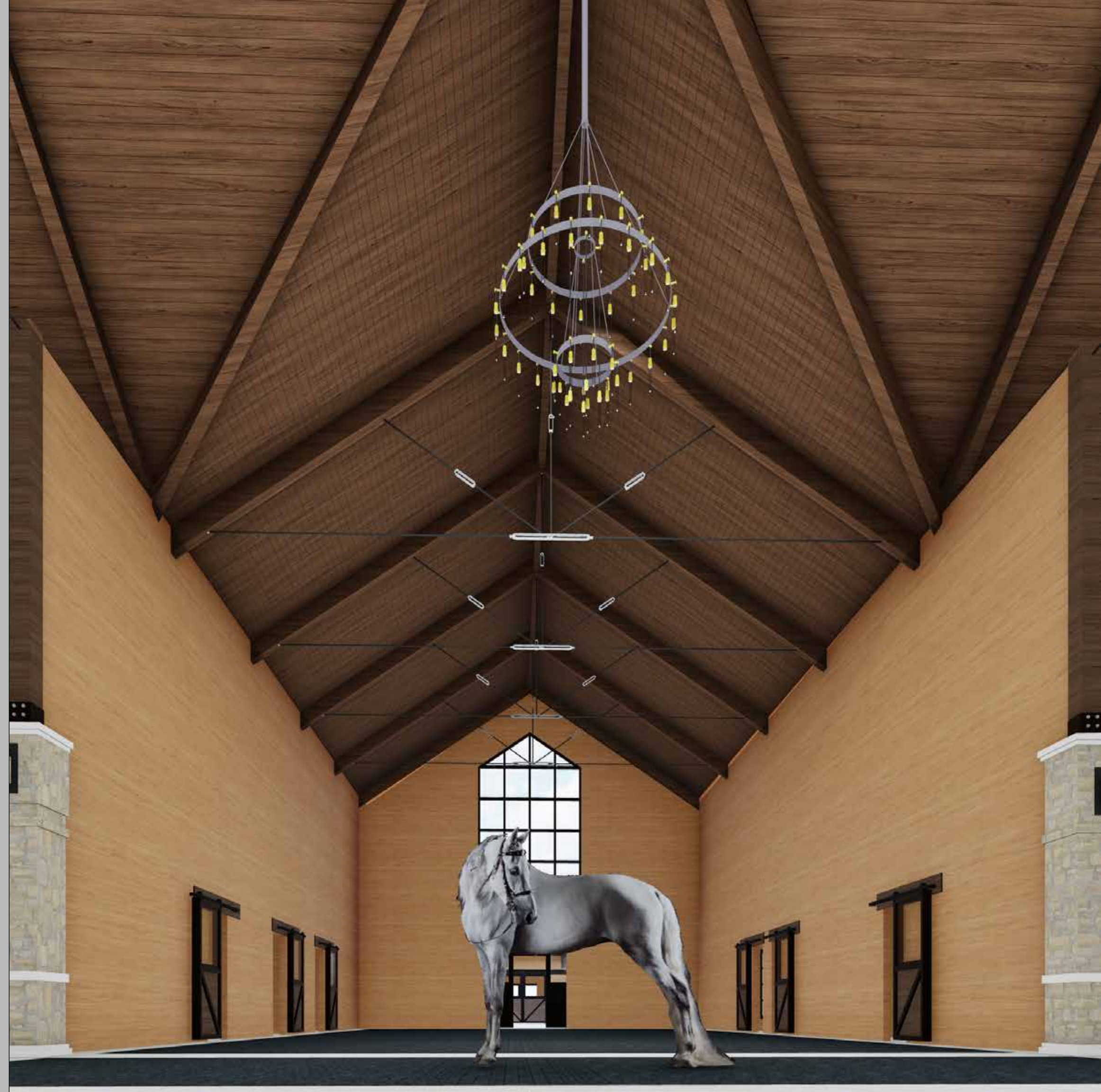




*"Simple materials and forms; planned  
and executed with great care..."*



# EQUINE REHABILITATION CENTER

Master of Architecture | Heather White

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Koichiro Aitani | committee chair

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James C. Heird | committee member

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Shelley Holliday | committee member

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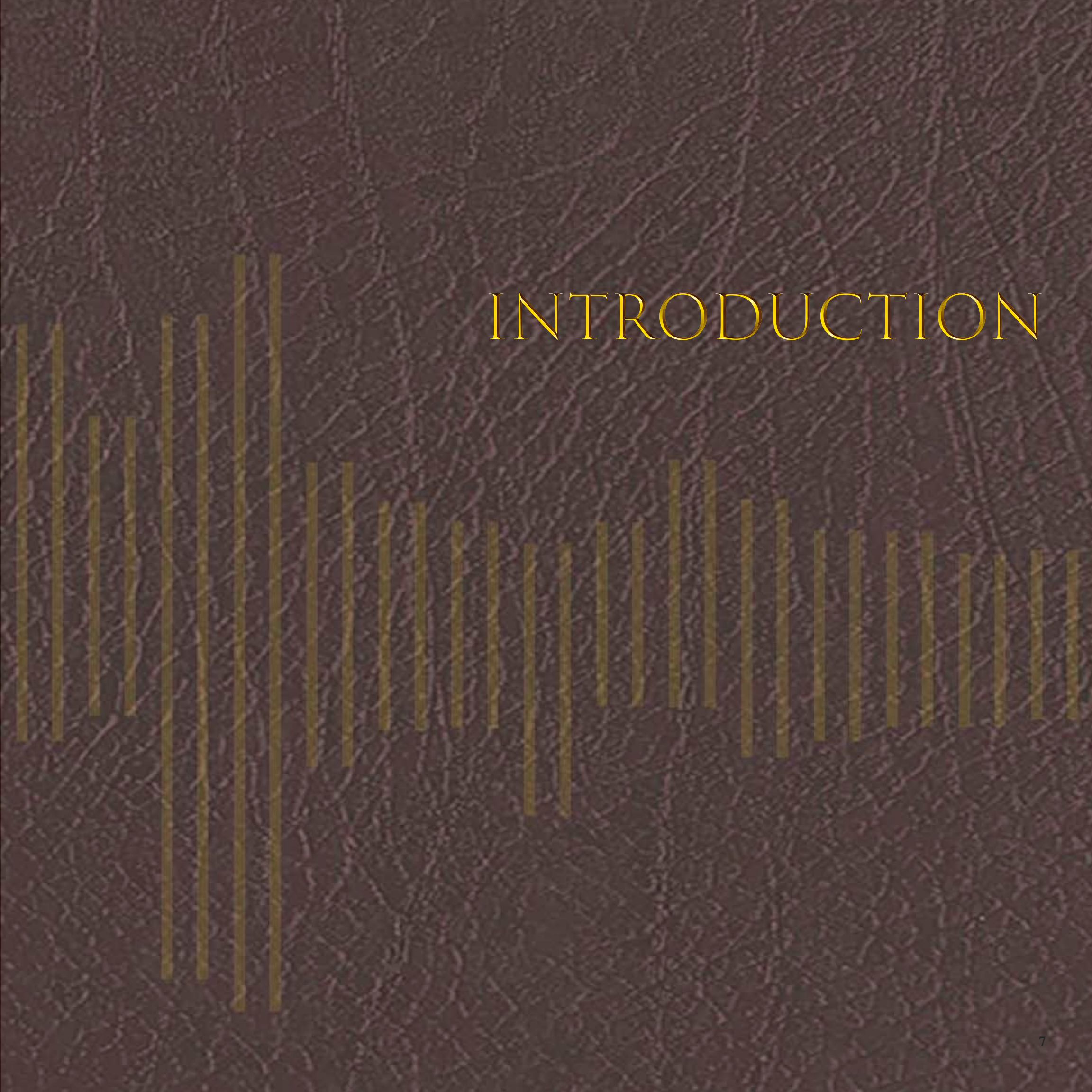
Ray Holliday | studio professor

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# INTRODUCTION



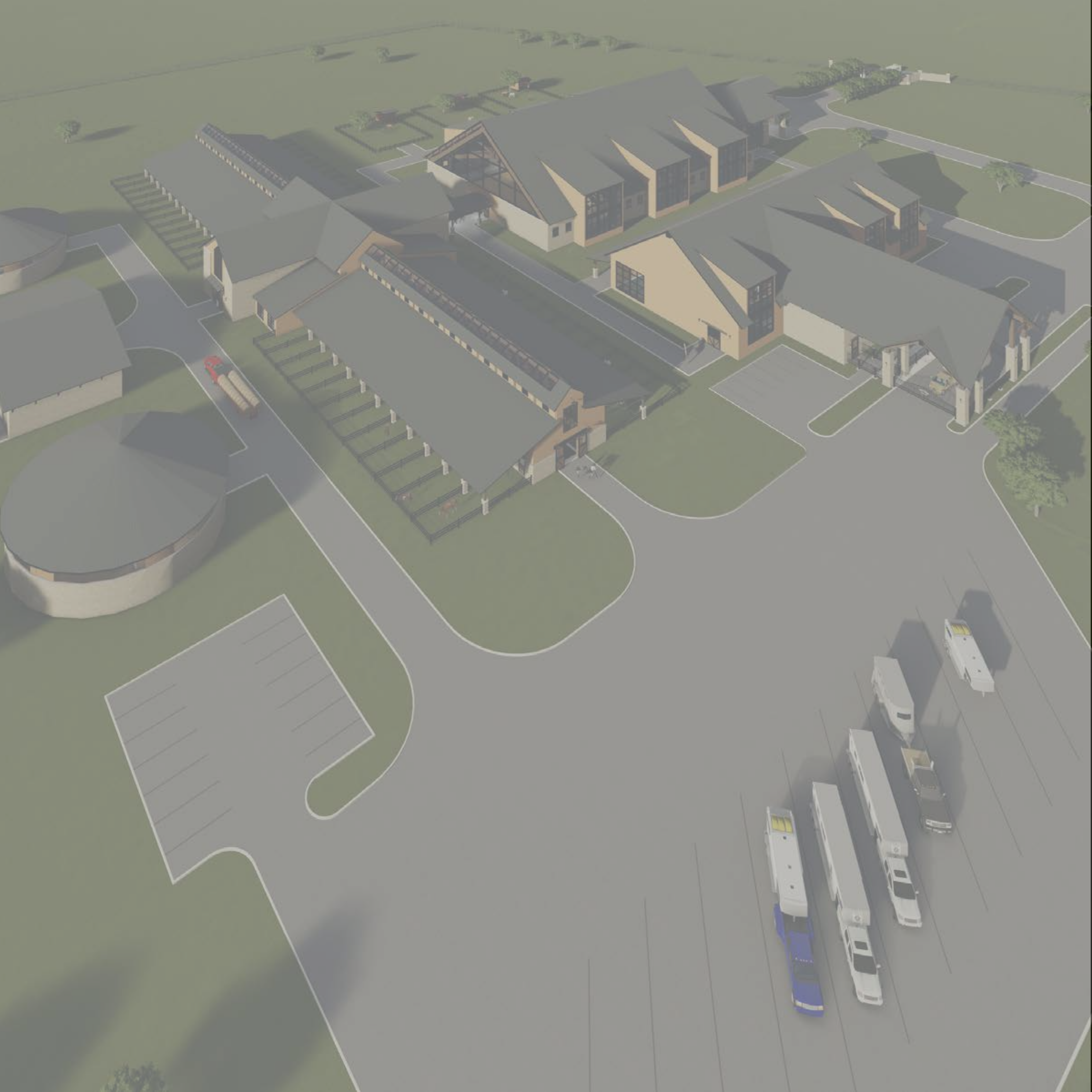


**T**raditional architecture focuses on human comfort and convenience. Equine architecture targets the health, safety, and well-being of the horse and their handlers. The Equine Rehabilitation Center has been designed to bring comfort and to meet the special needs of the horse as they complete the rehabilitation program customized specifically for them.

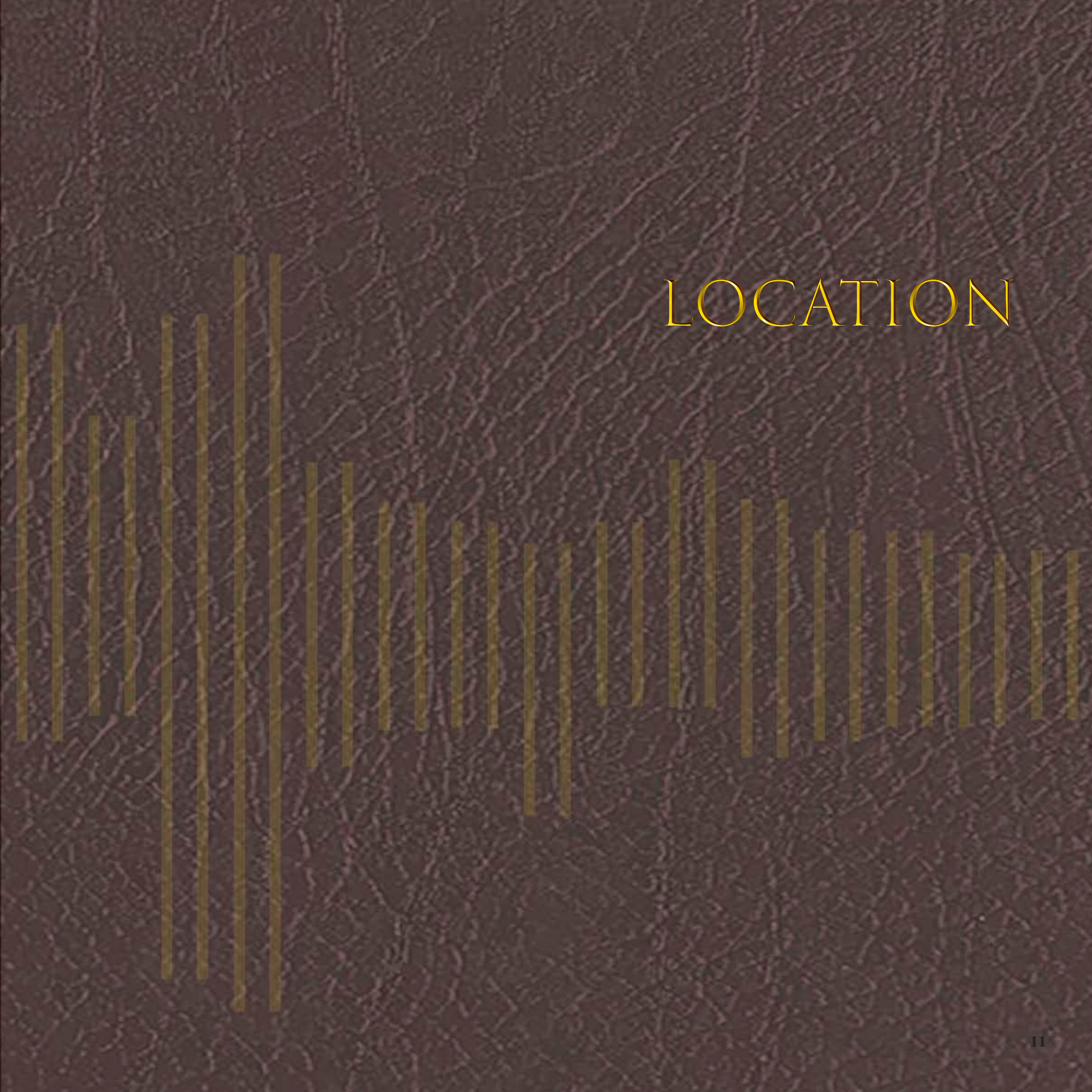
The Equine Rehabilitation Center is located in Lexington, Kentucky. Also known as the “horse capital of the world.” The region is home to about 450 horse farms as well as Keeneland, the world’s largest thoroughbred auction house. It is believed that Kentucky’s hills are filled with limestone whilst the bluegrass is rich in calcium. This is believed to build strong bones in horses.

When designing an equine facility, several considerations should be addressed such as sound, insulation, maintenance, durability, safety, and appearance. Steel frame construction is commonly used in public equine facilities today while post frame barn structures are a popular choice when designing private stables. However, cost and maintenance become a big factor when considering materials.

The materials used throughout the Equine Rehabilitation Center are heavy timber, stone, and steel. Large windows throughout the facilities allow natural light and provide views around the property. Large open spaces and high ceilings allow for proper ventilation. The overall facility consists of six buildings: the rehab barn, stables, main lobby with attached indoor arena, exerciser-wet, exerciser-dry, and equipment-hay barn.

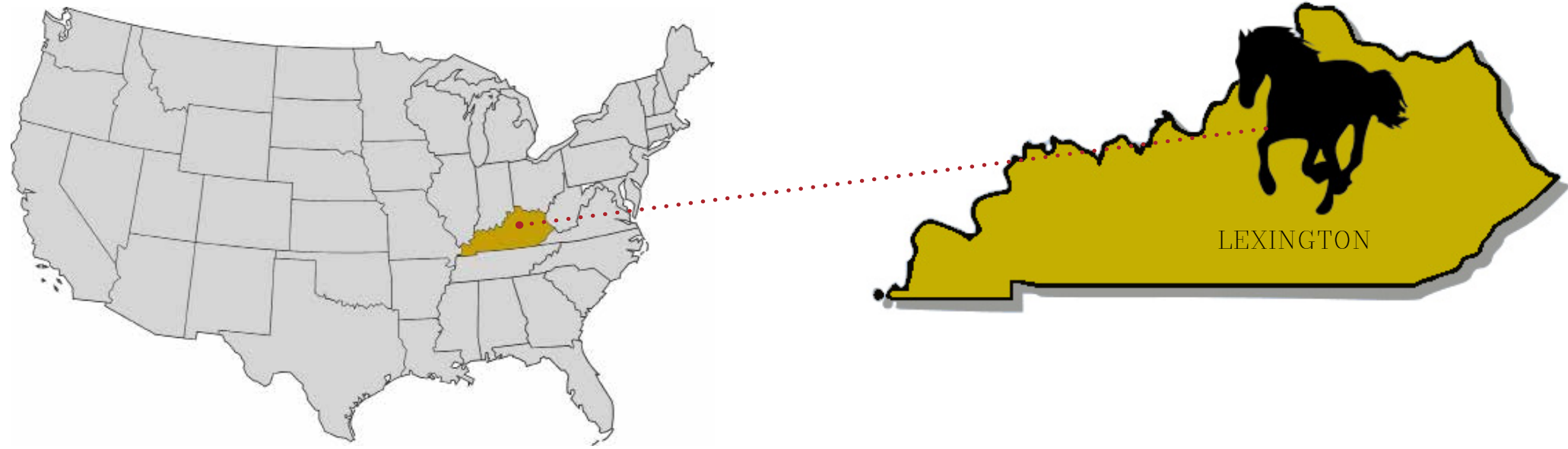


# LOCATION



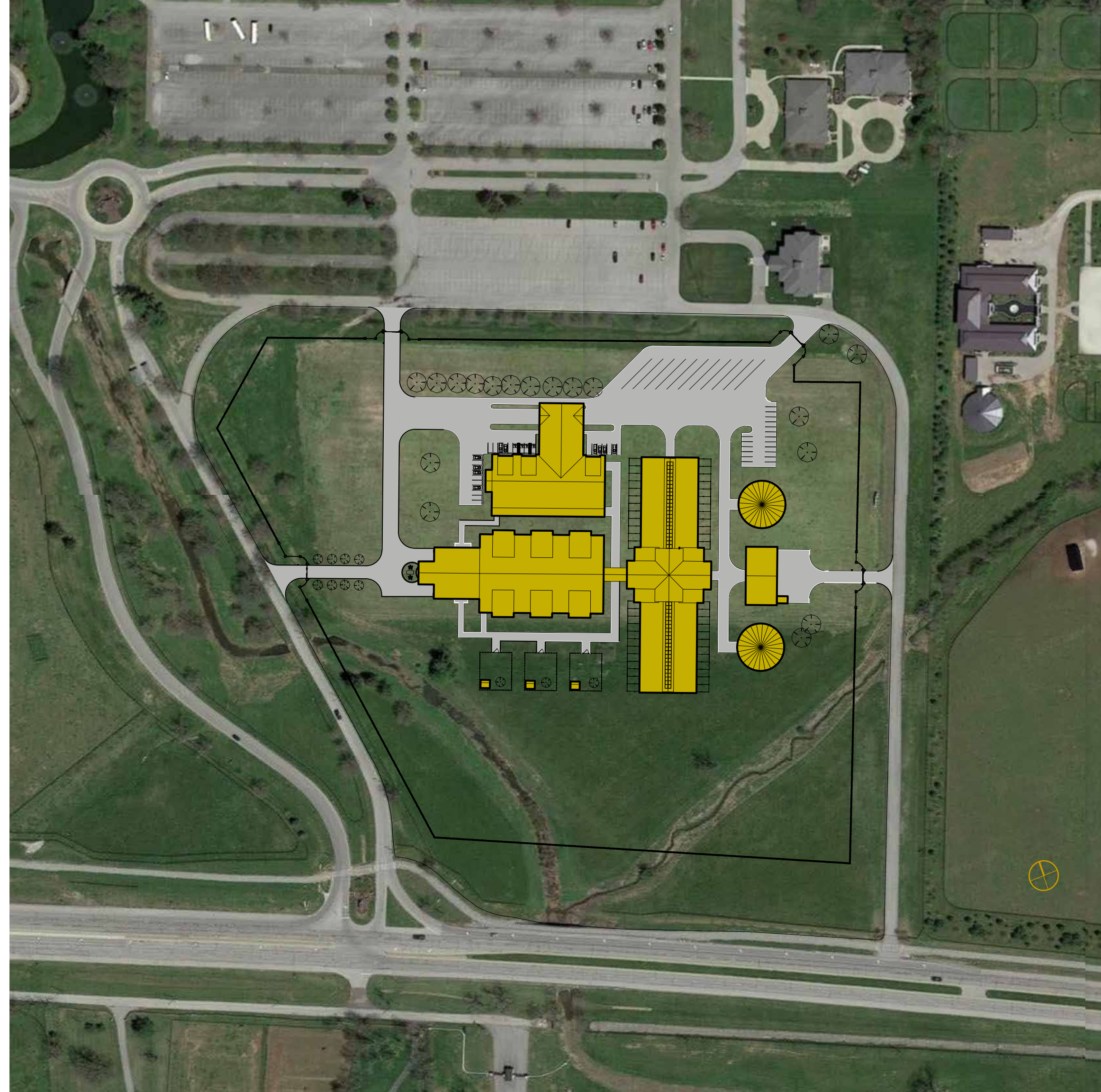


# KENTUCKY



**T**he Equine Rehabilitation Center sits on 11 acres and is located in Lexington, Kentucky. Due to the large amount of acreage needed, these facilities are often pushed back into the country and can be difficult to find. The site was chosen based on the location and its surroundings. It is conveniently located off of highway 75, making it easy to find and provides easy access on and off of the property. The facility's entrance is located on the west side of the site and has two exits, both located on the northern side. Service trucks can enter the site from the eastern side.

Parking lots are typically an eye sore so all parking was located on the northern side of the lot. If additional parking is needed, the preexisting parking on the adjacent lot can be used. The site is surrounded by several equine facilities and attraction. The Kentucky Horsepark Campground is nearby if overnight stays are necessary.







# SURROUNDING AMENITIES





# VEHICULAR CIRCULATION

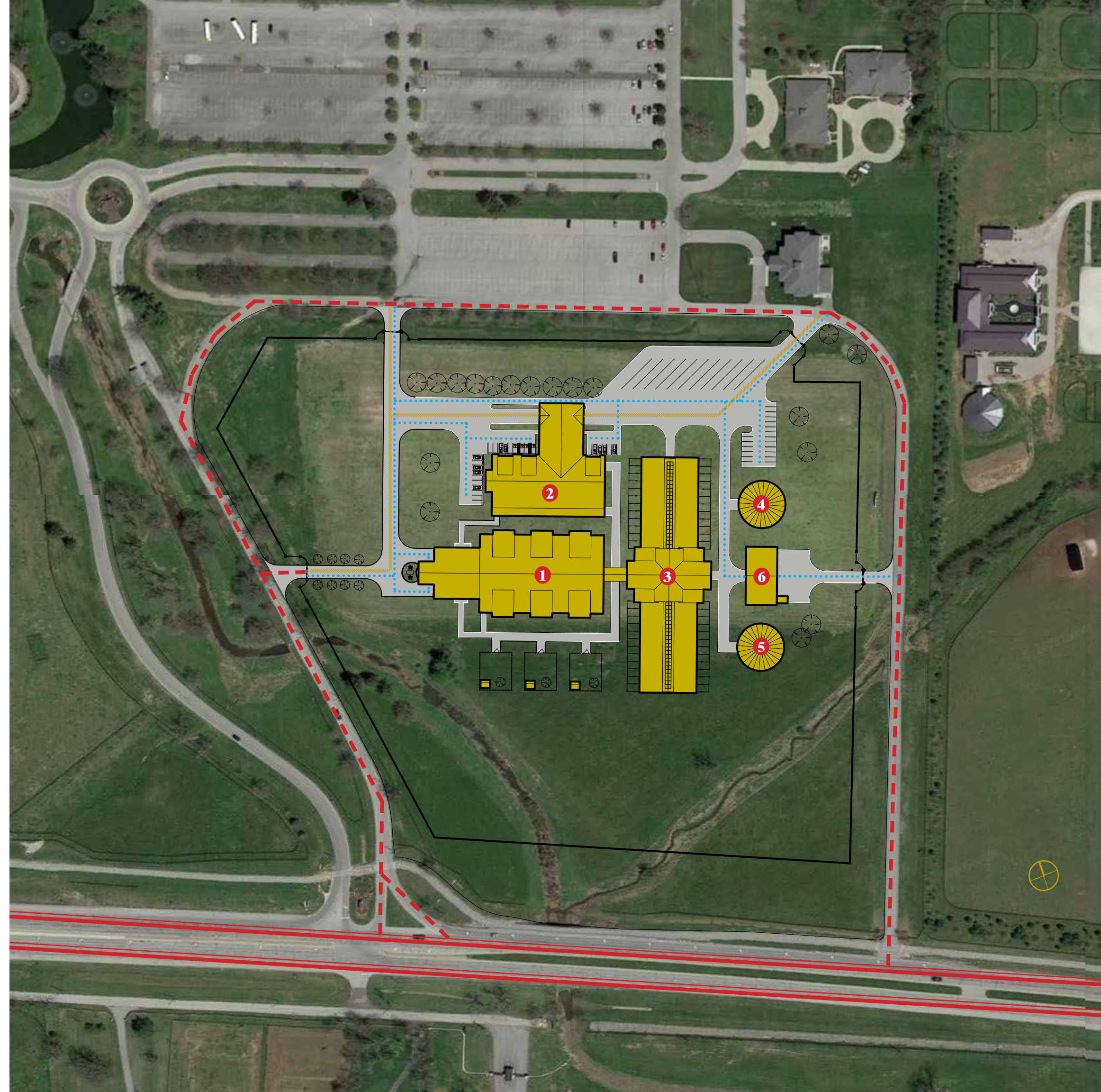
The facility is gated for the safety of the patients and to control who comes in and out of the property. Organized vehicular circulation is important for the safety of the patients and their handlers. By limiting vehicular activity to one side of the site, this maintains the separation and reduces any physical contact that could be made between the patient and vehicles. Upon entering the site on the western side, the main lobby with attached indoor arena is the first building that the public sees. Trucks with trailers will make their way to the rehab barn where they will approach a gated loading and unloading zone. Trailer parking is provided just beyond the gate. Parking is provided near the facilities for all other vehicles. Service vehicles can enter the site from the western or eastern side of the lot. The preexisting roads surrounding the site allows for easy access on and off of Highway 75.

## VEHICULAR LEGEND

-  HIGHWAY TRAFFIC
-  SITE TRAFFIC
-  TRAILERS
-  VEHICLES

## BUILDING KEYNOTE

-  MAIN LOBBY W/ATTACHED INDOOR ARENA
-  REHAB BARN
-  STABLES
-  EXERCISER- WET
-  EXERCISER- DRY
-  EQUIPMENT-HAY BARN



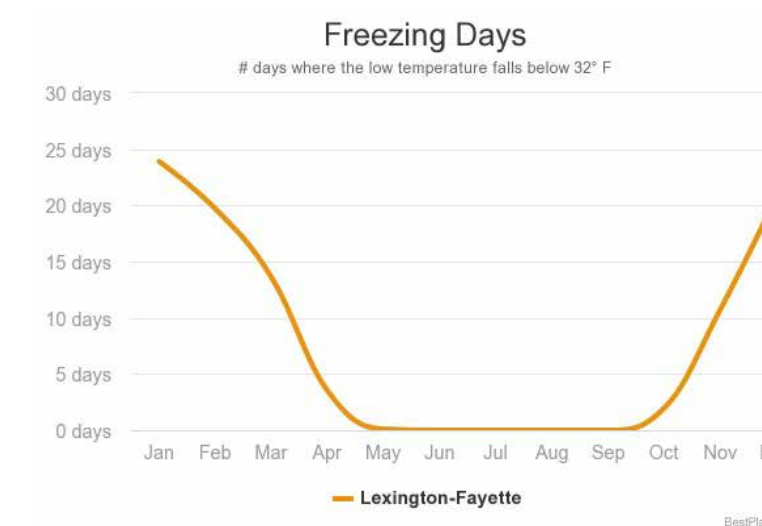
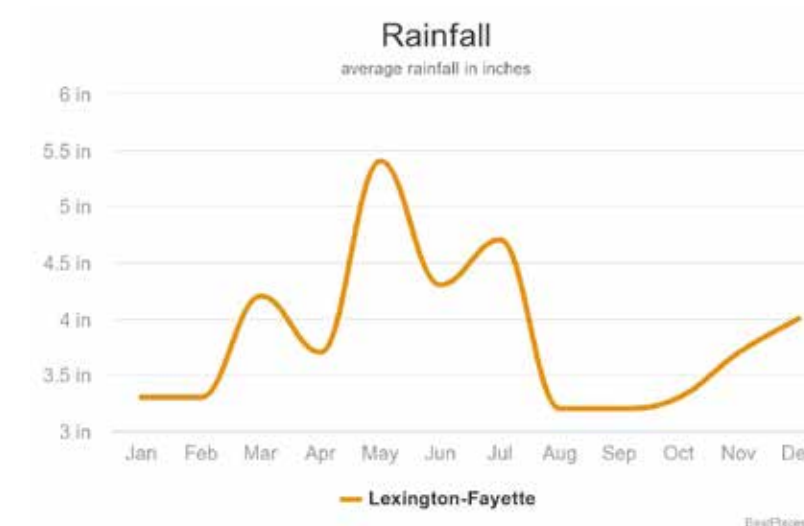
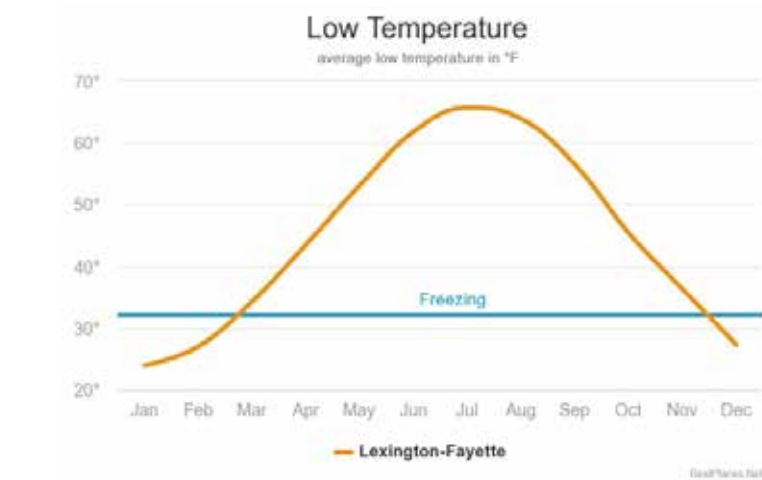
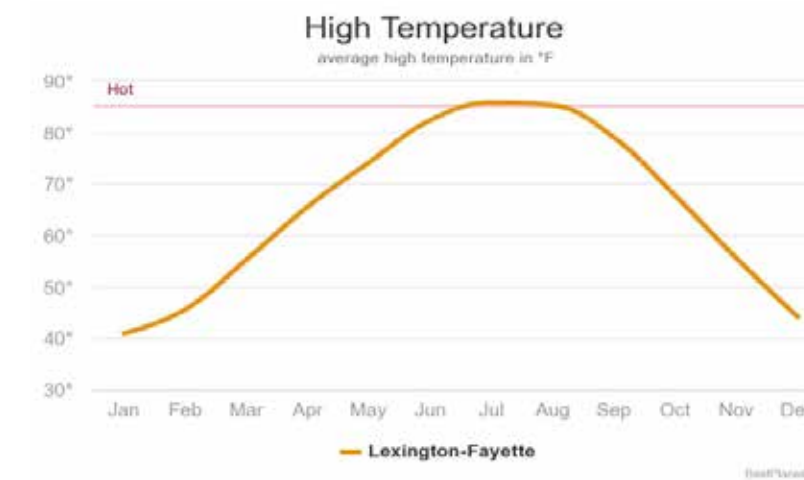
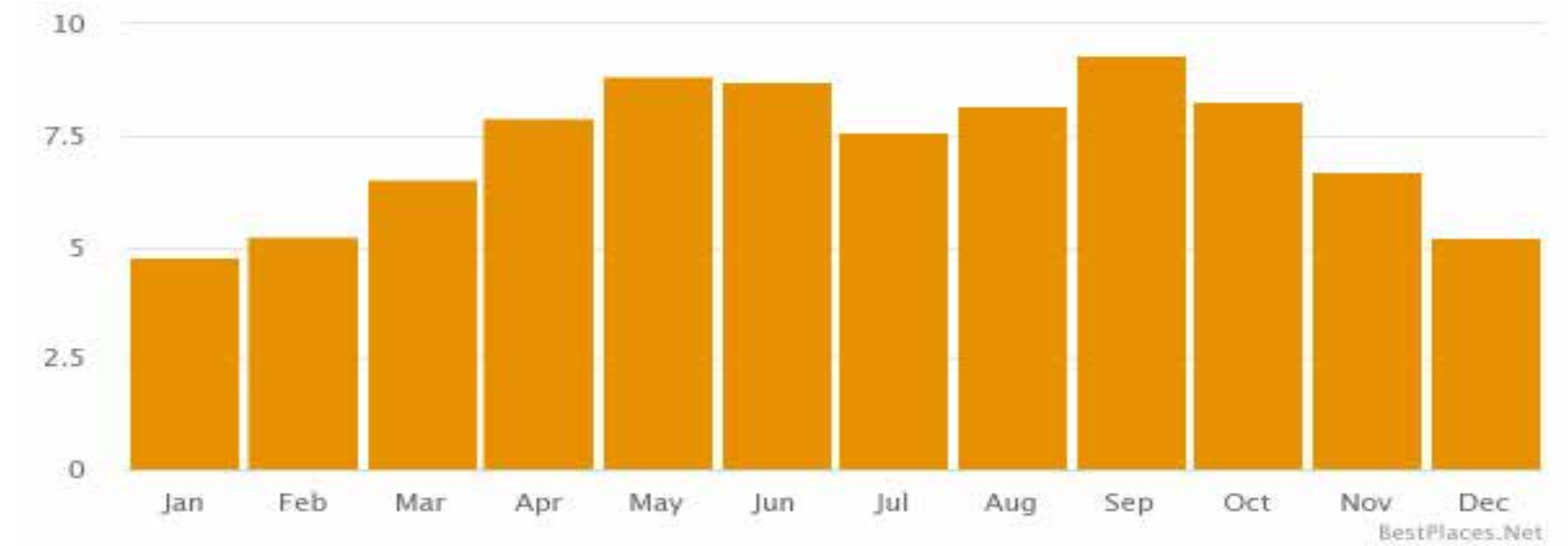
# CLIMATE

Kentucky experiences all four seasons, with warm summers and moderately cold winters. The daytime temperatures average 87 degrees while the lows average around 23 degrees. Due to the average snow and rainfall each year, it was important to create an environment that is comfortable for the patients and handlers all year long.

This was achieved by designing an indoor arena and attaching partially covered runs to each stall. This allows the horse to move freely in and out of the stall as long as the door remains open. Horses that experience too much time in there stalls begin to experience stress and exhibit stereotypes such as cribbing, chewing, wall kicking, and stall pacing. Covered walkways were also included for a safe transition from one facility to another.

Rainwater will be collected and reused throughout the facility as needed.

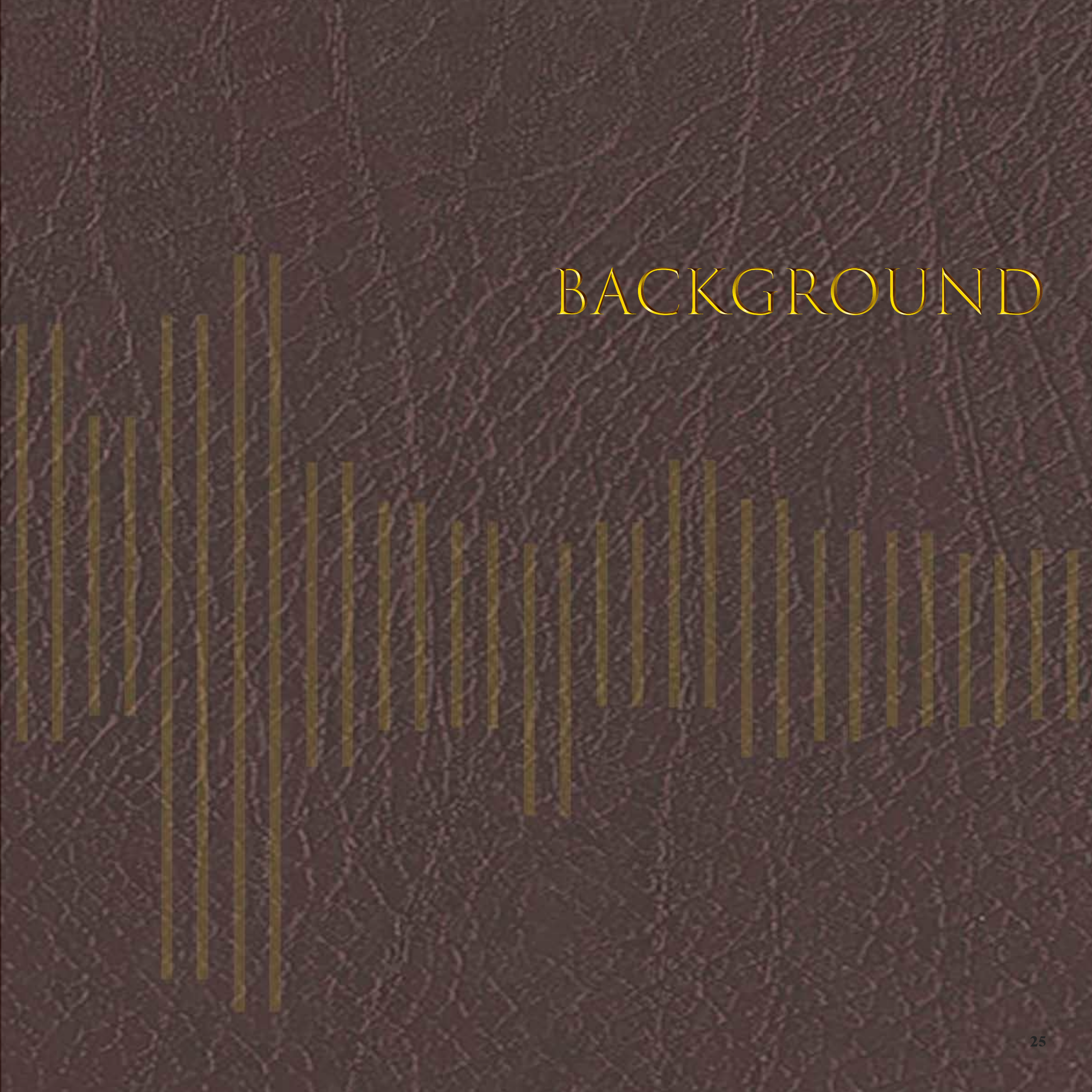
Bestplaces Comfort Index







# BACKGROUND



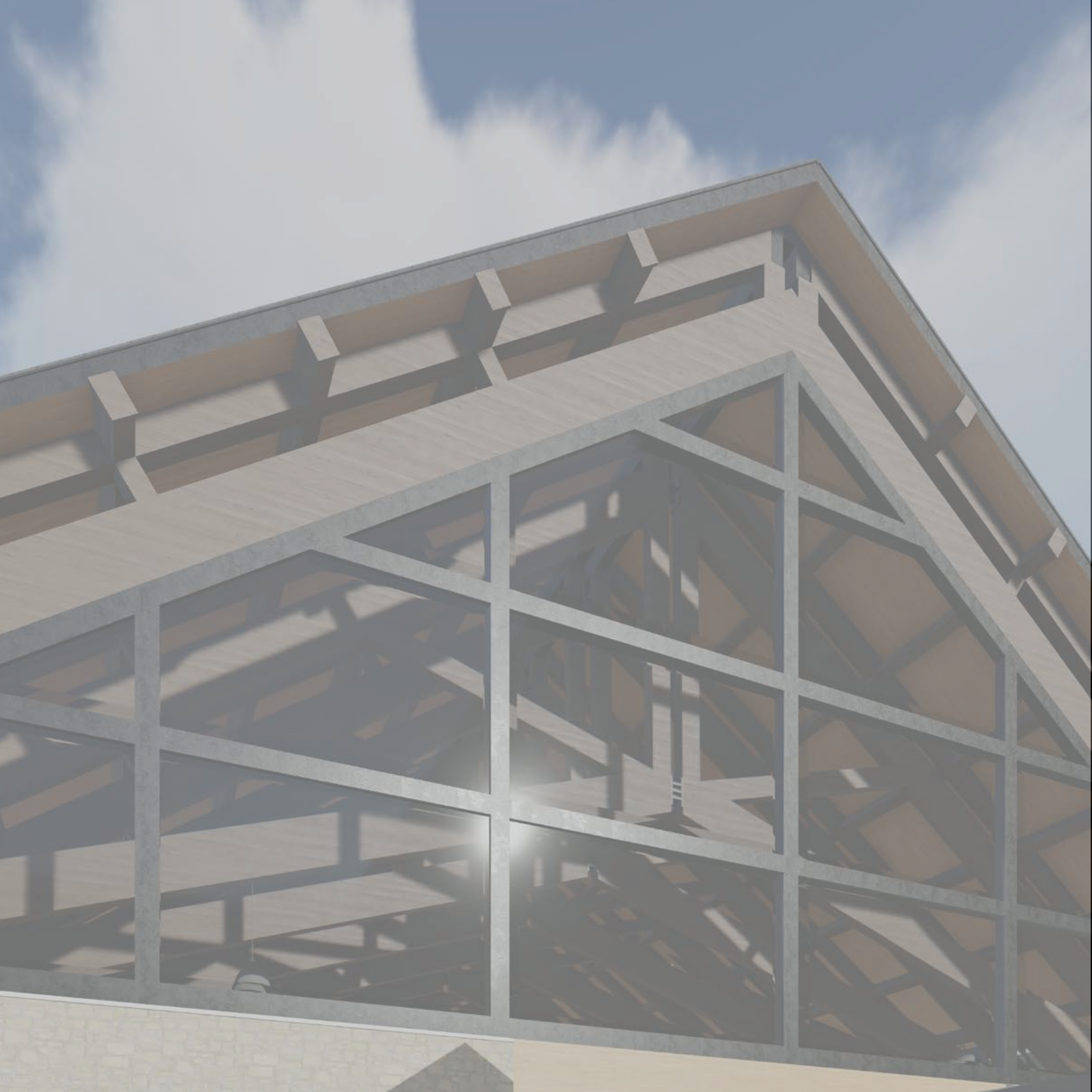
The inspiration behind this project is my loving mare, Misty. Misty has been with me for 15 years now. She has been my therapy through good and bad times and I believe she has molded me to the person I am today. As a kid, I never thought a large-beautiful creature could make such an impact on my life. It is because of her that I wanted to design a facility that would put the horses needs first. The facility would provide the best possible care to every horse that checked in.

Just on the other side of Highway 75 is the popular vet clinic, Hagyard Equine Medical Institute. Horses that undergo surgery at the Medical Institute can be transfered and recover at the Equine Rehabilitation Center. However, the facility is open to all patients who need care outside of the Hagyard Equine Medical Institute. The goal is to provide a safe, healthy, and happy atmosphere for the patients as they complete their therapy programs.

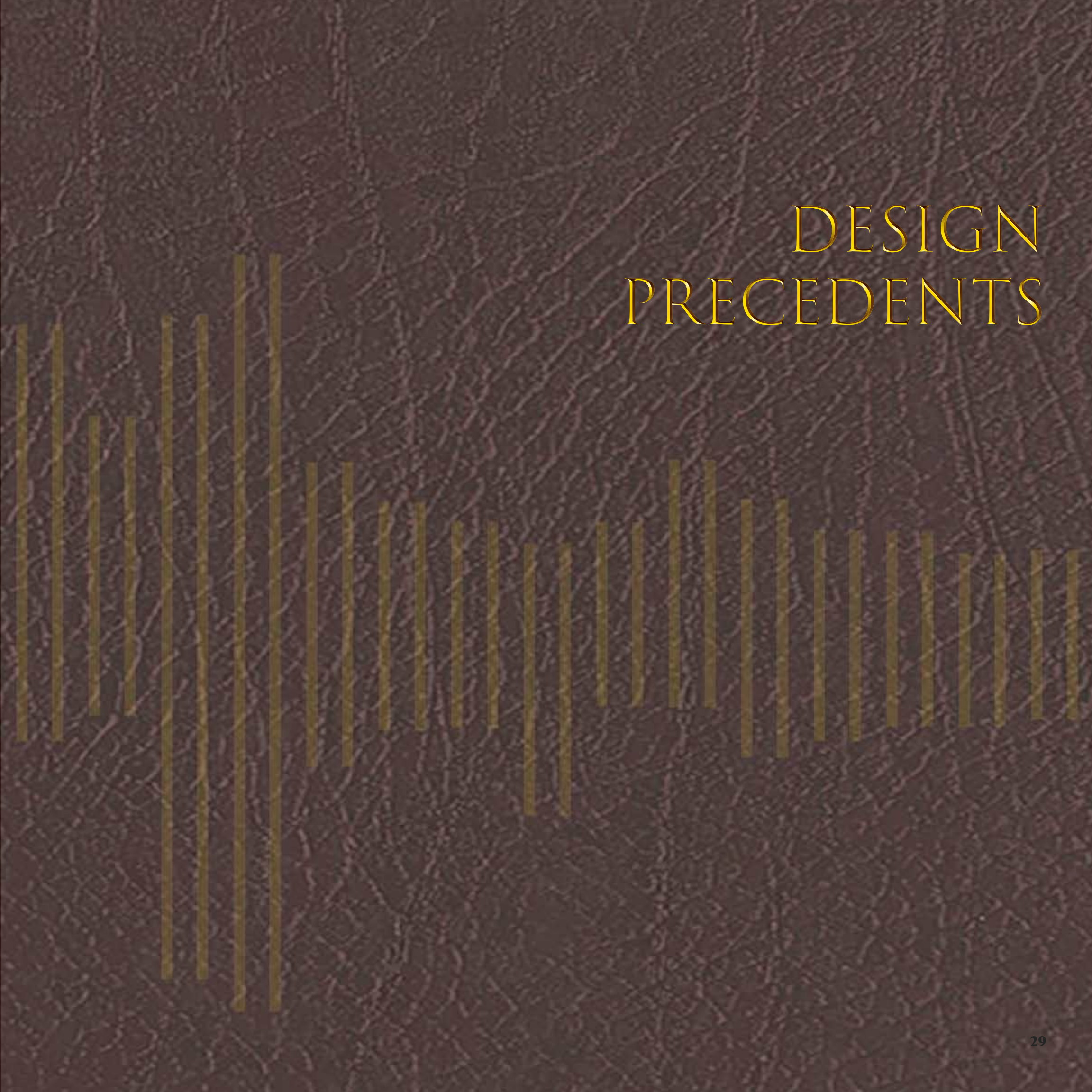
The rehab barn was designed to provide specific treatments. A luxurious stables was designed to provide the most comfortable living conditions. The indoor arena allows patients to stay on schedule with their given rehab program no matter the weather. Hay has a chemical reaction that builds heat and can become a fire hazard. It is important to store the hay in a separate building.

A well organized facility that is properly run and maintained will create a comfortable atmosphere for the patients, ensuring that with proper treatment and care, they will be back on their hooves in no time.





# DESIGN PRECEDENTS



**JAMES CUTLER**



I was intrigued by Cutler's work. The structures are large yet, feel so light. Throughout each project the structure remains exposed and his use of natural materials and steel heavily influenced my design. His proportions are controlled and balanced. Views are created on all sides and natural light fills the double height spaces.

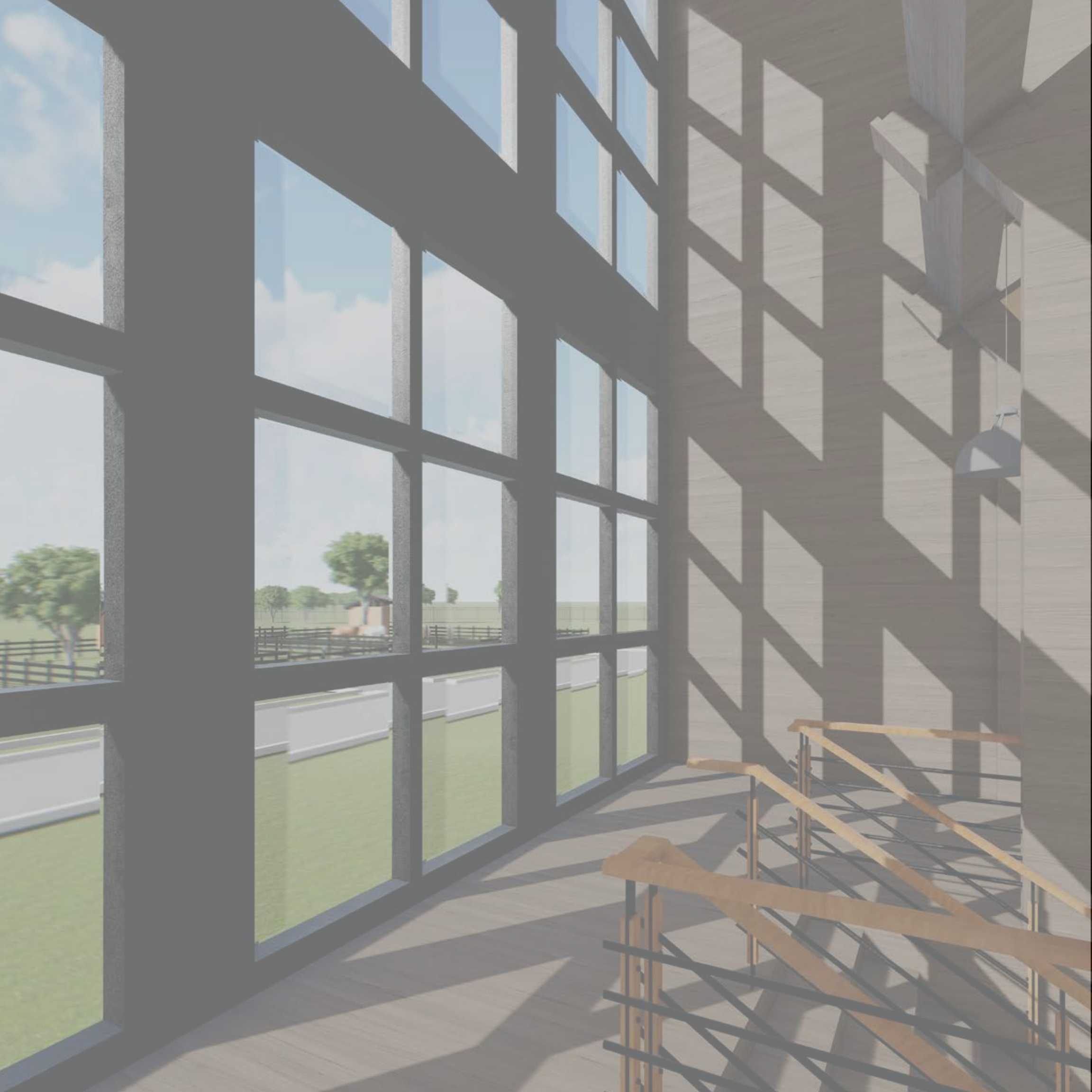
**TEXAS A&M UNIVERSITY EQUINE ORTHOPEDIC AND WELLNESS CENTER- COLLEGE STATION, TEXAS**



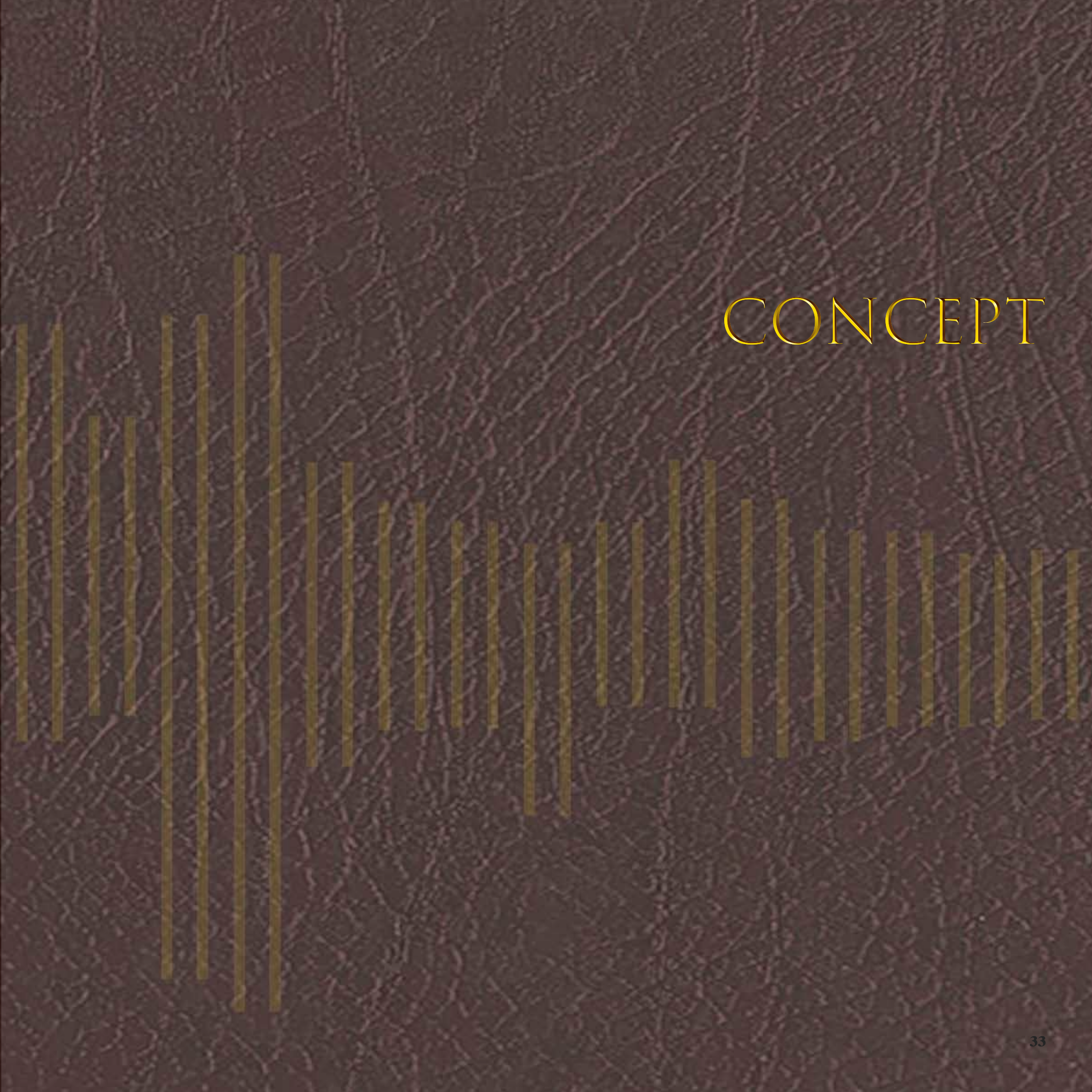
**CENTER RANCH- CENTERVILLE, TEXAS**







# CONCEPT



# CONCEPTUAL PROGRAM



**EXERCISER-WET**



**EXERCISER-DRY**



**HIGH SPEED TREADMILL**



**AQUATREAD**



**SOLARIUM**



**INDOOR ARENA**



**ULTRASOUND**



**EXAM**



# DESIGN GUIDELINES

- 14'X14' stalls
- 16' wide aisles for horses
- ADA for pedestrians
- 10' minimum ceiling for horses
- Natural light
- Covered stall runs
- Turnout pastures
- Reduce site circulation
- Gated property
- Gated loading/unloading zone
- Separate hay barn
- Covered walkways
- Two story lobby

# PRELIMINARY DESIGN

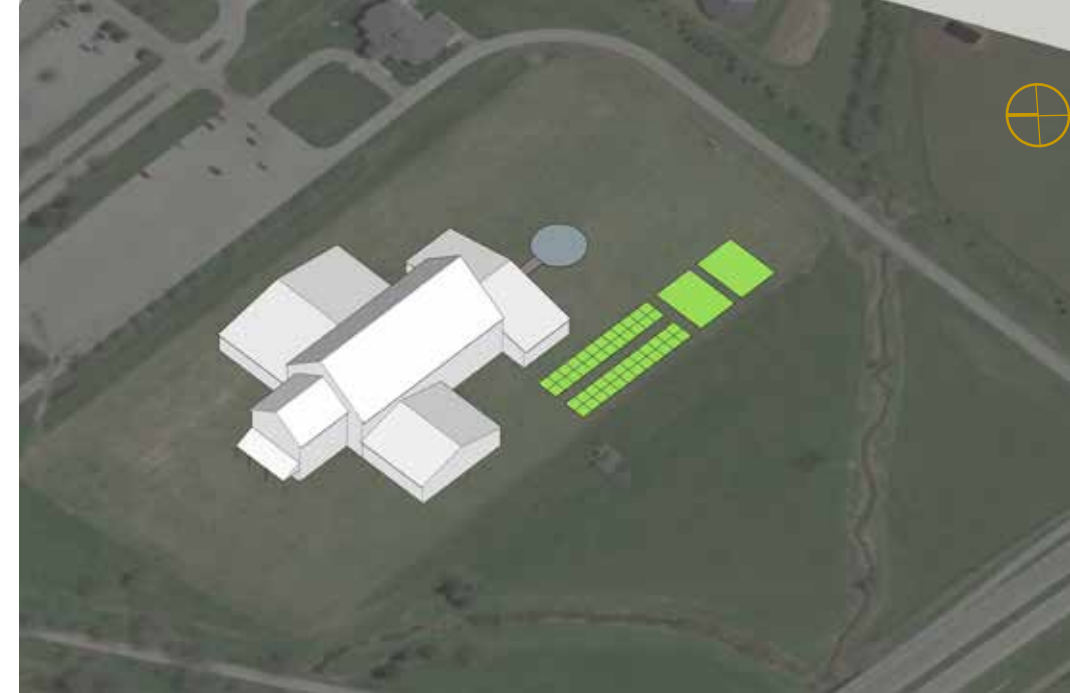
There are various ways an equine facility can be designed. Some are organized as one large volume while others are broken into separate buildings based on the program and the equipment needed. Both of these options were explored throughout the preliminary design phase. The overall program consists of a rehab barn, stables, a main lobby, an indoor arena, an exerciser-wet, an exerciser-dry, an equipment-hay barn, turn outs, and pasture.

**SCHEME A** shows the programs organized as a cluster. This option reduces unnecessary circulation around the site and prevents any exposure to harsh weather conditions. Turnouts and pasture are located near the rear.

**SCHEME B** breaks the programs into separate buildings, allowing indoor and outdoor circulation. The buildings are oriented in a horseshoe shape, creating a central courtyard. Turnouts and pasture are located at the rear.

**SCHEME C** begins working with balance, symmetry and geometry. The way a horse and its handler move through the facility is very important. Turnouts and pasture surround the back of the facility.

As the schemes were further developed, the final layout and forms took shape.



SCHEME A

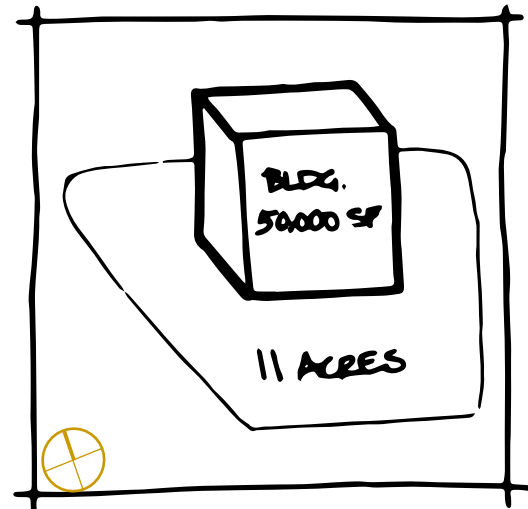


SCHEME B



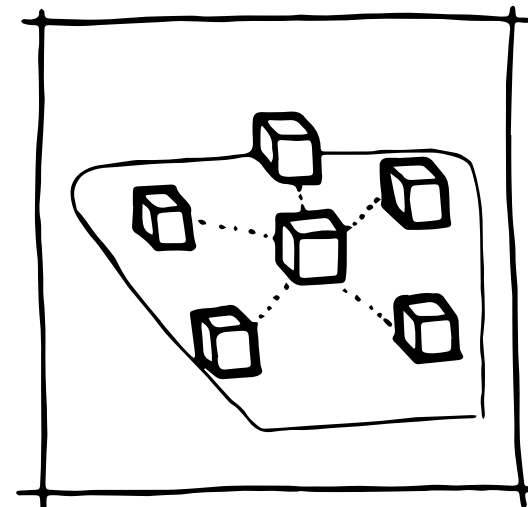
SCHEME C

# DESIGN DEVELOPMENT



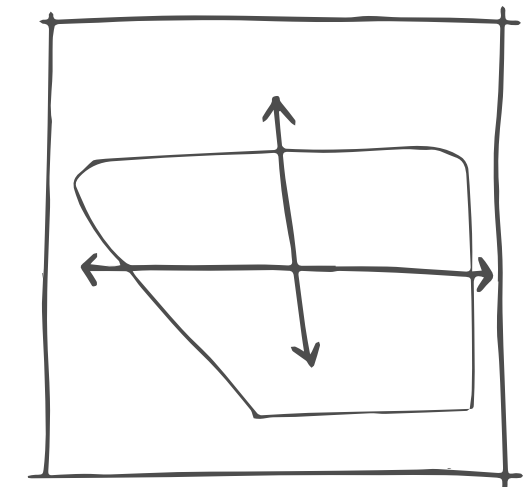
## SITE

The site is located off of Highway 75 and is composed of 11 acres where the Equine Rehabilitation Center of approximately 50,000 SF will sit.



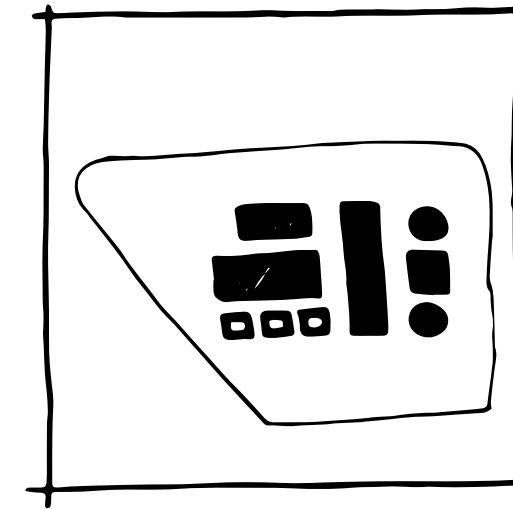
## EXPLODE

The program was separated into 6 buildings. The rehab barn, stables, main lobby with attached indoor arena, an exerciser-wet, an exerciser-dry, and an equipment-hay barn.



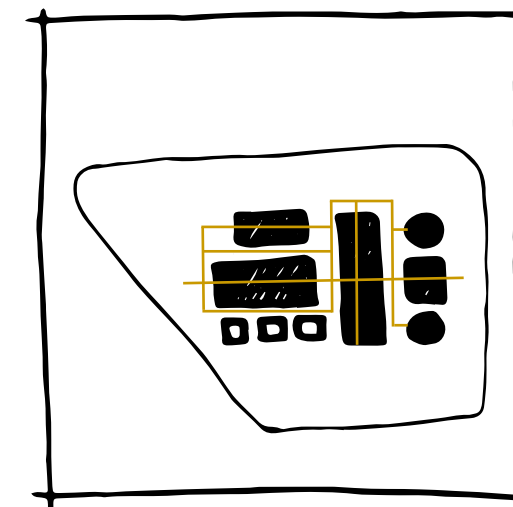
## AXIS

An axis was used to create a sense of order. This helped when deciding where the entrance and exits should be. The axis also helps maintain the circulation throughout the facility.



## GEOMETRY

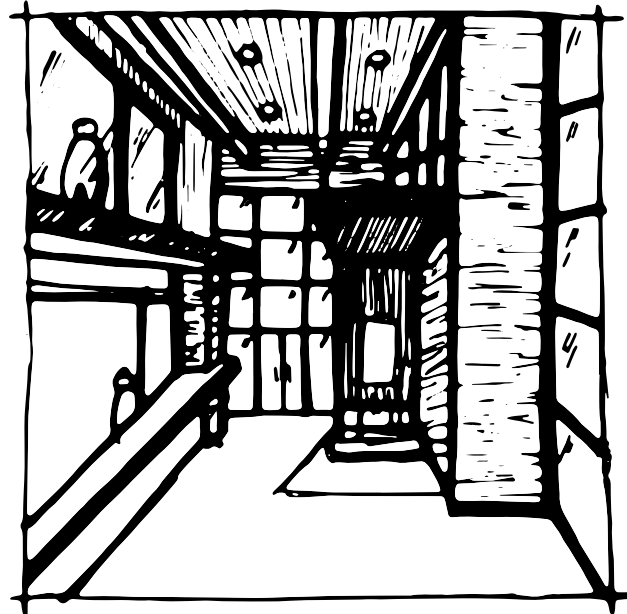
The buildings were separated and designed using geometry to create functional, safe, and aesthetically pleasing spaces. Symmetry and proportion maintained a healthy balance throughout the design. Despite the scale of these buildings, when proportioned and sited correctly, they fit together.



## CIRCULATION

The circulation was carefully thought through from vehicular traffic to the horse and its handler. Keeping the vehicles separate from the patients is crucial. Due to Kentucky's climate, a covered path has been created from one building to the other, ensuring the horse and handler get to their next destination as safe and quickly as possible.

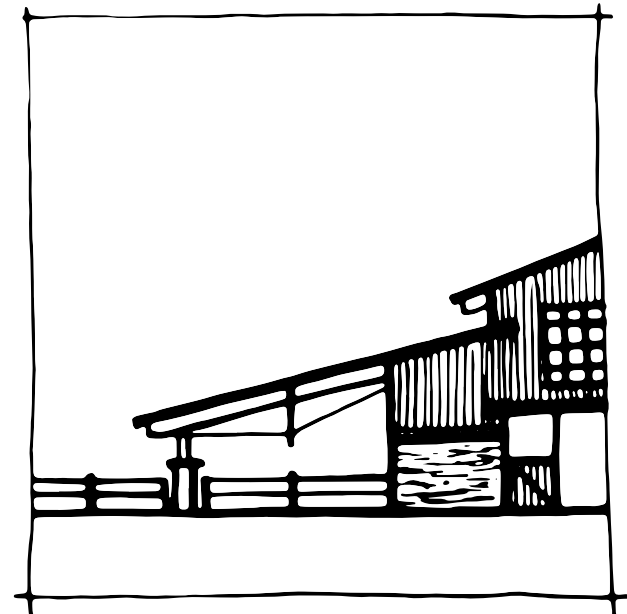
# SKETCHES



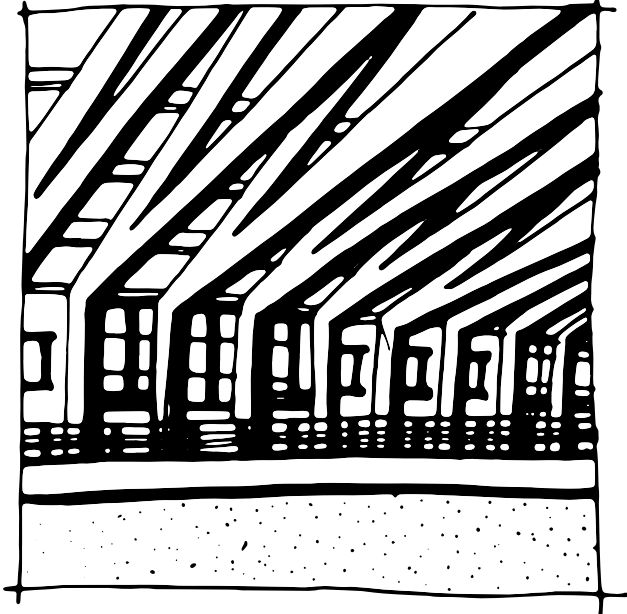
MAIN LOBBY



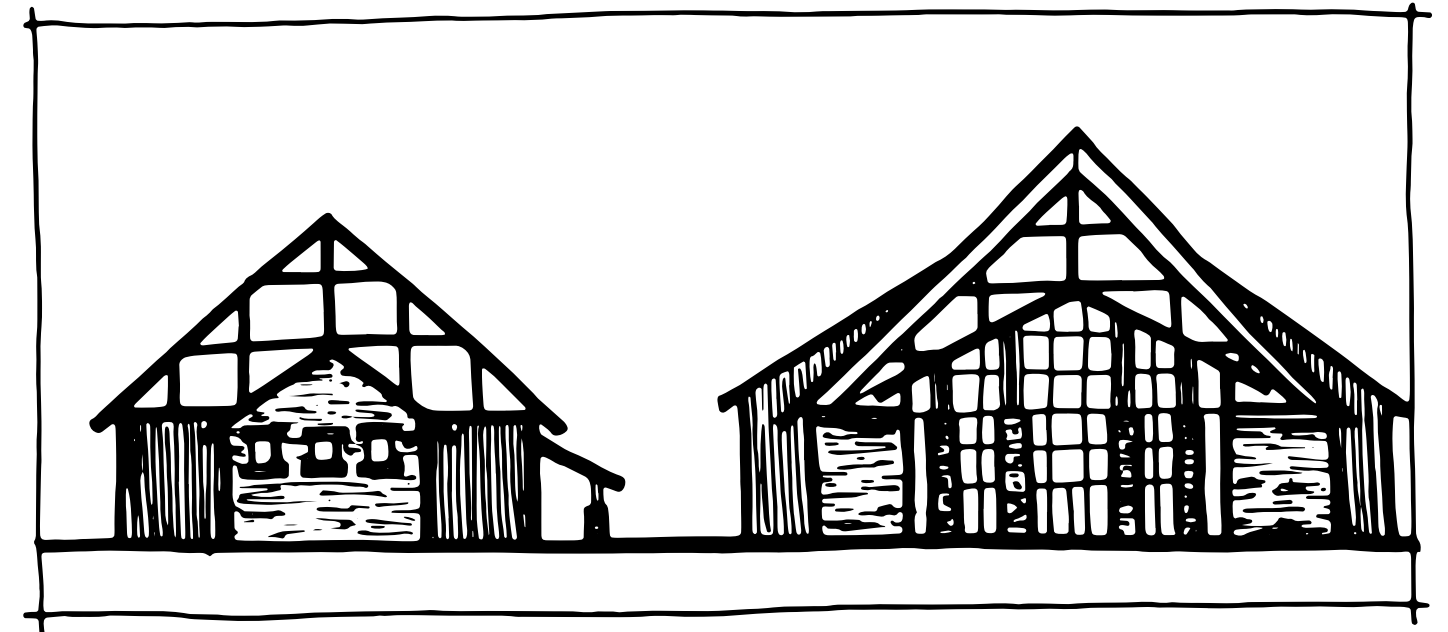
STABLES



STALL RUNS



ARENA SEATING



WEST ELEVATION



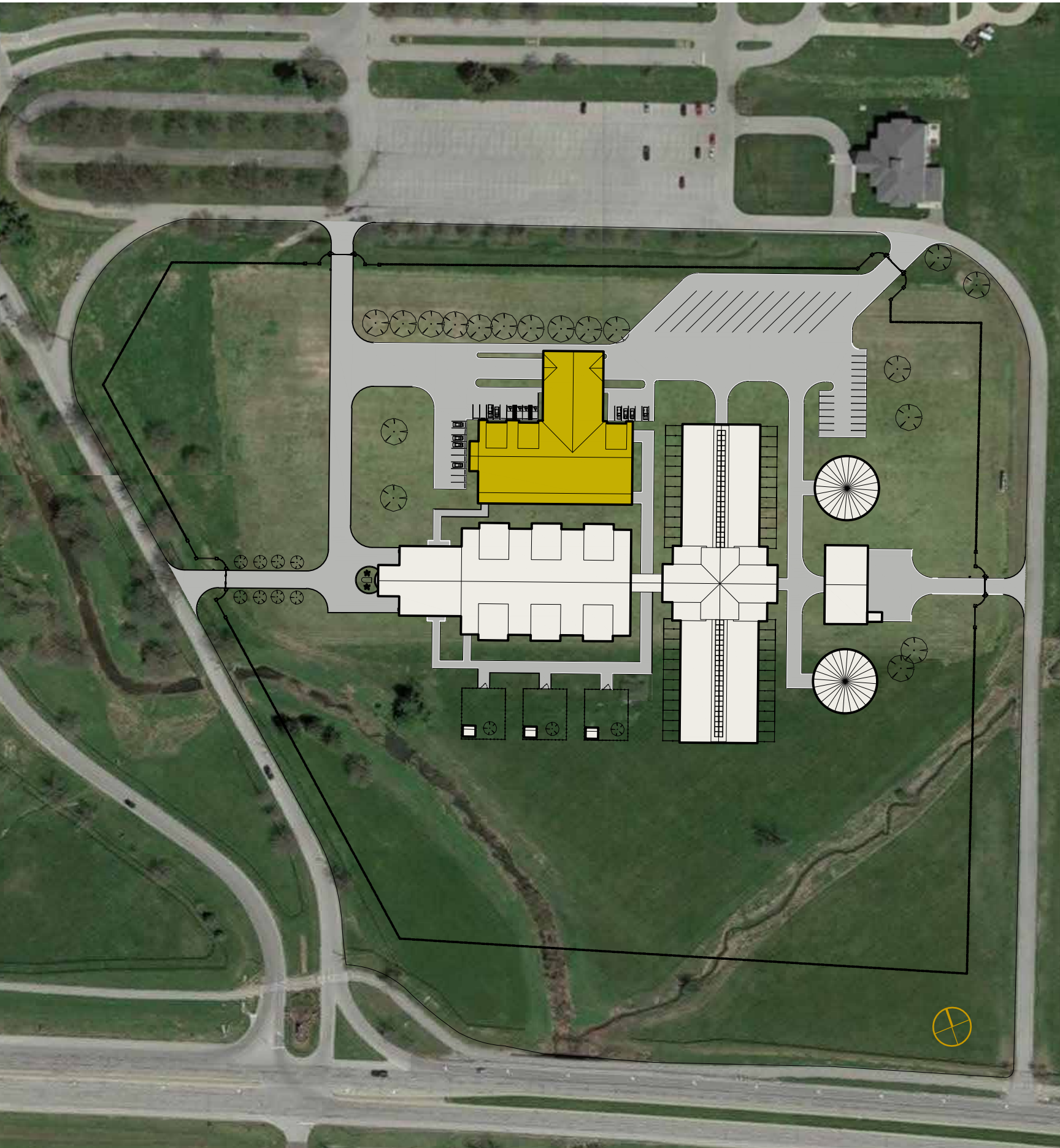
SOUTH ELEVATION



4089

ENTRANCE

# REHAB BARN







**ACCESS TO THERAPEUTIC BARN**



**GATED LOADING/ UNLOADING ZONE**

# REHAB BARN | PROGRAM

The Rehab barn is where the patient will be examined and treated based on the existing conditions upon arrival. The patient will be unloaded from the horse trailer in the gated loading/unloading zone to ensure the safety for the patient and the handler.

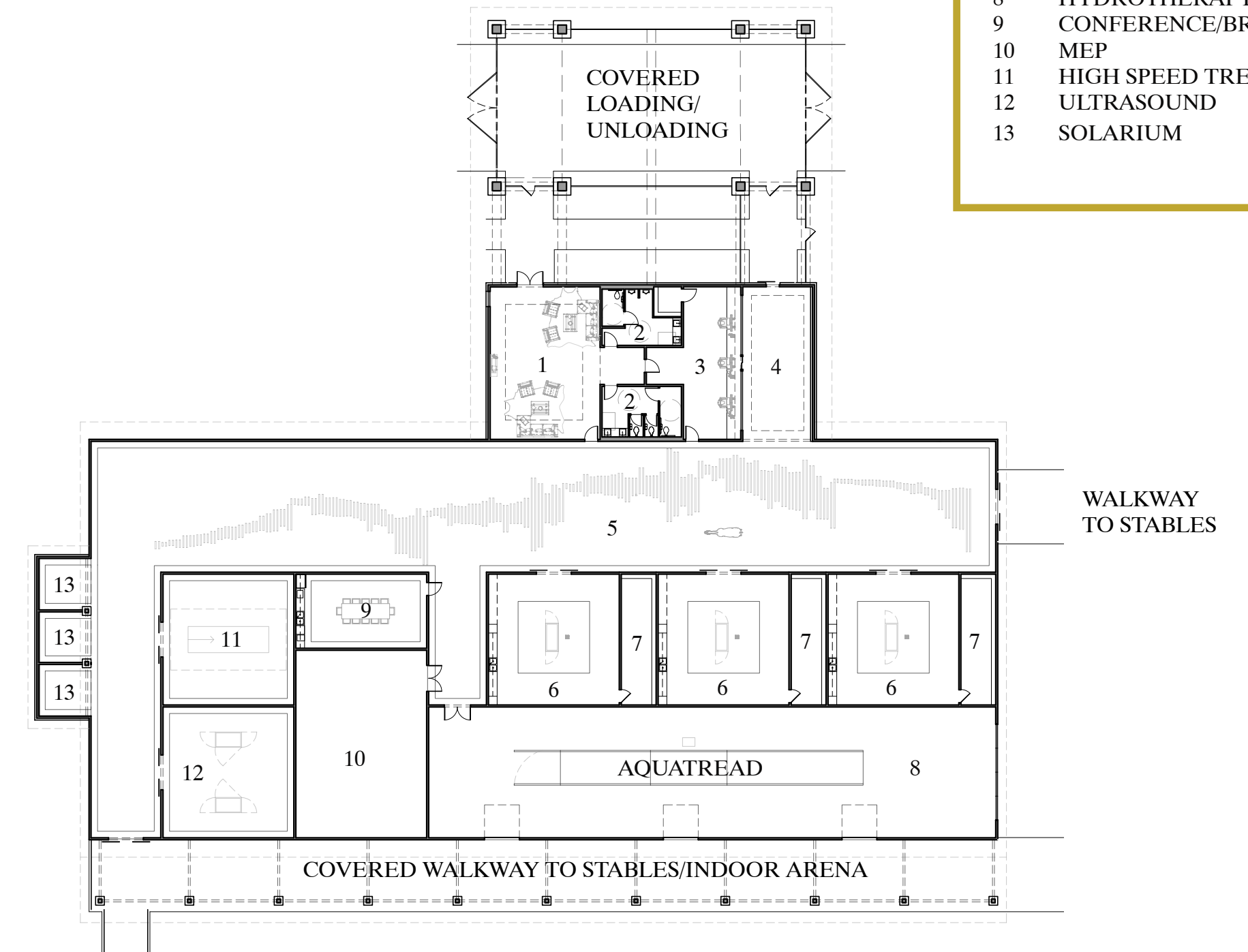
The patient and handler will proceed through the barn door where the patient will be checked in by the receptionist. A veterinary assistant will take the patient to the examination room to diagnose the symptoms. If necessary, the vet may ask the assistant to trot the patient down the wide long hallway, also known as the lameness runway, to see if the patient is sound. The unique floor pattern down the lameness runway reflects a graph from a study that was done in regards to how a horse moves.

The rehab barn contains a number of spacious treatment rooms. The ceilings are tall and open so that the patient does not feel claustrophobic. Large windows allow natural light to enter the space and provide views to the outside. The open ceiling allows all of the structural and MEP systems to be exposed. Heavy timber, stone, and steel are used throughout the buildings. Recycled rubber brick flooring is used throughout the buildings because of its durability and aesthetic options. It is slip resistant and holds up to abuse and in a wide variety of environmental and weather conditions.

The patients owner(s) can wait in the lobby until treatments are done. Once the patient has completed their therapy session(s), the patient will be escorted to the stables for proper care and rest.

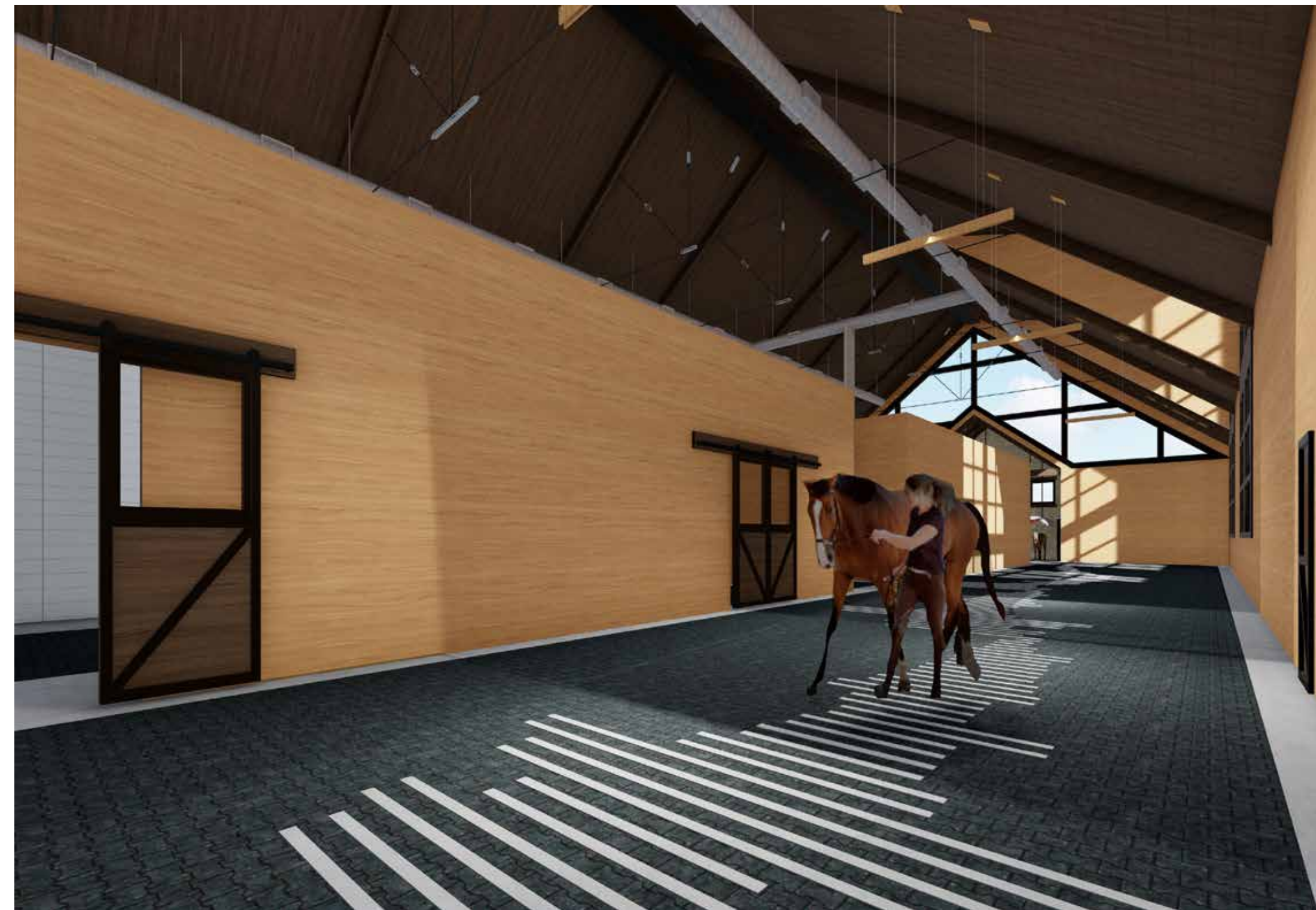
## FLOOR PLAN KEY NOTES

- 1 LOBBY
- 2 RESTROOM
- 3 OFFICE
- 4 PATIENT CHECK-IN
- 5 LAMENESS RUNWAY
- 6 EXAMINATION ROOM
- 7 STORAGE
- 8 HYDROTHERAPY
- 9 CONFERENCE/BREAK ROOM
- 10 MEP
- 11 HIGH SPEED TREADMILL
- 12 ULTRASOUND
- 13 SOLARIUM

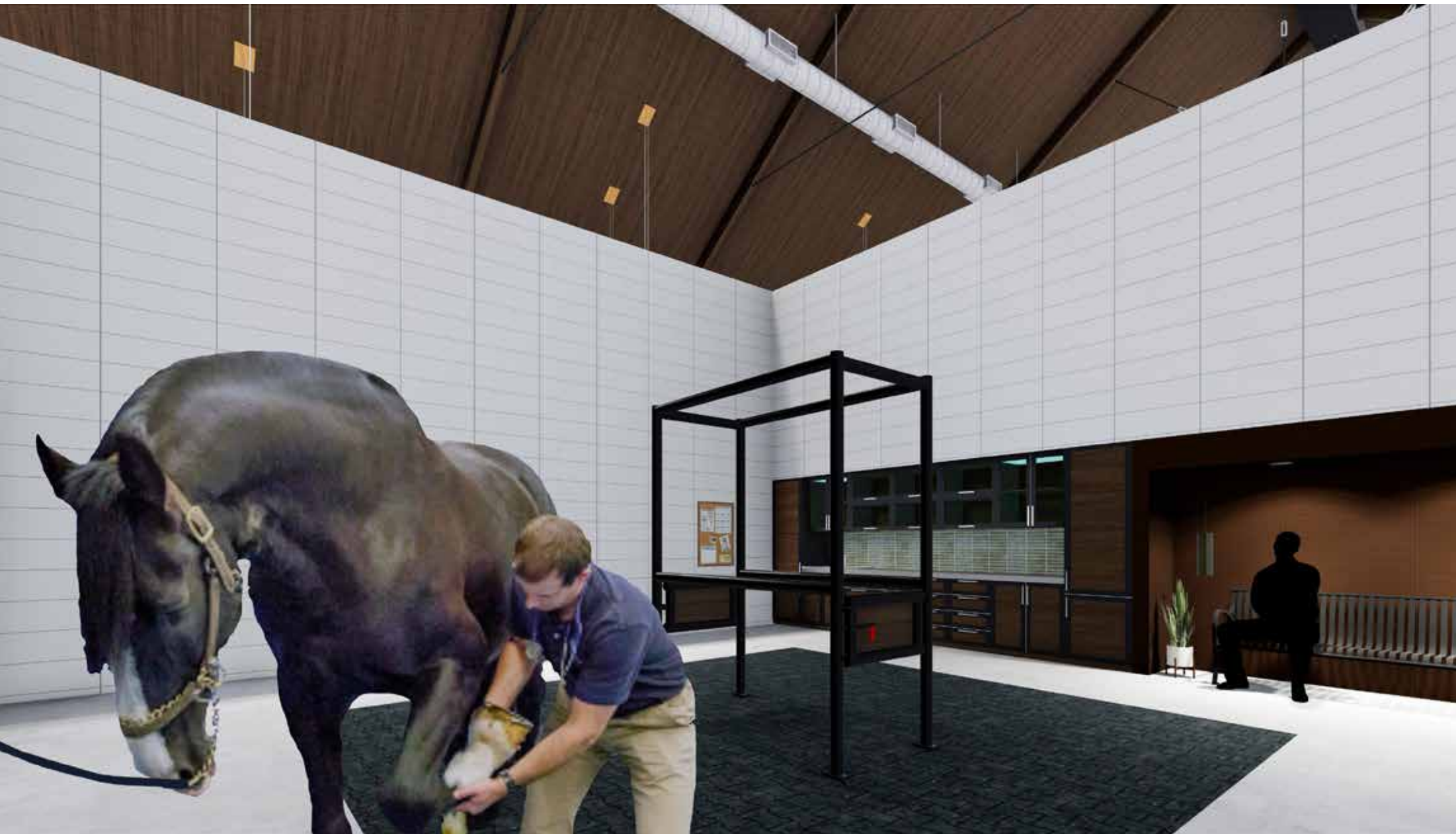




**PATIENT CHECK-IN**



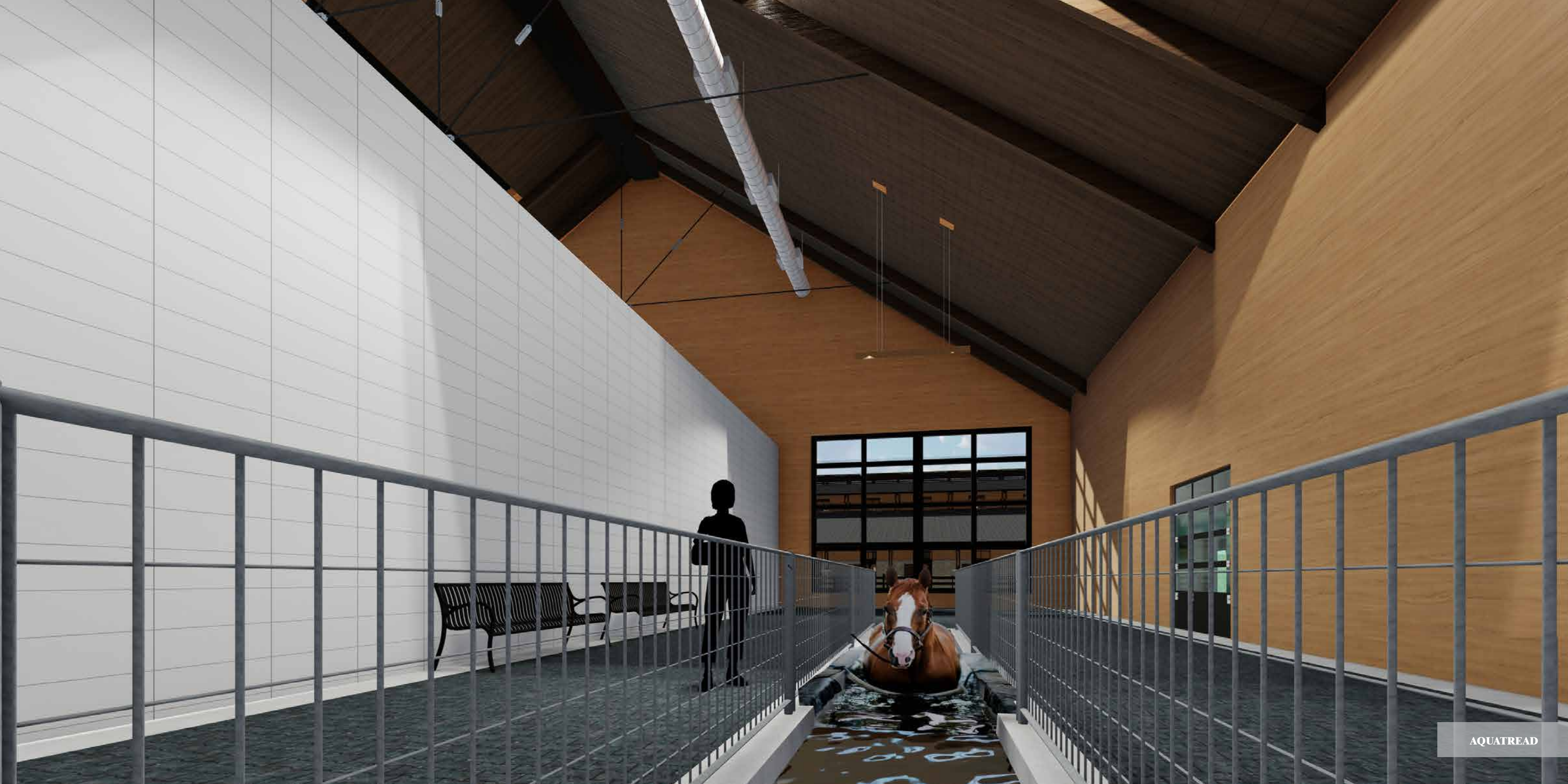
**LAMENESS RUNWAY**



**EXAMINATION ROOM**

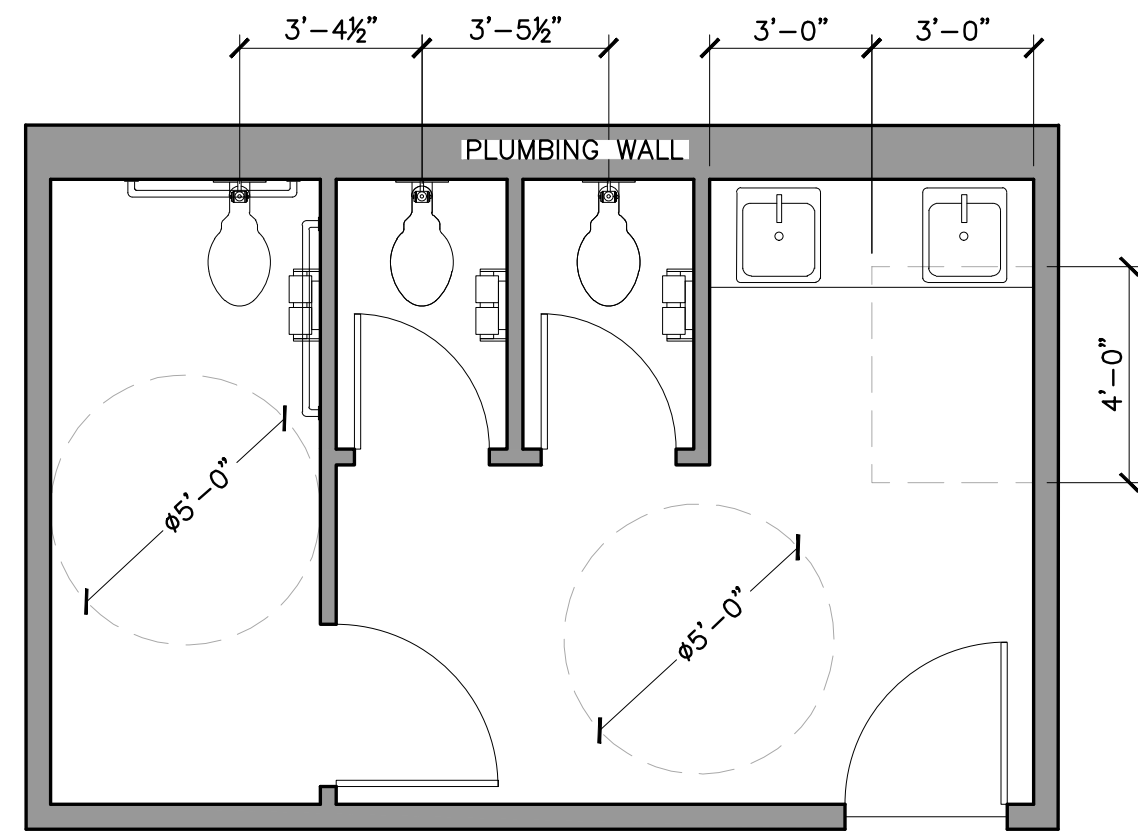


**SOLARIUMS**





# ACCESSIBILITY



**RESTROOM DETAIL**

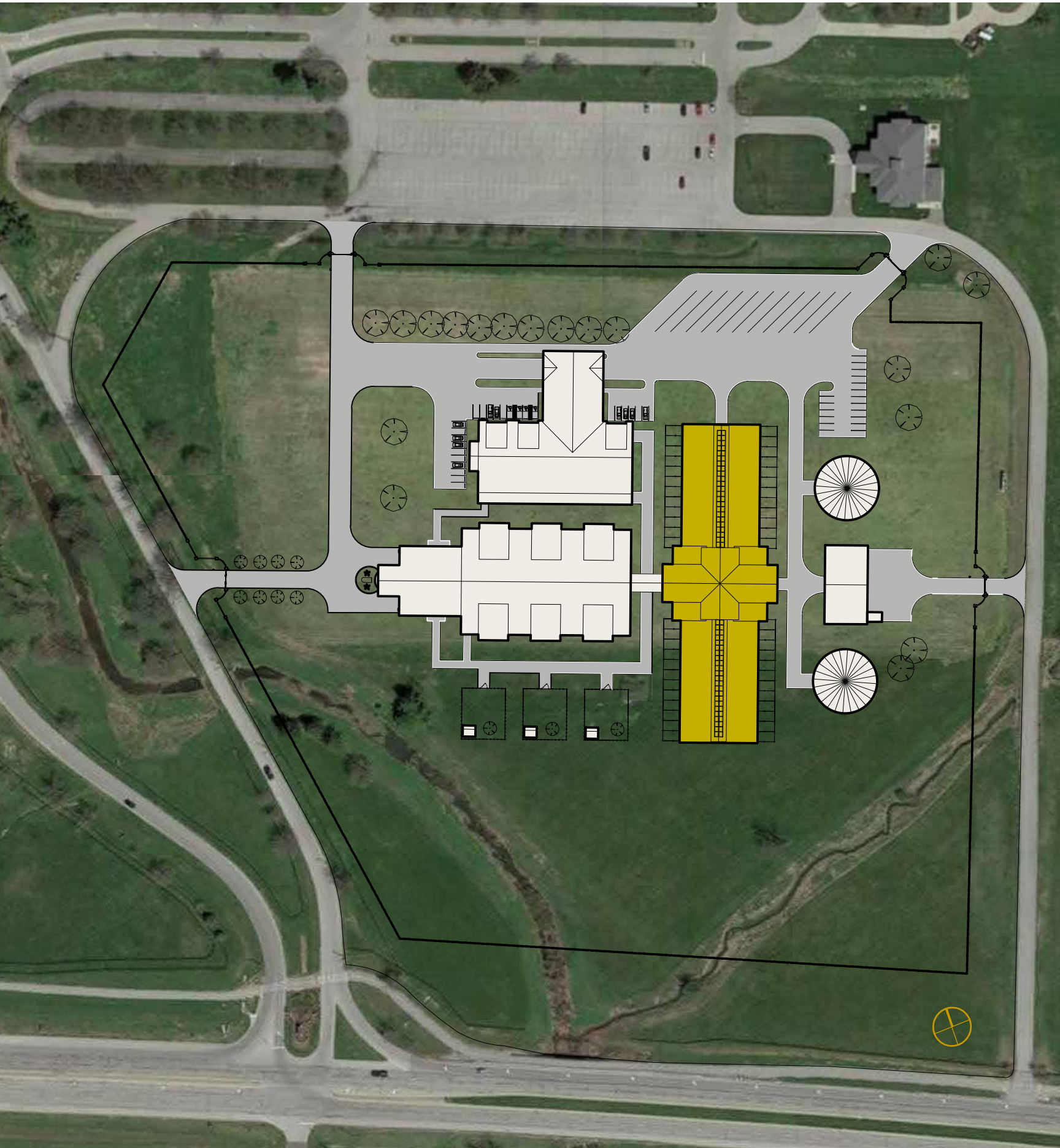


**RESTROOM**





# STABLES



# STABLES | PROGRAM

Attention to detail is very important when designing the stables because this is where the patient will spend most of their time. Most horses do not like being locked up in a stall all day. It is important to create an atmosphere that is safe, healthy, and comfortable.

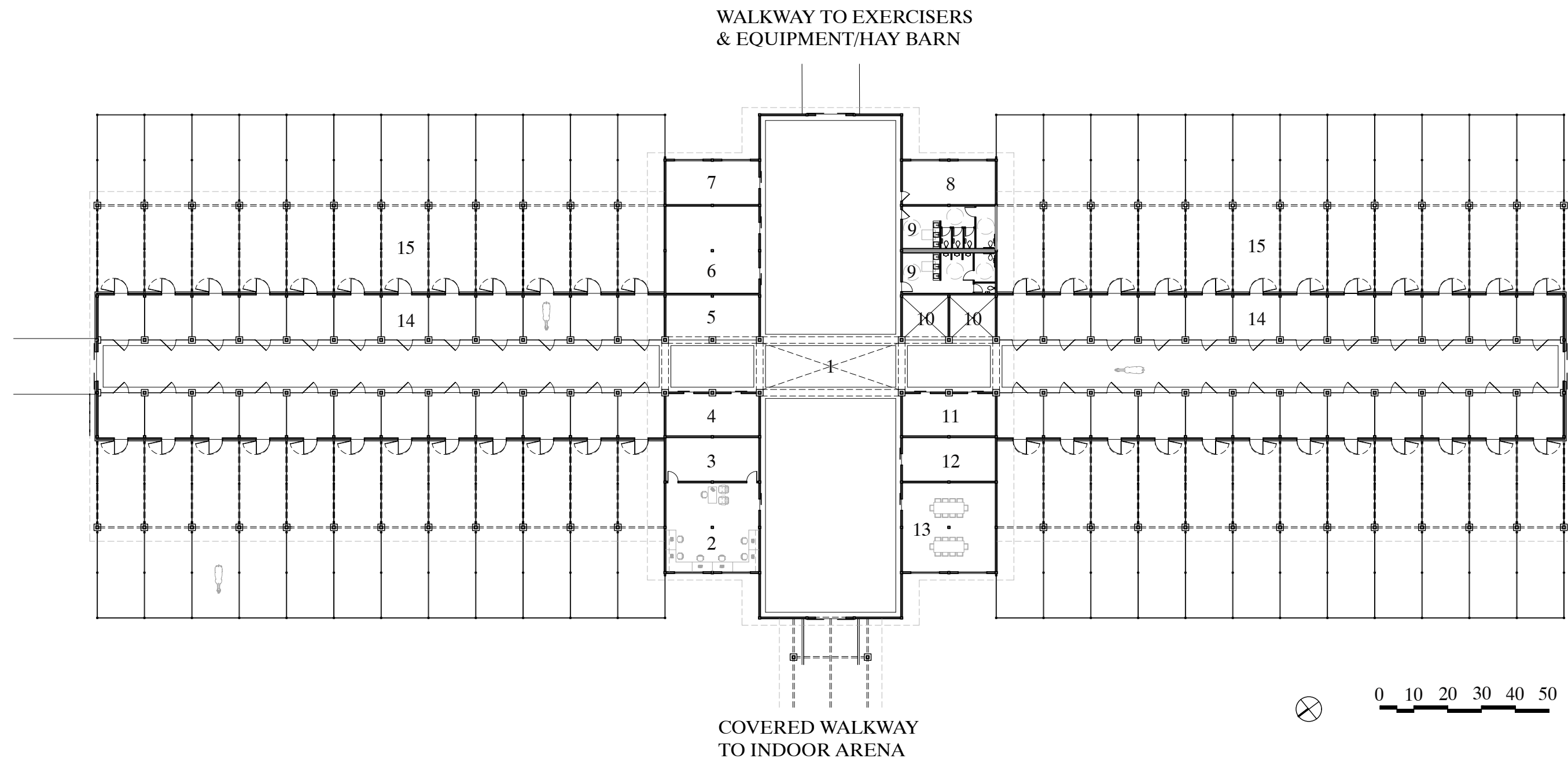
The structure features heavy timber framing with steel connections and a stone veneer. The aisles are 16' wide to allow patients and handlers to pass each other safely. A continuous ridge skylight is provided on both wings of the stables to provide a generous amount of natural light indoors. Natural light is more conducive to healthy conditions for the horse than fluorescent and incandescent lighting. Overall, the structure is light, bright, and full of healthy ventilation.

The luxurious stables contain 48 stalls with attached runs. The stalls are above average size which allows the patient to lie down and rest without feeling cramped. Each stall has a partially covered run providing shade, cool breeze, and a room with a view. This allows the patient to come and go from their stall to stretch their legs and get fresh air. Each stall has a private window and the clerestory windows along the wings allow for more natural light.

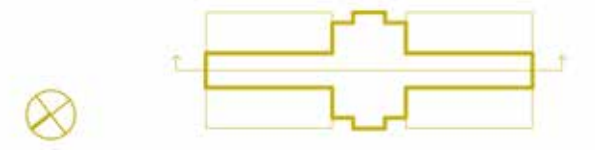
The stone columns not only provide structure, they each have a niche with a hook for storing the patients halter. This prevents loose tack from hanging in the aisles.

## FLOOR PLAN KEY NOTES

1	AISLE INTERSECTION	9	RESTROOM
2	OFFICE	10	WASH RACK
3	OFFICE STORAGE	11	TACK ROOM
4	TACK ROOM	12	MEP
5	FARRIER STATION	13	CONFERENCE ROOM
6	STORAGE/EQUIPMENT	14	14'X14' STALL
7	FEED ROOM	15	14'X54' STALL RUN
8	LAUNDRY ROOM		

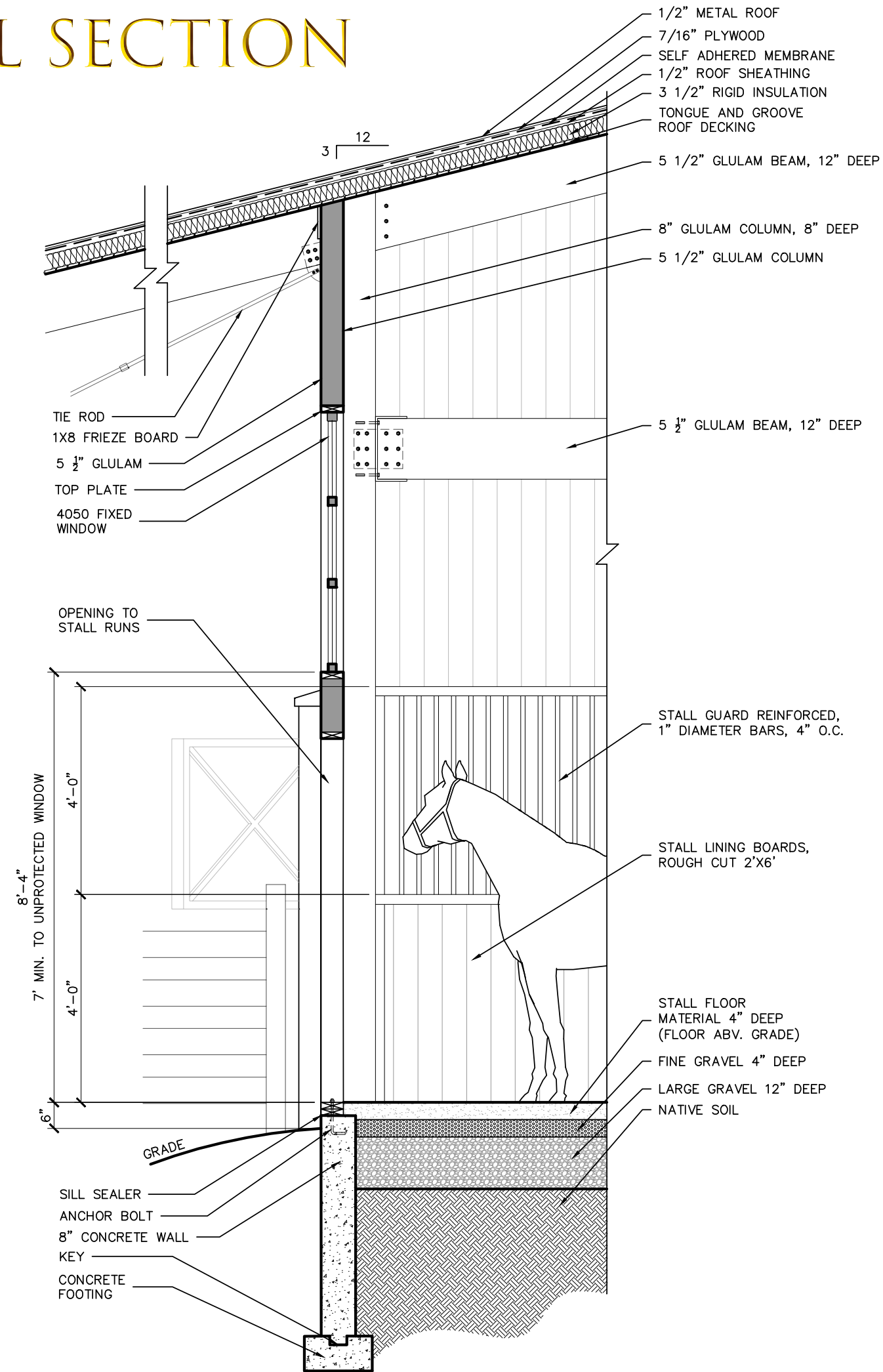


# SECTION

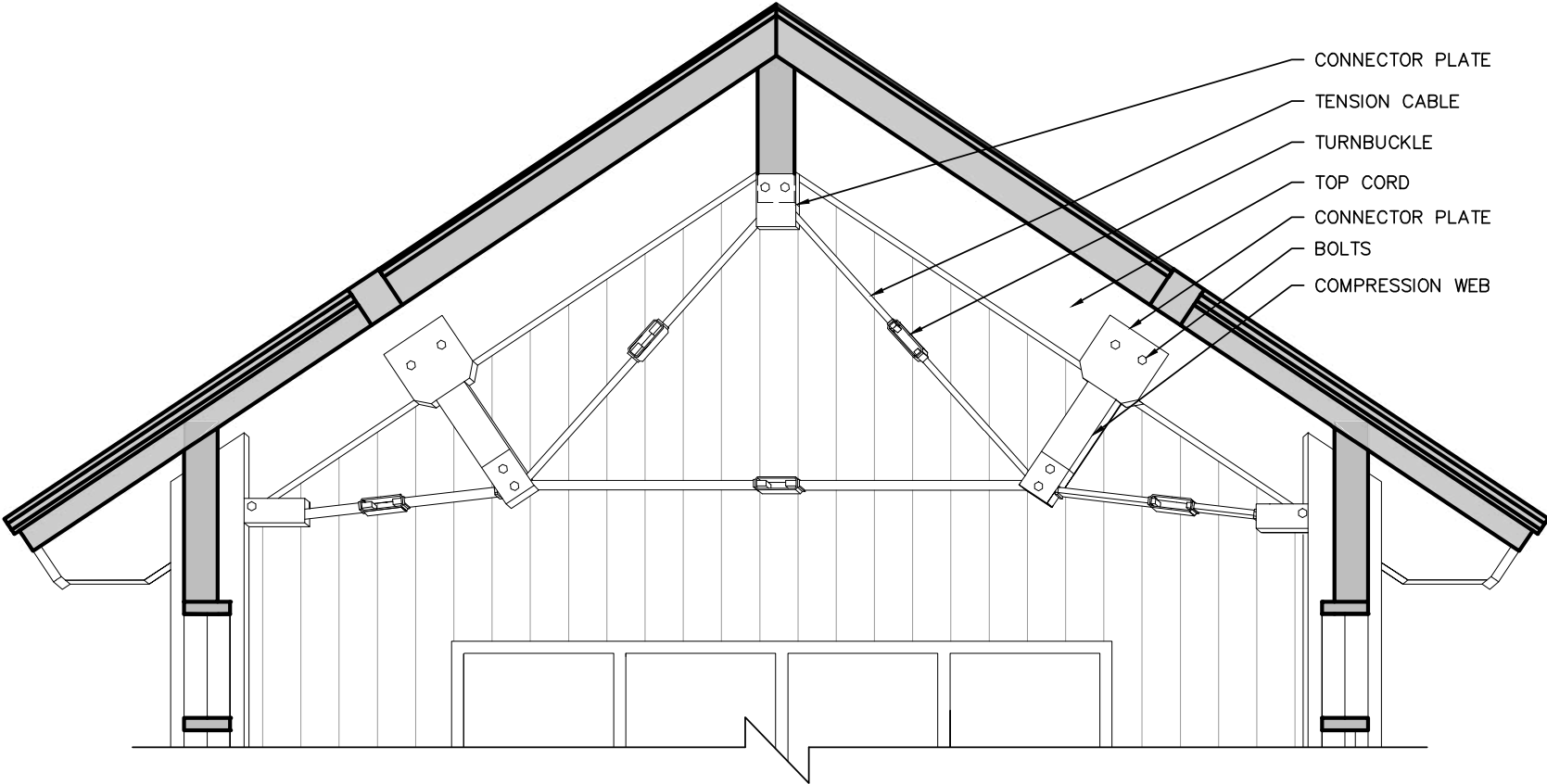




# WALL SECTION



# DETAIL



**TRUSS DETAIL**

Heavy timber can feel overbearing if not proportioned correctly. To lighten the structure, tie rods were chosen when designing the trusses. This design can translate into spacious, airy, lighter-looking spaces.

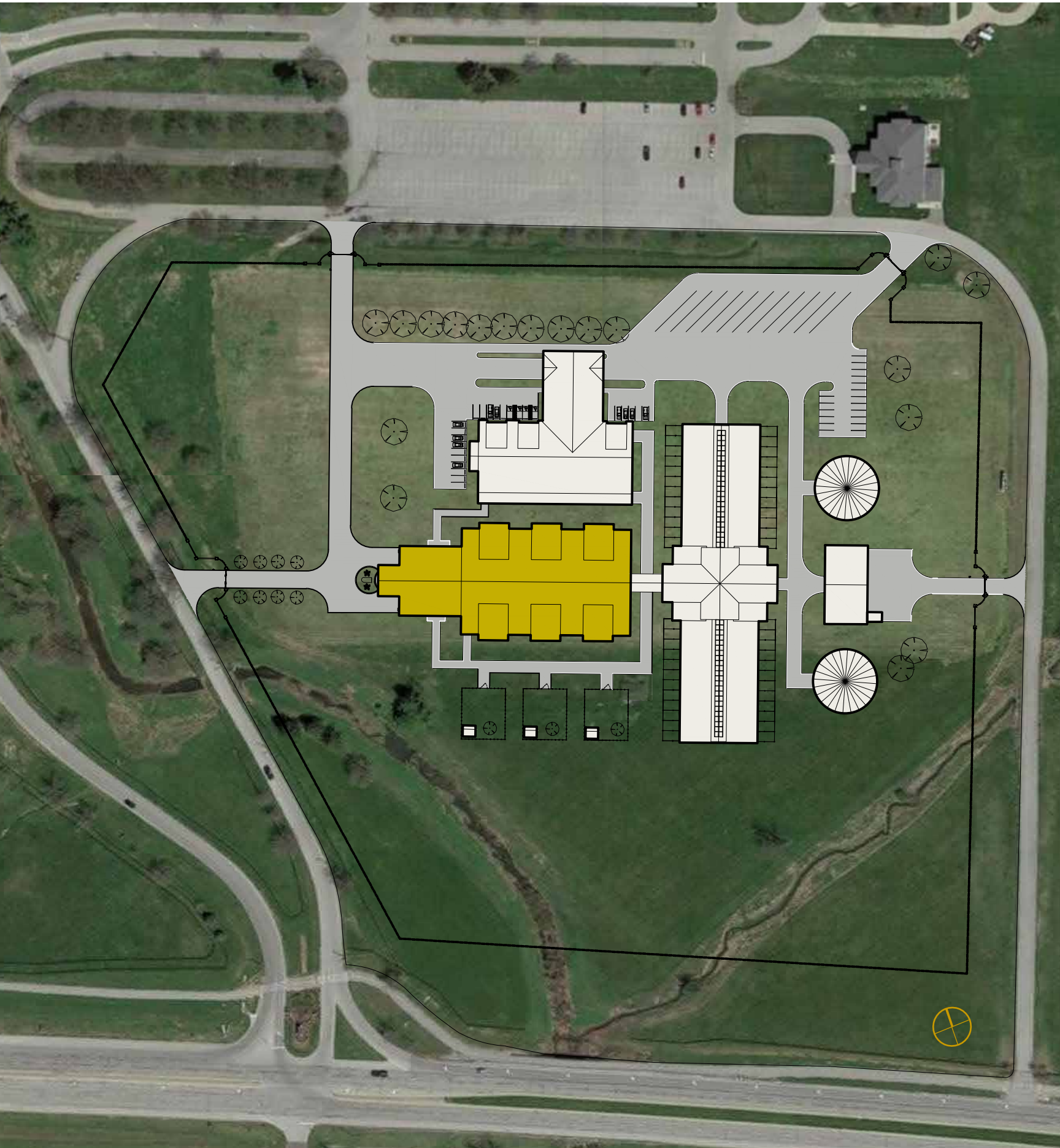


**SKYLIGHT**



TACK ROOM

# MAIN LOBBY & INDOOR ARENA









# MAIN LOBBY & INDOOR ARENA | PROGRAM

## FLOOR PLAN KEY NOTES

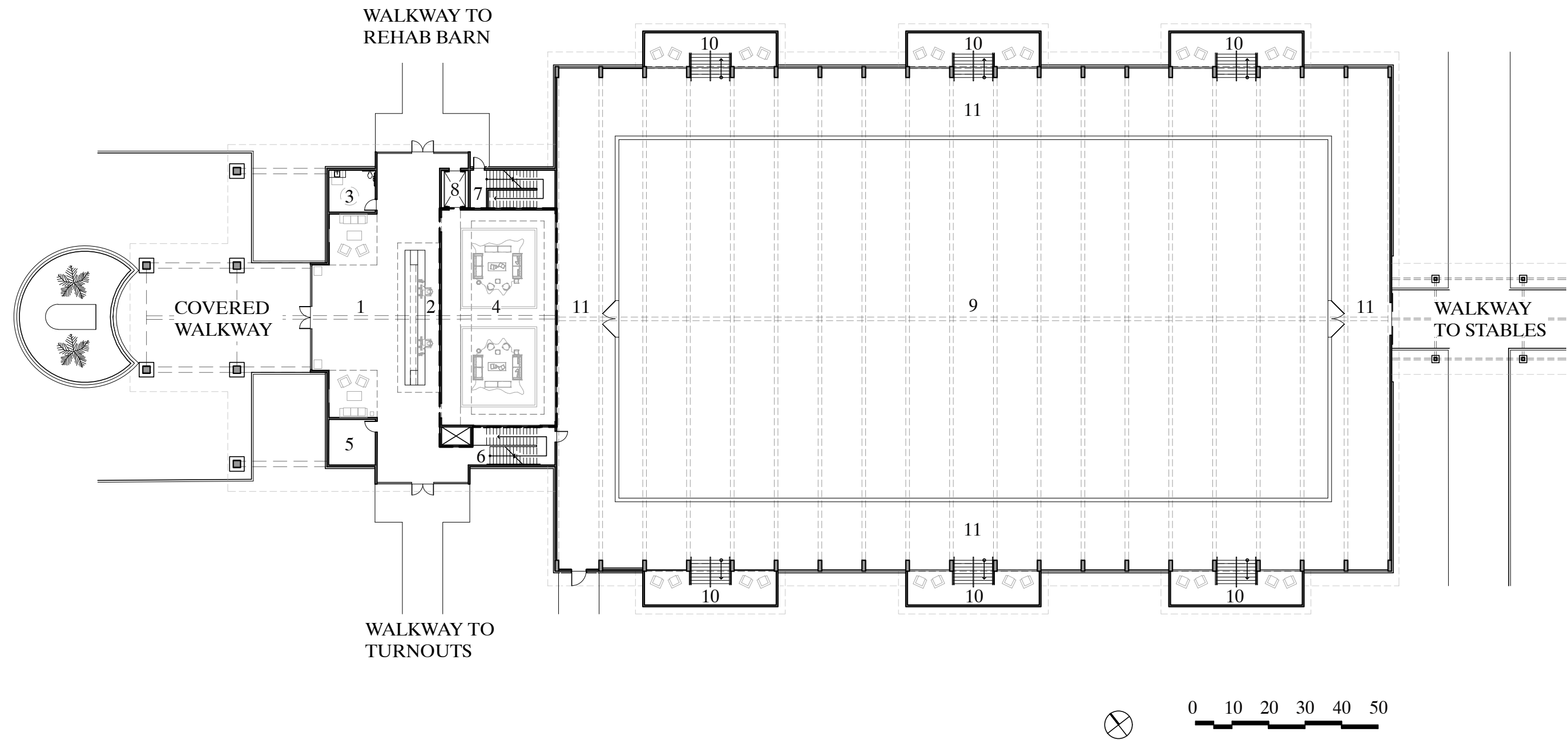
- |   |                |    |                |
|---|----------------|----|----------------|
| 1 | LOBBY          | 7  | FIRE STAIR     |
| 2 | RECEPTION DESK | 8  | ELEVATOR       |
| 3 | RESTROOM       | 9  | INDOOR ARENA   |
| 4 | LOUNGE         | 10 | SEATING        |
| 5 | MEP            | 11 | 16' WIDE AISLE |
| 6 | STAIR          |    |                |

The main lobby with the attached indoor arena is the first building that is seen as you pass the facility on the highway and upon entering the site.

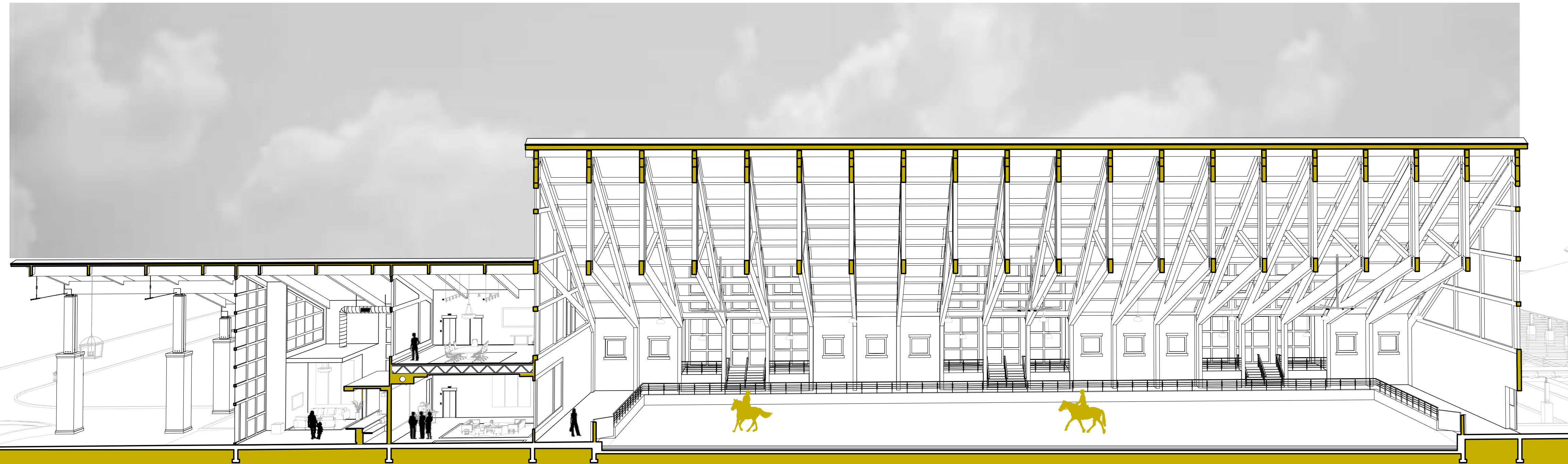
Due to the moderately cold winters, the facility was oriented so that the long side of the arena faces south. The grand structure is wrapped in glazing to provide views and natural lighting. It has tall slender columns that allow for double height spaces inside. Seating is provided in the lobby and transactions can be held at the reception desk. A public lounge is located on the first floor, enabling visitors to watch as their horse is being worked. A private lounge is located on the second floor, directly above the lounge on the first floor. On one side, the private lounge overlooks the main lobby while the other overlooks the arena.

The indoor arena allows the patient to remain on schedule no matter the weather conditions. It provides a comfortable working environment for the patient and handler all year long. Additional seating is provided in the niches along both sides of the arena. Large windows surround the arena on all sides to provide an indoor-to-outdoor feel.

Heavy timber was challenged when designing the structure. Heavy timber can offer longer, unsupported span possibilities, larger open-space plans and taller buildings. Arenas require large open-spaces and have incredible spans. A scissor truss was designed to support the span of this arena.



# PERSPECTIVE SECTION





MAIN LOBBY



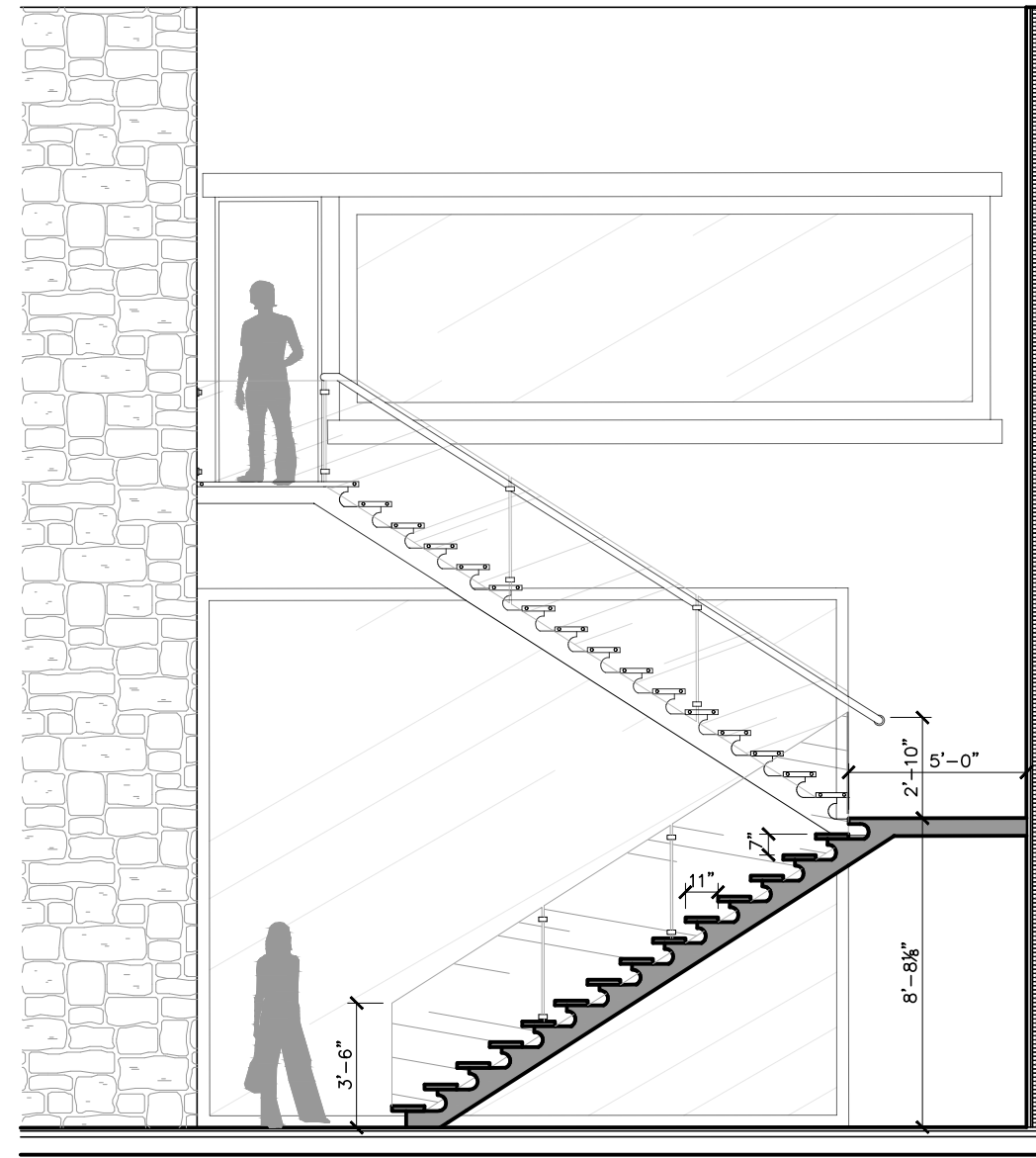


LOUNGE

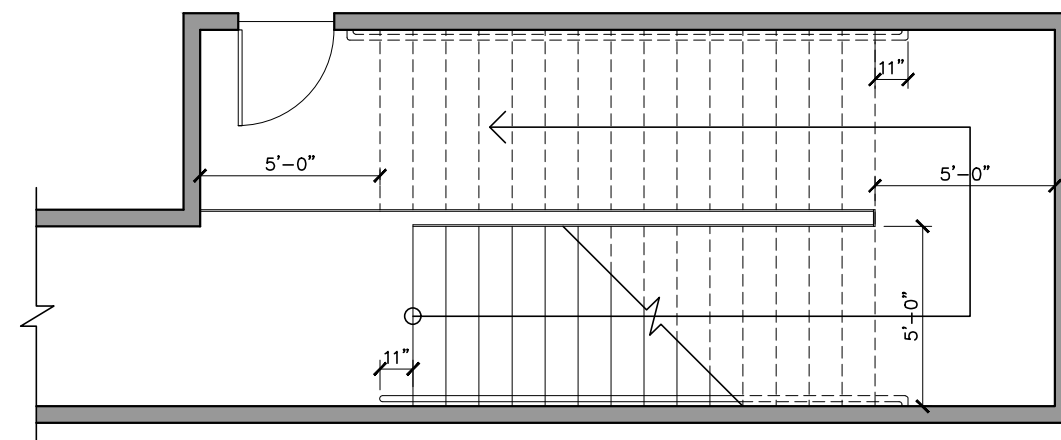
# VERTICAL CIRCULATION

The stairs are made of steel and wood with a glass railing. Visitors can find the private lounge on the second floor just up the stairs which are located near the first floor lounge.

A large glass pane separates the lounge from the vertical circulation to reduce noise. However, it allows visitors to see movement throughout the facility.



STAIR DETAIL



FIRST FLOOR LOUNGE





**SECOND FLOOR LOUNGE OVERLOOKING LOBBY**



**SECOND FLOOR LOUNGE OVERLOOKING INDOOR ARENA**



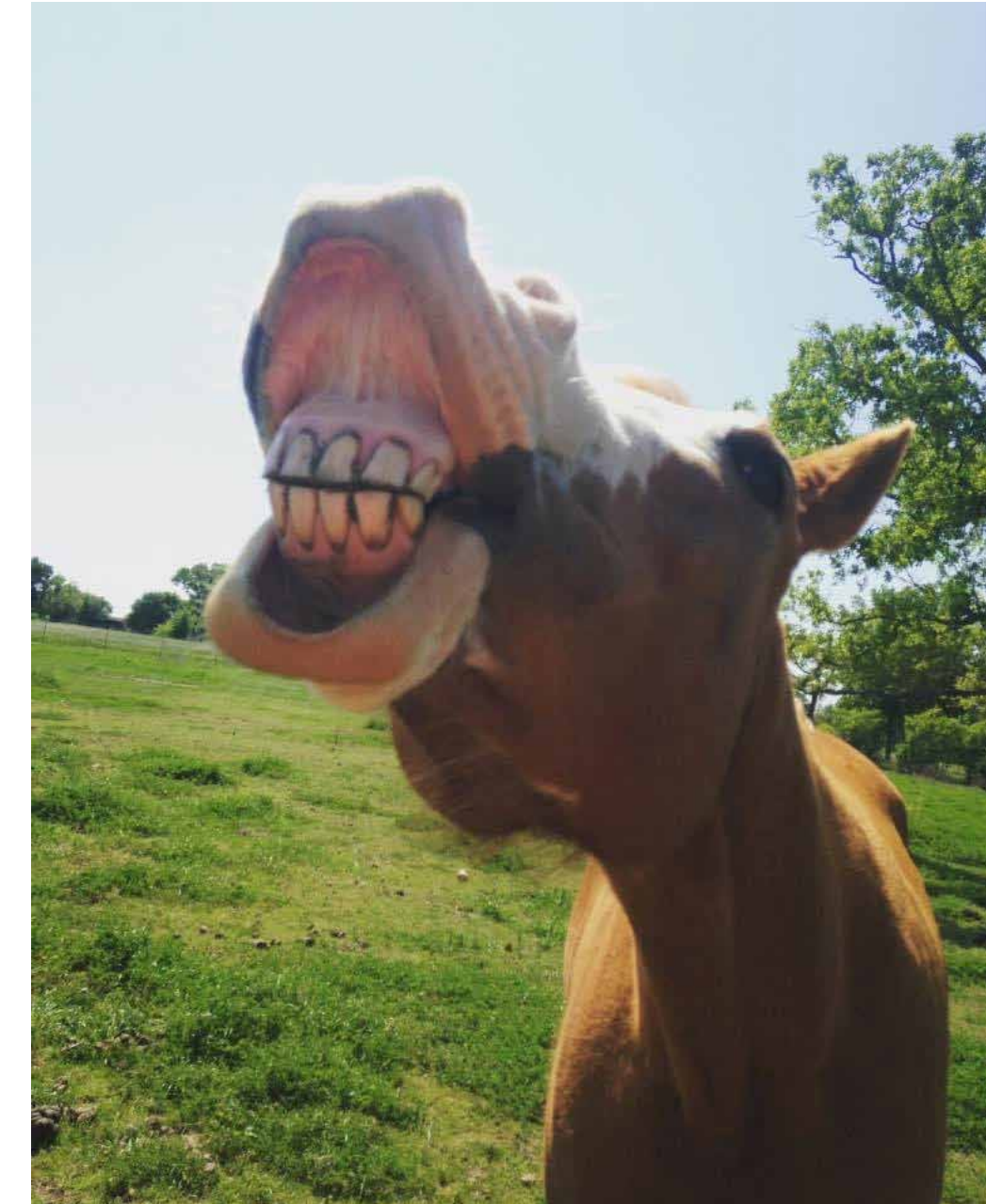
INDOOR ARENA



# ACKNOWLEDGMENTS

I would like to express my sincere gratitude to my committee who gave me the opportunity to create this wonderful project. Their immense knowledge and professional expertise has enabled me to complete this project successfully. It has been an honor to work beside them throughout my journey at Texas A&M University and without their support and guidance, this project would not have been possible.

To my family and friends, the outpouring of love and support I received not only during college, but throughout this journey of life, means the world to me. Without you all, I may not be where I am today. I could not have asked for better people in my life. Thank you for being there for me, for caring about me, loving me, believing in me, and empowering me to be and do my best. I wanted to say thank you and let you know how much you all mean to me!



**MISTY**

