



U

OOM

RBAN





# THE URBAN LOOM

A TRANSIT CENTER IN BRYAN, TX

JONATHAN MARCELL

TEXAS A&M UNIVERSITY

MASTERS OF ARCHITECTURE

2023

# COMMITTEE

I had the privilege of working alongside a distinguished committee of professionals who provided invaluable guidance and support throughout the project's execution. Their expertise and insights proved instrumental in helping me achieve my project goals and to successfully bring it to fruition. Throughout the duration of the project, the committee demonstrated a deep commitment to excellence, challenging me to push the boundaries of my design thinking and offering constructive feedback to refine my ideas.



DAVI XAVIER

CHAIR

Hold's a Professional Degree in Architecture and Urban Planning (2010) from UFPB, and is a licensed architect in Brazil. A principal at DLMA space and also works as a Visiting Assistant Professor at Texas A&M University.

## XAVIER

## GI



BI

Specializes in architectural sustainability, and Currently licensed as well as of the Pr University.

# BBS



**BRIAN GIBBS**  
MEMBER

s and works with  
ral theory and design,  
lity, affordable hous-  
professional practice.  
a principal and  
t PACT Design Studio  
an Assistant Professor  
actice at Texas A&M



**YOONSUCK CHOE**  
EXTERNAL MEMBER

Professor in the Department of  
Computer Science and Engi-  
neering. Research is broadly  
based in artificial intelligence off  
the following: computational  
neuroscience, brain imaging and  
analysis, and deep learning or  
tasks that typically require  
human intelligence.

# CHOE

# ERMINY



**MARCEL ERMINY**  
STUDIO PROFESSOR

Simply an Architect. A leader  
that truly lives in the world of  
design while teaching others to  
work past the given and into the  
opportunity of thought.

# DEDICATION

I would like to take a moment to express my heartfelt gratitude and appreciation to my mother, who has been a constant source of love, encouragement, and support throughout my Architectural studies. I am deeply grateful for her sacrifices, her endless patience, and her boundless love, all of which have enabled me to pursue my passion for Architecture and reach new heights of achievement. Without her, this project would not have been possible, and I owe her a debt of gratitude that I can never fully repay. Thank you, Mom, for everything you have done for me, for being my rock, and for inspiring me to be the best version of myself. This project is as much yours as it is mine, and I dedicate it to you with all my heart.

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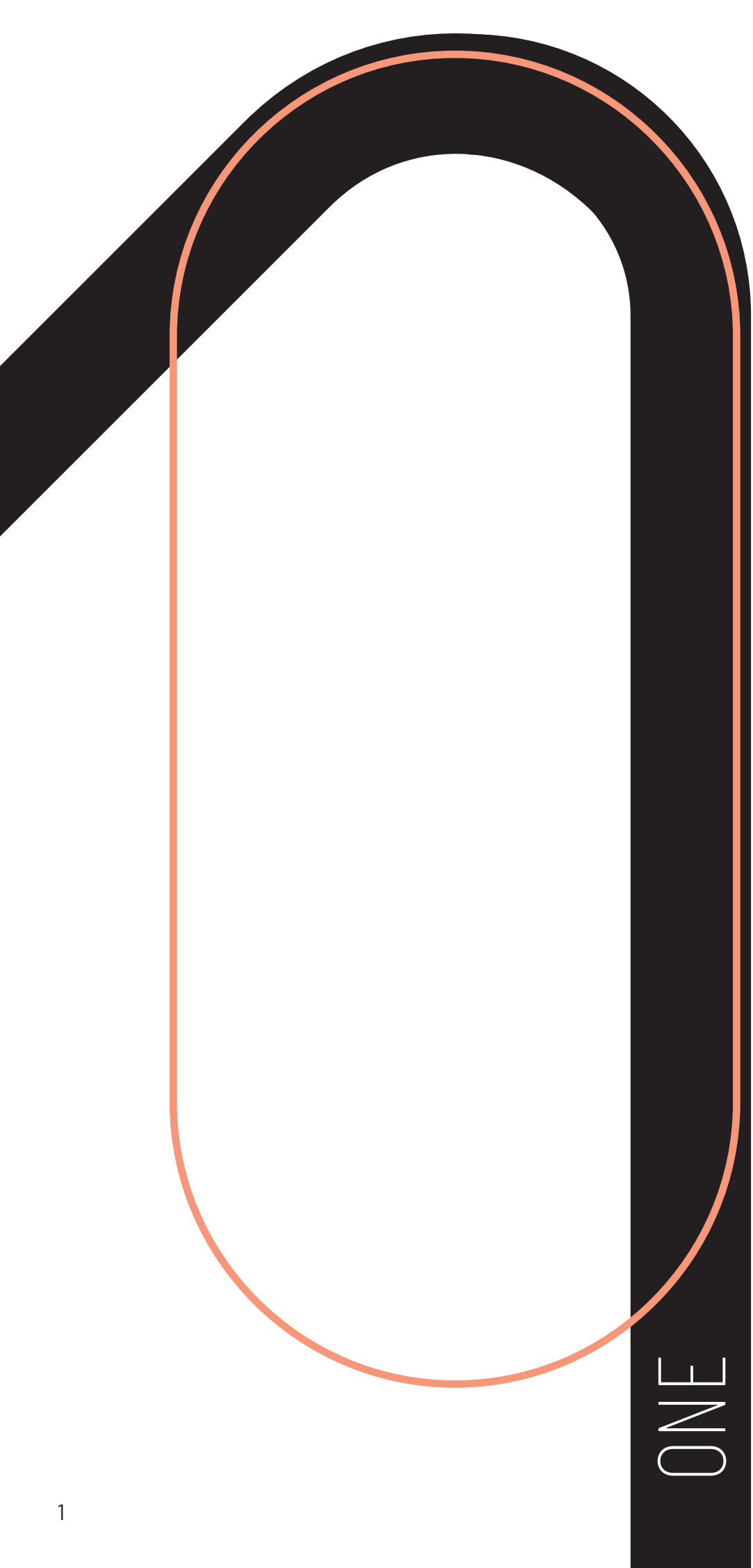
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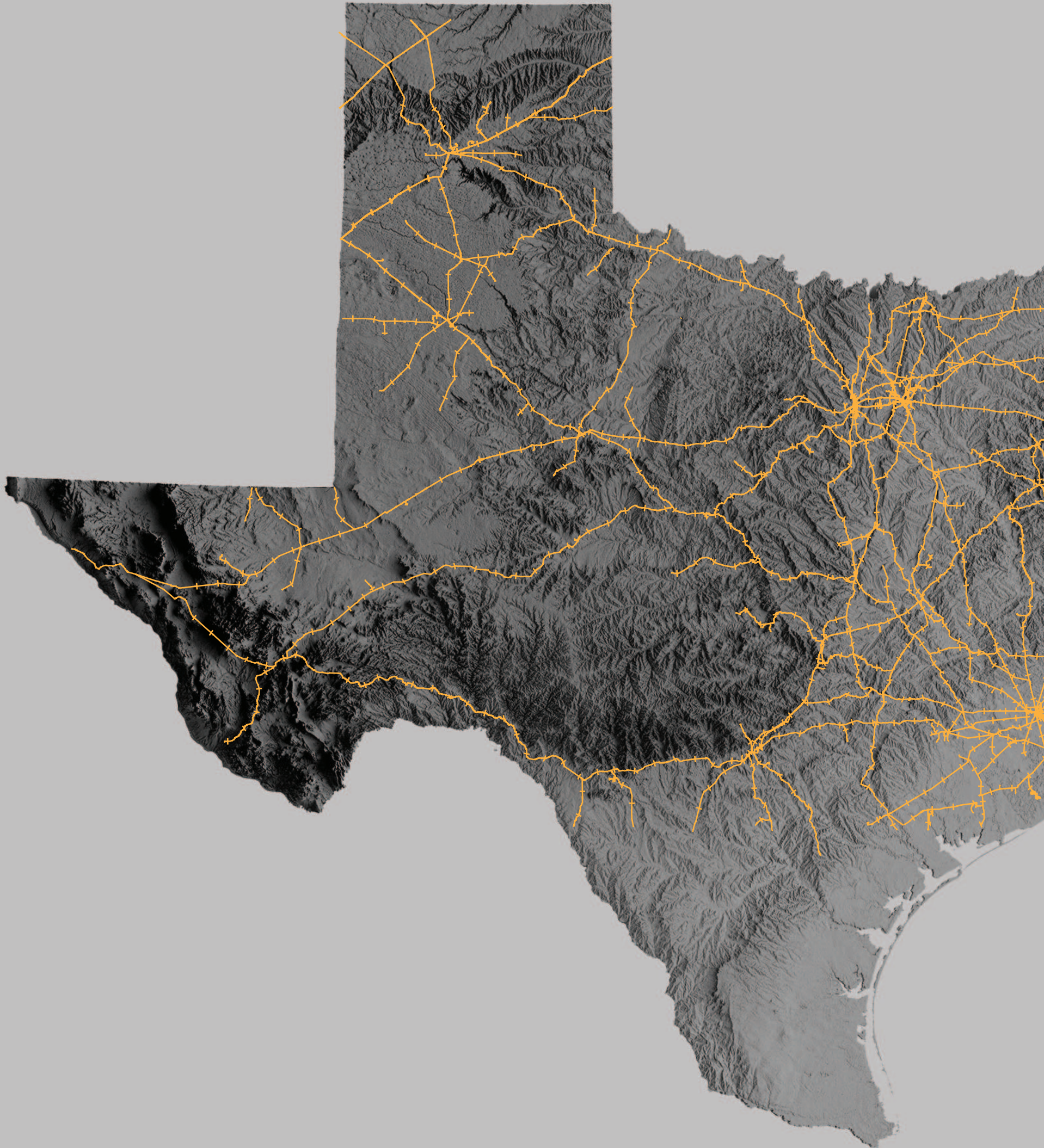


ABSTRACT

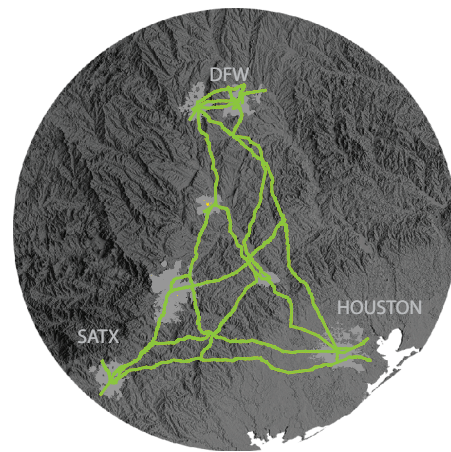
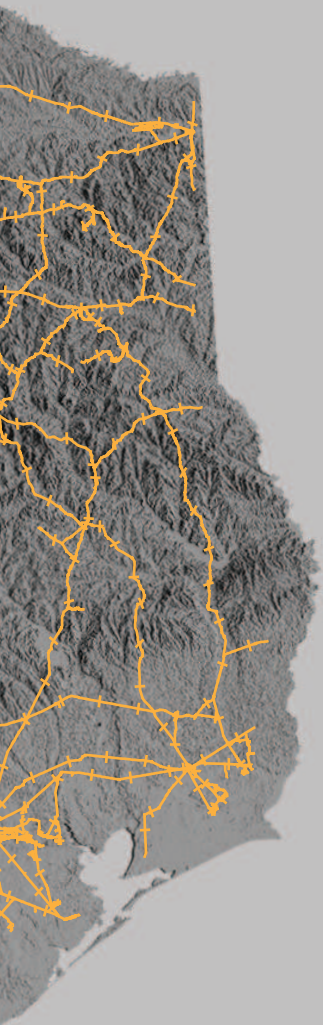
ONE

As travel continues to rise, the need for efficient and sustainable transportation solutions becomes increasingly pressing. However, waiting for new infrastructure to be built can be a daunting and time-consuming process, prompting the exploration of alternative approaches that leverage existing infrastructure to create innovative transportation systems. Specifically, the study will explore the potential for the proposed transit center to serve as a hub for sustainable transportation, providing seamless connections between different modes of transit and enabling more efficient and eco-friendly travel. Additionally, the study will consider the potential impact of the transit center on the surrounding urban fabric, exploring opportunities to enhance the quality of life for residents and visitors alike.

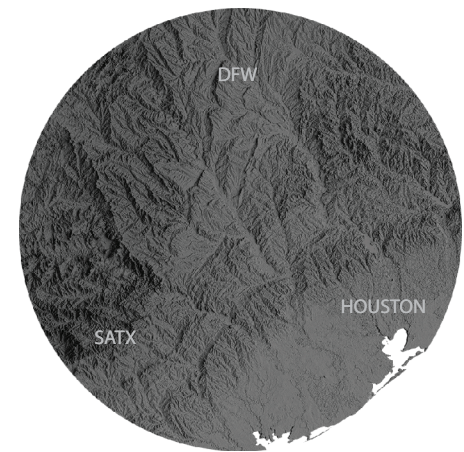




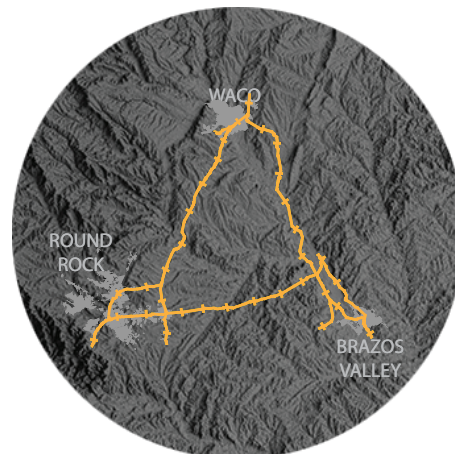




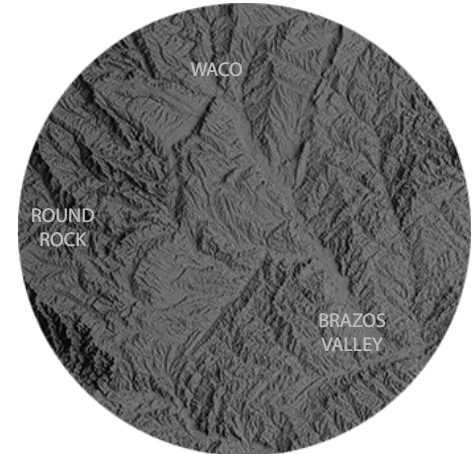
THE TEXAS TRIANGLE



TEXAS TRIANGLE  
TOPOGRAPHY

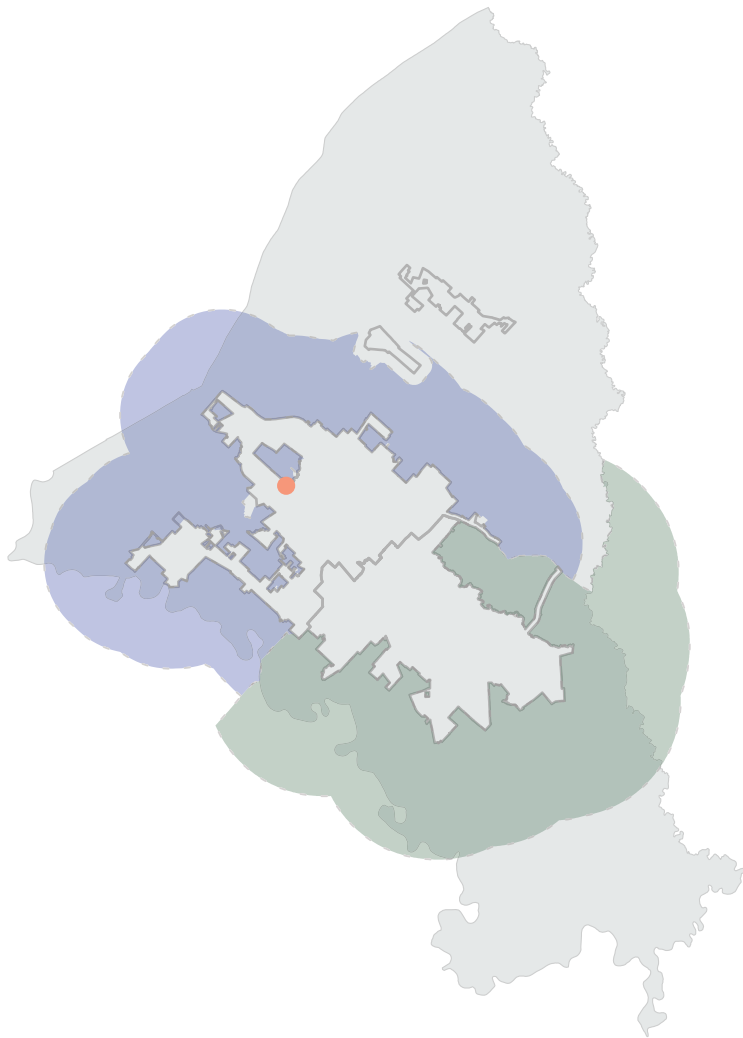


INNER LOOP



INNER LOOP  
TOPOGRAPHY

To address the challenge of creating efficient and sustainable transportation in Texas, this study proposes the integration of an urban transit center that leverages the state's existing rail infrastructure. By capitalizing on this infrastructure, the proposed transit center offers a range of benefits for the state's economy, social fabric, and cultural landscape. While the Texas Triangle is often considered for introducing rail transit, this proposal goes a step further by exploring the potential of an existing inner-loop, which can showcase the opportunities for sustainable transit even at a smaller scale.



The Brazos extraterritorial jurisdiction (ETJ) played a key role in selecting the location of the proposed transit center in Bryan, TX. By conducting a thorough analysis of potential locations and taking into account anticipated growth, the ETJ recommended a location that provides convenient access to key destinations and has the potential to catalyze future development.

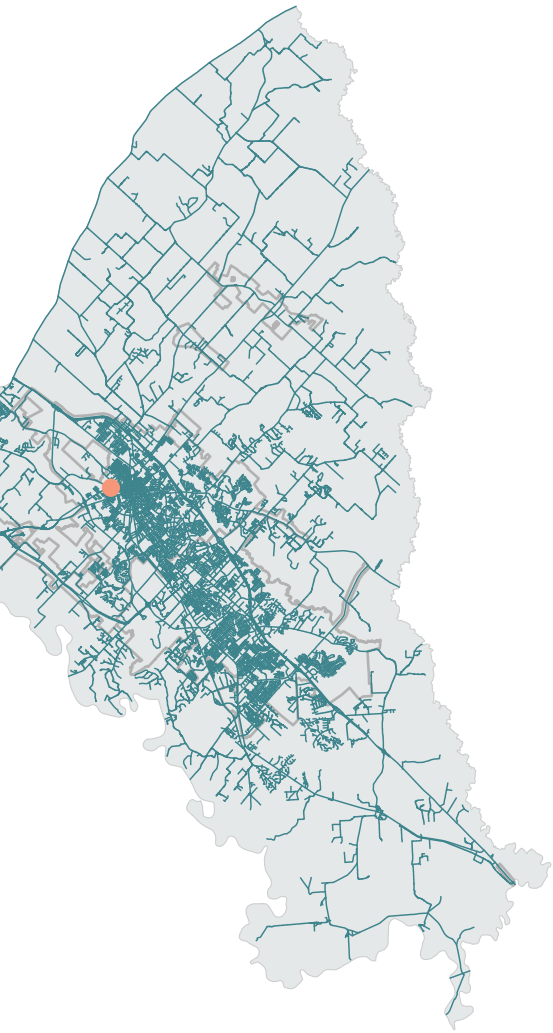


The existing rail infrastructure that runs through the downtown area played a significant role in determining the location of the proposed transit center in Bryan, TX. The rail system provided a pre-existing connection to major destinations, making it an attractive option for commuters and travelers. By leveraging this existing infrastructure, the proposed transit center aims to maximize connectivity and convenience, offering seamless connections between different modes of transportation and facilitating more efficient and sustainable travel in the region. The location was therefore selected due to its close proximity to the existing rail infrastructure, making it a natural hub for transit in the downtown area.

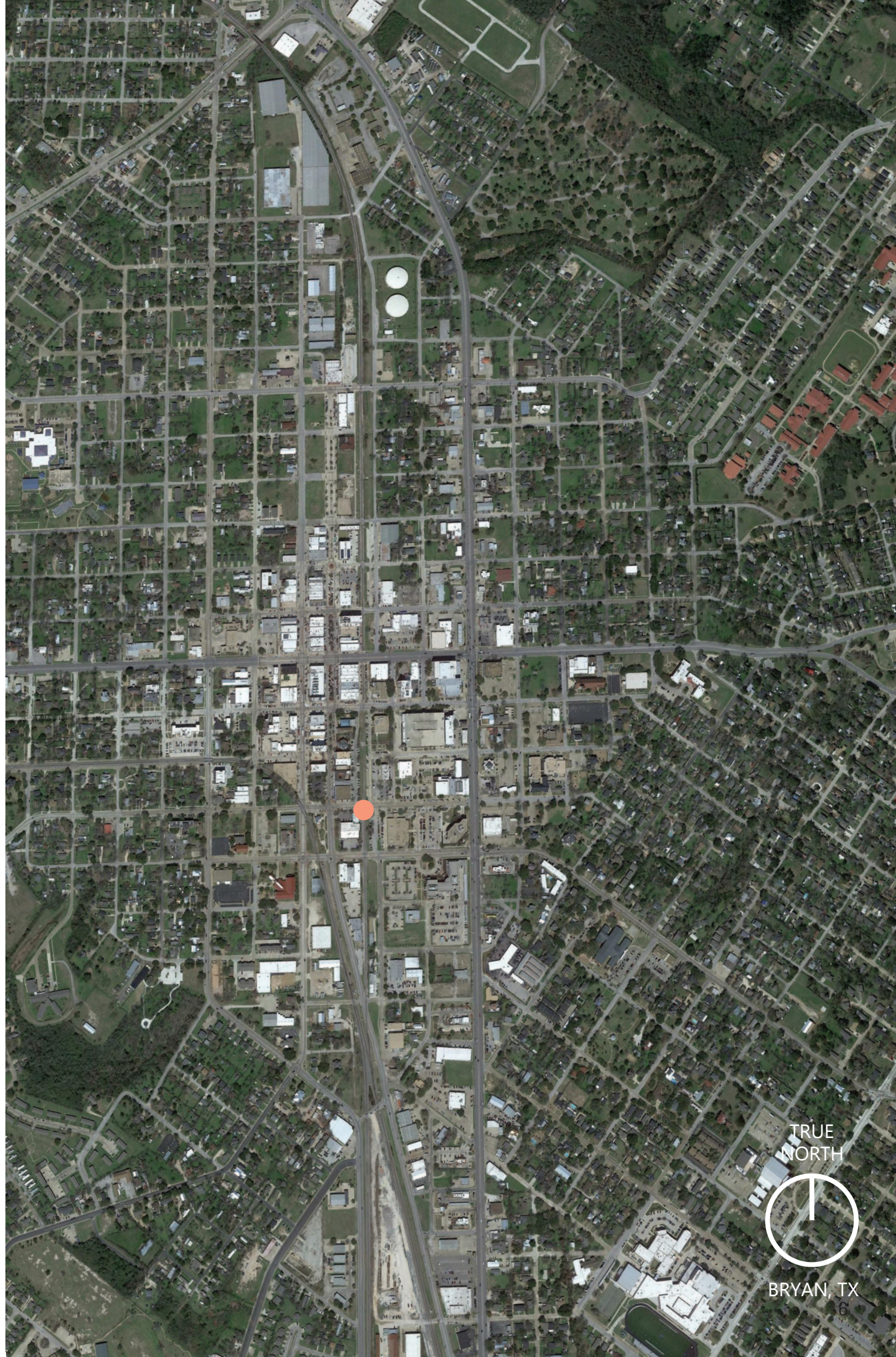


The local... and bus...  
 mining t...  
 center in...  
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 seamless...  
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ation of the existing thoroughfare station played a crucial role in determining the location of the proposed transit station in Bryan, TX. By locating the transit station near these existing transportation nodes, the proposed system can provide easy connections to various transportation modes and offer maximum connectivity and convenience for commuters.

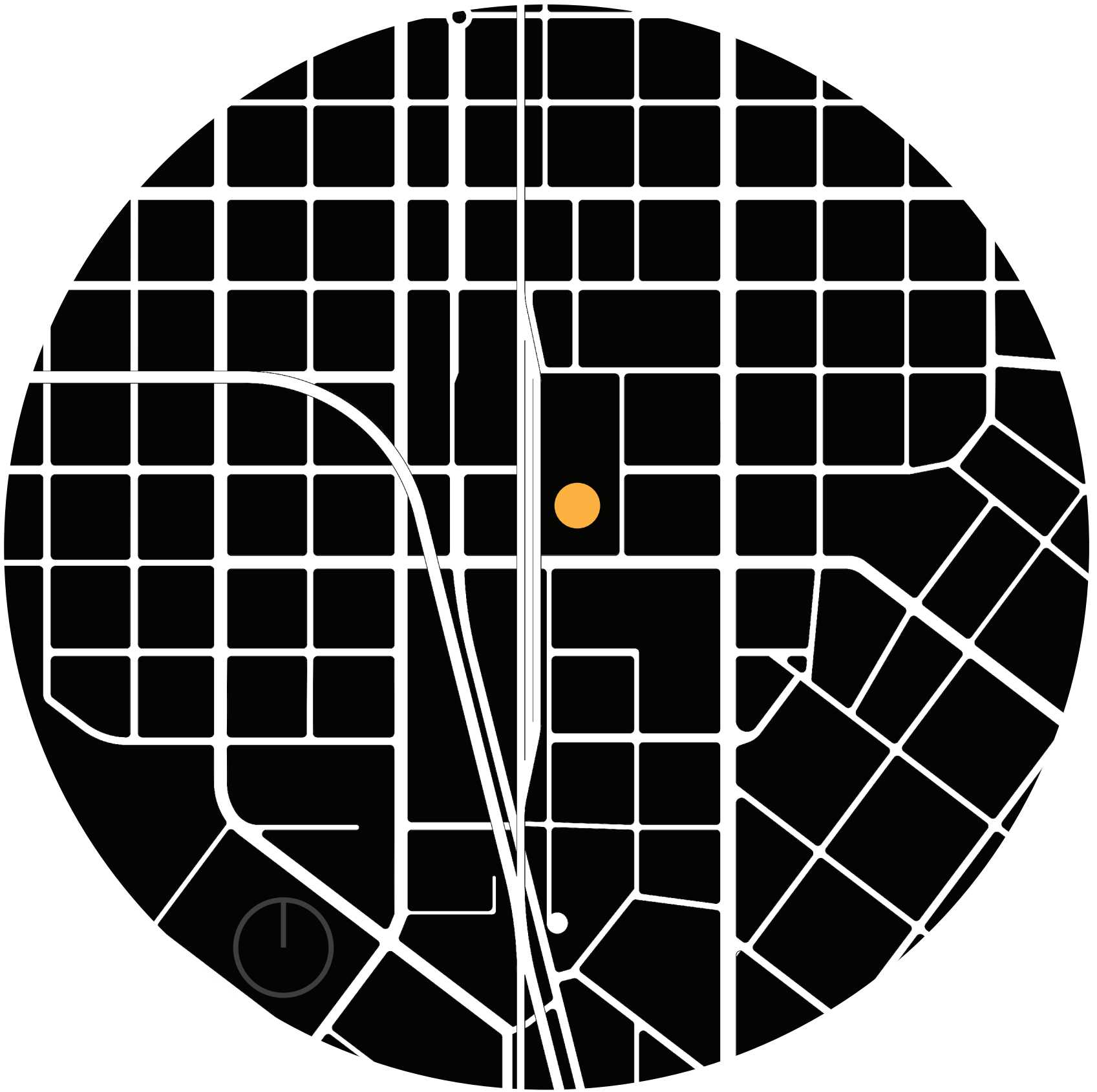






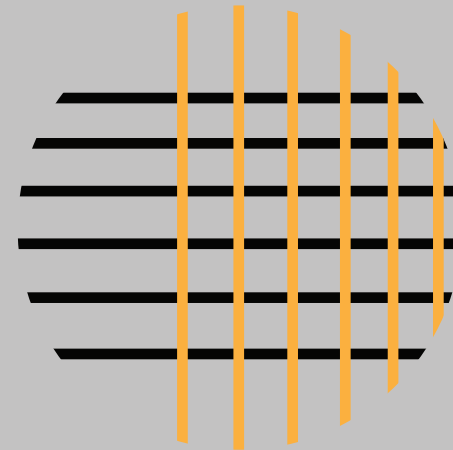
STRATEGY

Upon discovering the urban fiber pattern depicted in the figure ground plan, it became evident that integrating the project into the city required a nuanced understanding of the context, including its urban patterns and pathways. This understanding served as a foundation for determining the programmatic requirements of the site and developing a strategy for its successful implementation, not only within the confines of the site but also in the broader urban context.

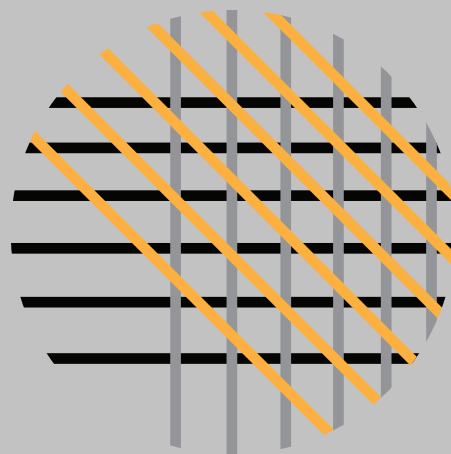




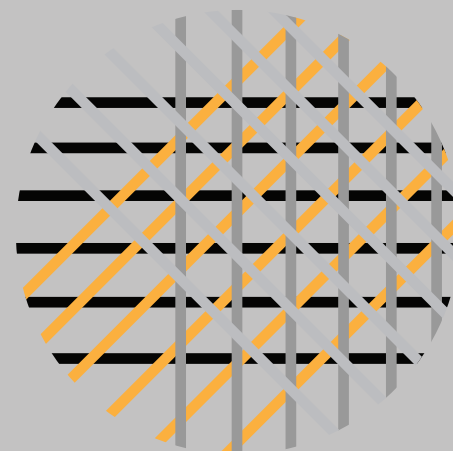
AXIAL



BIAXIAL



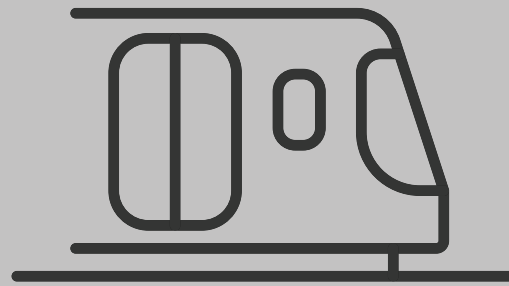
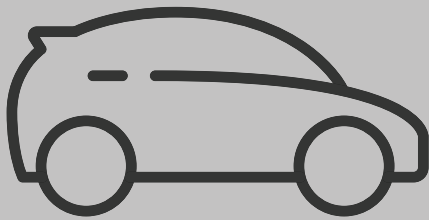
TRIAxIAL



QUADRIAXIAL

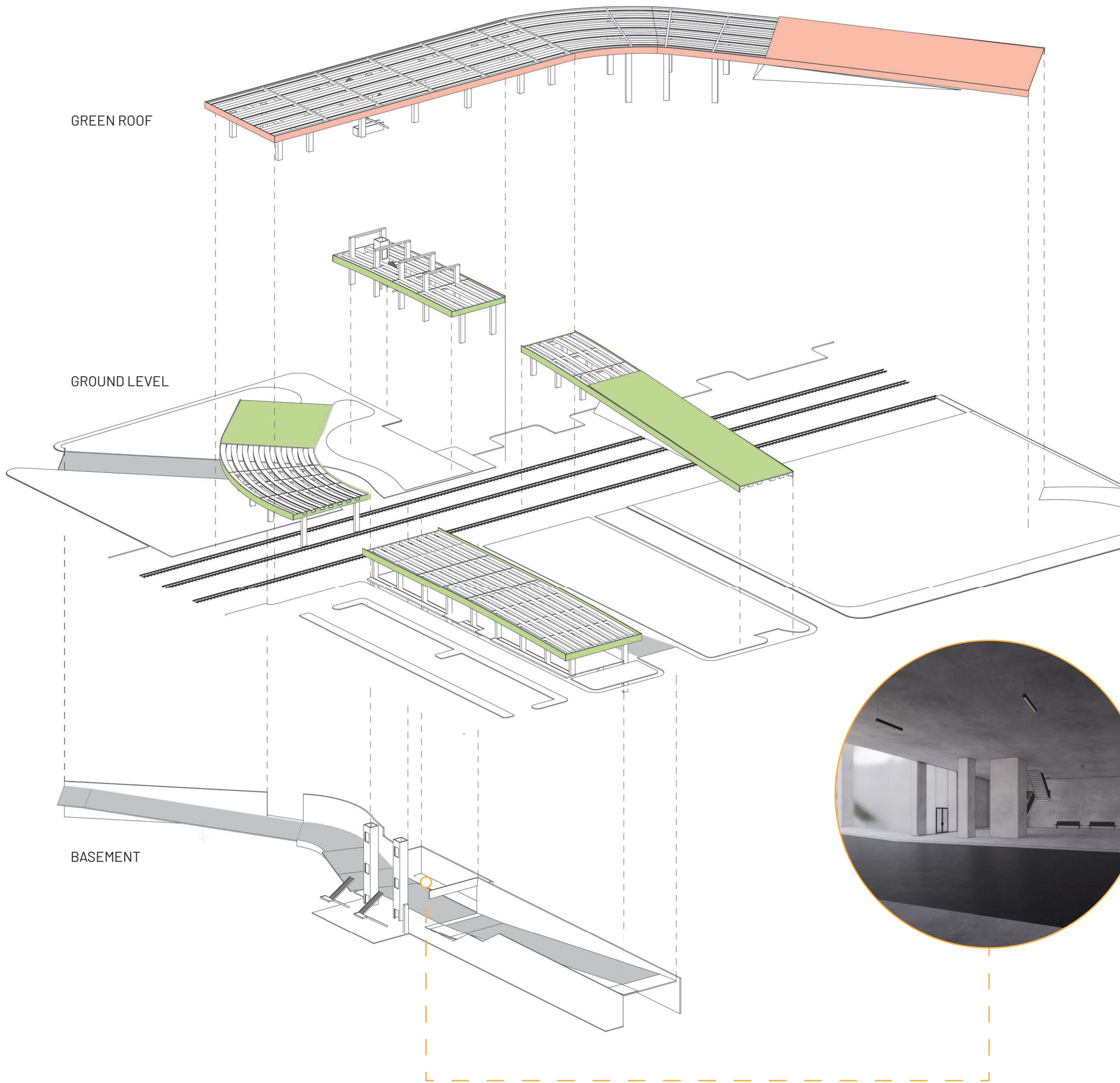
The process of removing buildings for a figure ground map allows us to observe the underlying infrastructure that forms the fabric weave of Downtown Bryan. In a literal sense, this fabric can be identified as a quadriaxial weave, consisting of four main layers resolving in angles of  $0^{\circ}/+45^{\circ}/90^{\circ}/-45^{\circ}$ . This unique fabric configuration confers strength in all directions, providing a durable and resilient foundation for the built environment.



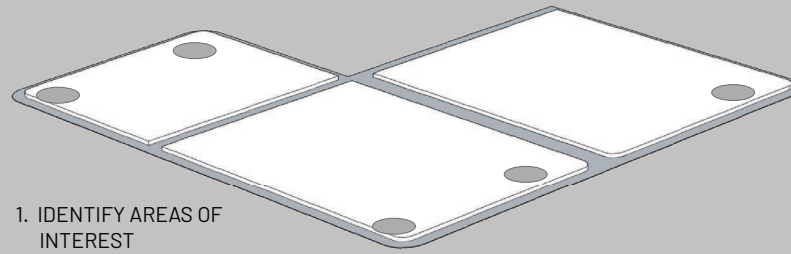


The location of the proposed transit center in Bryan, TX was chosen by taking into account various existing points of interest in the area, including the downtown area, the bus station, existing rail infrastructure, library, municipal offices, and arterial roads. By locating the transit center near these key destinations, the proposed system can offer seamless connections and convenience for commuters and travelers. Additionally, the proximity of the transit center to major transportation hubs and arterial roads can facilitate greater usage of public transit, reducing traffic congestion and improving air quality in the region. Overall, the location of the transit center was selected to provide maximum connectivity, convenience, and sustainability for the community.

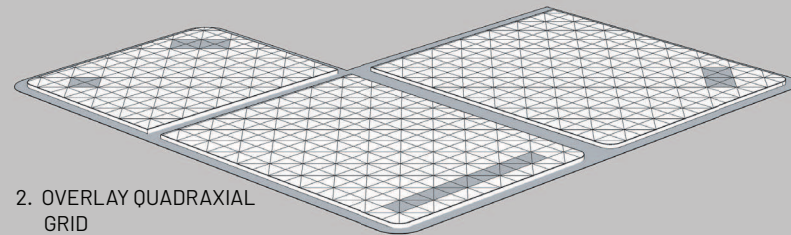




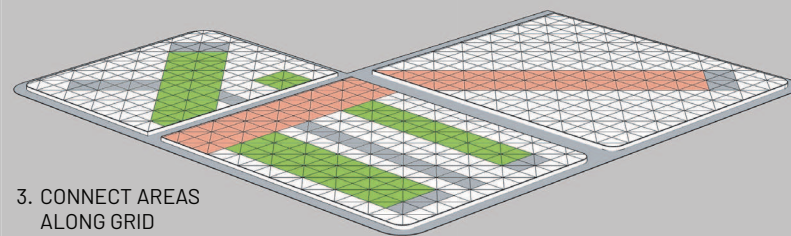




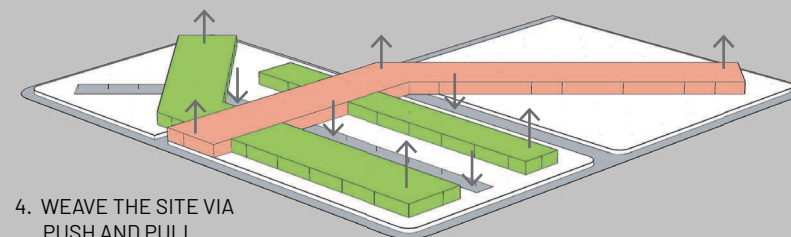
1. IDENTIFY AREAS OF INTEREST



2. OVERLAY QUADRAXIAL GRID



3. CONNECT AREAS ALONG GRID



4. WEAVE THE SITE VIA PUSH AND PULL

Our initial objective was to identify the key points of interest within the site. After identifying key points, we overlaid the grid that was obtained from the foreground map. By analyzing the quadraxial weave depicted in the foreground map, we were able to pinpoint the crucial angles that needed to be connected in order to establish a coherent pathway along the grid. Subsequently, we devised a strategy to optimize the circulation within the site. This involved the manipulation of masses through a careful push and pull technique, enabling them to traverse over and under the tracks. By implementing this approach, we were able to create a well-defined circulation system that facilitated the seamless movement of people and resources across the site.

THREE

PLA

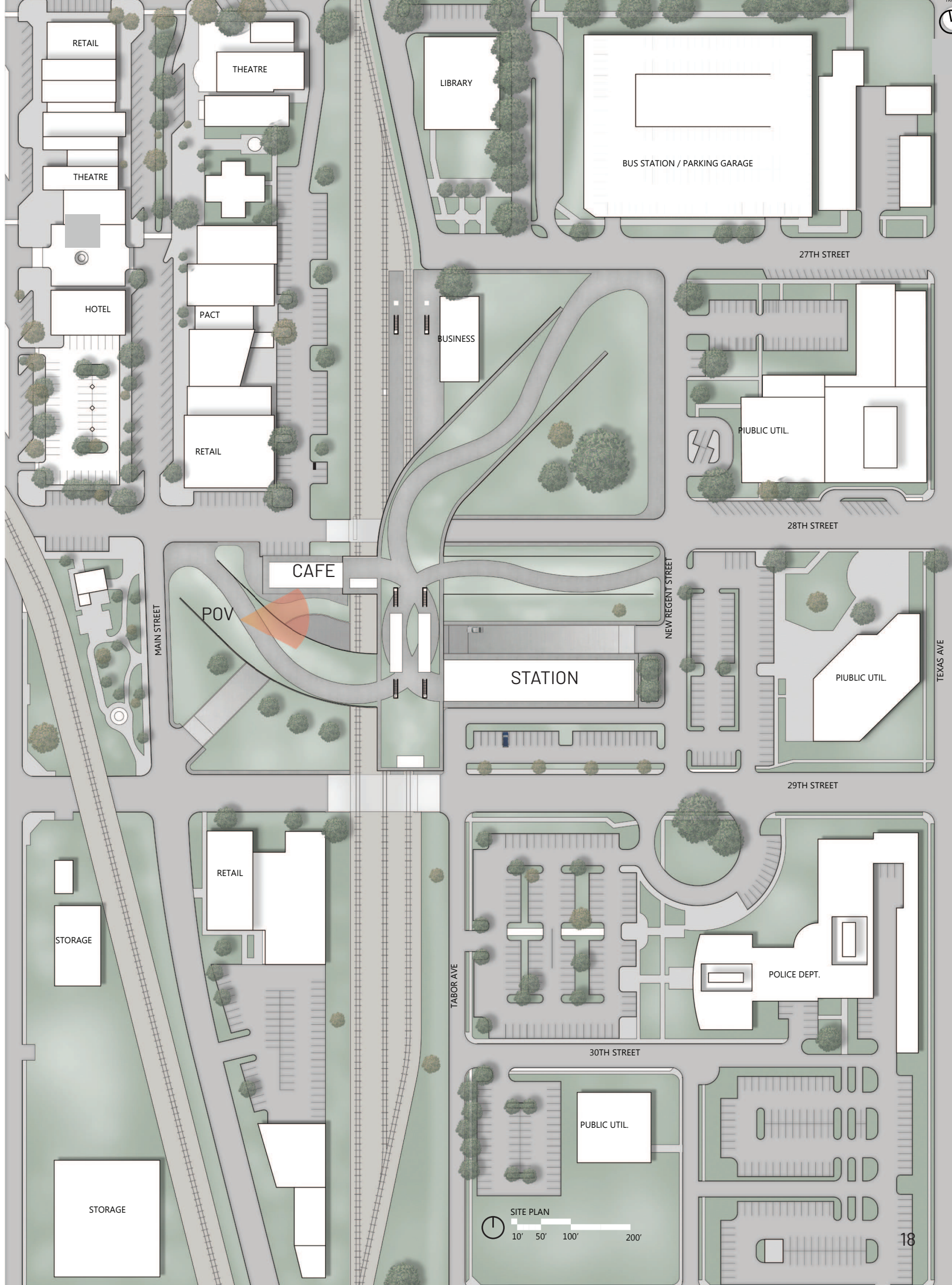
# NS

Our approach to laying out the program involved careful consideration of the points of interest within the site and their integration into the existing grid. Through this process, we were able to establish a clear and efficient pathway system that facilitated seamless movement across the sprawling site, while also penetrating the urban fabric in a manner that enhanced the tight-knit community of Bryan, Texas. The plans were developed in a linear and elongated fashion, with the aim of promoting accessibility and circulation within the site, and to strengthen the urban fabric of the community. This deliberate approach to site planning was crucial in achieving our goal of creating a functional and harmonious built environment that meets the needs of both the site and the broader community.



Our methodology for integrating multiple modes of transportation underscored the importance of effective planning and circulation as the bedrock for a successful master plan. Ensuring that circulation remains at a steady flow is critical to the seamless integration of the project into the surrounding context, without causing any obstruction or issues but rather solving them proactively. We recognized that thoughtful planning and intelligent circulation design are essential to creating an environment that is both functional and responsive to the needs of the community it serves.





RETAIL

THEATRE

LIBRARY

BUS STATION / PARKING GARAGE

27TH STREET

THEATRE

HOTEL

PACT

BUSINESS

PUBLIC UTIL.

28TH STREET

RETAIL

CAFE

NEW REGENT STREET

POV

STATION

PUBLIC UTIL.

MAIN STREET

29TH STREET

TEXAS AVE

STORAGE

RETAIL

POLICE DEPT.

30TH STREET

TABOR AVE

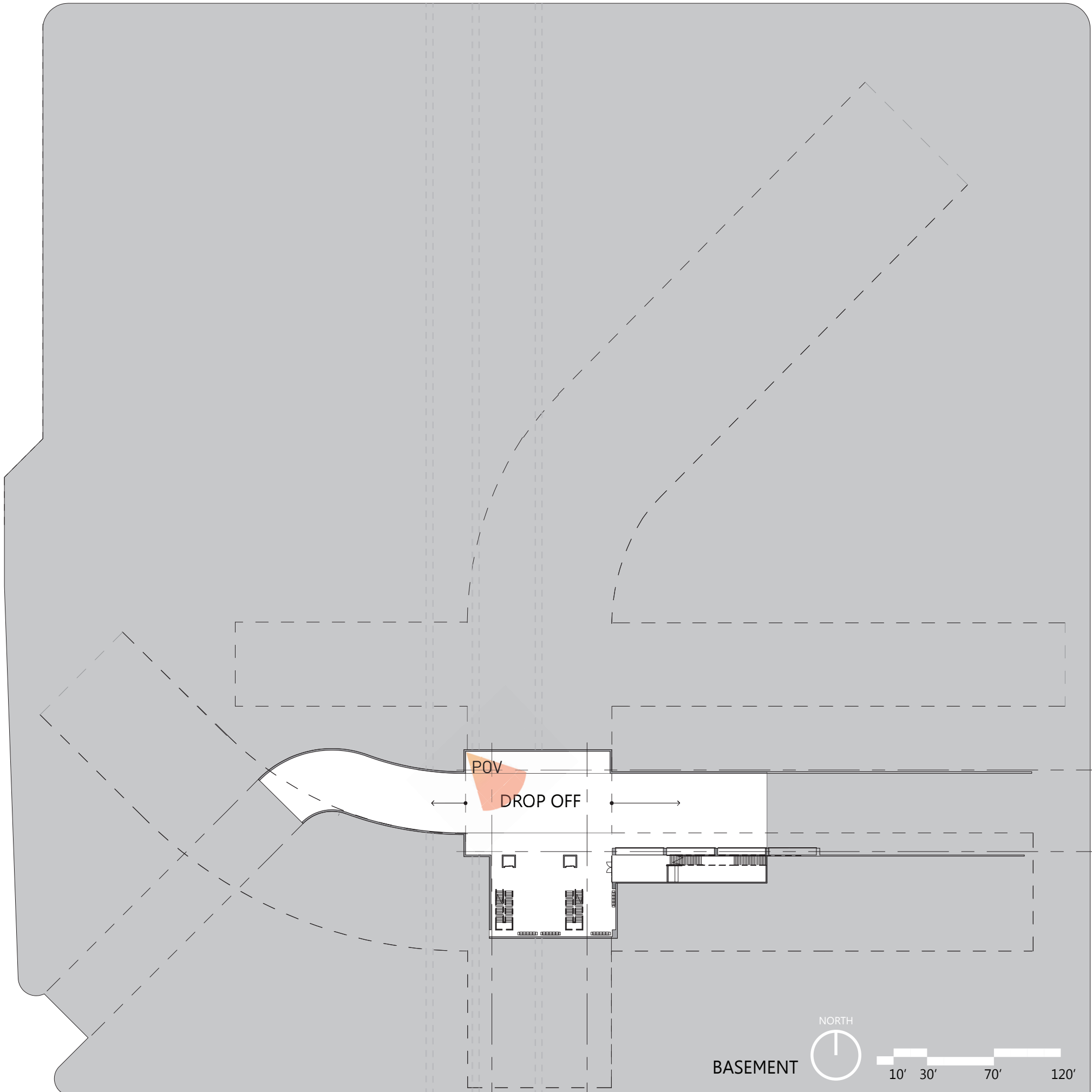
STORAGE

PUBLIC UTIL.

SITE PLAN







6

7

C

D



BASEMENT



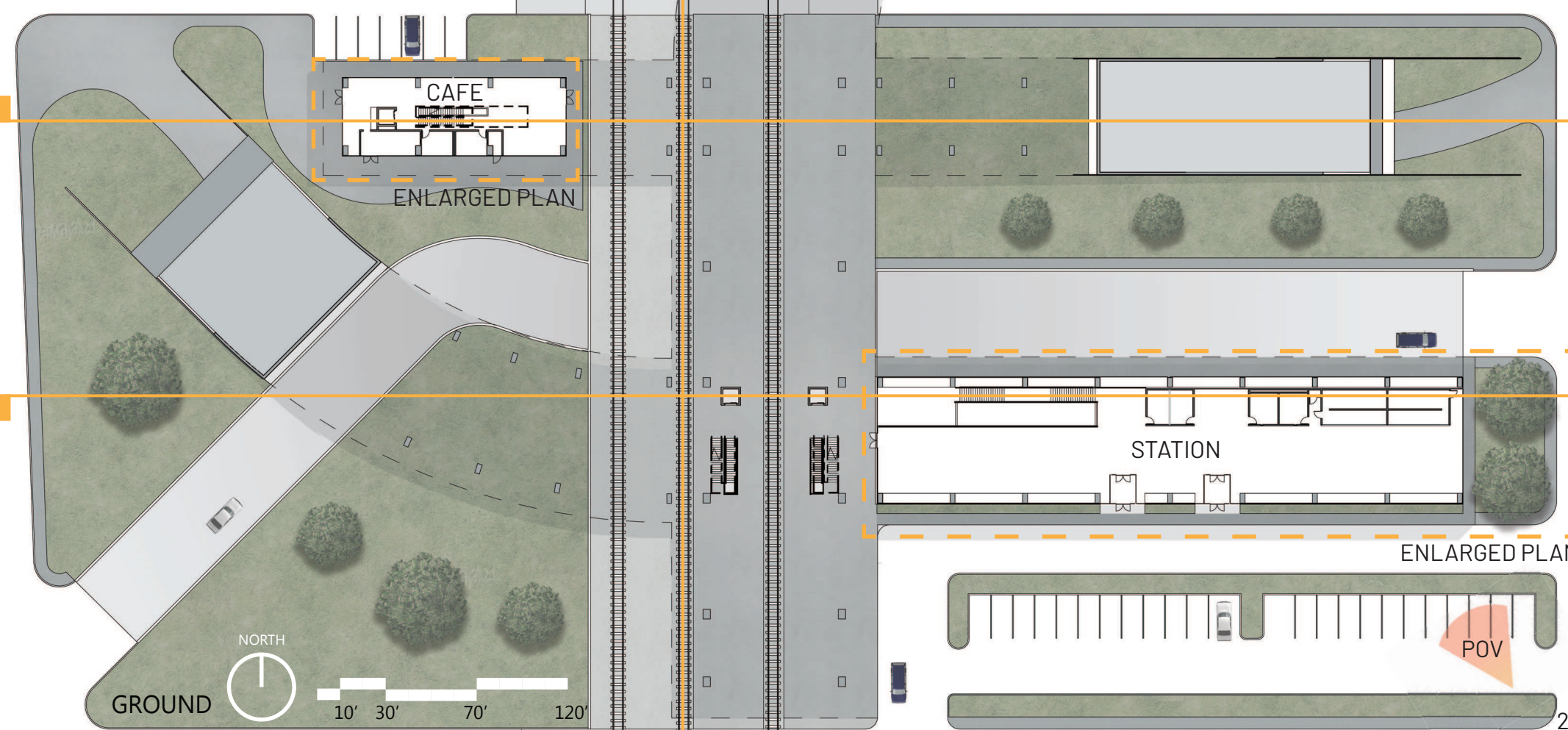
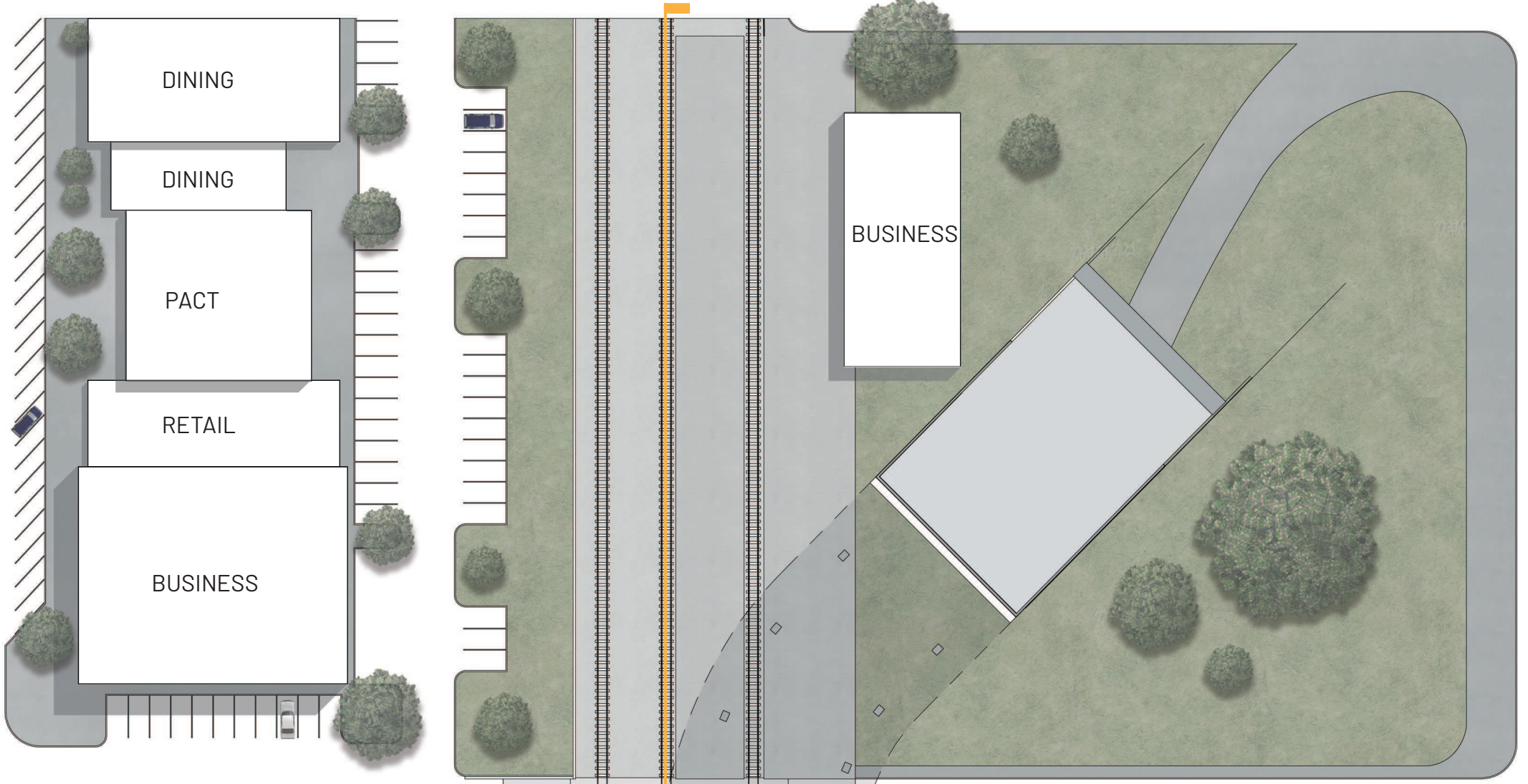


The proposed inclusion of a basement level in the design of the transit center serves to fulfill dual objectives. Firstly, it facilitates a smooth transition from the upper platform to the lower platform, ensuring ease of accessibility for users. Secondly, it incorporates an optimized vehicular circulation system that obviates the disruption of train services during loading and passing operations. In this way, the basement level presents a practical solution that enhances the overall functionality and user experience of the transit center.



In an effort to mitigate the complexity of the built environment, we have strategically incorporated vegetation in the vicinity of the station, including beneath, within, and atop the structure. This approach effectively creates a cohesive fabric that interweaves the urban context with the mass of the station.



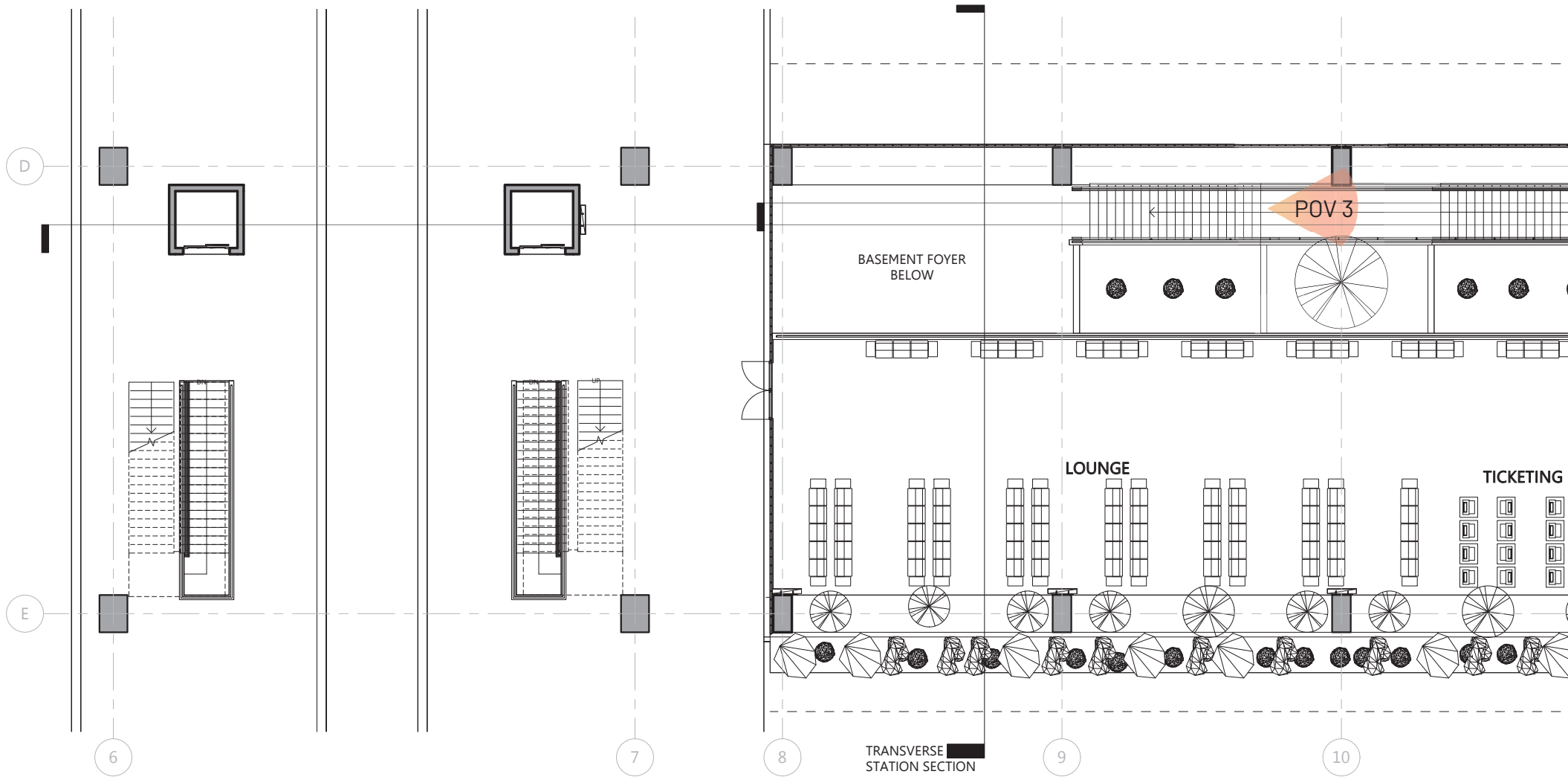


PERSPECTIVE PLATFORM SECTION

LONGITUDINAL CAFE SECTION

LONGITUDINAL STATION SECTION

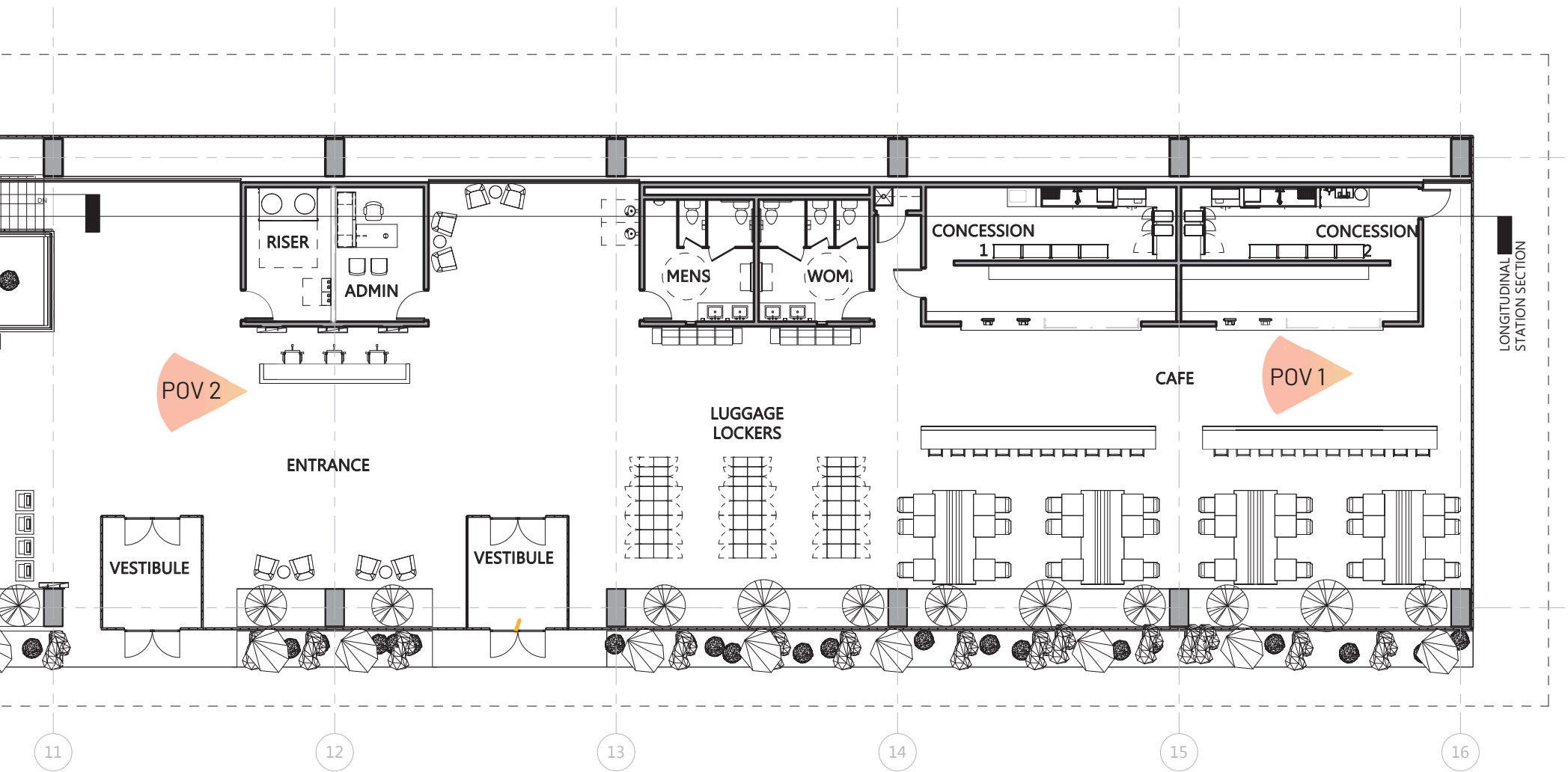




ENLARGED STATION PLAN  

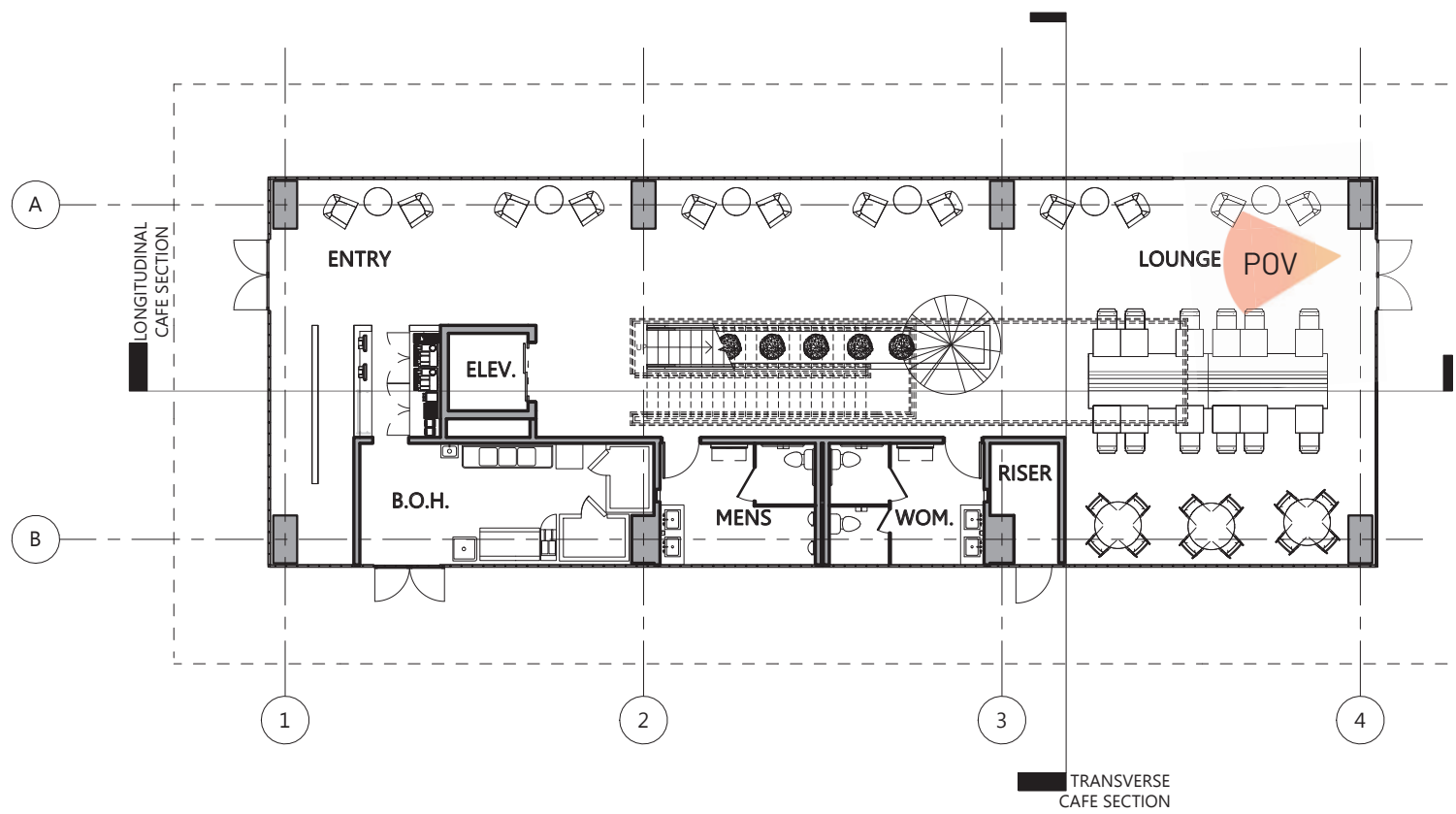
5' 15' 25' 45'



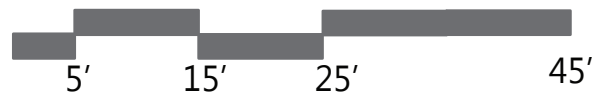




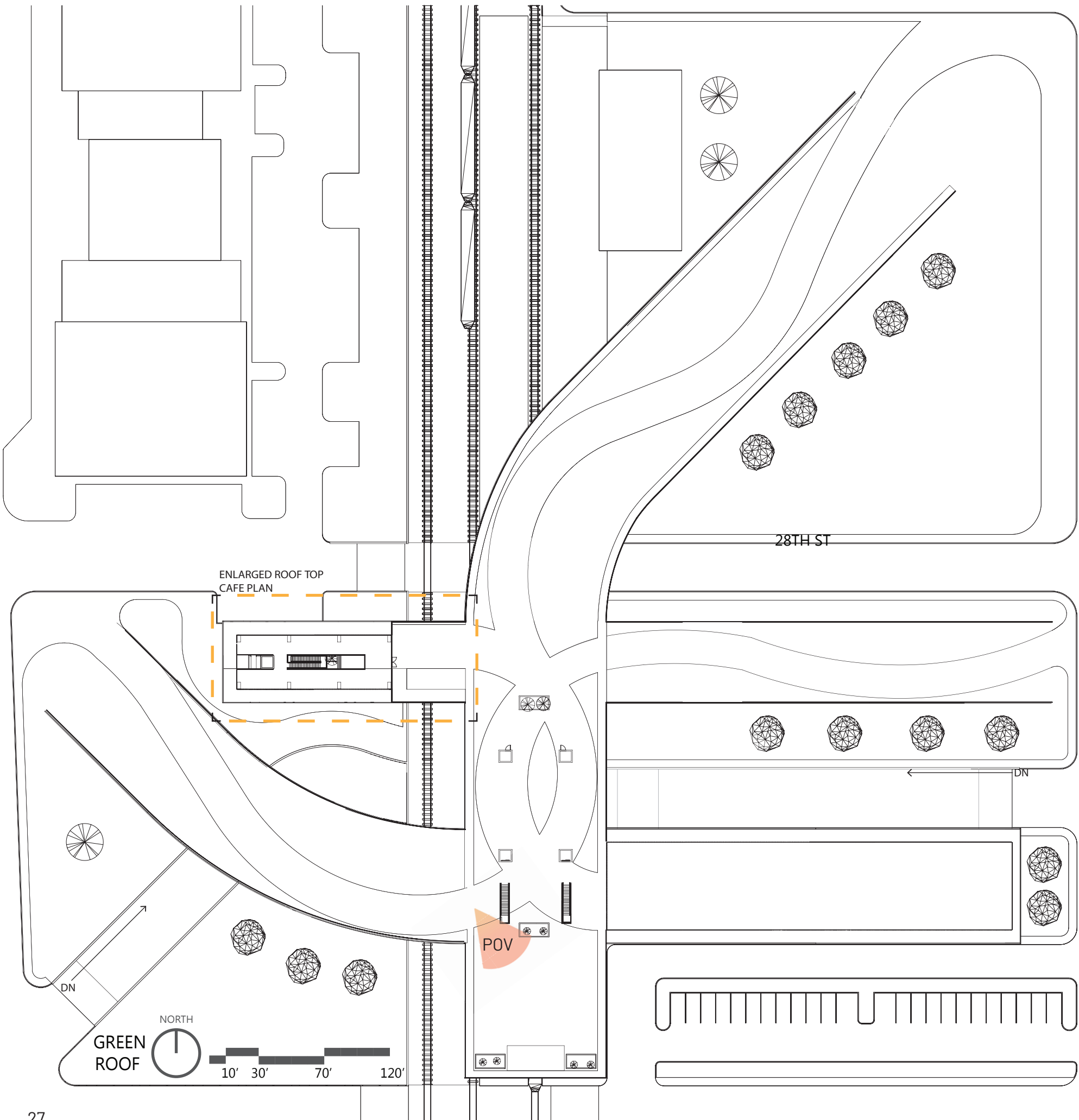


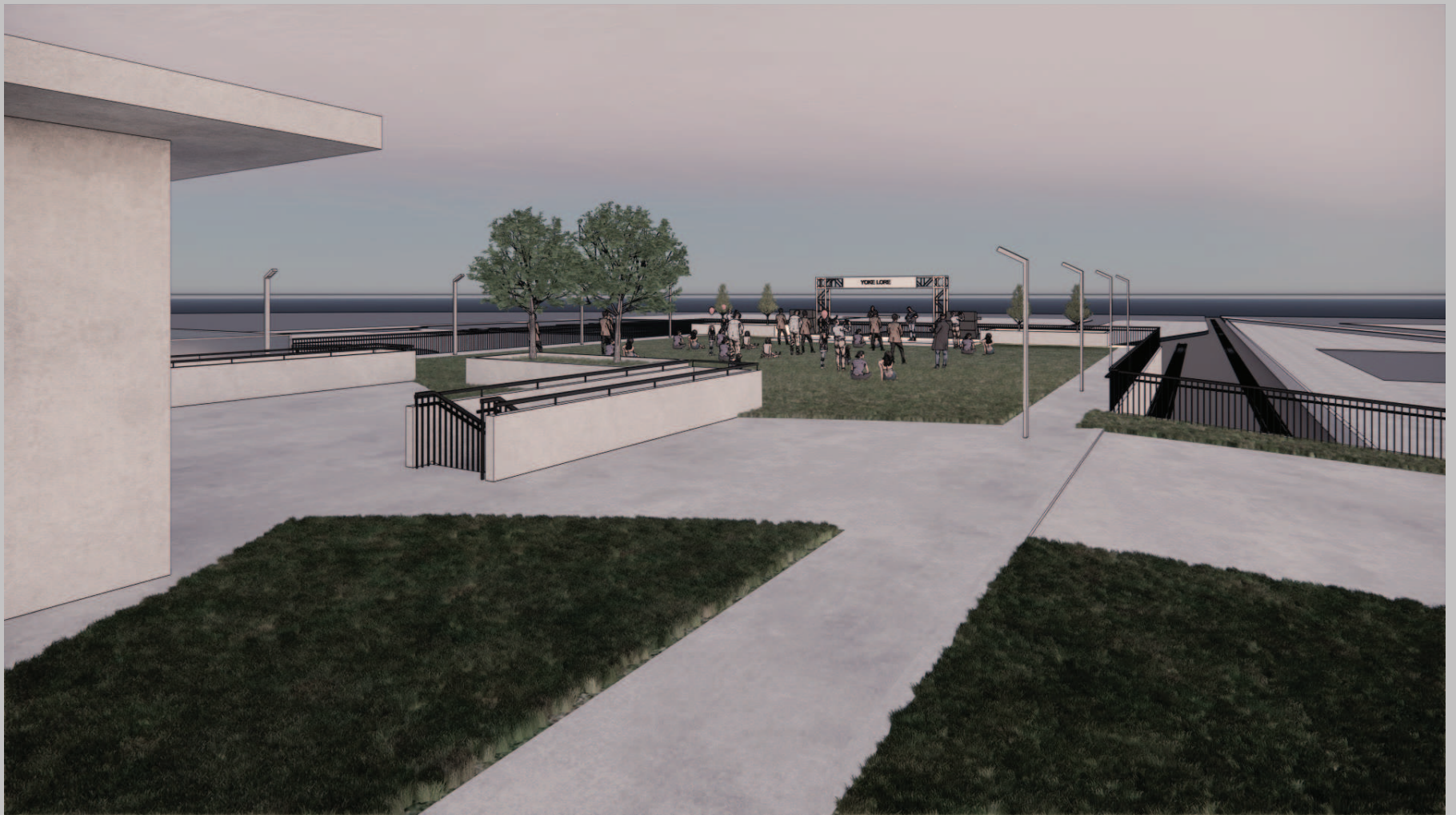


ENLARGED CAFE PLAN

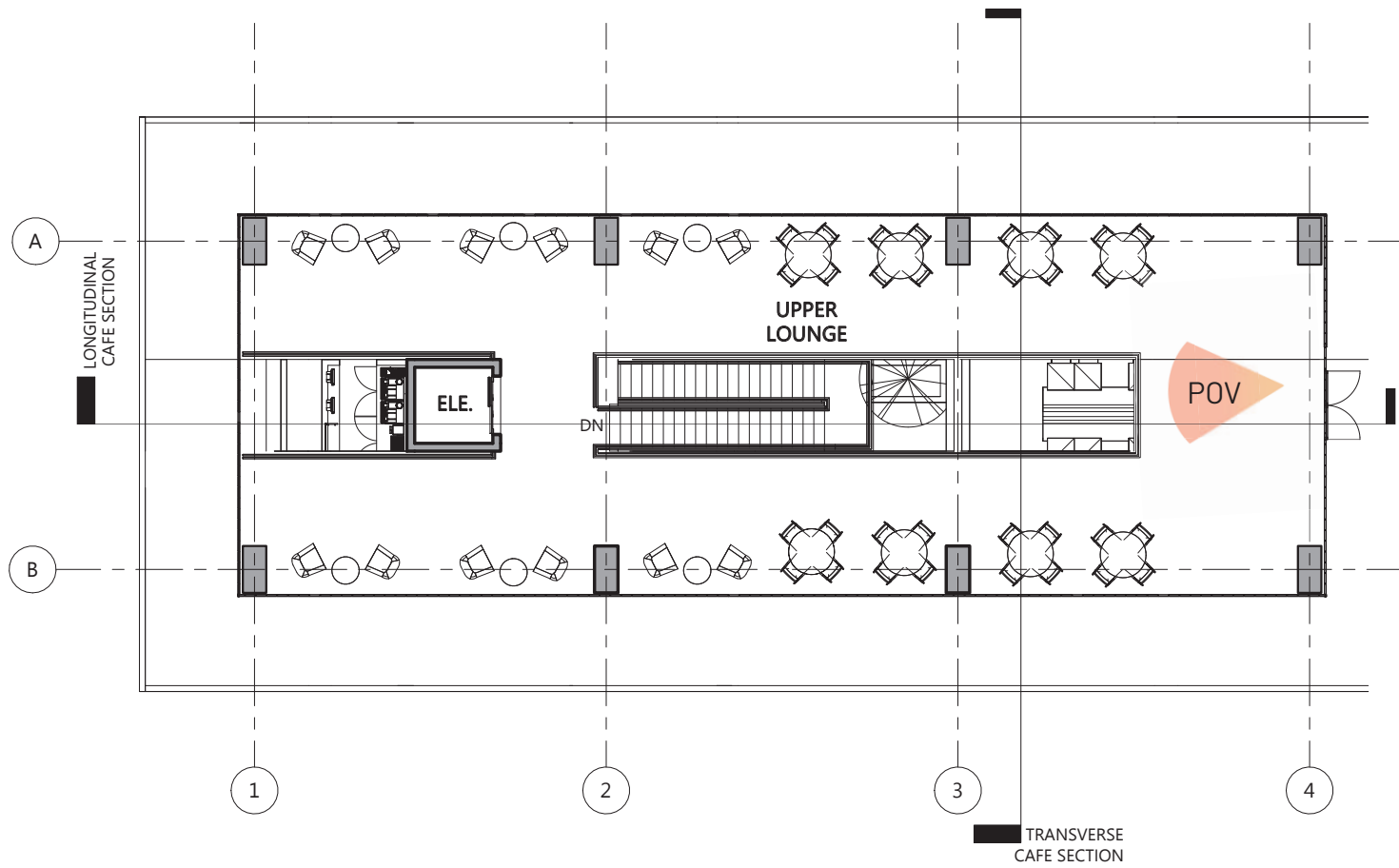










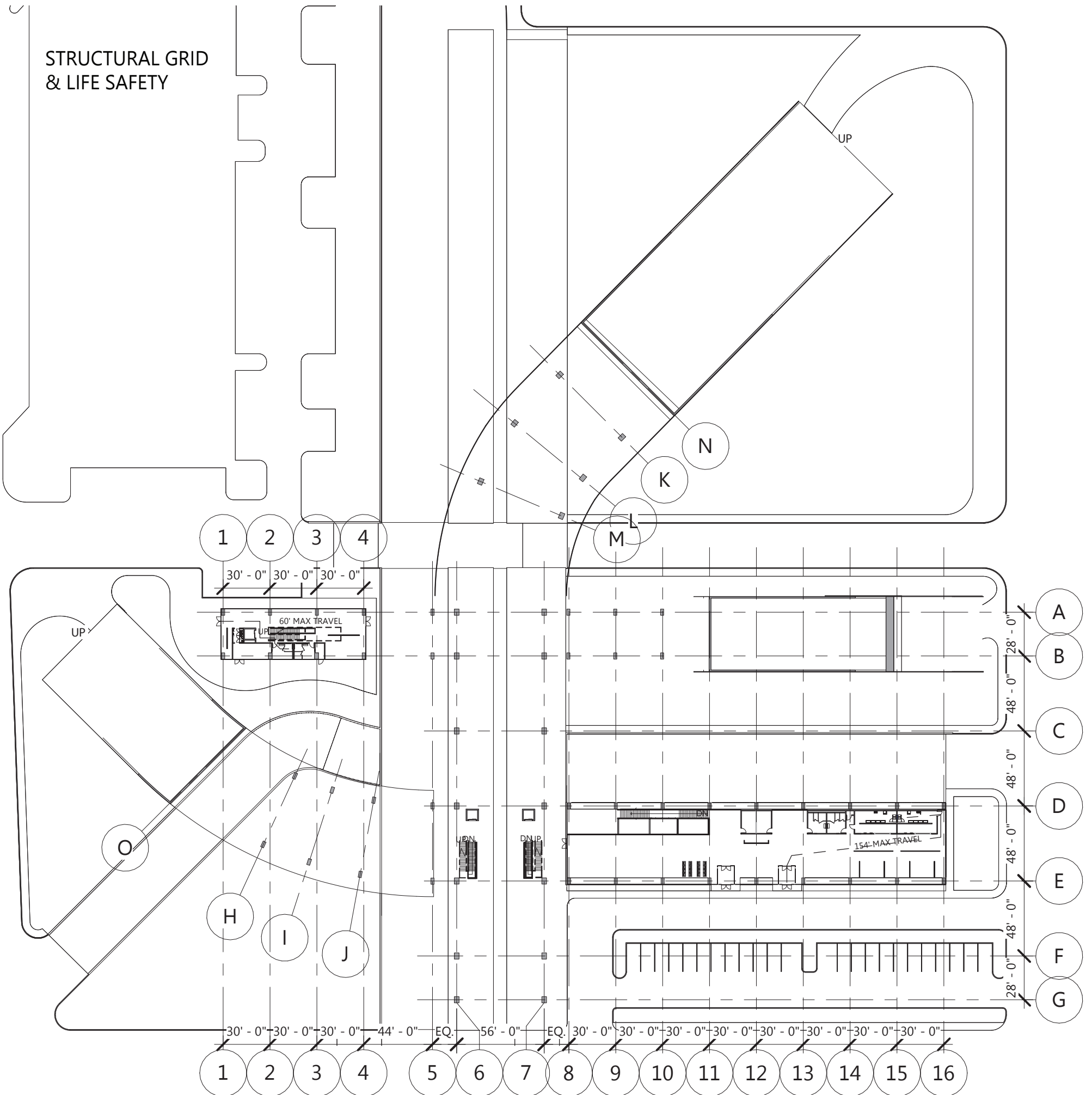


ENLARGED CAFE PLAN - ROOF TOP

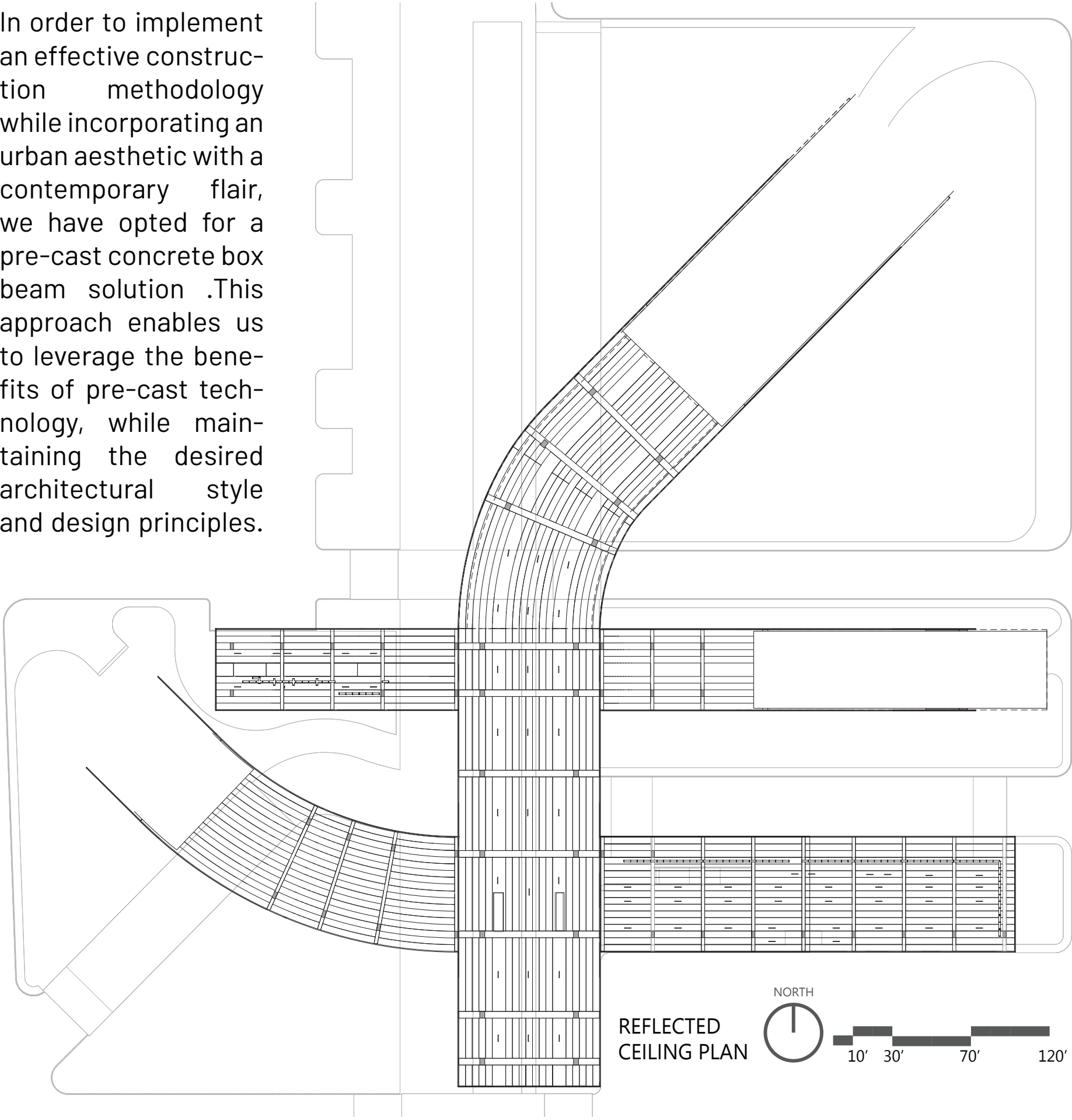


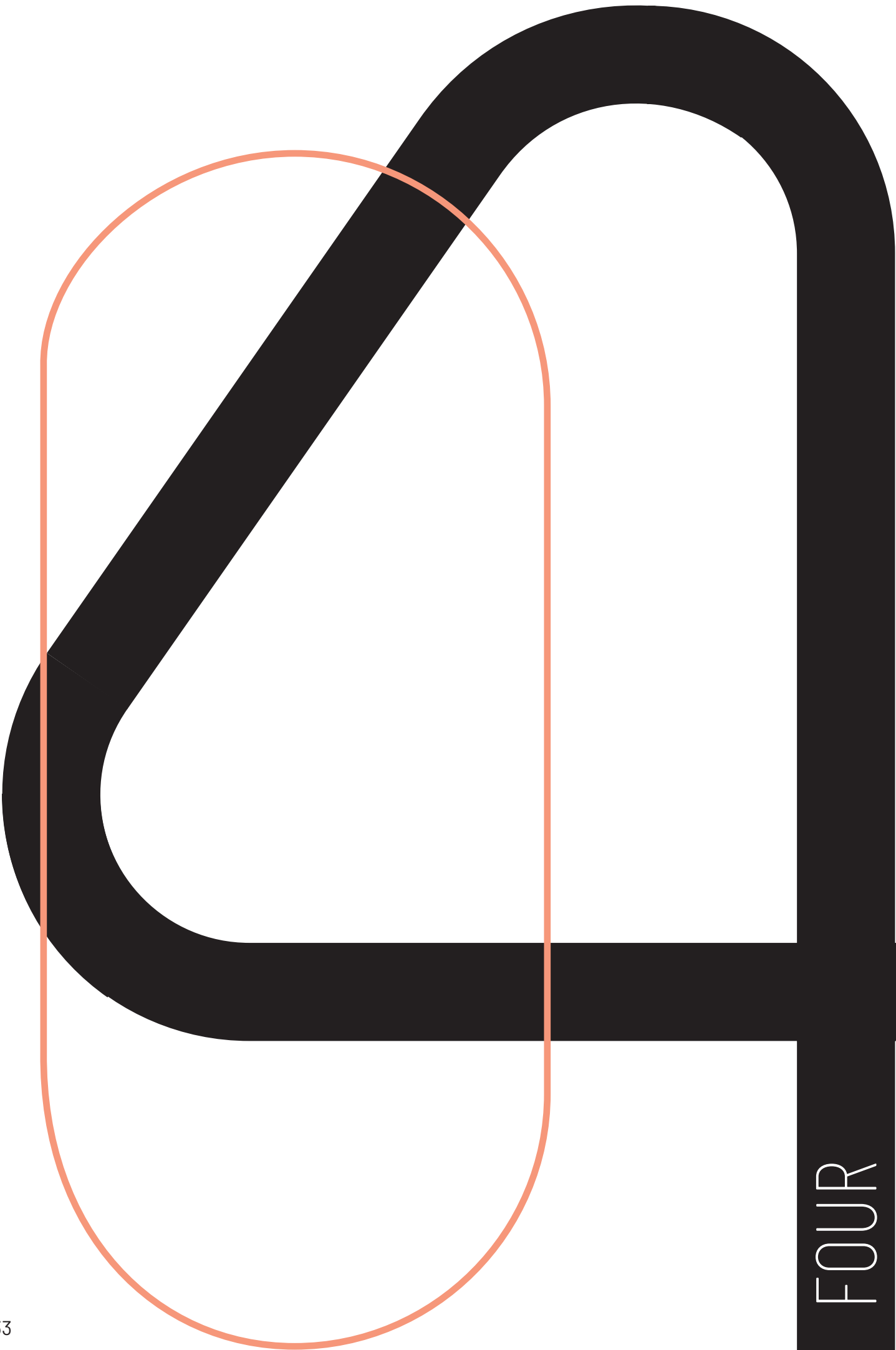


STRUCTURAL GRID  
& LIFE SAFETY



In order to implement an effective construction methodology while incorporating an urban aesthetic with a contemporary flair, we have opted for a pre-cast concrete box beam solution. This approach enables us to leverage the benefits of pre-cast technology, while maintaining the desired architectural style and design principles.



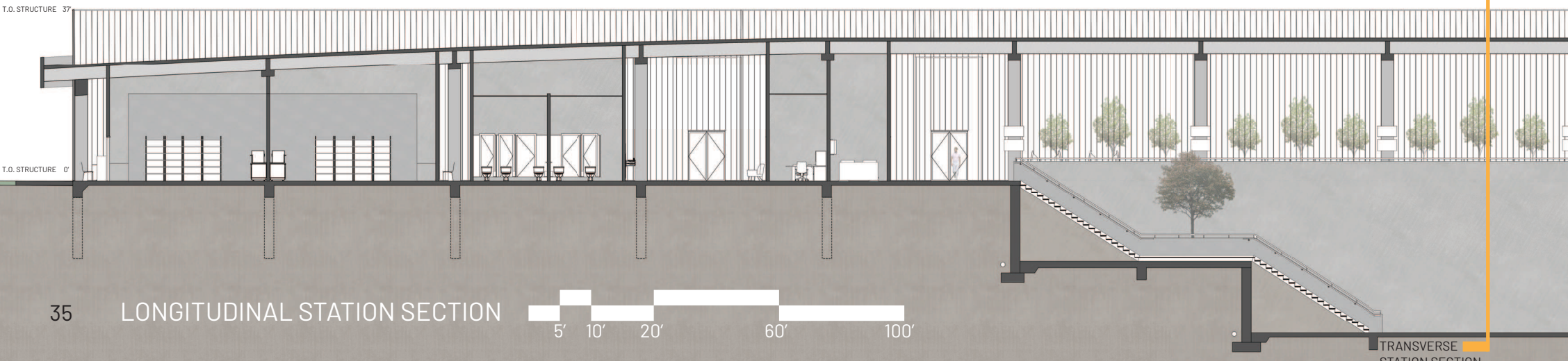


SECTIONS

FOUR

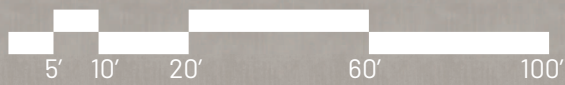
It is essential to possess a comprehensive understanding of the complexities, limitations, and standards of various materials. Such knowledge significantly influences the successful integration of individual pieces to form a cohesive end product. In the case of pre-cast members, the developed system offers numerous benefits. It effectively organizes the different components of a project, including vertical circulation, structural grids, and the application of mechanical, electrical, and plumbing systems. Ultimately, this system facilitates the realization of the most feasible and achievable spans, thereby enhancing the overall structural integrity of the project.



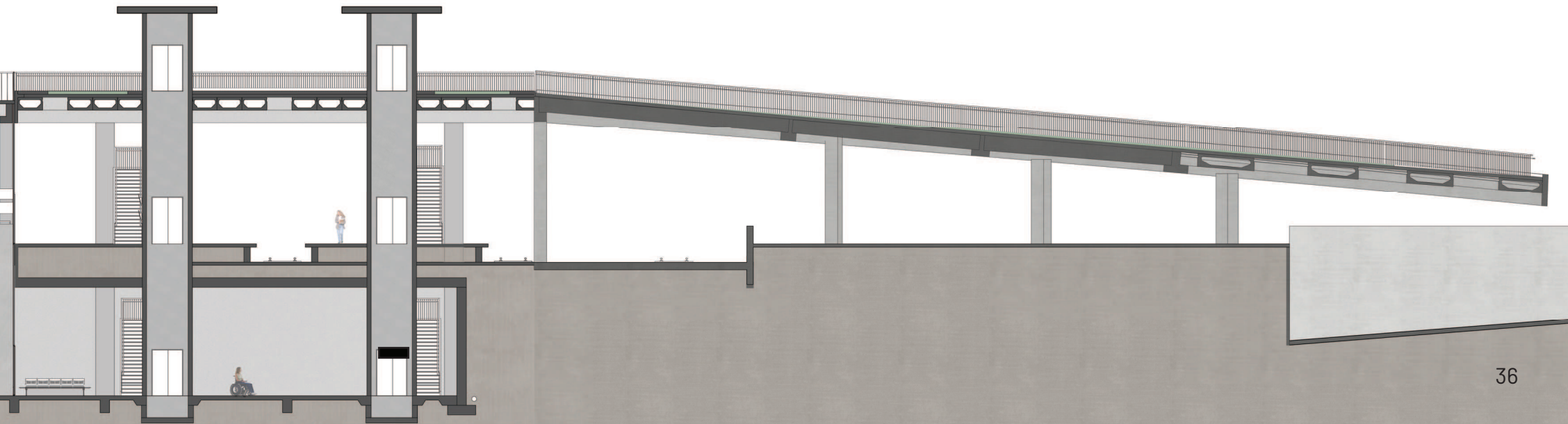


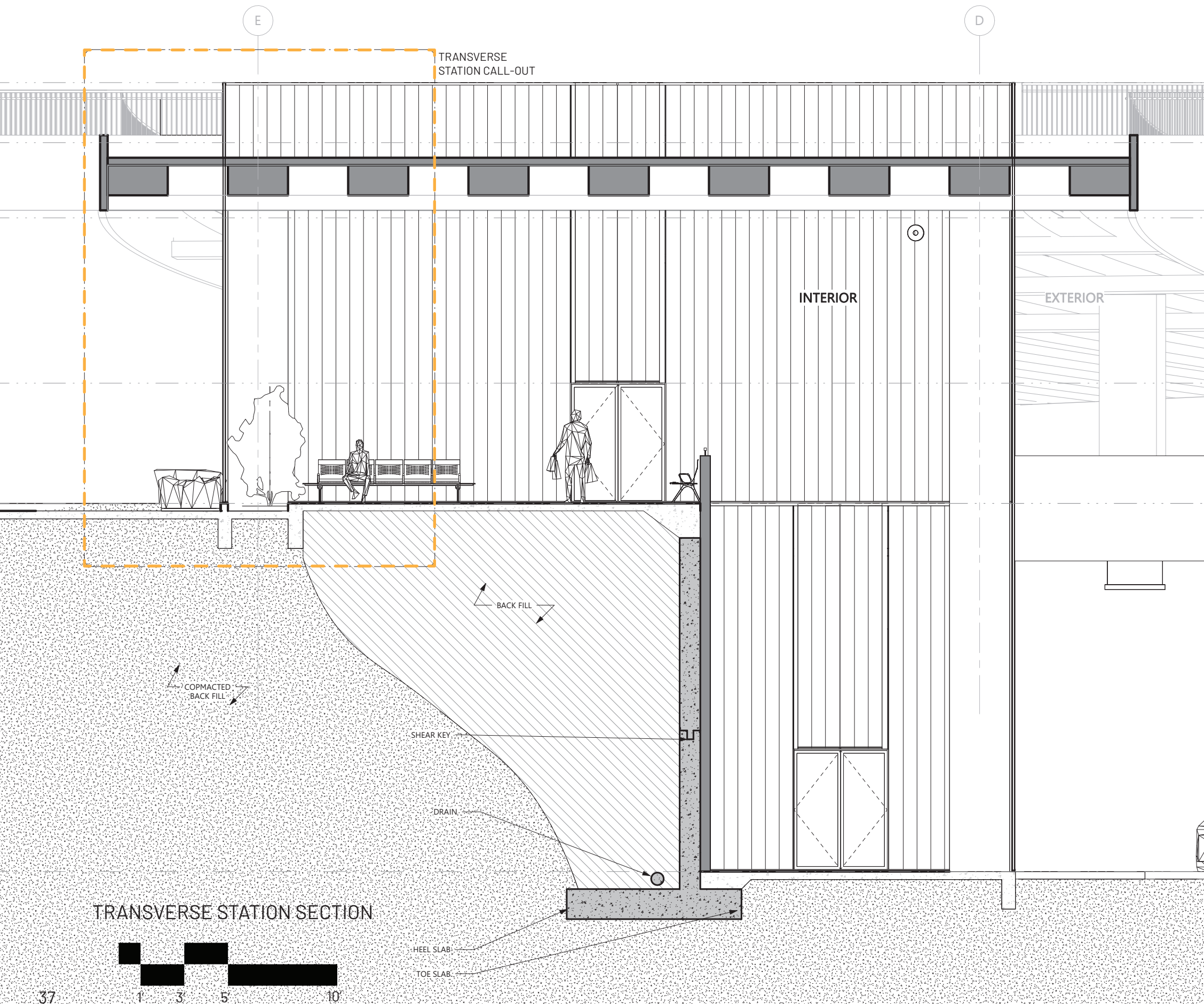
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LONGITUDINAL STATION SECTION

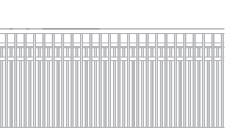


TRANSVERSE  
STATION SECTION









T.O. BUILDING  
28' - 0"

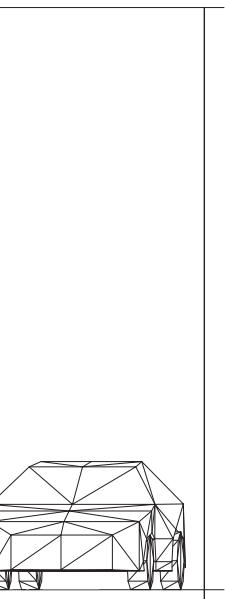
2ND FLOOR  
24' - 0"

MIN. CLEAR HEIGHT  
19' - 0"



B.O. HEADER  
8' - 0"

GROUND LEVEL  
0' - 0"

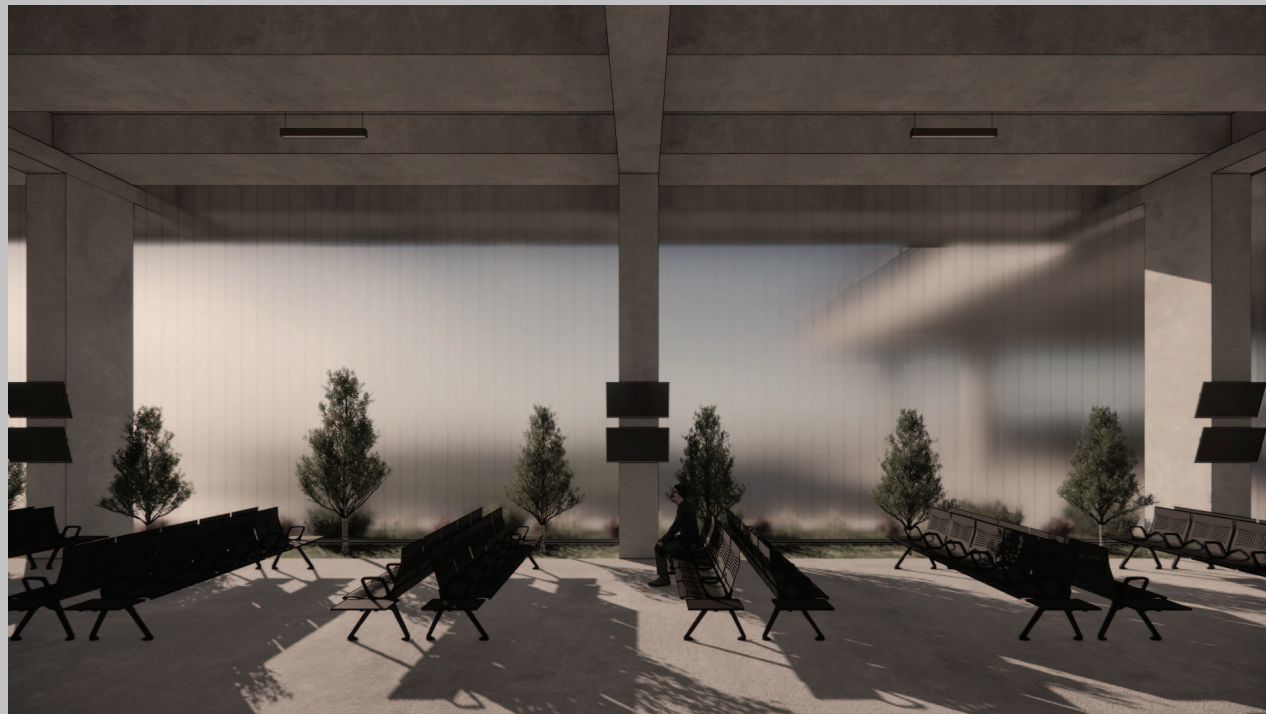


UNDERGROUND  
-24' - 6"



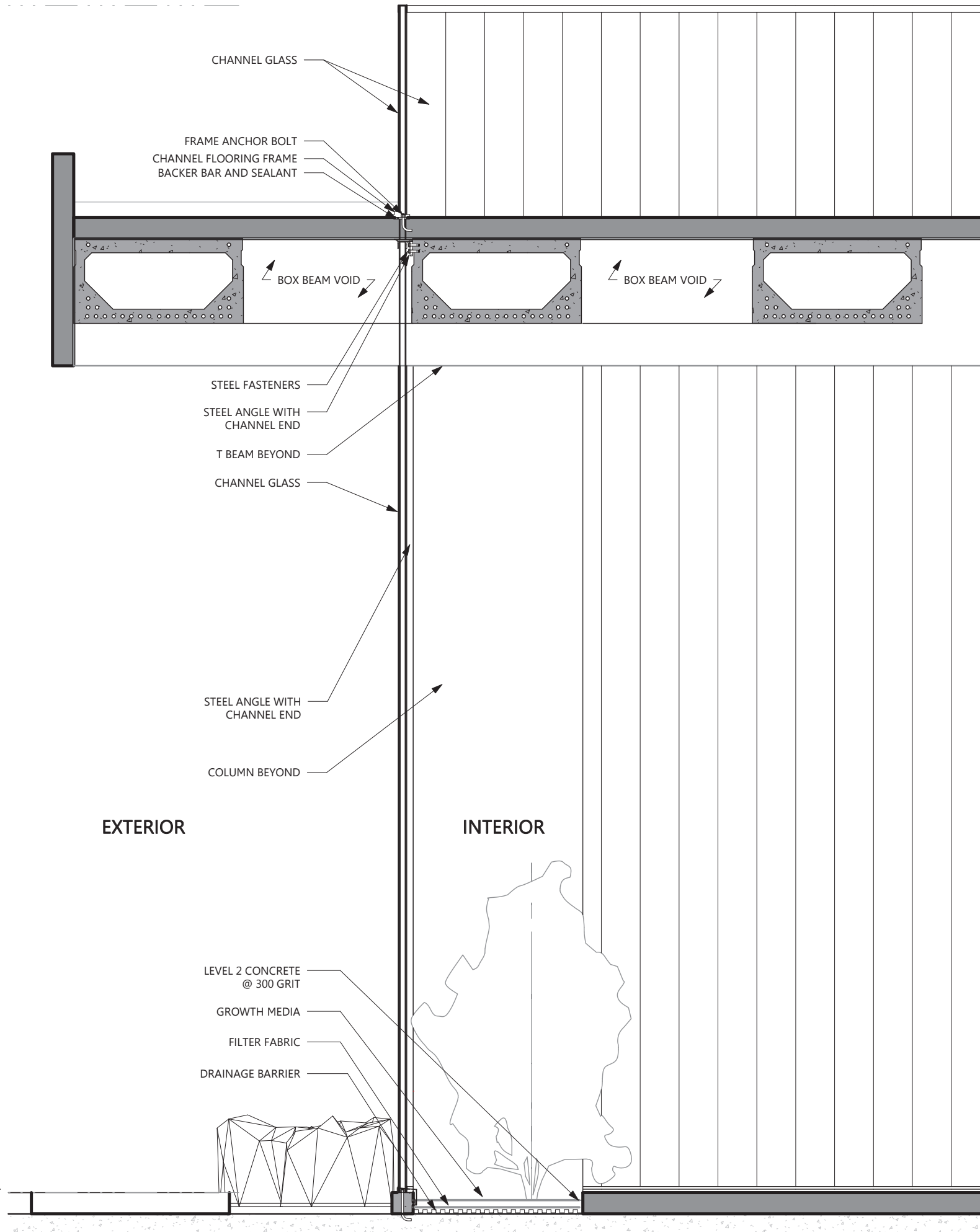
The use of retaining walls and abutments was a critical building component. These structural elements enabled the seamless integration of areas below ground or built up with the surrounding landscape. Furthermore, the successful implementation of these structures allowed for uninterrupted vertical circulation, regardless of the mode of transportation utilized. This feature played a pivotal role in the overall success of the construction project.





Incorporating vegetation into the floor plan creates a natural atmosphere within the station's interior. The aim of this approach was to promote an effortless integration with the surrounding site, resulting in a nearly imperceptible transition. By extending the greenery onto the floor, the station's interior seamlessly blends with the exterior environment. To achieve this effect, the use of transparent channel glass maintains a consistent ground level, enhancing the connection between the inside and outside spaces

T.O. BUILDING  
28' - 0"

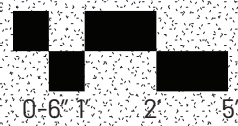


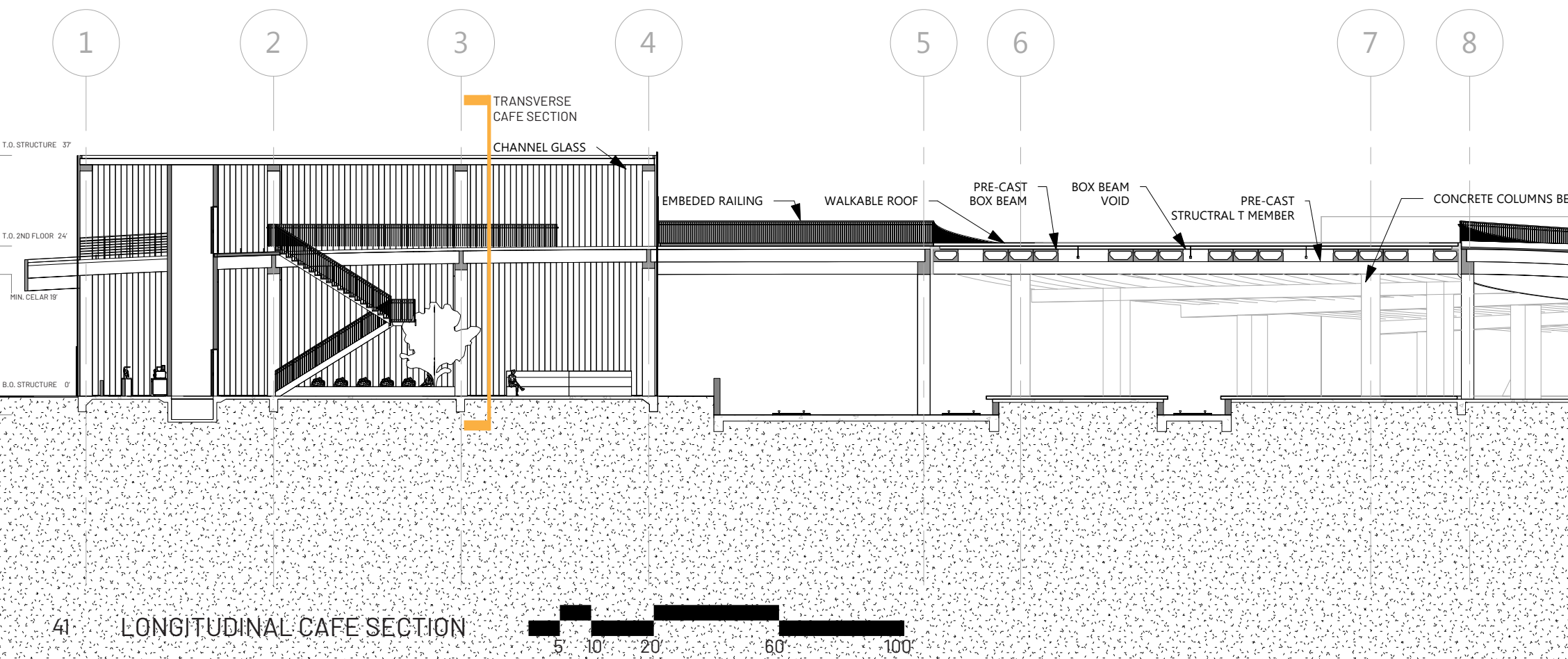
EXTERIOR

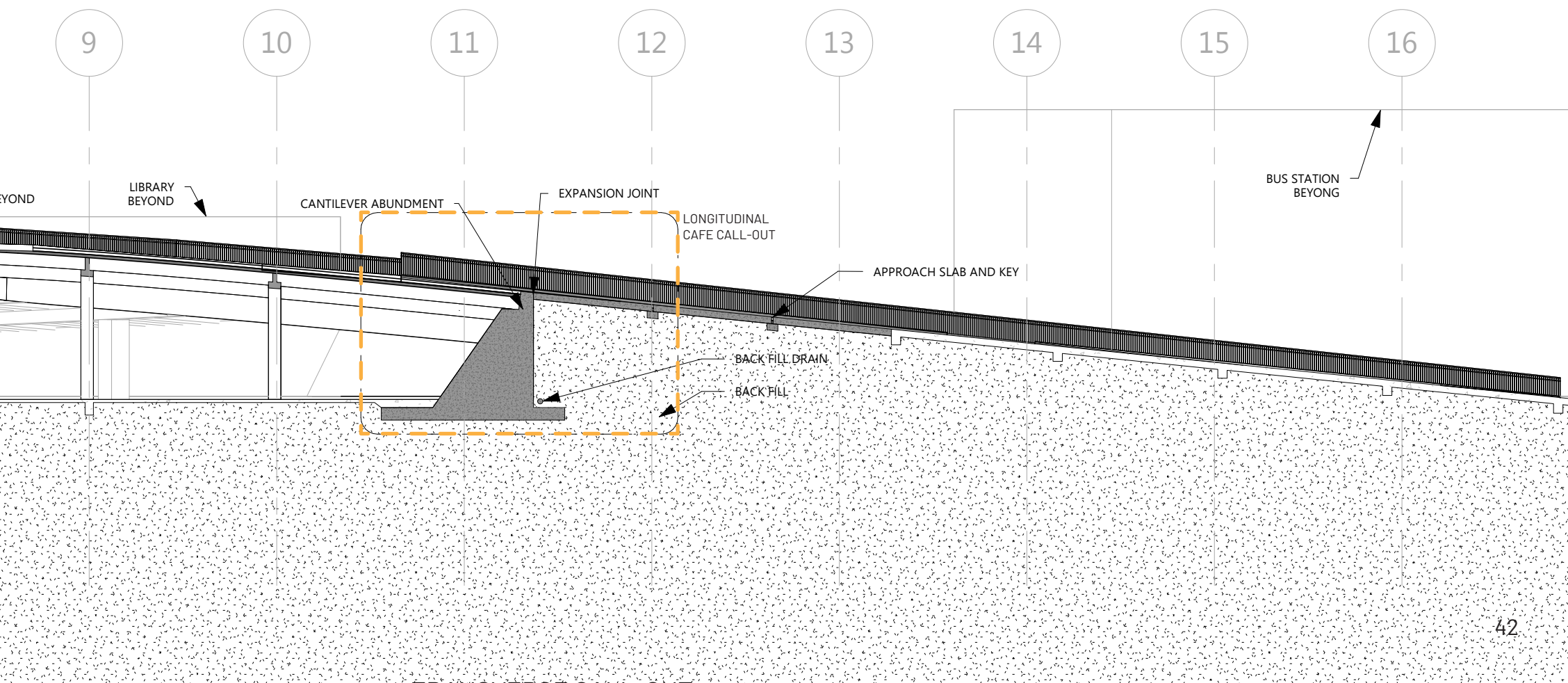
INTERIOR

GROUND LEVEL  
0' - 0"

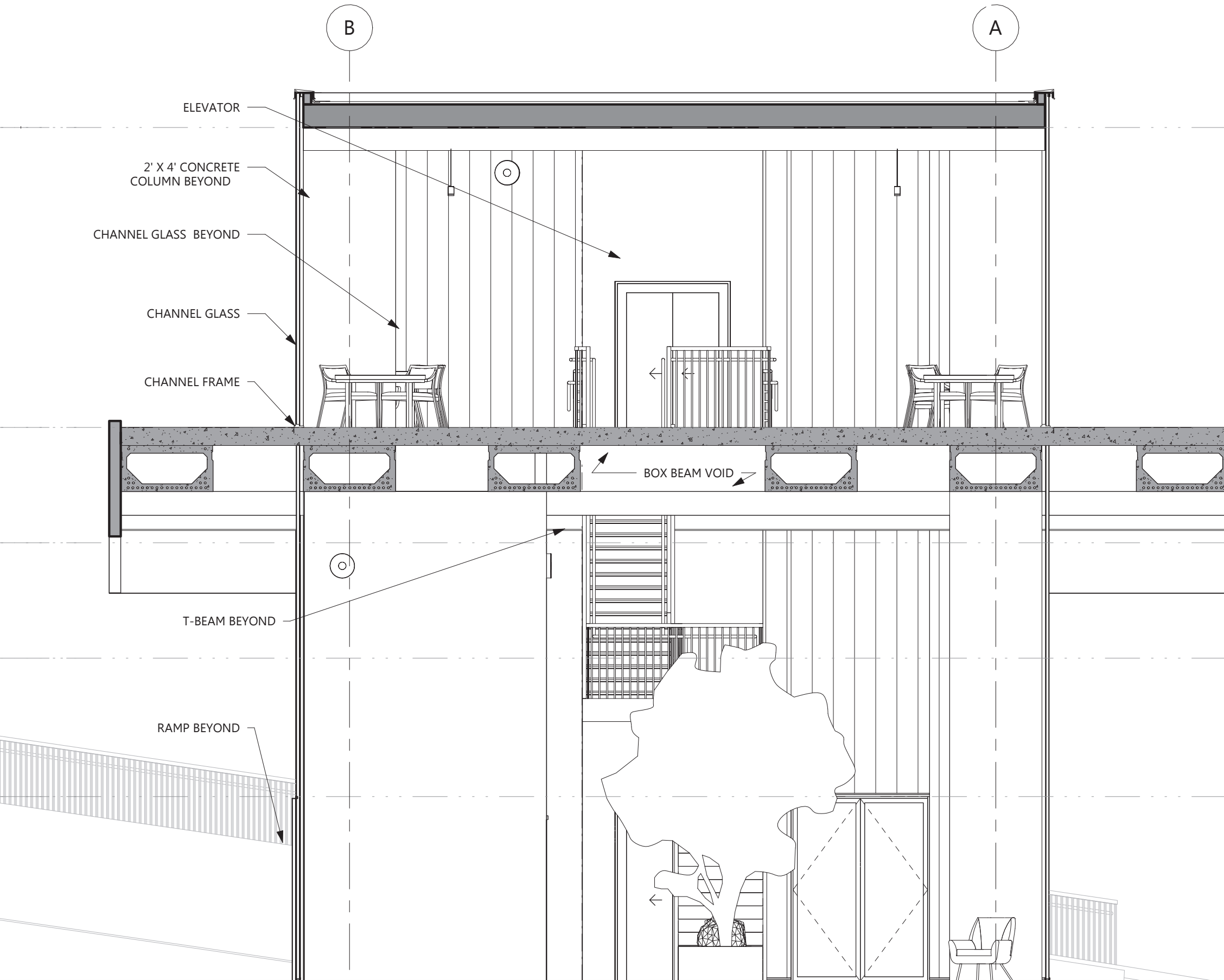
TRANSVERSE  
STATION  
CALLOUT



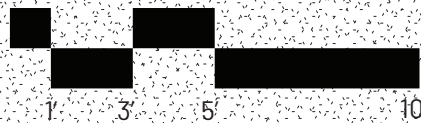








TRANSVERSE CAFE SECTION



T.O. STRUCTURE  
37' - 0"

2ND FLOOR  
24' - 0"

MIN. CLEAR HEIGHT  
19' - 0"

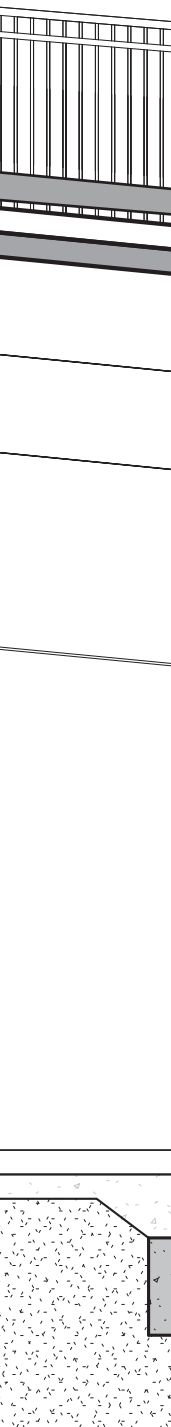
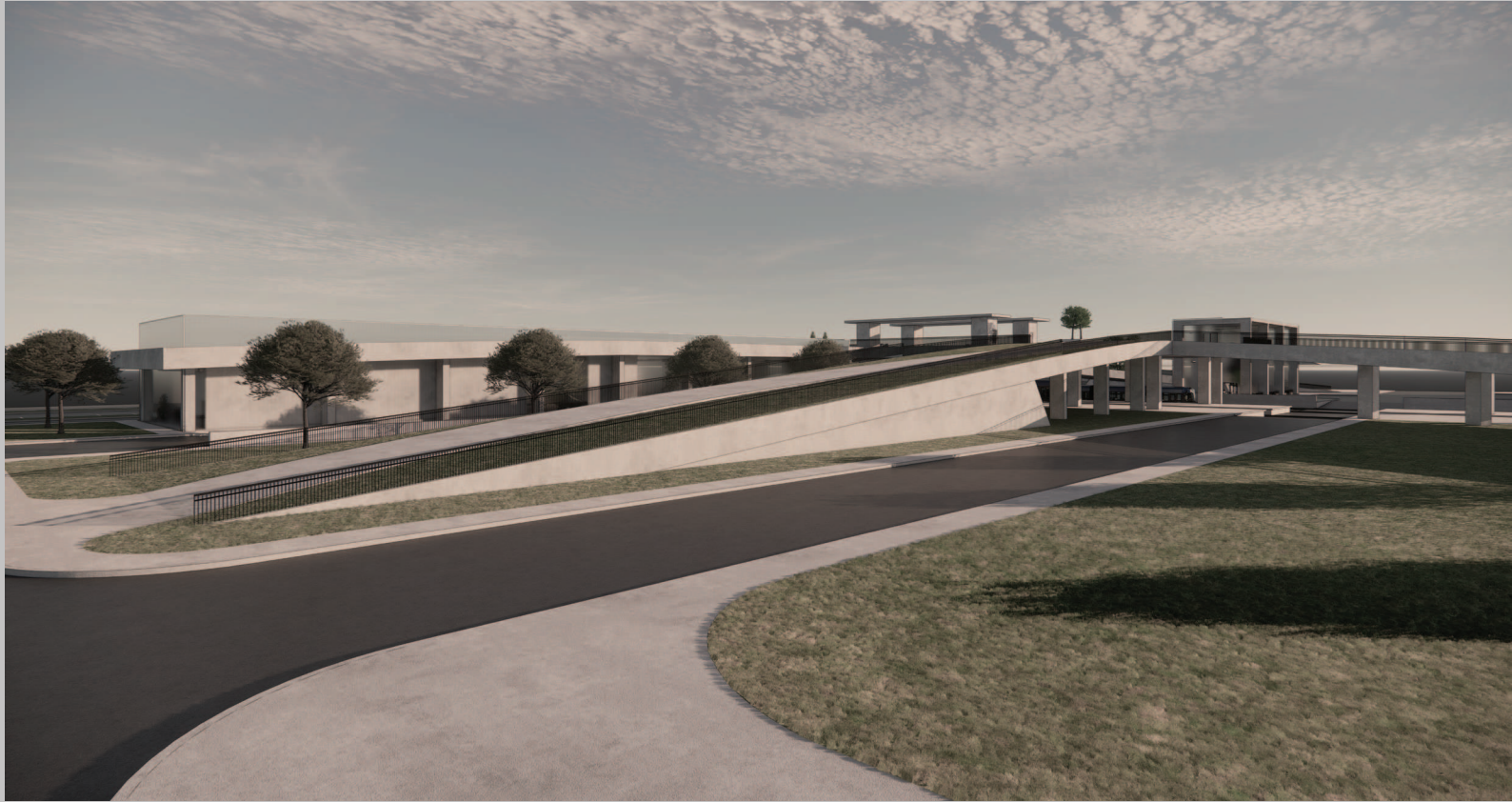
B.O. SOFFIT  
14' - 0"

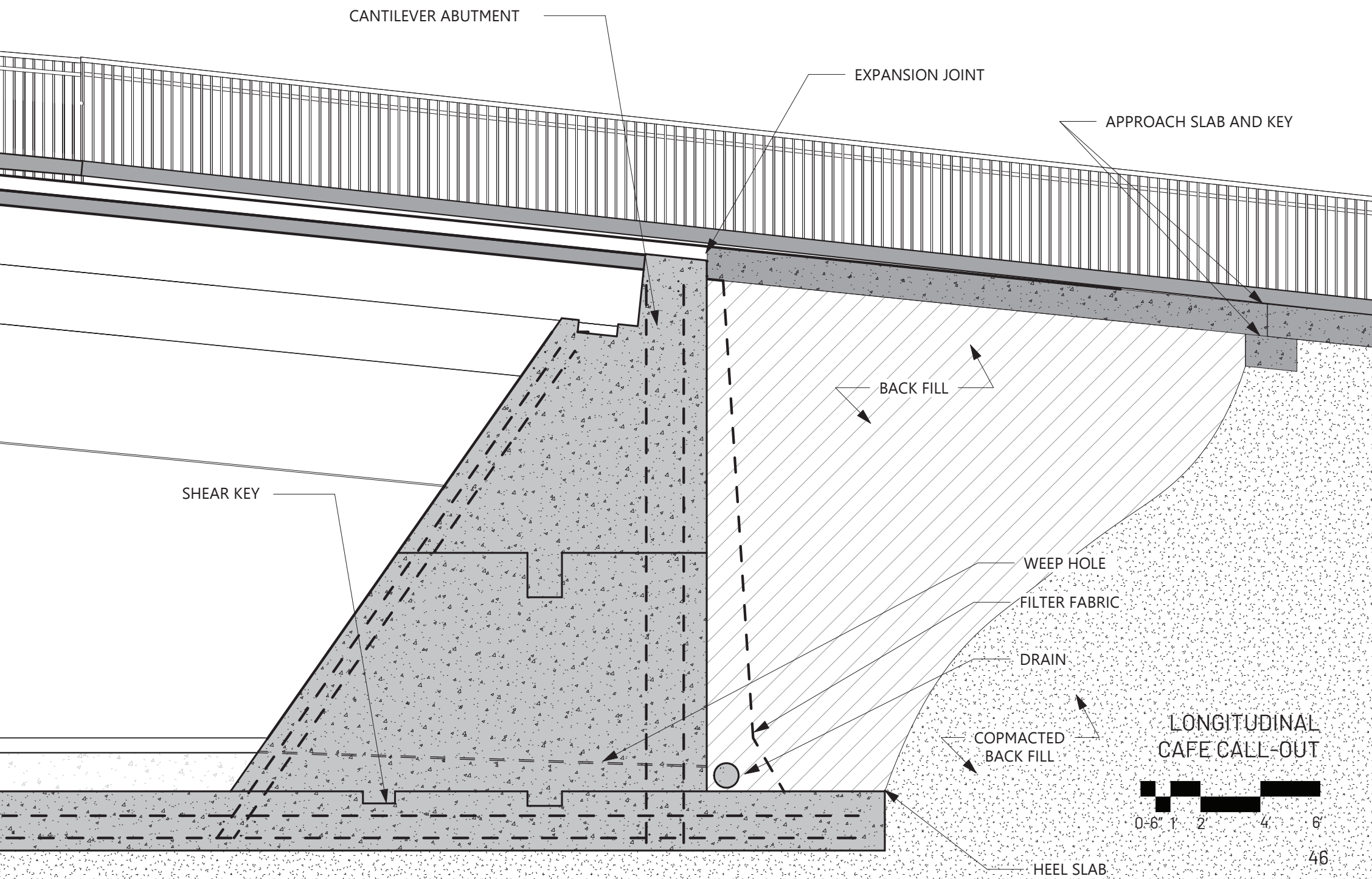
B.O. HEADER  
8' - 0"

GROUND LEVEL  
0' - 0"



As demonstrated in the transverse section to the left, the voids present in the concrete box beams play a crucial role in organizing the previously mentioned circulation. Of particular note is the centered double box beam void, which provides sufficient width for effective circulation.





CANTILEVER ABUTMENT

EXPANSION JOINT

APPROACH SLAB AND KEY

SHEAR KEY

BACK FILL

WEEP HOLE

FILTER FABRIC

DRAIN

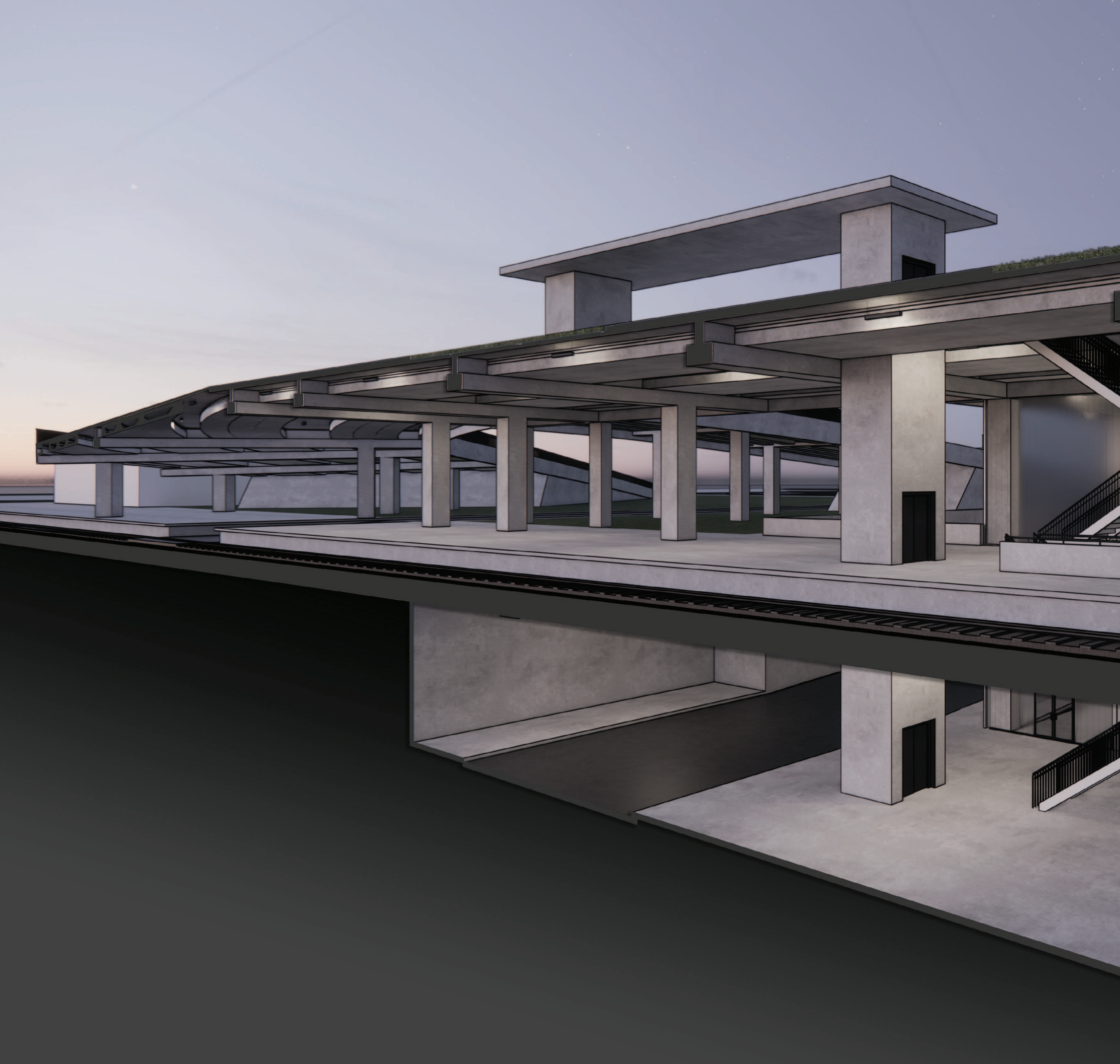
COMPACTED  
BACK FILL

LONGITUDINAL  
CASE CALL-OUT

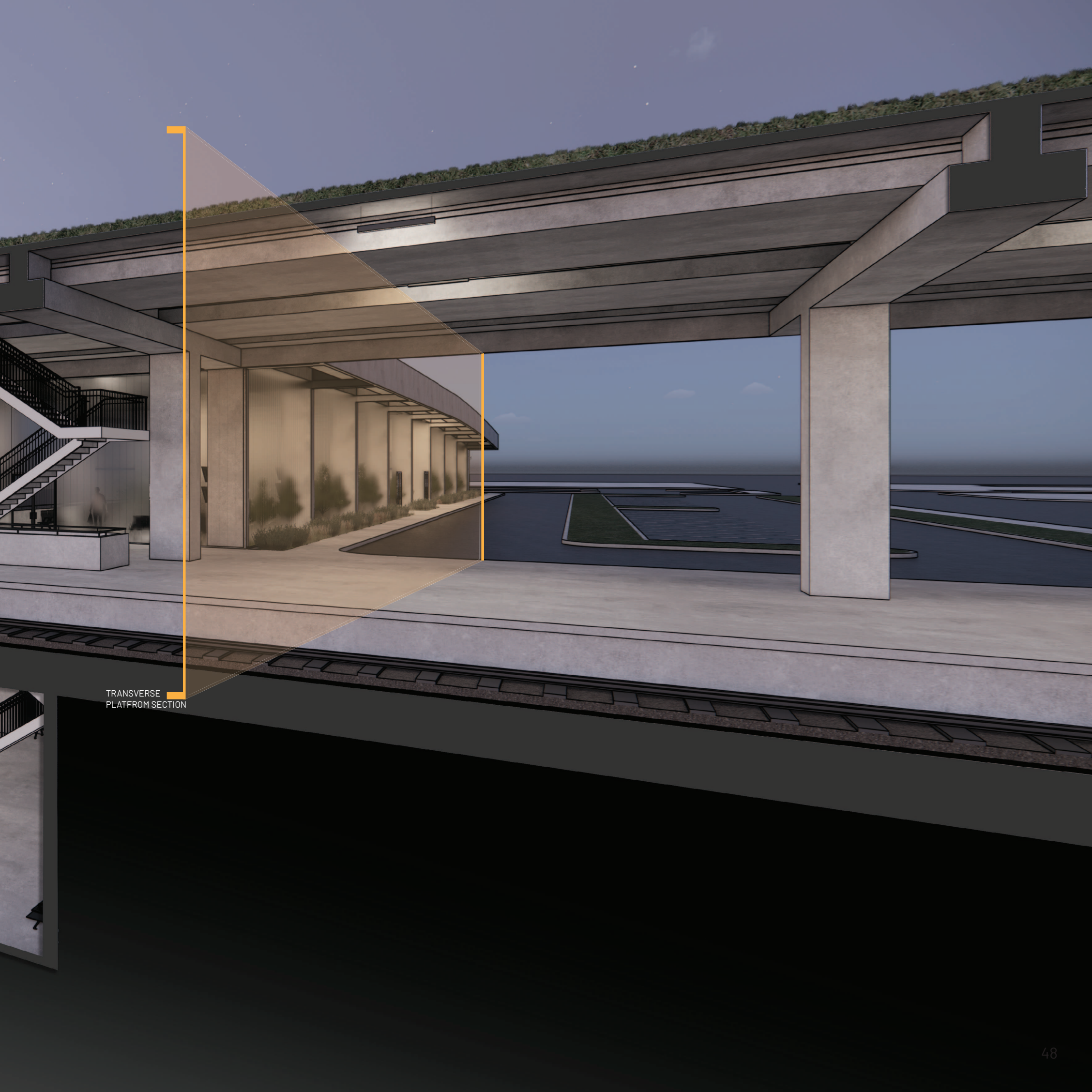


HEEL SLAB





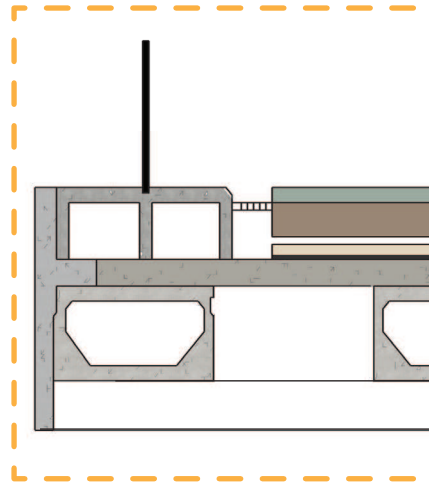




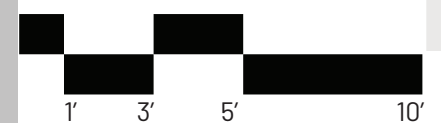
TRANSVERSE  
PLATFORM SECTION



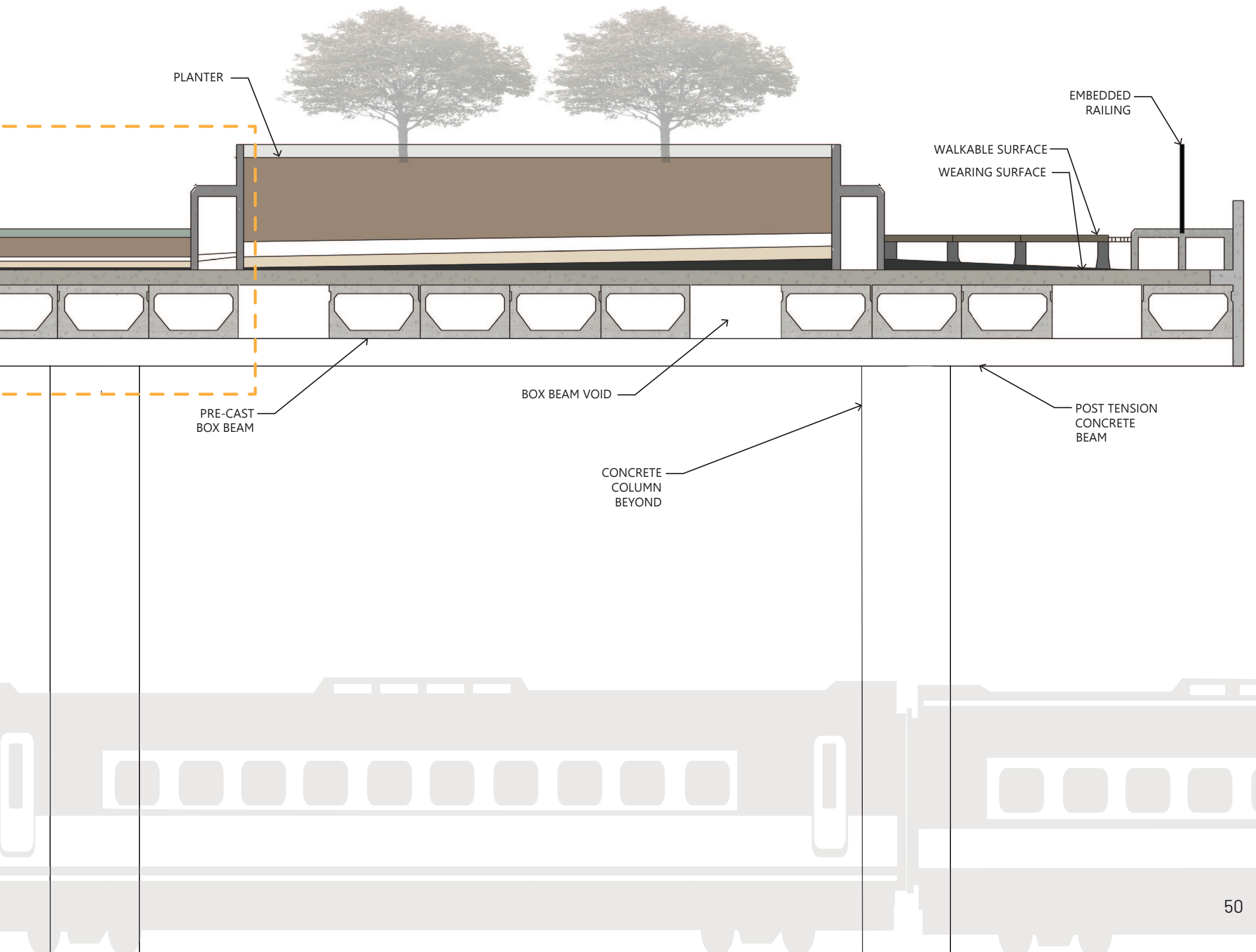
TRANSVERSE PLATFORM CALL-OUT



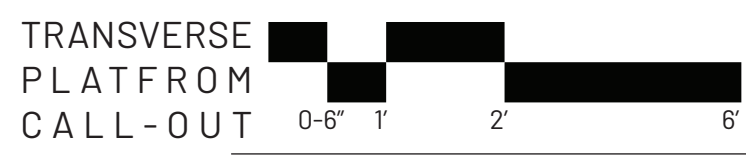
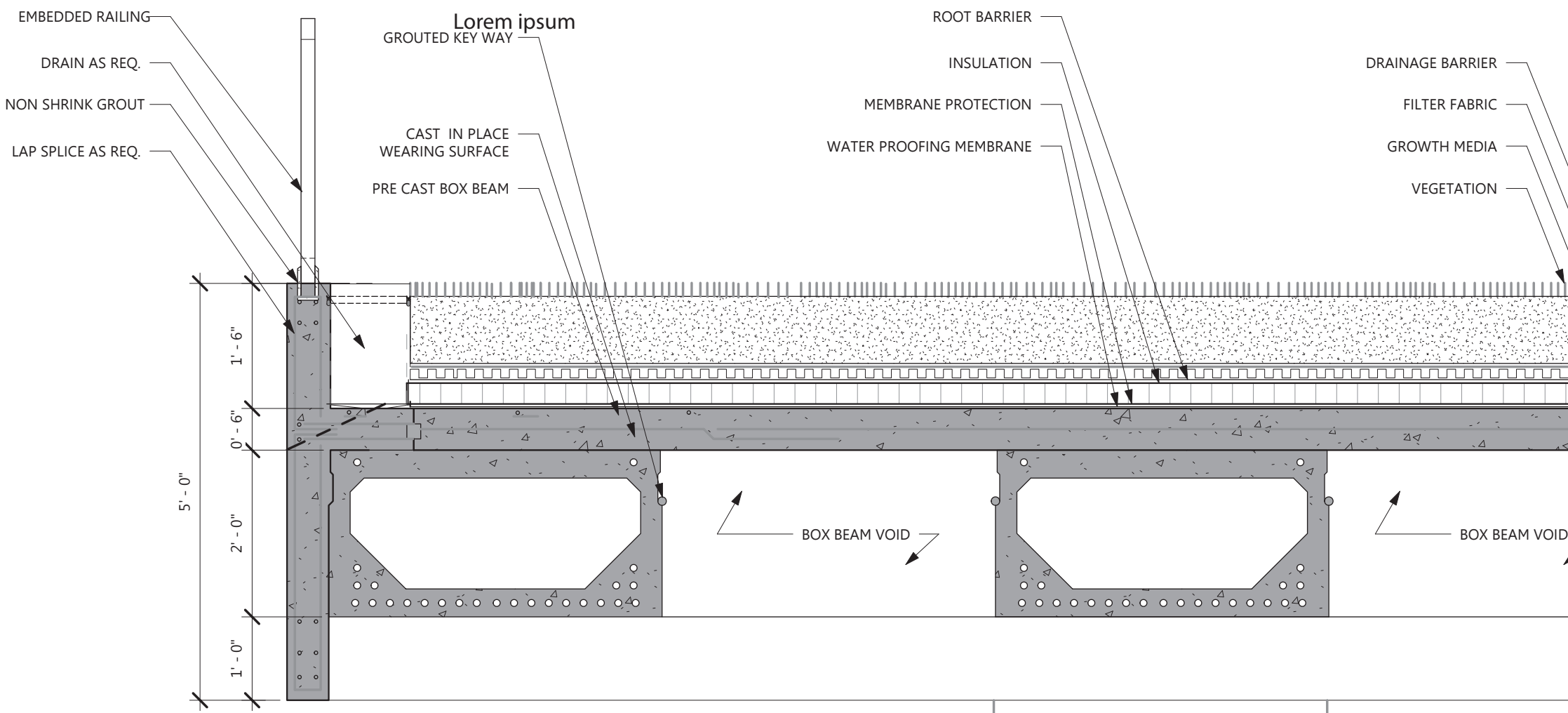
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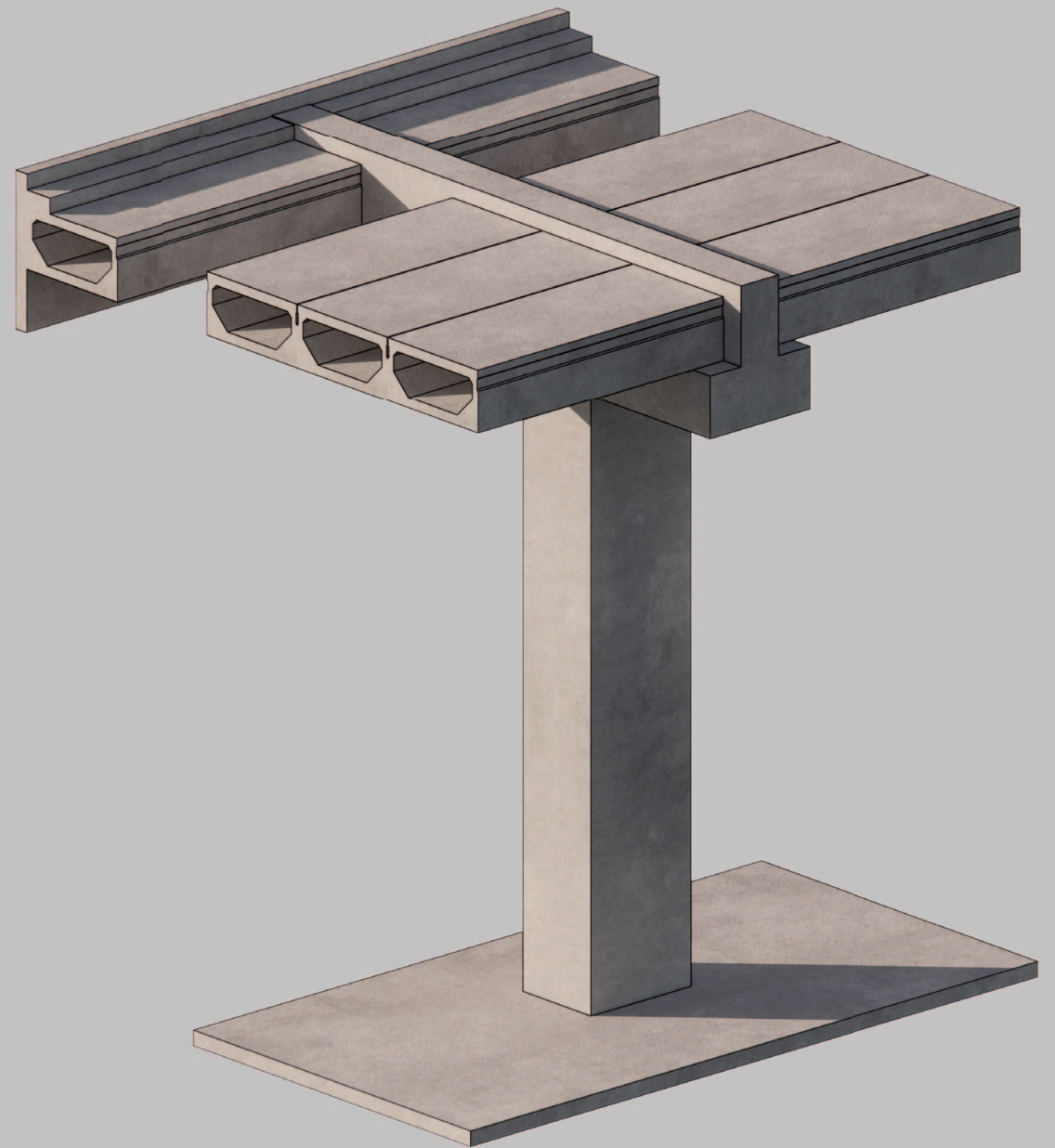
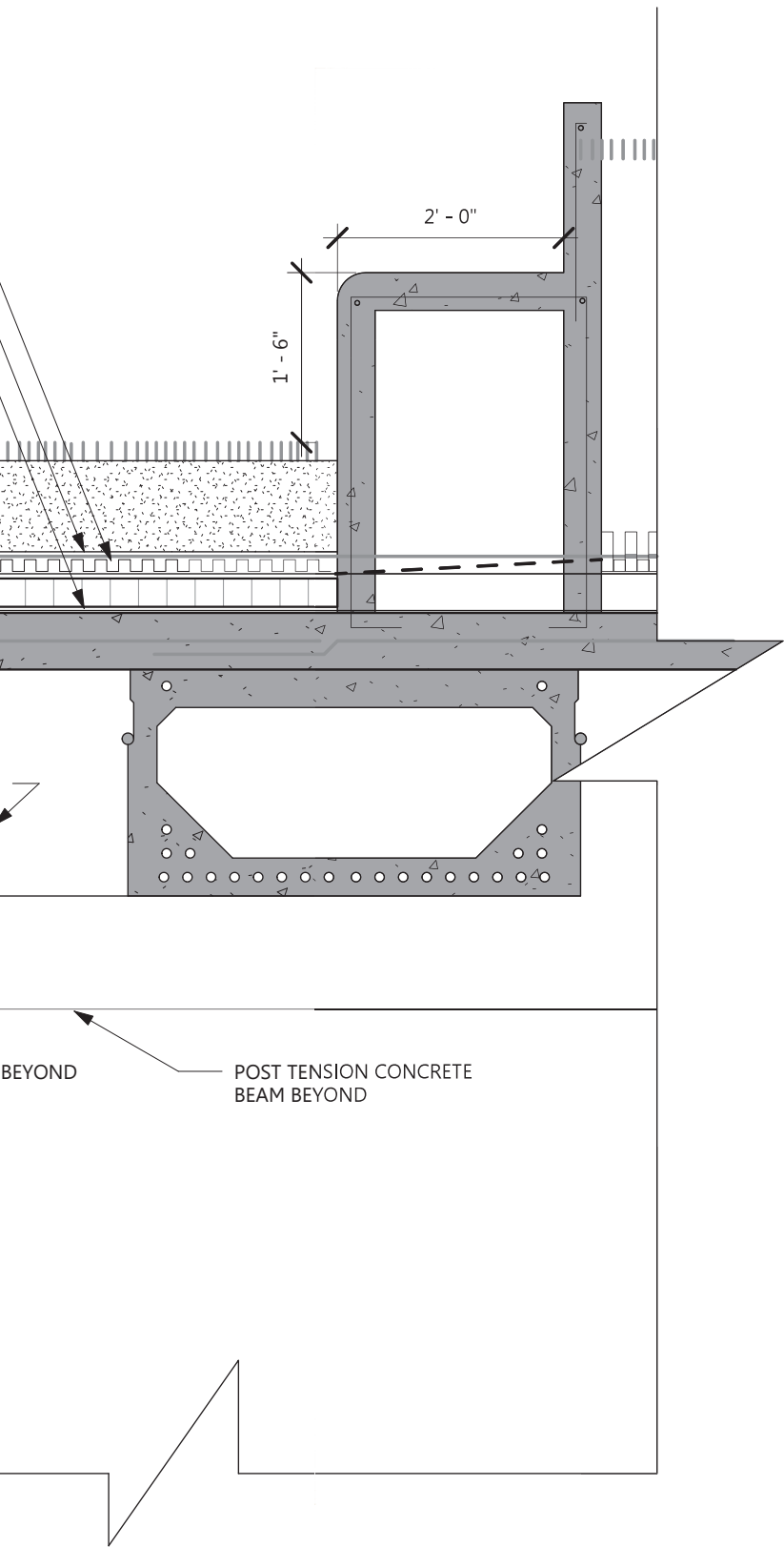












# CONCLUSION

The integration of high-speed rail travel in Texas presents a unique opportunity for economic growth, improved transportation, and sustainability. With an established infrastructure of stations and transit centers, cities and towns of all sizes can be interconnected, providing travelers with a faster, more efficient, and more convenient mode of transportation. With over 40 cities already located along the rail infrastructure, the integration of high-speed rail travel would have a significant impact on Texas's economy. Each of these cities would experience an economic boost as travelers flock to these stations, boosting local businesses and industries. Furthermore, the overall economy of Texas would also benefit from this development, as it would help create job opportunities and increase the demand for goods and services. The strategic placement of transit centers at key points such as Bryan, Texas, would be critical in ensuring the seamless integration of high-speed rail travel. By incorporating the Quadraxial fabric integration concept, tailored programs could be developed based on the unique context and site location of each station or transit center. This approach would further amplify the success of high-speed rail travel, benefiting both the local and state economies. In addition to the economic benefits, the integration of high-speed rail travel would also have numerous sustainability advantages. The use of high-speed rail travel could significantly reduce the carbon footprint of transportation in Texas, leading to improved air quality and public health outcomes. Furthermore, the reduction in traffic congestion would enhance public safety, and the decreased demand for airport expansion would save the state from the cost and environmental impact of expanding existing airports or building new ones. In conclusion, the integration of high-speed rail travel in Texas would provide a fast, efficient, and sustainable mode of transportation, offering significant economic benefits and enhancing the quality of life for Texas residents. By leveraging the existing infrastructure and incorporating sustainability principles, the state can create a transportation system that benefits both the economy and the environment.

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