

THE CURRENT ACTIONS IN RESPONSE TO URBAN ECOSYSTEMS ARE UNSUCCESSFUL.

3 GOALS FOR COEXISTING WITH URBAN WILDLIFE:

1

DESIGN FOR HUMANS AND WILDLIFE EQUALLY.

2

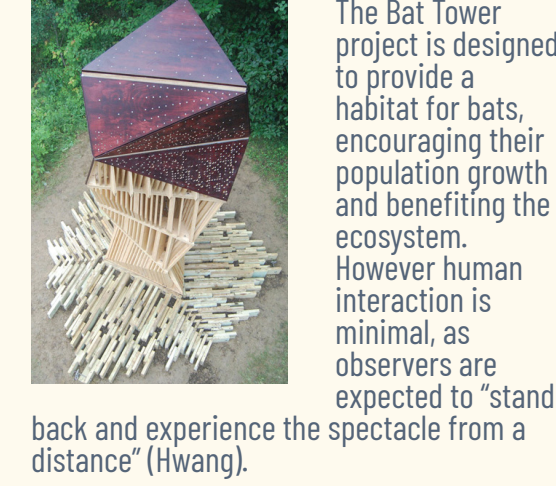
USE REALISTIC METHODS THAT ARE SUSTAINABLE.

3

MAINTAIN A HEALTHY ECOSYSTEM.

ISSUES WITH EXISTING PROJECTS:

BAT TOWER JOYCE HWANG



The Bat Tower project is designed to provide a habitat for bats, encouraging their population growth and benefiting the ecosystem. However human interaction is minimal, as observers are expected to "stand a distance" (Hwang).

back and experience the spectacle from a distance" (Hwang).

back and experience the spectacle from a distance" (Hwang).

✗ DOES NOT CONSIDER HUMANS (unequal consideration).

VERTICAL FOREST MILAN BOERI STUDIO

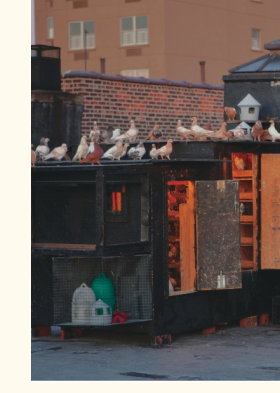


The Vertical Forest aims to create a "home for trees that also houses humans and birds" by integrating thick vegetation on its facades, providing habitats and absorbing CO2 (Last). Despite the intent to benefit wildlife and process carbon-intensive and costly.

humans, the construction process is carbon-intensive and costly.

✗ IS NOT REALISTIC OR SUSTAINABLE (construction methods).

ROOFTOP PIGEON LOFTS PIGEON FLIERS (NY RESIDENTS)



Rooftop Pigeon Lofts attract and house pigeons. The pigeons are tended to by NYC residents often leading to domestication (MessyNessy). Despite the initial intent to provide a proper home, the Pigeon Lofts often lead to natural ecosystem.

domestication and removal from their natural ecosystem.

✗ DISRUPTS WILDLIFE BEHAVIOR (domestication).

BANFF (WILDLIFE CROSSINGS) PUBLIC WORKS CA

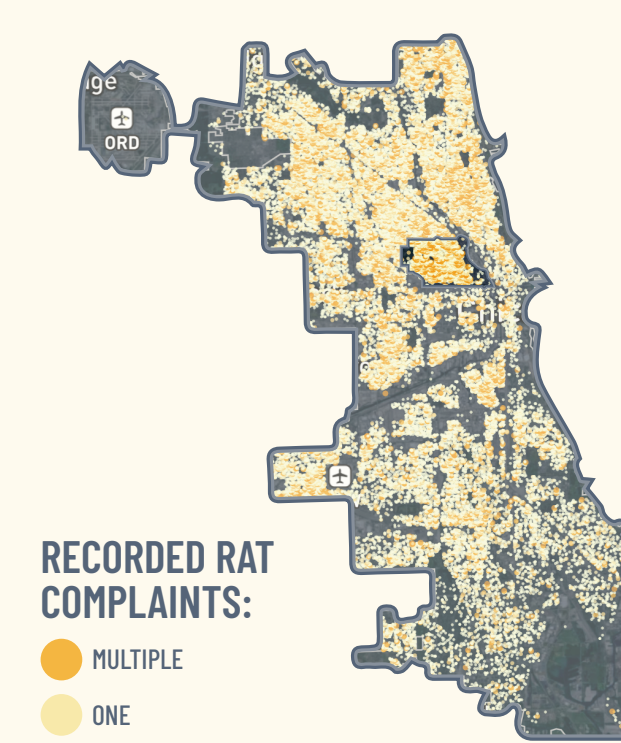
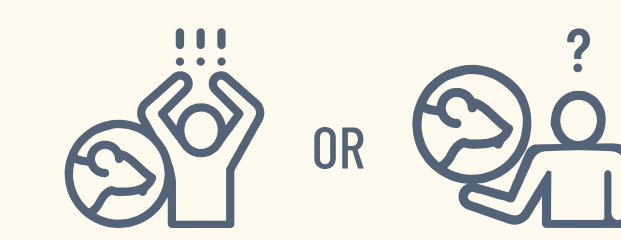


This project enables wildlife to safely cross freeways, offering a secure travel option for animals and reducing the risk of collisions for humans. However, certain ecologists hypothesize that over time, these could evolve into prey-traps that may disrupt the current ecosystem.

evolve into prey-traps that may disrupt the current ecosystem.

✗ DISRUPTS WILDLIFE BEHAVIOR (prey-traps).

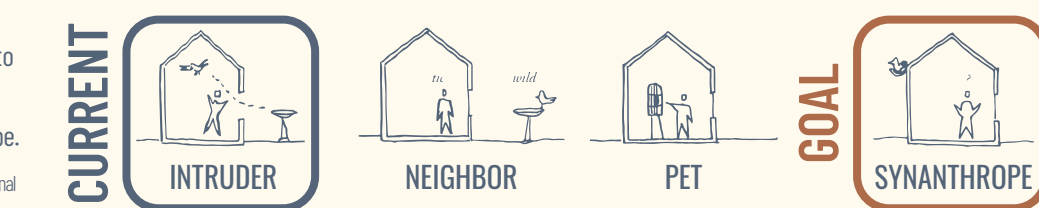
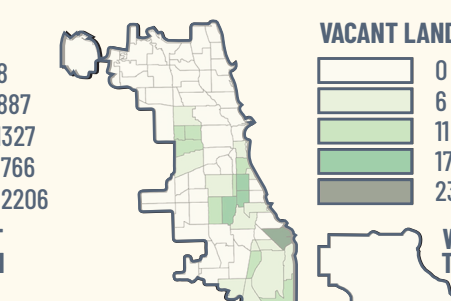
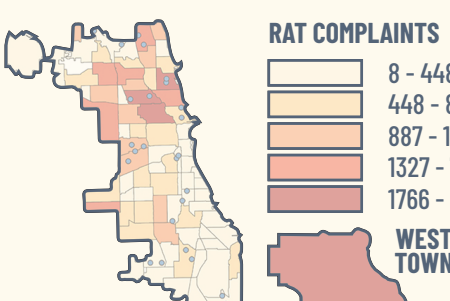
RAT POPULATIONS:



RECORDED RAT COMPLAINTS:
● MULTIPLE
● ONE

HOW SHOULD WE LIVE WITH RATS?
Urban wildlife needs a place to live just as much as humans do. Since they don't plan on leaving urban spaces anytime soon, it's important that our designs are intentionally created with our relationship to them in mind.

Sarah Gunawan has proposed ecological transformations within suburbs. In addition to the typical relationships with wildlife, Gunawan has established a specific type of relationship with urban wildlife: the Synanthrope.



Humans and wildlife share many enjoyable moments, however, when it comes to rats they are typically unpleasant. The overall health of Chicago's ecosystem declining, potentially facing species going extinct or overpopulating (i.e. rats) and loss of green spaces.

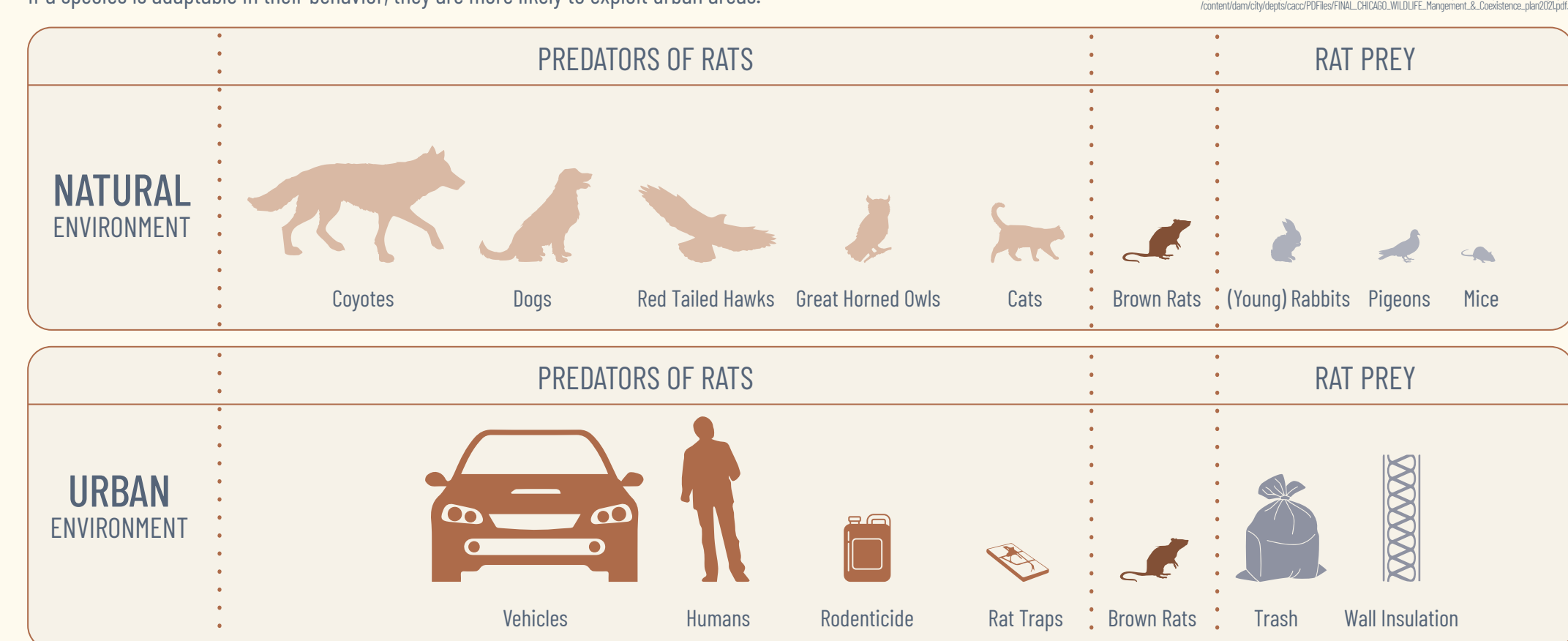
West Town, Chicago (shown above) has the most recorded rat complaints within the city. Rat populations affect the value of homes and amount of vacancies, making it especially difficult to bounce back.

RATS ARE THE 2ND MOST POPULATED MAMMAL ON EARTH BEHIND HUMANS.

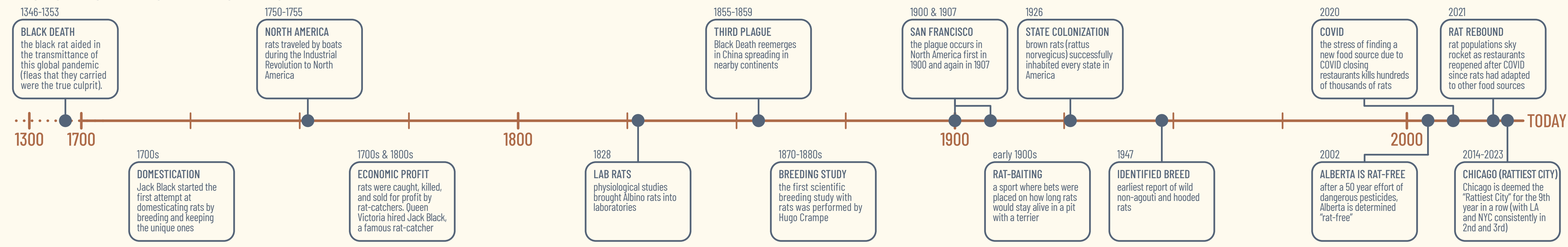
IN THE UNITED STATES, CHICAGO HAS THE HIGHEST POPULATION OF RATS.

WILDLIFE HAS ADAPTED TO THE URBAN ENVIRONMENT

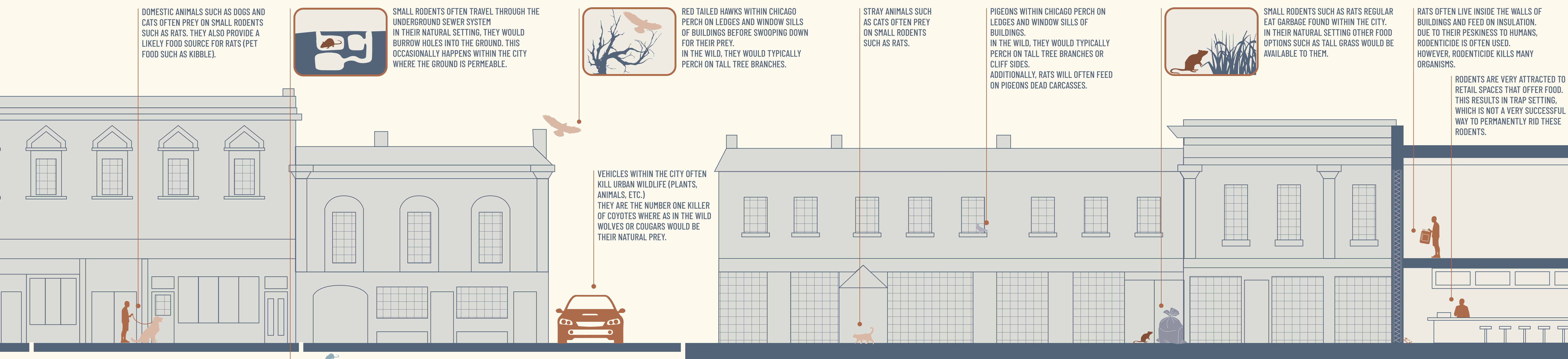
WILDLIFE ADAPTATIONS LEAD TO DRASTIC ECOLOGICAL SHIFTS
Wildlife within Chicago consists of many urban adapters ("they sometimes take advantage of human resources"). Many adapt to living in cities for the resources that they provide. If a species is adaptable in their behavior, they are more likely to exploit urban areas.



HISTORY OF RATS AND HUMANS



WILDLIFE CONDITIONS IN THE CITY



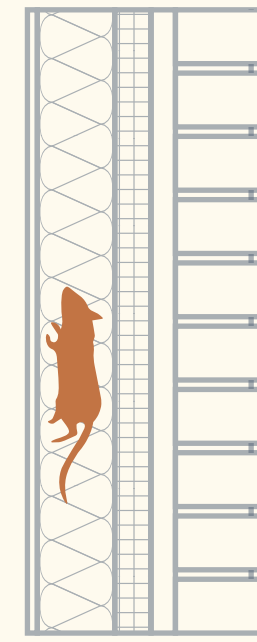
ARCHITECTURE CAN ADJUST TO ACCOMMODATE THE WAY RATS ALREADY EXIST.

RATS ARE EXCELLENT CLIMBERS. IN THE CITY OF CHICAGO THEY CAN EASILY SCALE WALLS, ESPECIALLY IF THE WALL HAS ANY TEXTURE.



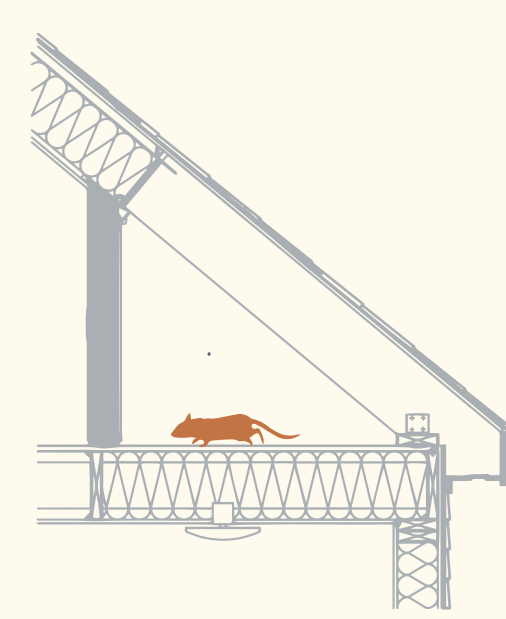
GAPS AND HOLES IN ENCLOSURE SYSTEMS ARE OFTEN HOW RATS GAIN ACCESS INTO BUILDINGS.

RATS HAVE ADAPTED TO EAT ALMOST ANYTHING. IN THE CITY OF CHICAGO THEY OFTEN EAT CAVITY INSULATION IN WALLS AS WELL AS STRUCTURAL ELEMENTS AND ELECTRICAL WIRES.



THIS CAUSES HOUSE FIRES, STRUCTURAL DAMAGE, AND AN OFTEN NEED FOR INSULATION REPLACEMENT.

WHEN RATS CLIMB, THEY OFTEN REACH THE ATTIC WHERE THEY ARE ABLE TO FEAST ON A LOT OF INSULATION AND CAUSE SIMILAR PROBLEMS AS WHEN THEY ARE IN THE WALLS.



RATS NEED MORE SAFE CIRCULATION METHODS SO THAT THEY ARE NOT TEMPTED TO ENTER HOMES.

AS RATS CLIMB ON TOP OF BUILDINGS, THEY OFTEN TRAVEL ON ROOFTOPS.



THIS IS OFTEN WHERE THEY MIGHT FIND HOLES OR GAPS THAT GIVE THEM ACCESS TO THE INTERIORS OF THE BUILDING BELOW.

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GAPS AND HOLES IN ENCLOSURE SYSTEMS ARE OFTEN HOW RATS GAIN ACCESS INTO BUILDINGS.

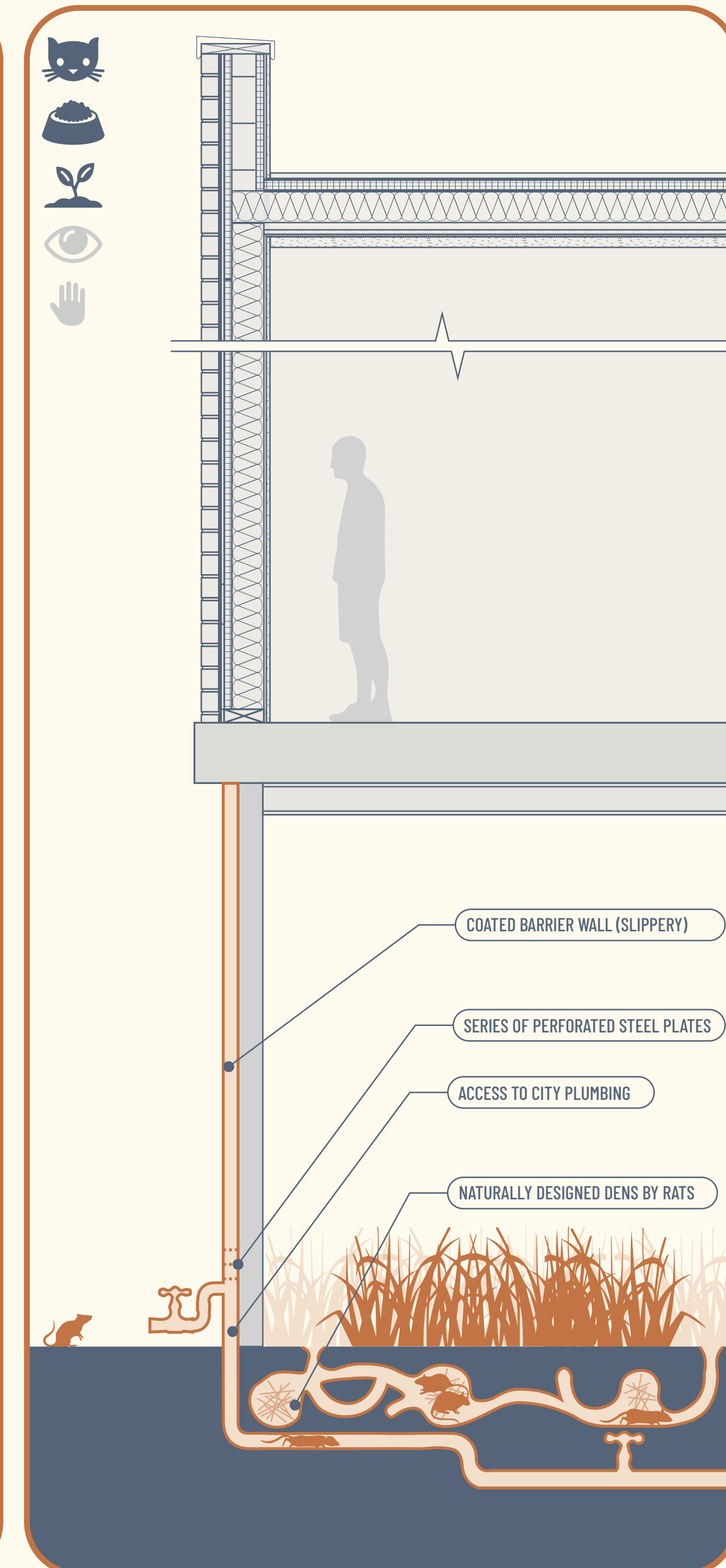
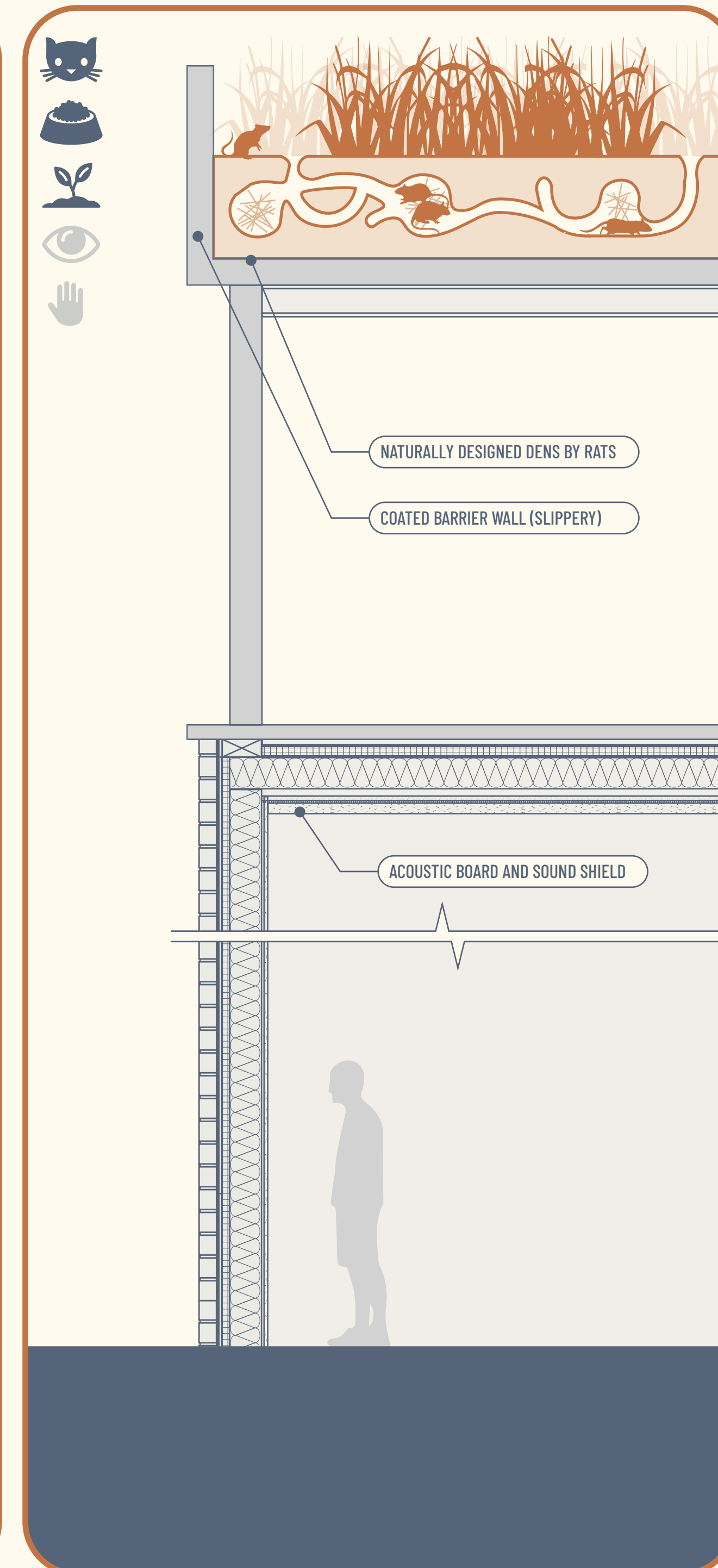
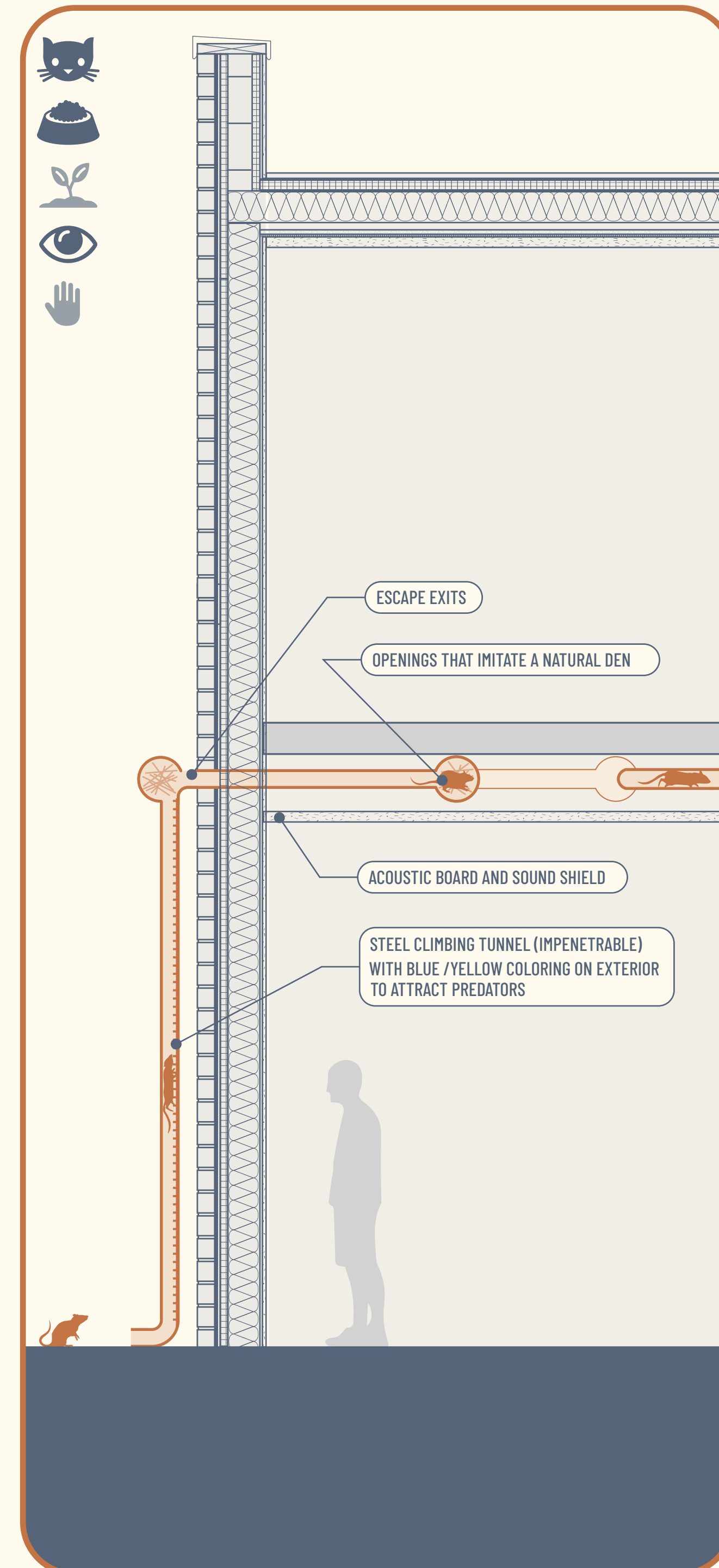
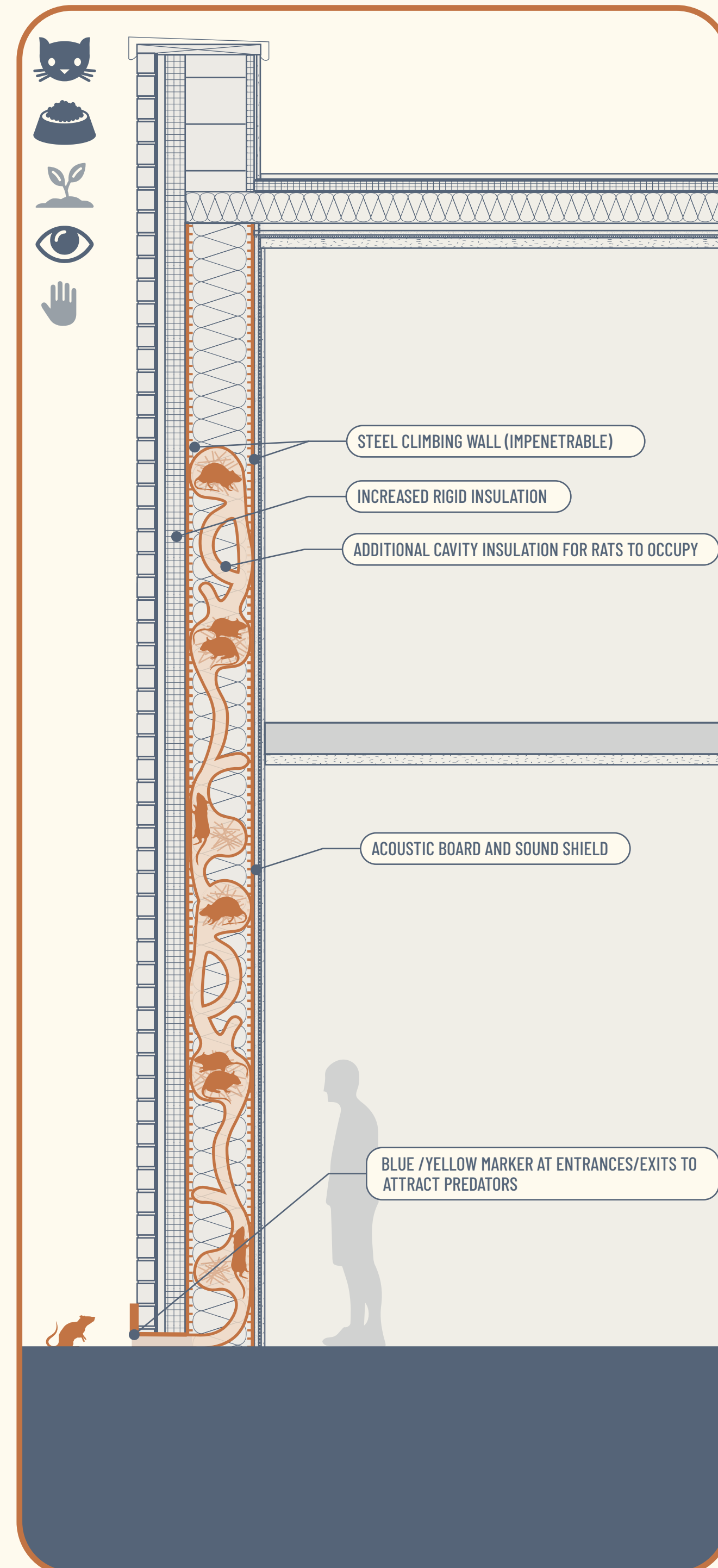
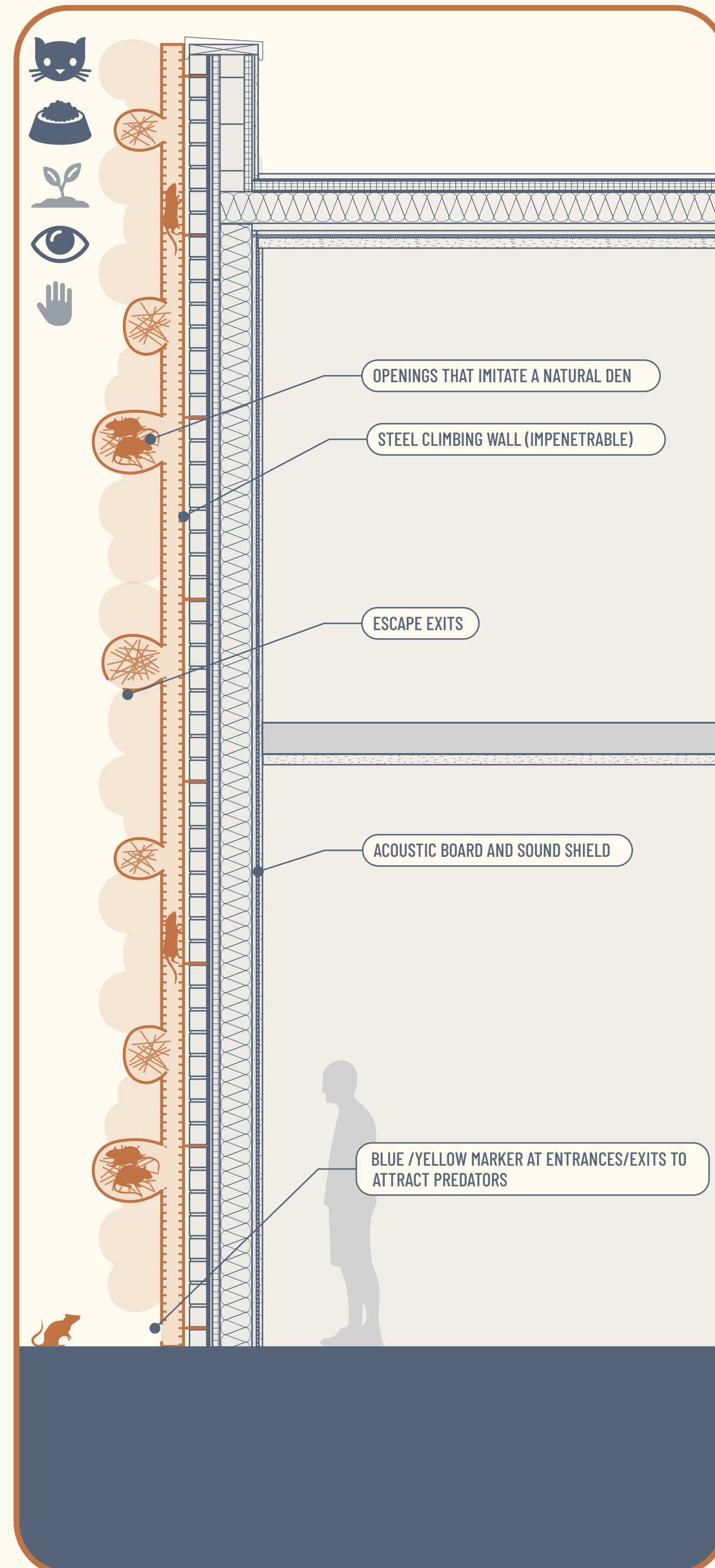
ATTACHED

AROUND

THROUGH

ABOVE

BELOW



CHICAGO'S CONDITIONS ENCOURAGE RAT SURVIVAL.

WHAT WE SEE

FOOD



TRASH



A BIG MEAL

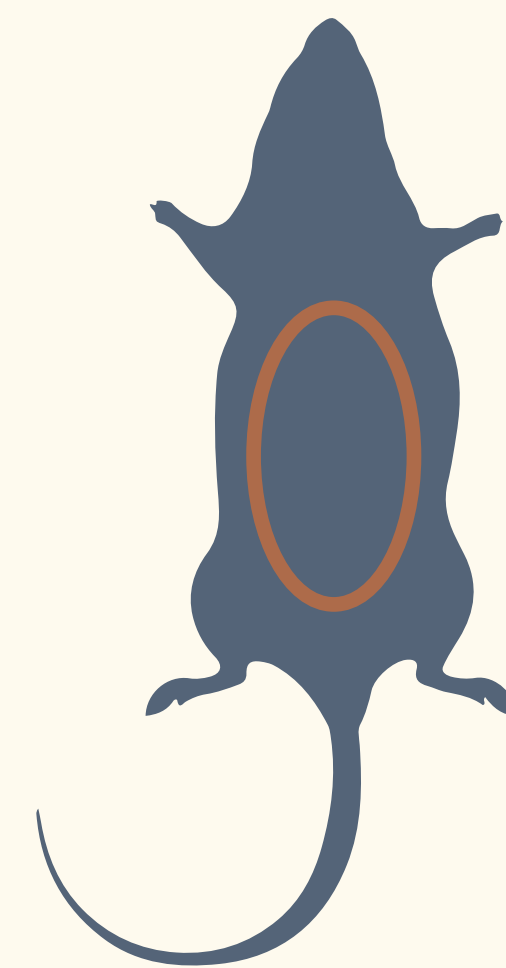


A. LONG ALIMENTARY CANAL

This allows them to absorb as many of the nutrients as possible, taking advantage of every meal.

B. LARGE CAECUM

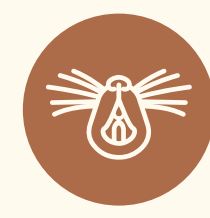
This allows them to digest cellulose. This widens their diet, making it easy to find food.



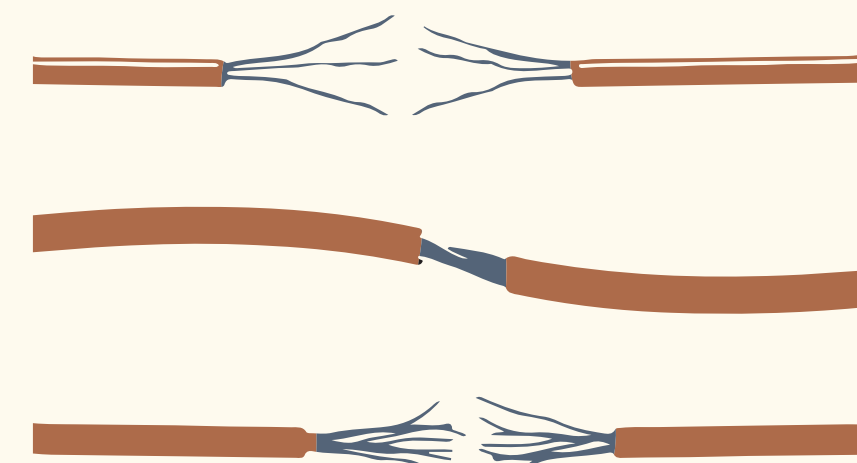
ALSO SEE: C, E, G, H

McCartney, Leslie. "Digestive System of the Rat (Rattus Norvegicus)." Instructure. vassl.instructure.com/courses/6421/files/84392/download?wrap=1&--text=%E2%9E%94%20They%20have%20a%20large,their%20search%20for%20food%20easier.

CHEWING MATERIAL



ELECTRICAL WIRES



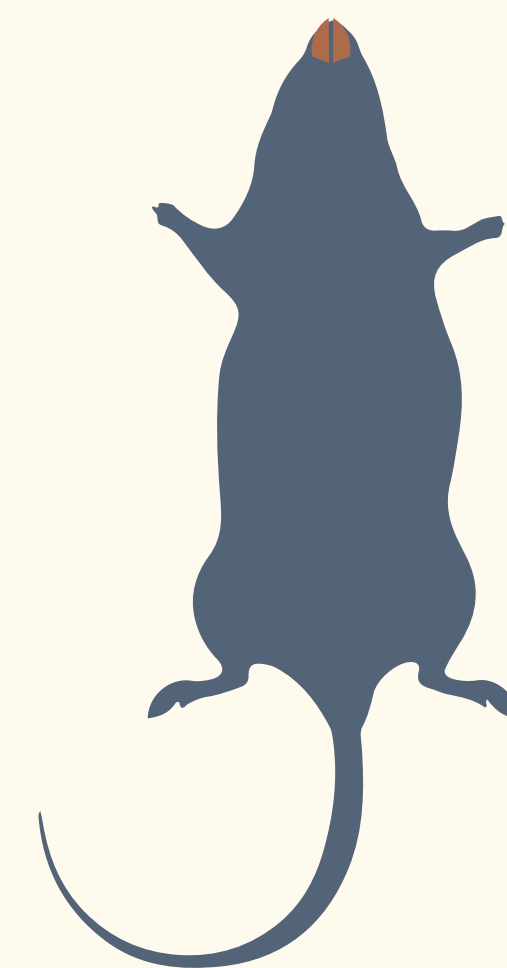
DENTAL HYGIENE



C. INCISORS

Rats' front teeth (incisors) never stop growing. Therefore, gnawing is important to their dental hygiene to maintain sharp and trimmed teeth.

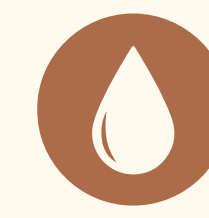
These incisors are more than 3x the size of the other teeth in their mouth. This allows them to chew through many different materials, also allows them to have a very wide diet.



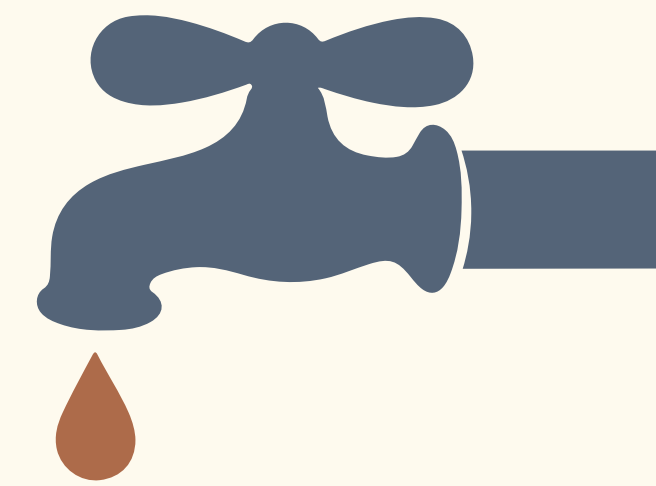
ALSO SEE: F, H

Froberg-Fejko, Karen. "Give a Rat a Bone: Satisfying Rodents' Need to Gnaw." Nature News. Nature Publishing Group. 19 Sept. 2014. www.nature.com/articles/16111.

WATER



DRIPPING PIPES



A REFRESHING DRINK

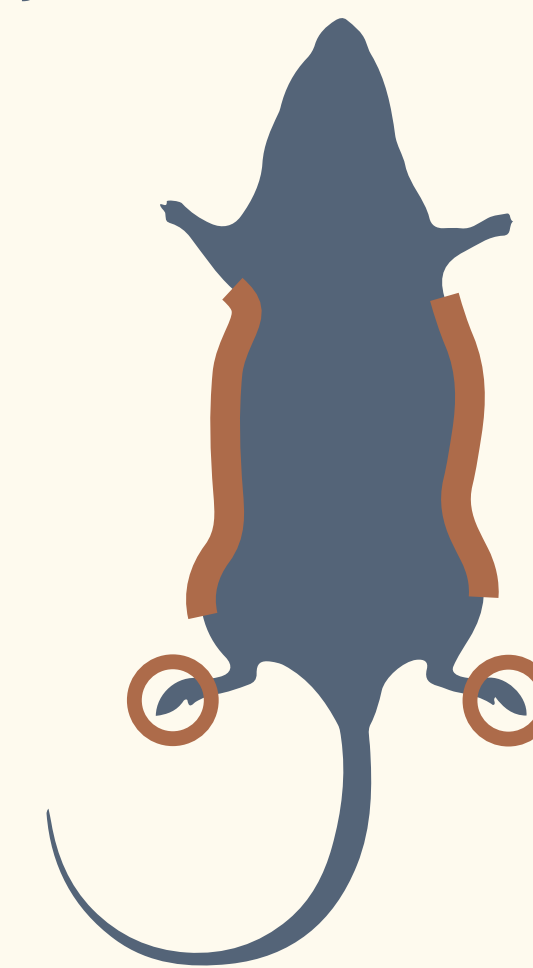


D. LACK OF A COLLAR BONE

Rats have very flexible bodies, that can squeeze into holes as small as a quarter. Rats don't have a collar bone, so they can manipulate their mass.

E. STRENGTH

Rats can jump up to 3' vertically and 4' horizontally. They can also tread water for 3 days straight and hold their breath for up to 3 min, making pipes an easy place to stay.



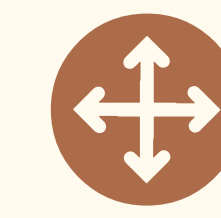
ALSO SEE: F, G, H, I

How Rats Enter Homes from Sewers - Allegheny County. www.alleghenycounty.us/uploadedfiles/Allegheny_Home/Health_Department/Programs/Housing_and_Community_Environment/Rodent-ACHD-How-Rats-Enter-Homes-from-Sewers.pdf. Accessed 28 Oct. 2023.

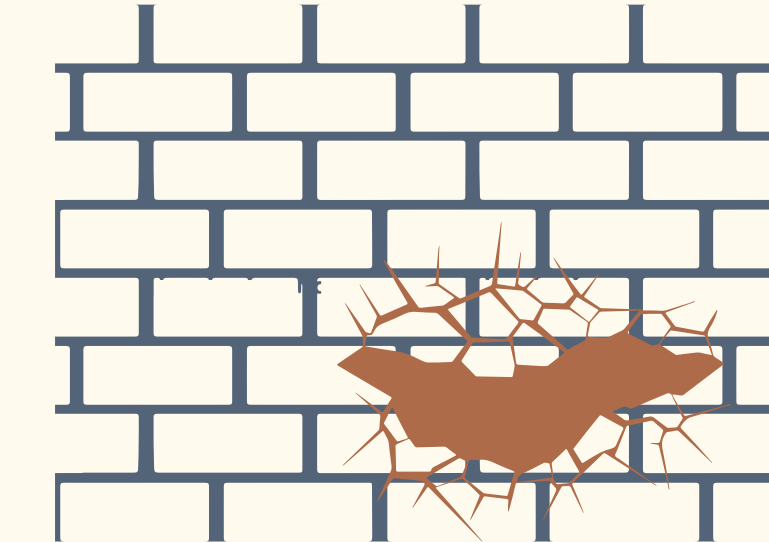
NEST



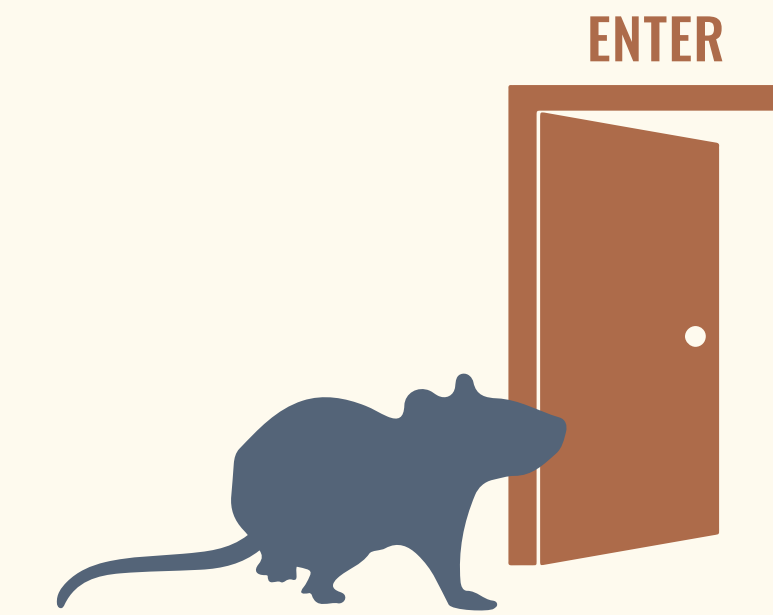
SAFE TRAVEL



WALL CRACKS



SECURE ACCESS TO WARMTH



F. WHISKERS

Rats' whiskers pick up frequencies that send signals to their brain. Allowing them to detect tiny specks on walls. Whiskers help them navigate since they have poor eyesight.

G. NOSE

Rats have a highly sensitive olfactory ability. If strong smells come from inside your home, a rat have a higher desire to enter.



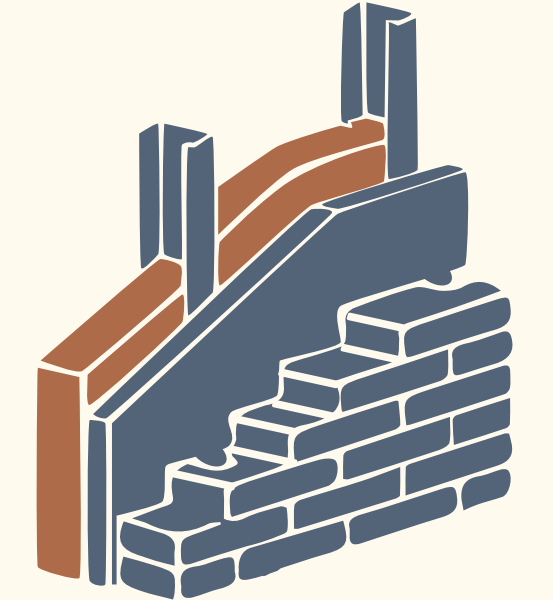
ALSO SEE: D, G, I

"How Good Is a Rat's Sense of Smell?" Terminus. https://www.terminix.com/. 24 July 2023. www.terminix.com/blog/science-nature/rats-sense-of-smell/#--text=Rats%20rank%20pretty%20high%20in,too%20and%20nines%20and%20tuberculosis. "How Whiskers Help Rats Find Their Way." NBCNews.Com. NBCUniversal News Group. 27 Feb. 2008. www.nbcnews.com/id/wbna23373403.

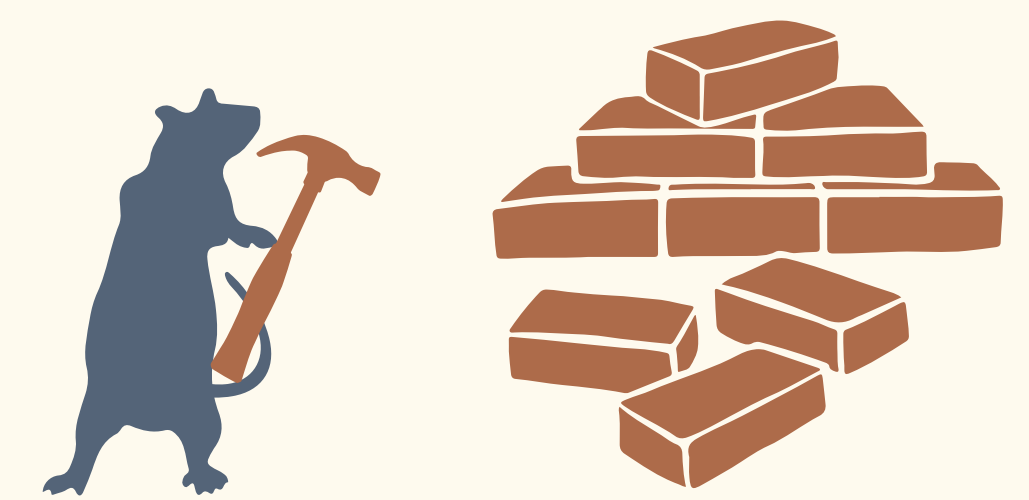
NESTING MATERIALS



WALL INSULATION



HOME RENOVATION

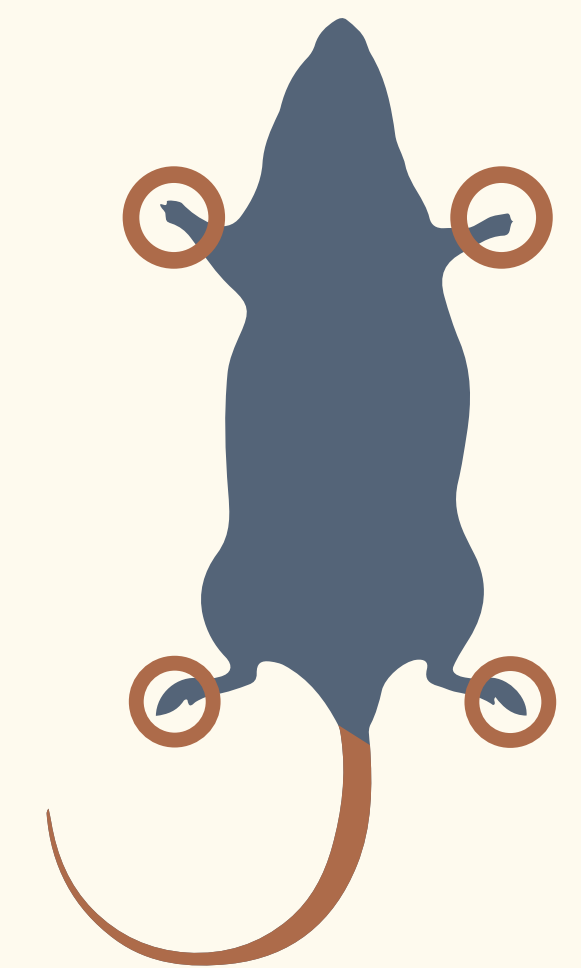


H. PAWS

Rat paws have ridges that give them more friction to climb and latch onto almost any surface. They also have 5 sharp phalanges on each paw, allowing them to pull on nesting materials.

I. TAILS

Rats balance and wrap around items (such as cords, wires, ropes, etc.) by using their tails.



ALSO SEE: C, D

Termite, Vulcan. "Can Rats Climb?" Vulcan Termite & Pest Control. 9 June 2019. www.vulcantermite.com/pest-profiles/can-rats-climb/#--text=they%20have%20five%20phalanges%20%E2%80%9Cfingers,%20%20wires%20ropes%20etc.

WHAT RATS SEE

WHY THIS HAPPENS

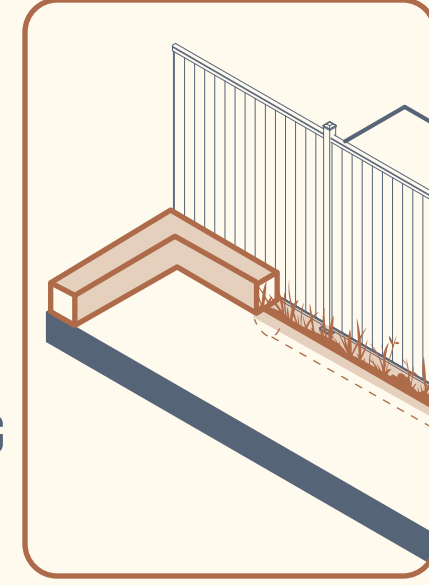
HUMANS HAVE CREATED AN IDEAL ENVIRONMENT FOR RATS.

PATHS & NESTS ALONG OUR FENCES

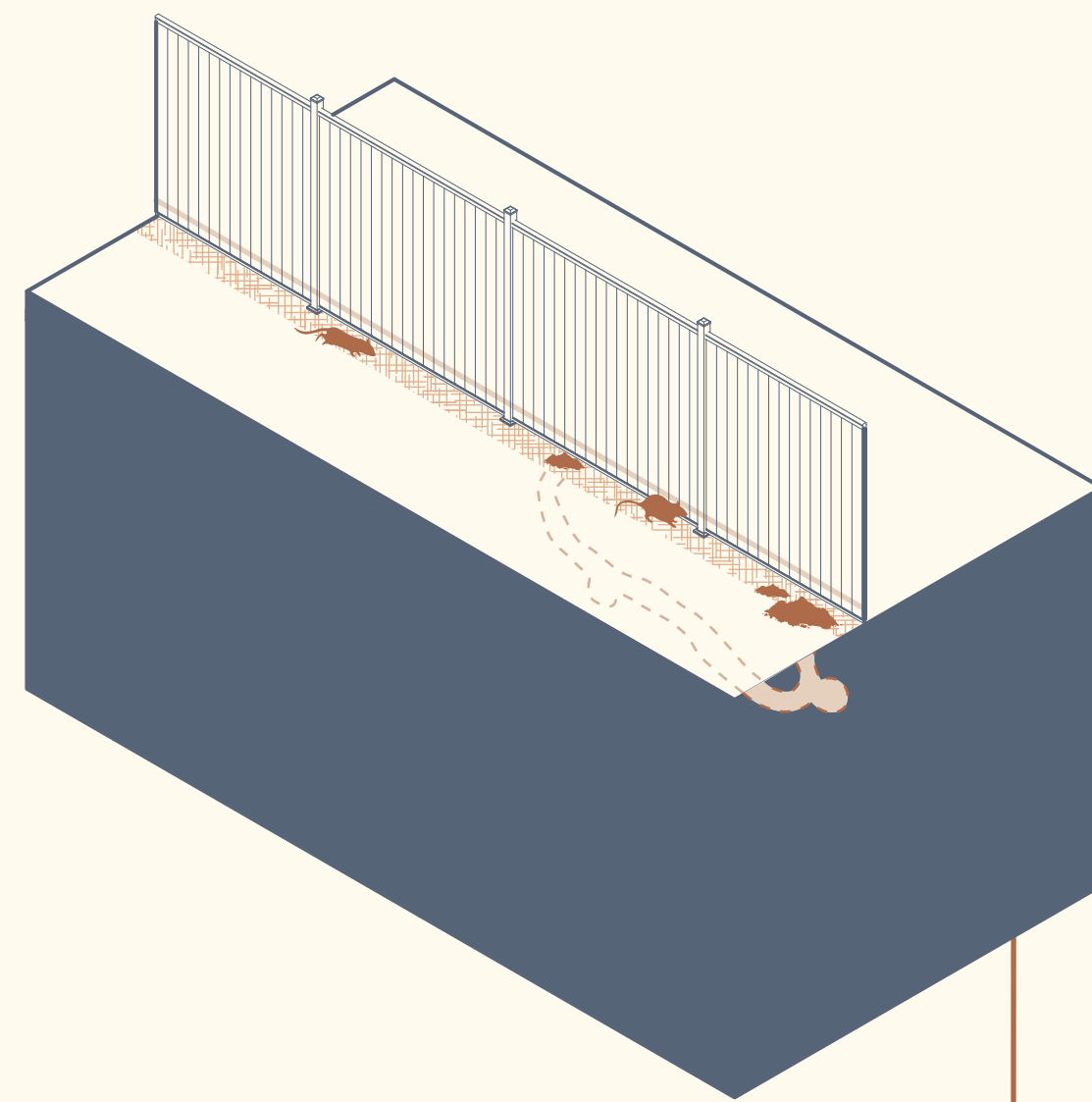
Rats do this...
- mainly during the night
- to get to resources safely
- to create a routine

ADJUST:
- OUR BUILT VERTICAL PLANES
- THE PATH TO RESOURCES

PROPOSAL:
- ENCLOSED PATH THROUGHOUT THE CITY
- BIOS-WALES TO MITIGATE FLOODING AND COVER RAT HOLES
- PRIME ACCESS TO RESOURCES
- BETTER CURB APPEAL



SEE:

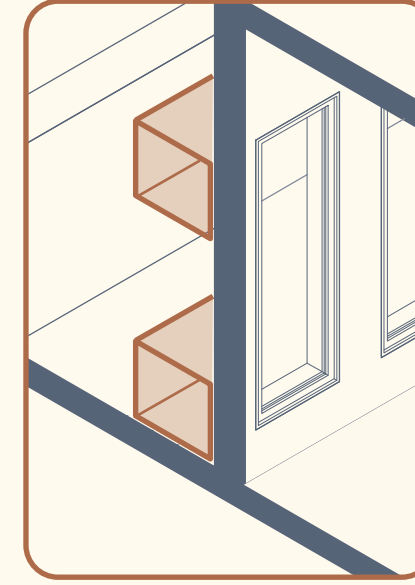


EXISTING IN OUR WALLS

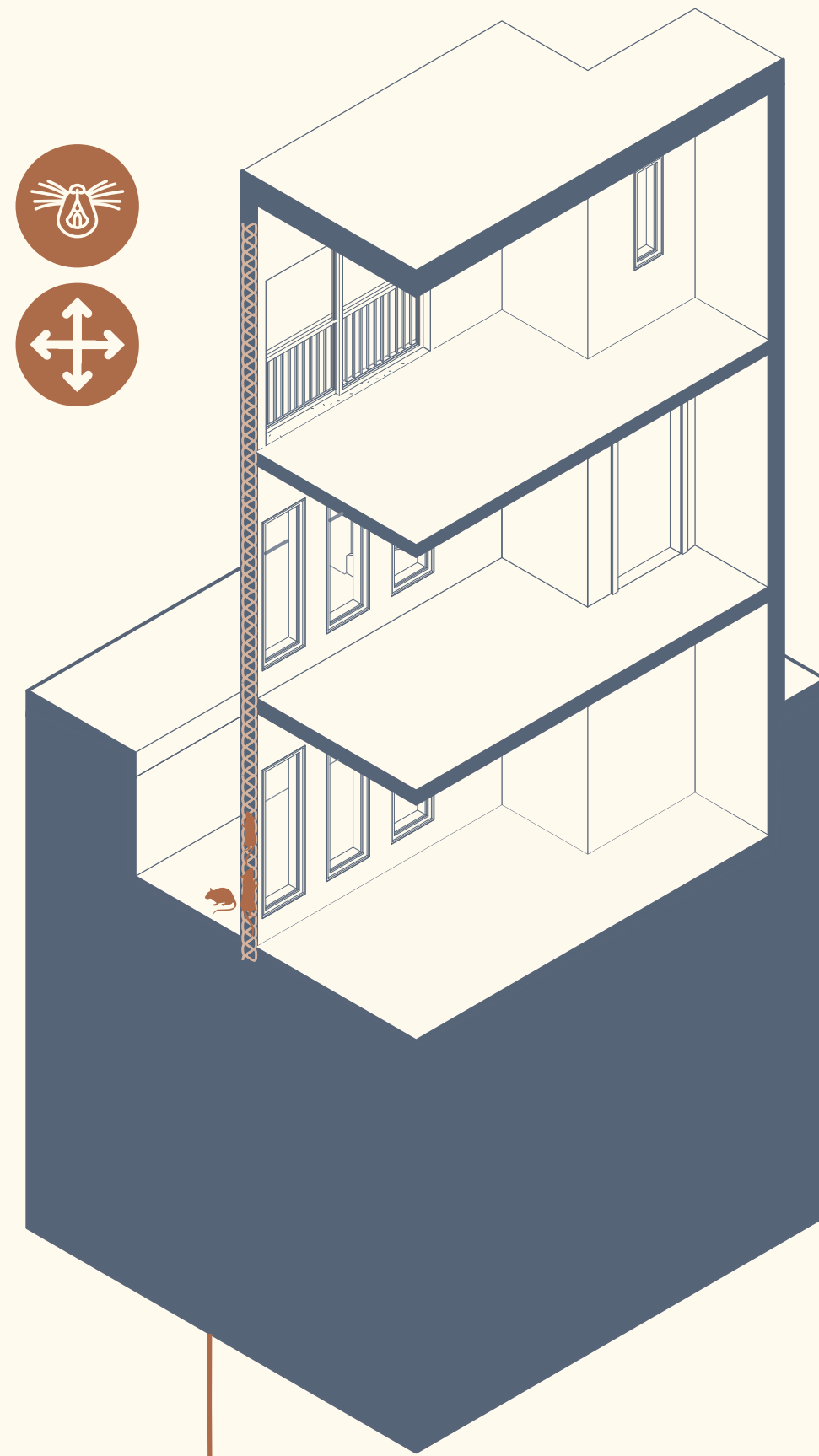
Rats do this...
- in colder months
- when they are building a new nest
- when resources are nearby

ADJUST:
- OUR WALLS

PROPOSAL:
- HEATED POCKETS INTEGRATED ONTO THE FACADE
- WARMTH FOR IDEAL NESTING
- NON-INVASIVE RAT HOME FOR WINTER
- DYNAMIC FACADE APPEAL



SEE:

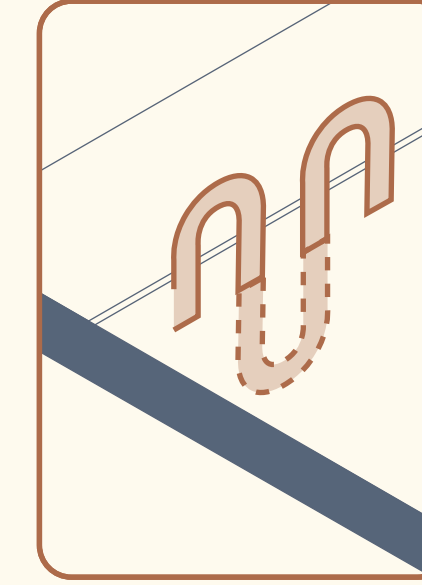


TRAVELING THROUGH OUR PIPES

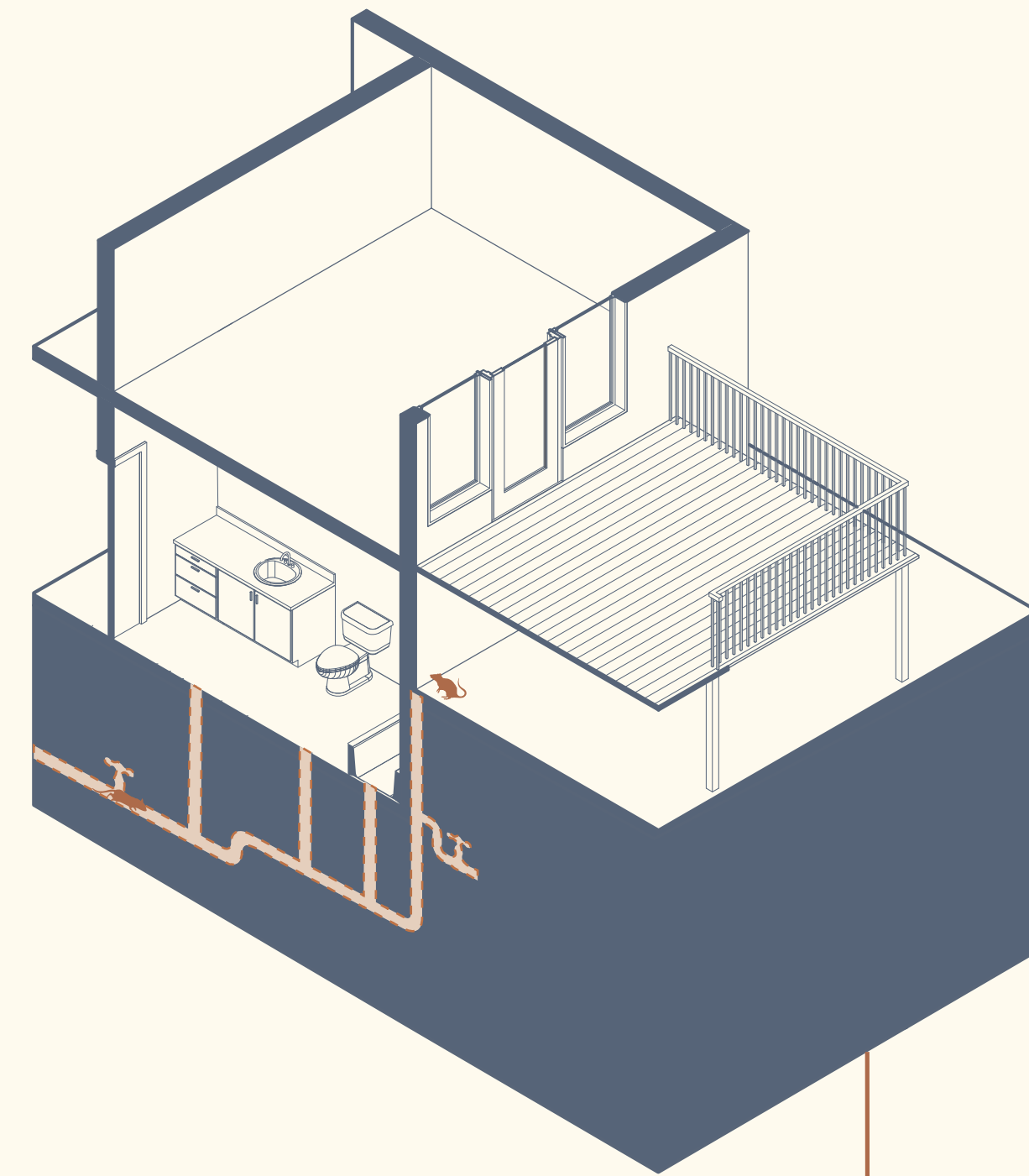
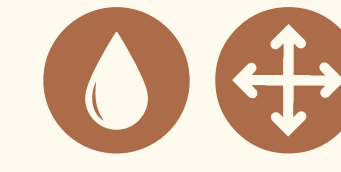
Rats do this...
- in warmer months
- when there aren't many water sources

ADJUST:
- PLACEMENT OF SOFT GROUND
- EASE OF WATER ACCESS

PROPOSAL:
- INSTALL MOCK PIPING THAT DOUBLES AS A BIKE RACK, ATTACHED TO SEWER SYSTEM
- ACCESS TO WATER FOR RAT RESOURCES
- BETTER CURB APPEAL



SEE:

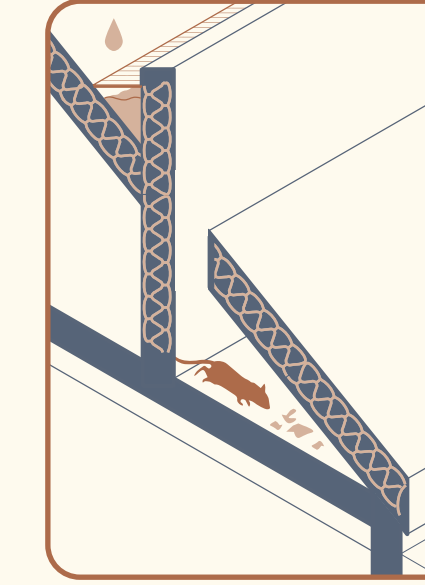


NESTING & FORAGING IN OUR ATTICS & ROOFS

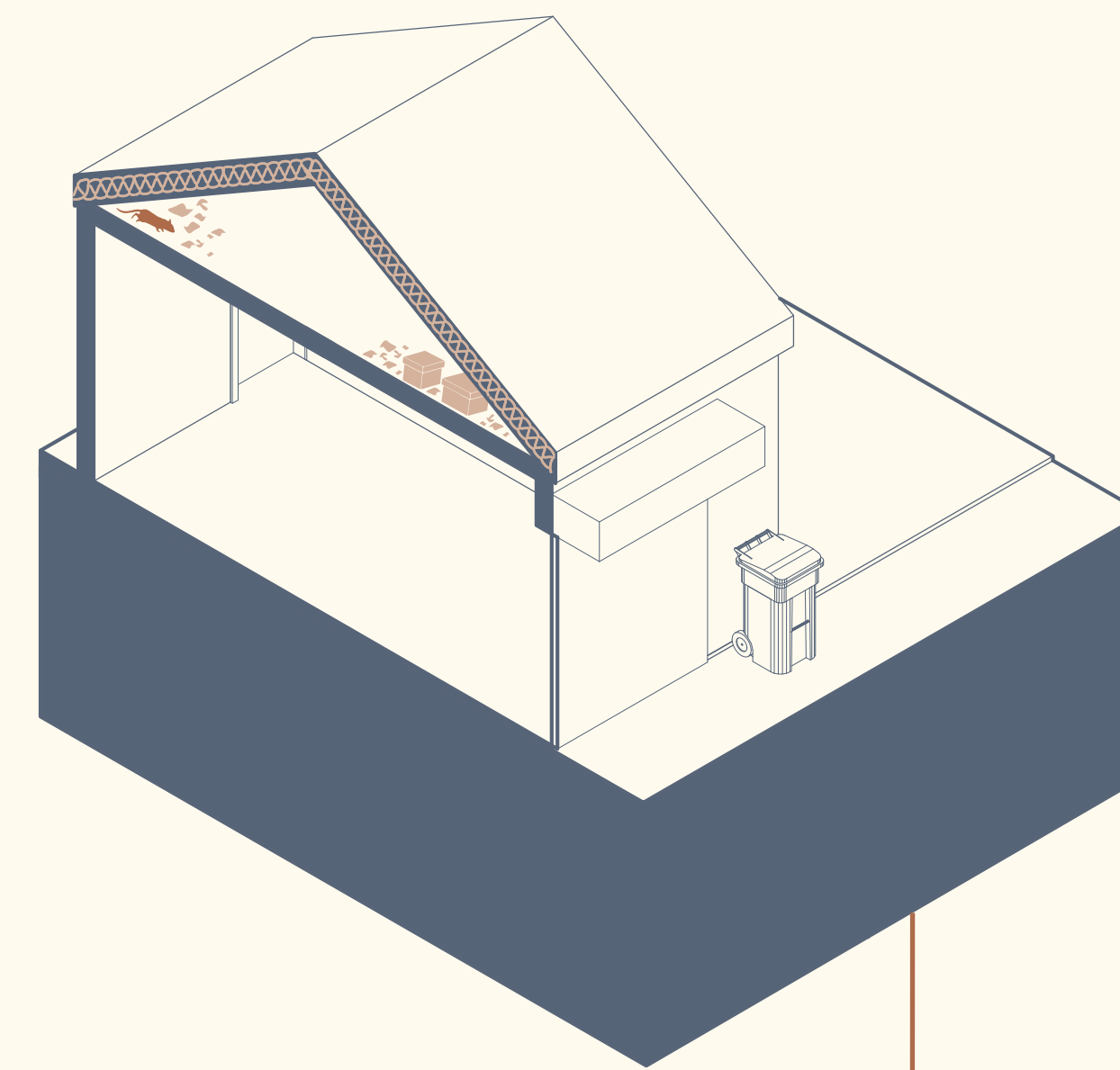
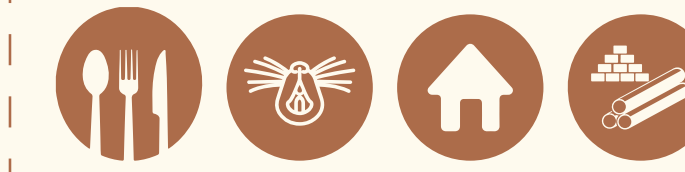
Rats do this...
- in colder months
- when they are building a new nest
- when resources are nearby

ADJUST:
- OUR ROOF/ATTIC CONDITIONS

PROPOSAL:
- INSTALL INSULATED PARTITION ON ROOFS
- ENCLOSURE FOR RAT SAFETY
- PRIME ACCESS TO RESOURCES
- INSTALL A RAINWATER COLLECTION SYSTEM IN RESULTING FORM



SEE:

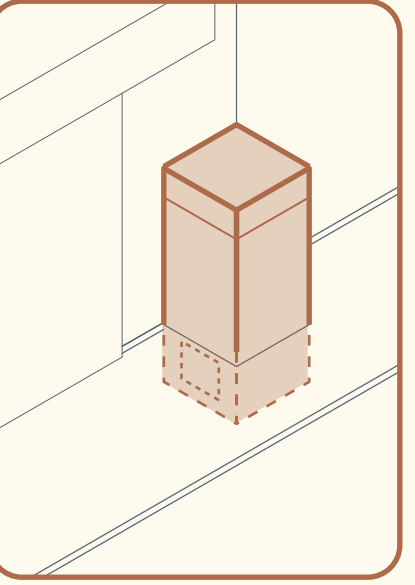


FORAGING THROUGH OUR TRASH

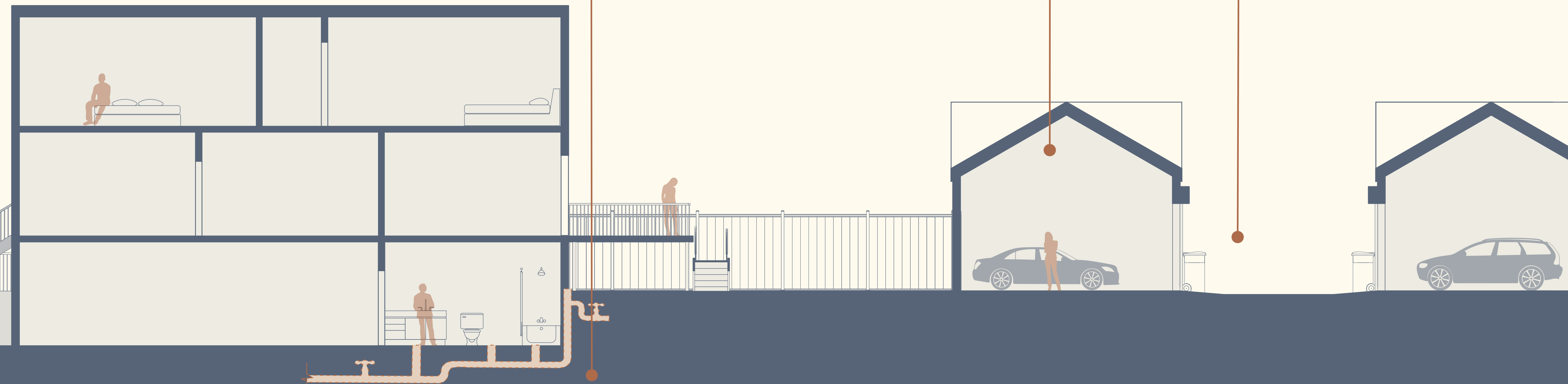
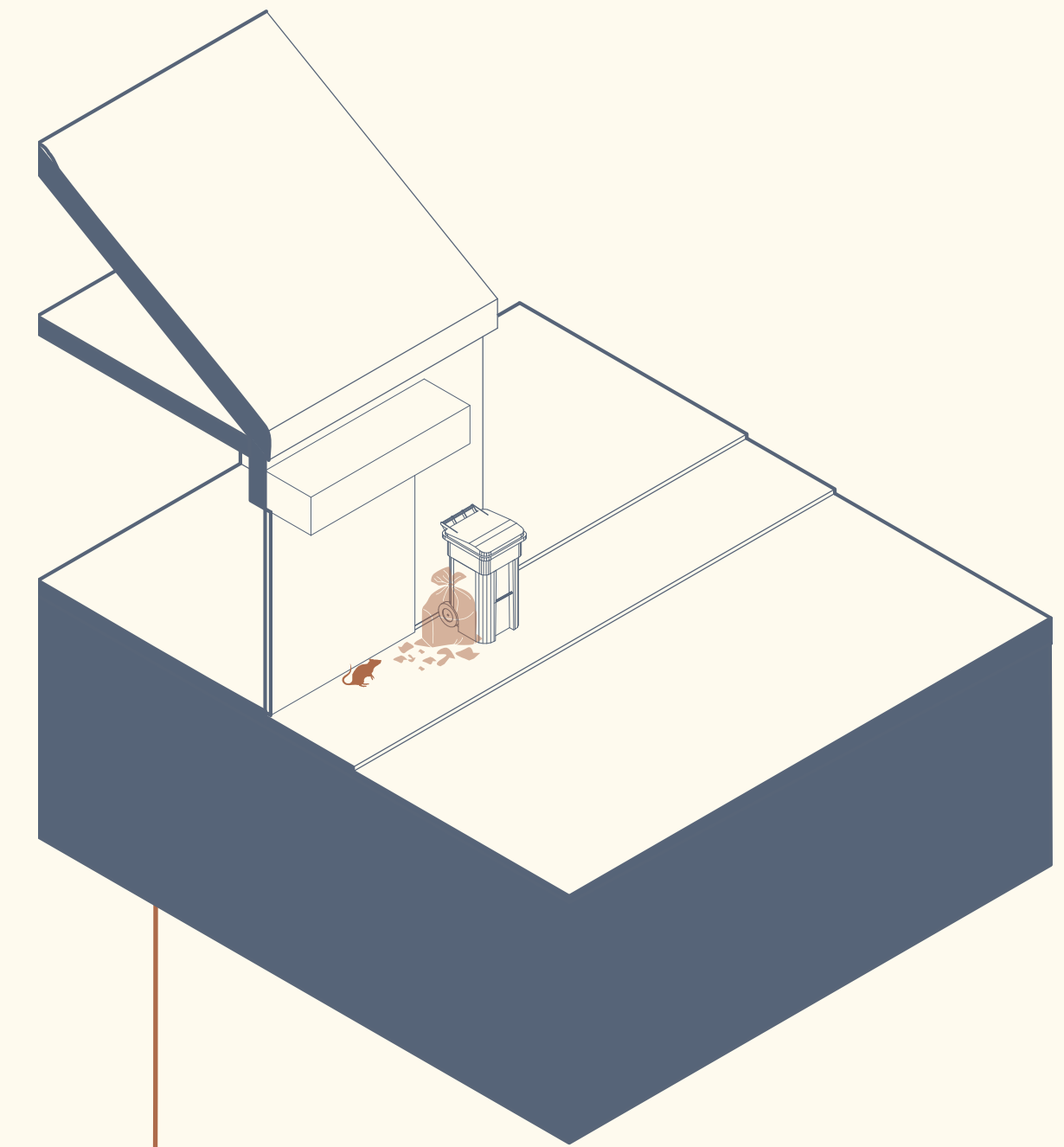
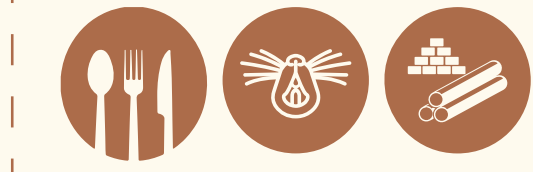
Rats do this...
- mainly during the night
- to get food
- to get nesting materials

ADJUST:
- OUR TRASH SYSTEM
- THE PATH TO RESOURCES

PROPOSAL:
- SEPARATE RAT & HUMAN ACCESS TO TRASH
- PRIME ACCESS TO RESOURCES
- BETTER CURB APPEAL



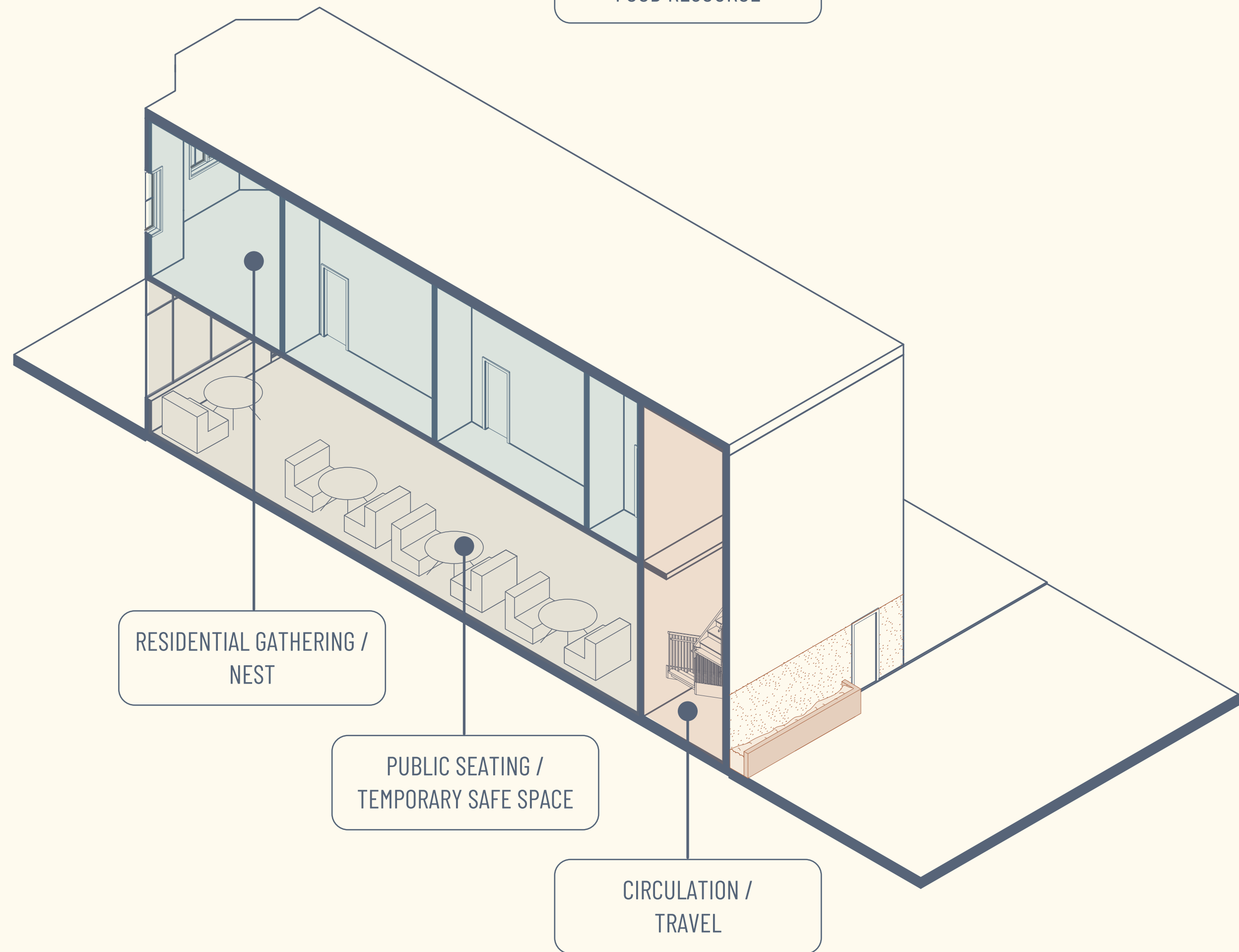
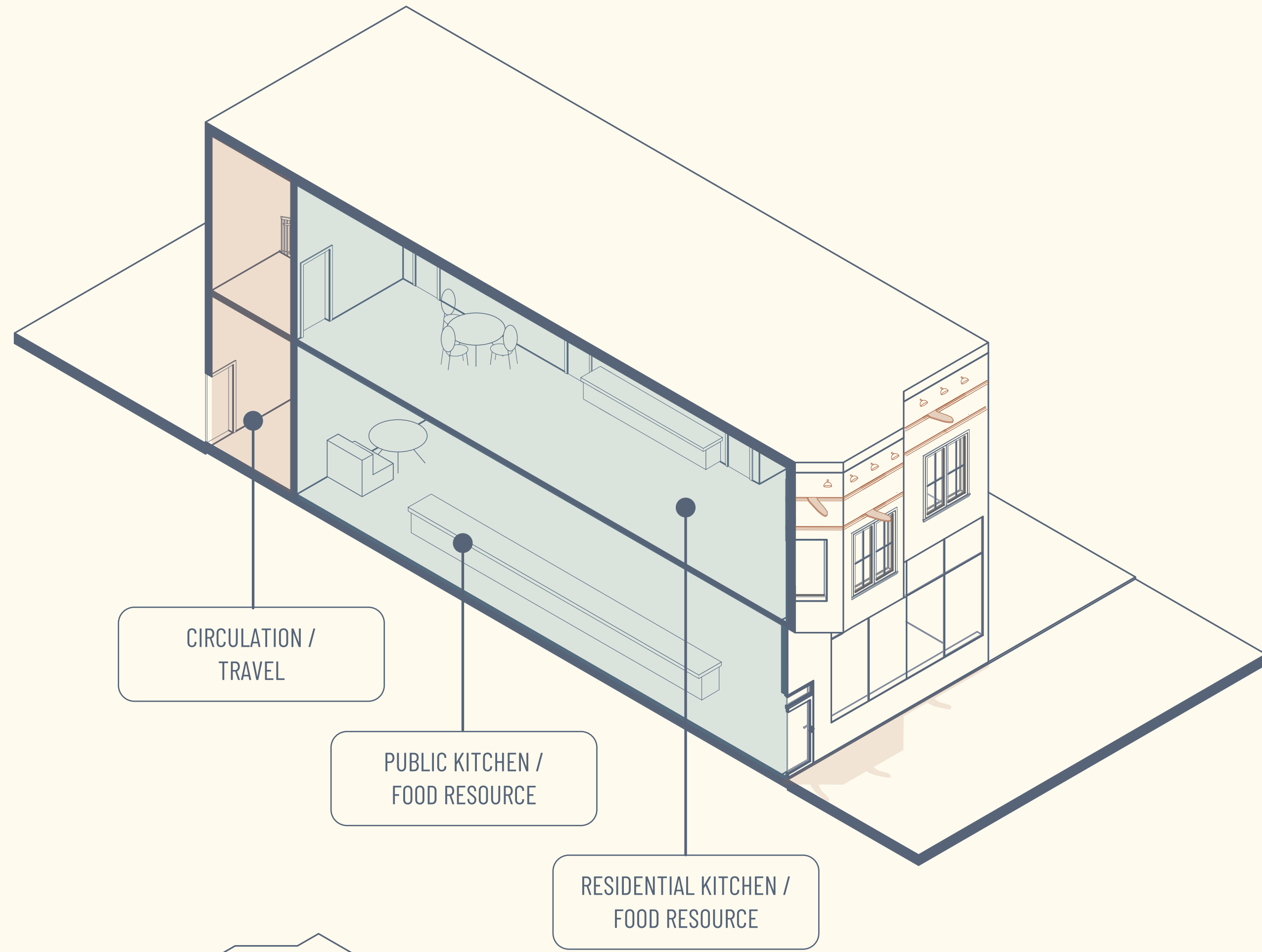
SEE:



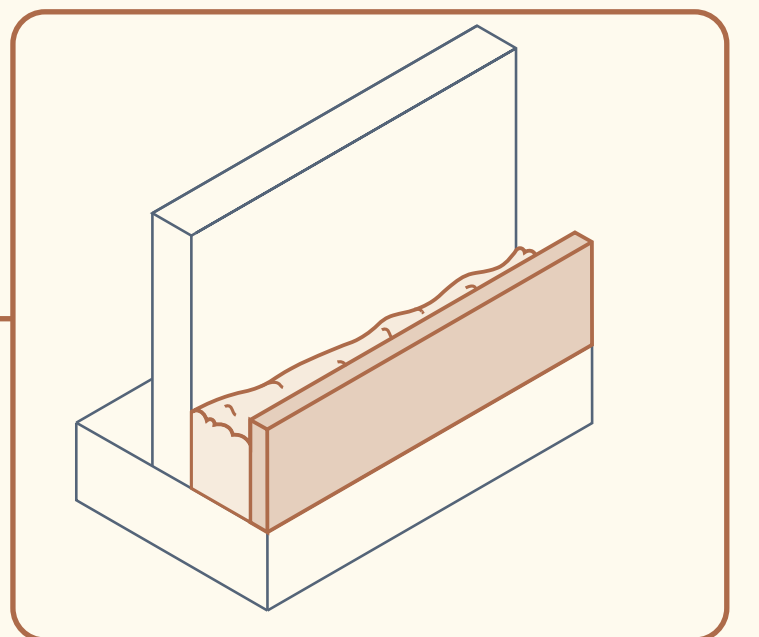
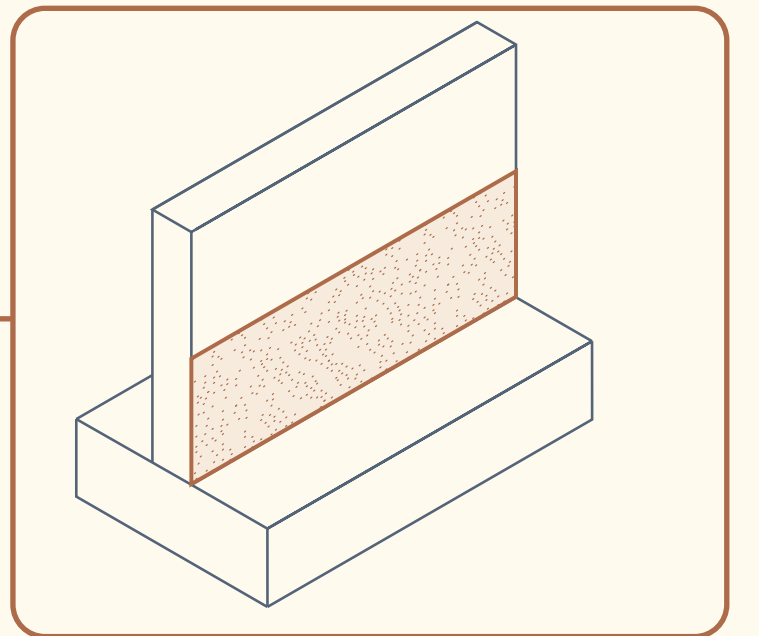
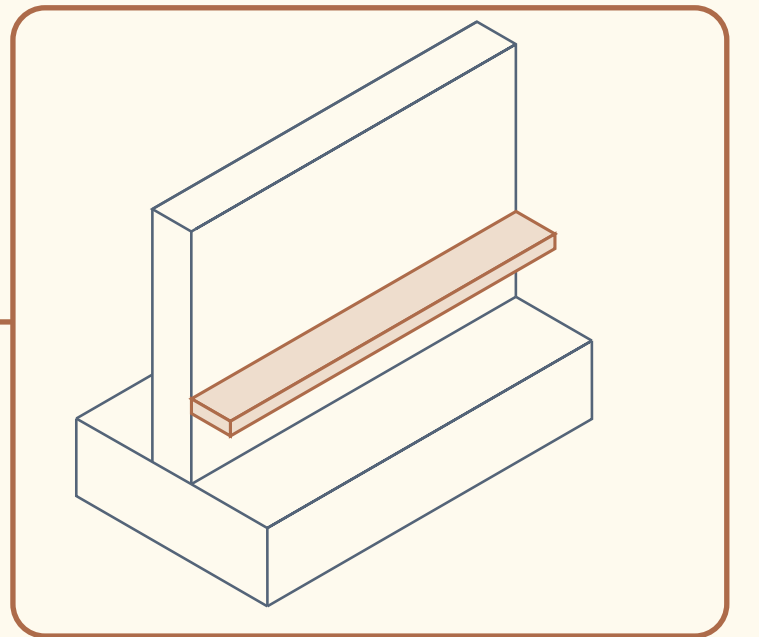
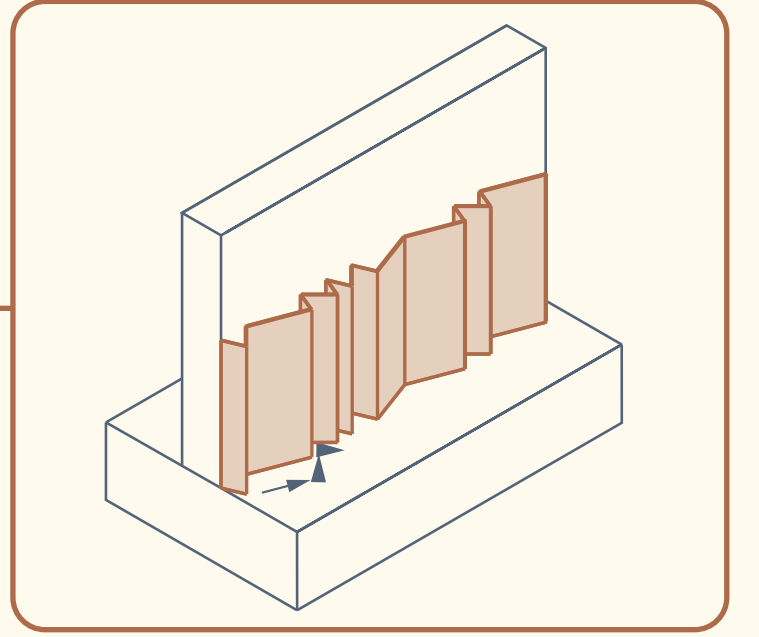
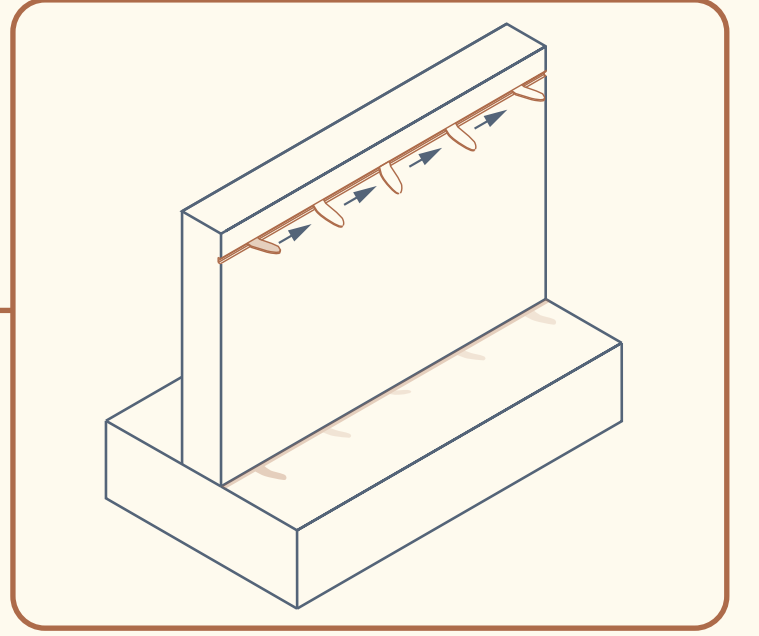
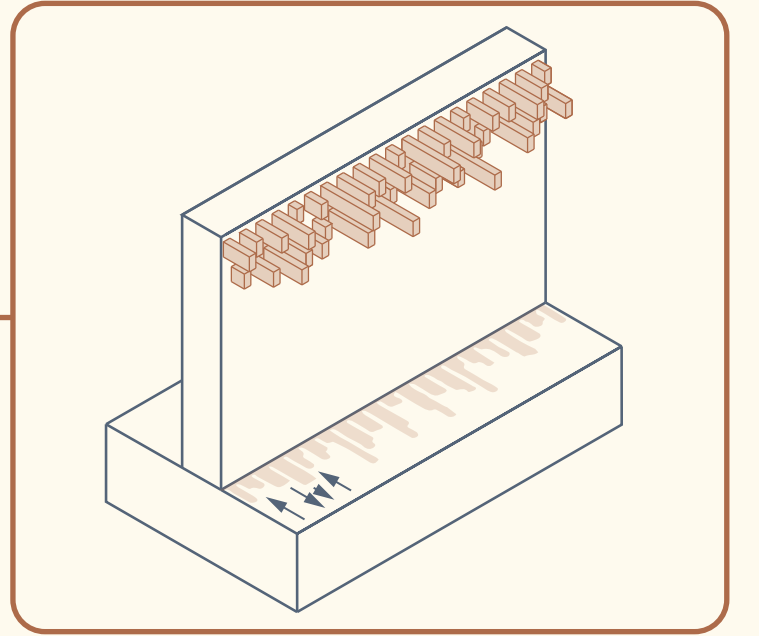
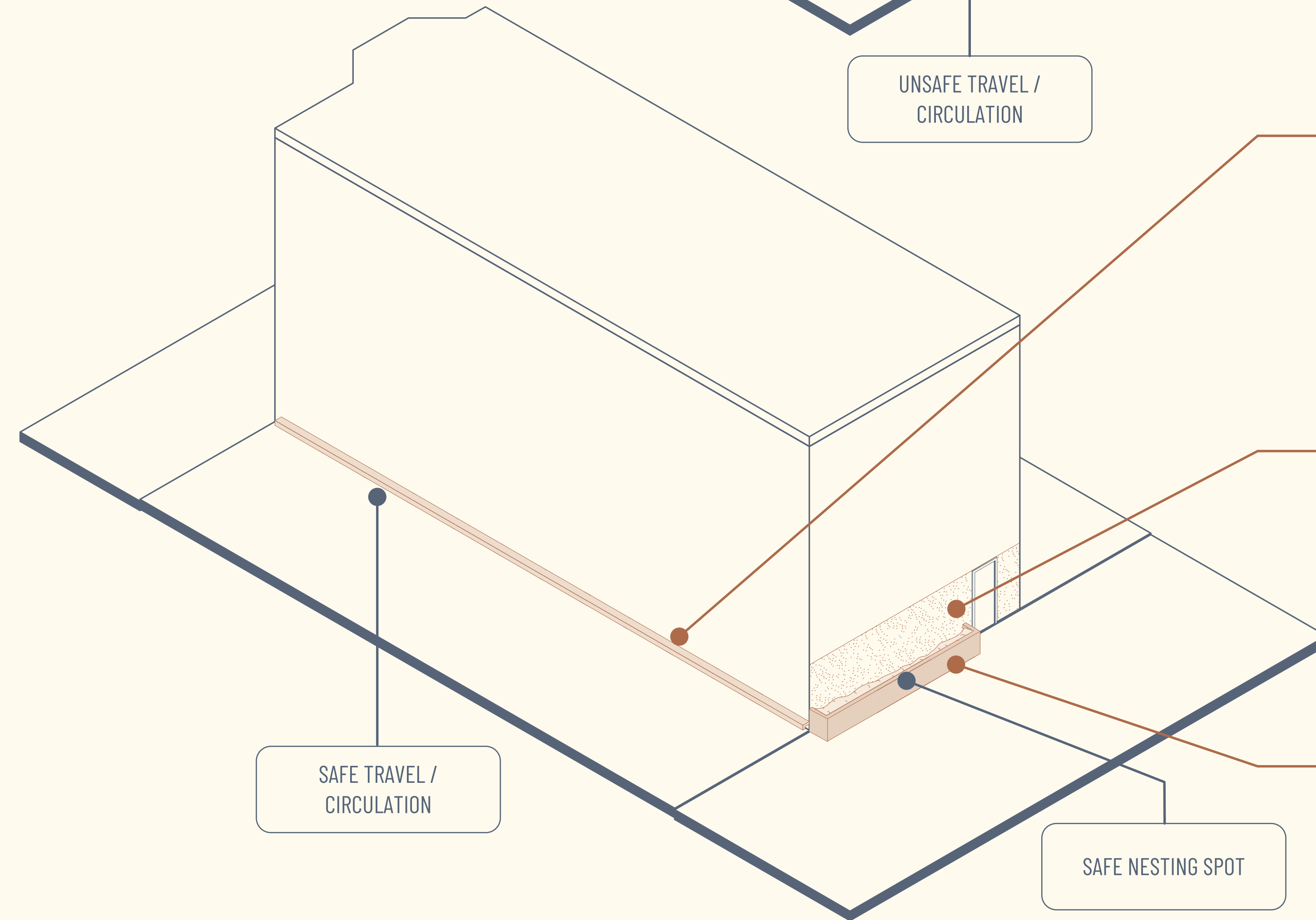
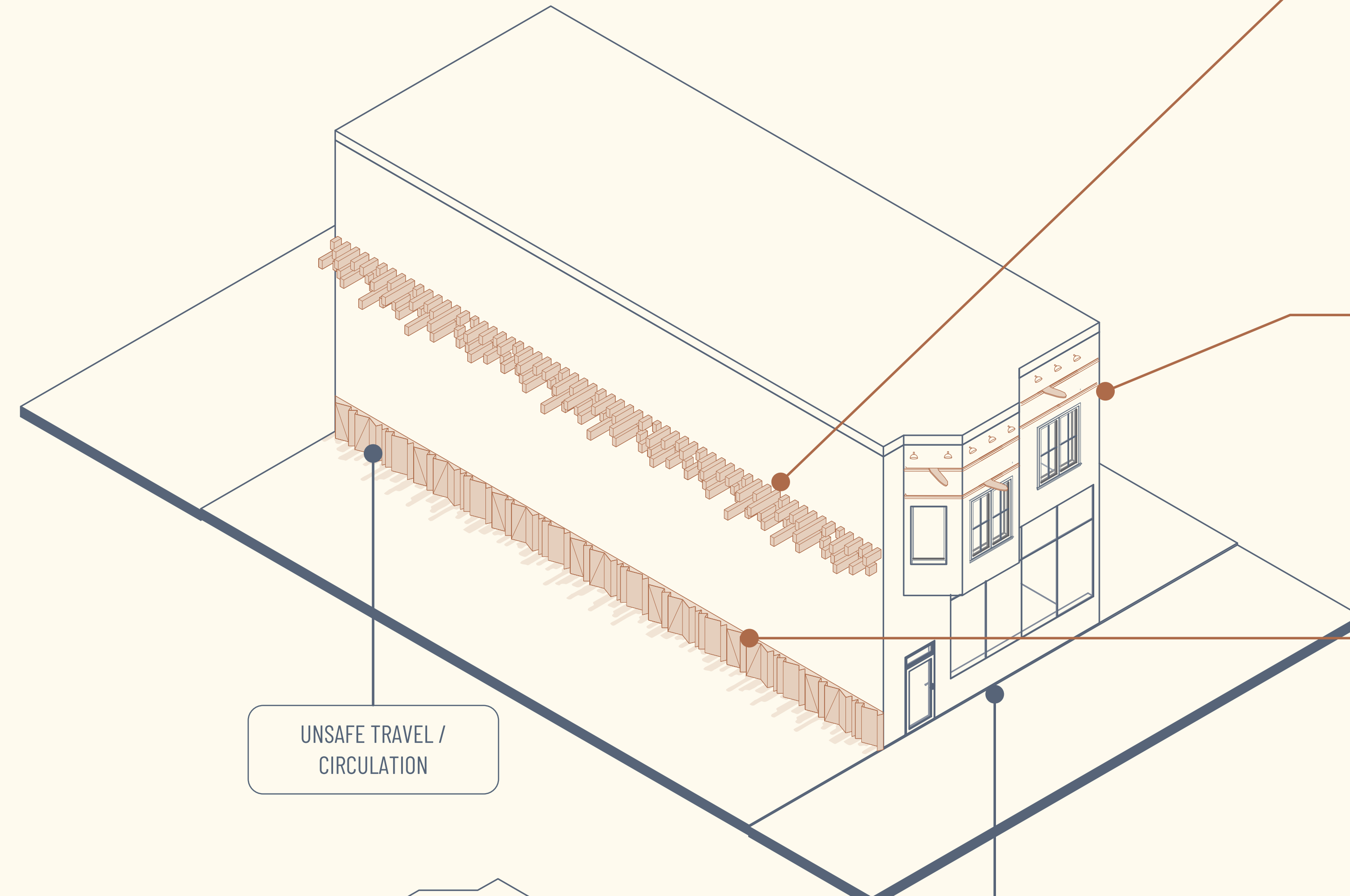
RAT DESIGN IN HUMAN SPACES

DEFINING HUMAN SPACES

HUMAN PREFERENCE TO RAT ACCESS
LEAST TOLERABLE  MOST TOLERABLE



DEFINING RAT SPACES

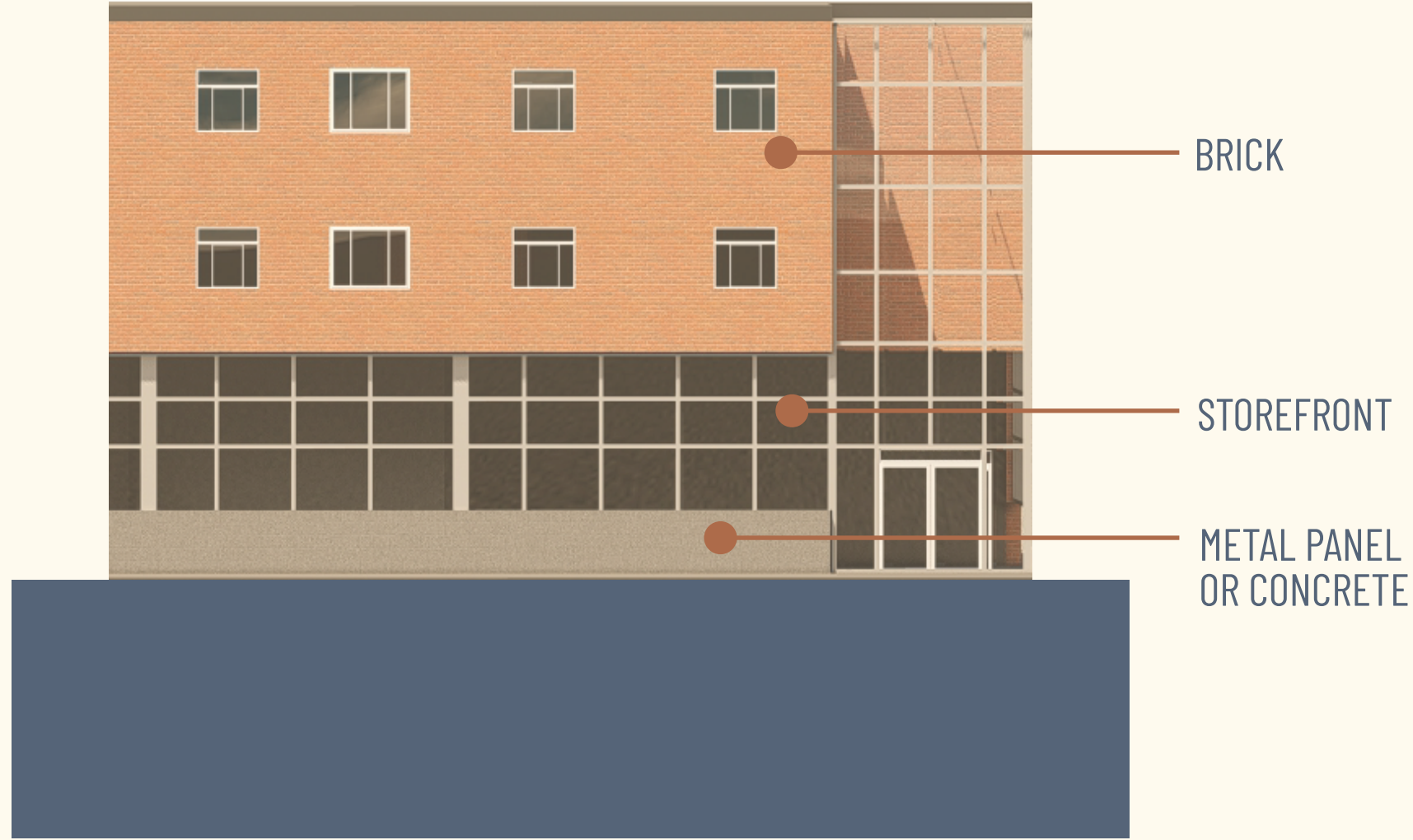


CHICAGO RAT DETERRENT STRATEGIES

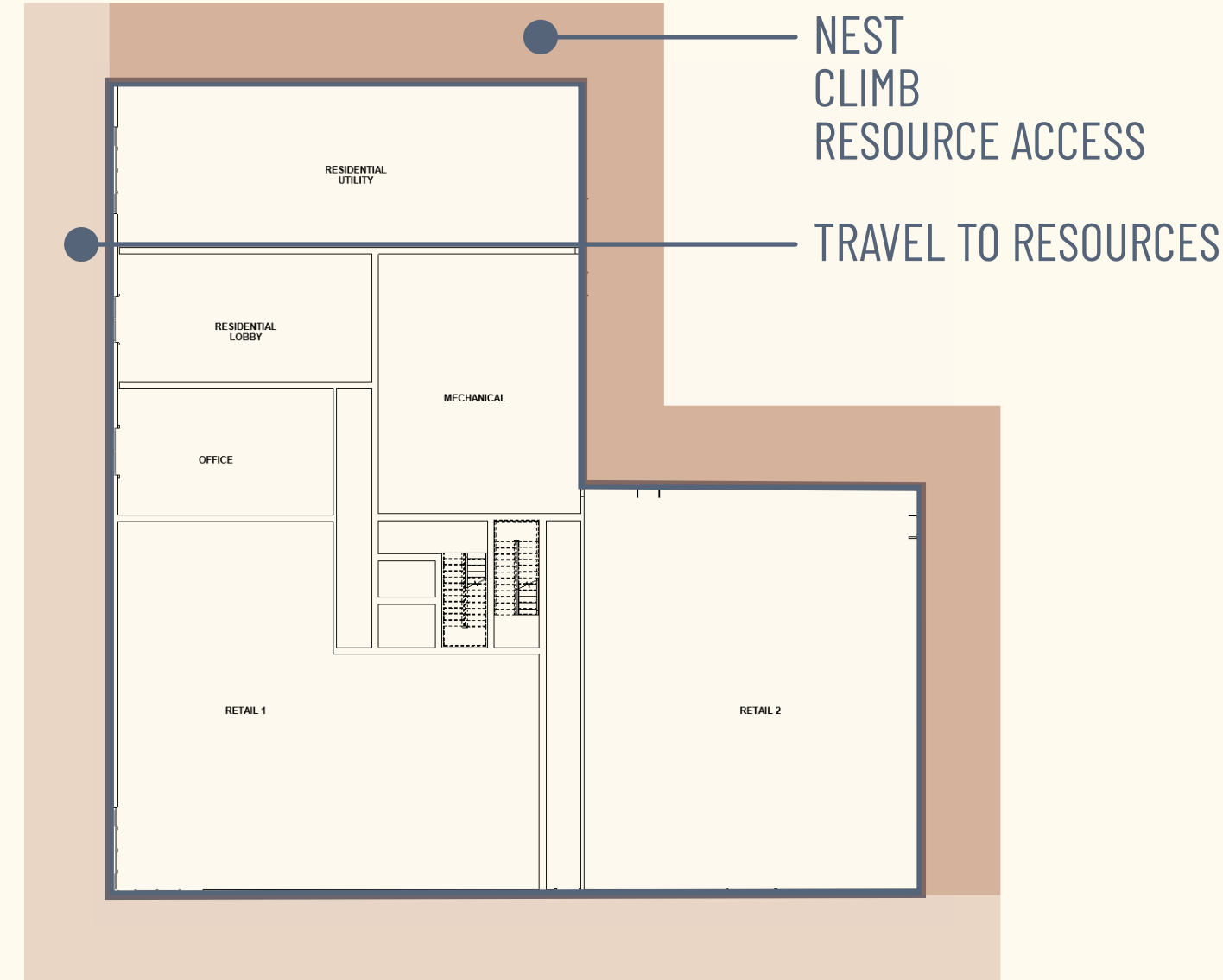
CHICAGO MIXED USE BUILDINGS CONDITIONS

MIXED USE BUILDINGS IN CHICAGO TYPICALLY CONSIST OF BRICK AND A STOREFRONT CURTAIN WALL.

OFTENTIMES THE BOTTOM 3'-4' IS NOT BRICK DUE TO THE LIKELINESS OF DAMAGES. RATS ARE OFTEN PART OF THE REASON FOR THESE DAMAGES.



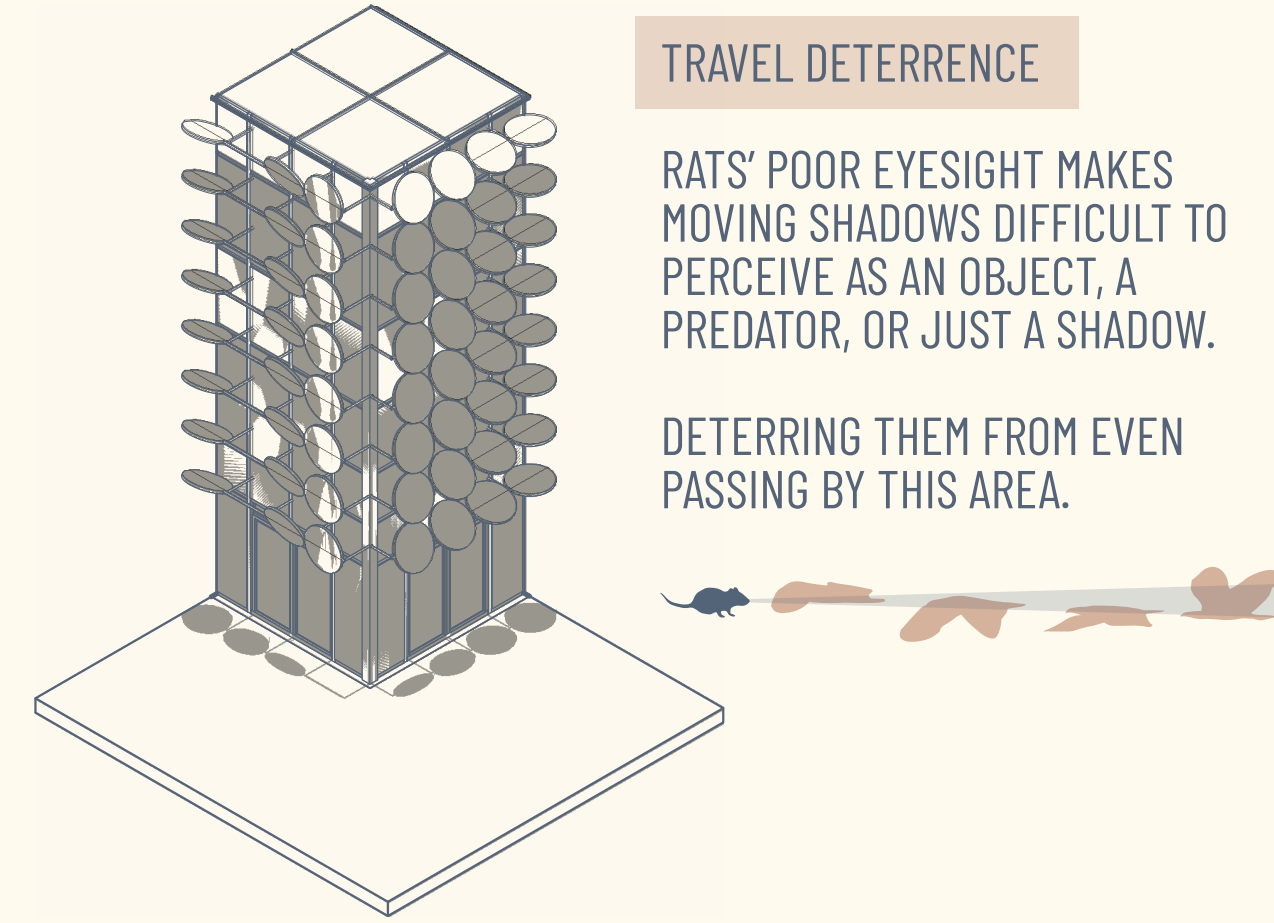
- FRONT FACADES ARE MUCH CLEANER WITH HIGHER HUMAN TRAFFIC AND MORE ARTIFICIAL LIGHTING
- BACK FACADES OFTEN COLLECT LITTER/TRASH WITH A LOWER AMOUNT OF HUMAN TRAFFIC AND LIGHTING



OVERPOPULATED RATS ARE BAD FOR HUMANS AND RATS



DYNAMIC CURTAIN WALL

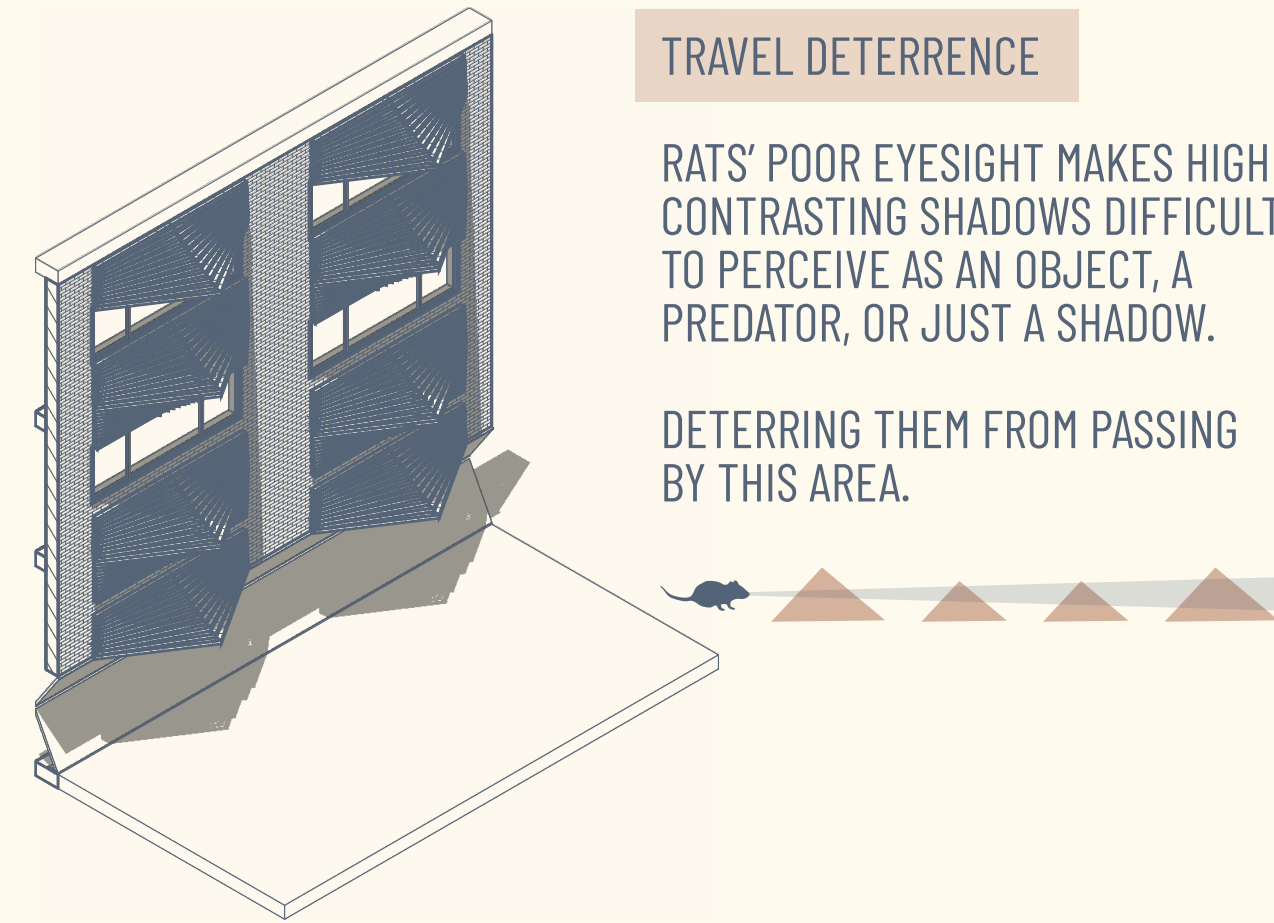


TRAVEL DETERRENCE

RATS' POOR EYESIGHT MAKES MOVING SHADOWS DIFFICULT TO PERCEIVE AS AN OBJECT, A PREDATOR, OR JUST A SHADOW.

DETECTING THEM FROM EVEN PASSING BY THIS AREA.

BRICK PATTERN

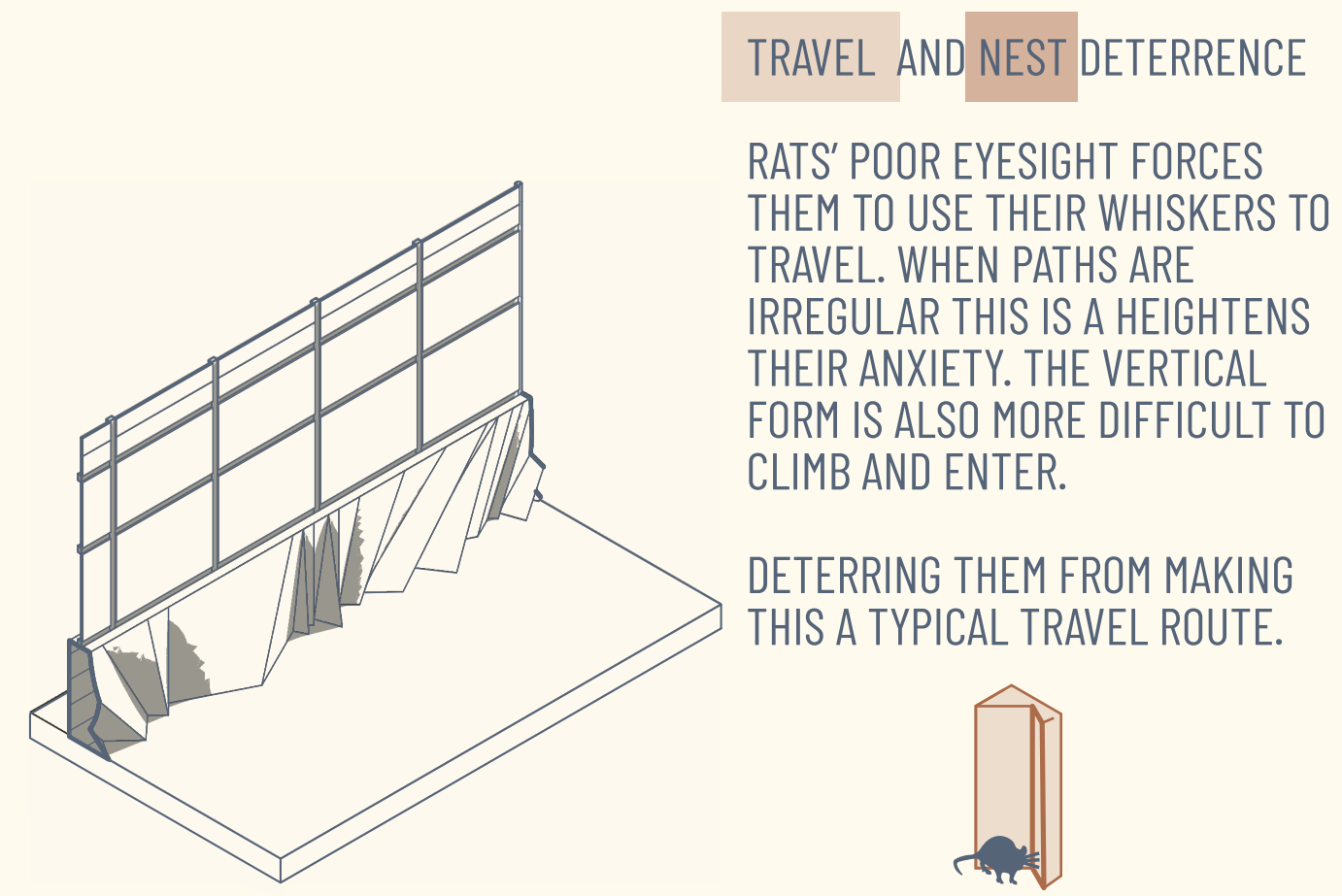


TRAVEL DETERRENCE

RATS' POOR EYESIGHT MAKES HIGH CONTRASTING SHADOWS DIFFICULT TO PERCEIVE AS AN OBJECT, A PREDATOR, OR JUST A SHADOW.

DETECTING THEM FROM PASSING BY THIS AREA.

PRECAST CONCRETE

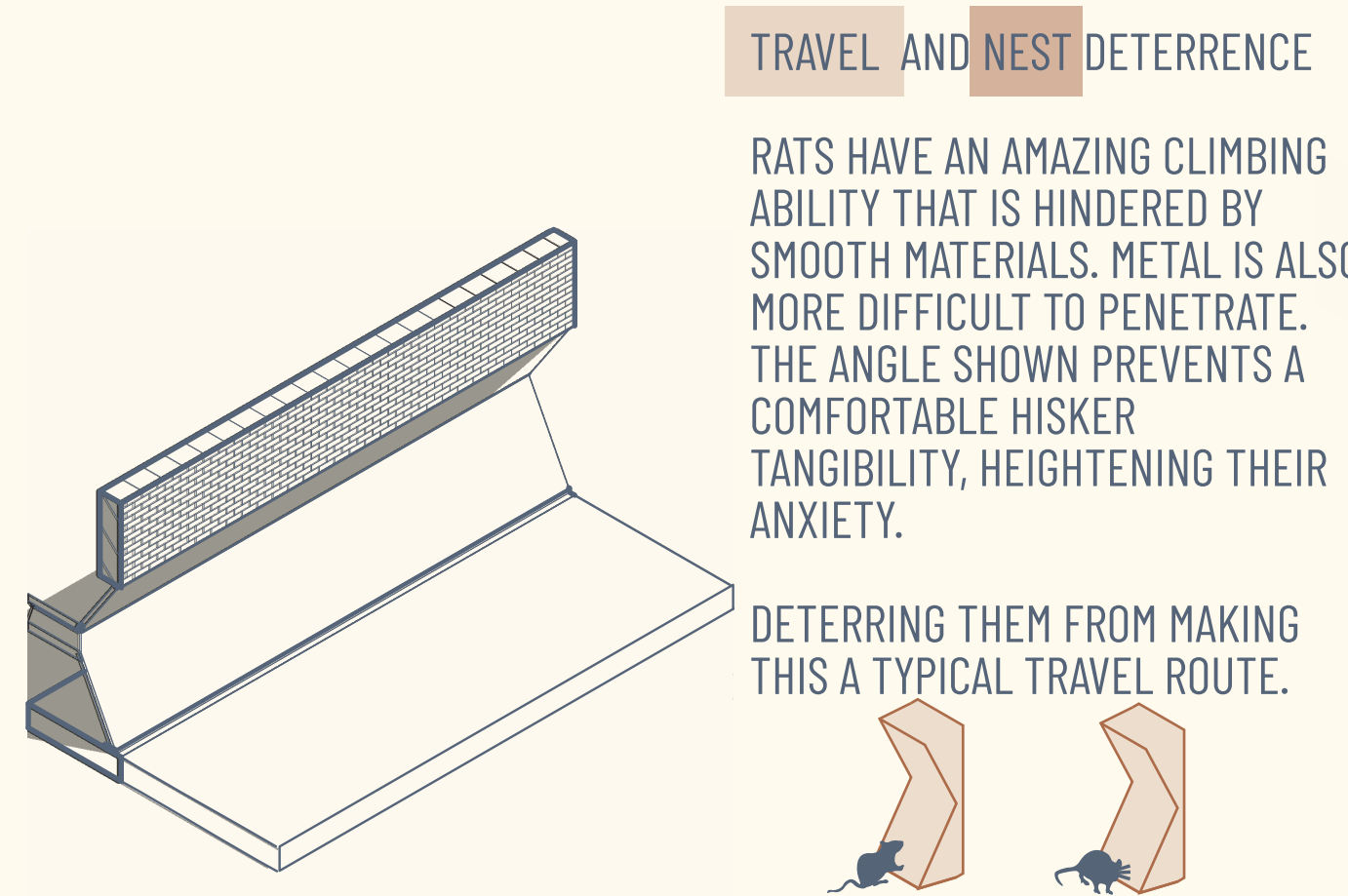


TRAVEL AND NEST DETERRENCE

RATS' POOR EYESIGHT FORCES THEM TO USE THEIR WHISKERS TO TRAVEL. WHEN PATHS ARE IRREGULAR THIS IS A HEIGHTENS THEIR ANXIETY. THE VERTICAL FORM IS ALSO MORE DIFFICULT TO CLIMB AND ENTER.

DETECTING THEM FROM MAKING THIS A TYPICAL TRAVEL ROUTE.

ANGLED METAL PANEL

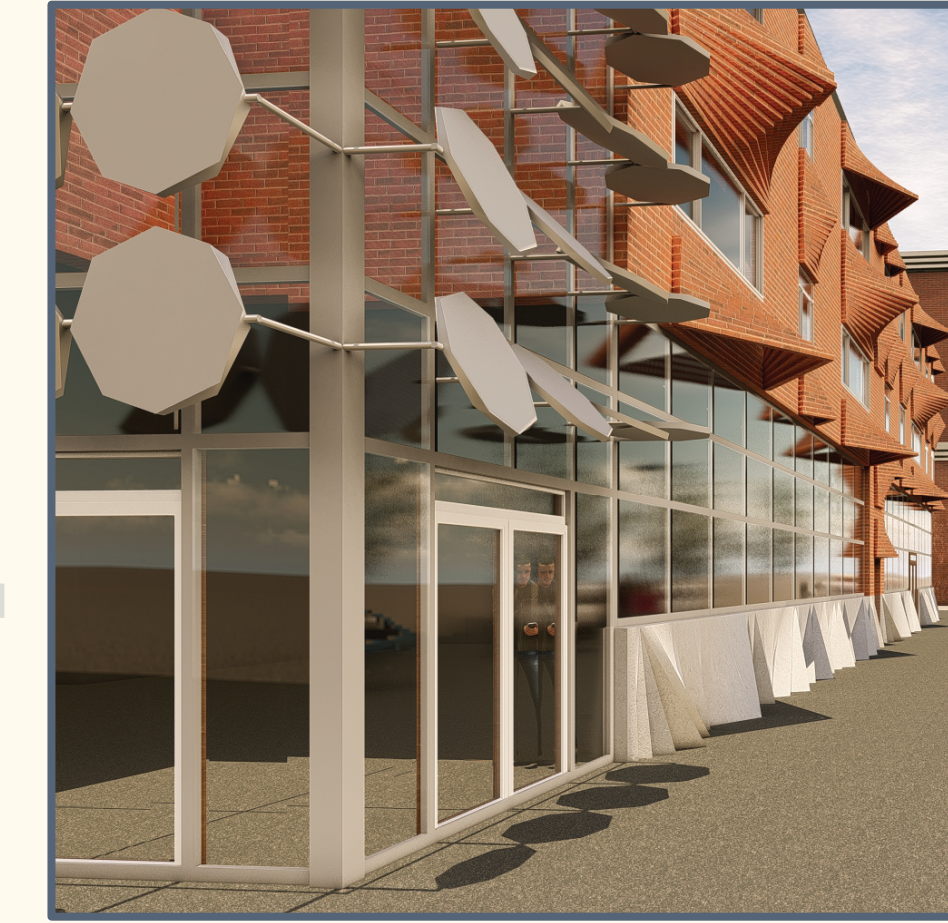


TRAVEL AND NEST DETERRENCE

RATS HAVE AN AMAZING CLIMBING ABILITY THAT IS HINDERED BY SMOOTH MATERIALS. METAL IS ALSO MORE DIFFICULT TO PENETRATE. THE ANGLE SHOWN PREVENTS A COMFORTABLE HISKER TANGIBILITY, HEIGHTENING THEIR ANXIETY.

DETECTING THEM FROM MAKING THIS A TYPICAL TRAVEL ROUTE.

HUMAN PERSPECTIVE



RAT PERSPECTIVE



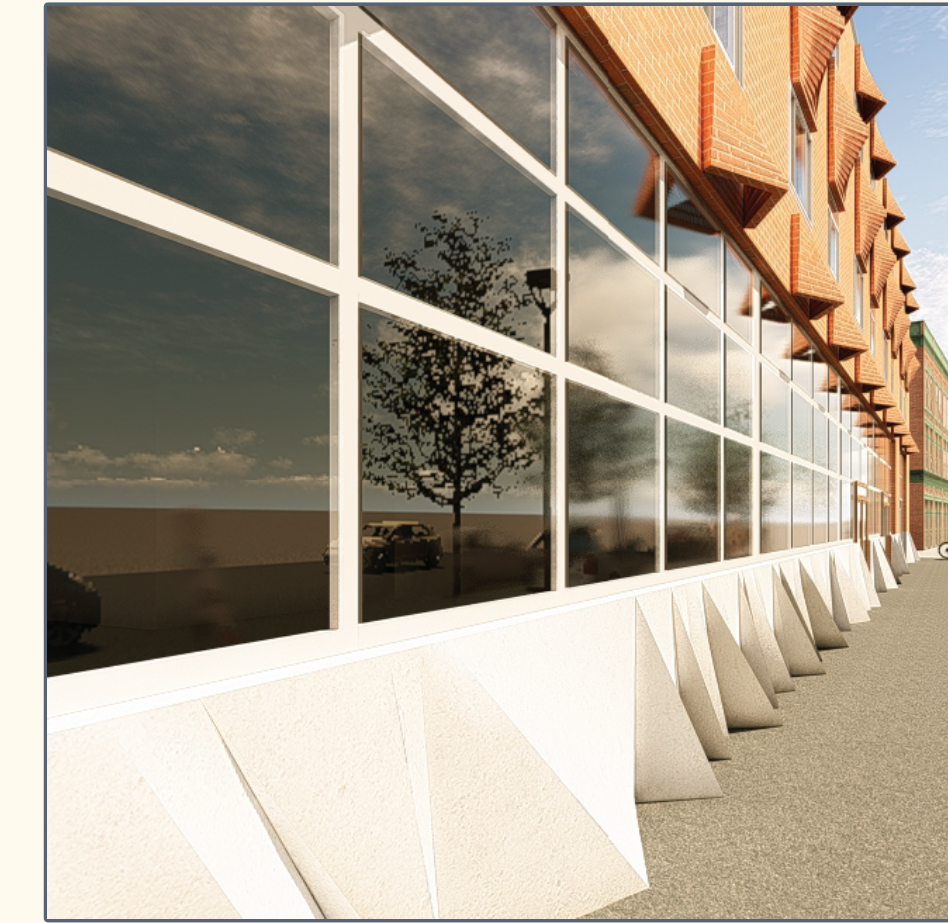
HUMAN PERSPECTIVE



RAT PERSPECTIVE



HUMAN PERSPECTIVE



RAT PERSPECTIVE



HUMAN PERSPECTIVE



RAT PERSPECTIVE

