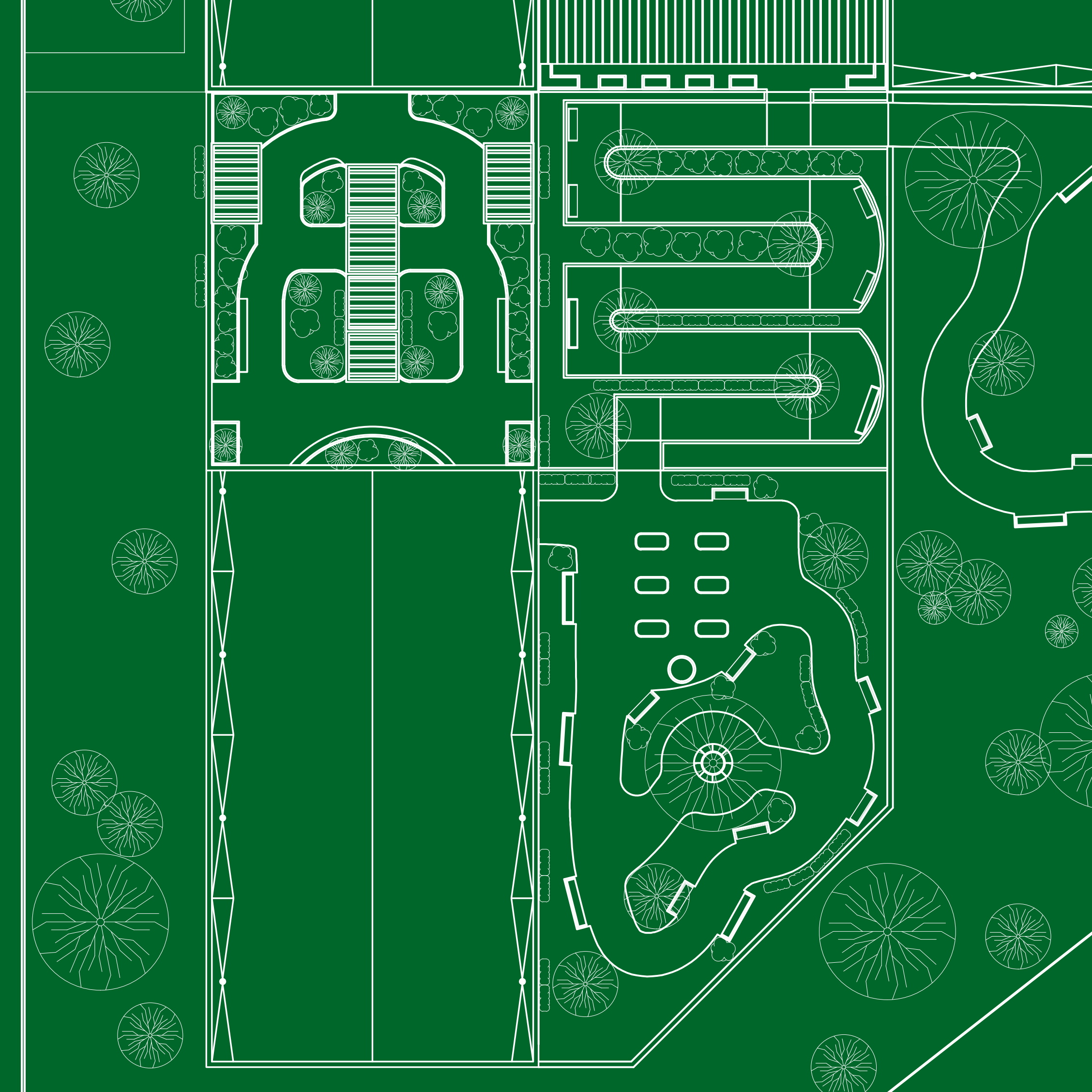


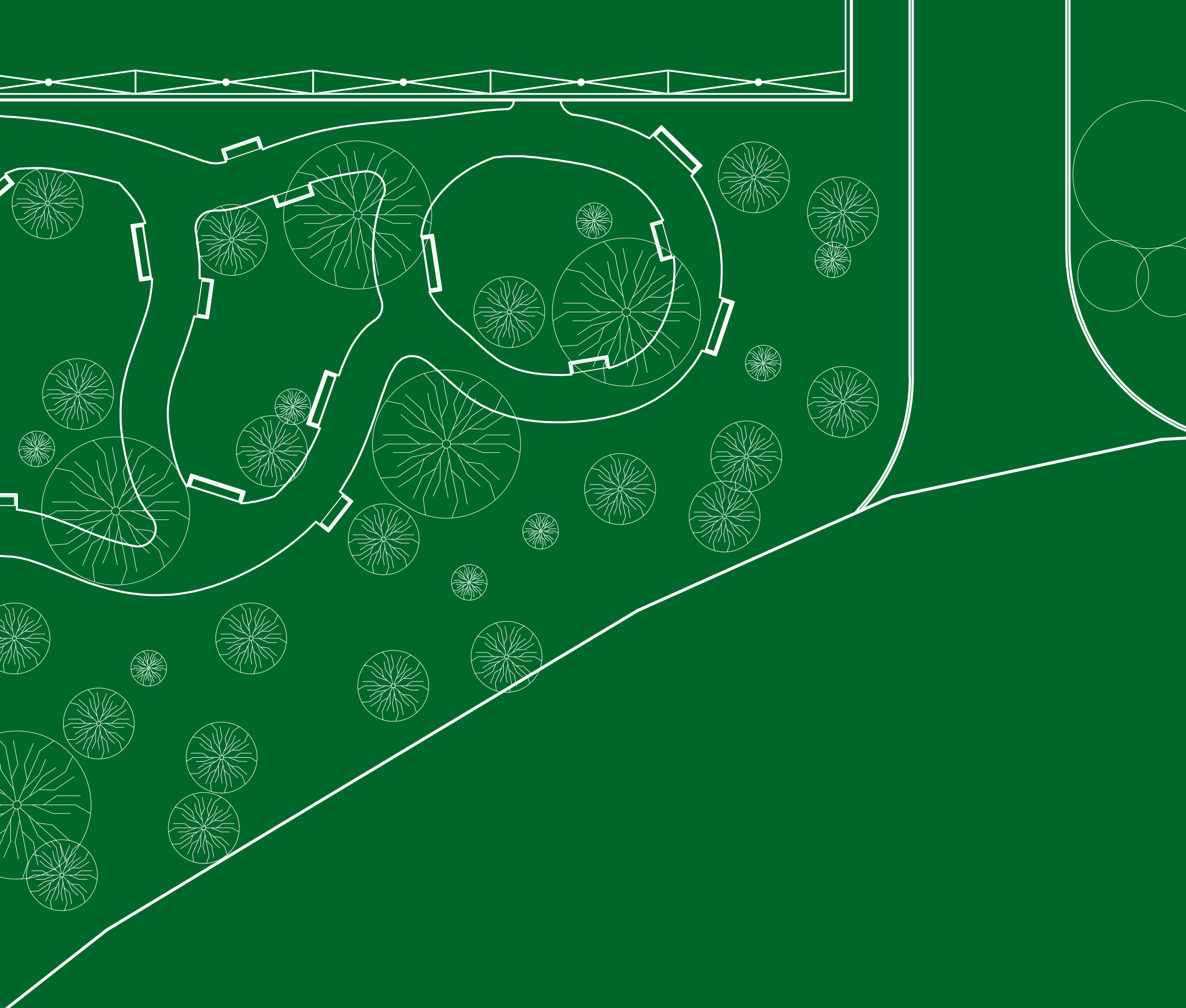
DESIGN - WALL SECTION



The building's structure is made of AAC block or Autoclaved aerated concrete. This was done so the interior of the rooms and units would have more flexibility when it came to columns grid for support. The AAC block would be able to carry more of their own load if the walls overlapped each other on each level with the same wall thickness. In areas where they didn't overlap, columns were placed to hold the load of the next floor. The exterior material is mainly a dark-gray stone brick design as it fit well with the scenery of the building being partially buried underground. The bridge on the second floor and the exterior walls of the balconies of the units are of a rustic copper plating, metallic plates with a copper shine that is weathered down, to add a bit of color to the facility and to

make each slot of the balcony pop more in the view of the building. thickness. In areas where they didn't overlap, columns were placed to hold the load of the next floor. The exterior material is mainly a dark-gray stone brick design as it fit well with the scenery of the building being partially buried underground. The bridge on the second floor and the exterior walls of the balconies of the units are of a rustic copper plating, metallic plates with a copper shine that is weathered down, to add a bit of color to the facility and to make each slot of the balcony pop more in the view of the building.





GARDEN

GARDEN



1



2



3

The gardens and landscaping are important pieces to this pandemic-resistant assisted living facility. During a pandemic moral can easily drain a person while being kept locked indoors all the time. The private, public, and second floor patio gardens all give the residents the space and scenery they need to raise their spirits while keeping them safe with social distancing. All three gardens have over 6 feet apart seating and the roads and paths are 8 feet wide, allowing the residents to move past one another, lowering the risk of accidentally

cross infection. The plants and fresh air can help with the stressing situation of another pandemic, helping the residents through this tough time if it ever happens again.

Renders:

- 1 - Aerial shot Private Garden
- 2 - Aerial shot Second Floor Patio
- 3 - Aerial shot Public Garden

GARDEN

Either coming out through the ground floor or the ramp, the first area in the private garden is the 7 waist high planters used by the residents. Going past them is the center seating underneath a large tree used for shading and scenery for the garden. Around the private garden's paths are several benches that vary from 6 to 9 feet in length used for the residents to take in the scenery or rest after working on the planters.

Renders:

- 1 - Perspective view Ramp to Private Garden
- 2 - Perspective view Private Garden towards Ramp
- 3 - Perspective view Private Garden waist high planters





2



3

GARDEN



1



2



3

Renders:

- 1 - Perspective view Public Garden from Ramp entry.
- 2 - Perspective view Public Garden path near north section entry.
- 3 - Perspective view middle intersection of Public Garden pathway.

REFERENCES

Anil Kumar. Archana Sagdeo. Pankaj R. Sagdeo. (2021) Photodiagnosis and Photodynamic Therapy. *Possibility of using ultraviolet radiation for disinfecting the novel COVID-19* 23. Retrieved April 5, 2022, from https://www.sciencedirect.com/science/article/pii/S1572100021000600?casa_token=P0m_8yWwFKoAAAAA:CWDtw0BHHWYybuICf19FntIxtOE-iNdkqfbNeoJCwqF98SmpSQj-59do2NBOXBg0A5dE56DI571c

Atlanta Regional Commission. (2019). *How Downtown Woodstock Transformed into a More Lively, Walkable Place* [Infographic]. Atlantaregional.org (Figure 2.) - <https://atlantaregional.org/whats-next-atl/articles/how-downtown-woodstock-transformed-into-a-more-lively-walkable-place/>

Brown. (2021). *Deaths of assisted living residents spiked during COVID-19 pandemic, study reveals* [Infographic]. Broen.edu (Figure 1.) - <https://www.brown.edu/news/2021-06-14/assisted-living>

Cedar Lake Ventures, Inc. (2022). *Climate and Average Weather Year Round in Woodstock*. WeatherSpark.com <https://weatherspark.com/y/15703/Average-Weather-in-Woodstock-Georgia-United-States-Year-Round>

Centers for Disease Control and Prevention. (2021, November 24). *Improving Ventilation in Your Home*. CDC.govAnil <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/improving-ventilation-home.html>

Janie Corley. Judith A. Okely. Adele M. Taylor. (2021). *Journal of Environmental Psychology. Home garden use during COVID-19: Associations with physical and mental wellbeing in older adults* 73. Retrieved April 5, 2022, from <https://www.sciencedirect.com/science/article/pii/S0272494420307106>

MASS. (2011). *Butaro, Burera District, Rwanda*. Massdesigngroup.org <https://massdesigngroup.org/work/design/butaro-district-hospital>

