THE ARCHITECTURE OF THE THRESHOLD
AUSTIN DEPARTMENT OF MOTOR VEHICLES

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ABSTRACT

Temples, shrines, religious monuments and some of the earliest buildings in time were built upon the foundation of influencing human emotion. Places which awe and inspire those that encounter these magnificent spaces was the original blueprint. As time has passed, there are still places which thrive on the intended emotional impact such as casinos, haunted houses, and government buildings. Now it has been proven that design can mentally and physically heal. Healthcare facilities are implementing design techniques which render a physiological change and a positive state of mind. Techniques like these, which positively enhance the user experience, should be employed in every new construction project, regardless of the building type.

A Department of Motor Vehicles in Austin, Texas is used to demonstrate a variety of thresholds and the impact these thresholds have on the overall quality of the architectural experience. The architectural threshold is defined as a transitional link between two unrelated spaces. This in-between space marks a passageway with the opportunity to act as a transformative space. To create an effective liminal transition, there are multiple design characteristics to introduce including layering, blurring, and ambiguity. These characteristics are meant to alter the mentality of the occupant as they move through the threshold and allow for a clear and fresh mindset as they enter the adjoining space.

Through the careful design of such thresholds, the predetermined emotional responses can be achieved with any design.

ARCHITE

THR

CTURAL
RESHOLD

ARCHITECTURAL THRESHOLD

The architectural threshold acts as the transitional link between two unrelated spaces. This link generates the first impression of the adjoining space, possibly the most critical point through which architecture impacts the user experience. By narrowing down a study on the architecture of the threshold, we are able to better understand these liminal spaces and their affects on the psychological journey. Throughout the study, different ways to address many thresholds will be applied to a building program to compare the potential resulting affect it may provide to enhance the user experience.

THRESHOLD BREAKDOWN

In order to define the various thresholds, categories are used to differentiate. An overarching category, psychological thresholds, refers to all the thresholds impacting the user's experience. Physical thresholds include the physical movement through spaces as well as anything impacting the tactile sense. Social thresholds are intangible and include the human relationships encountered throughout the building and the differences between programmatic spaces. Visual thresholds include the massing and form of the building, materials, colors, and plants.

PSYCHOLOGICAL THRESHOLDS

PHYSICAL THRESHOLDS
SOCIAL THRESHOLDS
VISUAL THRESHOLDS

PHYSICAL THRESHOLDS

ENTRANCE/EXIT
MATERIAL/TACTILE
PROGRAMMATIC
VEGETATION

VISUAL THRESHOLDS

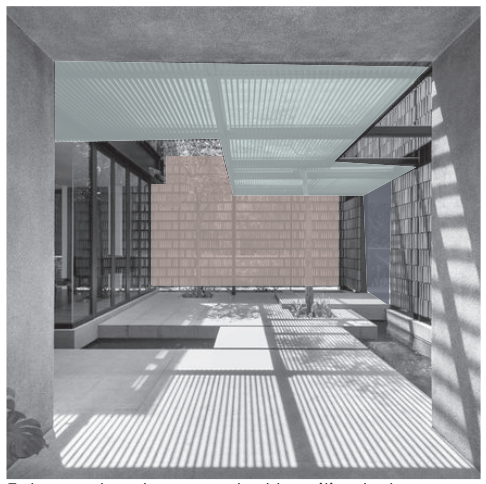
MASSING
MATERIAL/COLORS
FRAMED VIEWS
VEGETATION

SOCIAL THRESHOLDS

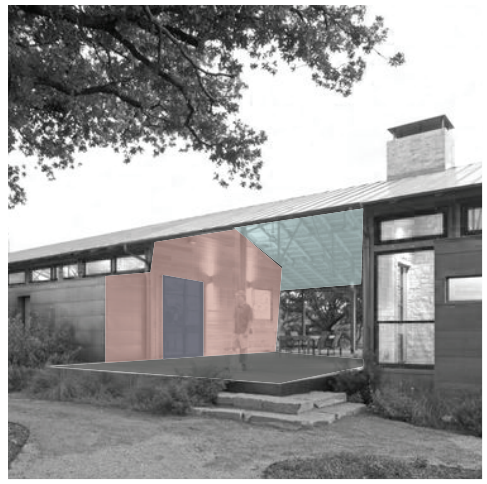
STAFF TO STAFF
STAFF TO USER
USER TO USER
PROGRAMMATIC

SPATIALLY RECOGNIZABLE DEMARCATIONS OF A PHYSICAL THRESHOLD

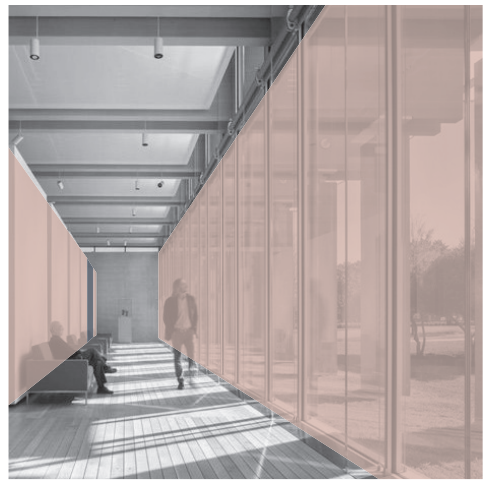
Spatially recognizable demarcations include the elements of architecture that are encountered along a user's transition. Walls and windows create a physical boundary, stairs and ramps create vertical access, doors and other openings are typically the first contact with the adjacent space, and ceiling heights affect the feeling of a space. Though these are the obvious markers of a transitional space, there are other physical thresholds that do not necessarily demarcate a user's physical threshold. For example, where one material meets another there must be a physical transition. By accentuating these transitions, the individual materials can each make their own statement and stand apart from the neighboring material. Two materials that are flush may not have the same impact as two that are separate.



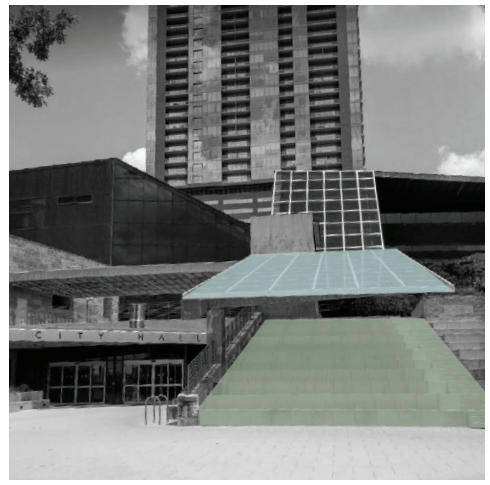
Entry courtyard as a gradual transition between exterior and interior spaces



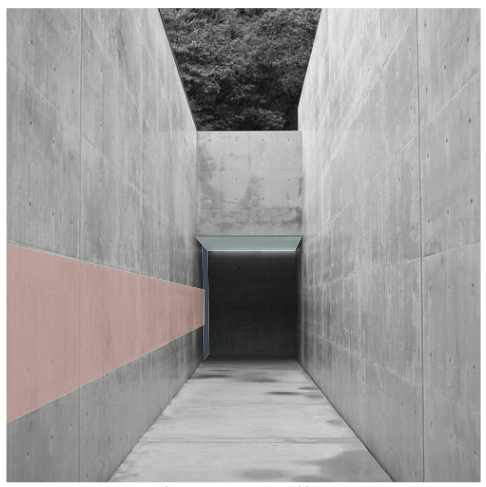
Dog trot transition acts as a crossroads between 4 spaces



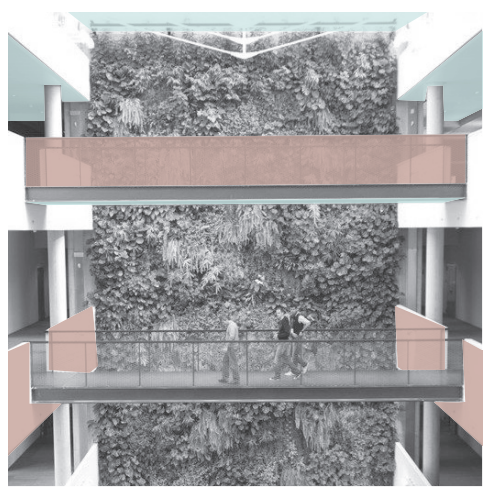
Long corridor acts as circulation with views of exterior



Passersby are introduced to an exterior seating space as the building is approached



Long entryway with lowered ceiling

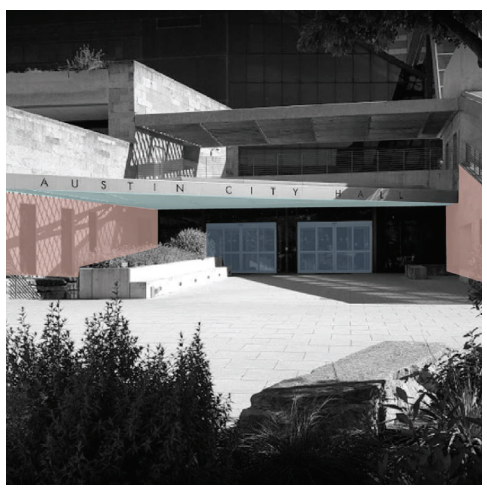


Raised open walkways between two larger sectioned areas

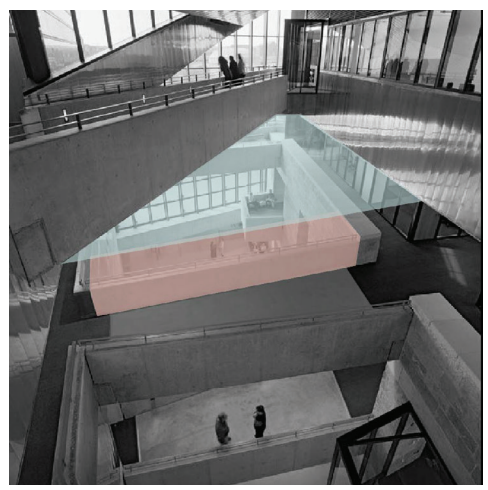
An open office plan is separated with a low wall, lowered ceiling, and material changes

A large green space separate the busy street and the front facade of the building

Stairs leading to a plaza act as a large threshold between the street and the building

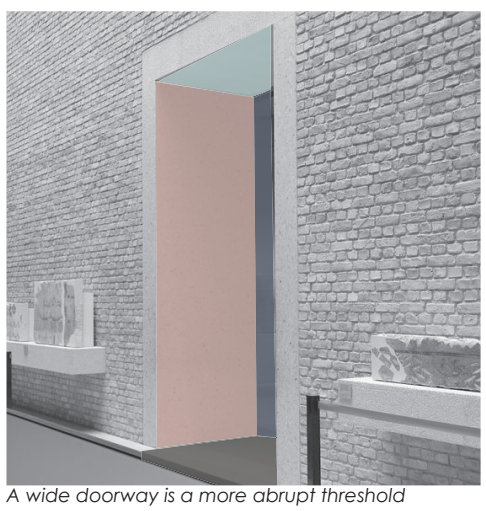


*The entrance to **Austin City Hall** has a large overhang allowing the entrance to be set back*



Upper level walkways crisscross the main lobby space of the building

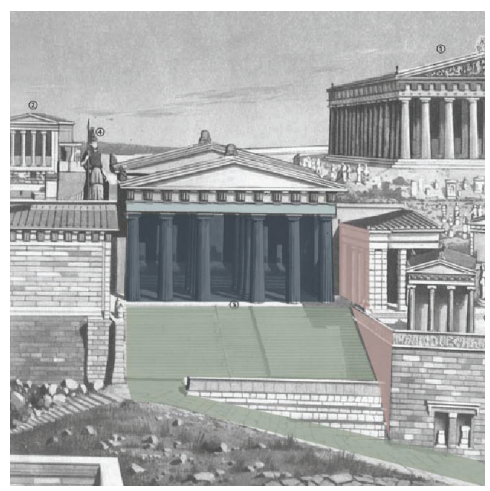
Exterior stairs lead to the side entrance and an upper exterior level of the building



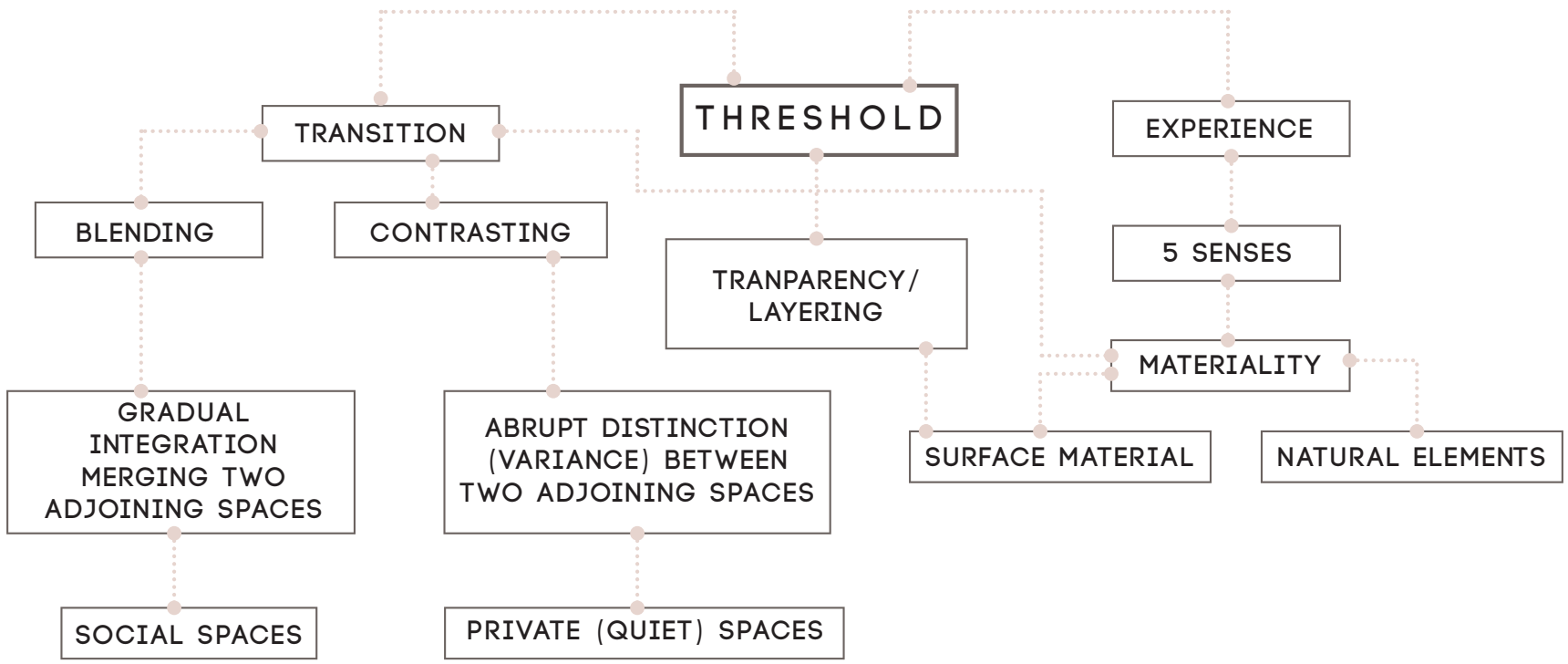
A wide doorway is a more abrupt threshold between two spaces

Pedestrian friendly transitions are incorporated between buildings within exterior spaces

Threshold between the exterior and interior of the building



Many steps rise to the top of the Acropolis where the Propylaea sits and acts as the entrance threshold



"Environmental psychology can be defined as "the study of the transactions between individuals and their socio-physical environments (Cassidy, 2003, p. 4). Environments can be defined based on their objective, hard and quantifiable physical properties, such as intensity of **lighting**, **volume** of background noise, and **color** of a room. The same environments can also be described based on their perceived and socially constructed aesthetic and symbolic attributes."

"A **boundary** around an important precinct, whether a neighborhood, a building complex, or some other area, is most critical at those points where paths cross the boundary. If the point where the path crosses the boundary is invisible, then to all intents and purposes the boundary is not there. It will be there, it will be felt, only if the **crossing is marked**" (Alexander, Ishikawa, and Silverstein, 1977).

"Buildings, and especially houses, with a **graceful transition** between the street and the inside, are more **tranquil** than those which open directly off the street. **The experience of entering a building influences the way you feel inside the building.** If the transition is too abrupt there is no feeling of arrival, and the inside of the buiding fails to be an inner sanctum" (Alexander, Ishikawa, and Silverstein, 1977).

"There is mounting evidence that contact with **nature** has significant **positive impacts on mental health**," said Mardie Townsend, PhD, an honorary professor at the School of Health and Social Development at Deakin University in Australia.

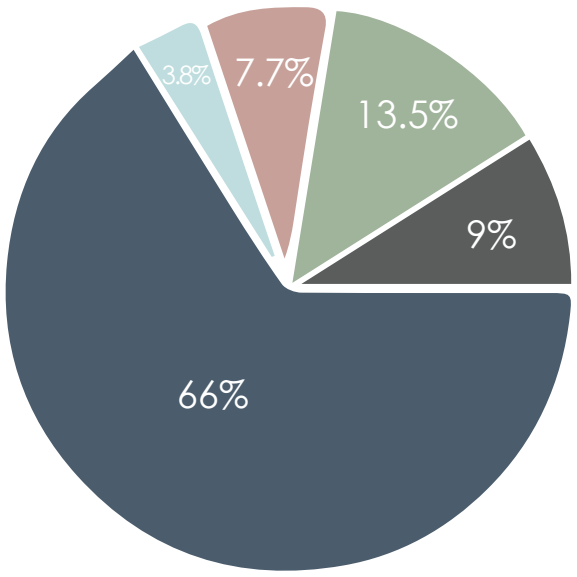
"Perceptions of **crowding** have been shown to be positively correlated with physiological arousal and **discomfort** (Aiello, Epstein, & Karlin, 1975; Evans 1979)."

MASSACHUSETTS GENERAL HOSPITAL - LUNDER BUILDING

It is becoming increasingly important to design with psychological impact in mind within the healthcare realm due to the research connected to the built environment and human health. The Massachusetts General Hospital expanded to provide for its increasing patient numbers with a new building called the Lunder Building. The design of the Lunder Building aims at providing "a high-tech, patient-centered healing environment" ("A Fitting Opportunity," n.d.). Scientific studies and evidence-based design have proven that patients whom experience daylight, views, plants, and physical and acoustical privacy have an increased recovery time (Ulrich, 2001). Therefore, the Lunder Building was designed to provide a quieter environment "to be calm and conductive to healing. ("A Fitting Opportunity," n.d.). Other measures taken to improve the patient and staff experience include a well-connected building for ease of circulation, maximizing opportunities for future flexibility, and an increased amount of daylight (Stephens, 2012).

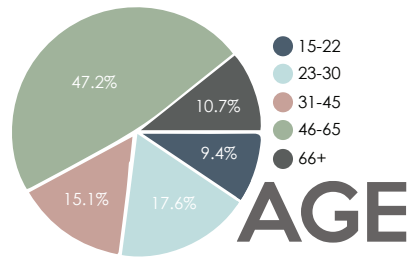
Architecture is the art, which above all others, combines **expression**, technology, and the satisfaction of human needs. Its purpose is to make places where people **feel more human**, more alive, more fulfilled."

Gary T. Moore, Assistant Professor and Coordinator, Environment-Behavior Studies Option

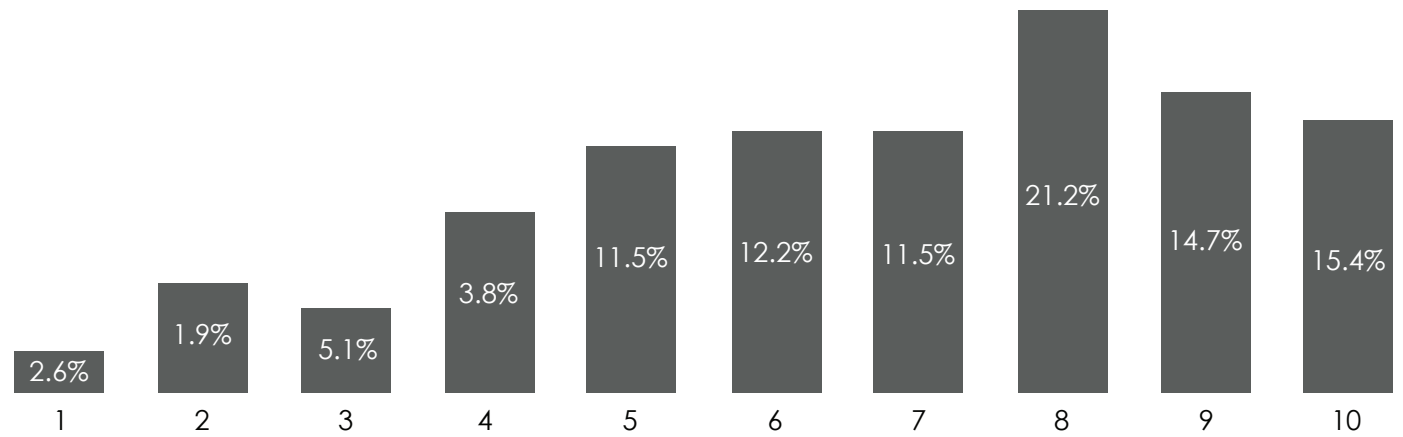


SPENT TIME ON MY ELECTRONIC DEVICE
READ A BOOK
STARED AT THE WALL
TALKED TO SOMEONE
NO WAIT

TIME WELL SPENT



AGE



INTERACTION WITH DMV STAFF

Starting the project with an informal questionnaire set some standards for the wants, needs, and goals for the programming. Asking people to describe their last visit to the DMV resulted in varying responses multiple of which used descriptors such as “boring,” “uncomfortable,” and “frustrating.” Without even asking information about wait time, many people commented on whether they waited for a long time or not at all. The questionnaire responses led me to introducing a program that appealed to the most people and created a positive, calming environment.

SITE & P

ROGRAM

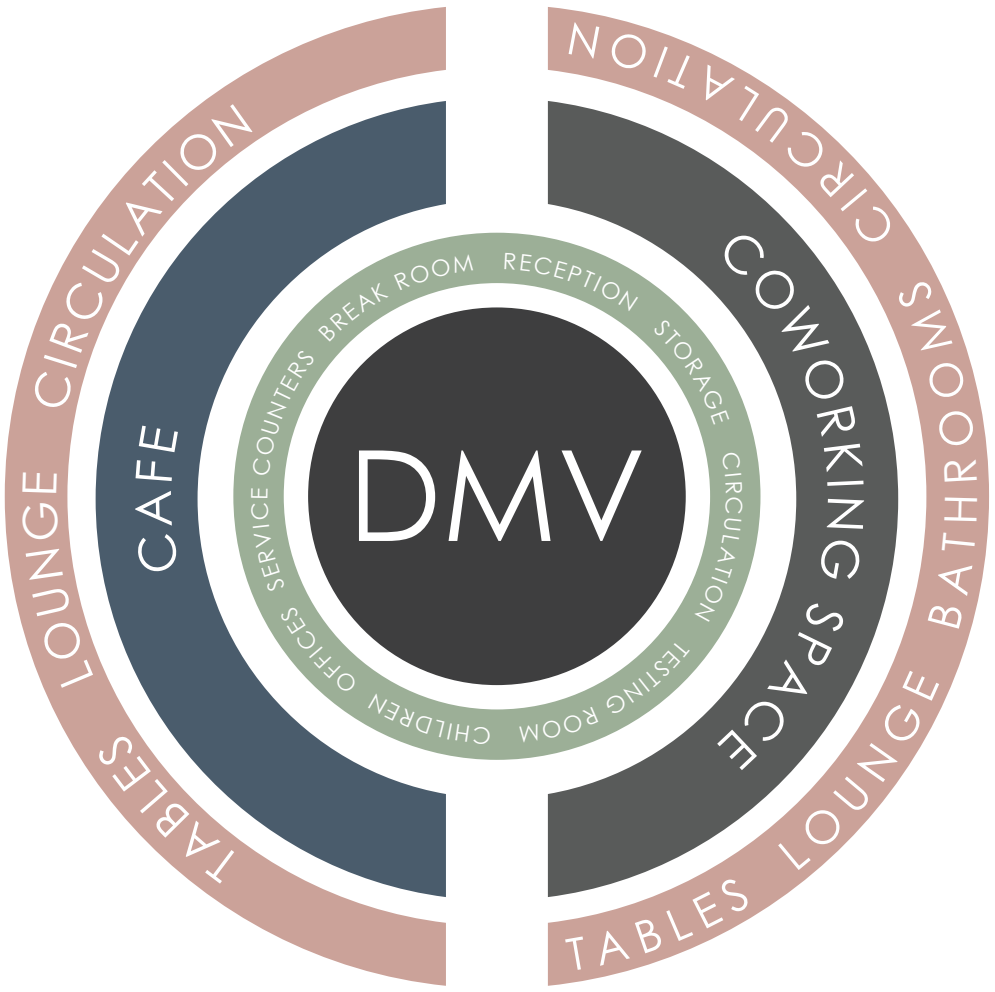
600 West Cesar Chavez was once home to the city of Austin's first wastewater treatment facility, Thomas C. Green Water Treatment Plant. Austin Water was formed in the early 1900's and built the treatment plant in 1919. The new plant used innovative technologies for that time and can receive up to 150 million gallons of sewage per day that is treated and returned to the Colorado River (Austin Water History, n.d.).

Green Water Development refers to the redevelopment of the land which previously housed the city's first wastewater treatment plant. This development in the Seaholm District along the Colorado River will include residential, office, hotel, and retail spaces. The master plan aims to make significant contributions to sustainability, open space, affordability, public art and music.

600 WEST CESAR CHAVEZ STREET

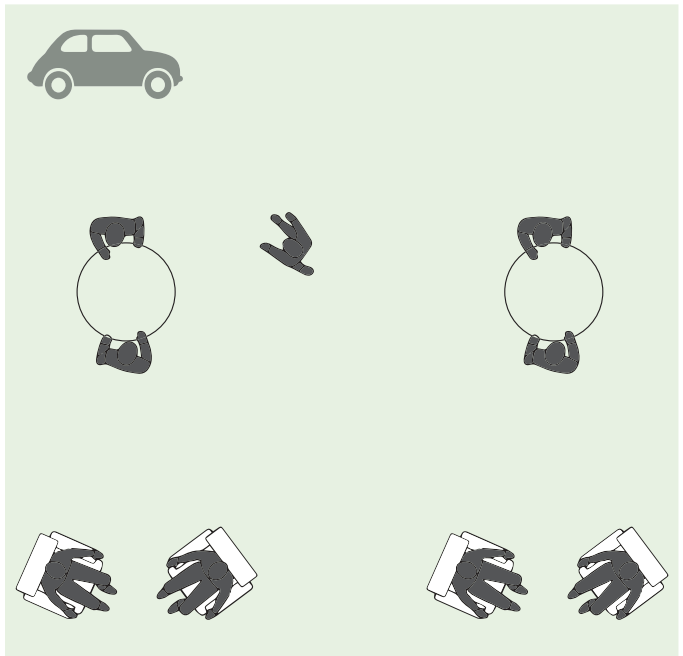
The proposed site is considered prime real estate in the downtown Austin area. Views of Lady Bird Lake, a segmented attraction of the Colorado River, is situated across Cesar Chavez Street. To the west, the new Central Public Library is just beyond Shoal Creek. New surrounding buildings include a grocery, hotel, high rise apartments, and restaurants. The history of the site and the new surrounding buildings support the addition of a public service building. A DMV on this site helps establish the city's values including public service and engagement, responsibility and accountability, innovation and sustainability, diversity and inclusion, and ethics and integrity (Office of the City Manager, n.d.).

Austin



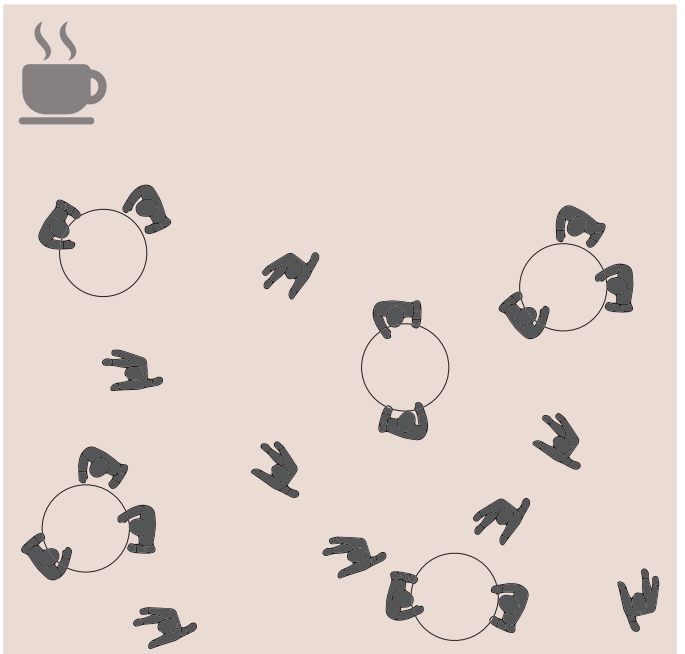
PROJECT GOALS

- Attract people from the street to the building. Expand the users of a DMV building.
- Services include necessary DMV services and other activities to enjoy while waiting and to draw in pedestrians
- Create an environment that promotes positive interactions between customers and staff
- Use exterior space to encourage waiting/relaxing outside
- Provide views of the river, creek, and nature throughout the building
- Quality should resemble “Austin style.” Use similar materials found in the neighboring area
- Use the DMV wait time as “activity” time
- Develop exterior spaces that respond to the needs of the area
- Design to allow for advancements in technology



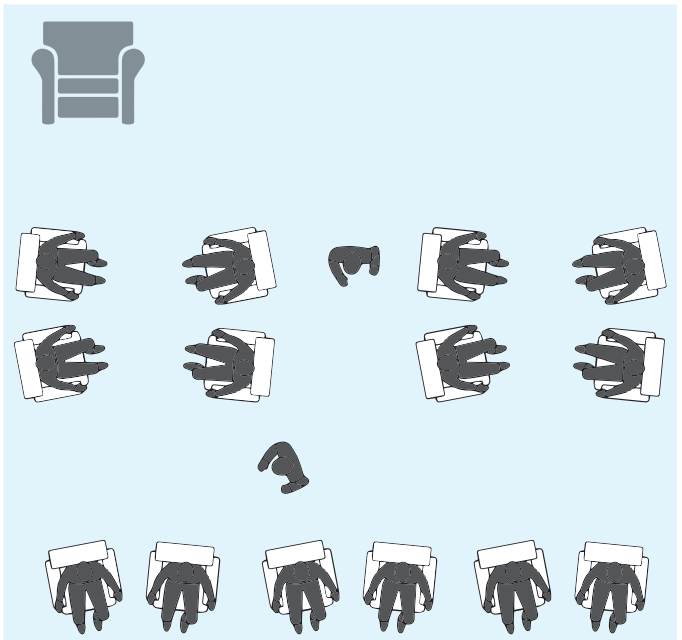
DMV

The new and improved DMV services is one that should capture a **peaceful** and **friendly** atmosphere. Within the space there should be a **sense of ease** and **calming**.



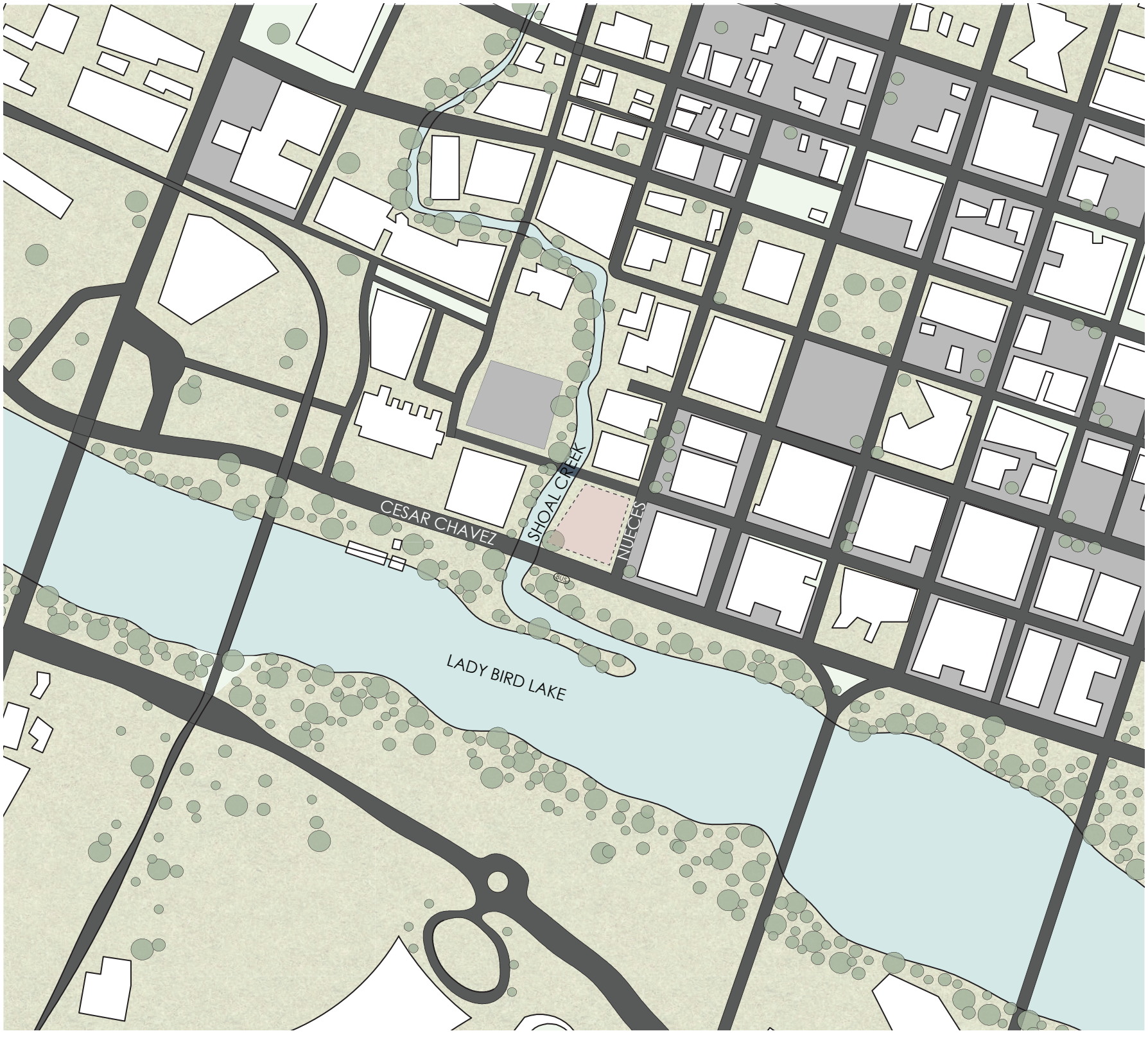
CAFE

The cafe should be perceived as an active environment where people can gather for small talk. This space is meant to evoke a feeling of **openness**, **excitement** and **friendliness**.

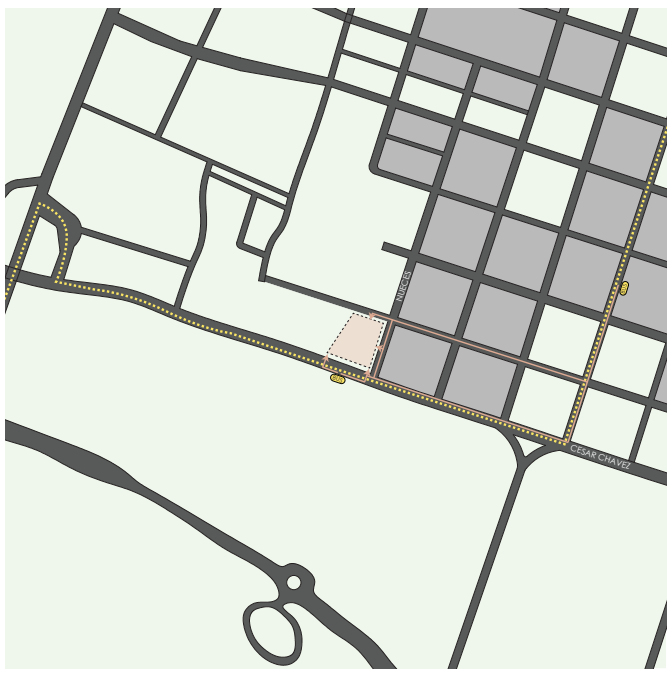


LOUNGE/COWORKING

Both the lounge and coworking areas should exude **relaxed** and **creative** spaces. These spaces are meant for *individuals* who choose to either escape from business or get some private work accomplished.

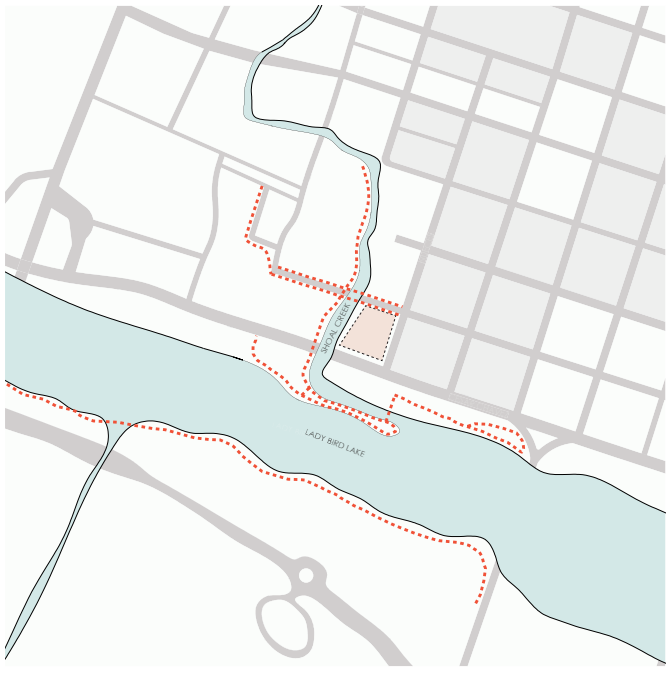

CESAR CHAVEZ
SHOAL CREEK
NUECES
LADY BIRD LAKE

relationship to surrounding buildings



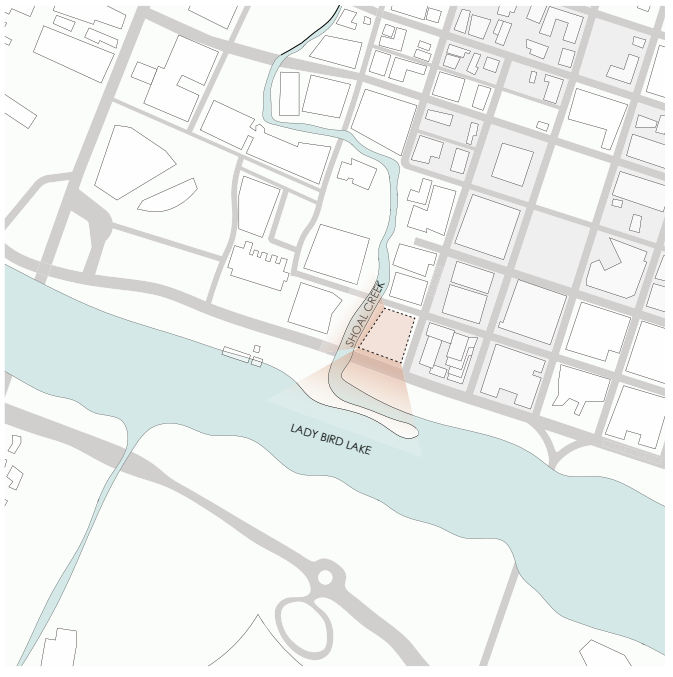
bus route and access to site

surrounding green spaces



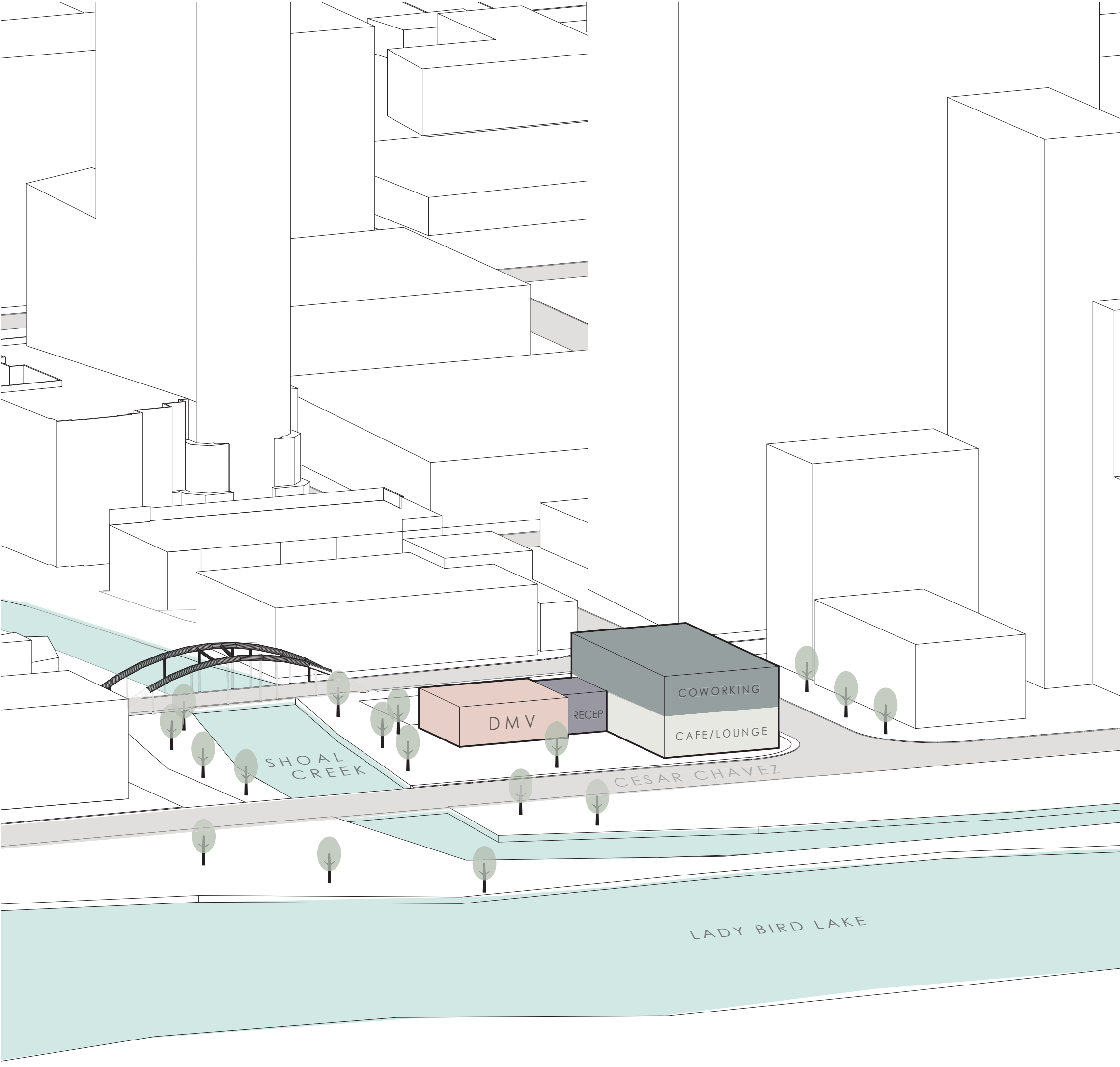
pedestrian walkways

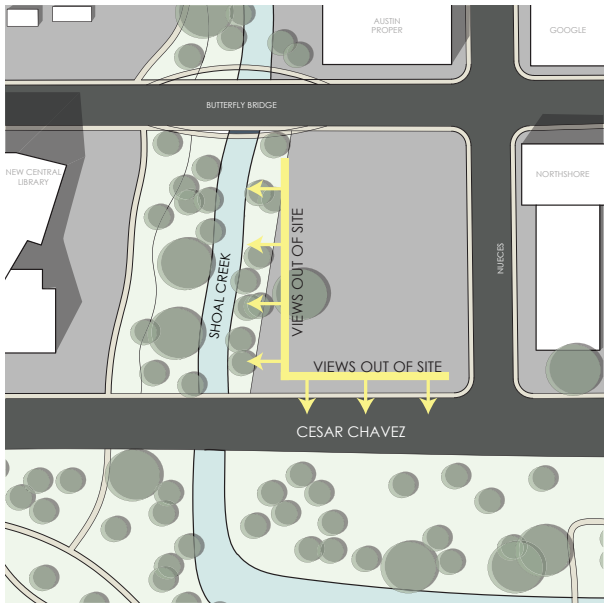
vehicular traffic



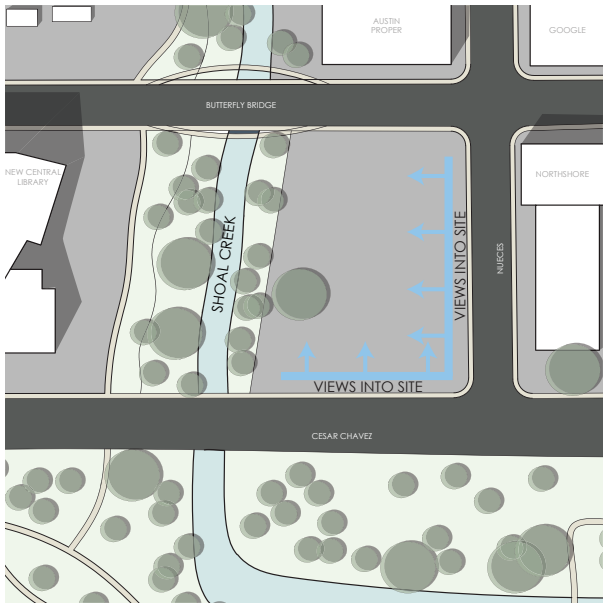
exterior views to waterways

CONTEXTUAL SITE THRESHOLDS

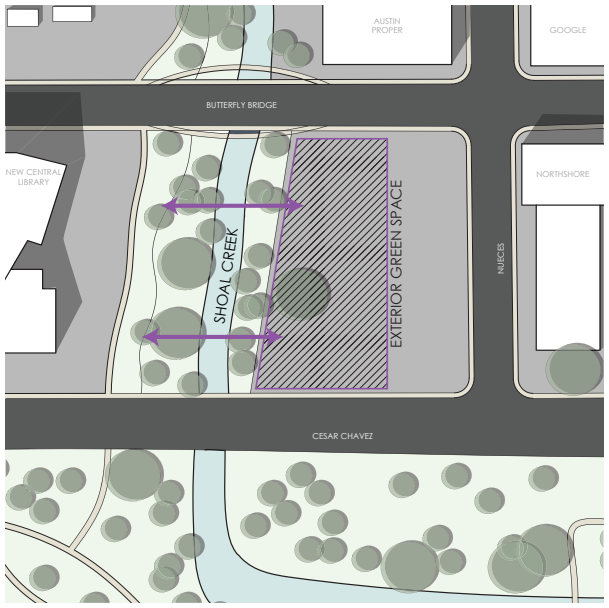

DMV
RECEP
COWORKING
CAFE/LOUNGE
SHOAL CREEK
CESAR CHAVEZ
LADY BIRD LAKE



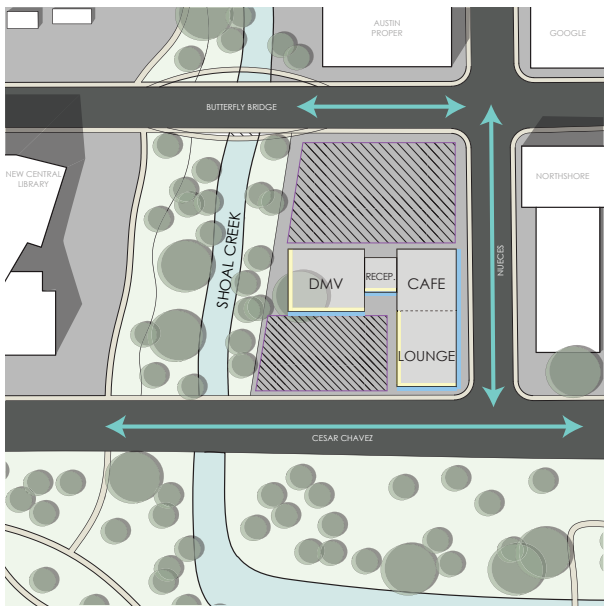
Views to the south and west of the site offer sights of Shoal Creek and Lady Bird Lake, so exterior space and glazing would be best located where indicated.



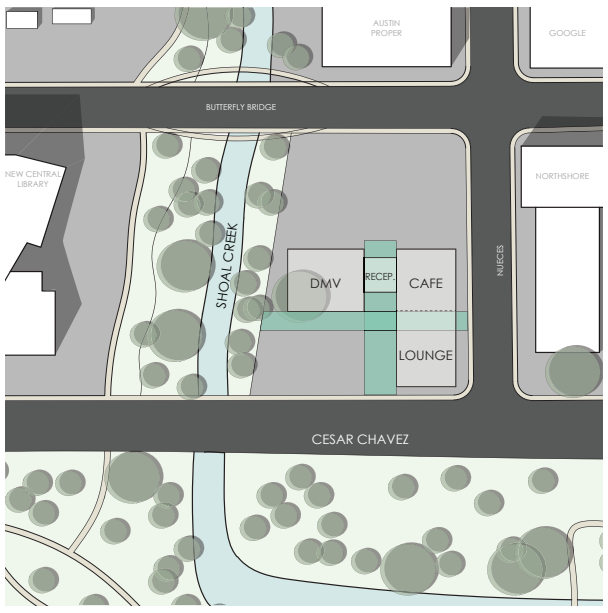
Heavy pedestrian traffic enters the site from the south and east, so these locations offer the best views into the site.



In response to the library's green space and the green space across Cesar Chavez, green space on the site would be best on the south-west.



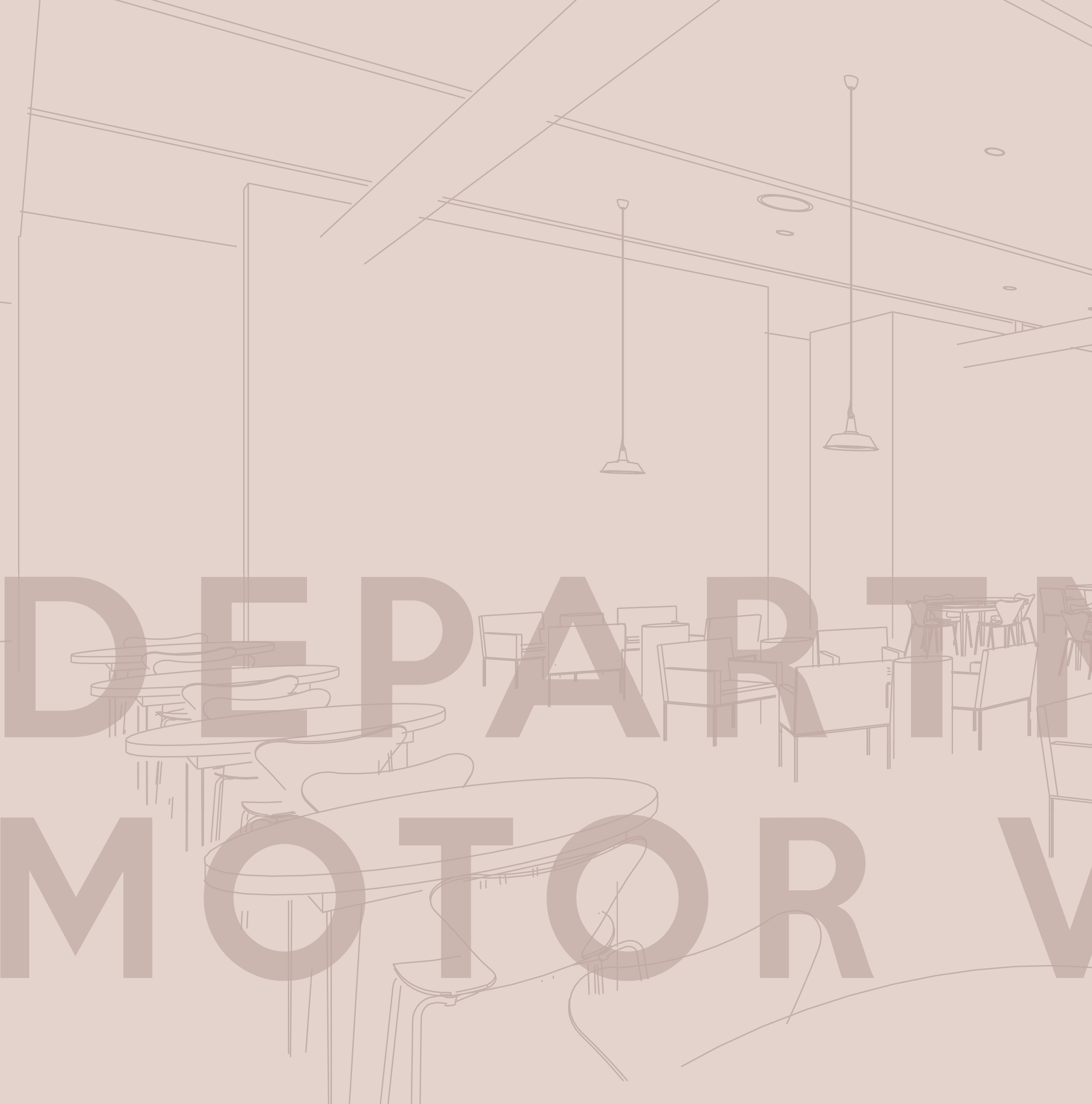
The DMV services and offices should be located on the west to offer the best views. Locating the cafe opposite the DMV will draw consumers into the restaurant. The lounge on the corner responds to the views of Lady Bird Lake and connects with the exterior lounge space to the west.



Thresholds moving into and out of the building have crossing paths just outside of the building's entrance to the south. The building's reception/lobby is a critical point of the building's threshold which greets the users coming from the south and those who use the parking lot in the same space.

Programmatic thresholds are shown above where users move between the DMV, reception/lobby, cafe, lounge, and the second floor coworking space.

RESPONSIVE SITE THRESHOLDS


DEPARTM
MOTOR V

VENTOF

VEHICLES

AUSTIN PROPER

W 2ND ST

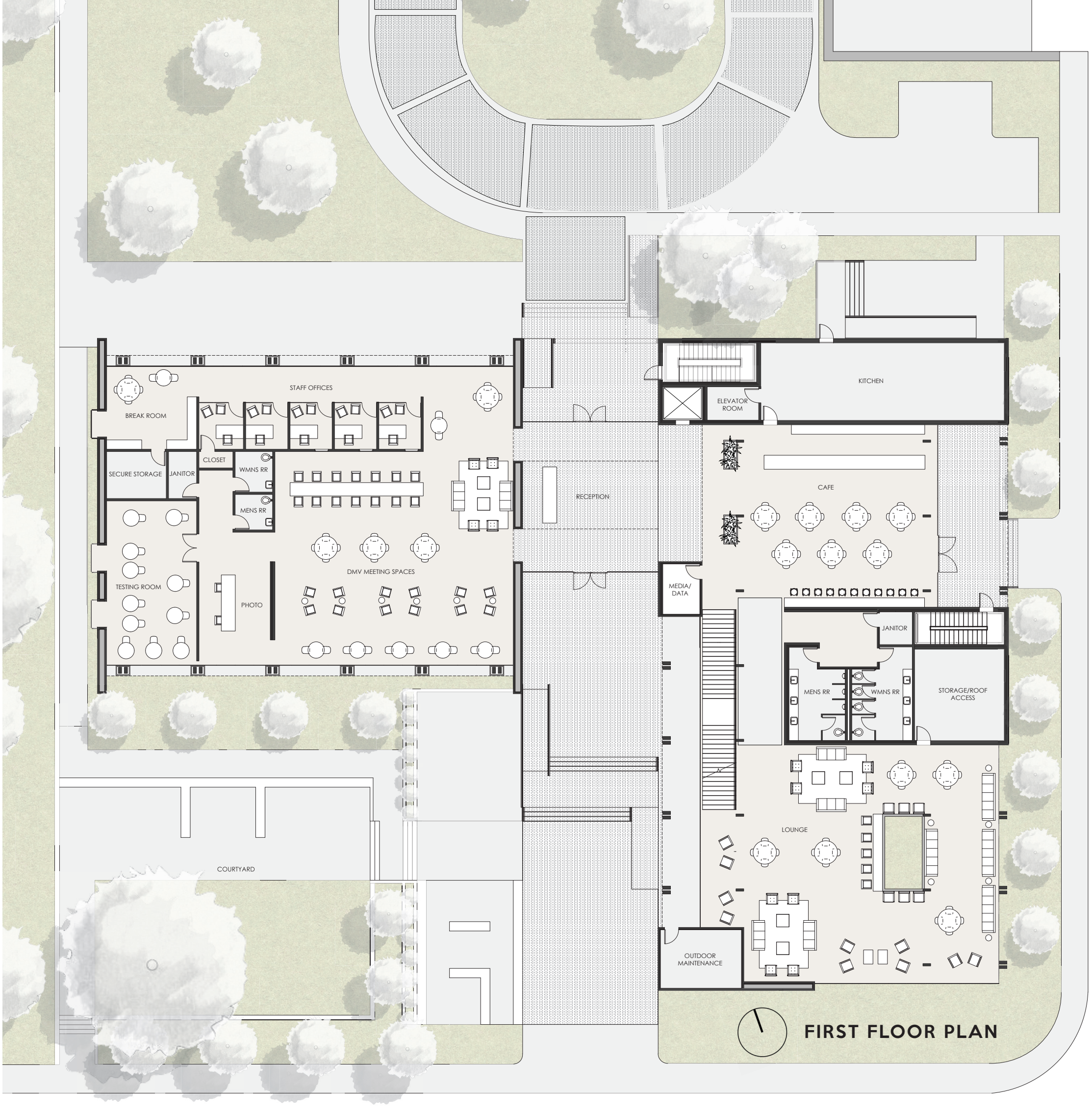
SHOAL CREEK

NUECES ST

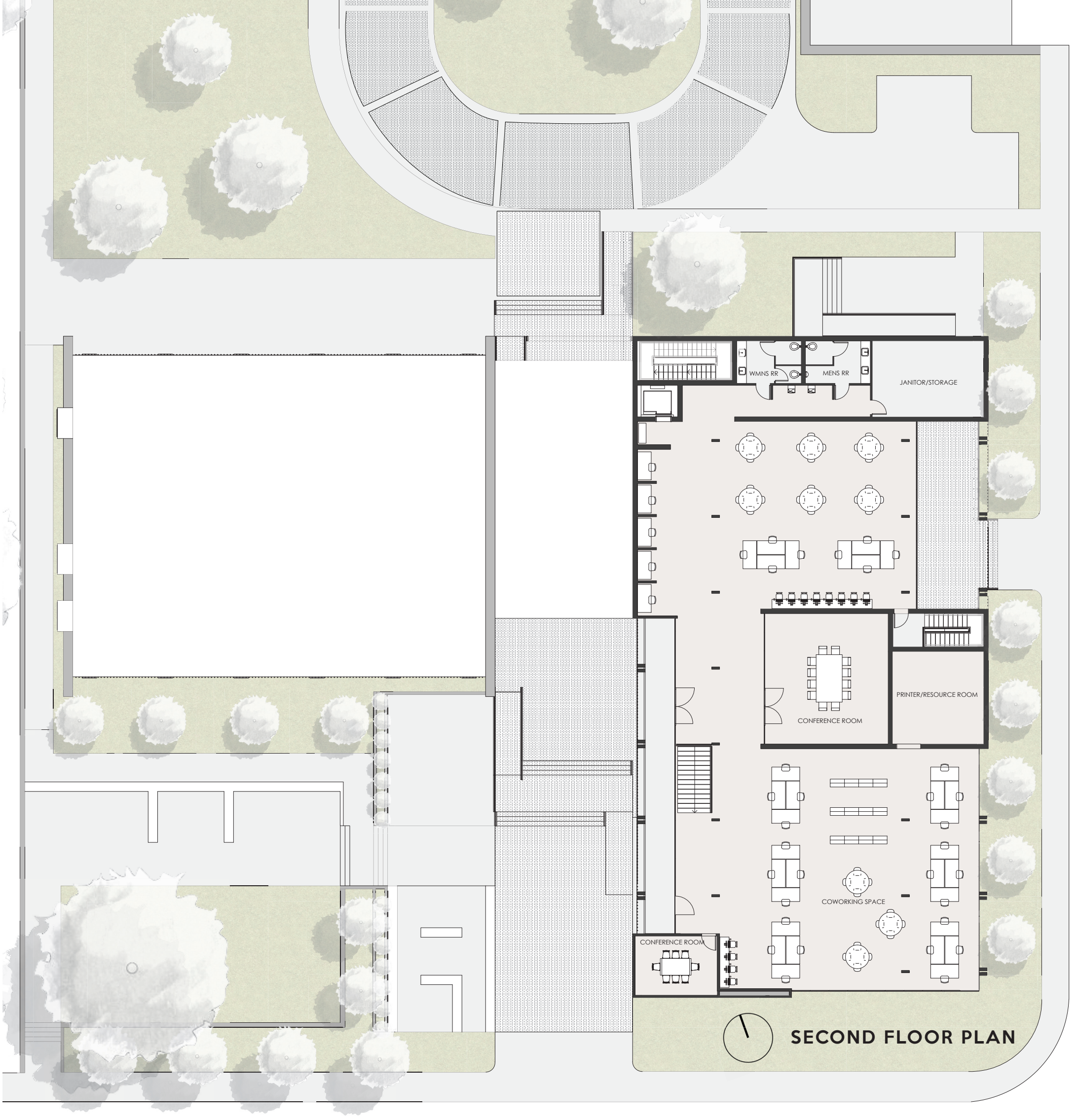
NORTHSHORE

W CESAR CHAVEZ ST

SITE PLAN

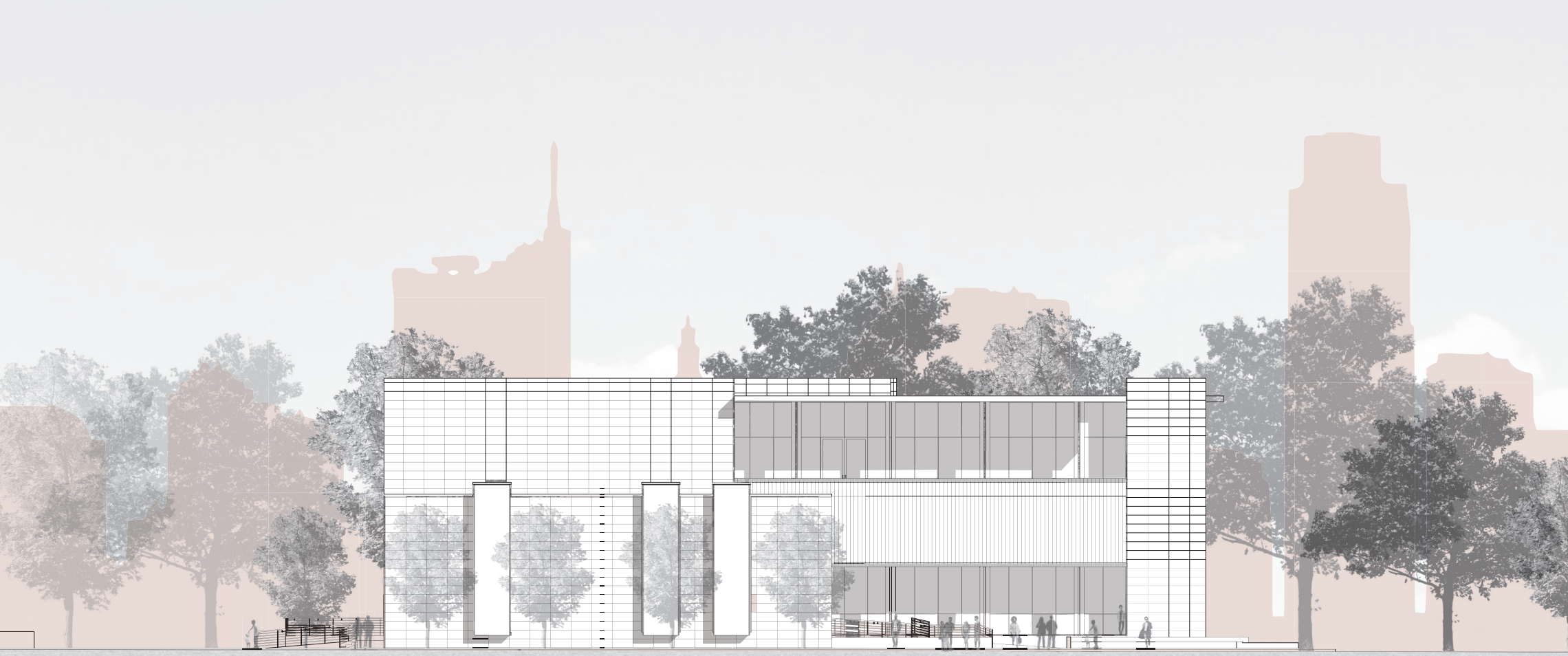


FIRST FLOOR PLAN



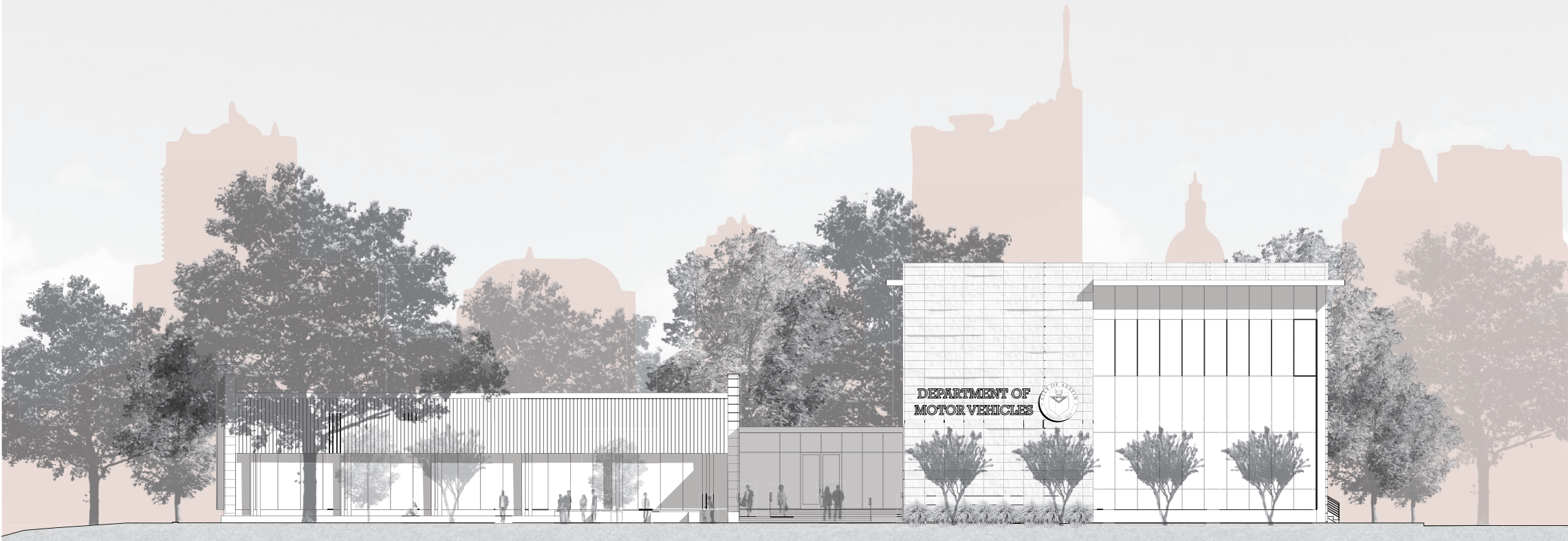
SECOND FLOOR PLAN

EAST ELEVATION

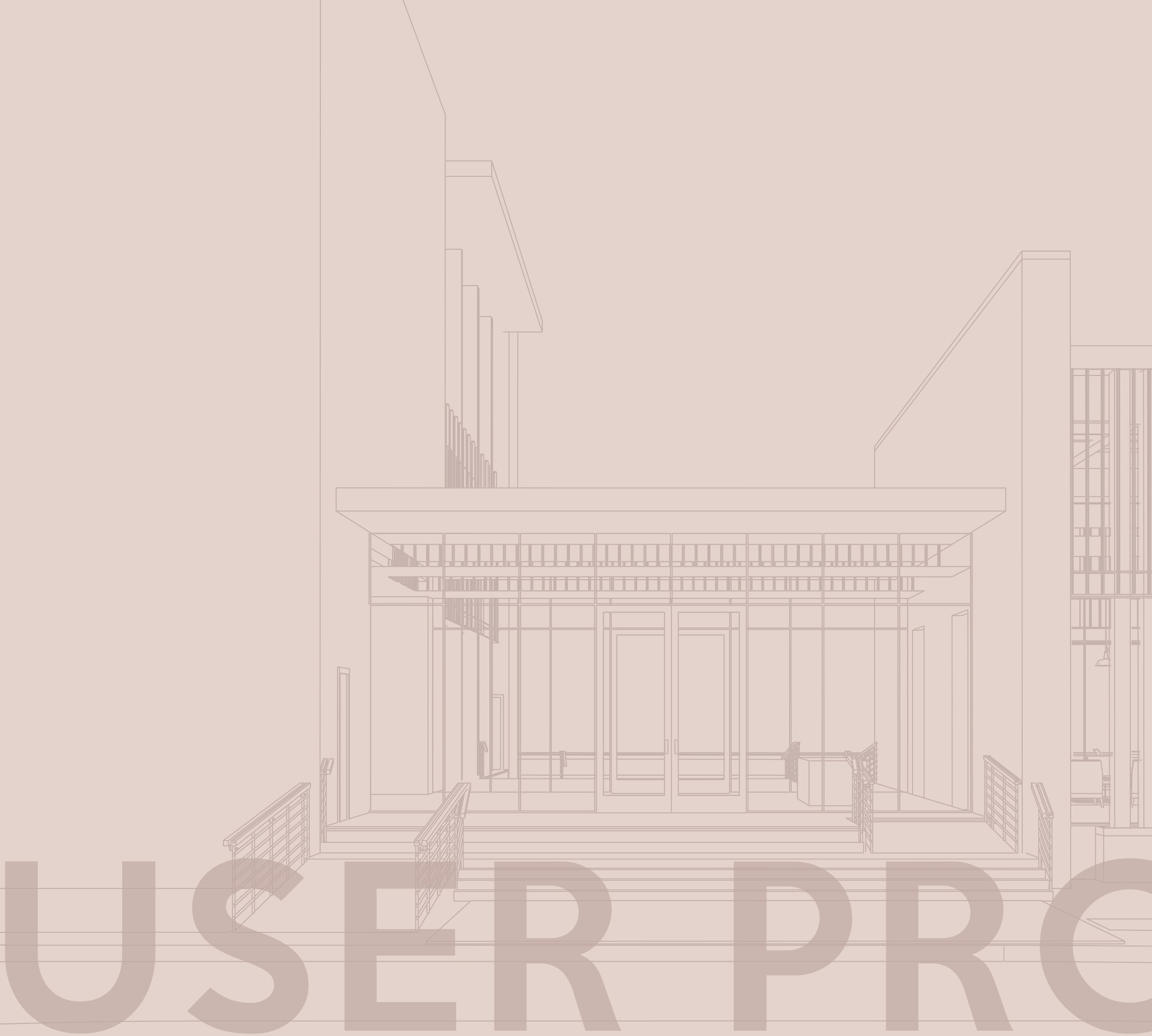


WEST ELEVATION

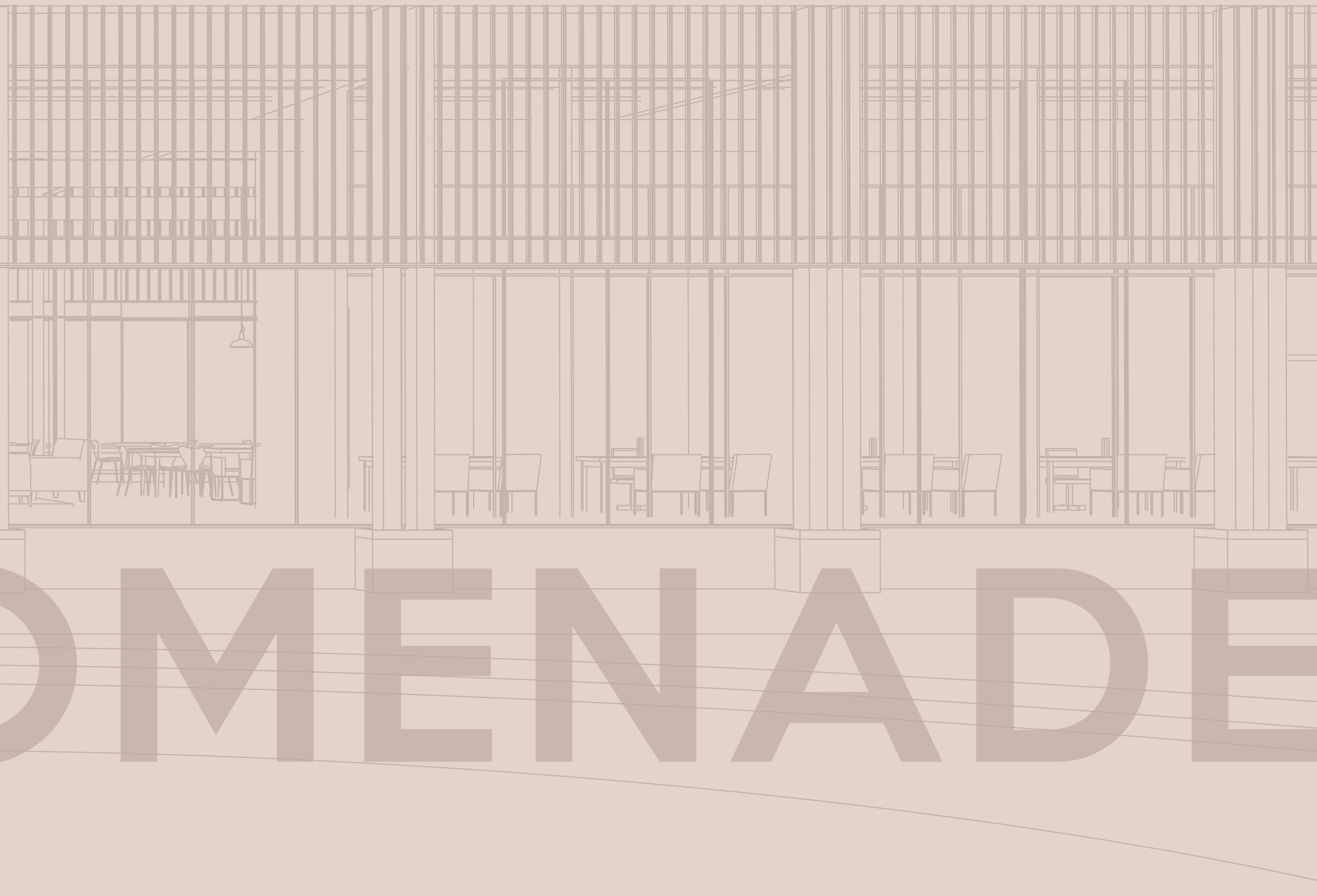
NORTH ELEVATION



SOUTH ELEVATION

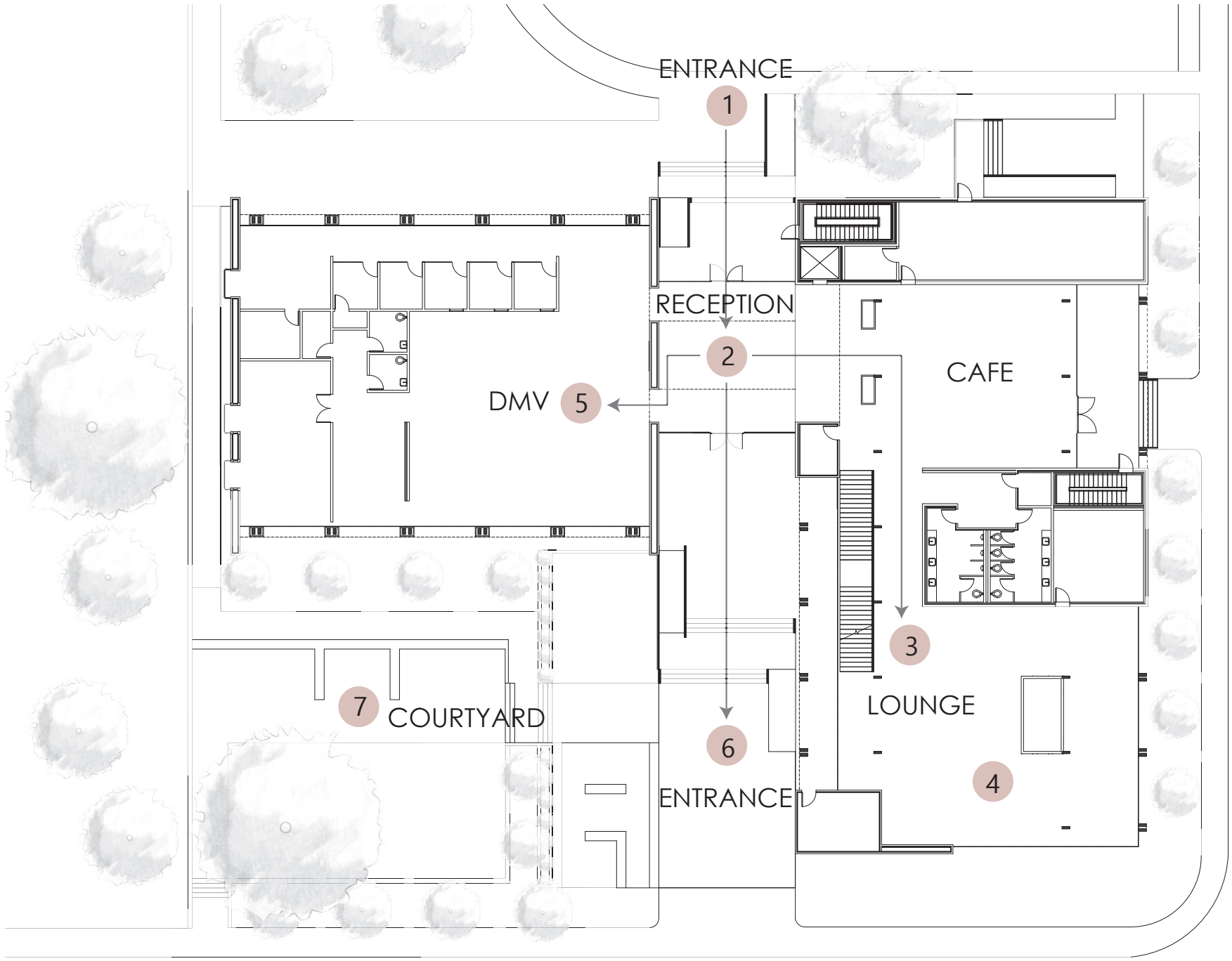


USER PRO


OMENADE

NOTE:

The thresholds are broken down and characterized by type allowing them to be analyzed by function and impact. **Physical, social, and visual thresholds** are the categories which each contribute to impacting the overall psychological threshold, the main contributing factor to the architectural experience. The following renderings visually represent each of these thresholds by location in an attempt to grade the effectiveness of the resulting design.



1 ENTRANCE - OUTSIDE TO INSIDE

2 RECEPTION - CROSSROADS

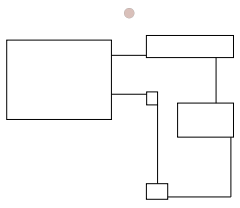
3 CAFE TO LOUNGE

4 LOUNGE

5 DMV

6 ENTRANCE/EXIT

7 COURTYARD

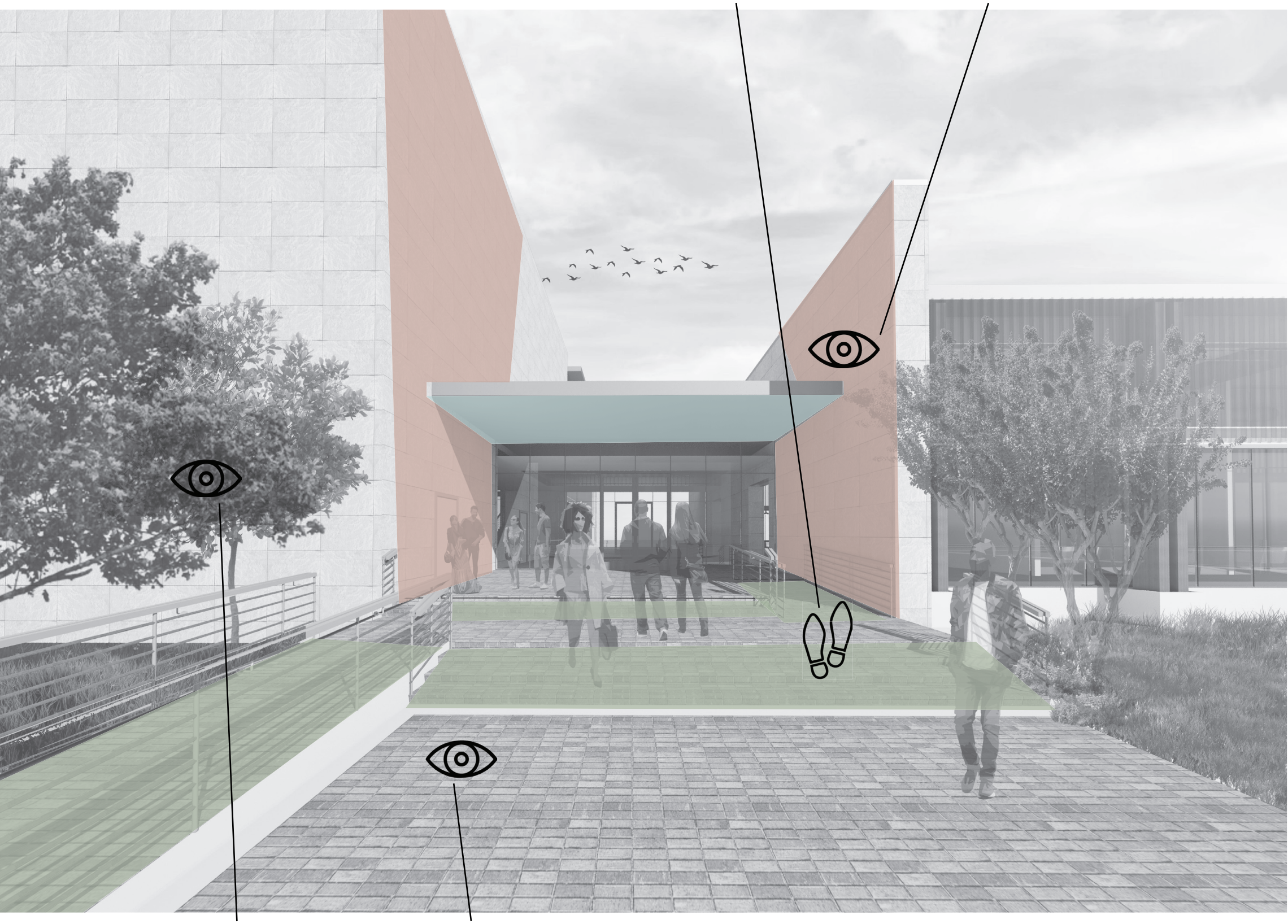


stairs and a ramp act as an additional physical transition between the parking and porch

stairs elevate the users physically and physiologically before they enter the building in order to give them a sense of importance

walls and overhang create an exterior porch before entering the building

the porch creates a sense of enclosure and refuge and is the transition element seen between the open exterior and enclosed interior

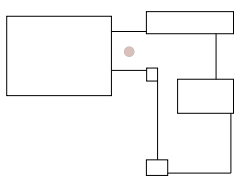


heavy landscaping lines the entrance walkway towards the building

the vegetation acts as a visual barrier to the parking lot and brings a sense of ease to the user before they enter the building

pavers move their way from the exterior to the interior

this seamless material transition allows these two spaces to feel less of an abrupt threshold and allows the user to move through the spaces more gradually



visual connection with exterior courtyard

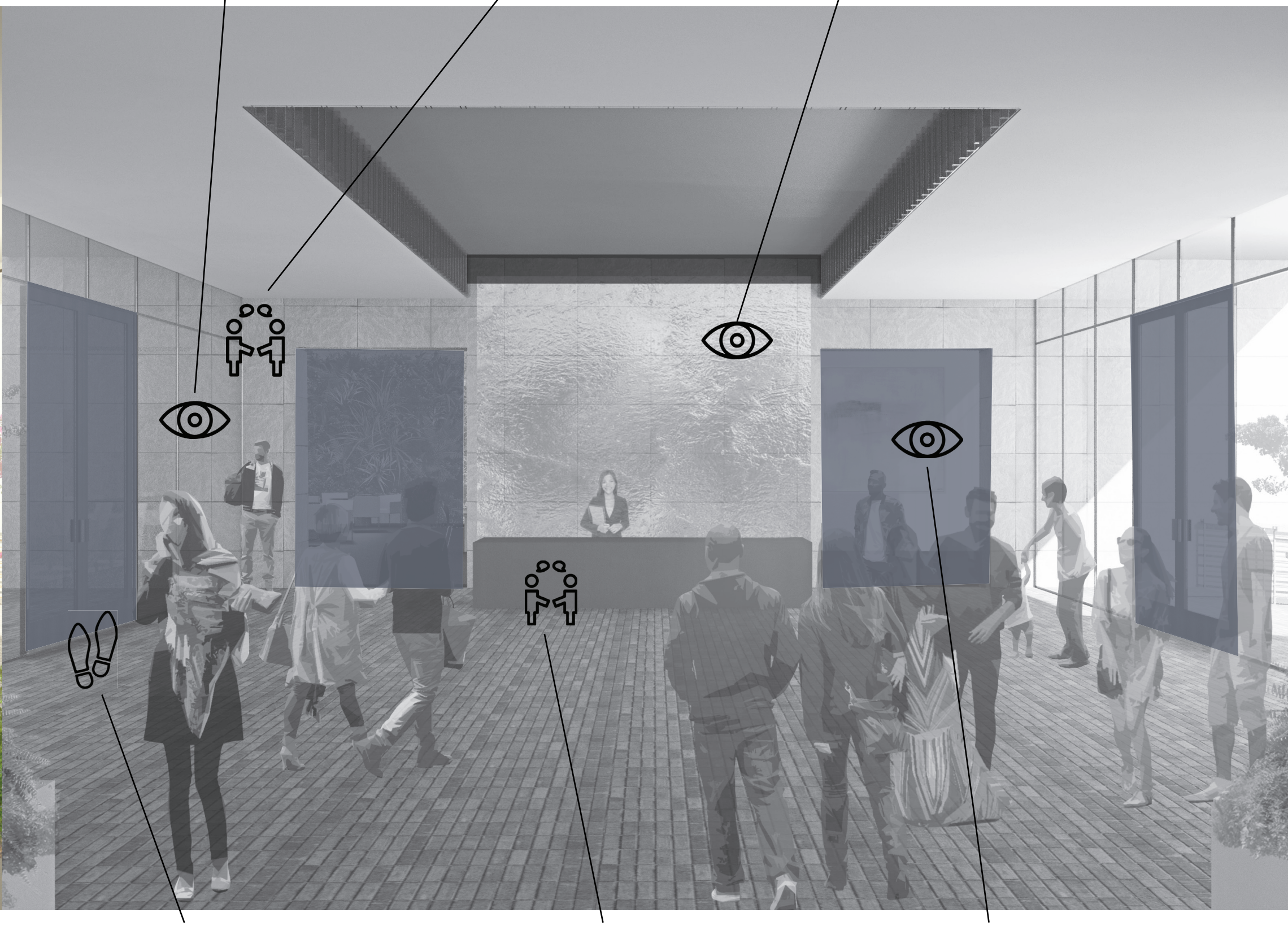
large storefront windows connect the reception to the surrounding nature and creates a fluid transition from interior to exterior

programmatic threshold entering into a public service space

the DMV is a public service that should capture the excitement and privileges of driving. by creating a personal experience, the DMV can exert a better experience

visual separation from DMV services and water feature for a calming atmosphere

water is known to have calming qualities; using a water feature here will give the DMV services a more private feel without the feeling of complete separation



physical threshold between interior and exterior

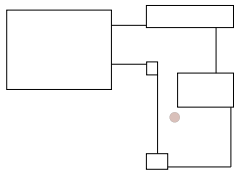
a storefront glass door connects the users from the exterior and interior. this creates a nearly seamless boundary between outside and inside

initial contact between staff and user

by creating a calming environment with exterior connections, a water feature, and a personal work space, the staff should be in a positive mood when interacting with guests

view of DMV services from opening of reception

the colors, materials, and vegetation seen from the framed opening will be a calming, familiar, homey feeling

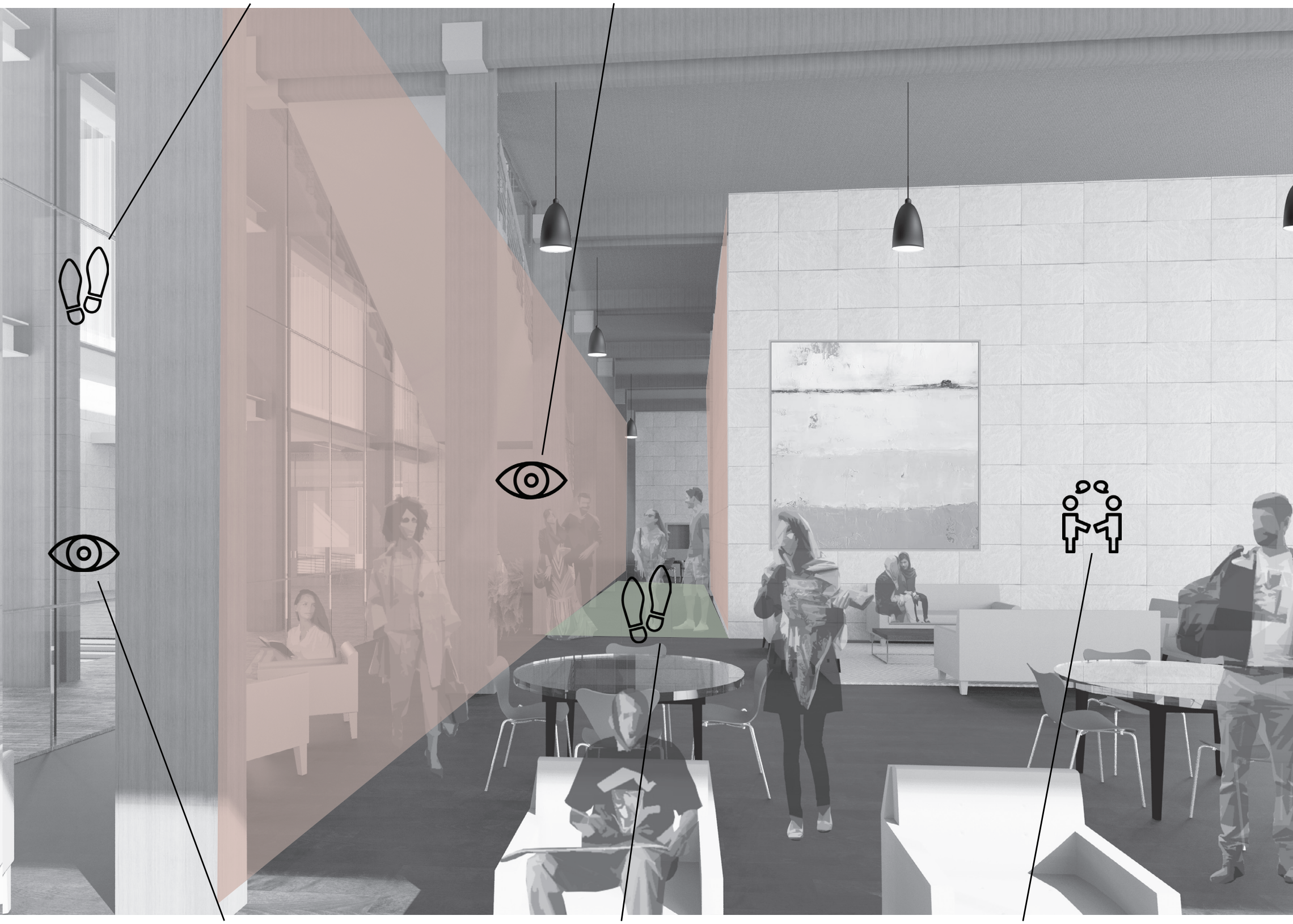


the large storefront acts as a **physical** barrier between the courtyard and lounge

the storefront wall guides guests into the main entrance but also entices them to the lounge and to the courtyard from the lounge

creating a short hallway between the lounge and cafe accentuates a transition

-the length of transition allows this threshold to be more abrupt
-a change in flooring material creates a defined threshold



the large storefront acts as a **visual** threshold between the courtyard and lounge

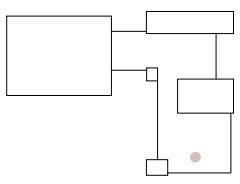
the storefront is used here to connect the inside and outside. plants and activities can be seen outside and a relaxing environment is seen inside

a threshold separates the programmatic differences between the cafe and lounge

separating these two spaces allows them to have a different feeling. the cafe can be more social while the lounge can be more independent

individualized spaces are created through furniture arrangements

creating these smaller pockets of lounge spaces makes the space feel more secluded and will therefore be quieter and a more productive environment



u-channel glass is used around the building to help shade the interior from the sun

the shade helps to keep the building cool, while still keeping the view wide and adding another layer of intrigue to the building's design

the ceiling height of the cafe and lounge spaces are 18 feet

the room height gives a sense of openness, freedom, and creativity

large storefront glazing opens the lounge space to the exterior courtyard

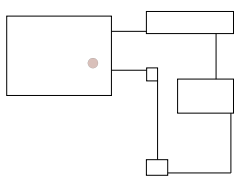
the view into and out of the lounge further opens the space for a sense of freedom while still giving the users a sense of security and refuge

variety of seating arrangements and furniture are spaced around the room

the variety allows users to choose their preference allowing them a sense of control and individuality

a large planter box sits in the room to add indoor greenery

the plants are good to ease stress but they also add a variety of height in the room which helps move they eye



glulam wood beams are used in a single direction throughout the space

the wood beams add warmth to the space and using them in a single direction is easy for the eye to follow therefore relaxing the state of mind

a plant wall as well as potted plants are used to add greenery to the space

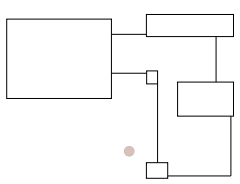
plants and the natural environment have been scientifically proven to reduce stress

comfortable seating is used throughout the building for users and staff

comfortable furniture allows the user and staff to make a more personal, relaxed conversation

the flooring transitions from a brick paver in the reception to wood flooring in the DMV

the warm tones of the wood flooring create a relaxed, homey feeling

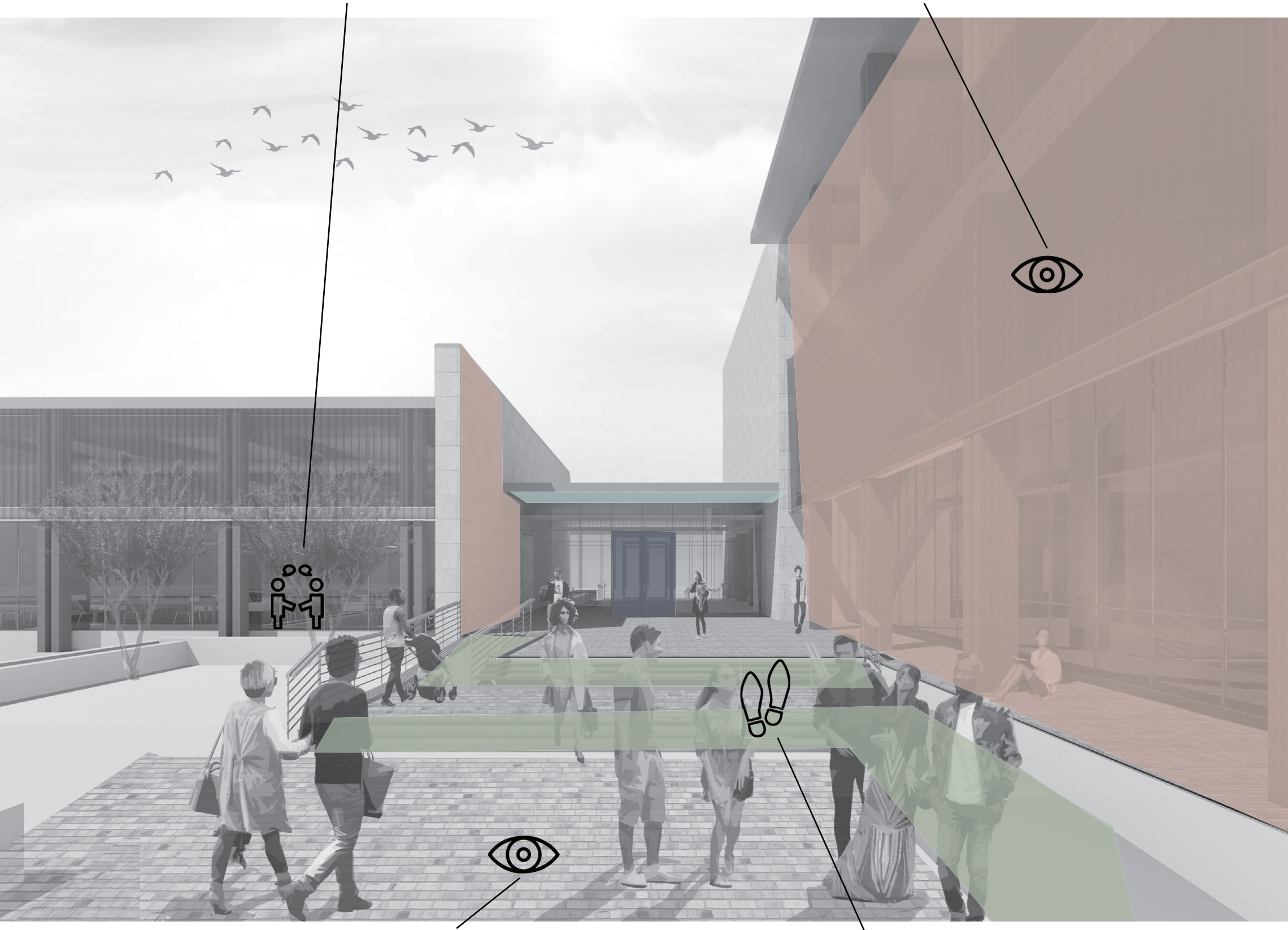


an exterior courtyard is set of the west side of the site and entrance threshold

the courtyard introduces plant life as well as another layer of the "waiting" experience. children can play and people can enjoy Shoal Creek and people watching along Chavez St.

the building's edge created with a line of columns and limestone wall guide the user to the entrance

this long promenade slowly eases the user through the transition in order to rid the mind of stress



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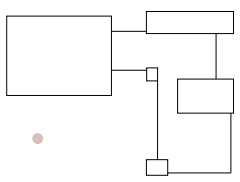


the channel glass is used on each facade of the building

although the functions of the building differ, the channel glass is consistent throughout the design to aesthetically tie the building together

the building mass frames the sunken courtyard

this further emphasizes the boundaries of the courtyard and orients the views toward Lady Bird Lake and Shoal Creek

concrete benches frame the sunken courtyard orienting views toward waterways

the benches allow for individual or small group seating, the typical users who visit DMVs

stairs and a ramp guide users to a sunken courtyard

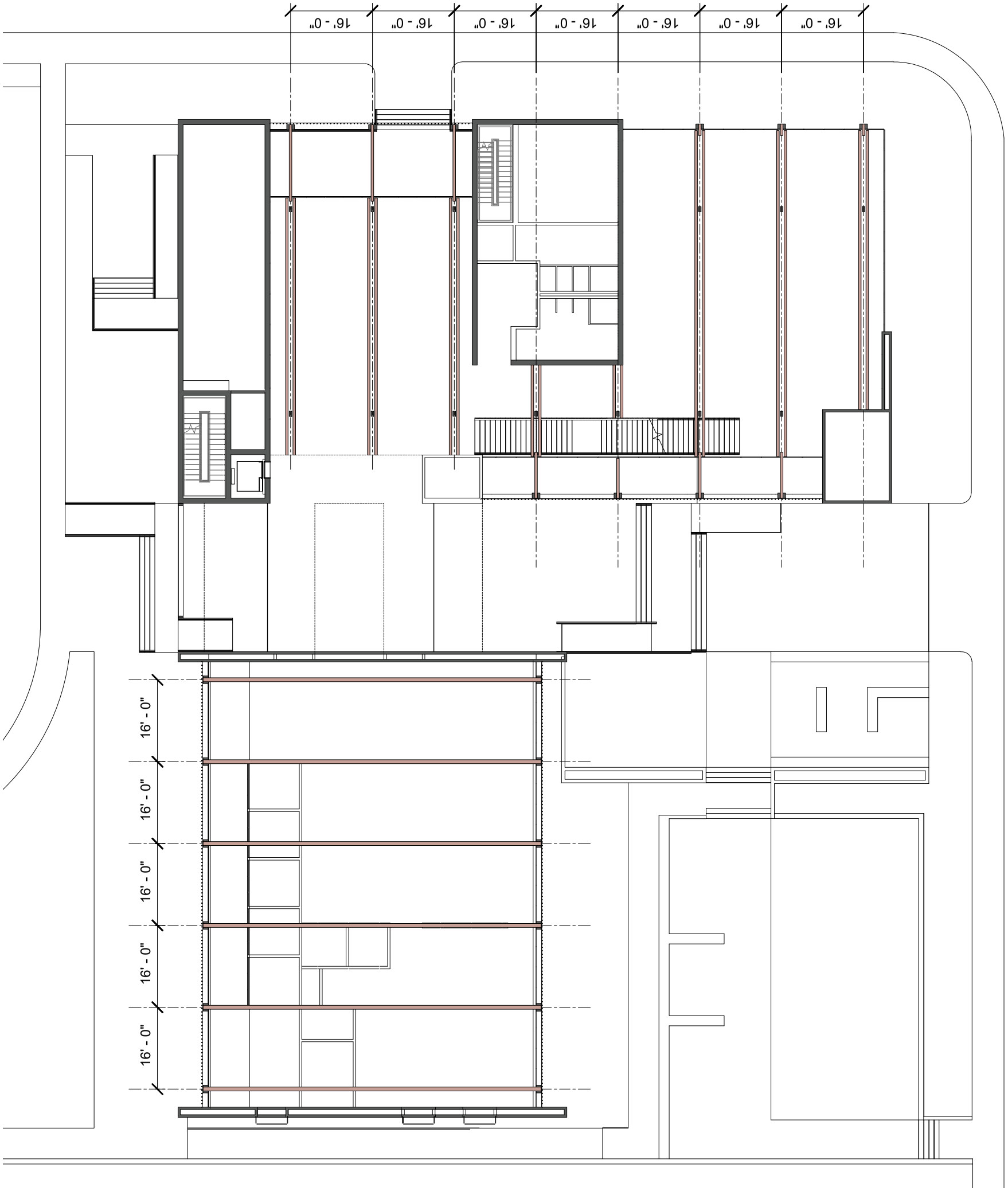
the sunken courtyard reinforces a separated space to encourage additional activities and seating

STR

RUCTURE

The building's structure is based on a 16-foot-wide repeating wood structural bay. The length of the bay differs. The smallest length is 16 feet and the largest is 40 feet. By moving the columns to the building's exterior, the large open interior spaces are less interrupted by columns. Glu-lam beams are paired and span across the building's interior. In the case of the upper balcony and lower corresponding space, once the thermal threshold is encountered at the exterior glazing, the double beams transition to a single 12-inch-deep beam. This beam then cantilevers from the glazing to the exterior column eight feet away carrying the weight of the tributary area of the roof above and transferred to double glu-lam wood columns. The building's service spaces are made up of a limestone clad, metal stud structure which follows the structural grid and contributes to the rigidity of the building. Channel glass is used throughout the design as a shading element, balcony railing, interior dividers, and acts as a linking component to create a cohesive design. The weight of the channel glass is transferred from steel beams framing the glass to independent steel columns placed between the exterior double glu-lam columns.

A custom steel joint, referred to in the design as a threshold joint, has multiple functions throughout the structure. At the top of the columns, it acts as a connection piece to the beams. The same joint is used at the top of the single column to double beam connection and the double column to single beam, the joint is just mirrored. The threshold joint is turned on its side and is also used to join the single beam to double beam and acts as a lateral brace and channel glass frame assembly on the exterior columns. The core spaces pierce through the roof providing a parapet-like space for mechanical units. Packaged rooftop units are used to zone the varying programmatic spaces. Exposed ducts move there way through the DMV services while the other spaces have the ducts hidden. The café, lounge, and reception have ceiling vents and the coworking space utilizes floor vents. This allows all the ducts to be placed between the floors.


16' - 0"
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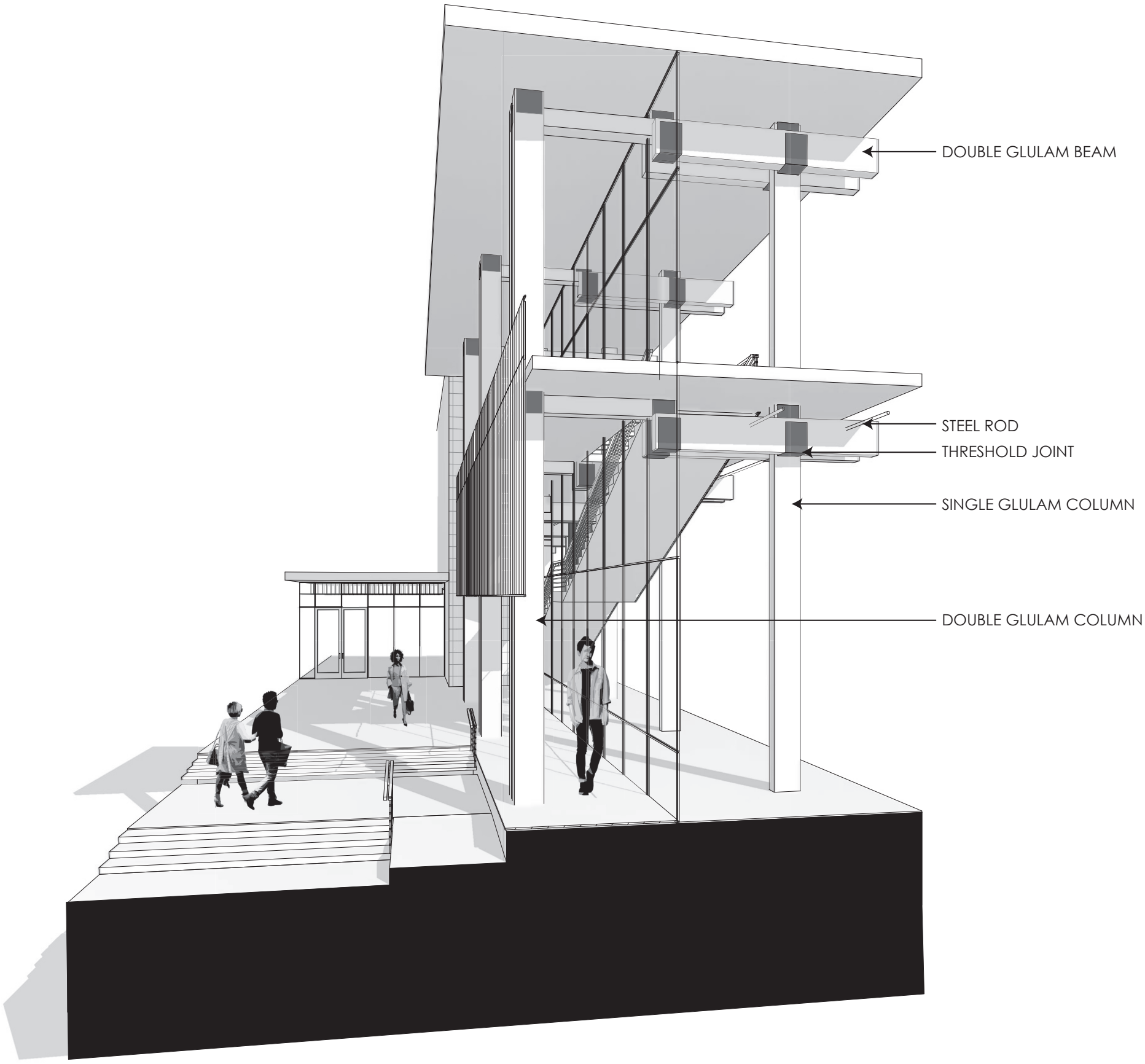
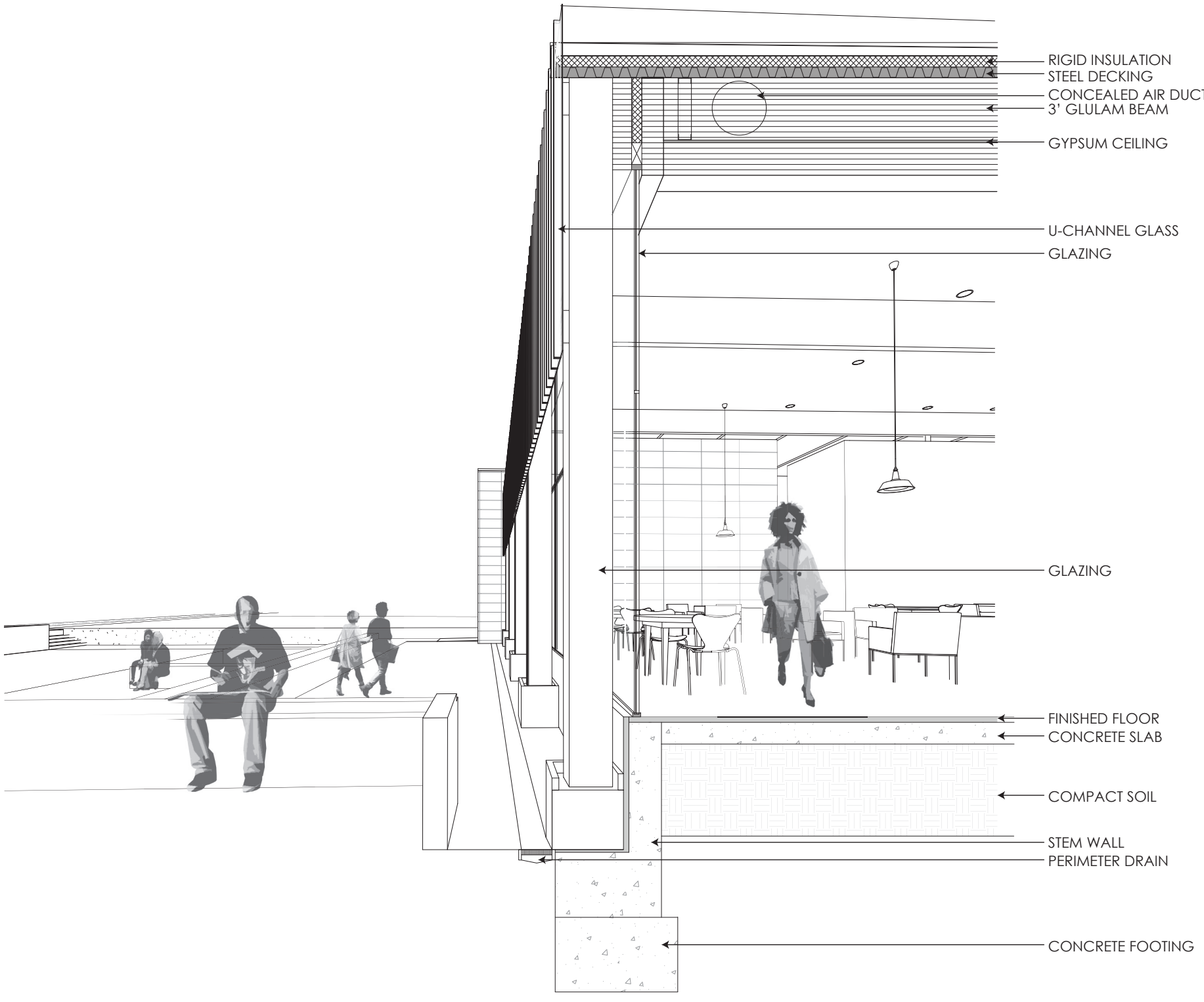

DOUBLE GLULAM BEAM
STEEL ROD
THRESHOLD JOINT
SINGLE GLULAM COLUMN
DOUBLE GLULAM COLUMN


RIGID INSULATION
STEEL DECKING
CONCEALED AIR DUCT
3' GLULAM BEAM
GYPSUM CEILING
U-CHANNEL GLASS
GLAZING
GLAZING
FINISHED FLOOR
CONCRETE SLAB
COMPACT SOIL
STEM WALL
PERIMETER DRAIN
CONCRETE FOOTING

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